State of California
AIR RESOURCES BOARD

PUBLIC HEARING TO CONSIDER THE PROPOSED UPDATES TO THE SUGGESTED CONTROL MEASURE FOR ARCHITECTURAL COATINGS

STAFF REPORT FOR PROPOSED UPDATES TO THE SUGGESTED CONTROL MEASURE FOR ARCHITECTURAL COATINGS

DATE OF RELEASE: April 19, 2019

SCHEDULED FOR CONSIDERATION: May 23, 2019

Location**:**

California Environmental Protection Agency
California Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the California Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

CALIFORNIA
AIR RESOURCES BOARD

This Page Intentionally Left Blank

Table of Contents

LIST OF TABLES

LIST OF FIGURES

This Page Intentionally Left Blank

EXECUTIVE SUMMARY

Introduction

California Air Resources Board (CARB or Board) staff is proposing to update the Suggested Control Measure for Architectural Coatings (SCM). The proposed SCM would reduce emissions of volatile organic compounds (VOC) that result from the application of architectural coatings. The proposed SCM is not a formal regulation; it is a model rule that can be adopted by the local air pollution control and air quality management districts (APCD/AQMD or district) that need to reduce VOC emissions to improve air quality. This Staff Report presents the staff's proposed updates to the SCM for Architectural Coatings.

Since the proposed SCM is a model rule, rather than a formal regulation, CARB staff is not required to prepare an Initial Statement of Reasons or a Final Statement of Reasons to respond to public comments. Instead, staff has prepared this Staff Report that is similar to an Initial Statement of Reasons and addresses comments that were received during the development process. In this Staff Report, staff presents their rationale for the proposed update to the SCM.

Background

Architectural coatings are products that are applied to stationary structures and their accessories. They include house paints, stains, industrial maintenance coatings, traffic coatings, and many other products. When these coatings are applied, VOCs are emitted from the coatings and from solvents that are used for thinning of the coatings and clean-up of the application equipment.

Control of VOC emissions from architectural coatings is primarily the responsibility of the air districts. CARB serves as an oversight agency and provides assistance to the districts. One way that CARB provides assistance is by developing an SCM for architectural coatings. The SCM serves as a model rule that can be used by districts throughout California. CARB approved an SCM for architectural coatings in 1977 and updated it in 1985, 1989, 2000, and 2007. While CARB provides support to the districts by developing the SCM, the districts are ultimately responsible for adopting, implementing, and enforcing architectural coating rules in California.

Currently, 22 of the 35 air districts have architectural coating rules; 15 are based on the SCM that the Board approved in 2007, six are based on the 2000 SCM, and the South Coast AQMD Rule 1113 is more stringent than the 2007 SCM. The remaining 13 districts are covered by the United States Environmental Protection Agency (U.S. EPA) Architectural Coatings: National Volatile Organic Compounds Emission Standards (National Rule).

In the presence of sunlight, VOCs and nitrogen oxides (NO_x) undergo a series of chemical reactions to form ozone. VOC emissions from architectural coatings can also lead to the formation of particulate matter (PM). Ozone and PM are two of the most serious air pollutants in California. Ozone is a strong oxidizer that irritates the respiratory system, leading to a variety of adverse health effects. It also damages plant life and property. Particulate matter less than 10 microns in diameter can be inhaled deep into the lungs. PM exposure has also been associated with a wide range of adverse health impacts, including hospitalization and premature death. Since the use of architectural coatings generates air pollutants, CARB staff has worked with districts and other stakeholders to reduce emissions from architectural coatings and help districts achieve their air quality goals.

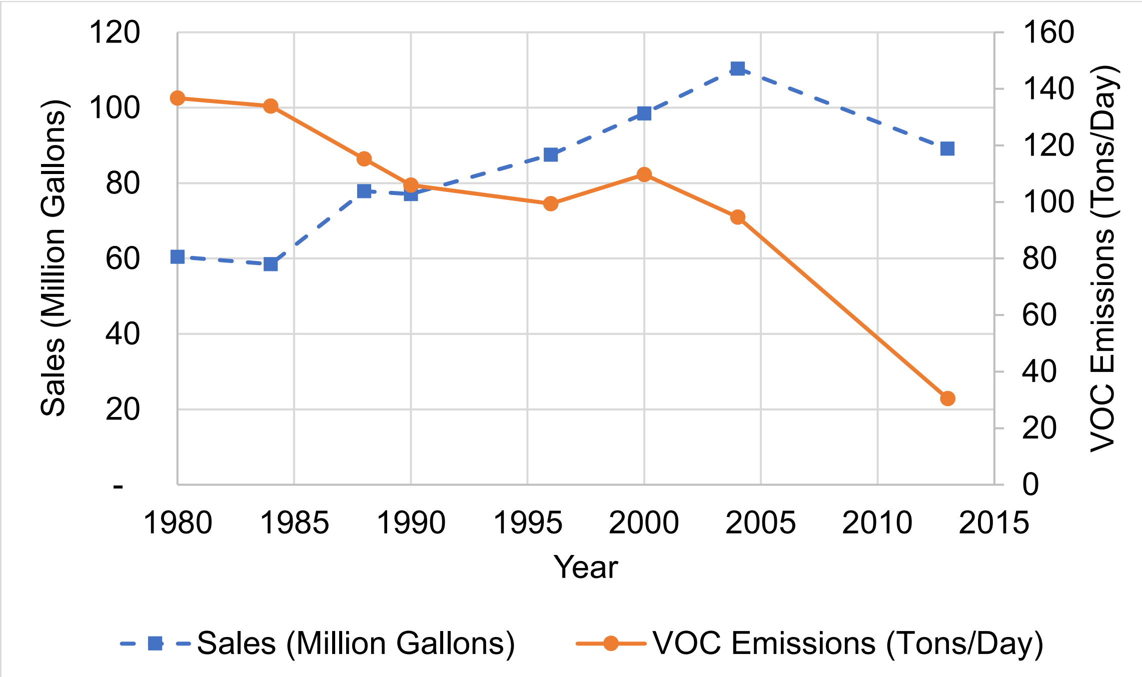
To protect California's population from the harmful effects of exposure to ozone and PM, CARB and the U.S. EPA have established air quality standards for these contaminants. Most of California's 35 local districts are classified as "nonattainment", because they do not meet State or federal ambient air quality standards for ozone and PM. For nonattainment districts, clean air laws require districts to develop plans to describe how they will attain ambient air quality standards. The California Clean Air Act requires nonattainment districts to prepare and submit plans for attaining and maintaining the State standards. The federal Clean Air Act requires districts to develop state implementation plans (SIPs) if they have not attained federal air quality standards.

Process for Developing the SCM

The proposed SCM was developed in cooperation with air districts and in consultation with industry stakeholders. CARB staff formed a district Working Group as part of the SCM development process.

CARB staff began by conducting a survey of coatings sold in California in calendar year 2013. Staff consulted with air districts and industry stakeholders throughout the survey process. In developing the proposal, staff analyzed the survey data and consulted with district staff and industry. To establish the proposed VOC limits in the proposed SCM, CARB staff conducted a detailed assessment of each coating category to determine the maximum emission reductions that are technically feasible and cost-effective.
Figure ES-1 presents a sales trend from the results of the current and previous surveys. It is noteworthy, that emissions of architectural coatings have decreased significantly since the last survey in 2004.

Figure ES-1
Sales and Emissions Trends



Objectives of the Proposed Updates

The proposed SCM will update the 2007 SCM to reflect current coatings technology. A key objective of the SCM is to promote consistency and uniformity among district rules. This consistency makes it easier for manufacturers and painting contractors to comply with district rules.

Architectural coatings represent a significant source of VOC emissions throughout California. The proposed SCM will further decrease VOC emission from the use of these coatings which will assist air districts efforts to meet the ambient air quality standards. One district included control measures for architectural coatings in their 2016 Ozone SIP. Other districts may include control measures for architectural coatings when they prepare future air quality management plans. Also, air districts are required to implement all feasible measures to continue progress towards attaining both the federal and State ozone standard. The proposed SCM will help districts meet these goals by achieving additional reductions from the use of architectural coatings.

The proposed SCM is primarily intended for the 21 districts that have rules based on the SCM. In addition, the proposed SCM is intended for districts that may need to adopt a new architectural coating rule to achieve VOC emission reductions and meet ambient air quality standards.

The South Coast AQMD (South Coast AQMD) Rule 1113 includes VOC limits that are, in some cases, more stringent than the proposed SCM (see Chapter IV). CARB staff and the district Working Group reviewed South Coast AQMD Rule 1113 limits as part of the technical feasibility assessment for the proposed SCM. The 21 districts with an SCM-based rule encompass about 55 percent of California's population, and the South Coast AQMD accounts for another 43 percent. The remaining districts account for about two percent of the State's population. Architectural coatings sold in these areas must meet the VOC limits in the National Rule for architectural coatings.

Overview of the Proposed Updates

In general, manufacturers will comply with the VOC limits by reformulating their products to replace some of the VOC solvent with water or exempt compounds. Manufacturers may also modify their formulations by increasing the amount of resin and pigment solids contained in the coatings. However, many manufacturers already have large volumes of complying products, and no reformulation would be required to meet the proposed limits.

The proposal consists of lowering VOC limits for several existing coating categories and setting VOC limits for three new categories. The proposal also establishes VOC limits for colorants. The proposed limits align with the existing limits in South Coast AQMD rule 1113. Once the SCM is implemented by air districts, the proposed SCM would increase the uniformity of the districts' architectural coatings rules.

In addition, staff is proposing three new definitions and several updates to existing definitions. The proposal also includes updates to several test methods to reflect the latest versions. Additionally, the proposal includes an anti-bundling provision to prevent bundling of exempt small containers to avoid meeting coating category limits. Table ES-1 below shows the proposed VOC content limits for the three new categories of architectural coatings and lower VOC limits for nine existing coating categories. The district Working Group assisted CARB staff in the development of the proposed SCM. The draft proposed updates to the 2007 SCM were jointly developed with the working group.

Table ES-1
Proposed VOC Limits

Coating Category	Current Limit (g/l)[2]	Proposed Limit (g/l)[2]	Rule 1113 Limits (g/l)[2]
New Coating Categories:			
Building Envelope Coatings	NA	50	50
Stains, Interior[1]	250	250	250
Tile and Stone Sealers	100	100	100
Existing Coating Categories:			
Aluminum Roof Coatings	400	100	100
Dry Fog Coatings	150	50	50
Fire Resistive Coatings	350	150	150
Floor Coatings	100	50	50
Form Release Compounds	250	100	100
Nonflat Coatings	100	50	50
Nonflat - High Gloss Coatings	150	50	50
Stains	250	100	100
Waterproofing Membranes	250	100	100
Colorants added to:			
Architectural Coatings, excluding IM Coatings	NA	50	50
Solvent-Based IM	NA	600	600
Waterborne IM	NA	50	50
Wood Coatings	NA	600	50

1. The 2007 SCM category for Stains included Interior Stains.
2. Limits are VOC Regulatory, less water and exempt compounds.

New Coating Categories

The proposed SCM establishes VOC limits for three new categories: Building Envelope Coatings, Interior Stains, and Tile and Stone Sealers. The existing VOC limit of 250 grams per liter remains applicable for Interior Stains. Dual purpose stains intended for both exterior and interior applications would be required to meet the VOC limit for Stains. The VOC limits for the three new are categories are in Table ES-1.

Colorants

The proposed SCM also sets VOC limits for Colorants added to architectural coatings. VOC limits are proposed for colorants added to architectural coatings. A VOC limit of 50 grams per liter is proposed for colorant added to architectural coatings not meeting the definition of Industrial Maintenance Coatings or Wood Coatings. For architectural coatings meeting the definition of Industrial Maintenance Coatings, separate limits are proposed for solvent-based and waterborne coatings. Table ES-1 presents the VOC limits for colorants.

Proposed Changes to Existing Coating Categories

In addition to establishing new categories, the proposed SCM includes proposed revised VOC limits for nine of the existing categories. The proposed revised VOC limits are equivalent to VOC limits already in effect in the South Coast AQMD. Table ES-1 lists the categories and the proposed revised VOC limits.

Other Coating Categories

As part of the SCM development process, staff discussed with the Air District Working Group whether to pursue lower VOC limits for additional categories. It was agreed that many of the existing category limits are as low as they can go. Also, many of the categories are relatively small but contain significant numbers of products that would have to be reformulated if limits were reduced. Some of these categories offer minimal emission reduction benefits but come at a high cost for reformulation.

Staff considered lowering VOC limits for several other categories but decided not to propose lower limits because of toxicity concerns with exempt compounds that are used to achieve lower VOC levels. For Zinc Rich Primers, Metallic Pigmented Coatings, and Rust Preventative Coatings it appears that exempt compounds such as tertiary-Butyl acetate (TBAc) and Parachlorobenzotrifluoride (PCBTF) are relied upon to achieve lower VOC levels. Staff considered lower VOC limit for Industrial Maintenance Coatings as well. While this category employs less exempts it still relies on these compounds to formulate higher performance products.

In 2004, U.S. EPA exempted TBAc as a VOC due to determination that TBAc has low photochemical reactivity and low potential for adverse environmental impacts. Some air districts have adopted a partial or full VOC exemption for TBAc in their architectural coatings rules. California's Office of Environmental Health Hazard Assessment (OEHHA) is concerned about the carcinogenicity of tertiary-butanol (TBA), which is the primary metabolite of TBAc in rodents (Cruzan and Kirkpatrick, 2006). It is also the presumed primary metabolite in humans based on rodent data for TBAc (Hong et al., 1997). OEHHA's basis for evaluating the carcinogenicity status of TBAc is the National Toxicology Program (NTP) long-term carcinogenicity bioassay of TBA in rats and mice. After analyzing a National Toxicology Program (NTP) bioassay for TBA, OEHHA has concluded that the data are sufficient to conclude that TBA is a carcinogen, and thus, TBAc should be considered a carcinogen (OEHHA, 2018). In 2018, OEHHA adopted a cancer inhalation unit risk and slope factors and cancer oral slope factor for TBAc (OEHHA, 2018).

CARB staff is also aware of concerns regarding the potential health impacts that may result from using PCBTF. PCBTF is widely used as a solvent in coating resins such as epoxy and acrylics (NTP, 2018). It is a combustible, clear, colorless liquid with an aromatic odor (Merck, 2006). PCBTF is insoluble in water, making it unsuitable for waterborne coatings. PCBTF is used primarily in rust preventative coatings and zinc-rich primers.

In 1994, U.S. EPA exempted PCBTF from their list of VOCs primarily to replace the use of hazardous air pollutants 1,1,1-trichloroethane and xylene (CARB, 2001a). PCBTF is exempt in all architectural coatings rules in California. However, a recent study conducted by NTP determined PCBTF to be a potential carcinogen (NTP, 2018). Based on this new data, SCAQMD requested OEHHA in April 2018 to evaluate the health data regarding the cancer potency of PCBTF (SCAQMD, 2018). Additionally, OEHHA published a notice of intent to list PCBTF on Proposition 65, formally known as the Safe Drinking Water and Toxic Enforcement Act, on November 2018. Along with listing PCBTF on Proposition 65, OEHHA is currently conducting a review of the available health data to determine whether PCBTF is a human carcinogen.

CARB staff is not proposing to remove the VOC exempt status of PCBTF at this time. OEHHA is expected to complete their determination in 2020 and SCAQMD will be re-evaluating their exemptions of TBAc and PCBTF once OEHHA has made a determination for PCBTF. Since OEHHA has finalized the cancer unit risk factor for TBAc districts may choose to reevaluate TBAc exemption status for certain applications. CARB staff encourages districts to conduct their own analyses to determine whether the use of TBAc would pose unacceptable exposures and risk. CARB staff will monitor OEHHA's evaluation of PCBTF and future district actions regarding the VOC exempt status of both PCBTF and TBAc.

In addition, Staff considered to split the Concrete Curing Compounds category similar to the categories in South Coast AQMD Rule 1113. The analysis showed there would be minimal emission benefits from changing this category. Therefore, the proposed SCM does not change the Concrete Curing Compounds category. See Chapter V for a list of categories staff is not proposing changes to the VOC limits.

Industry Concerns on Proposed VOC Limits

Industry representatives expressed several concerns on some of the proposed limits. In order to meet the low VOC limits for many of the coating categories, the coatings will need to be waterborne instead of solventborne. Industry representatives stated that in some instances, the waterborne coatings are lower performing products by providing less durability, less life expectancy, or a less desired appearance. The effectiveness of waterborne coatings are also affected by climatic conditions, such as cold or wet climates. Some of the proposed VOC limits affect categories that include coatings used to protect critical infrastructure. Industry representatives acknowledge these issues do not apply to areas adjacent to the South Coast AQMD, since the climatic conditions for these areas are similar to the South Coast AQMD. Detailed discussions about the specifics of these issues are discussed in Chapter V.

Air Quality Benefits

The proposed SCM reduces VOC emissions by 1.46 tons per day (TPD) from 2007 SCM areas and 2.5 tons per day statewide in 2022. Table ES-2 includes the reductions for each category. Because the proposed SCM VOC limits are no more stringent than those in effect in the South Coast AQMD, no reductions would be achieved in the South Coast AQMD. Staff anticipates the proposed SCM would result in a VOC reduction of 2.5 tons per day statewide, except in the South Coast AQMD.

Table ES-2
Complying Marketshare and Estimated Emission Reductions

Coating Category	% Complying Market Share (excl quarts)	Emission Reductions in 2007 SCM areas TPD**	Emission Reductions Statewide TPD**
New Coating Categories:			
Building Envelope Coatings	84	0.01	0.01
Stains: Interior	88	0	0.08
Tile and Stone Sealers	100	0	0
Existing Coating Categories:			
Aluminum Roof	70	0.20	0.27
Dry Fog Coatings	67	0.03	0.05
Fire Resistive Coatings	67	0.02	0.02
Floor Coatings	75	0.01	0.04
Form Release Compounds	83	0.08	0.18
Nonflat Coatings	93	0.41	0.67
Nonflat - High Gloss Coatings	84	0.02	0.16
Stains	73	0.43	0.67
Waterproofing Membranes	67	0.11	0.20
Colorants added to:		0.14	0.15
Architectural Coatings, excluding IM Coatings			
Solvent-Based IM			
Waterborne IM			
Wood Coatings			
Total	NA	**1.46**	**2.50**

Staff Recommendation

Staff recommend the Board approve the proposed SCM and direct staff to transmit the SCM to the air districts for their consideration when updating their architectural coatings rules.

CHAPTER I. INTRODUCTION AND BACKGROUND

A. Introduction

Architectural coatings are products that are applied to stationary structures and their accessories. They include house paints, stains, industrial maintenance coatings, traffic coatings, and many other products. When these coatings are applied, volatile organic compounds (VOCs) are emitted from the coatings and from solvents that are used for thinning and clean-up.

Control of VOC emissions from architectural coatings is primarily the responsibility of the local air pollution control and air quality management districts (APCD/AQMD or district). The California Air Resources Board (CARB or Board) is responsible for serving as an oversight agency and providing assistance to the air districts. One way that CARB provides assistance is by developing a SCM for architectural coatings. The SCM serves as a model rule that can be used by air districts throughout California. CARB approved a SCM for architectural coatings in 1977 and, as technology advanced, updated it in 1985, 1989, 2000, and 2007. While CARB provides support to the air districts by developing the SCM, the air districts are ultimately responsible for adopting, implementing, and enforcing architectural coating rules in California. Staff is proposing to update the 2007 SCM to reflect the continued changes in coating technology.

B. Background

Currently, 15 California air districts have adopted architectural coating rules based on the SCM that the Board approved in 2007. Six additional air districts have architectural coating rules based on the 2000 SCM and California's 13 remaining air districts are covered by the National Rule. The National Rule was finalized in September 1998 and became effective throughout the country, including all California air districts, on September 13, 1999. In addition, the Ozone Transport Commission (OTC), which represents northeastern states, has developed a model rule for architectural coatings based in part on the 2007 SCM. Environment Canada (EC) has also indirectly relied on the SCMs. The EC regulation is based on an earlier version of the OTC model rule which relied on the 2000 SCM.

The proposed SCM (see Appendix A) will update the 2007 version of the SCM (see Appendix B). The proposed SCM lowers the VOC limits and clarifies definitions for many categories. Staff is also proposing the SCM to promote consistency and uniformity among air district rules. This consistency makes it easier for manufacturers and painting contractors to comply with air district rules. Rationale for the proposed updates to the 2007 SCM is provided in the following chapters.

C. Why Regulate Architectural Coatings?

Historically architectural coatings have represented a significant source of VOC emissions throughout California. VOC emissions from architectural coatings can lead to the formation of ozone and particulate matter (PM), two of the most serious air pollutants in California. Ozone is a strong oxidizer that irritates the respiratory system, leading to a variety of adverse health effects. It also damages plant life and property. Particulate matter less than 10 microns in diameter can be inhaled deep into the lungs. PM exposure has also been associated with a wide range of adverse health impacts, including hospitalization and premature death.

Through the ongoing efforts of CARB, VOC emissions from architectural coatings use in California have been reduced from an estimated 95 tons per day (tpd) in 2004 to an estimated 30 tpd on an annual average basis in 2013. Even with these significant reductions, California continues to have air quality problems that require unique strategies for meeting federal and State ambient air quality standards. In this section, staff provides an overview of these air quality problems and the need for emission reductions from all sources of air pollution, including architectural coatings.

1. Ozone

In the presence of sunlight, VOCs and nitrogen oxides (NO_x) undergo a series of chemical reactions to form ozone. The rate of ozone generation is related closely to the concentration of VOCs in the atmosphere, the types of VOCs that are present, the availability of NO_x, and meteorological conditions (U.S. EPA, 1996; Seinfeld and Pandis, 1998). Ozone is a colorless gas with a pungent odor, and is the chief component of urban smog. It is one of the State's more persistent air quality problems. Air quality data has revealed that over 90% percent of Californians, or 34 million people, live in areas designated as nonattainment for the federal 8-hour ozone standard based on the 2010 census data. In addition, California has eight of the top ten areas in the United States with the highest levels of ozone (U.S. EPA, 2018).

It is well documented that ozone adversely affects the respiratory functions of humans and animals. In some animal studies, changes to lung structure were observed with long-term exposure to ozone concentrations above ambient; these changes remained even after periods of exposure to clean air (U.S. EPA, 1996; U.S. EPA, 2006). Ozone is a strong irritant that can cause a number of adverse health effects. Human exposure studies show that 6.6-hour to 8-hour exposures to ozone at 0.08 ppm can induce acute reduction in lung function, airways inflammation, and symptoms of respiratory irritation such as cough and chest tightness, and increased asthma symptoms (CARB, 1997; CARB and OEHHA, 2000; U.S. EPA, 1996; U.S. EPA 2006). Ozone in sufficient doses can also increase the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. Other health effects that have been associated with ozone exposure are increased school absences, hospitalization for worsening of pre-existing heart and lung diseases, and premature death (CARB, 2005a).

Because the majority of ozone exposure occurs outdoors, the greatest risk is to people who are active outdoors during smoggy periods, such as children, athletes, and outdoor workers. Recent evidence also suggests that ozone may be linked to the onset of new asthma in very active children who reside in high ozone communities (McConnell et al., 2002).

Not only does ozone adversely affect human and animal health, but it also affects vegetation throughout most of California, resulting in disfiguration or unsatisfactory growth in ornamental vegetation, reduced yield and quality in agricultural crops, and damage and death to native plants. During the summer, ozone levels are often highest in the urban centers in Southern California, the San Joaquin Valley, and the Sacramento Valley. These are adjacent to the principal production areas in the State's multibillion-dollar agricultural industry (USDA, 2006). CARB studies indicate that ozone pollution damage to crops is estimated to cost agriculture over $500 million annually (CARB, 1987; CARB, 2006b).

2. Particulate Matter

VOC emissions from architectural coatings contribute to the formation of PM. PM is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in size, shape, and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. PM can be emitted directly from sources (e.g., diesel engine exhaust) or can be produced indirectly from sources emitting gases, including VOCs that are converted to PM by atmospheric processes. PM particles that are 10 microns or less in diameter are called "PM10", while particles that are 2.5 microns or less in diameter are called "PM2.5". PM, particularly PM2.5, contributes significantly to regional haze and reduction of visibility in California. In addition, the acidic portion of PM (nitrates, sulfates) can harm crops, forests, aquatic environments, and other ecosystems (CARB, 2002).

Both PM10 and PM2.5 can be inhaled deeply into the lungs. Extensive research indicates that exposure to PM is associated with increased risk of: hospitalization for worsening of chronic lung and heart diseases; emergency room and urgent care visits for asthma exacerbation; worsened asthma and bronchitis symptoms; and increased premature death, particularly in elderly people with pre-existing heart and lung disease. Certain populations, including the elderly, people with lung or heart disease, infants, children, and asthmatics, are at increased risk of experiencing adverse effects with exposure to PM. In children, several studies have shown associations between chronic PM exposure and reduced lung function growth and increased school absences. PM exposure can also lead to increased use of bronchodilator medications in asthmatic children (CARB, 2002).

D. Air Quality Standards

To protect California's population from the harmful effects of ozone and PM, CARB and U.S. EPA have established ambient air quality standards for these contaminants. Most of California's 35 air districts are classified as "nonattainment", because they do not comply with State or federal ambient air quality standards for ozone and PM. For nonattainment air districts, clean air laws require air districts to develop plans to describe how they will attain ambient air quality standards. Appendix C contains a detailed discussion of air quality standards and air districts that have been designated as "nonattainment", because they exceed these standards. The California Clean Air Act requires nonattainment air districts to prepare and submit plans for attaining and maintaining the State standards. The federal Clean Air Act requires air districts to develop state implementation plans (SIPs) if they have not attained federal air quality standards. These SIPs include control measures that explain the air districts' plans for adopting new or modified rules to achieve emission reductions.

In many of the nonattainment air districts, substantial VOC emission reductions are needed to achieve and maintain air quality standards. Reductions are achieved by implementing rules that target sources of VOC emissions. The proposed SCM for architectural coatings is intended to assist air districts by providing a model rule that will reduce VOC emissions and help them attain the ozone and PM ambient air quality standards.

The proposed SCM is primarily intended for the 21 air districts that currently have a rule based on the SCM. In addition, the proposed SCM is intended for air districts that may need to adopt a new architectural coating rule to achieve VOC emission reductions and meet air quality standards. The South Coast AQMD is not expected to adopt the proposed SCM because its architectural coatings Rule 1113 includes VOC limits that are at least as stringent as the proposed SCM. The 21 air districts with an SCM based rule encompass about 55 percent of California's population, and the South Coast AQMD accounts for another 43 percent. The remaining two percent of the State's population is covered by the National Rule for architectural coatings.

Currently, Ventura County APCD has commitments based on their 2016 SIP and they will be updating their rule based on the SCM updates. As the proposed SCM is not as stringent as SC Rule 1113, Ventura may decide to fully implement VOC limits based on South Coast AQMD Rule 1113 as they have similar climatic conditions and the same coating distributors that supply South Coast also supply Ventura.

San Diego County APCD has also expressed that they are planning to update their SIP in 2019. As additional counties plan and update their own SIPs in the future, the updated SCM will be available for their adoption. The proposed SCM will help air districts meet their VOC emission reduction goals. Chapter II contains a discussion of VOC emissions and the expected emission reductions from the proposed SCM.

E. Architectural Coatings Regulatory History

1. CARB's Suggested Control Measure (SCM)

Widespread regulation of emissions from architectural coatings in California began with the approval of the SCM for architectural coatings by CARB in 1977. Subsequently, many of the air districts adopted rules based on this SCM. CARB's SCM was updated in 1985, 1989, 2000, and 2007. Many air districts adopted or amended their architectural coatings rules after these revisions to the SCM. Air districts have also revised their rules independent of changes to the SCM.

Currently, 15 of California's 35 air districts have an architectural coatings rule based on the 2007 SCM, and six air districts have an architectural coatings rule based on the 2000 SCM. The South Coast AQMD has its own architectural coatings rule, Rule 1113. These 15 air districts, listed in Table 1-1, encompass about 53 percent of California's population and the South Coast AQMD accounts for another 43 percent. Therefore, 96 percent of the State's population has an architectural coating rule that is more stringent than the National Rule (See Section 1.D.4). Appendix D lists the current VOC limits for the 2007 SCM, South Coast AQMD Rule 1113, and the National Rule.

Table 1-1
California Air District Architectural Coatings Rules[1]

Air District	Architectural Coating Rule	% of State Population
2007 SCM		
Antelope Valley AQMD	Rule 1113	1.0%
Bay Area AQMD	Rule 8-3	18.9%
El Dorado County AQMD	Rule 215	0.5%
Feather River AQMD	Rule 3-15	0.4%
Imperial County APCD	Rule 424	0.5%
Kern County APCD	Rule 410.1	0.3%
Mojave Desert AQMD	Rule 1113	1.4%
Monterey Bay Unified	Rule 426	2.0%
Placer County APCD	Rule 218	0.9%
Sacramento Metropolitan AQMD	Rule 442	3.8%
San Diego County APCD	Rule 67.0	8.4%
San Joaquin Valley Unified APCD	Rule 4601	10.3%
Santa Barbara County APCD	Rule 323	1.1%
Ventura County APCD	Rule 74.2	2.2%
Yolo-Solano AQMD	Rule 2.14	0.9%
2000 SCM		
Butte County AQMD	Rule 230	0.6%
Colusa County APCD	Rule 2.26	0.1%
Northern Sonoma APCD	Rule 485	0.1%
San Luis Obispo County APCD	Rule 433	0.7%
Shasta County AQMD	Rule 3:31	0.5%
Tehama County APCD	Rule 4:39	0.2%
Total	NA	**54.8%**

1. Does not include South Coast AQMD

2. South Coast AQMD Rule 1113

The South Coast AQMD amended its rule numerous times since it was originally adopted. The amendment in June 2006 clarified the definitions of several coating categories, exempted TBAc for use in industrial maintenance coatings, lowered the VOC limits for concrete curing compounds, dry-fog coatings, and traffic coatings, and set interim limits for non-flat high gloss, quick dry enamels, and specialty primer/sealer/undercoaters (SCAQMD, 2006). The rule was amended again in 2007 (SCAQMD, 2007). In a 2011 amendment South Coast AQMD added colorants to the rule. It set VOC limits for colorants that are added to the coatings at the point of sale. The latest amendment in February 2016, included further reductions in the allowed VOC of several coating categories, removal of the small container exemption for some categories, and the addition of test methods to better address the determination of VOC content of low VOC coatings (SCAQMD, 2016).

3. Other States' Rules

In October 2000, the State and Territorial Air Pollution Program Administrators/ Association of Local Air Pollution Control Officials (STAPPA/ALAPCO) issued a model rule identical to ARB's 2000 SCM. The adoption of this rule was recommended for all states or local air districts with the caveat that certain local conditions may not warrant the adoption of some of the SCM limits (STAPPA/ALAPCO, 2000).

The Ozone Transport Commission (OTC) adopted the STAPPA/ALAPCO model rule as its model rule in 2002 with some modifications. The OTC set the VOC limit effective dates for January 1, 2005 to provide sufficient lead time for manufacturers. The OTC recently updated its 2002 model rule to be similar to the 2007 SCM with some modifications, effective January 1, 2014 (OTC, 2014). The OTC created separate categories for conversion varnishes, concrete surface retarders, thermoplastic rubber and mastic coatings, calcimine recoaters, nuclear coatings, and impacted immersion coatings, with limits identical to those in the U.S. EPA National Rule, and exempted the latter five categories from the Most Restrictive VOC Limits provision (OTC, 2014). Currently, four out of thirteen OTC states have adopted the OTC 2009-12 Model Rule and New York is proposing to adopt the most recent OTC Model Rule. Two out of six Lake Michigan Air Directors Consortium (LADCO) states have adopted the OTC 2002 Model Rule.

4. U.S. EPA's National Architectural Coatings Rule

In the 1990 Clean Air Act Amendments, the U.S. Congress enacted section 183(e), which established a new regulatory program for controlling VOC emissions from consumer and commercial products. Section 183(e) directs the U.S. EPA Administrator to determine the ozone-forming potential of these products, and to prioritize the need for regulation of these products. Architectural coatings were in the first group of products to be regulated.

The U.S. EPA proposed a draft rule in June 1996 that established specific VOC limits for various categories of architectural coatings. The U.S. EPA Architectural Coatings:

National Volatile Organic Compounds Emission Standards (National Rule) was finalized in September 1998. The National Rule went into effect throughout the country, including all California air districts, on September 13, 1999.

The National Rule contains over 20 categories that are not typically included in air district rules as specific categories. These categories are typically included in general categories, such as Flat Coatings and Nonflat Coatings. Almost all of the VOC limits listed in the National Rule are less stringent than those of the 2007 SCM. In addition, for many of the categories that are in both the air district rules and the National Rule, the National Rule has definitions that differ significantly from those of the air district rules. The applicable VOC limits in the National Rule are listed in Appendix D and are compared to the proposed SCM in Chapter IV.

The U.S. EPA had planned to update the National rule in 2007. The limits proposed in that update were expected to reflect those limits found in the 2002 OTC model rule. However, the National Rule has not yet been updated.

CHAPTER II. EMISSIONS & REDUCTIONS

A. Estimated Emissions from Architectural Coatings

Emissions of VOCs in California from the use of architectural coatings, including colorants, are estimated to be about 32 tons per day (tpd) on an annual average basis in 2013, and 44 tpd of associated solvent thinning and cleanup activities are included. The South Coast AQMD accounts for 11 tons per day, excluding colorants and solvent thinning and cleanup. As shown in Table 2-1, total emissions from architectural coatings and associated materials represent about five percent of the total VOC emissions from stationary and area sources, and 2.6 percent of all VOC emissions statewide. The VOC emissions from architectural coatings are almost the same as VOC emissions from oil and gas production and more than the VOC emissions from petroleum refining. Detailed emissions data for individual coating categories are provided in Chapter V and Appendix H.

Table 2-1
California Emission Inventory Data

Category	2013 VOC Emissions (tons/day, Summer)
Stationary Sources	**383**
Fuel Combustion	28
Waste Disposal	54
Cleaning and Surface Coatings	141
Petroleum Production and Marketing	105
Industrial Processes	54
Area-Wide Sources	**511**
Consumer Products	202
Architectural Coatings & Related Process Solvent	**44**
Pesticides/Fertilizers	61
Asphalt Paving/Roofing	30
Residential Fuel Combustion	13
Farming Operations	128
Fires	1
Managed Burning and Disposal	25
Cooking	6
Mobile Sources	**788**
Total – All Sources	**1,682**

Note: Emissions data for architectural coatings are from the 2014 Survey (Appendix H). The remaining data, including Consumer Products emissions, are from CARB CEPAM: 2016 SIP – Standard Emission Tool (CARB, 2018).

Emissions from architectural coatings are estimated from surveys of architectural coatings sales in California. CARB has conducted eight surveys over the past 30 years which collected sales and emissions data for coatings sold in California in 1975, 1980, 1984, 1988, 1990, 1996, 2000, 2004, and 2013.

In 2014, CARB conducted a survey to collect data on architectural coatings sold during calendar year 2013 (Appendix H). Notifications of the survey were emailed to companies that potentially sold architectural coating products in California. General notification was also done via the list serve for architectural coatings which has over 3000 subscribers. The survey was conducted primarily using electronic forms (tool) developed in consultation with stakeholders. Staff received 172 responses from 161 companies, comprising either survey data or a form to explain why companies were not submitting data. Survey data from nine companies were not included in the data analysis due to incomplete surveys. Reasons for not submitting data included:

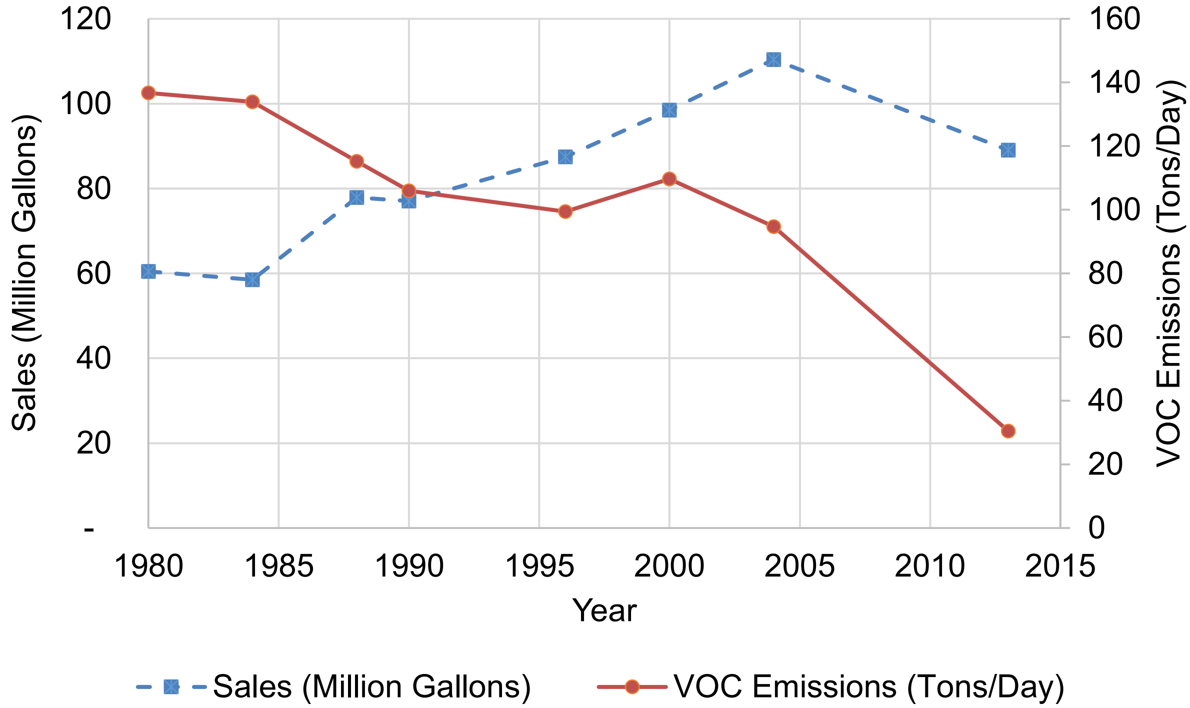
- They did not have any sales of architectural coatings in California during 2013;
- They did not manufacture architectural coatings; or
- Their sales were being reported by another company.

To ensure that these data were representative of the California market, staff compared the sales from CARB's survey to nationwide census data. Staff assumed that California shipments are proportional to California's share of the national population which is approximately equal to 12 percent of the nationwide sales for architectural coatings. Staff found that the survey sales volume is similar to the estimate based on census data. Therefore, staff believes the survey reasonably captures the California sales of architectural coatings.

In many cases, parent companies submitted data for multiple divisions or for subsidiaries. When compiling the summary list of companies, staff consolidated all submittals under one company name. In summary, a total of 161 companies submitted data. Draft survey data were compiled and summary results were made available for public review in December 2017.

Table 2-2 compares the 2014 Survey results for architectural coatings sold in 2004 and 2013 and Figure 2-1 illustrates the sales and emissions trends for architectural coatings. The sales volume for architectural coatings decreased from more than 110 million gallons in 2004 to over 89 million gallons in 2013, about a 19 percent decrease. However, the total VOC emissions for architectural coatings decreased from 95 tpd from 2004 to just over 30 tpd in 2013, a reduction of 67 percent. Contributing factors for these large additional reductions include implementation of rules with lower VOC limits, increased consumer demand for low VOC coatings, and other factors. These emissions quantities do not include emissions from thinning solvents, cleanup solvents, or additives.

Figure 2-1
Sales and Emissions Trends



The survey data indicate that architectural coatings in California are continuing to shift toward waterborne products. From 2004, the percent of total sales volume attributed to waterborne coatings increased from 88 percent to 94 percent. During this same time period, the architectural coating emissions per capita and the average amount of VOCs per gallon of coating decreased by more than 60 percent.

Table 2-2
Summary Comparison Between 2005 and 2014 Surveys - Statewide Data

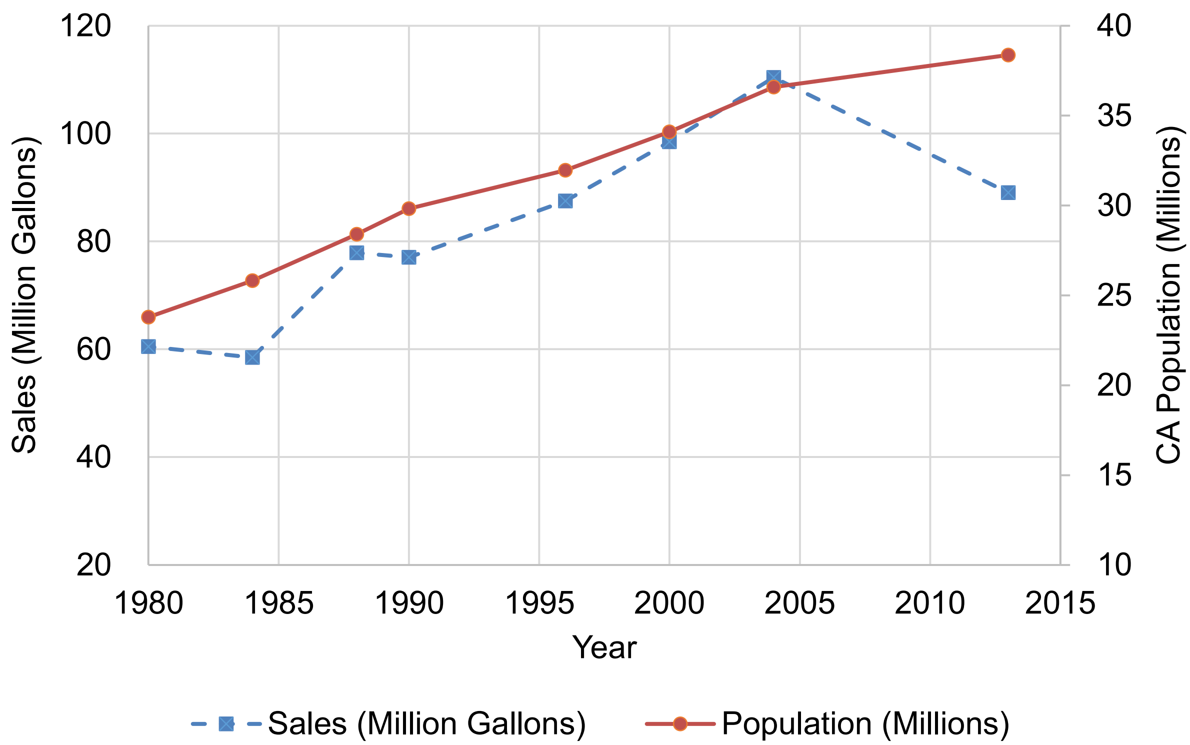
	2014 Survey (2013 Sales, including quarts)	2005 Survey (2004 Sales, including quarts)	Percent Change
COATING SALES VOLUME DATA			
Total Sales Volume Reported (gallons)	**89,071,627**	**110,407,721**	**-19%**
Waterborne Coating Sales Volume	83,367,037	97,354,686	-14%
Solventborne Coating Sales Volume	5,701,299	13,053,035	-56%
Percent Waterborne Sales	94%	88%	
Percent Solventborne Sales	6%	12%	
Coating Sales Volume Per Capita (gals per person)	2.2	3.1	
EMISSIONS DATA – COATINGS ONLY			
Total Coating Emissions (tons/day)	**30.45**	**95**	**-68%**
Waterborne Coating Emissions	14.64	45.7	-68%
Solventborne Coating Emissions	15.81	49.0	-68%
Percent Waterborne Emissions	48%	48%	
Percent Solventborne Emissions	52%	52%	
Emissions per capita (lbs VOC emitted per person)	0.5	1.9	
Emission Factor - Coatings Only (lb VOC/gal)	**0.25**	**0.63**	**-60%**
Waterborne Coating Emission Factor	0.13	0.34	-62%
Solventborne Coating Emission Factor	2.02	2.74	-26%
COLORANT SALES VOLUME DATA			
Total Sales Volume Reported (gallons)	**2,003,372**	NA	NA
Waterborne Colorant Sales Volume	612,373		
Solventborne Colorant Sales Volume	35,608		
Universal Colorant Sales Volume	1,355,391		
Percent Waterborne Sales	31%		
Percent Solventborne Sales	2%		
Percent Universal Sales	68%		
COLORANT EMISSIONS DATA			
Total Colorant Emissions (tons/day)	**1.13**	NA	NA
Waterborne Colorant Emissions	0.39		
Solventborne Colorant Emissions	0.13		
Universal Colorant Emissions	0.61		

Notes:

1. CA Population in 2004 = 36,506,000 (DOF, 2006).
2. CA Population in 2013 = 40,628,000 (DOF, 2016).
3. Emissions data are on an "Annual Average" basis.
4. Sales volume reflects a market adjustment factor of 1.1 for market coverage.

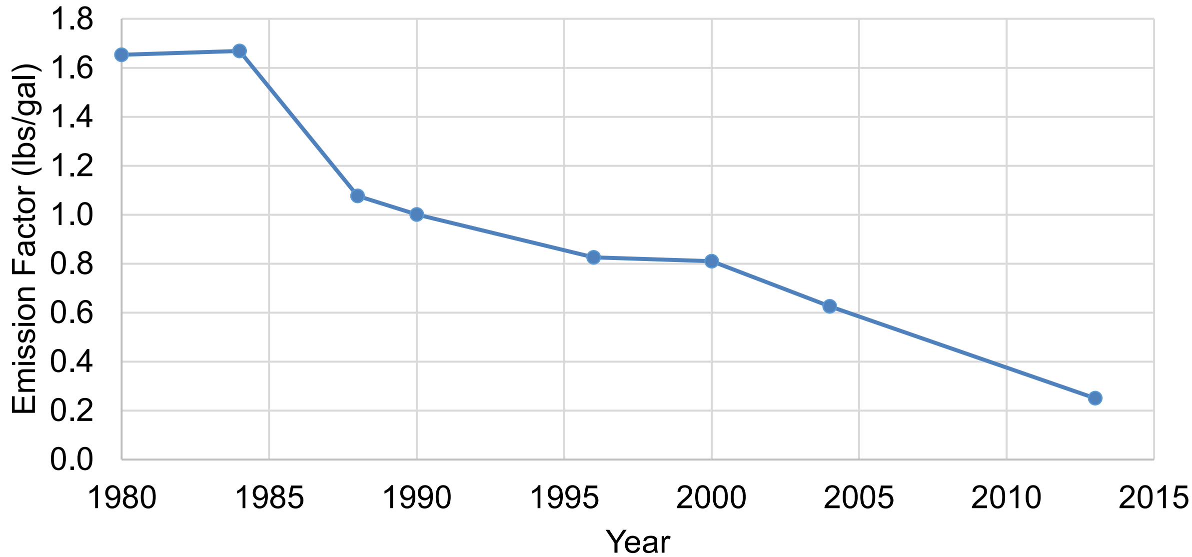
The population in California has steadily grown. Figure 2-2 shows the historic trend for California Population and architectural coatings sales. Sales has increased as population has increased, approximately at the rate of one percent per year. The housing market bubble in 2007 and subsequent recession impacted this trend with a decrease in architectural coating sales volumes mirroring a decline in new home sales. As the housing market recovers, it is anticipated that coatings sales volumes will increase as population increases. Between 2004 and 2013, California's population climbed 11 percent, while California's coating sales decreased 19 percent. Also, from 2004 to 2010, nationwide sales of architectural coatings decreased 19 percent (U.S. Census, 2011), consistent to the trend in California.

Figure 2-2
Architectural Coatings Sales and Population Trends



The amount of VOCs emitted per gallon of architectural coating has continually decreased over time due to manufacturer reformulations. In 1980, the average emission factor for architectural coatings was approximately 1.7 pounds of VOC per gallon of coating. Data from the 2014 Survey showed this value had dropped approximately to 0.3 pounds of VOC per gallon of coating. Figure 2-3 displays the VOC emission factor trend for architectural coatings over time.

Figure 2-3
Architectural Coatings VOC Emission Factor Trends



Emissions data from the 2014 Survey are provided in Table 2-3. The total number of architectural coatings products reported was 18,745, with a total of 89 million gallons sold in 2013.

Table 2-3
Sales and VOC Emissions by Product Category (Includes Small Containers)[3]

Coating Category	# Products	2013 Sales [1] (Gallons)	SWA VOC Reg. [2] (g/l)	VOC Emissions (tons/day)	% Small Containers
Flat Coatings	2,539	27,082,572	32	3.65	3%
Nonflat Coatings	3,842	30,697,959	33	4.62	6%
Nonflat – High Gloss Coatings	539	983,489	71	0.41	9%
Specialty Coatings					
Aluminum Roof	21	208,760	146	0.31	PD
Basement Specialty Coatings	13	PD	PD	PD	PD
Bituminous Roof Coatings	22	2,106,442	4	0.07	PD
Bituminous Roof Primers	15	34,758	241	0.1	PD
Bond Breakers	2	PD	PD	PD	PD
Building Envelope Coatings	20	79,224	27	0.01	PD
Concrete Curing Compounds	107	1,316,050	124	0.9	PD

Table 2-3
Sales and VOC Emissions by Product Category (Includes Small Containers)

Coating Category	# Products	2013 Sales [1] (Gallons)	SWA VOC Reg. [2] (g/l)	VOC Emissions (tons/day)	% Small Containers
Concrete/Masonry Sealers	795	2,819,790	93	1.45	7%
Driveway Sealers	16	320,652	12	0.02	0%
Dry Fog Coatings	56	362,987	58	0.11	0%
Faux Finishing Coatings	403	178,824	145	0.13	26%
Fire Resistive Coatings	10	16,403	132	0.02	0%
Floor Coatings	514	783,426	59	0.29	3%
Form-Release Compounds	25	219,983	117	0.21	0%
Graphic Arts Coatings (Sign Paints)	105	1,707	350	0	PD
High Temperature Coatings	76	10,890	406	0.04	38%
Industrial Maintenance Coatings	3,168	1,883,610	125	2.12	1%
Low Solids Coatings	152	456,692	177	0.37	12%
Magnesite Cement Coatings	14	PD	PD	PD	PD
Mastic Texture Coatings	34	56,730	104	0.07	PD
Metallic Pigmented Coatings	95	23,148	421	0.10	36%
Multi-Color Coatings	51	PD	PD	PD	PD
Pre-Treatment Wash Primers	No products reported.				
Primers, Sealers, and Undercoaters	943	9,703,314	51	2.39	3%
Reactive Penetrating Sealers	22	24,130	207	0.05	PD
Recycled Coatings	54	PD	PD	PD	PD
Roof Coatings	558	2,916,960	36	0.62	0%
Rust Preventative Coatings	357	583,638	232	1.41	33%
Shellacs:					
• Clear	36	PD	PD	PD	PD
• Opaque	11	PD	PD	PD	PD
Specialty Primers, Sealers, and Undercoaters	59	310,438	180	0.60	3%
Stains					
• Exterior and Dual	971	1,413,729	100	1.13	10%
• Interior	1,020	623,849	392	2.68	71%

Table 2-3
Sales and VOC Emissions by Product Category (Includes Small Containers)

Coating Category	# Products	2013 Sales [1] (Gallons)	SWA VOC Reg. [2] (g/l)	VOC Emissions (tons/day)	% Small Containers
Stone Consolidants	2	PD	PD	PD	PD
Swimming Pool Coatings	79	36,451	264	0.08	PD
Tile and Stone Sealers					
Traffic Marking Coatings	294	1,040,073	89	0.68	PD
Tub and Tile Refinish Coatings	8	PD	PD	PD	PD
Waterproofing Membranes	80	487,183	99	0.55	PD
Wood Coatings	1,509	1,822,249	389	3.43	29%
Wood Preservatives	59	89,422	374	0.34	PD
Zinc-Rich Primers	51	35,241	264	0.10	14%
Total	**18,745**	**89,071,627**	**NA**	**31.58**	**NA**

1. Sales are market adjusted.
2. VOC Regulatory, less water and exempt compounds.
3. PD is protected data. Fewer than four companies reported sales.

B. Estimated Emission Reductions from the Proposed SCM

Because the proposed SCM is most likely to be implemented in air districts with local rules based on the 2007 SCM, the estimated emission reductions excludes the South Coast AQMD, air districts operating under the National Rule, and air districts with rules based on the 2000 SCM. In addition, emission reductions are only calculated for large containers, because small containers (one liter or less) are exempt from the proposed VOC limits. In 2013, these small containers represented about five percent of architectural coating sales volume in California.

The baseline for determining emission reductions is the 2013 data from the 2014 Survey. For architectural coatings, the 31.58 tpd of statewide VOC emissions are apportioned to air districts based on population. Air districts outside of the South Coast AQMD represent 57 percent of the State’s population. Because South Coast has collected data on sales and VOC emissions from architectural coatings annually since 2008, staff adjusted the emissions apportioned to the rest of the State to reflect the South Coast inventory. The inventory outside South Coast is estimated at 20.09 tpd of VOC emissions, including small containers. This does not include VOC emissions from cleanup solvents, thinners, or additives.

As shown in Table 2-4, the proposed SCM is expected to achieve 1.46 tpd in VOC emission reductions for areas of California with local rules based on the 2007 SCM, excluding the South Coast AQMD. This represents about a seven percent overall emission reduction. If the proposed SCM limits were adopted statewide, the expected VOC emission reductions would be 2.50 tpd. Table 2-4 lists categories for which staff is proposing lower VOC limits and the expected reductions from only those air districts with local rules based on the 2007 SCM. Although there are emission reductions from several categories, 58 percent of the emission reductions are from two categories, which account for 44 percent of the emissions from these categories. These two categories are highlighted in boldface in Table 2-4.

Table 2-4
VOC Emission Reductions By Product Category
(Large Containers Only, Excluding the South Coast AQMD)

Coating Category	**Existing VOC Limit (g/l)**	**Proposed VOC Limit (g/l)**	**Emissions in 2013 (excluding SCAQMD)[1] (tons/day)**	**Emission Reductions for 2007 SCM Areas (excluding SCAQMD)[1] (tons/day)**
Aluminum Roof Coatings	400	100	0.31	0.20
Building Envelope Coatings	NA	50	0.01	0.01
Dry Fog Coatings	150	50	0.11	0.03
Fire Resistive Coatings	350	150	0.02	0.02
Floor Coatings	100	50	0.20	0.01
Form Release Compounds	250	100	0.21	0.08
Nonflat - High Gloss Coatings	150	50	0.31	0.02
Nonflat Coatings	**100**	**50**	**4.04**	**0.41**
Stains (Exterior/Dual)	**250**	**100**	**0.97**	**0.43**
Stains (Interior)	250	250	0.18	0.00
Waterproofing Membranes	250	100	0.55	0.11
Colorants Added to:				
Architectural Coatings, excluding Industrial Maintenance Coatings	NA	50		
Solvent-Based Industrial Maintenance Coatings	NA	600	1.13	0.14
Waterborne Industrial Maintenance Coatings	NA	50		
Wood Coatings	NA	600		
Total			**11.46**	**1.46**

Notes:
1. This column does not include emissions for the South Coast AQMD, which represents 43% of California's population. It also does not include emissions from small containers or emissions from thinning, cleanup, or additives.

The emissions reductions in Table 2-4 are based on annual average data from 2013. Appendix E contains a detailed explanation of the methodology that was used to calculate emissions and emission reductions. To estimate future emission reductions after the proposed SCM is implemented, CARB staff and air district staff will "grow" the emission reductions by using established growth factors that depend on the demographic data for a given air district. In addition, the reductions will be adjusted to represent average summer emissions, rather than annual average emissions. The emissions data used in ozone attainment plans (or SIPs) are usually presented as average summer emissions, since the peak ozone season in California is typically the summer. Also, the estimated emissions on an average summer day are greater than on an average annual day because more painting is done in May through October than the rest of the year, due to weather conditions. Annual average daily emissions spread out these higher summer emissions evenly throughout the year.

Table 2-5 illustrates the approach used to estimate emission reductions for the air districts. The emission reductions for individual air districts are estimated by apportioning the reductions based on air district population percentages. Each air district is assigned a portion of the 31.58 tpd statewide emissions based on their population percentage. For the non-South Coast AQMD portion of the State, which represents 57 percent of California's population, total emission reductions are expected to be 1.46 tpd. CARB staff apportioned this 1.46 tpd to the air districts, based on population.

Table 2-5
Allocation of Estimated Emission Reductions from the Proposed SCM

Rule Areas	% of CA Population[1]	Emission Inventory (TPD in 2013)	% of Total SCM Reductions	Reductions from SCM (TPD in 2022)
South Coast AQMD	43.3%	11.49[2]	0%	0
2007 SCM	52.7%	18.64	58%	1.46
2000 SCM	2.1%	0.75	21%	0.52
National Rule	2.0%	0.70	21%	0.52
TOTAL:	**100%**	**31.58**	**100%**	**2.50**

Notes:
1. CA Population in 2013 = 40,628,000 (DOF, 2016).
2. Coating emissions from South Coast AQMD (SCAQMD, 2018); colorant emissions from 2014 Survey (Appendix H)

In addition to estimating emission reductions, CARB staff also used 2013 sales data to determine the portion of the market that complies with the VOC limits in the proposed SCM. Table 2-6 lists the complying marketshare, which represents the percentage of the 2013 sales volume that meets the proposed VOC limits. The table also lists the number of complying products. Table 2-6 only includes coating categories whose VOC limit would decrease with the proposed SCM. Complying marketshare for all categories are provided in Appendix H.

Table 2-6
Complying Marketshare and Number of Complying Products

Coating Category	Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Complying Marketshare	# of Complying Products
Aluminum Roof Coatings	400	100	70%	6
Dry Fog Coatings	150	50	67%	28
Fire Resistive Coatings	350	150	67%	7
Floor Coatings	100	50	75%	227
Form Release Compounds	250	100	83%	10
Nonflat - High Gloss Coatings	150	50	84%	181
Nonflat Coatings	100	50	93%	2555
Stains (Exterior/Dual)	250	100	73%	410
Stains (Interior)	250	250	88%	175
Waterproofing Membranes	250	100	67%	53

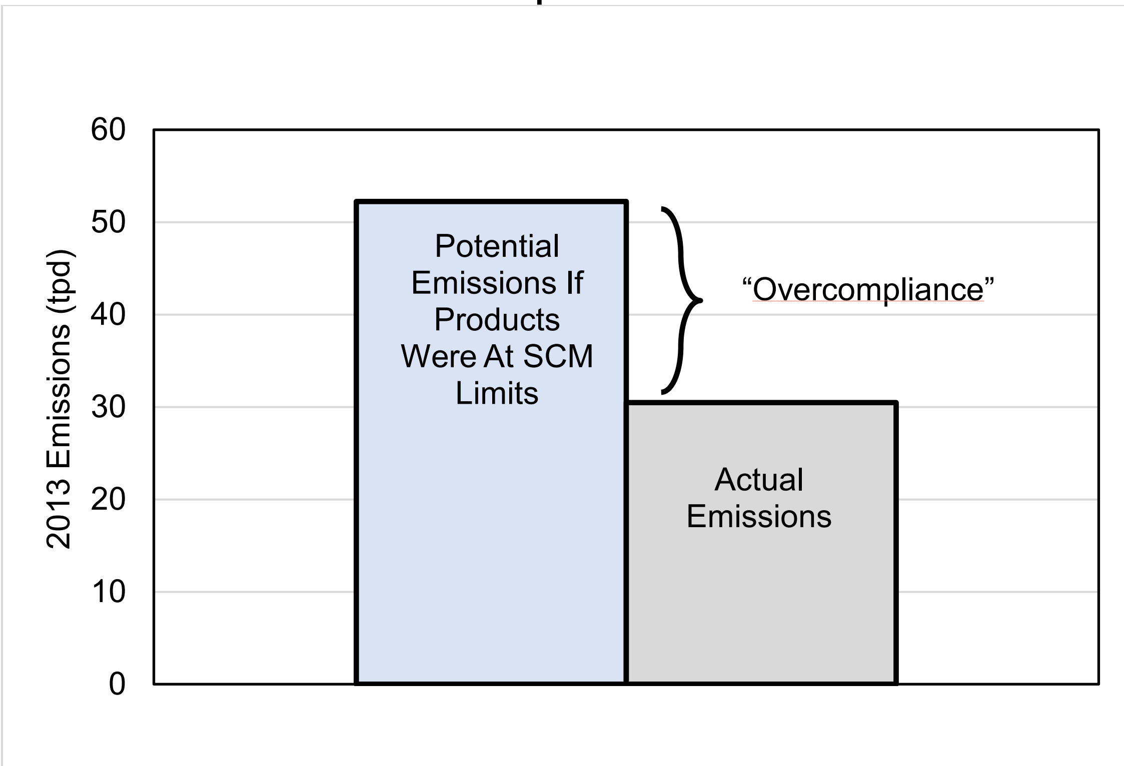
C. Limit-to-Limit Reductions

To estimate emission reductions, CARB staff evaluates each product reported in the architectural coatings survey. For each product, staff determines the current VOC emissions, as reported in the survey, and then calculates the expected future VOC emissions at the new VOC limit in the proposed SCM. For the purposes of estimating emission reductions, it is assumed that all manufacturers will reformulate their products to be equal to the new VOC limit. However, in reality, many manufacturers actually reformulate their products below VOC limits to ensure compliance.

After 15 air districts adopted rules based on the 2007 SCM, many manufacturers reformulated their coatings to be below the VOC limits. Consequently, there was a certain amount of “overcompliance” and this was confirmed when CARB staff conducted the architectural coating survey. Since CARB’s emission inventory is based on the results of the architectural coating survey, the “overcompliance” eventually gets incorporated into the emission inventory, but it is not necessarily documented in SCM staff reports.

Based on the 2014 Survey, the 2013 VOC emissions from the architectural coatings were approximately 30 tpd, excluding colorants and solvent thinning and cleanup. If all of the products in these categories had VOC contents that were equal to the 2007 SCM limits, estimated emissions would have been 52 tpd. The difference of 22 tpd represents “overcompliance” by manufacturers (see Figure 2-4).

Figure 2-4
Manufacturers' "Overcompliance" with 2007 SCM Limits



CHAPTER III. PROPOSED SUGGESTED CONTROL MEASURE

A. Introduction

In this chapter, staff provides a discussion of CARB's proposed SCM for architectural coatings, which is contained in Appendix A. The proposed SCM is an update to the SCM the Board approved in 2007. Where applicable, staff discusses how the proposed SCM's provisions differ from those of the 2007 SCM. For reference purposes, the 2007 SCM is contained in Appendix B.

Control of VOC emissions from architectural coatings is primarily the responsibility of the local air pollution control districts and air quality management districts, collectively referred to as air districts. The proposed SCM is not a CARB regulation. It is a model rule that air districts can follow when adopting and amending their local architectural coatings rules. If air districts adopt the VOC limits in the proposed SCM, air district personnel are responsible for enforcing those limits.

The proposed SCM controls VOC emissions by establishing limits on the VOC content of various architectural coating products. These VOC limits are expressed in grams of VOC per liter of coating, less water and exempt compounds. To establish the limits in the proposed SCM, CARB staff conducted a detailed assessment of each coating category to determine the maximum emission reductions that are technically feasible and cost-effective. In general, manufacturers will comply with the VOC limits by reformulating their products to replace some of the VOC solvent with water or exempt compounds. Manufacturers may also modify their formulations by increasing the amount of resin and pigment solids contained in the coatings. However, many manufacturers already have complying products, and no reformulation would be required to meet the proposed VOC limits.

B. Major Proposed Changes

Provided below is a summary of the major proposed changes between the 2007 SCM and the proposed SCM. Details of these changes are discussed in this chapter and in Chapter V.

- The proposed SCM adds the term "markets" in the applicability and standards sections to address mail order coatings and e-commerce companies who do not sell the coatings themselves but market them for sale. The term is also defined in the definitions section. The term was added to the South Coast AQMD Rule 1113 in 2011.
- The proposed SCM removes the Nonflat - High Gloss Coatings category from the table of VOC limits.
- The proposed SCM adds three categories to the table of VOC limits: Building Envelope Coatings, Interior Stains, and Tile and Stone Sealers.
- The proposed SCM adds VOC content limits for Colorants; setting limits for Colorant added to: Architectural Coatings, excluding Industrial Maintenance

Coatings and Wood Coatings; Solvent-Based Industrial Maintenance Coatings; Waterborne Industrial Maintenance Coatings; and Wood Coatings.

- The proposed SCM lowers VOC limits for nine coating categories.
- The proposed SCM also revises several definitions for clarification purposes. Definitions have also been revised to update referenced test methods and standards.
- The proposed SCM includes anti-bundling language for small containers.

Below staff summarizes the changes to each section of the proposed SCM.

C. Applicability

If adopted by the air districts, the proposed SCM would apply to anyone who supplies, sells, offers for sale, or manufactures architectural coatings for use in those air districts. It would also apply to anyone who applies or solicits the application of architectural coatings for use in those air districts. Those who are subject to the SCM include, but are not limited to, the following:

- Manufacturers
- Distributors
- Retailers
- Importers
- Paint Contractors
- Construction Workers
- Maintenance Staff
- Public Works Personnel

Staff is adding the term “markets” in the applicability section to address mail order coatings and e-commerce companies (e.g. Amazon, E-Bay) who do not sell the coatings themselves but market them for sale.

D. Severability

The Severability Section states that each provision of the proposed SCM is separate, in legal terms. If a judge determined that a particular section of the SCM was not valid, all of the other provisions of the SCM would still be in effect and enforceable.

No changes are proposed for the severability provisions.

E. Exemptions

The SCM is a model rule, thus, it only applies to architectural coatings that are used within air districts that have adopted the SCM. Architectural coatings that are manufactured in an air district that has adopted the SCM are not subject to the SCM if they are sold and used in an air district that has not adopted the SCM. If an air district does not have a local rule, architectural coatings must comply with the National Rule for architectural coatings (U.S. EPA, 1998a; U.S. EPA, 1998b). Aerosol coatings are exempt from the proposed SCM, because they are not defined as architectural coatings, and are covered by CARB’s aerosol coatings regulation (CARB, 2013).

Architectural coatings sold in small containers (one liter or less) are exempt from the VOC limits and majority of the provisions of the proposed SCM. However, coatings in small containers are subject to the reporting requirements in Section 7 of the SCM. Manufacturers are required to provide survey data for small containers. Additionally, CARB is proposing language that would prevent bundling small containers of the same coating category. The label or any other product literature cannot suggest combining small containers and the coating container must not be bundled together with other containers of the same specific coating category to be sold as a unit if such combination would exceed a liter. This would include language directing consumers to mix multiple containers for color consistency.

CARB is also proposing that colorants added at the factory or at the worksite are exempt from the Colorant VOC limits of the proposed SCM. Containers of colorants sold at the point of sale for use in the field or on a job site are also not subject to VOC limits.

F. Definitions

To help clarify and enforce the proposed SCM, Section 4 of the proposed SCM provides several new and revised definitions. The following definitions are added:

- As part of the Building Envelope Coating definition, Building Envelope, Air Barriers and Water Resistive Barriers are defined.
- Interior Stain
- Intumescent
- Market
- Tile and Stone Sealers

Some definitions are deleted, because the categories are no longer listed in the table of VOC limits or the terms are no longer used. Definitions were deleted for the following:

- Gonioapparent
- Metallic
- Nonflat - High Gloss Coating

In some cases, staff is proposing revised definitions for clarification or limitation to the types of products that qualify for inclusion in a category. Revised definitions are proposed for the following categories:

- Reactive Penetrating Sealer
- Traffic Marking Coatings

Staff is proposing to add colorant to the definition of VOC content and VOC regulatory. These are necessary to reflect the proposed addition of VOC limits for colorants.

Staff is also proposing to define market since this term will be included in the applicability and standards section of the SCM. This definition specifies that sales of architectural coatings within a district will apply to e-commerce and catalog sales, but not promotion or advertising of coatings.

For the Reactive Penetrating Sealer category, Caltrans conducted a series of tests on potential coatings, and none could meet the criteria listed in the 2007 SCM section 4.44.2 defining that the Reactive Penetrating Sealer must not reduce the water vapor transmission rate by more than two percent after application on a concrete or masonry substrate. Based on Caltrans' tests, CARB is proposing to revise that section to defining that the Reactive Penetrating Sealer must provide a breathable waterproof barrier for concrete or masonry surfaces that does not prevent or substantially retard water vapor transmission (CalTrans, 2013).

For the Traffic Marking Coating category, the definition is revised for clarification purposes. The definition incorporates the reference to the procedure specified in Section 8.4 for analyzing VOC content of Methacrylate Traffic Marking Coatings used as Traffic Marking Coatings.

G. Standards

The term "market" is added to section 5.1.2 to ensure sales through third party vendors are covered by the SCM. These activities are included in the current SCM by the term "supply." Adding the term "market" clarifies sales of architectural coatings by third party vendors, such as mail order and e-commerce companies (e.g. Amazon, E-Bay), are covered by the SCM. These transactions are increasing and need emphasis to make clear that the sale of architectural coatings are subject to the VOC limits.

New VOC limits are also included for colorants, indicating that colorants added to any architectural coating at the point of sale are subject to the VOC limits. The proposed SCM establishes a VOC limit for colorants added to architectural coatings, excluding industrial maintenance coatings and wood coatings at 50 g/l. For colorants added to waterborne industrial maintenance coatings the proposed limit is also 50 g/l. For colorants added to solventborne industrial maintenance coatings and wood coatings the proposed limits is 600 g/l (see Appendix A, Table 2).

1. VOC Content Limits

As shown in Table 3-1 below, the proposed SCM (see Appendix A) will establish VOC content limits for three new categories and revise the VOC limits for nine existing categories of architectural coatings (**shown in bold**). Items in boldface indicate VOC limits that are more stringent than the previous SCM. Most of the proposed limits are consistent with the existing limits in the South Coast AQMD Rule 1113. The proposed limits would become effective on January 1, 2022. As noted in Chapter II, there is already a high level of complying market share in all of the categories for which staff is proposing to lower the VOC limits.

With the exception of the Low Solids category, the VOC limits are expressed in terms of VOC Regulatory, which is also referred to as "VOC, Less Water, Less Exempt Compounds" or "Coating VOC". For the Low Solids category, the VOC limit is expressed in terms of VOC Actual, which is also referred to as “Material VOC”. Limits are expressed as VOC Regulatory, thinned to the manufacturer’s maximum recommendation, excluding any colorant added to tint bases. “Manufacturer’s maximum recommendation” means the maximum recommendation for thinning that is indicated on the label or lid of the coating container.

Table 3-1 list the coating categories and the VOC limits. Shown in bold are the categories for which a new VOC limit or a lower VOC limit is being proposed.

Table 3-1
Proposed VOC Content Limits for Architectural Coatings

Coating Category	Current Limit	Proposed Limit Effective 1/1/2022
Flat Coatings	50	
Nonflat Coatings	**100**	**50**
Nonflat - High Gloss Coatings[1]	**150**	**50**
Specialty Coatings		
Aluminum Roof Coatings	**400**	**100**
Basement Specialty Coatings	400	
Bituminous Roof Coatings	50	
Bituminous Roof Primers	350	
Bond Breakers	350	
Building Envelope Coatings		**50**
Concrete Curing Compounds	350	
Concrete/Masonry Sealers	100	
Driveway Sealers	50	
Dry Fog Coatings	**150**	**50**
Faux Finishing Coatings	350	
Fire Resistive Coatings	**350**	**150**
Floor Coatings	**100**	**50**
Form-Release Compounds	**250**	**100**
Graphic Arts Coatings (Sign Paints)	500	
High Temperature Coatings	420	
Industrial Maintenance Coatings	250	
Low Solids Coatings[2]	120	
Magnesite Cement Coatings	450	
Mastic Texture Coatings	100	
Metallic Pigmented Coatings	500	
Multi-Color Coatings	250	

Table 3-1
Proposed VOC Content Limits for Architectural Coatings

Coating Category	Current Limit	Proposed Limit Effective 1/1/2022
Pre-Treatment Wash Primers	420	
Primers, Sealers, and Undercoaters	100	
Reactive Penetrating Sealers	350	
Recycled Coatings	250	
Roof Coatings	50	
Rust Preventative Coatings	250	
Shellacs: • Clear • Opaque	 730 550	
Specialty Primers, Sealers, and Undercoaters	100	
Stains: • **Exterior/Dual** • Interior	 **250** 250	 **100** 250
Stone Consolidants	450	
Swimming Pool Coatings	340	
Tile and Stone Sealer[3]	100	100
Traffic Marking Coatings	100	
Tub and Tile Refinish Coatings	420	
Waterproofing Membranes	**250**	**100**
Wood Coatings	275	
Wood Preservatives	350	
Zinc-Rich Primers	340	

1. Effective January 1, 2022, Nonflat - High Gloss Coatings will be combined with the Nonflat Coatings.
2. Limit is expressed as VOC Actual.
3. Tile and Stone Sealers are currently part of Concrete Masonry Sealers with a VOC limit of 100 g/l

Staff is proposing to remove the Nonflat - High Gloss Coatings category definition and products now classified as Nonflat - High Gloss Coatings would go into Nonflat Coatings with a proposed VOC limit of 50 g/l.

Staff is also proposing to separate interior stains from the Stains category, creating a new category called Interior Stains. The Interior Stains would remain at 250 g/l VOC. Staff is proposing to lower the VOC limit for Stains (exterior and dual) to 100 g/l.

2. Sell-Through of Coatings

Under the proposed SCM, an architectural coating listed in Table 3-1 and manufactured prior to the effective date of the VOC content limit for that coating category may be sold, supplied, or offered for sale for up to three years after the effective date. This three-year time period is referred to as the “sell-through” provision, which allows unlimited use of coatings manufactured prior to the effective dates of the proposed limits. It is important to note that coatings sold prior to the effective dates listed in Table 3-1 must comply with the VOC limits in effect at the time of manufacture. For example, if an exterior stain is manufactured in 2019, it would be subject to a VOC limit of 250 g/l applicable to stains. If that coating complies with the 250 g/l VOC limit, it could be sold until 2022 under the three-year sell-through provision. However, if an exterior stain is manufactured in 2022, it must comply with the 100 g/l VOC limit.

Changes are being proposed for the sell-through provision to clarify that the sell-though also applies to the colorant categories.

3. Painting Practices

The Standards Section of the proposed SCM also specifies that coating containers and any VOC-containing products used for cleaning or thinning are to be closed when not in use. No changes are being proposed for the painting practices provision.

4. Thinning

If a user adds thinners or other additives to a coating, the coating must still meet the VOC limits in Table 3-1. In many cases, manufacturers have formulated coatings just below the VOC limit and the addition of any thinning solvent can make a coating non-compliant. No changes are being proposed for the thinning provision.

5. Coatings Not Listed in Table 3-1

If a coating does not meet any of the definitions for the categories listed in Table 3-1, that coating will be classified as Flat or Nonflat based on its gloss level, and the corresponding VOC content limit will apply. No changes are being proposed for the coatings not listed provision.

H. Container Labeling Requirements

The proposed SCM describes labeling requirements and specifies where information should be placed on coating containers. Staff is proposing to add language to clarify that the labeling and date code provisions in this section apply to colorant categories.

I. Reporting Requirements

The proposed SCM contains reporting requirements. No changes are being proposed for the reporting requirement.

J. Compliance Provisions and Test Methods

This section of the proposed SCM designates acceptable methods for determining compliance with the requirements contained in the SCM. New methods are proposed for Building Envelope Coatings, Reactive Penetrating Sealers, and Tile and Stone Sealers.

1. VOC Content Determination

The proposed SCM designates acceptable methods for determining compliance with the requirements. Traditionally, U.S. EPA Method 24 has been designated as the official way of verifying the VOC content for architectural coatings.

South Coast AQMD has adopted Method 313 to determine VOC content of coatings using gas chromatograph analysis. This method is intended to facilitate the VOC content determination of coatings with VOC less than 150 g/l. Another alternate method is ASTM D6886. Staff is proposing to incorporate Method 313 and ASTM D6886 as alternative methods that can be used for determining the VOC content of low VOC coatings.

Industry has expressed reservations regarding the incorporation of South Coast AQMD Method 313, because some technical issues remain unresolved. However, South Coast AQMD continues to work with industry to resolve some aspects of the method.

The proposed SCM allows for the use of alternative test methods, but manufacturers must first obtain written approval from the air district, CARB, and the U.S. EPA. If an alternative test method is approved, the results of the alternative method will govern, if there are discrepancies between the results of the alternative method and formulation data. Similarly, if there are discrepancies between VOC content based on formulation data and the results of a Method 24 test, Method 24 test results will prevail.

2. New Test Methods

The proposed SCM contains new test methods to verify compliance with proposed changes in the Definitions Section. New test methods have been added for Building Envelope Coatings, Reactive Penetrating Sealers, and Tile and Stone Sealers.

3. Deleted Test Methods

The proposed SCM removes the Gonioapparent Characteristics for Coatings Test Method because the Metallic definition, which uses gonioapparent to define itself, has been removed from the SCM.

CHAPTER IV. PROCESS FOR DEVELOPING PROPOSED SCM

In 2014, CARB staff initiated activities to develop the proposed SCM. These activities have included:

- Conducting a survey of architectural coatings sold in California;
- Meeting with air district representatives;
- Meeting with industry trade groups and individual manufacturers;
- Hosting a public workshop;
- Evaluating the South Coast AQMD Rule 1113
- Evaluating the National Rule for architectural coatings;
- Conducting technology assessments of all the coating categories;
- Preparing an environmental impact analysis; and
- Preparing an economic analysis.

A. 2014 Architectural Coatings Survey

In late 2014, CARB staff began working with manufacturers and industry groups to develop a new survey of architectural and industrial maintenance coatings sold in California. The last such CARB survey was undertaken in 2005 (CARB, 2007b) and collected sales and VOC contents of coatings sold in 2004.

In December 2014, CARB staff released the survey seeking 2013 sales data. The survey due date was May 1, 2015, but manufacturers submitted data as late as November 2017.

Data entry and quality assurance checking were completed in December 2017, and draft survey results were posted for public review. Notifications were sent to all survey respondents and other interested parties that were subscribers to the CARB Architectural Coatings ListServe. Industry provided feedback on several coating categories. CARB staff re-evaluated the data for these categories before finalizing the data. This included contacting the survey respondent in many cases. A discussion of the survey results is included in Chapter V.

B. Informal Meetings with Air Districts and Industry

In March 2018, CARB staff and air district personnel established an Air District Working Group to discuss the update of the 2007 SCM. CARB staff had five conference calls with this group to discuss items including air district SIP commitments for emission reductions from architectural coatings; findings of the 2014 Survey; possible SCM proposals, and specific SCM language.

In November 2018, the Air District Working Group met with coating industry representatives to discuss a preliminary proposal and potential revisions to the SCM. The group discussed potential revisions to the SCM including: revisions of coating category definitions; proposed VOC limits; the use of exempt VOCs, specifically the use of TBAc and PCBTF; and incorporating anti-bundling language for small containers.

CARB staff also had meetings and conference calls with coating industry representatives and individual manufacturers about their particular concerns.

C. Formal Public Meetings

In developing the proposed SCM, CARB staff hosted one public workshop in Sacramento on February 19, 2019. Participants included representatives from industry (coatings manufacturers, and trade associations); local air districts; the U.S. EPA; and other interested parties. At the workshop CARB staff presented draft VOC limits and draft revised definitions for several coating categories. CARB staff also made available and presented draft regulatory language for the SCM. Comments were submitted to CARB from manufacturers, trade associations, and other stakeholders. CARB's staff responses to those comments are contained in Chapter V.

Staff posted draft SCM materials on CARB's Internet site, sent List Serve notices to over 3,200 subscribers to announce the availability of these materials, and sent email notices to all 2014 Survey respondents. Posted items included: workshop announcement; draft SCM revision; summary of the proposal (workshop handout); and workshop slide presentation. The workshop announcement is contained in Appendix F.

D. Evaluation of Other Architectural Coating Rules

1. U.S. EPA National Architectural Coating Rule

On August 14, 1998, the U.S. EPA promulgated the final version of their National Volatile Organic Compound Emission Standards for Architectural Coatings (National Rule) (U.S. EPA, 1998a). The National Rule took effect on September 13, 1999 and it was adopted in accordance with section 183(e) of the Federal Clean Air Act, which allows U.S. EPA to regulate manufacturers and importers to obtain VOC emission reductions. Section 183(e) does not give U.S. EPA the authority to regulate end users, so the National Rule only applies to manufacturers and importers of architectural coatings (U.S. EPA, 1998a; U.S. EPA,1998b). CARB's SCM applies to a broader range of entities, including manufacturers, distributors, retailers, and users of architectural coatings.

The National Rule, section 59.410, specifically allows states or local governments to adopt more stringent emission limits for architectural coatings. The VOC limits in the 2007 SCM and the proposed SCM are equal to or more stringent than those in the National Rule, as shown in Table 4-1. In California, approximately two percent of the population lives in areas that are governed by the National Rule. About 55 percent of the population is subject to air district rules based on the 2007 SCM or the 2000 SCM, and about 43 percent of the population is covered by South Coast AQMD Rule 1113.

Table 4-1
Comparison Between National Rule and Proposed SCM

U.S. EPA Category	U.S. EPA VOC Limit (g/l)	Corresponding Categories in Proposed SCM	SCM VOC Limit (g/l)
Antenna Coatings	530	Industrial Maintenance	250
Anti-Fouling Coatings	450	Industrial Maintenance	250
Anti-Graffiti Coatings	600	Industrial Maintenance	250
Bituminous Coatings and Mastics	500	Bituminous Roof Coatings Bituminous Roof Primers Concrete/Masonry Sealers Driveway Sealers Industrial Maintenance Waterproofing Membranes	50 350 100 50 250 100
Bond Breakers	600	Bond Breakers	350
Calcimine Recoaters	475	Flat Specialty PSU	50 100
Chalkboard Resurfacers	450	Industrial Maintenance	250
Concrete Curing Compounds	350	Concrete Curing Compounds	350
Concrete Curing and Sealing Compounds	700	Concrete Curing Compounds Concrete/Masonry Sealers	350 100
Concrete Protective Coatings	400	Concrete/Masonry Sealers	100
Concrete Surface Retarders	780	Concrete Curing Compounds	350
Conversion Varnish	725	Wood Coatings	275
Dry Fog Coatings	400	Dry Fog Coatings	50
Extreme high durability coatings	800	Industrial Maintenance	250

Table 4-1
Comparison Between National Rule and Proposed SCM

U.S. EPA Category	U.S. EPA VOC Limit (g/l)	Corresponding Categories in Proposed SCM	SCM VOC Limit (g/l)
Faux Finishing/Glazing	700	Faux Finishing Coatings	350
Fire-Retardant/Resistive Coatings:			
Clear	850	Fire Resistive [1]	150
Opaque	450	Fire Resistive [1]	150
Flat Coatings:			
Exterior	250	Flat	50
Interior	250	Flat	50
Floor Coatings	400	Floor Coatings	50
Flow Coatings	650	Industrial Maintenance	250
Form Release Compounds	450	Form Release Compounds	100
Graphic Arts Coatings (Sign Paints)	500	Graphic Arts Coatings (Sign Paints)	500
Heat Reactive Coatings	420	Industrial Maintenance	250
High Temperature Coatings	650	High Temperature Coatings	420
Impacted Immersion Coatings	780	Industrial Maintenance	250
Industrial Maintenance Coatings	450	Industrial Maintenance Tub and Tile Refinish	250 420
Lacquers (including lacquer sanding sealers)	680	Wood Coatings	275
Magnesite Cement Coatings	600	Magnesite Cement Coatings	450
Mastic Texture Coatings	300	Mastic Texture Coatings	100
Metallic Pigmented Coatings	500	Metallic Pigmented Coatings Aluminum Roof Zinc-Rich Primers	500 100 340
Multi-Colored Coatings	580	Multi-Color Coatings	250
Nonferrous Ornamental Metal Lacquers and Surface Protectants	870	Rust Preventative Nonflat Coatings Primers, Sealers, Undercoaters	250 50 100

Table 4-1
Comparison Between National Rule and Proposed SCM

U.S. EPA Category	U.S. EPA VOC Limit (g/l)	Corresponding Categories in Proposed SCM	SCM VOC Limit (g/l)
Nonflat Coatings:			
Exterior	380	Nonflat Coatings	50
Interior	380	Nonflat Coatings	50
Nuclear Coatings	450	Industrial Maintenance	250
Pretreatment Wash Primers	780	Pretreatment Wash Primers	420
Primers and Undercoaters	350	Primers, Sealers, Undercoaters Specialty PSU	100 100
Quick-Dry Coatings:			
Enamels	450	Nonflat Coatings	50
Primers, Sealers, and Undercoaters	450	Primers, Sealers, Undercoaters Specialty PSU	100 100
Repair and Maintenance Thermoplastic	650	Industrial Maintenance	250
Roof Coatings	250	Roof Coatings	50
Rust Preventative Coatings	400	Rust Preventative Coatings	250
Sanding Sealers (other than lacquer sanding sealers)	550	Wood Coatings	275
Sealers (including interior clear wood sealers)	400	Primers, Sealers, Undercoaters Specialty PSU Wood Coatings Concrete/Masonry Sealers	100 100 275 100
Shellacs:		Shellacs:	
Clear	730	Clear	730
Opaque	550	Opaque	550
Stains:			
Clear and Semitransparent	550	Stains Stains, Interior Wood Coatings (Clear Stains)	100 250 275
Opaque	350	Stains Stains, Interior	100 250
Low Solids	120[2]	Low Solids	120[2]
Stain Controllers	720	Wood Coatings	275

Table 4-1
Comparison Between National Rule and Proposed SCM

U.S. EPA Category	U.S. EPA VOC Limit (g/l)	Corresponding Categories in Proposed SCM	SCM VOC Limit (g/l)
Swimming Pool Coatings	600	Swimming Pool Coatings	340
Thermoplastic Rubber Coatings and Mastics	550	Roof Coatings	50
Traffic Marking Coatings	150	Traffic Marking Coatings	100
Varnishes	450	Wood Coatings	275
Waterproofing Sealers and Treatments	600	Concrete/Masonry Sealers Wood Coatings Basement Specialty Coating Driveway Sealers Waterproofing Membrane	100 275 400 50 100
Wood Preservatives:			
Below Ground Wood Preservatives	550	Wood Preservatives	350
Clear and Semitransparent	550	Wood Preservatives	350
Opaque	350	Wood Preservatives	350
Low Solids	120[2]	Low Solids	120[2]
Zone Marking Coatings	450	Traffic Marking Coatings	100

1. In the 2007 SCM, the "Fire Resistive" category was retained for those products that are certified in accordance with ASTM E119-07. However, the "Fire Retardant" category was eliminated and coatings with fire retardant properties would fall under their primary categories (e.g., Flat, Nonflat, etc.)
2. Units are grams of VOC per liter of coating, including water and exempt compounds, thinned to the maximum thinning recommended by the manufacturer.

The National Rule contains flexibility provisions that are not in the proposed SCM: (1) an exceedance fee provision; (2) a tonnage exemption; and (3) a recycled coatings compliance option. For compliance with these provisions, manufacturers and importers must keep specified records and submit annual reports to the appropriate regional U.S. EPA office.

The exceedance fee provision allows manufacturers and importers to comply with the rule by paying a fee, in lieu of meeting the VOC content limits. The tonnage exemption allows manufacturers and importers to sell or distribute limited quantities of architectural coatings that do not comply with the VOC content limits and for which no exceedance fee is paid.

The recycled coatings compliance option allows calculation of an adjusted VOC content for coatings that contain a certain percentage of post-consumer coating.

Containers of recycled architectural coatings must include labeling that shows the percentage, by volume, of post-consumer coating content.

CARB staff did not include an exceedance fee or tonnage exemption in the proposed SCM, because staff needs to maximize emission reductions, due to the severe air quality problems in California. The National Rule's recycled coating option was not included in the proposed SCM, because staff believes having a Recycled Coatings category with a VOC limit of 250 g/l accomplishes the same goal of encouraging recycling without the need for an adjusted VOC content credit.

It is important to remember that the proposed SCM is intended for the non-South Coast AQMD portion of California. It is not intended to be a model for the entire United States. There are some VOC limits that may be inappropriate for other parts of the country. Because many parts of the country have significantly higher precipitation, both rain and snow, and significantly lower temperatures, architectural coating categories that are sensitive to application temperature may need to have higher VOC limits to allow for more solventborne products.

2. South Coast AQMD Rule 1113

On November 8, 1996 and May 14, 1999, the South Coast AQMD revised Rule 1113, their architectural coating regulation (SCAQMD, 1996; 1999). These revisions of Rule 1113 contained interim VOC limits that were largely adopted in the 2000 SCM. Since that time, the South Coast AQMD has revised Rule 1113 in 2001, 2002, 2003, 2004, 2006, 2007, 2011, 2013, and 2016 (SCAQMD, 2001; 2002a; 2003; 2004; 2006b; 2007; 2011; 2013; 2016). While developing the proposed SCM, CARB staff considered the feasibility of proposing the Rule 1113 VOC limits that were proposed in 2016 with limits coming to effect on January 1st, 2019. In many cases, CARB staff determined that the final South Coast AQMD limits would be feasible for implementation outside the boundaries of the South Coast AQMD. However, there are some categories for which staff determined that a higher VOC limit would be more appropriate at this time. The most significant of these categories are Industrial Maintenance Coatings, Metallic Pigmented Coatings, Rust Preventative Coatings, and Zinc-Rich Primers, and Concrete Curing Compounds. The primary reasons for having a higher limit in the proposed SCM include the following:

<u>The Proposed SCM Needs to be Suitable for a Variety of Climates</u>

Rule 1113 applies to coating activities that occur within the boundaries of the South Coast AQMD, which has a relatively mild, warm climate. This type of climate provides advantages for developing low-VOC coatings with acceptable performance and durability. However, in Northern California and other parts of the State, the climate can have far greater extremes of temperature and humidity. For these areas outside of the South Coast, coatings have to withstand harsher climates and it can be more difficult to develop low-VOC products. This concern applies in varying degrees to Industrial Maintenance Coatings, Rust Preventative Coatings, and Zinc-Rich Primers.

Industry representatives acknowledge areas adjacent to the South Coast AQMD have similar climate as the South Coast AQMD. Therefore, climate related issues are not applicable to these areas.

<u>The Proposed SCM Does Not Contain a VOC Exemption for TBAc</u>

Rule 1113 contains a limited VOC exemption for TBAc to allow for its use in Industrial Maintenance Coatings only. Under this exemption, manufacturers do not have to include TBAc when calculating the VOC content of Industrial Maintenance Coatings. Because the South Coast AQMD allowed the use of TBAc as an exempt solvent, it was technologically feasible to establish a VOC limit of 100 g/l for Industrial Maintenance Coatings. CARB staff has not proposed a similar exemption for TBAc, due to potential toxicity health concerns identified by the Office of Environmental Health Hazard Assessment (OEHHA). Additionally, another commonly used exempt solvent, PCBTF, is currently being evaluated for potential carcinogenic effects. Since the proposed SCM does not allow for the use of TBAc as an exempt solvent, and there is the potential that PCBTF will also be found to be carcinogenic, staff concluded that it was appropriate to retain the 250 g/l VOC limit for the Industrial Maintenance category.

Industry has expressed a high level of concern regarding the potential removal of both TBAc and PCBTF from the VOC exempt list. They have stated that it would not be feasible to meet the VOC limits in South Coast AQMD Rule 1113 for metallic pigmented, zinc rich primers, industrial maintenance and potentially other categories if these exempts are not available for formulation.

<u>The Proposed SCM Does Not Contain an Exemption for High Elevations</u>

Rule 1113 contains an exemption for all stains and lacquers that are used in areas with elevations of 4,000 feet or greater above sea level. Stains and lacquers that are used at these high elevations are exempt from VOC limits and all other requirements of Rule 1113. The proposed SCM does not include an exemption for high elevations.

Table 4-2 contains a comparison between South Coast AQMD's Rule 1113 and the proposed SCM VOC limits. The limits in bold are where the SCM and South Coast AQMD's Rule 1113 differ.

Table 4-2
Comparison Between South Coast Rule 1113 and Proposed SCM

South Coast Rule 1113 Category	Small Container Exemption	Rule 1113 VOC Limit (g/l)	Potential Corresponding Categories in Proposed SCM	SCM VOC Limit (g/l)
Bond Breakers	X	350	Bond Breakers	350
Building Envelope Coating	X	50	Building Envelope Coating	50
Concrete-Curing Compounds	**X**	**100**	**Concrete Curing Compounds**	**350**
Concrete-Curing Compounds For Roadways and Bridges		350	Concrete Curing Compounds	350
Concrete Surface Retarder	**X**	**50**	**Concrete Curing Compounds**	**350**
Driveway Sealer	X	50	Driveway Sealers	50
Dry-Fog Coatings	X	50	Dry Fog Coatings	50
Faux Finishing Coatings				
Clear Topcoat	**X**	**100**	**Faux Finishing Coatings**	**350**
Decorative Coatings	X	350	Faux Finishing Coatings	350
Glazes	X	350	Faux Finishing Coatings	350
Japan	X	350	Faux Finishing Coatings	350
Trowel Applied Coatings	**X**	**50**	**Faux Finishing Coatings**	**350**
Fire-Proofing Coatings	X	150	Fire Resistive Coatings	150
Flats	X [3]	50	Flat Coatings	50
Floor Coatings	**X**	**50**	**Floor Coatings**	**50**
Form Release Compound	X	100	Form-Release Compounds	100
Graphic Arts (Sign) Coatings	X	500	Graphic Arts Coatings (Sign Paints)	500

Table 4-2
Comparison Between South Coast Rule 1113 and Proposed SCM

South Coast Rule 1113 Category	Small Container Exemption	Rule 1113 VOC Limit (g/l)	Potential Corresponding Categories in Proposed SCM	SCM VOC Limit (g/l)
Industrial Maintenance Coatings	**X [3]**	**100 [1]**	**Industrial Maintenance Coatings**	**250**
Color Indicating Safety Coatings	**X [3]**	**480**	**Industrial Maintenance Coatings**	**250**
High Temperature IM Coatings	X [3]	420	High Temperature Coatings	420
Non-Sacrificial Anti-Graffiti Coatings	**X [3]**	**100**	**Industrial Maintenance Coatings**	**250**
Zinc-Rich IM Primers	**X [3]**	**100**	**Zinc-Rich Primers**	**340**
Low-Solids Coating	X	120 [2]	Low Solids Coatings	120 [2]
Magnesite Cement Coatings		450	Magnesite Cement Coatings	450
Mastic Coatings	X	100	Mastic Texture Coatings	100
Metallic Pigmented Coatings	**X**	**150**	**Metallic Pigmented Coatings**	**500**
Multi-Color Coatings		250	Multi-Color Coatings	250
Nonflat Coatings	X [3]	50	Nonflat Coatings	50
Nonflat - High Gloss	X [3]	50	Nonflat - High Gloss	50
Pre-Treatment Wash Primers		420	Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	X	100	Primers, Sealers, and Undercoaters	100
Reactive Penetrating Sealers		350	Reactive Penetrating Sealers	350
Recycled Coatings	X	150	Recycled Coatings	250
Roof Coatings	X	50	Roof Coatings Bituminous Roof Coatings	50 50
Roof Coatings, Aluminum	X	100	Aluminum Roof Coatings	100
Roof Primers, Bituminous		350	Bituminous Roof Primers	350
Rust Preventative Coatings	**X [4]**	**100**	**Rust Preventative Coatings**	**250**

Table 4-2
Comparison Between South Coast Rule 1113 and Proposed SCM

South Coast Rule 1113 Category	Small Container Exemption	Rule 1113 VOC Limit (g/l)	Potential Corresponding Categories in Proposed SCM	SCM VOC Limit (g/l)
Sacrificial Anti-Graffiti Coatings	X	50	**Industrial Maintenance Coatings** **Nonflat Coatings**	250 50
Shellac			Shellacs	
Clear		730	Clear	730
Pigmented		550	Opaque	550
Specialty Primers	X	100	Specialty Primers, Sealers, and Undercoaters	100
Stains	**X**	**100**	**Stains (Exterior/Dual)**	**100**
Stains, Interior	X	250	Stains (Interior)	250
Stone Consolidants		450	Stone Consolidants	450
Swimming Pool Coatings				
Repair		340	Swimming Pool Coatings	340
Other		340	Swimming Pool Coatings	340
Tile and Stone Sealers	X	100	Tile and Stone Sealers	100
Traffic Coatings	X	100	Traffic Marking Coatings	100
Waterproofing Sealers		**100**	**Concrete/Masonry Sealers** **Wood Coatings** **Basement Specialty Coatings** **Waterproofing Membranes**	**100** **275** **400** **100**
Waterproofing Concrete/Masonry Sealers		**100**	**Concrete/Masonry Sealers** **Basement Specialty Coatings** **Waterproofing Membranes**	**100** **400** **100**

Table 4-2
Comparison Between South Coast Rule 1113 and Proposed SCM

South Coast Rule 1113 Category	Small Container Exemption	Rule 1113 VOC Limit (g/l)	Potential Corresponding Categories in Proposed SCM	SCM VOC Limit (g/l)
Wood Coatings		275	Wood Coatings	275
Varnish		275	Wood Coatings	275
Sanding Sealers		275	Wood Coatings	275
Lacquer		275	Wood Coatings	275
Wood Conditioners		**100**	**Wood Coatings**	**275**
Wood Preservatives				
Below-Ground		350	Wood Preservatives	350
Other		350	Wood Preservatives	350
Default	X	**50**	**Form-Release Compounds** **Stone Consolidant** **Tub and Tile Refinish** **Default**	**100** **450** **420** **50**

1. For Industrial Maintenance Coatings, Rule 1113 allows for the use of TBAc as an exempt solvent to help achieve the 100 g/l VOC limit.
2. Units are grams of VOC per liter of material (i.e., including water and exempt compounds).
3. Effective 01/01/2019, the small container exemption is further limited by section (f)1 of South Coast AQMD Rule 1113.
4. Effective 01/01/2020, the small container exemption is further limited by section (f)1 of South Coast AQMD Rule 1113

Traditionally, architectural coating rules have contained an exemption for products sold in small containers ("one liter or less"). This exemption has served as a safety valve for small volume, niche applications that may need a higher VOC product. Based on data from several CARB surveys, small containers have consistently accounted for a small percentage of architectural coating sales. In 2013, small containers only accounted for five percent of the total sales volume. However, as the emissions from architectural coatings have decreased significantly over time, small containers are becoming a larger percentage of total emissions. The small containers account for about 24 percent of the total emissions.

In December 2003, South Coast AQMD revised their small container exemption to eliminate the small container exemptions for several categories, effective July 1, 2006. In February 2016, South Coast AQMD further restricted the small container exemption for several categories by either adding requirements to qualify for the small container exemption or eliminating the small container exemption altogether with implementation occurring over multiple years with full implementation by January 1, 2020. In addition, the South Coast AQMD requires manufacturers to submit an annual report to document sales of products sold in small containers.

The proposed SCM retains the small container exemption, because staff has found it to be an effective way of addressing niche applications and providing flexibility without a significant loss of emission reductions. CARB staff does not believe that the small container exemption needs to be updated or deleted at this time. CARB staff will monitor the emissions from small containers as part of future surveys and will assess the feasibility of regulating small containers.

E. Technology Assessment

To ensure that the proposed SCM is technologically and commercially feasible, CARB staff conducted a technology assessment for the coating categories where new or lower VOC limits are proposed. Details of these assessments are provided in Chapter V. Some of the sources of information utilized in the technology assessments included: the 2014 Survey data; manufacturers' product data sheets; Internet websites; books and trade magazines; technical reports; test results and specifications; U.S. EPA's Background Information Document (U.S. EPA, 1998b); discussions with manufacturers; and information from trade associations. Based on these technical analyses, staff has concluded that the overall performance of the reformulated products in each category will be similar to the performance of their higher VOC counterparts.

F. Environmental Analysis

For the 2000 SCM, staff prepared a Program Environmental Impact Report (PEIR), which is incorporated by reference herein (CARB, 2000a). The PEIR included an analysis of environmental impacts that could potentially result from the implementation of the 2000 SCM throughout California (excluding the South Coast AQMD). Staff investigated the potential for environmental impacts in six main areas: air quality; water demand and quality; public services; transportation and circulation; solid and hazardous waste; and health hazards. The analysis concluded that implementing the 2000 SCM would have no significant adverse impacts, but would have a net air quality benefit.

The proposed 2019 SCM serves as a model rule, and would not be implemented by CARB, nor would it be implemented by any districts unless they choose to do so. As such, the proposed 2019 SCM is only a model rule, and is not a "project" subject to CEQA, as its approval by CARB would not commit any jurisdiction to implementing it. Furthermore, even if it were deemed a "project" subject to CEQA, the 2019 SCM would likely be eligible for one or more CEQA exemptions, including but not limited to the Class 8 exemption for actions by regulatory agencies for protection of the environment. (See 14 CCR § 15308.) However, as CARB did in the 2000 PEIR, CARB has chosen to analyze the SCM under CEQA in an effort to facilitate use of the SCM by local air districts, essentially providing the districts with a turn-key model rule that has been fully analyzed under CEQA. Chapter VI provides the basis for CARB's determination that, even assuming the 2019 SCM is a "project" and is not exempt from CEQA, no subsequent or supplemental environmental analysis is required for the proposed 2019 SCM the basis for CARB's determination.

G. Economic Analysis

Chapter VIII discusses the economic impacts CARB staff anticipates from implementation of the proposed SCM. CARB staff quantified the economic impacts to the extent feasible, but economic impact analyses can be inherently imprecise by nature. Therefore, some projections are necessarily qualitative or semi-quantitative, based on general observations about the architectural coatings industry. The economic impacts analysis for the proposed SCM provides a general picture of the economic impacts that typical businesses might encounter, but staff recognizes that individual companies may experience impacts different than those projected in this analysis.

The staff evaluation included a cost-effectiveness analysis and a business impacts analysis. The cost-effectiveness analysis measured how cost-efficient the proposed SCM will be in reducing VOCs relative to other regulatory programs. The business impacts analysis evaluated the impacts on profitability, employment, and competitiveness to California businesses, consumers, and government agencies.

CHAPTER V. TECHNICAL ASSESSMENT OF CATEGORIES

A. Overview of Technical Assessment

In this chapter, staff provides a discussion of the architectural coating categories in the proposed SCM for which staff is proposing new VOC limits. This chapter contains descriptions of the coatings that are covered under each category, and the rationale for establishing a new VOC limit or lowering the existing VOC limit.

In most cases, the VOC limits in the proposed SCM are consistent with the South Coast AQMD's Rule 1113 VOC limits that are currently in effect. To allow time for air district rule adoption and manufacturer reformulation, CARB is proposing an effective date of January 1, 2022, for the proposed limits.

The discussions of the proposed VOC limits for each of the coating categories explain why staff believes that they are technologically and commercially feasible by the proposed effective date. Sources of information for the technology assessments included the following:

- Data from CARB's 2014 survey of architectural coatings;
- Information from coating manufacturers and resin suppliers (brochures, product data sheets, product labels, and safety data sheets);
- Coating formulation and performance data from Internet websites; books and trade magazines; technical reports;
- Industry standards and specifications;
- Meetings with manufacturers;
- Information provided by trade associations;
- Discussions with local air districts;
- 2007 SCM technical support documents (CARB, 2007a; CARB, 2007b);
- 2000 SCM technical support documents (CARB, 2000b);
- South Coast AQMD staff reports from Rule 1113 amendments (SCAQMD, 1996; SCAQMD, 1999; SCAQMD, 2001; SCAQMD, 2002a; SCAQMD, 2003; SCAQMD, 2004; SCAQMD, 2006b; SCAQMD, 2007; SCAQMD, 2011; SCAQMD, 2013; SCAQMD, 2016); and
- National Rule preamble and Background Information Document (U.S. EPA, 1998a; U.S. EPA, 1998b).

While industry representatives have raised some concerns about the efficacy of the lower VOC products in severe climate conditions, staff has concluded that the proposed VOC limits are technically and commercially feasible, as illustrated by the high levels of product availability already at or below the proposed VOC limits. Consumers are purchasing and using these products without significant concerns. Table 5-1 contains a summary of the proposed categories and VOC limits.

Table 5-1
Proposed VOC Limits

Coating Category	Current VOC Limit (g/l)	Proposed VOC Limit (g/l)
Aluminum Roof Coatings	400	100
Building Envelope Coatings*	**NA**	**50**
Dry Fog Coatings	150	50
Fire Resistive Coatings	350	150
Floor Coatings	100	50
Form-Release Compounds	250	100
Nonflat Coatings	100	50
Nonflat - High Gloss Coatings	150	50
Stains (Exterior/Dual)	250	100
Stains (Interior)**	**250**	250

* This is a new category
**These products were previously included in the Stains category.

As part of the SCM development process, staff discussed with the Air District Working Group whether to pursue lower VOC limits for additional categories. It was agreed that many of the existing category limits are as low as they can go. Also, many of the categories are relatively small but contain significant numbers of products that would have to be reformulated if limits were reduced. Some of these categories offer minimal emission reduction benefits but come at a high cost for reformulation.

Table 5-2 presents the categories for which staff is not proposing changes. Many of these categories have very low levels of VOCs already. Over half of the emissions from these categories are from those with limits of 100 g/l or less. About 25 percent of the emissions come from categories with VOC limits of 50 g/l; the lowest VOC limit for any category by any regulatory agency. For example, the two largest categories for which staff is not proposing changes in terms of volume and emissions are the Flat Coatings and Primer, Sealers, and Undercoaters categories. Flat Coatings are the second largest volume category with a VOC limit of 50 g/l. The Primers, Sealers and Undercoaters is the third largest category overall with a 100 g/l VOC limit. For both of these categories over 99 percent of the product sold is waterborne. Detailed results of the 2014 Survey for all coating categories are provided in Appendix H, which includes data for each category such as sales, emissions, and sales weighted average VOC content.

Staff considered lowering VOC limits for several categories listed in Table 5-2, but decided not to propose lower limits for a number of reasons. Specifically, for Zinc Rich Primers, Metallic Pigmented Coatings, and Rust Preventative Coatings the low VOC coating formulations rely on the VOC exempt compounds: TBAc and PCBTF. Because of potential toxicity concerns with these exempt compounds, staff is not proposing lower VOC limits for these categories. Staff considered lowering the VOC limit for Industrial Maintenance Coatings as well. While this category employs less exempts, it still relies on these compounds to formulate higher performance products. Thus, staff is not proposing to lower the VOC limit for this category. Staff also considered splitting up the Concrete Curing Compounds category similar to the categories in South Coast AQMD Rule 1113. The analysis showed there would be minimal emission benefits from changing this category, therefore the proposed SCM does not change the Concrete Curing Compounds category.

For these categories and others for which lower limits are proposed, industry raised concerns regarding the efficacy of the low VOC products in extreme climatic conditions. While many areas in California have climate that generally should not interfere with the performance of most of these coatings, there are some areas where such conditions may be challenging for some products. Industry acknowledged that there are areas, specifically those adjacent to the South Coast AQMD, where concerns regarding performance due to climatic differences are not significant. Air districts such as Ventura County APCD and San Diego APCD may choose to pursue more stringent limits than the proposed SCM. For example, they may choose to implement VOC limits the same as South Coast AQMD Rule 1113.

Table 5-2
Coating Categories with no Changes in VOC Limits

Coating Category	Current VOC Limit (g/l)
General Categories	
Flat Coatings	50
Specialty Categories	
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	**350**
Concrete/Masonry Sealers	100
Driveway Sealers	50
Faux Finish Coatings	350
High Temperature Coatings	420
Industrial Maintenance Coatings	**250**
Low Solids Coatings[1]	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	**500**
Multi-Color Coatings	250
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs: Clear	730
Shellacs: Opaque	550
Specialty Primers, Sealers, and Undercoaters	100
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Wood Coatings	275
Wood Preservatives	350
Zinc Rich Primers	**340**

1. Low Solids Coatings VOC limits are VOC Actual.

Industry representatives also suggested consolidating all categories which have a 50 g/l limit and grouping them into a single category with a 50 g/l VOC content limit for consistency and ease of compliance. CARB staff agrees that such consolidation could simplify the rule, however, it would require a significant restructuring of the rule and categories. Staff believes this would be better addressed as part of a future update where it could be given full consideration and discussion of potential ramifications.

The remainder of this chapter contains a write up for each coating category where the VOC limit is being lowered or a new VOC limit is proposed. The write up includes: a comparison of VOC limits from different architectural coating rules, the proposed category definition, major changes between the 2007 SCM and the proposed SCM, a description of product uses and formulations, survey data, the rationale for the proposed VOC limit, and a discussion of the issues associated with the proposed VOC limit. For each category, survey data is provided for solventborne products only, waterborne products only, and all products. Sales-weighted averages are based on the reported sales volumes for solventborne products, waterborne products, and all products, including small containers. More information about all the categories is available in the 2007 SCM Technical Support Document (CARB, 2007b).

B. Aluminum Roof Coatings

Table 5-B.1
VOC Limits for Aluminum Roof Coatings (g/l)

USEPA: 500 (under Metallic Pigmented)	Canada: 500 (under Metallic Pigmented)	OTC: 450	SCAQMD: 100	SCM Proposed: 100

1. Category Definition

A coating labeled and formulated exclusively for application to roofs and containing at least 84 grams of elemental aluminum pigment per liter of coating (0.7 pounds per gallon). Pigment content shall be determined in accordance with South Coast AQMD Method 318-95.

2. Proposed Changes

Aluminum Roof Coatings is an existing category for coatings that was established in the 2007 SCM. Prior to the 2007 SCM these coatings were covered under Metallic Pigmented. The proposed VOC Limit for Aluminum Roof Coatings would decrease from 400 g/l to 100 g/l.

3. Coating Description

Aluminum Roof Coatings are primarily used as a topcoat for asphalt roof systems or metal roofs that need a reflective coating. They contain aluminum flakes for the reflection of solar radiation to reduce the surface temperature of the roof and the internal temperature of the structure. These aluminum pigments float to the surface of the coating during settling (a process known as “leafing”) and they can reflect up to 60% of ultraviolet (UV) rays. They also aid in the inhibition of rust formation and alleviate corrosion of metal surfaces. Aluminum Roof Coatings are also aesthetically pleasing. In addition, most Aluminum Roof Coatings are

Underwriter's Laboratory (UL) Class A Fire Rated, which improves fire resistance and enhances building safety.

Aluminum Roof Coatings are usually single component products that can be sprayed on, brushed, or roller applied. Typically, these coatings have a smooth texture with some degree of a glossy, metal luster. They are generally applied by contractors on flat, low-slope commercial buildings, but they can also be applied by homeowners or business owners. Even when these coatings are applied properly, aluminum particles naturally degrade and erode over time due to UV exposure and ponding water.

4. Substrates/Exposures

All Aluminum Roof Coatings are applied to external roofing surfaces to provide solar reflective properties. These coatings can be applied to new roof systems that have cured for at least 30-90 days or they can be applied for maintenance of weathered systems. They are usually applied to asphalt and metal substrates, but can be applied to other bituminous surfaces (Built-Up Roofs and Modified Bituminous Systems), concrete, stone, masonry, and some properly prepared wood and shingled surfaces. Aluminum Roof Coatings should not be installed on roofs that are damaged or cracked and susceptible to ponding water as it leads to adhesion failure and degradation of the aluminum. Application on improper surfaces can drastically shorten the lifetime and impair the reflective properties, resulting in more frequent re-application and higher energy costs.

5. Survey Results

Most of the reported Aluminum Roof Coatings are composed of asphaltic/bituminous resins, but a few have alkyd, oleoresin or styrene/butadiene resins. Some Aluminum Roof Coatings contain fibers that allow for cross-linking and interlocking to increase durability, longevity, and/or viscosity for application purposes. Aluminum Roof Coatings are formulated to maximize the aluminum surface area that is exposed to solar radiation and optimize reflectivity.

Most of the reported Aluminum Roof Coatings are waterborne products with relatively low VOC levels, but some solventborne formulations were also reported in CARB's survey. When comparing solventborne to waterborne products, the lowest VOC solventborne product generates almost four times the VOC emissions of the highest VOC waterborne product. Table 5-B.2 summarizes the estimate of sales and VOC emissions from the Aluminum Roof Coatings category, based on results from the 2014 Survey. In 2013, the sales volume for Aluminum Roof Coatings in California was almost 209,000 gallons which represents about 0.2 percent of the total California sales volume for architectural coatings.

In 2013, VOC emissions from Aluminum Roof Coatings were about 0.3 tpd, which represents about one percent of the total emissions from architectural coatings. Solventborne coatings produce about 82 percent of the VOC emissions from this category, but they only account for 30 percent of the sales volume. According to the 2014 Survey, roughly 1.1 tpd of VOCs are released from all coatings related to roofing, including emissions from Aluminum Roof Coatings, Bituminous Roof, Bituminous Roof Primer, and Roof Coatings. Aluminum Roof Coatings emit 28 percent of reported VOC emissions from all roofing-related products, but they only make up four percent of the total sales volume of these products.

Table 5-B.2
Survey Data (Includes Small Containers)
Aluminum Roof Coatings

Number of Products	Sales in CA (gals/year) [1]	% SB/ WB	% Int	% Ext	% Dual	% in Small Containers[2]	SWA VOC (g/l)[3]	VOC Emissions (tons/day)[4]
21	208,760	30%/70%	0%	100%	0%	PD[5]	146	0.31

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Percentage of sales volume in small containers, one quart or less.
3. Sales-Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
4. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.
5. PD is protected data. Fewer than four companies reported sales.

Table 5-B.3 contains complying marketshare data for the Aluminum Roof Coatings category, based on results from the 2014 Survey. This table shows that 70 percent of the sales volume for Aluminum Roof Coatings complies with the proposed VOC limit of 100 g/l. The expected VOC emission reductions for this proposed limit are 0.2 tpd.

Table 5-B.3
Complying Marketshare & Emission Reductions
(Excludes Small Containers)
Aluminum Roof Coatings

Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Number of Complying Products	Complying Marketshare (%) by Volume [1]	VOC Reductions in 2007 SCM Areas (tpd)	Statewide VOC Reductions (tpd)
400	100	6	70%	0.2	0.27

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit. The Complying Marketshare does not include small containers that are exempt from VOC limits.

Of the seven companies that reported sales in this category, three offered Aluminum Roof Coatings that comply with the proposed limit. One of these three companies is considered a small business because they employ less than 250 employees.

Staff reviewed data from the South Coast AQMD Architectural Coatings Rule 314 database and identified one solventborne formulation that meets the proposed 100 g/l VOC limit. Discussions with industry representatives confirmed there are solventborne products formulated with exempt VOCs (specifically, PCBTF) that meet the 100 g/l VOC limit.

6. Manufacturer and Industry Issues

Some manufacturers and industry representatives have expressed concerns about lowering the VOC limits for Aluminum Roof Coatings. Below are key issues that have been brought to staff's attention during interactions with industry representatives for the Aluminum Roof Coatings category.

Issue: The Roof Coatings Manufacturers Association (RCMA) and the American Coatings Association (ACA) believe that lowering the VOC limit from 400 g/l to 100 g/l could lead to a ban of unique and irreplaceable coatings that are low cost, have long term performance, have lower application rates, and decreased resistance to overnight moisture exposure.

Response: CARB staff is proposing a 100 g/l VOC limit, which has been in effect in the South Coast AQMD since 2005. Use of coatings meeting 100 g/l VOC limit has expanded beyond the South Coast AQMD as evidenced by the high complying market share of Aluminum Roof Coatings. Results from the 2014 Survey show that over 70 percent of product sold in the state meets the proposed 100 g/l VOC limit. Thus, staff concludes that the proposed 100 g/l VOC limit for Aluminum Roof Coatings is feasible for the remainder of California.

Issue: RCMA and other stakeholders have expressed concerns about the potential for hydrogen generation in enclosed product containers if waterborne Aluminum Roof Coatings are stored improperly or for long periods of time.

Response: While waterborne aluminum coatings could experience chemical reactions that produce hydrogen and the rate of reaction is accelerated when stored in a warm environment, it appears this issue has been effectively managed by coating manufacturers. Even as early as 2003 when the South Coast AQMD first established the 100 g/l VOC limit, manufacturers were minimizing the potential hydrogen generation through the use of additives (SCAQMD, 2003). Excessive pressure buildup and oxidation of the aluminum flake can be minimized through additives that slows the reaction down. Because the majority of these products are used by contractors who used them relatively quickly, long term storage is typically not a concern. The shelf life of waterborne aluminum roof coatings for residential use could be a concern because material kept for extended time periods may create pressure buildup in the container under improper storage conditions, such as a high ambient temperature. For the consumer market, manufacturers use containers equipped with pressure relief valves that mitigate the pressure buildup and minimize any concerns associated with hydrogen gas build-up by slowly releasing any hydrogen gas, if any (SCAQMD, 2003).

7. Conclusion

Staff recommends a 100 g/l VOC limit for Aluminum Roof Coatings, effective January 1, 2022. The proposed VOC limit is technologically and commercially feasible by January 1, 2022 based on staff's review of 2014 Survey data, complying marketshares, the number of companies making compliant products, and product information from manufacturers.

C. Building Envelope Coatings

Table 5-C.1
VOC Limits for Building Envelope Coatings (g/l)

USEPA: N/A	Canada: N/A	OTC: N/A	SCAQMD: 50	SCM Proposed: 50

1. Category Definition

The fluid applied coating applied to the building envelope to provide a continuous barrier to air or vapor leakage through the building envelope that separates conditioned from unconditioned spaces. Building Envelope Coatings are applied to diverse materials including, but not limited to, concrete masonry units (CMU), oriented strand board (OSB), gypsum board, and wood substrates and must meet the following performance criteria:

1. Air Barriers formulated to have an air permeance not exceeding 0.004 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.004 cfm/ft2 @ 1.57 psf), [0.02 liters per square meter per second under a pressure differential of 75 Pa (0.02 L/(s-m^2) @ 75 Pa)] when tested in accordance with ASTM E2178-13, incorporated by reference in subsection 8.5.23; and/or

2. Water Resistive Barriers formulated to resist liquid water that has penetrated a cladding system from further intruding into the exterior wall assembly and is classified as follows:

    a. Passes water resistance testing according to ASTM E331-00 (2016), incorporated by reference in subsection 8.5.24 and

    b. Water vapor permeance is classified in accordance with ASTM E96/E96M-16, incorporated by reference in subsection 8.5.25.

2. Proposed Changes

Building Envelope Coatings is a new category. These coatings were part of the Waterproofing Membranes category. The proposed VOC limit for Building Envelope Coatings is 50 g/l.

3. Coating Description

Building Envelope Coatings is a new proposed category, these coatings are currently in the Waterproofing Membranes category. These coatings did not exist during the development of the 2007 SCM and is a growing category. Staff recommends establishing a new category for these coatings with a VOC limit of 50 g/l.

4. Substrates/Exposures

Building Envelope Coatings are applied to diverse materials including, but not limited to, concrete masonry units, oriented strand board, gypsum board, and wood substrates.

5. Survey Results

These coatings are currently part of the Waterproofing Membranes category which has a VOC limit of 100 g/l. The proposed SCM establishes a VOC limit of 50 g/l, effective January 1, 2022. Based on manufacturer feedback, the proposed 50 g/l VOC limit is commercially and technologically feasible. Staff also researched the coatings currently being offered for sale in the South Coast AQMD, since the South Coast AQMD adopted this limit in 2016. Table 5-C.2 summarizes the estimate of sales and VOC emissions from the Building Envelope Coatings category, based on results from the 2014 Survey.

Table 5-C.2
Survey Data (Includes Small Containers)
Building Envelope Coatings

Number of Products	Sales in CA (gals/year) [1]	% SB/ WB	% Int	% Ext	% Dual	% in Small Containers[2]	SWA VOC (g/l)[3]	VOC Emissions (tons/day)[4]
20	79,224	PD/PD[5]	1%	62%	37%	PD[5]	27	0.01

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Percentage of sales volume in small containers, one quart or less.
3. Sales-Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
4. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.
5. PD is protected data. Fewer than four companies reported sales.

Table 5-C.3 contains complying marketshare data for the Building Envelope Coatings category, based on results from the 2014 Survey. This table shows

that 84 percent of the sales volume for Building Envelope Coatings meet the proposed 50 g/l VOC limit. The expected VOC reductions for this proposed limit is 0.01 tpd.

Table 5-C.3
Complying Marketshare & Emission Reductions
(Excludes Small Containers)
Building Envelope Coatings

Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Number of Complying Products	Complying Marketshare (%) by Volume [1]	VOC Reductions in 2007 SCM Areas (tpd)	Statewide VOC Reductions (tpd)
NA	50	10	84%	0.01	0.01

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit. The Complying Marketshare does not include small containers that are exempt from VOC limits.

6. Manufacturer and Industry Issues

Staff found 84 percent of the coatings in this category could meet the proposed 50 g/l VOC limit. No issues were raised regarding the proposed VOC limits for Building Envelope Coatings.

7. Conclusion

CARB recommends a 50 g/l VOC limit for Building Envelope Coatings, effective January 1, 2022. The proposed VOC limit is technologically and commercially feasible by January 1, 2022 based on staff’s review of 2014 Survey data, high complying marketshare, the number of companies making compliant products, and product information from manufacturers.

D. Dry Fog Coatings

Table 5-D.1
VOC Limits for Dry Fog Coatings (g/l)

USEPA: 400	Canada: 400	OTC: 150	SCAQMD: 50	SCM Proposed: 50

1. Category Definition

A coating labeled and formulated only for spray application such that overspray droplets dry before subsequent contact with incidental surfaces in the vicinity of the surface coating activity.

2. Major Proposed Changes

The VOC limit for Dry Fog Coatings will decrease from 150 g/l to 50 g/l.

3. Coating Description

Dry Fog Coatings are similar to interior flat and nonflat coatings, but the overspray from Dry Fog Coatings dries within 10 to 15 feet of application. Dry Fog (also called dry fall) Coatings are used in areas where applicators want to eliminate overspray. These products will typically reflect light and provide good hiding. Conventional application is by spray, which allows excess paint drops to dry before they reach the ground. Overspray drying distances tend to be about 10 to 15 feet below the surface of application, which may vary due to weather conditions such as humidity and temperature. Overspray drying distances have increased slightly which may be due to the decrease in VOC content of the products. Some companies manufacture low-VOC Dry Fog Coatings that are designed to be low-odor products that eliminate fire hazards and reduce cleanup costs.

The main solvent in acrylic, latex paints is water, while alkyd resins are formulated using hydrocarbon solvents. For waterborne products, coalescing agents are one of the main contributors to VOC emissions (Klein, 1993).

4. Substrates/Exposure

Dry Fog Coatings are used in interior commercial and industrial settings. Exterior use is limited to areas such as parking garages or covered areas where the coating is not subject to weathering or moist conditions. Dry Fog Coatings are applied to steel, galvanized metal and aluminum, pre-primed roof decking, concrete, and masonry. Unsuitable surfaces are high-abuse and high-corrosion areas. Application in times of high humidity is not recommended.

5. Survey Results

In 2013, the sales volume for Dry Fog Coatings was about 363,000 gallons with approximately 0.11 tpd of VOC emissions. Table 5-D.2 shows the survey results for this category.

Table 5-D.2
Survey Data (Includes Small Containers)
Dry Fog Coatings

Number of Products	Sales in CA (gals/year) [1]	% SB/ WB	% Int	% Ext	% Dual	% in Small Containers[2]	SWA VOC (g/l)[3]	VOC Emissions (tons/day)[4]
56	362,987	PD/PD[5]	99%	1%	0%	0%	58	0.11

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Percentage of sales volume in small containers, one quart or less.
3. Sales-Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
4. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.
5. PD is protected data. Fewer than four companies reported sales.

Table 5-D.3 contains complying marketshare data for Dry Fog Coatings, based on results from the 2014 Survey. This table shows that about 67 percent of the sales volume complies with the proposed VOC limit of 50 g/l and 28 of the 56 reported products already comply with the proposed limit. Implementing the proposed 50 g/l VOC limit would achieve approximately 0.03 tpd in VOC emission reductions for the non-South Coast AQMD portion of California, on an annual average basis.

Table 5-D.3
Complying Marketshare & Emission Reductions
(Excludes Small Containers)
Dry Fog Coatings

Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Number of Complying Products	Complying Marketshare (%) by Volume [1]	VOC Reductions in 2007 SCM Areas (tpd)	Statewide VOC Reductions (tpd)
150	50	28	67%	0.03	0.05

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit. The Complying Marketshare does not include small containers that are exempt from VOC limits.

6. Manufacturer and Industry Issues

No issues were raised regarding the proposed SCM VOC limits for Dry Fog Coatings.

7. Conclusion

CARB recommends a 50 g/l VOC limit for Dry Fog Coatings, effective January 1, 2022. The proposed VOC limit is technologically and commercially feasible based on CARB's review of survey data, the high complying marketshare, the number of companies making complying products, and product information from manufacturers.

E. Fire Resistive Coatings

Table 5-E.1
VOC Limits for Fire Resistive Coatings (g/l)

U.S. EPA: 850 (clear) 450 (opaque) (includes fire-resistant and fire-retardant coatings)	Canada: 350	OTC: 650 (clear) 350 (opaque) (as Fire-Retardant Coatings)	SCAQMD: 150 (as Fire-Proofing Coatings)	SCM Proposed: 150

1. Category Definition

A coating labeled and formulated to protect structural integrity by increasing the fire endurance of interior or exterior structural materials including steel. The Fire Resistive Coatings category includes sprayed fire resistive and intumescent coatings used to bring structural materials into compliance with federal, State, and local building code requirements. Fire Resistive Coatings shall be tested in accordance with ASTM Designation E-119-18ce, "Standard Test Methods for Fire Testing of Building Construction and Materials" (see section 4, Fire-Resistive Coatings). Fire Resistive Coatings must be approved by building code officials.

2. Major Proposed Changes

Fire Resistive Coatings is an existing category for coatings. The proposed VOC limit for Fire Resistive Coatings would decrease from 350 g/l to 150 g/l.

3. Coating Description

Fire Resistive Coatings are applied to structural materials to delay the onset of critical temperatures that will compromise the load-bearing capacity of the building material to which the coating is applied. Fire Resistive Coatings are commercially used to coat exterior and interior structural steel. Uses include office buildings, health care facilities, multi-family housing units (such as apartments and condominiums), hotels, restaurants, and schools. They are rarely used in single family homes (Brimo-Cox, 2005). Fire Resistive Coatings are also used in the petrochemical industry for exterior surfaces at refineries and offshore platforms.

Fire Resistive Coatings themselves carry no fire-resistance rating, because a fire resistive coating is only one component of a total fire rated assembly. A fire resistive coating imparts an additional degree of resistance to the total fire rated assembly. For example, structural steel retains only about half of its design strength at 1,100^{o} F. Unprotected, a steel building structure exposed to fire may collapse under the load it was designed to carry at normal temperatures. In accordance with the acceptance criteria in ASTM E-119, a fire resistive coating must limit steel temperatures during the standard fire exposure test to 1,000 ^{o} F for columns and 1,100^{o} F for beams.

Fire Resistive Coatings do not include fire retardant coatings. Fire retardant coatings are considered a flat or nonflat coating, depending on the gloss of the coating. There is a difference between coatings classified as Fire Resistive Coatings and those classified as fire retardant coatings. The latter classification is made by Underwriters Laboratory. Fire retardant coatings are qualified on the basis of their surface burning characteristics (such as flame spread and smoke created) and their ability to reduce the surface burning characteristics of the particular substrate to which they are applied. Unlike Fire Resistive Coatings, fire retardant coatings have not been rated for fire resistance (Falconer, 2006).

A more detailed description of Fire Resistive Coatings was provided in the development of the 2007 SCM (CARB, 2007b).

4. Substrates/Exposures

An important performance consideration for Fire Resistive Coatings is the ability to maintain fire resistive properties while exposed to environmental conditions that may exist during the coating's service life. Prior to listing an intumescent fire resistive coating under the classification of "Mastic and Intumescent Coatings", UL requires the product to undergo a series of environmental exposures, including accelerated aging and high humidity. In addition, all products intended for exterior use, whether conventional spray-applied fire resistant materials (SFRM) or mastic and intumescent coatings, must be tested and qualified for exterior use to ensure that fire-resistive performance is not reduced by weathering. Test exposures include ultraviolet light, freeze-thaw, carbon dioxide and sulfur dioxide air mixture, and salt spray. The loss of fire resistance caused by any of these interior and exterior exposure conditions cannot be greater than 25 percent of the fire resistance of the control sample. Fire Resistive Coatings are then categorized for one or more of three uses: conditioned interior space, interior general, or exterior. Conventional SFRMs are usually limited to interior use unless the fire test design information specifically indicates the product is qualified for exterior use. Typically, the higher-density Portland cement-based SFRMs qualify for exterior use applications. Waterborne intumescent coatings may require a topcoat to qualify for exterior and interior general use (Falconer, 2006).

5. Survey Results

The sales and VOC emissions for Fire Resistive Coatings from the 2014 Survey are summarized in Table 5-E.2. In 2013, the sales volume for Fire Resistive Coatings in California was approximately 16,403 gallons. Fire Resistive Coatings represent less than one percent of the total California sales volume of architectural coatings. VOC emissions from Fire Resistive Coatings are about 0.02 tpd, which represents less than one percent of the total emissions from architectural coatings.

Table 5-E.2
Survey Data (Includes Small Containers)
Fire Resistive Coatings

Number of Products	Sales in CA (gals/year) [1]	% SB/ WB	% Int	% Ext	% Dual	% in Small Containers[2]	SWA VOC (g/l)[3]	VOC Emissions (tons/day)[4]
10	16,403	PD/PD[5]	37%	1%	61%	0%	132	0.02

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Percentage of sales volume in small containers, one quart or less.
3. Sales-Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
4. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.
5. PD is protected data. Fewer than four companies reported sales.

Table 5-E.3 contains complying marketshare data for Fire Resistive Coatings, based on results from the 2014 Survey. Products with a VOC content equal to or lower than 150 g/l represent about 67 percent of the market**.** Seven of the ten products reported already comply with the proposed limit. Once the new limit for Fire Resistive Coatings is fully implemented, VOC emissions from Fire Resistive Coatings will be less than 0.01 tpd.

Table 5-E.3
Complying Marketshare & Emission Reductions
(Excludes Small Containers)
Fire Resistive Coatings

Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Number of Complying Products	Complying Marketshare (%) by Volume [1]	VOC Reductions in 2007 SCM Areas (tpd)	Statewide VOC Reductions (tpd)
350	150	7	67%	0.02	0.02

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit. The Complying Marketshare does not include small containers that are exempt from VOC limits.

6. Manufacturer and Industry Issues

The American Coatings Association expressed concerns about the proposed VOC limit for Fire Resistive Coatings.

Issue: Applying Fire Resistive Coatings to building steel that is exposed to the weather during construction poses a challenge for waterborne products.

Response: 2014 Survey data indicate the VOC limit for Fire Resistive Coatings is technologically and commercially feasible based on the complying marketshare, the number of companies making compliant products, and product information from manufacturers. In addition, the South Coast AQMD represents approximately 43 percent of the market and has had a VOC Limit of 150 g/l for these types of products since 2007. The South Coast AQMD has had no issues with Fire Resistive Coatings meeting the 150 g/l VOC limit.

7. Conclusion

Staff recommends a 150 g/l VOC limit for Fire Resistive Coatings, effective January 1, 2022. The proposed VOC limit is technologically and commercially feasible based on staff's review of 2014 Survey data, complying marketshare, the number of companies making compliant products, and product information from manufacturers.

F. Floor Coatings

Table 5-F.1
VOC Limits for Floor Coatings (g/l)

USEPA: 400	Canada: 250	OTC: 100	SCAQMD: 50	SCM Proposed: 50

1. Category Definition

An opaque coating that is labeled and formulated for application to flooring, including, but not limited to, decks, porches, steps, garage floors, and other horizontal surfaces which may be subject to foot traffic.

2. Major Proposed Changes

The VOC limit for Floor Coatings will decrease from 100 g/l to 50 g/l.

3. Coating Description

Floor Coatings cover a wide range of applications and functions including use on porch, deck, and stairs, garage floors, and sports surfaces. The Floor Coatings category is not intended for products that are applied to industrial/institutional/commercial floors or clear coatings for wood floors. Those types of products would be covered by other categories (e.g., Concrete/Masonry

Sealers, Industrial Maintenance Coatings, Wood Coatings, etc.). Provided below is a description of the primary applications.

Porch, Deck, and Stairs: These products are opaque coatings for patios, porches, stairs, balconies, pool decks, and other similar surfaces that may be subject to foot traffic. Application methods include brush, roller, spray, squeegee, and trowel. Some floor coatings are single component solventborne or waterborne formulations with resin types that include: alkyd, urethane, polyurethane, acrylic, acrylic copolymer, and epoxy. Floor Coatings are also available in multi-component solventborne formulations with resin types that include: epoxy, urethane, and polyurethane.

Garage Floors: These products are opaque coatings for garage floors that are designed to be resistant to abrasion, hot tire pick up, and some chemicals (e.g. oil, grease, and gasoline stains). Other formulation types include multi-component waterborne epoxies and single component waterborne products with acrylic and polyurethane resins. Products can either be applied by homeowners or professional contractors and application methods include brush, roller, and sprayer. Prior to application, it is usually necessary to etch the concrete by using muriatic acid or some other etching solution. After etching, the surface must be neutralized or cleaned, thoroughly rinsed, and dried before coatings can be applied. Garage floor coatings need to be fully cured before they are strong enough to withstand vehicle traffic.

Sports Surfaces: These products are used on sports surfaces (e.g., tennis courts, running tracks, playgrounds, ball courts, and gymnasium floors). The coatings are generally designed to provide abrasion resistance and withstand wear from foot traffic. Clear products that are applied to wood gymnasium floors would not be included in the Sports Surfaces group, because those coatings are covered by the Wood Coatings category. Sports Surfaces products can be applied by professional contractors or homeowners and application methods include sprayer, roller, brush, and squeegee.

4. Substrates/Exposure

Floor Coatings are typically applied to concrete, wood, and asphalt substrates, with both interior and exterior exposures. Floor Coatings are used on a variety of surfaces, such as wood porches and stairs; concrete garage floors; wood gymnasium floors; concrete patios and pool decks; running tracks; and concrete tennis courts.

5. Survey Results

Table 5-F.2 summarizes staff's estimate of sales and VOC emissions from the Floor Coatings category, based on the 2014 Survey. In 2013, the sales volume for Floor Coatings in California was approximately 783,000 gallons. This

represents about one percent of the total California sales volume of architectural coatings.

Table 5-F.2
Survey Data (Includes Small Containers)
Floor Coatings

Number of Products	Sales in CA (gals/year) [1]	% SB/ WB	% Int	% Ext	% Dual	% in Small Containers[2]	SWA VOC (g/l)[3]	VOC Emissions (tons/day)[4]
514	783,426	7%/93%	10%	5%	85%	3%	59	0.29

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Percentage of sales volume in small containers, one quart or less.
3. Sales-Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
4. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.
5. PD is protected data. Fewer than four companies reported sales.

Table 5-F.3 contains the complying marketshare for Floor Coatings in large containers, based on results from the 2014 Survey. There are more than 200 Floor Coatings products that comply with the proposed VOC limit. Implementing the proposed 50 g/l VOC limit would achieve approximately 0.04 tpd in VOC emission reductions for the non-South Coast AQMD portion of California, on an annual average basis.

Table 5-F.3
Complying Marketshare & Emission Reductions
(Excludes Small Containers)
Floor Coatings

Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Number of Complying Products	Complying Marketshare (%) by Volume [1]	VOC Reductions in 2007 SCM Areas (tpd)	Statewide VOC Reductions (tpd)
100	50	227	75%	0.01	0.04

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit. The Complying Marketshare does not include small containers that are exempt from VOC limits.

6. Manufacturer and Industry Issues

Below are key issues that have been brought to staff's attention during interactions with industry representatives for the Floor Coatings category.

Issue: The American Coatings Association (ACA) has expressed concerns about meeting the proposed 50 g/l VOC limit and that the limit should remain at 100 g/l. Industry's main concern is the proposed limit is too low for specific floor coating uses.

Response: CARB's analysis of the category shows that the limit is feasible for the Floor Coatings category. Use of coatings on surfaces that require higher VOC content would be covered by other categories (e.g., Concrete/Masonry Sealers, Industrial Maintenance Coatings, Wood Coatings, etc.).

Issue: The American Coatings Association (ACA) has expressed concerns about specifiers (such as architects) asking for floor coatings that meet 50 g/l in situations where they should be asking for products that fall under the Industrial Maintenance Coatings category. Industry's main concern is the while the category is not intended for commercial/institutional/industrial floor products, as previously stated in the 2007 SCM, most specifiers are not aware of this distinction. Industry representatives requested clarification of the definition to indicate that the category is for "residential" floor coating products,

Response: CARB staff discussed this issue with the District Working Group and decided not to modify the definition. The Floor Coatings category is not intended for products that are applied to industrial/institutional/commercial floors or clear coatings for wood floors. Those types of products would be covered by other categories (e.g., Concrete/Masonry Sealers, Industrial Maintenance Coatings, Wood Coatings, etc.). Districts believe the definition is clear and they are able to effectively implement and enforce the limits.

7. Conclusion

Staff recommends a 50 g/l VOC limit for Floor Coatings, effective January 1, 2022. The proposed VOC limit is technologically and commercially feasible based on the high complying marketshare, the number of companies making complying products, and information provided by manufacturers.

G. Form Release Compounds

Table 5-G.1
VOC Limits for Form Release Compounds (g/l)

USEPA: 450	Canada: 250	OTC: 250	SCAQMD: 100	SCM Proposed: 100

1. Category Definition

A coating labeled and formulated for application to a concrete form to prevent the freshly poured concrete from bonding to the form. The form may consist of wood, metal, or some material other than concrete.

2. Major Proposed Changes

The proposed VOC limit for Form Release Compounds will decrease from 250 g/l to 100 g/l.

3. Coating Description

Concrete forms are generally made of wood, metal, or fiberglass, providing shape and support during the concrete pouring and curing process. Form Release Compounds are applied in a thin film on concrete forms to prevent freshly poured concrete from sticking to the form. The compounds can also help provide a smooth concrete surface by preventing bugholes or air voids. Form Release Compounds are designed to not stain the concrete surface or leave a residue that could interfere with the adhesion of concrete sealers or coatings. On wooden forms, repeated use of Form Release Compounds can provide a water repellent coating that can extend the life of the form. Some products contain rust inhibitors that help prevent rusting of metal forms. All of the Form Release Compounds that were reported in the 2014 Survey are single component products sold in large containers and fall into two main groups:

- Chemically Reactive: These products react with the alkali or lime in the concrete to form a slippery film.
- Non-Reactive: These products provide an oily film, but do not react with the concrete.

Chemically Reactive: These Form Release Compounds react with the alkali or lime in the concrete to form a slippery film that prevents concrete from sticking to the forms. Products are available in waterborne formulations (oleoresins and paraffin oils) and solventborne formulations (fatty acids, mineral oils, naphthenic oils, oleoresins, paraffin oils, soybean oils, and tall oils). The product formulations generally do not contain fuel oils or kerosene and some are designed to be biodegradable. Many products are not suitable for use on molds made of latex, plaster, rubber, or foam. In addition, some are not suitable for tilt-up construction.

Non-Reactive: These products provide an oily film, but do not react with the concrete. Most of the reported products are solventborne formulations (naphthenic oils, paraffin oils, petroleum distillates, mineral oils, and vegetable oils), but there are also waterborne formulations (vegetable oil emulsions). Some products are not suitable for use on molds made of latex, expanded polystyrene, rubber, or styrene-butadiene rubber (SBR). In addition, some are not suitable for tilt-up construction.

4. Substrates/Exposures

Form Release Compounds are applied to substrates that include, but are not limited to, wood, metal, and fiberglass. The compounds are temporary coatings and are not designed to withstand long-term exposure to chemicals.

5. Survey Results

Table 5-G.2 summarizes the estimate of sales and VOC emissions from the Form Release Compounds category, based on the 2014 Survey.

Table 5-G.2
Survey Data (Includes Small Containers)
Form Release Compounds

Number of Products	Sales in CA (gals/year) [1]	% SB/ WB	% Int	% Ext	% Dual	% in Small Containers[2]	SWA VOC (g/l)[3]	VOC Emissions (tons/day)[4]
25	219,983	44%/56%	0%	41%	59%	0%	117	0.21

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Percentage of sales volume in small containers, one quart or less.
3. Sales-Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
4. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.

The sales volume for Form Release Compounds represents about 0.2 percent of the total California sales volume of architectural coatings in 2013. VOC emissions from Form Release Compounds represent less than one percent of the total emissions from architectural coatings.

Table 5-G.3 contains the complying marketshare for Form Release Compounds, based on results from the 2014 Survey. This table shows that 83 percent of the sales volume for Form Release Compounds complies with the proposed VOC limit. There will be a 0.08 tpd in VOC emission reductions for the 2007 SCM areas and 0.18 tpd statewide.

Table 5-G.3
Complying Marketshare & Emission Reductions
(Excludes Small Containers)
Form Release Compounds

Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Number of Complying Products	Complying Marketshare (%) by Volume [1]	VOC Reductions in 2007 SCM Areas (tpd)	Statewide VOC Reductions (tpd)
250	100	10	83%	0.08	0.18

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit. The Complying Marketshare does not include small containers that are exempt from VOC limits.

6. Manufacturer and Industry Issues

No issues related to this coatings category have been raised by manufacturer or industry stakeholders.

7. Conclusion

Staff recommends a 100 g/l VOC limit for Form Release Compounds, effective January 1, 2022. The proposed VOC limit is technologically and commercially feasible based on the complying marketshare, the number of companies making complying products, and product information from manufacturers.

H. Nonflat Coatings

Table 5-H.1
VOC Limits for Nonflat Coatings (g/l)

USEPA: 380	Canada: 150	OTC: 100	SCAQMD: 50	SCM Proposed: 50

1. Category Definition

A coating that is not defined under any other definition in the rule and that registers a gloss of 15 or greater on an 85-degree meter and 5 or greater on a 60-degree meter according to ASTM Designation D523-14 (2018).

2. Major Proposed Changes

For Nonflat Coatings, the proposed VOC limit will decrease from 100 g/l to 50 g/l.

3. Coating Description

Most Nonflat Coatings are waterborne, single component products. The most prevalent resins for Nonflat Coatings are vinyl acrylic and 100% acrylic. Because most Nonflat Coatings are waterborne, the VOCs acrylic coatings come from additives such as resin coalescing aids, polymer plasticizers, freeze/thaw stabilizers, and anti-foam agents. These additives help create homogeneous films, improve block and print resistance, prevent coagulation, ease application, and reduce defects formed during application. Other additives that contribute to the VOC content are preservatives, thickeners and colorants. Resin coalescing aids and freeze/thaw stabilizers are the two main contributors to VOCs in Nonflat Coatings. Most coating manufacturers use ester alcohols (e.g., Texanol®) as coalescing agents. Freeze/thaw stabilizers are glycols (e.g., ethylene glycol or propylene glycol) that help prevent the paint from coagulating or solidifying when exposed to freezing temperatures.

4. Substrates/Exposures

Nonflat Coatings are used for both interior and exterior applications. With proper surface preparation and priming, Nonflat Coatings can be used on a large variety of substrates including drywall, plaster, concrete block, wood, and metal. The coatings work best on smooth, well-prepared walls because the gloss may bring out imperfections present on the substrate. Generally, ambient and surface temperatures of application are limited to above 50 F.

5. Survey Results

Table 5-H.2 summarizes CARB's estimates of sales and VOC emissions based on the 2014 Survey. Table 5-H.3 summarizes the complying marketshare and potential emission reductions for Nonflat Coatings.

In 2013, the sales volume for Nonflat Coatings in California was approximately 31 million gallons. This represents about 34 percent of the total California sales volume of architectural coatings. Waterborne coatings dominate the Nonflat Coatings market. From 2004 to 2013, VOC emissions have decreased from 18.3 tons/day (tpd) to 4.62 tpd. Nonflat Coatings represent about 15 percent of total emissions from architectural coatings.

Table 5-H.2
Survey Data (Includes Small Containers)
Nonflat Coatings

Number of Products	Sales in CA (gals/year) [1]	% SB/ WB	% Int	% Ext	% Dual	% in Small Containers[2]	SWA VOC (g/l)[3]	VOC Emissions (tons/day)[4]
3,842	30,697,959	0%/100%	69%	22%	10%	6%	33	4.62

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Percentage of sales volume in small containers, one quart or less.
3. Sales-Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
4. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.

Table 5-H.3 contains the complying marketshare for Nonflat Coatings based on results from the 2014 survey. This table shows that 2,555 products accounting for about 93 percent of the sales volume for Nonflat Coatings complies with the

proposed VOC limit. This table also shows 0.41 tpd in VOC emission reductions for the 2007 SCM areas and 0.67 tpd statewide.

Table 5-H.3
Complying Marketshare & Emission Reductions
(Excludes Small Containers)
Nonflat Coatings

Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Number of Complying Products	Complying Marketshare (%) by Volume [1]	VOC Reductions in 2007 SCM Areas (tpd)	Statewide VOC Reductions (tpd)
100	50	2,555	93%	0.41	0.67

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit. The Complying Marketshare does not include small containers that are exempt from VOC limits.

6. Manufacturer and Industry Issues

No issues related to this coating category have been raised by manufacturers or industry stakeholders.

7. Conclusion

Staff recommends a 50 g/l VOC limit for Nonflat Coatings, effective January 1, 2022. The proposed VOC limit is technologically and commercially feasible based on the complying marketshare, the number of companies making complying products, and product information from manufacturers.

I. Nonflat – High Gloss Coatings

Table 5-I.1
VOC Limits for Nonflat - High Gloss Coatings (g/l)

USEPA: 380	Canada: 250	OTC: 150	SCAQMD: 50	SCM Proposed: 50

1. Category Definition

A nonflat coating that registers a gloss of 70 or greater on a 60–degree meter according to ASTM Designation D 523–89. Nonflat – High Gloss Coatings must be labeled in accordance with SCM labeling requirements.

2. Major Proposed Changes

Nonflat – High Gloss Coatings will be merged with Nonflat Coatings because both will have the same proposed VOC limit of 50 g/l.

3. Coating Description

Most Nonflat – High Gloss Coatings are waterborne, single component products. The most prevalent resins for Nonflat – High Gloss Coatings are vinyl acrylic and 100 percent acrylic. Other resin types include alkyds and urethanes. Because most Nonflat – High Gloss Coatings are waterborne, the VOCs in acrylic coatings come from additives such as resin coalescing aids, polymer plasticizers, freeze/thaw stabilizers and anti–foam agents. These additives help create homogeneous films, improve block and print resistance, prevent coagulation, ease application, and reduce defects formed during application. Other additives that contribute to the VOC content are preservatives, thickeners, and colorants. Resin coalescing aids and freeze/thaw stabilizers are the two main contributors to VOCs in Nonflat – High Gloss Coatings. Currently, most coating manufacturers use ester alcohols (e.g., Texanol®) as coalescing agents. Freeze/thaw stabilizers are glycols (e.g., ethylene glycol or propylene glycol) that prevent the paint from coagulating or solidifying when exposed to freezing temperatures.

4. Substrates/Exposure

Nonflat – High Gloss Coatings are used for both interior and exterior applications. With proper surface preparation and priming, Nonflat – High Gloss Coatings can be used on a large variety of substrates including drywall, plaster, concrete block, wood, and metal. These products are commonly exposed to areas where moisture is present and are often subject to frequent cleaning. Generally, ambient and surface temperatures of application are limited to above 50 F.

5. Survey Results

Table 5-I.2 summarizes the estimate of sales and VOC emissions from the Nonflat – High Gloss Coatings category, based on the 2014 Survey. Waterborne coatings represent 96 percent of the Nonflat – High Gloss Coatings sales volume. VOC emissions from Nonflat – High Gloss Coatings are about 0.41 tpd, which represents approximately one percent of the total emissions from architectural coatings.

Table 5-I.2
Survey Data (Includes Small Containers)
Nonflat - High Gloss Coatings

Number of Products	Sales in CA (gals/year) [1]	% SB/ WB	% Int	% Ext	% Dual	% in Small Containers[2]	SWA VOC (g/l)[3]	VOC Emissions (tons/day)[4]
539	983,489	4%/96%	15%	14%	71%	9%	71	0.41

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Percentage of sales volume in small containers, one quart or less.
3. Sales–Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
4. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.

Table 5-I.3 contains the complying marketshare for Nonflat – High Gloss Coatings based on results from the 2014 Survey. The table shows that 181 products with 84 percent of the marketshare for Nonflat – High Gloss Coatings complies with the proposed VOC limit.

Table 5-I.3
Complying Marketshare & Emission Reductions
(Excludes Small Containers)
Nonflat - High Gloss Coatings

Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Number of Complying Products	Complying Marketshare (%) by Volume [1]	VOC Reductions in 2007 SCM Areas (tpd)	Statewide VOC Reductions (tpd)
150	50	181	84%	0.02	0.16

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit. The Complying Marketshare does not include small containers that are exempt from VOC limits.

6. Manufacturer and Industry Issues

No issues related to this coatings category have been raised by manufacturer or industry stakeholders.

7. Conclusion

Staff recommends merging Nonflat – High Gloss with Nonflat Coatings and proposing a 50 g/l VOC limit for Nonflat Coatings, effective January 1, 2022. The proposed VOC limit is technologically and commercially feasible based on the complying marketshare, the number of companies making complying products, and product information from manufacturers.

J. Stains

Table 5-J.1
VOC Limits for Stains (g/l)

USEPA: 550 (semitransparent); 350 (opaque)	Canada: 250	OTC: 250	SCAQMD: 100 (exterior); 250 (interior)	SCM Proposed: 100 (exterior); 250 (interior)

1. Category Definition

A semitransparent or opaque coating labeled and formulated to change the color of a surface but not conceal the grain pattern or texture.

2. Major Proposed Changes

The Stains category will be split into Stains and Interior Stains. A new category definition is proposed for Interior Stains, while exterior and dual stains will remain in the Stains category. Stains will have a proposed VOC limit of 100 g/l while Interior Stains will remain at the current 250 g/l VOC limit.

3. Coating Description

Stains are all single component coatings that are sprayed, wiped, rolled, or brushed on. The Stains category includes products for both wood and concrete surfaces. Wood stains are used for aesthetic purposes while providing some protection from water, UV radiation, and tannin bleed. Many concrete stains are formulated to penetrate and react chemically with the concrete substrate to produce a variety of color effects. Reactive concrete stains contain inorganic metallic salts dissolved in an acid and water solution. Non-reactive concrete stains can contain drying oils and acrylic resins. Semitransparent stains change the color of the surface without concealing the grain pattern or texture. Opaque stains completely conceal the natural grain pattern while allowing the texture of the surface to be seen.

4. Substrates/Exposures

Stains are used both indoors and outdoors in residential, commercial, and institutional areas. Semitransparent stains are used on a variety of interior wood surfaces including cabinets, floors, paneling, trim, doors, molding, and stairs. Semitransparent and opaque stains are commonly applied to exterior wood surfaces such as decks, shakes, shingles, siding, boat docks, and fences. In addition to wood, stains can also be applied to interior or exterior concrete, cement, asphalt, masonry, and stucco. Concrete driveways, garage floors, sidewalks, and patios are all common areas for application of concrete stains. Most stains have some resistance to UV radiation and are water repellent. Opaque stains contain more pigment making them more resistant to UV radiation than semitransparent stains. Deck stains are formulated to withstand foot traffic and standing water.

5. Survey Results

Table 5-J.2 summarizes the estimate of sales and VOC emissions for Stains, excluding interior stains. In 2013, the sales volume for Stains, excluding interior stains, was approximately 1.4 million gallons. This represents around two percent of the total California sales volume for architectural coatings. Emissions for Stains are approximately four percent of the total emissions from architectural coatings.

Table 5-J.2
Survey Data (Includes Small Containers)
Stains

Number of Products	Sales in CA (gals/year) [1]	% SB/ WB	% Int	% Ext	% Dual	% in Small Containers[2]	SWA VOC (g/l)[3]	VOC Emissions (tons/day)[4]
971	1,413,729	22%/78%	0%	94%	6%	10%	100	1.13

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Percentage of sales volume in small containers, one quart or less.
3. Sales-Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
4. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.

Table 5-J.3 contains the complying marketshare for Stains based on the 2014 Survey. This table shows that 410 products accounting for approximately 73 percent of the sales volume complies with the current VOC limit.

Table 5-J.3
Complying Marketshare & Emission Reductions
(Excludes Small Containers)
Stains

Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Number of Complying Products	Complying Marketshare (%) by Volume [1]	VOC Reductions in 2007 SCM Areas (tpd)	Statewide VOC Reductions (tpd)
250	100	410	73%	0.43	0.67

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit. The Complying Marketshare does not include small containers that are exempt from VOC limits.

6. Manufacturer and Industry Issues

Below are key issues that have been brought to staff's attention during interactions with industry representatives for the Stains category.

Issue: Industry has concerns that stains at 100 g/l will have issues with grain raising (increase labor to sand finish), appearance, freeze/thaw, mildew/fungus resistance, stain blocking, and dirt pickup.

Response: The concerns raised by industry representatives are limited to Stains applied to wood substrates. Staff does not think these will be issues because the 100 g/l VOC limit for Stains has existed in the South Coast AQMD since 2007 and the 2014 Survey shows a 73 percent complying marketshare. Although the South Coast AQMD has a different climate than other parts of California, a local air district can grant a variance if manufacturers have difficulty meeting the limit in certain air districts. CARB is also giving manufacturers until 2022 to reformulate, and local air districts may not even adopt the proposed SCM until after 2019, which may make the effective date for the 100 g/l VOC limit past the 2022 year. Finally, the proposed SCM retains the small container exemption, which would enable manufacturers to offer higher VOC products if they were needed.

7. Conclusion

Staff recommends a 100 g/l VOC limit for Stains, effective January 1, 2022. The proposed VOC limit is technologically and commercially feasible based on the complying marketshare, the number of companies making complying products, and product information from manufacturers.

K. Waterproofing Membranes

Table 5-K.1
VOC Limits for Waterproofing Membranes (g/l)

USEPA: 600 (as Waterproofing Sealers and Treatments)	Canada: 400	OTC: 250	SCAQMD: 100	SCM Proposed: 100

1. Category Definition

A clear or opaque coating that is labeled and formulated for application to concrete and masonry surfaces to provide a seamless waterproofing membrane that prevents any penetration of liquid water into the substrate. Waterproofing Membranes are intended for the following waterproofing applications: below-grade surfaces, between concrete slabs, inside tunnels, inside concrete planters, and under flooring materials. Waterproofing Membranes must meet the following criteria:

- Coating must by applied in a single coat of at least 25 mils (0.025 inch) dry film thickness; and
- Coatings must meet or exceed the requirements contained in ASTM Standard C836/C836M-18 (Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course).

The Waterproofing Membranes category does not include topcoats that are included in the Concrete/Masonry Sealers category (e.g., parking deck topcoats, pedestrian deck topcoats, etc.).

2. Major Proposed Changes

For Waterproofing Membranes, the proposed VOC limit decreases from 250 g/l to 100 g/l.

3. Coating Description

These products are applied to concrete and masonry to provide a seamless waterproofing coating for both interior and exterior exposures. These coatings can be applied for a variety of waterproofing uses, such as:

- Between concrete slabs (e.g., parking decks, roof decks, bridges)
- Below-grade exterior walls, foundations, basements
- Inside tunnels
- Inside concrete planters
- Underneath tile flooring

The Waterproofing Membranes category is intended for non-wearing surfaces (e.g., between slabs) and it does not include products that are used to coat the surface of parking decks, roof decks, bridges, etc. Those types of deck coatings are covered under the Concrete/Masonry Sealers category.

Under the National Rule, Waterproofing Membranes would be covered by the "Waterproofing Sealers and Treatments" category.

Most Waterproofing Membranes products are either single component, moisture-cure, elastomeric polyurethanes or single component bituminous coatings. There are also some multi-component elastomeric coatings.

4. Substrates/Exposures

Waterproofing Membranes are intended for application to concrete and masonry substrates in non-wear locations (e.g., between concrete slabs; on exterior below-grade surfaces; inside tunnels; inside planters; under flooring; etc.). Products in this category provide a waterproofing seal to prevent water intrusion and can be applied to wet surfaces. The products are not designed to be resistant to abrasion from pedestrian traffic or vehicle traffic.

5. Survey Results

Table 5-K.2 summarizes CARB's estimates of sales and VOC emissions based on the 2014 survey. Table K-3 summarizes the complying marketshare and potential emission reductions for Waterproofing Membranes.

In 2013, the sales volume for Waterproofing Membranes in California was approximately 487,163 gallons. This represents about 0.5 percent of the total California sales volume of architectural coatings. Waterproofing Membranes represent about two percent of total emissions from architectural coatings.

Table 5-K.2
Survey Data (Includes Small Containers)
Waterproofing Membranes

Number of Products	Sales in CA (gals/year) [1]	% SB/ WB	% Int	% Ext	% Dual	% in Small Containers[2]	SWA VOC (g/l)[3]	VOC Emissions (tons/day)[4]
80	487,163	PD/PD[5]	0%	38%	62%	PD[5]	99	0.55

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Percentage of sales volume in small containers, one quart or less.
3. Sales–Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
4. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.
5. PD is protected data. Fewer than four companies reported sales.

Table 5-K.3 contains the complying marketshare for the proposed new Waterproofing Membranes category, based on the 2014 Survey. Based on reported sales volume, 67 percent of the reported Waterproofing Membranes coatings comply with the proposed VOC limit of 100 g/l. Lowering the limit will result in a 0.20 tpd reduction statewide.

Table 5-K.3
Complying Marketshare & Emission Reductions (Excludes Small Containers)
Waterproofing Membranes

Existing VOC Limit (g/l)	Proposed VOC Limit (g/l)	Number of Complying Products	Complying Marketshare (%) by Volume [1]	VOC Reductions in 2007 SCM Areas (tpd)	Statewide VOC Reductions (tpd)
250	100	73	67%	0.11	0.20

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit. The Complying Marketshare does not include small containers that are exempt from VOC limits.

6. Manufacturer and Industry Issues

No issues related to this coatings category have been raised by manufacturer or industry stakeholders.

7. Conclusion

Staff recommends a 100 g/l VOC limit for Waterproofing Membranes, effective January 1, 2022. The proposed VOC limit is technologically and commercially feasible by January 1, 2022, based on the complying marketshare, the number of companies making complying products, and product information from manufacturers.

L. Tile and Stone Sealers

Table 5-L.1
VOC Limits for Tile and Stone Sealers (g/l)

USEPA: 350	Canada: 350	OTC: 350	SCAQMD: 100	SCM Proposed: 100

1. Category Definition

Clear or pigmented coatings that are used for sealing tile, stone or grout to provide resistance against water, alkalis, acids, ultraviolet light or staining and which meet one of the following subcategories:

1. Penetrating sealers are polymer solutions that cross-link in the substrate and must meet the following criteria:
    a. A fine particle structure to penetrate dense tile such as porcelain with absorption as low as 0.10 percent per ASTM C373-18, ASTM C97/C97M-18, or ASTM C642-13;
    b. Retain or increase static coefficient of friction per ANSI A137.1;
    c. Not create a topical surface film on the tile or stone; and
    d. Allow vapor transmission per ASTM E96/96M-16.
2. Film forming sealers which leave a protective film on the surface.

2. Major Proposed Changes

A new category for Tile and Stone Sealers is established. Currently, Tile and Stone Sealers are included in Concrete and Masonry Sealers. The South Coast AQMD added the Tile and Stone Sealers category in the 2016 amendments to South Coast AQMD Rule 1113 (SCAQMD, 2016). The Tile and Stone Sealers category was established so the South Coast AQMD could gather sales and emissions data specific to these coatings. The proposed VOC Limit for Tile and Stone Sealers would remain the same as Concrete and Masonry Sealers at 100 g/l.

3. Coating Description

Tile and Stone Sealers are clear or pigmented coatings that are used for sealing tile, stone or grout to provide resistance against water, alkalis, acids, ultraviolet light or staining and meet the definition of penetrating sealers or film forming sealers. Tile and Stone Sealers are applied to tile or stone materials to impart resistance against water, alkalis, acids, and ultraviolet light or staining.

Tile and Stone Sealers are a subset of the Concrete and Masonry Sealers in the 2007 SCM.

4. Substrates/Exposures

Tile and Stone Sealers are used for sealing tile, stone or grout. These coating may be used for interior or exterior use.

5. Survey Results

2014 Survey data for Tile and Stone Sealers are included in the Concrete and Masonry Sealers.

6. Manufacturer and Industry Issues

No issues related to this coatings category have been raised by manufacturer or industry stakeholders. Industry representatives requested to establish this category.

7. Conclusion

Staff recommends establishing the new category for Tile and Stone Sealers.

M. Colorants

Table 5-M.1
VOC Limits for Colorants (g/l)

Colorant Added To	USEPA:	Canada:	OTC:	SCAQMD:	SCM Proposed:
Architectural Coatings, excluding Industrial Maintenance Coatings	NA	NA	NA	50	50
Solvent-Based Industrial Maintenance Coatings	NA	NA	NA	600	600
Waterborne Industrial Maintenance Coatings	NA	NA	NA	50	50
Wood Coatings	NA	NA	NA	50	600

1. Category Definition

A concentrated pigment dispersion in water, solvent, and/or binder that is added to an architectural coating after packaging in sale units to produce the desired color.

2. Major Proposed Changes

Colorants are currently unregulated outside of the South Coast AQMD. The proposed SCM would limit the VOC content of colorants added to architectural coatings at the point of sale. It sets the VOC limits for all colorants added to architectural coatings, except those added to Industrial Maintenance Coatings and Wood Coatings, at 50 g/l. For Industrial Maintenance Coatings the proposed SCM establishes VOC limits for Solvent-Based Industrial Maintenance Coatings at 600 g/l and for Waterborne Industrial Maintenance Coatings at 50 g/l. For Wood Coatings the proposed SCM establishes a VOC limit at 600 g/l.

3. Coating Description

Colorants are pigments added to a coating that impart the color. In many instances, colorants are added during the production process and are available as a finished product at the retail store. However, if a specific tint is desired the colorant is added at the point of sale. The colorants affected by the SCM are the colorants added at the point of sale.

Colorants are categorized into three general groups: universal, waterborne, and solventborne. Waterborne colorants are only used to tint waterborne coatings, likewise solventborne colorants are only used to tint solventborne coatings. Universal colorants may be used to tint either waterborne or solventborne coatings. The types of coatings that are typically tinted at the point of sale are flat, nonflat, and occasionally primers. The only notable exception is stains, which are sometimes also tinted at the point of sale (SCAQMD, 2011).

VOC emissions from colorants have not been part of the baseline emissions of architectural coatings nor have the VOC emissions of colorants been regulated outside of the South Coast AQMD. The VOC content of colorants has been regulated in the European Union for almost 20 years (SCAQMD, 2011). The approach taken in Europe is to regulate the whole paint, including the colorant added at the point of sale.

The South Coast AQMD had been aware of the availability of low-VOC colorants for waterborne coatings since 1996. The South Coast AQMD evaluated the availability of low-VOC colorants for the November 1996 amendments to Rule 1113, but deemed that the percentage of VOC added as a result of the colorant was not a significant factor compared to the relatively high-VOC limits (SCAQMD, 2010).

In 2010, the South Coast AQMD conducted a survey for colorants. The survey results showed: existing colorants could significantly increase the VOC content of the coatings as applied; low-VOC colorants were commercially available and marketed; majority of the respondents to the surveys indicated that more than 50 percent of the products sold in stores are tinted with colorants, the majority of which are flat or nonflat coatings; the highest sales are for light base (up to 4 ounces) followed by the saturated colors of the clear bases (up to 12 ounces) (SCAQMD, 2010). The volume of colorant added varies widely depending on the desired color; light or pastel colors require as little as 0.5 ounce while deep colors can require up to 12 ounces.

In 2011, the South Coast AQMD set limits for colorants that became effective in 2014. Prior to this, colorants added at the point of sale were unregulated in California. South Coast AQMD Rule 1113 set limits for colorants as follows: All colorants added to architectural coatings have a VOC limit of 50 g/l, except for colorants added to Industrial Maintenance (IM) Coatings. For IM Coatings, Rule 1113 set two VOC limits: waterborne IM colorants have a 50 g/l VOC limit and solventborne IM coatings have a VOC limit of 600 g/l (SCAQMD, 2011).

To satisfy market demands for truly zero-VOC architectural coatings, manufacturers have been striving toward colorants that are as close to zero-VOC as possible. The major issue that is encountered when solvents are removed is tip drying in the dispenser, which may result in mistints. This issue can be resolved with the addition of humectants or plasticizers that keep the tips from drying. Unlike solvent, the humectants do not evaporate and leave the paint film. In order to resolve issues with the use of waterborne colorants, retailers have been transitioning to more sophisticated dispensing equipment that is equipped with pumps with greater sensitivity, humidification systems, and other advancements.

The colorant market trend is to tint small paint samples, where the dispenser has to be capable of delivering a small fraction of an ounce of colorant. According to dispenser manufacturers, all of the new dispensers are capable of delivering near zero-VOC colorants, so a switch to a dispenser capable of tinting a sample size of paint will also be capable of dispensing near zero-VOC colorants (SCAQMD, 2011).

4. Applications

Colorants are added to architectural coatings at numerous points of use. Colorants are added to architectural coatings during manufacturing and are packaged for retail purchase, added at the point of sale, and added at the worksite.

At the point of manufacture any colorant added is considered part of the overall VOC content of the coating. Once the product reaches the retail or wholesale market, any colorant added at that point would not be considered as part of the total VOC of the product. However, colorants added at the point of sale are subject to their own VOC limits.

The point of sale includes retail outlets that add colorant to a coating container to obtain a specific color. Colorant added at the factory or at the worksite is not subject to the VOC limit. In addition, containers of colorant sold at the point of sale for use in the field or on a job site are also not subject to the VOC limit on colorants.

The VOC Limits for colorants are intended for colorants added to architectural coatings at the point of sale.

5. Survey Results

In order to assess the use of colorants statewide, CARB collected data on colorants, specifically sales and VOC content, as part of the 2014 Survey. In 2013, the sales volume for colorants was about two million gallons with approximately 1.13 tpd of VOC emissions. The sales of volume of colorants is approximately two percent of the total sales volume of architectural coatings, which would correspond to an average of about 2.5 ounces of colorant per gallon of architectural coating. Table 5-M.2 shows the 2014 Survey results for this category.

The current emissions inventory for architectural coatings does not include colorants; they are an unregulated source of emissions. Table 5-M.3 summarizes the current emissions inventory estimated from colorants and the estimated reductions, based on the proposed VOC limits. The survey indicates that the emissions in 2013 are about 1.13 tpd and the sales-weighted average VOC content is 91 g/l.

Table 5-M.2
Survey Data
Colorants

Number of Products	Sales in CA (gals/year) [1]	Solventborne	Waterborne	Universal	SWA VOC (g/l)[2]	VOC Emissions (tons/day)[3]
776	2,003,372	2%	31%	68%	91	1.13

1. Statewide sales volume in California in 2013, including South Coast AQMD (gallons per year).
2. Sales-Weighted Average VOC Regulatory (grams VOC per liter of coating, less water and exempt compounds).
3. Statewide VOC Emissions, including South Coast AQMD (tpd). Does not include emissions from thinning solvents, cleanup solvents, or additives.

Table 5-M.3
Complying Marketshare & Emission Reduction
Colorants

<table>
<tr><th>Colorant Type</th><th>Proposed VOC Limit (g/l)</th><th>Number of Complying Products</th><th>Complying Marketshare (%) by Volume [1]</th><th>VOC Reductions in 2007 SCM Areas (tpd)</th><th>Statewide VOC Reductions (tpd)</th></tr>
<tr><td>Colorant*</td><td>50</td><td rowspan="3">454</td><td rowspan="3">55%</td><td rowspan="3">0.14</td><td rowspan="3">0.15</td></tr>
<tr><td>Waterborne IM</td><td>50</td></tr>
<tr><td>Solventborne IM</td><td>600</td></tr>
</table>

1. Complying Marketshare: Percentage of sales volume that complies with the VOC limit.
2. Colorants added to architectural coatings, except IM Coatings and Wood Coatings.

6. Manufacturer and Industry Issues

Issue: Industry representatives have indicated that they cannot meet the proposed VOC limit for colorants added to architectural coatings when they are used to tint wood coatings. Wood coatings include lacquers, sanding sealers, and clear stains. These coatings are generally solvent borne because waterborne coatings do not work as well on wood substrates.

Response: CARB staff discussed the issue with the Air District Working Group and while it appears that the issue is limited to a small segment of coatings, staff has concluded that it is appropriate to allow a higher limit for colorants used in Wood Coatings.

7. Conclusion

Staff recommends establishing the VOC limits for Colorants Added to Architectural Coatings, effective January 1, 2022. The proposed VOC limits are technologically and commercially feasible based on staff's review of 2014 Survey data, complying marketshares, the number of companies making compliant products, and product information from manufacturers.

CHAPTER VI. ENVIRONMENTAL ANALYSIS

A. Introduction

CARB's regulatory program which involves the adoption, approval, amendment, or repeal of standards, rules, regulations, or plans for the protection and enhancement of the State's ambient air quality has been certified by the California Secretary for Natural Resources under Public Resources Code section 21080.5 of the California Environmental Quality Act (CEQA) (14 CCR 15251(d)). Public agencies with certified regulatory programs are exempt from certain CEQA requirements, including but not limited to, preparing environmental impact reports, negative declarations, and initial studies. CARB, as a lead agency, prepares a substitute environmental document (referred to as an "Environmental Analysis" or "EA") as part of the Staff Report to comply with CEQA (17 CCR 60000-60008).

The proposed SCM serves as a model rule, and would not be implemented by CARB, nor would it be implemented by any districts unless they choose to do so. As such, the proposed SCM is only a model rule, and is not a "project" subject to CEQA, as its approval by CARB would not commit any jurisdiction to implementing it. Furthermore, even if it were deemed a "project" subject to CEQA, the SCM would likely be eligible for one or more CEQA exemptions, including but not limited to the Class 8 exemption for actions by regulatory agencies for protection of the environment (See 14 CCR § 15308). However, as CARB did in the 2000 Program Environmental Impact Report (PEIR), CARB has chosen to analyze the SCM under CEQA in an effort to facilitate use of the SCM by local air districts, essentially providing the districts with a turn-key model rule that has been fully analyzed under CEQA. As stated in the 2000 PEIR, this environmental analysis is "not intended to dictate how a district may use the ARB's SCM Program EIR. It will be up to each district to decide on the best way to comply with CEQA in their particular circumstances. The ARB's SCM Program EIR will simply be available for whatever use the district feels is appropriate." (CARB, 2000a).

This chapter provides the basis for CARB's determination that, even assuming the proposed SCM is a "project" and is not exempt from CEQA, no subsequent or supplemental environmental analysis is required for the proposed SCM. A brief explanation of this determination is provided in section D below. This EA serves as a substitute document equivalent to an addendum to the Final Program Environmental Impact Report for the 2000 SCM for Architectural Coatings (2000 PEIR) to explain CARB's determination that no additional environmental analysis is required for the proposed SCM.

B. Prior Environmental Analysis

As noted above, in connection with developing the 2000 SCM for Architectural Coatings, staff prepared the 2000 PEIR, which is incorporated by reference herein (CARB, 2000a). The PEIR included an analysis of environmental impacts that could potentially result from the implementation of the 2000 SCM throughout California (excluding the South Coast AQMD). Staff investigated the potential for environmental impacts in six main areas: air quality, water demand and quality, public services, transportation and circulation, solid and hazardous waste, and health hazards. The analysis concluded that implementing the 2000 SCM would have no significant adverse impacts and a net air quality benefit. This section summarizes the analysis from the 2000 PEIR on air quality, wastewater treatment, hazardous waste disposal, and human health.

1. Air Quality Impacts

Adverse air quality impacts are considered significant if the proposed SCM: conflicts with or obstructs implementation of the applicable air quality plan; violates any air quality standard or contributes to an existing or projected air quality violation; exposes sensitive receptors to substantial pollutant concentrations; exposes off-site receptors to significant concentrations of hazardous air pollutants; results in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment; diminishes an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutants; or creates objectionable odors affecting a substantial number of people.

Staff found in the 2000 PEIR that the adoption and implementation of the SCM on a statewide basis (excluding the South Coast AQMD) would produce long-term VOC emission reductions, and staff concluded that no significant adverse air quality impacts would result from the SCM. During the development of the 2000 SCM, industry had concerns that lowering the VOC content of coatings would result in increased VOC emissions due to increased coating thickness, thinning, topcoats, touch-ups, priming, recoating, substitution with higher VOC coatings, and greater reactivity. Industry claimed that new formulations would result in more coating use, causing an increase in VOC emissions. Industry also claimed that more reactive solvents would be used in the compliant formulations than those used in existing coatings, contributing to increased ozone formation. At the time, staff reviewed their concerns, and found that industry's concerns would not occur and the SCM would achieve significant VOC emission reductions. A more detailed analysis of industry concerns can be found in Chapter IV of the 2000 PEIR (CARB, 2000a).

Industry also claimed that increased application of acetone-based coatings had the potential to increase objectionable odors. Staff found that this was not accurate, because acetone used as a replacement for other solvents may have fewer odor impacts due to its higher odor threshold in comparison to other solvents used in coatings. The SCM allowed manufacturers sufficient time to reformulate and solve any associated odor problems. It was determined that no significant adverse odor impacts were expected from lowering VOC limits.

No significant adverse air quality impacts were anticipated, therefore, no mitigation measures were necessary.

2. Human Health Hazards

The human health impacts analysis performed in the 2000 PEIR for the 2000 SCM examined the potential increased long-term (carcinogenic and chronic) and short-term (acute) human health impacts associated with the use of various replacement solvents in compliant coating formulations. The analysis concluded that due to the application of compliant coatings, the public and coating applicators would not be exposed to either long-term or short-term health risks due to the application of compliant coatings. Future compliant coatings would contain less hazardous materials, or nonhazardous materials, as compared to solventborne coatings, resulting in a net benefit.

Staff also evaluated the use of low- or zero-VOC, two-component, industrial maintenance (IM) systems containing diisocyanate compounds, and the field monitoring data showed that concentrations of diisocyanate compounds emitted during application were below the established health protective thresholds. Furthermore, staff determined the exposure to diisocyanates would be limited since IM systems are typically used for touch-up and exposure and applicators follow sufficient safety equipment and procedures. Thus, no adverse human health impacts were anticipated and no mitigation measures were necessary.

3. Potential Water Resources Impacts

Water resource impacts are divided into two categories: water demand and water quality. In the 2000 PEIR, staff found that the SCM would not have significant impacts on water demand and water quality. The 2000 SCM did not promote the use of coatings formed with hazardous solvents that would create water quality impacts. While some hydrologic regions had insufficient capacity to meet the current and projected water demand, staff determined at the time that the increased water demand associated with implementing the SCM was *de minimus*. Staff also found that the use of exempt solvents that are not considered VOCs and were less toxic than solvents used at that time was expected to result in equivalent or fewer water quality impacts. Manufacturing and cleanup practices associated with waterborne coatings did not change as a result of the SCM, thus, no additional water quality impacts would result from the SCM. No significant impacts were expected therefore no mitigation measures were necessary.

4. Hazardous Waste Disposal

The Department of Toxic Substances Control (DTSC) is the lead agency in California for hazardous waste management. DTSC enforces California's Hazardous Waste Control laws, issues permits to hazardous waste facilities, and mitigates contaminated hazardous waste sites. In California, leftover liquid waterborne and solventborne coatings are considered a hazardous waste and must be disposed of with a facility that is registered with DTSC. Hazardous materials as defined in 40 CFR 261.20 and California Title 22 Article 9 (including listed substances, 40 CFR 261.30) are disposed of in Class I landfills.

The solid waste/hazardous waste analysis performed in the PEIR for the 2000 SCM examined increased disposal of compliant coatings due to the possibility of shorter shelf or pot lives or lesser freeze/thaw capabilities. Based on staff's analysis, adverse solid waste/hazardous waste impacts associated with the proposed SCM were determined to be insignificant. Therefore, no mitigation measures were necessary.

5. Other Environmental Impacts

The PEIR for the 2000 SCM determined that there will be no significant adverse impacts to the following environmental resources in California as a result of implementing the SCM:

- Public Services
- Transportation/Circulation
- Land Use and Planning
- Population and Housing
- Geophysical
- Biological Resources
- Energy and Mineral Resources
- Noise
- Aesthetics
- Cultural Resources
- Recreation

C. Proposed Modifications

Please refer to Chapter 3 for a detailed discussion of the proposed changes to the SCM. The proposed SCM would establish VOC limits for three new coating categories, reduce VOC limits for nine existing coating categories, set VOC limits for colorants (tints) that are added to coatings at the point of sale. The proposed SCM also includes some new definitions and revision to existing definition for clarification.

The proposed SCM is expected to achieve 1.46 tpd in VOC emission reductions for areas of California with local rules based on the 2007 SCM, excluding the South Coast AQMD. This represents about a seven percent overall emission reduction. If the proposed SCM limits were adopted statewide, the expected VOC emission reductions are 2.50 tpd. Although there are emission reductions from several categories, 58 percent of the emission reductions are from two categories, Nonflat Coatings and Stains, which account for 44 percent of the emissions from these categories.

Furthermore, a majority of companies have products that comply with the proposed SCM limits. As shown by the data from the 2014 survey, greater levels of low VOC coatings are now available in the market. All of the categories with proposed lower VOC limits have high complying market share, which indicates widespread consumer acceptance of the lower VOC coatings. Therefore, staff concludes that no changes to compliance responses evaluated in the 2000 PEIR would result from these updates.

D. Analysis

1. Legal Standards

When considering modifications to the SCM for which a substitute document equivalent to an PEIR or negative declaration had previously been prepared, CARB looks to Public Resources Code section 21166 and CEQA Guidelines section 15162 for guidance on the requirements for subsequent or supplemental environmental review.

CEQA Guidelines section 15162 states:

(a) When an PEIR has been certified or a negative declaration adopted for a project, no subsequent PEIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

(1) Substantial changes are proposed in the project which will require major revisions of the previous PEIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous PEIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous PEIR was certified as complete or the negative declaration was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous PEIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous PEIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous PEIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

If a subsequent or supplemental PEIR or negative declaration is not required, the lead agency may document its decision and supporting evidence in an addendum (14 CCR 15164 (e)). The addendum and lead agency's findings should include a brief explanation, supported by substantial evidence, of the decision not to prepare a subsequent or supplemental PEIR or negative declaration (14 CCR 15164(e)). An addendum need not be circulated for public review, but must be considered by the lead agency prior to making a decision on the project (14 CCR 15164(c), (d)).

2. <u>Basis for Determination</u>

CARB has determined that the proposed amendments do not involve any changes that result in any new significant adverse environmental impacts or a substantial increase in the severity of the significant adverse impacts previously disclosed in the 2000 PEIR. Furthermore, there are no changes in circumstances or new information that would otherwise warrant any subsequent or supplemental environmental review. The 2000 PEIR adequately addresses the implementation of the SCM as modified by the proposed amendments and no additional environmental analysis is required. The basis for CARB's determination that none of the conditions requiring further environmental review are triggered by the proposed modifications is based on the following analysis.

(1) There are no substantial changes to the SCM previously analyzed in the Environmental Analysis which require major revisions to the

Environmental Analysis involving new significant environmental effects or a substantial increase in the severity of previously identified effects.

The intent of the proposed update to the SCM is to reduce the public's exposure to ozone and PM by reducing emissions of VOC, which are precursors to both ozone and PM. Based on available information, CARB has determined that no significant adverse environmental impacts should occur if air districts adopt the proposed SCM.

(2) *There are no substantial changes with respect to the circumstances under which the SCM is being undertaken which require major revisions to the previous Environmental Analysis involving new significant environmental effects or a substantial increase in the severity of previously identified effects.*

There are no substantial changes to the environmental setting or circumstances in which the updates to the SCM are being implemented compared to that analyzed in the 2000 PEIR. As explained above, the intent of the proposed update to the SCM is to reduce the public's exposure to ozone and PM by reducing emissions of VOCs, which are precursors to both ozone and PM. Based on available information, CARB has determined that no significant adverse environmental impacts should occur if districts adopt the proposed SCM.

(3) *There is no new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous Environmental Analysis was certified as complete, that changes the conclusions of the Environmental Analysis with regard to impacts, mitigation measures, or alternatives;*

No new information of substantial importance has become available to CARB staff since the 2000 PEIR was certified. Therefore, the conclusions found in the 2000 PEIR about the compliance responses for the SCM or potential environmental impacts to any resource areas have not changed.

No supplemental or subsequent environmental analysis is required for the proposed updates to the SCM because, as described above, the proposed changes do not result in any new environmental impacts or in a substantial increase in the severity of the impacts previously disclosed for the SCM in the 2000 PEIR. Further, there are no changes in circumstances or new information that would otherwise warrant any additional environmental review. For a more detailed discussion regarding these topics, please refer to the PEIR for the

2000 SCM (CARB, 2000a). Staff believes that districts can use the information in this chapter and the PEIR from the 2000 SCM to support their environmental impact analyses when they adopt local rules based on the proposed SCM.

CHAPTER VII. ENVIRONMENTAL JUSTICE

State law defines environmental justice as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies (Government Code, section 65040.12, subdivision (c)). CARB is committed to making environmental justice an integral part of its activities. The Board approved its Environmental Justice Policies and Actions (Policies) on December 13, 2001, to establish a framework for incorporating environmental justice into CARB's programs consistent with the directives of State law (CARB, 2001b). These policies apply to all communities in California, but recognize that environmental justice issues have been raised more in the context of low-income and minority communities.

The proposed SCM is not expected to result in significant negative impacts in any community. The result of the proposed SCM will be reduced exposure to VOCs for all California communities, including those with large populations of low-income and minority residents.

Generally, use of architectural coatings products is fairly uniform across the state, tracking with human population, and their emissions are spread over the course of a day, rather than concentrated at a particular time of day. For these reasons, staff believes that reducing emissions from the use of architectural coatings would benefit all Californians. Staff does not expect any communities, especially those with low-income and minority populations, regardless of location, to be disproportionately impacted by Board’s approval, and eventual implementation by the air districts, of the proposed updates to the SCM.

CHAPTER VIII. ECONOMIC IMPACTS

A. Background

This chapter discusses the economic impacts staff anticipates from implementing the proposed SCM VOC limits. CARB staff quantified the economic impacts to the extent feasible, but economic impact analyses can be inherently imprecise by nature. Therefore, some projections are necessarily qualitative or semi-quantitative, based on general observations about the architectural coatings industry. The economic impacts analysis for the proposed SCM provides a general picture of the economic impacts that typical businesses might encounter. However, staff recognizes that individual companies may experience impacts different than those projected in this analysis.

The overall projected impacts are summarized first, followed by a more detailed discussion of specific aspects of the economic impacts in the sections listed below:

- Summary of Economic Impacts
- General Approach
- Annual Cost and Cost Effectiveness
- Impact to Businesses
- Impact to Consumers
- Mitigation of Potential Impacts Through Additional Regulatory Flexibility

It is important to note that staff conducted the economic impacts analysis even though the analysis is not required under the California Administrative Procedure Act (APA) for suggested control measures. The analysis uses methodologies and assumptions similar to those used to support adoption of the 1998 U.S. EPA National Architectural Coatings Rule (U.S. EPA, 1998a; U.S. EPA, 1998b), the 2011 South Coast AQMD Rule 1113 (SCAQMD, 2011), and CARB's 2007 SCM for Architectural Coatings (CARB, 2007a; CARB, 2007b). Moreover, the analysis uses the same methodology adopted by the Board in approving all consumer product rulemakings since 1990 (CARB, 1990; CARB, 1991; CARB, 1997; CARB, 1999; CARB, 2013).

B. Summary of Economic Impacts

Overall, most affected businesses will be able to absorb the costs of the proposed VOC limits and requirements with no significant adverse impacts on their profitability. Profitability impacts were estimated by calculating the decline in the return on owner's equity (ROE). Assuming that coating manufacturers will have to absorb all costs associated with the SCM, the proposed SCM is expected to result in an average ROE decline of three percent, which is not considered to be a significant impact on the profitability of affected businesses.

However, the proposed VOC limits may impose economic hardship on some small businesses with very little or no margin of profitability.

Overall, staff expects the proposed SCM to have no significant impact on employment, business creation, elimination or expansion, or business competitiveness in California. Staff also expects no significant adverse fiscal impacts on any local or State agencies. The total cost to affected architectural coating manufacturers by the proposed SCM is approximately 1.4 million dollars per year in nonrecurring costs and 1.6 million dollars in annual recurring costs. This corresponds to a total annualized cost of three million dollars per year in 2019 dollars.

CARB's analysis shows the proposed limits cost-effectiveness is similar to the cost-effectiveness of South Coast AQMD's Rule 1113, existing consumer product regulations and other CARB regulatory programs. Staff estimates the proposed SCM overall cost-effectiveness ranges from a net savings to a cost of $19.93 per pound of VOC reduced. When weighted by sales, this results in an overall cost-effectiveness of $1.85 per pound of VOC reduced in 2019 dollars. In comparison, the cost-effectiveness of other CARB consumer product regulations and measures fall within a range of no cost to about $6.90 per pound of VOC reduced. The 2007 architectural coatings SCM had an overall cost effectiveness of $1.12 per pound of VOC reduced.

To project the maximum potential impacts on consumers, staff assumes the opposite scenario relative to the business impacts analysis. When analyzing consumer impact, staff assumes manufacturers and retailers pass on all the costs to consumers by raising the price of coatings that need reformulation. With this assumption, staff projects a maximum cost increase ranging from a net savings to a cost of $5.29 per reformulated gallon, with an average increase of about $0.96 per gallon. Based on an assumed 4X multiplier (i.e., the distributor doubles the purchase price from the manufacturer, and the retailer doubles the purchase price from the distributor), the maximum retail price increase ranges from a net savings to a cost of about $21.17 per reformulated gallon, with an average increase of about $3.82 per gallon. Assuming the average retail price per gallon of noncompliant coating currently ranges from $18.24 to $66.16 with an average of about $34.65, the maximum retail price increase would range from a net savings to a 24 percent increase, with an average increase of about eleven percent.

However, it is important to note that most individual consumers buy Stains (Exterior/Dual), Floor Coatings, Nonflat Coatings and Nonflat - High Gloss Coatings. For these categories, if all costs were passed on to consumers, staff estimates a maximum retail price increase from $0.79 to $17.92 per reformulated gallon, with an average increase of $3.43 per gallon. Assuming the average retail price per gallon of noncompliant coating ranges from $28.12 to $38.72, with an average of $31.91. The maximum retail price increase would range from two percent to 46 percent increase, with an average increase of about 11 percent.

Consumers who do not wish to purchase these reformulated coatings could buy the available compliant coatings at current prices. These products will still be available with no expected price increase. The competition from the existing compliant coatings will constrain any price increases for the reformulated coatings. As a result, manufacturers would have the inability to pass all costs to consumers, which was assumed in staff's analysis. Therefore, the increase in actual retail price would be less than staff's projections.

The results are summarized in Table 8-1.

Table 8-1
Summary of Economic Impacts

Average ROE Decline	3%
Total Annual Cost in 2019 Dollars	$3,047,307 million
Overall Cost Effectiveness Range (Dollars per Pound VOC Reduced)	Net savings to $19.93
Overall Average Cost Effectiveness (Dollars per Pound VOC Reduced)	$1.85
Maximum Retail Price Increase Range (Dollars per Gallon)	Net savings to $21.17
Average Maximum Retail Price Increase (Dollars per Gallon)	$3.82
Maximum Retail Price Increase for Stains (Exterior/Dual), Floor, Nonflat and Nonflat - High Gloss (Percent Increase per Gallon)	2% to 46%

C. General Approach

1. Legal Requirements

Section 11346.3 of the Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment shall consider the impact of the proposed regulation on California jobs, business expansion, elimination or creation, and the ability of California business to compete with businesses in other states. Because the staff's proposal is a SCM rather than an administrative regulation, the business impacts assessment is not required. However, CARB staff conducted the normally required business impacts assessment to provide the Board and air districts a comprehensive evaluation of the potential cost impacts.

Similarly, staff also evaluated the SCM's potential impacts to State and local agencies even though the analysis is not required for a SCM. Normally, State agencies are required to estimate the cost or savings to any State or local agency and school district in accordance with instructions adopted by the Department of Finance. Staff's estimate shall include any nondiscretionary cost or savings to local agencies and the cost or savings in federal funding to the State.

If the proposal been a regulation, Health and Safety Code section 57005 would have required the CARB to perform an economic impact analysis of submitted alternatives to a proposed regulation before adopting any major regulation. A major regulation is defined as a regulation that will have a potential cost to California business enterprises in an amount exceeding ten million dollars in any single year.

2. Methodology

Since the South Coast AQMD will not adopt this SCM, it is excluded from the economic impacts analysis. An analysis was conducted to determine the annual cost impact to manufacturers based on raw material costs of typical complying and noncomplying coatings. A sensitivity analysis was conducted to determine the impact on the annual cost from assumed changes to resin cost. Resin cost is the primary variable that influences raw material cost. In addition, staff estimated the cost to market and distribute coatings that comply with the limits of the proposed SCM based on discussions with manufacturers. The projected annual costs then become the inputs for determining the three main outputs of the analysis: the cost-effectiveness, the business impacts, and the consumer impacts.

The cost-effectiveness is presented to compare the proposal's cost efficiency in reducing a pound of VOC relative to the cost-efficiency of other rules and control measures adopted by the air districts and CARB. The business impact analysis employs two scenarios under which all costs incurred to meet the proposal are absorbed by the coating manufacturers, and then by assuming that all costs incurred are passed on to consumers in the form of increased cost of coatings at the retail level. These two parts of the analysis represent the boundaries of expected impacts, with the actual regulatory impacts from the proposal probably falling somewhere between these two extremes (i.e., some costs are absorbed by the manufacturer, with the remaining costs passed on to consumers). Thus, the actual business impacts and price increases will likely be less than predicted in this analysis. The methodology is explained in detail in Appendix G. This methodology takes on the same approach as used in the 2007 CARB SCM for Architectural Coatings (CARB, 2007a; CARB, 2007b). Contractors, raw material suppliers, distributors, and retailers of architectural coatings may also be impacted by the proposed VOC limits.

D. Annual Costs and Cost-Effectiveness of the Proposed Limits

1. Introduction

In the following analysis, staff presents the anticipated annual costs and cost-effectiveness of the proposed new limits. A well-established methodology was applied for converting compliance costs, both nonrecurring and recurring costs, to an annual basis. Staff then reports the ratio of the annual costs to the annual emission reductions in terms of “dollars (to be) spent per pound of VOC reduced.” Determining the proposal’s cost-effectiveness allows staff to compare the efficiency of the proposed limits in reducing a pound of VOC relative to other CARB regulations and control measures.

2. Methodology

The cost-effectiveness of a limit is generally defined as the ratio of total dollars to be spent to comply with the limit (as an annual cost) to the mass reduction of the pollutant(s) to be achieved by complying with that limit (in annual pounds). Annual costs include annualized nonrecurring costs (e.g., total research and development (R&D), product and consumer testing, equipment purchases/modifications, one-time distributional/marketing changes, literature changes, etc.) and annual recurring costs (e.g., increases or decreases in raw material costs, labeling, packaging, recordkeeping & reporting, etc.). Staff used an established set of per product reformulation costs in 2007 dollars for each phase of bringing a reformulated product into the market. These costs were grown using a well-established method of rationing chemical engineering plant cost indices (Peters and Timmerhaus, 1980). Thus, the cost-effectiveness is calculated according to the following general equations:

$$\textit{Cost-Effectiveness} = \frac{\textit{Annualized Nonrecurring Costs} + \textit{Annual Recurring Costs}}{\textit{Annual Emission Reductions}}$$

where,

$$\textit{Annualized Nonrecurring Costs} = \textit{CRF} \text{ x} \sum (\textit{Nonrecurring Costs})$$

where,

$$\textit{Cost Recovery Factor (CRF)} = \frac{i(i+1)^n}{(i+1)^n - 1}$$

i = discount rate, assumed 5%

n = project horizon, assumed 5 years

$$\textit{Annual Recurring Costs} = \textit{Non-Raw Material Costs} + \textit{Raw Material Costs}$$

Non-Recurring costs (in 2017 dollars) = Non-Recurring Costs (in 2007 dollars) x $\frac{C.E. 2017\ index}{C.E. 2007\ index}$

where,

C.E. 2017 index	=	2017 Chemical Engineering Plant Cost Index = 567.5 (Chemical Engineering, 2017).
C.E. 2007 index	=	2007 Chemical Engineering Plant Cost Index = 525.4 (Chemical Engineering, 2007).

The Capital Recovery Method for annualizing fixed costs is recommended by California Environmental Protection Agency (Cal/EPA) guidelines (Cal/EPA, 1996), and is consistent with the methodology used in previous cost analyses for CARB regulations, including the 2007 SCM for Architectural Coatings (CARB, 2007a, 2007b).

In this analysis, each proposed limit was analyzed as a separate, stand-alone regulation. This means the annual costs and the cost-effectiveness of each limit are calculated independently. This approach, approved by the Board when it approved the Mid-Term Measures regulation in 1997 (CARB, 1997a), represents an expansion and upgrade of previous analyses conducted by the CARB staff in which groups of product categories were evaluated collectively for cost-effectiveness (CARB and CAPCOA, 1989; CARB, 1990; CARB, 1991; CARB, 1995). The approach used in this proposal is also significantly different from standardized cost-effectiveness analyses conducted for stationary sources, mobile sources, and other regulated entities. In the typical analysis for those sources, only the cost-effectiveness for the entire regulation is reported, rather than the cost-effectiveness for separate requirements of the regulation (e.g., *see* CARB, 1998).

For several reasons, it is appropriate to treat each proposed limit as a separate regulation. First, this approach prevents limits with large emission reductions coupled with low costs from “masking” limits that are not cost-effective. Staff evaluated limits that are not cost-effective for possible elimination or substitution by other proposed limits that are more cost-effective. Another reason for treating each limit independently is that each limit is generally independent of all the other limits. For these reasons, treating each limit separately for cost-effectiveness calculations provides a more conservative and realistic analysis.

As shown earlier, staff annualized the nonrecurring costs (e.g.., one-time fixed costs such as R&D, equipment purchases, etc.) using the Capital Recovery Method, which is the recommended approach under Cal/EPA guidelines. Using this method, staff multiplies the estimated total fixed costs to comply with each proposed limit by the Capital Recovery Factor (CRF) to convert these future costs into discounted, equal annual payments in current dollars over the selected project horizon (i.e., the projected useful life of the investment) (Cal/EPA, 1996). Staff then sums the annualized fixed costs with the annual recurring costs (subtracting out any cost savings due to changes in raw material costs) and divide that sum by the annual emission reductions to calculate the cost-effectiveness of the proposed limits. These calculations and the associated assumptions are presented in more detail in Appendix G.

3.A. Category Results

The total cost of the proposed limits is estimated to be three million dollars per year in 2019 dollars. As shown in Table 8-2, the cost-effectiveness of individual categories ranges from -$6.51 (a net savings) to a net cost of $19.93 per pound of VOC reduced. Therefore, staff believes that it is appropriate for the remaining manufacturers to reformulate their products to meet the proposed limit.

The overall average cost-effectiveness of the proposed limits is estimated to be $1.85 per pound of VOC reduced. This compares favorably with the cost-effectiveness of similar regulations.

Table 8-2
Cost-Effectiveness and Maximum Per-Gallon Cost Increases

Coating Category	Individual Cost-Effectiveness for Each Limit (Dollars per Pound VOC Reduced)	Calculated Cost per Gallon to Consumers [1] (Dollars per Gallon)	Cost Increase Per Gallon to Consumers (Dollars per Gallon)
Aluminum Roof Coatings	-$0.39	$18.24	-$4.91
Building Envelope Coatings	$10.67	$29.40	$15.46
Dry Fog Coatings	-$6.51	$46.08	-$7.79
Fire Resistive Coatings	-$0.76	$66.16	-$6.13
Floor Coatings	$19.93	$34.76	$12.63
Form Release Compounds	$0.65	$36.68	$9.21
Nonflat Coatings	$0.86	$30.80	$0.79
Nonflat-High Gloss Coatings	$5.41	$28.12	$17.92
Stains (Exterior/Dual)	$1.50	$38.72	$8.43
Waterproofing Membranes	$5.64	$79.56	$21.17
	Cost-Effectiveness ($ Per Lb VOC Reduced)	**Cost per Gallon ($ Per Gallon)**	**Cost Increase ($ Per Gallon)**
OVERALL RESULTS	**$1.85**	**$34.65**	**$3.82**

1 – Costs per gallon were calculated based on raw material costs, and do not necessarily reflect actual retail prices.

Table 8-3
Cost-Effectiveness of Proposed Limits vs. Similar Control Programs

Regulation or Control Measure	Overall Cost-Effectiveness (Dollars per Pound VOC Reduced)	Per-Limit Cost-Effectiveness (Dollars per Pound VOC Reduced)
2019 Architectural Coatings Suggested Control Measure	$1.85	Net savings to $19.93
2007 Architectural Coatings Suggested Control Measure	$1.12	Net savings to $13.90
SCAQMD 2003 Amended Rule 1113	$2.11 to $5.70	Not Determined
2000 Architectural Coatings Suggested Control Measure	$3.20	Net savings to $7.65
2005 Automotive Refinishing Suggested Control Measure	$1.45	Not Determined
SCAQMD 1999 Rule 1113	$2.45	$0.50 to 5.60
1989 AIM Suggested Control Measure	net savings to $6.90	Not Determined
Aerosol Coating Products	$2.85 to $3.20	Not Determined
Mid-Term Measures II Consumer Products	$0.40	$0.00 to $6.30
Mid-Term Measures I Consumer Products	$0.25	$0.00 to $7.10
Phase II Consumer Products	<$0.01 to $1.10	Not Determined

(CARB, 1989; CARB, 1990; CARB, 1991; CARB, 1997; CARB, 1999; CARB, 2004; SCAQMD, 1999; CARB, 2005b; CARB, 2000; CARB, 2007; SCAQMD, 2003)

3.B. Colorant Results

The total cost of the colorants is estimated to be 1.6 million dollars per year in 2019 dollars. The overall average cost-effectiveness is estimated to be $14.57 per pound of VOC reduced.

Table 8-4
Colorants Cost-Effectiveness

Colorant Type	Proposed VOC Limit (g/l)	Total Annual Cost ($/yr) (A)	Total VOC Reduced (lb/yr) (B)	Cost Effectiveness ($/lb VOC Reduced) (A)/(B)
Colorant*	50	$1,611,339	110,629	$14.57
Waterborne IM	50			
Solventborne IM	600			
Wood Coatings	600			

*Colorants added to architectural coatings, except Industrial Maintenance Coatings and Wood Coatings.

E. Economic Impacts on Businesses

1. Potential Impact on California Businesses

The staff's analysis shows that most affected businesses would be able to absorb the costs of the proposed SCM with no significant adverse impacts on their profitability. However, the proposed SCM may impose economic hardship on some businesses with small or no margin of profitability. These businesses, if hard pressed, can seek relief under the variance provision of the local air districts for extensions to their compliance dates. Such extensions may provide sufficient time to minimize the cost impacts to these businesses. Because the proposed updates would not alter significantly the profitability of most businesses, staff does not expect a noticeable change in employment, business creation, elimination or expansion, and business competitiveness in California.

2. Affected Businesses

This portion of the economic impact analysis is based on a comparison of the return on owners' equity (ROE) for affected businesses before and after inclusion of the cost to comply with the proposed requirements utilizing financial data from the industry representative of various company sizes. The data used in this analysis are obtained from Bizminer 2018 and the 2014 Survey.

Any business that manufactures or markets architectural coatings would potentially be affected by the proposed SCM. Also potentially affected are businesses that supply resins, solvents, other ingredients and equipment to these manufacturers or marketers, or distribute, sell or use architectural coatings. However, the focus of this analysis is manufacturers because these businesses would be directly affected by the proposed SCM. The North American Industry Classification System (NAICS) code 325110 was utilized in this analysis to identify relevant industry data. Architectural Coatings constitute roughly 30 - 35% of the Paints and Coatings Industry represented by NAICS code 325110. All affected categories of coatings are classified under the North American Industry Classification System (NAICS) 325510.

According to the 2014 Survey, 161 companies nationwide manufacture or market architectural coatings in California. Of these 161 companies, 73 manufacture or market coatings in one of the categories with a proposed change in VOC limit. These 73 companies are represented in Table 8-5. Of the 73 companies that manufacture or market coatings in one of the categories with a proposed change in VOC limit, 53 manufacture noncompliant products, according to the 2014 Survey.

Paints and coatings manufacturers generated about $27.5 billion in national sales in 2016, of which an estimated $1.3 billion was in California (ACA, 2018; U.S. Census, 2018c). The majority of the revenue was generated by a few companies; ten of the 161 manufacturers account for 85 percent of the volume, with the remaining 151 companies accounting for the remaining 15 percent.

The 73 architectural coatings companies that manufactured or marketed non--complying products in California marketed about 33 million gallons of coatings, of which 30 million gallons were compliant and 3 million gallons were noncompliant (*Id.*). California based companies accounted for 52 percent of compliant gallons, 66 percent of noncompliant gallons, and 53 percent of the overall sales volume for coatings marketed in California as shown in Table 8-5 (*Id.*).

Table 8-5
Sales Volume for Compliant and Non-Compliant Coatings in Categories with a Change in VOC Limit

Sales Volume in 2013	**California Manufacturers (23)**		**Non-California Manufacturers (50)**		**All Manufacturers (73)**	
Compliant Products (Gallons)	15,639,125	88%	14,444,625	93%	30,083,750	90%
Non-Compliant Products (Gallons)	2,093,399	12%	1,096,217	7%	3,189,616	10%
Total	**17,732,524**		**15,540,842**		**33,273,366**	

3. Study Approach

Of the 161 manufacturers or marketers of architectural coatings included in the CARB 2014 Survey, a total of 73 companies manufactured or marketed noncompliant paints and coatings in California in 2013. This study covers these affected businesses. The approach used in evaluating the potential economic impact of the proposed SCM on these businesses is outlined as follows:

(1) Industry data representative of typical architectural coating manufacturers of different sizes were selected from the list of 73 affected businesses based on the size of their sales and quantity of noncompliant coatings they manufactured or marketed. Firm sizes utilized were: Large (Revenue of $100-$250 M), Medium (Revenue of $10-100 M) and Small ($5-$10 M).
(2) If applicable, the survey-reported compliance cost was used, otherwise the compliance cost was estimated for each of these businesses.
(3) Estimated cost was adjusted for Federal and State taxes.
(4) The five-year average ROE was calculated for each business size by averaging their ROEs for 2013 through 2017 (Bizminer, 2018). ROE is calculated by dividing the net after-tax profit by the net worth. The adjusted cost was then subtracted from net after-tax profit data. The results were used to calculate an adjusted five-year average ROE. The adjusted ROE was then compared with the ROE before the subtraction of the adjusted cost to determine the potential impact on the profitability of the affected businesses. A reduction of more than 10 percent in profitability is considered to indicate a potential for significant adverse economic impacts.

The threshold value of 10 percent has been used consistently by the CARB staff to determine impact severity (CARB, 1990; CARB, 1991; CARB, 1995; CARB, 1998; CARB, 2000b; CARB, 2005b). This threshold is consistent with the thresholds used by the United States Environmental Protection Agency and others.

4. Assumptions

The ROEs before and after the subtraction of the adjusted compliance costs were calculated for each size business using financial data for 2013 through 2017. The calculations were based on the following assumptions:

(1) Selected businesses are representative of affected noncompliant businesses;
(2) All affected businesses are subject to the highest Federal and State corporate tax rates of 21 percent and 8.84 percent respectively; and
(3) Affected businesses are not able to increase the prices of their products, nor can they lower their costs of doing business through short-term cost-cutting measures.

Given the limitation of available data, staff believes these assumptions are reasonable for most businesses at least in the short run. However, they may not be applicable to all businesses.

5. Results

Typical California businesses are affected by the proposed SCM to the extent that the additional costs imposed by the proposed requirements would change their profitability.

Staff estimated profitability impacts by calculating the decline in the return on owner's equity (ROE). Assuming that coating manufacturers will have to absorb all of the costs associated with the SCM, the proposed SCM is expected to result in an average ROE decline of 3 percent, as shown in Table 8-6, which is not considered to be a significant impact on the profitability of affected businesses.

Table 8-6
Changes in Return on Owner's Equity (∆ROEs) for Typical Businesses in Architectural Coatings Industry

Size	∆ROE	Variance High Range	Variance Low Range
Large	2%	3%	1.5%
Medium	5%	16%	<0.01%
Small	2%	3%	1.5%
Average	**3%**	**7%**	**1%**

Note: All ∆ROEs shown are negative which indicates a decline in profitability.

As shown in Table 8-6, the projected change in profitability of typical businesses in the architectural coatings industry varied widely. The predicted decline in profitability of sample businesses ranged from a high of about 16 percent for a typical medium-sized business to a low of 0.004 percent for a typical medium-sized business. Additionally, this variation in the impact of the proposed SCM can be attributed mainly to the following factors. First, large businesses incur higher costs due to the quantity of noncompliant coatings they manufacture or market. Second, small businesses are usually more financially dependent on affected products than large businesses. Finally, the performance of businesses may differ from year to year, so the average 2013 through 2017 financial data used may not be representative of an average-year performance for some businesses.

The estimated variations to ROEs may be high for the following reasons. First, annualized costs of compliance are estimated using, in part, the current prices of raw materials. Raw material prices usually tend to fall as expected higher demand for these materials induces economy of scale production in the long run. Second, affected businesses probably would not absorb all of the increase in their costs of doing business. They might be able to either pass some of the cost on to consumers in the form of higher prices, reduce their costs, or do both.

6. Potential Impact on Suppliers

Companies which supply resins, solvents, other chemicals and equipment for use in reformulating architectural coatings would potentially benefit from the proposed SCM as they experience an increase in demand for their products. On the other hand, those companies that supply raw materials for existing noncompliant coatings may experience a decline in demand for their products.

7. Potential Impact on Employment

The proposed SCM is not expected to cause a noticeable change in California employment and payroll. According to the 2016 Annual Survey of Manufactures from the U.S. Census Bureau California employment in the paint and allied products industry (NAICS 325510), which includes establishments engaged in manufacturing paints, varnishes, lacquers, enamels and shellac, putties, wood fillers and sealers, paint and varnish removers, paint brush cleaners and allied paint products, was 2,284 in 2016, or about 6 percent of the national employment in the industry. This represents less than one percent of the total manufacturing jobs in California. The industry generated about $128 million in payroll in California, accounting for less than one percent of the total California manufacturing payroll in 2016 (U.S. BLS, 2019; U.S. Census, 2017; U.S. Census, 2018c; U.S. Census, 2018e).

Professional painters and contractors may also be impacted by the proposed SCM. According to 2016 data from the U.S. Census Bureau, California employment of painting and wall covering contractors (NAICS 238320), which includes establishments engaged in interior or exterior painting or interior wall covering. The work performed may include new work, additions, alterations, maintenance, and repairs, was 28,415, or about 14 percent of the national employment in the industry. These employees generated about $1.2 billion in payroll in 2018 (U.S. Census, 2018b; U.S. Census. 2018d).

The employment in the paint and coating industry is unlikely to change significantly as a result of the proposed SCM. This is because the proposed

SCM, if adopted by the districts, applies only to about 53 percent of the California market for architectural coatings. Thus, its impact will be even smaller than indicated above. In addition, as shown above, most affected manufacturers or marketers would be able to absorb the reformulation costs with no significant impact on their profitability.

8. Potential Impact on Business Creation, Elimination or Expansion

The proposed SCM should have no noticeable impact on the status of California businesses. This is because the reformulation costs are not expected to impose a significant impact on the profitability of most businesses in California. However, some small or medium-sized businesses with little or no margin of profitability may lack the financial resources to reformulate their products in a timely manner. Should the proposed SCM impose significant hardship on these businesses, temporary relief in the form of a compliance date extension under the local districts' variance provision may be warranted.

9. Potential Impact on Business Competitiveness

The proposed SCM should have no significant impact on the ability of California businesses to compete with businesses in other states. Because the proposed SCM would apply to all businesses that manufacture or market architectural coatings for sale in California regardless of their location, the staff's proposal should not present any economic disadvantages specific to California businesses. Of a total of 161 companies involved in manufacturing or marketing architectural coatings, 47 are located in California.

The proposed SCM may have an adverse impact on the competitive position of some small, marginal businesses in California if these businesses lack resources to develop commercially acceptable products in a timely manner. As stated above, such impacts can be mitigated to a degree with a justifiable compliance extension under the local districts' variance provision.

10. Potential Impacts on California State or Local Agencies

Some public agencies would be minimally impacted by the SCM. The California Prison Industry Authority (PIA) manufactures and markets products for use in State service, but none of their products fall under the proposed SCM (PIA, 2019). Other State or local agencies that use architectural coatings in their ordinary course of business such as the California Department of Transportation, will have the same variety of coatings available to purchase as any other industrial, commercial, or household consumer in California. Based on the above, staff have determined that the proposed limits will not create costs or savings, as defined in Government Code section 11346.5(a)(6), to any State agency or in federal funding to the State, costs or mandate to any local agency or school district whether or not reimbursable by the State pursuant to Part 7 (commencing with section 17500) Division 4, Title 2 of the Government Code, or other nondiscretionary savings to local agencies.

F. Potential Impacts on California Consumers

If businesses are unable to reduce their costs of doing business, they would pass their cost increases on to consumers. Staff estimates an average potential increase of about $3.82 per gallon, if all costs were passed on to the consumer. Currently, the average cost per gallon for consumers is about $34.65. Therefore, the maximum increase in the cost per gallon could be about 11 percent.

However, it is important to note that most individual consumers buy Stains (Exterior/Dual), Floor Coatings, Nonflat Coatings and Nonflat - High Gloss Coatings. For these categories, if all costs were passed on to consumers, staff estimates an average increase of $3.43 per gallon. Currently, the average cost per gallon for consumers for these categories is about $31.91. Therefore, the maximum increase in the cost per gallon could be about 11 percent.

As noted earlier, consumers who do not wish to purchase these reformulated coatings would still be able to buy the currently available complying coatings at lower prices. The competition from these existing compliant coatings will likely constrain any price increases for the reformulated coatings. In other words, most manufacturers would not be able to pass on all their costs to the consumers as staff assumed in this analysis, thereby making the actual retail price increases likely to be less than staff's projections.

G. Mitigation of Potential Impacts Through Additional Regulatory Flexibility

Businesses may be able to mitigate their cost impacts with a justified variance from local air district enforcement of the SCM to extend their compliance dates. In addition, with over two years to reformulate and an additional three years of allowable sell-through to eliminate noncompliant inventory, businesses should have ample time to make the necessary plans and adjustments in their operations to minimize the impacts from the SCM.

CHAPTER IX. EVALUATION OF REGULATORY ALTERNATIVES

Government Code section 11346.2, subdivision (b)(4) requires CARB to consider and evaluate reasonable alternatives to the proposed regulatory action and provide reasons for rejecting those alternatives. While the SCM is not a CARB regulation, staff considered alternatives to the proposed SCM. This section discusses alternatives evaluated and provides reasons why these alternatives were not included in the proposal. As explained below, no alternative proposed was found to be less burdensome and equally effective in achieving the purposes of the proposed SCM.

Alternative One – No Action

A “No Action” alternative would be to forgo approving the proposed updates, making no changes to the SCM, thereby keeping the VOC limits unchanged and leaving the colorants unregulated. The “No Action” alternative would require air districts that need to update their architectural coatings rules to perform their own technical evaluations of the feasibility of lowering VOC limits. The no action alternative was rejected because it would be a less efficient approach to achieving emission reductions and it would potentially not achieve emission reductions necessary to attain the State and federal ambient air quality standards.

Alternative Two – Update the SCM but Extend the Effective Date

A second alternative to the proposed SCM would be for CARB to approve the updates to the SCM but provide a longer effective date for implementation. CARB staff determined that this alternative would not be as effective at reducing VOC emissions from architectural coatings as the proposed SCM. The delayed effective date alternative was rejected because compliant coatings are currently available for all categories where a lower VOC limit is proposed. Based on the high compliant market share in each of the proposed categories, staff concluded that an extended effective data is not necessary.

CHAPTER X. REFERENCES

American Coatings Association. Facts About the Paint & Coatings Industry. 2018: https://www.paint.org/documents/2018/09/econ-contributions-fact-sheet.pdf/. (ACA, 2018).

Bizminer. Industry Financial Report NAICS 325510. Paint and Coating Manufacturing All United States. December 2018. (Bizminer, 2018)

Brimo-Cox, S. Intumescent Paint. PaintPro 7 No. 5. 2005. (Brimo-Cox, 2005).

California Air Resources Board. Technical Support Document. Effect of Ozone on Vegetation and Possible Alternative Ambient Air Quality Standard. March 1987. (CARB, 1987)

California Air Resources Board. Technical Support Document. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products. (a.k.a. Phase I Consumer Products Regulation). August 1990. (CARB, 1990)

California Air Resources Board. Technical Support Document. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products – Phase II. October 1991. (CARB, 1991)

California Air Resources Board. Staff Report. Proposed Alternative Control Plan for Consumer Products. August 1994. (CARB, 1994)

California Air Resources Board. Initial Statement of Reasons for a Proposed Statewide Regulation to Reduce Volatile Organic Compound Emissions from Aerosol Coating Products and Amendments to the Alternative Control Plan for Consumer Products. February 3, 1995. (CARB, 1995)

California Air Resources Board. Executive Summary and Technical Support Document. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation. (a.k.a. Mid-Term Measures I). June 6, 1997. (CARB, 1997a)

California Air Resources Board. Letter to Ms. Mary Nichols, United States Environmental Protection Agency. ARB Comments on U.S. EPA Proposal for New, National Clean Air Goals and Policies. March 11, 1997. (CARB, 1997b)

California Air Resources Board. Hearing Notice and Staff Report. Proposed Amendments to the California On-Road Motorcycle Regulation. October 1998. (CARB, 1998)

California Air Resources Board. Introduction and Executive Summary and Technical Support Document. Initial Statement of Reasons for Proposed

Amendments to the California Consumer Products Regulation. (a.k.a. Mid-Term Measures II). September 10, 1999. (CARB, 1999)

California Air Resources Board. Final Program Environmental Impact Report Suggested Control Measure for Architectural Coatings. June 2000. (CARB, 2000a)

California Air Resources Board. Staff Report for the Proposed Suggested Control Measure Architectural Coatings. June 2000. (CARB, 2000b)

California Air Resources Board. 2001 Update on the Architectural Coatings Suggested Control Measure (SCM) Enclosure 1 – Status Report: Architectural Coatings Suggested Control Measure. June 2001: https://www.arb.ca.gov/coatings/arch/meetings/bdreport.pdf. (CARB, 2001a)

California Air Resources Board. Policies and Actions for Environmental Justice. December 13, 2001: https://www.arb.ca.gov/ch/programs/ej/ejpolicies.pdf. (CARB, 2001b)

California Air Resources Board and Office of Environmental Health Hazard Assessment. Staff Report: Public Hearing to Consider Amendments to the Ambient Air Quality Standards for Particulate Matter and Sulfates. May 3, 2002: http://www.arb.ca.gov/research/aaqs/std-rs/pm-final/pm-final.htm. (CARB, 2002)

California Air Resources Board. Initial Statement of Reasons for the Proposed Amendments to the California Aerosol Coatings Products, Antiperspirants and Deodorants, and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measure for Para-Dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products. May 7, 2004. (CARB, 2004)

California Air Resources Board. Review of the California Ambient Air Quality Standard for Ozone. October 2005: http://www.arb.ca.gov/research/aaqs/ozone-rs/rev-staff/rev-staff.htm. (CARB, 2005a)

California Air Resources Board. Staff Report for the Proposed Suggested Control Measure for Automotive Coatings. October 2005. (CARB, 2005b)

California Air Resources Board. The California Almanac of Emissions and Air Quality, 2006 Edition. 2006: http://www.arb.ca.gov/aqd/almanac/almanac.htm. (CARB, 2006b)

California Air Resources Board. Staff Report For Proposed Amendments to the Suggested Control Measure For Architectural Coatings. September 2007. (CARB, 2007a)

California Air Resources Board. Technical Support Document For Proposed Amendments to the Suggested Control Measure For Architectural Coatings." September 2007. (CARB, 2007b)

California Air Resources Board. Staff Report: Initial Statement of Reasons for Proposed Rulemaking. Proposed Amendments to the Antiperspirants and Deodorants Regulations, the Consumer Products Regulation, the Tables of MIR Values, Test Method 310, and Proposed Repeal of the Hairspray Credit Program. August 7, 2013. (CARB, 2013).

California Air Resources Board. CEPAM: Standard Emission Tool. July 2018. (CARB, 2018)

California Air Resources Board and California Air Pollution Control Officers Association (CAPCOA). Technical Support Document. Suggested Control Measure for Architectural and Industrial Maintenance (AIM) Coatings. July 1989. (CARB and CAPCOA, 1989)

California Air Resources Board and Office of Environmental Health Hazard Assessment. Adequacy of California Ambient Air Quality Standards: Children's Environmental Health Protection Act. December 22, 2000: https://www.arb.ca.gov/ch/ceh/sb25.pdf. (CARB and OEHHA, 2000).

California Environmental Protection Agency, Memorandum from Peter M. Rooney, Undersecretary, to Cal/EPA Executive Officers and Directors. Economic Analysis Requirements for the Adoption of Administrative Regulations. Appendix C (Cal/EPA Guidelines for Evaluation Alternatives to Proposed Major Regulations). December 6, 1996. (Cal/EPA, 1996)

California Department of Transportation. Phone call from Kyle Keene, CARB, to Andy Rogerson, Caltrans. April 26, 2007. (Caltrans, 2007).

California Department of Transportation, Report on Reactive Penetrating Sealers for Concrete, May 28, 2013. (Caltrans, 2013)

California Environmental Protection Agency (Cal/EPA), Letter from Linda S. Adams, Secretary for Environmental Protection, to Mr. David Allaway, Oregon Department of Environmental Quality Regarding Regulation of Waste Latex Paints in California. June 13, 2007. (Cal/EPA, 2007)

California Office of Environmental Health Hazard Assessment (OEHHA). *Tertiary*-Butyl Acetate Cancer Inhalation Unit Risk Factor Technical Support Document for Cancer Potency Factors Appendix B. August 2018: https://oehha.ca.gov/media/downloads/crnr/tbaccanceriur081018.pdf. (OEHHA, 2018)

California Prison Industry Authority (PIA). Online Catalog of PIA Institutional Products. 2019: https://catalog.calpia.ca.gov/search/. (PIA, 2019)

Chemical Engineering – Essentials for the CPI Professional. 2007 Chemical Engineering Plant Cost Index. 2007: https://www.chemengonline.com/cepciupdates-january-2018-prelim-and-december-2017-final/?printmode=1. (Chemical Engineering, 2007)

Chemical Engineering – Essentials for the CPI Professional. 2017 Chemical Engineering Plant Cost Index. 2017: https://isr.umd.edu/~adomaiti/chbe446/literature/ChECostIndexJan2015.pdf. (Chemical Engineering, 2017)

Cruzan G. and Kirkpatrick D. *Tertiary*-butyl acetate metabolism, toxicity, and human health considerations. Toxicol Env Chem 88:405-421. 2006. (Cruzan and Kirkpatrick, 2006)

Department of Finance. E-7 California Population Estimates, with Components of Change and Crude Rates, July 1, 1900-2005. March 2006. (DOF, 2006)

Department of Finance. E-5 Population and Housing Estimates for Cities, Counties and the State. Sacramento, California. May 2016. (DOF, 2016)

Falconer, Donald F. Taking the heat in Style. Journal of Architectural Coatings 2.5: 56-58. 2006. (Falconer, 2006).

Hong J.Y., Yang C.S., Lee M., Wang Y.Y., Huang W.Q., Tan Y., Patten C.J. and Bondoc F.Y. Role of cytochromes P450 in the metabolism of methyl tert-butyl ether in human livers. Arch Toxicol 71:266-9. 1997. (Hong et al., 1997)

Klein, R.J. Formulating low-odor, low-VOC interior paints. Modern Paint and Coatings 83. 1993. (Klein, 1993)

McConnell, Rob, Kiros Berhane, Frank Gilliland, Stephanie J. London, Talat Islam, W. James Gauderman, Edward Avol, Helene G. Margolis, and John M. Peters. Asthma in exercising children exposed to ozone: a cohort study. The Lancet 359, no. 9304: 386-391. 2002. (McConnell et al., 2002)

National Toxicology Program. Toxicology and Carcinogenesis Studies of p-Chloro-α,α,α-Trifluorotoluene in Sprague Dawley Rats (Hsd:Sprague Dawley SD) and B6C3F1/N Mice (Inhalation Studies). Technical Report Series No. 594. US Department of Health and Human Services, NTP, Research Triangle Park, NC. Available at https://ntp.niehs.nih.gov/ntp/htdocs/lt_rpts/tr594_508.pdf. 2018. (NTP, 2018)

Ozone Transport Commission. Model Rule Preamble: Architectural and Industrial Maintenance Coatings. July 24, 2001: https://otcair.org/upload/Documents/Model%20Rules/AIM_Preamble_Model_Rule.pdf. (OTC, 2001)

Ozone Transport Commission. Model Rule: Architectural and Industrial Maintenance (AIM) Coatings. 2014:

https://otcair.org/upload/Documents/Model%20Rules/AIM_Preamble_Model_Rule.pdf. (OTC, 2014)

Peters, M.S. and Timmerhaus, K.D. Plant Design and Economics for Chemical Engineers. 3rd Edition, McGraw-Hill Book Company, pp. 159-162. 1980. (Peters and Timmerhaus, 1980)

Pourreau, D.B., Kelly, G.B., Junker, L.J., Wojcik, R.T., Goldstein, S.L., & Morgan, M. Formulating VOC-compliant coatings with exempt solvents. Paint & Coatings Industry. 1999. (Pourreau et al., 1999)

Seinfeld, J. H., and Pandis, S. N. Atmospheric Chemistry and Physics. John Wiley & Sons, New York. 1998. (Seinfeld and Pandis, 1998)

South Coast Air Quality Management District. Staff Report for Proposed Amendments to Rule 1113 – Architectural Coatings. September 26, 1996. (SCAQMD, 1996)

South Coast Air Quality Management District. Staff Report Proposed Amendments to Rule 1113 – Architectural Coatings. May 14, 1999. (SCAQMD, 1999)

South Coast Air Quality Management District. Staff Report for Proposed Amended Rule 1113 – Architectural Coatings. July 20, 2001. (SCAQMD, 2001)

South Coast Air Quality Management District. Staff Report for Proposed Amended Rule 1113 – Architectural Coatings. December 6, 2002. (SCAQMD, 2002)

South Coast Air Quality Management District. Staff Report for Proposed Amended Rule 1113 – Architectural Coatings. December 5, 2003. (SCAQMD, 2003)

South Coast Air Quality Management District. Staff Report for Proposed Amended Rule 1113 – Architectural Coatings. July 9, 2004. (SCAQMD, 2004)

South Coast Air Quality Management District. Staff Report for Proposed Amended Rule 1113 – Architectural Coatings. June 2, 2006. (SCAQMD, 2006)

South Coast Air Quality Management District. Staff Report for Proposed Amended Rule 1113 – Architectural Coatings. July 13, 2007. (SCAQMD, 2007)

South Coast Air Quality Management District. AQMD Colorant Survey for Proposed Amended Rule 1113 – Architectural Coatings. 2010. (SCAQMD, 2010)

South Coast Air Quality Management District. Staff Report for Proposed Amended Rule 1113 – Architectural Coatings". June 3, 2011. (SCAQMD, 2011)

South Coast Air Quality Management District. Staff Report for Proposed Amended Rule 1113 – Architectural Coatings. September 6, 2013. (SCAQMD, 2013)

South Coast Air Quality Management District. Staff Report for Proposed Amended Rule 1113 – Architectural Coatings. February 5, 2016. (SCAQMD, 2016)

South Coast Air Quality Management District. E-mail from Charlene Nguyen,

Assistant Air Quality Specialist, SCAQMD, to Jose Gomez, CARB. August 7, 2018. (SCAQMD, 2018)

State and Territorial Air Pollution Program Administrators /Association of Local Air Pollution Control Officials. Regulating Air Emissions from Paint. October 2000: http://www.4cleanair.org/RegAirPaintC.pdf. (STAPPA/ALAPCO, 2000)

The Merck Index. 14th ed. M.J. O'Neil, Ed., p. 352. Merck and Company, Inc., Whitehouse Station, NJ. 2006. (Merck, 2006)

United States Bureau of Labor Statistics. Databases, Tables, & Calculators by Subject – State and Area Employment, Hours, and Earnings. March 2019. (U.S. BLS, 2019)

United States Census Bureau. Annual Survey of Manufactures: Geographic Area Series: Detailed Statistics for All Manufacturing by State: 2016 and 2015. December 15, 2017. (U.S. Census, 2017)

United States Census Bureau. All sectors: Geographic Area Series: Economy-Wide Key Statistics: 2012 Economic Census of the United States. April 19, 2018. (U.S. Census, 2018a)

United States Census Bureau. Geography Area Series: County Business Patterns, 2016 Business Patterns. California NAICS 238320. April 19, 2018. (U.S. Census, 2018b)

United States Census Bureau. Geography Area Series: County Business Patterns, 2016 Business Patterns. California NAICS 325510. April 19, 2018. (U.S. Census, 2018c)

United States Census Bureau. Geography Area Series: County Business Patterns, 2016 Business Patterns. United States NAICS 238320. April 19, 2018. (U.S. Census, 2018d)

United States Census Bureau. Geography Area Series: County Business Patterns, 2016 Business Patterns. United States NAICS 325510. April 19, 2018. (U.S. Census, 2018e)

United States Department of Agriculture. Agricultural Outlook: Statistical Indicators, Table 34.-Cash Receipts from Farm Marketing, by State. July 2006. (USDA, 2006)

United States Environmental Protection Agency. Air Quality Criteria for Ozone and Related Photochemical Oxidants. July 1996, Volume I and III. (U.S. EPA, 1996)

United States Environmental Protection Agency. National Volatile Organic Compound Emission Standards for Architectural Coatings. 40 CFR Part 59. Federal Register: September 11, 1998. Volume 63. Number 176: 48848-48887. (U.S. EPA, 1998a)

United States Environmental Protection Agency. National Volatile Organic Compound Emission Standards for Architectural Coatings – Background for Promulgated Standards. EPA-453/R-98-0006b. August 1998. (U.S. EPA, 1998b)

United States Environmental Protection Agency. Staff Paper – Final Draft. Review of the National Ambient Air Quality Standards for Ozone: Policy Assessment of Scientific and Technical Information OAQPS. July 2007: http://www.epa.gov/ttn/naaqs/standards/ozone/s_o3_cr_sp.html. (U.S. EPA, 2007)

United States Environmental Protection Agency. Air Trends – Air Quality Design Values. August 9, 2018: https://www.epa.gov/air-trends/air-quality-design-values. (U.S. EPA, 2018)

This Page Intentionally Left Blank

APPENDIX A:

PROPOSED UPDATES TO THE SUGGESTED CONTROL MEASURE FOR ARCHITECTURAL COATINGS

California Air Resources Board (CARB)
Suggested Control Measure for Architectural Coatings

1. APPLICABILITY

1.1 Except as provided in subsection 3, this rule is applicable to any person who:

1.1.1 Supplies, sells, markets, or offers for sale any architectural coating for use within the District; or
1.1.2 Manufactures, blends, or repackages any architectural coating for use within the District; or
1.1.3 Applies or solicits the application of any architectural coating within the District.

2. SEVERABILITY

2.1 Each provision of this rule shall be deemed severable, and in the event that any provision of this rule is held to be invalid, the remainder of this rule shall continue in full force and effect.

3. EXEMPTIONS

3.1 This rule does not apply to:

3.1.1 Any architectural coating that is supplied, sold, offered for sale, or manufactured for use outside of the District or for shipment to other manufacturers for reformulation or repackaging.
3.1.2 Any aerosol coating product.

3.2 With the exception of section 7, this rule does not apply to any architectural coating that is sold in a container with a volume of one liter (1.057 quart) or less~~.~~ provided the following requirements are met:

3.2.1 The coating container is not bundled together with other containers of the same specific coating category (listed in Table 1) to be sold as a unit that exceeds one liter (1.057 quart), excluding containers packed together for shipping to a retail outlet, and
3.2.2 The label or any other product literature does not suggest combining multiple containers of the same specific category (listed in Table 1) so that the combination exceeds one liter (1.057 quart).

3.3 Colorant added at the factory or at the worksite is not subject to the VOC limit in Table 2. In addition, containers of colorant sold at the point of sale for use in the field or on a job site are also not subject to the VOC limit in Table 2.

4. DEFINITIONS

4.1 Adhesive: Any chemical substance that is applied for the purpose of bonding two surfaces together other than by mechanical means.

4.2 Aerosol Coating Product: A pressurized coating product containing pigments or resins that dispenses product ingredients by means of a propellant, and is packaged in a disposable ~~can~~ container for hand-held application, or for use in specialized equipment for ground traffic/marking applications.

4.3 Aluminum Roof Coating: A coating labeled and formulated exclusively for application to roofs and containing at least 84 grams of elemental aluminum pigment per liter of coating (at least 0.7 pounds per gallon). Pigment content shall be determined in accordance with SCAQMD Method 318-95, incorporated by reference in subsection 8.5.4.

4.4 Appurtenance: Any accessory to a stationary structure coated at the site of installation, whether installed or detached, including, but not limited to: bathroom and kitchen fixtures; cabinets; concrete forms; doors; elevators; fences; hand railings; heating equipment, air conditioning equipment, and other fixed mechanical equipment or stationary tools; lampposts; partitions; pipes and piping systems; rain gutters and downspouts; stairways, fixed ladders, catwalks, and fire escapes; and window screens.

4.5 Architectural Coating: A coating to be applied to stationary structures or their appurtenances at the site of installation, to portable buildings at the site of installation, to pavements, or to curbs. Coatings applied in shop applications or to non-stationary structures such as airplanes, ships, boats, railcars, and automobiles, and adhesives are not considered architectural coatings for the purposes of this rule.

4.6 Basement Specialty Coating: A clear or opaque coating that is labeled and formulated for application to concrete and masonry surfaces to provide a hydrostatic seal for basements and other below-grade surfaces. Basement Specialty Coatings must meet the following criteria:

4.6.1 Coating must be capable of withstanding at least 10 psi of hydrostatic pressure, as determined in accordance with ASTM D7088-~~04~~17, which is incorporated by reference in subsection 8.5.12; and

4.6.2 Coating must be resistant to mold and mildew growth and must achieve a microbial growth rating of 8 or more, as determined in accordance with ASTM D3273-~~00~~16 and ASTM D3274-~~95~~09 (2017), incorporated by reference in subsection 8.5.19.

4.7 Bitumens: Black or brown materials, including, but not limited to, asphalt, tar, pitch, and asphaltite that are soluble in carbon disulfide, consist mainly of hydrocarbons, and are obtained from natural deposits or as residues from the distillation of crude petroleum or coal.

4.8 Bituminous Roof Coating: A coating which incorporates bitumens that is labeled and formulated exclusively for roofing.

4.9 Bituminous Roof Primer: A primer which incorporates bitumens that is labeled and formulated exclusively for roofing and intended for the purpose of preparing a weathered or aged surface or improving the adhesion of subsequent surfacing components.

4.10 Bond Breaker: A coating labeled and formulated for application between layers of concrete to prevent a freshly poured top layer of concrete from bonding to the layer over which it is poured.

4.11 Building Envelope: The ensemble of exterior and demising partitions of a building that enclose conditioned space.

4.12 Building Envelope Coating: The fluid applied coating applied to the building envelope to provide a continuous barrier to air or vapor leakage through the building envelope that separates conditioned from unconditioned spaces. Building Envelope Coatings are applied to diverse materials including, but not limited to, concrete masonry units (CMU), oriented strand board (OSB), gypsum board, and wood substrates and must meet the following performance criteria:

4.12.1 Air Barriers formulated to have an air permeance not exceeding 0.004 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.004 cfm/ft^2 @ 1.57 psf), [0.02 liters per square meter per second under a pressure differential of 75 Pa (0.02 L/(s m^2) @ 75 Pa)] when tested in accordance with ASTM E2178-13, incorporated by reference in subsection 8.5.23; and/or

4.12.2 Water Resistive Barriers formulated to resist liquid water that has penetrated a cladding system from further intruding into the exterior wall assembly and is classified as follows:

4.12.2.1 Passes water resistance testing accordance to ASTM E331-00 (2016), incorporated by reference in subsection 8.5.24 and

4.12.2.2 Water vapor permeance is classified in accordance with ASTM E96/96M-16, incorporated by reference in subsection 8.5.25.

4.1~~1~~3 Coating: A material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, and stains.

4.1~~2~~4 Colorant: A concentrated pigment dispersion in water, solvent, and/or binder that is added to an architectural coating after packaging in sale units to produce the desired color.

4.1~~3~~5 Concrete Curing Compound: A coating labeled and formulated for application to freshly poured concrete to perform one or more of the following functions:

4.1~~3~~5.1 Retard the evaporation of water; or
4.1~~3~~5.2 Harden or dustproof the surface of freshly poured concrete.

4.1~~4~~6 Concrete/Masonry Sealer: A clear or opaque coating that is labeled and formulated primarily for application to concrete and masonry surfaces to perform one or more of the following functions:

4.1~~4~~6.1 Prevent penetration of water; or
4.1~~4~~6.2 Provide resistance against abrasion, alkalis, acids, mildew, staining, or ultraviolet light; or
4.1~~4~~6.3 Harden or dustproof the surface of aged or cured concrete.

4.1~~5~~7 Driveway Sealer: A coating labeled and formulated for application to worn asphalt driveway surfaces to perform one or more of the following functions:

4.1~~5~~7.1 Fill cracks; or
4.1~~5~~7.2 Seal the surface to provide protection; or
4.1~~5~~7.3 Restore or preserve the appearance.

4.1~~6~~8 Dry Fog Coating: A coating labeled and formulated only for spray application such that overspray droplets dry before subsequent contact with incidental surfaces in the vicinity of the surface coating activity.

4.1~~7~~9 Exempt Compound: A compound identified as exempt under the definition of Volatile Organic Compound (VOC), subsection 4.6~~3~~4. Exempt compounds content of a coating shall be determined by U.S. EPA Method 24 or South Coast Air Quality Management District (SCAQMD) Method 303-91 (Revised ~~1993~~1996), incorporated by reference in subsection 8.5.8.

4.~~18~~20 Faux Finishing Coating: A coating labeled and formulated to meet one or more of the following criteria:

4.~~18~~20.1 A glaze or textured coating used to create artistic effects, including, but not limited to: dirt, suede, old age, smoke damage, and simulated marble and wood grain; or
4.~~18~~20.2 A decorative coating used to create a metallic, iridescent, or pearlescent appearance that contains at least 48 grams of pearlescent mica pigment or other iridescent pigment per liter of

coating as applied (at least 0.4 pounds per gallon); or

4.~~18~~20.3 A decorative coating used to create a metallic appearance that contains less than 48 grams of elemental metallic pigment per liter of coating as applied (less than 0.4 pounds per gallon), when tested in accordance with SCAQMD Method 318-95, incorporated by reference in subsection 8.5.4; or

4.~~18~~20.4 A decorative coating used to create a metallic appearance that contains greater than 48 grams of elemental metallic pigment per liter of coating as applied (greater than 0.4 pounds per gallon) and which requires a clear topcoat to prevent the degradation of the finish under normal use conditions. The metallic pigment content shall be determined in accordance with SCAQMD Method 318-95, incorporated by reference in subsection 8.5.4; or

4.~~18~~20.5 A clear topcoat to seal and protect a Faux Finishing coating that meets the requirements of subsection 4.~~18~~20.1, 4.~~18~~20.2, 4.~~18~~20.3, or 4.~~18~~20.4. These clear topcoats must be sold and used solely as part of a Faux Finishing coating system, and must be labeled in accordance with subsection 6.1.4.

4.~~19~~21 Fire-Resistive Coating: A coating labeled and formulated to protect structural integrity by increasing the fire endurance of interior or exterior steel and other structural materials. The Fire Resistive category includes sprayed fire resistive materials and intumescent fire resistive coatings that are used to bring structural materials into compliance with federal, state, and local building code requirements. Fire Resistive coatings shall be tested in accordance with ASTM Designation E-119-~~07~~18ce1, incorporated by reference in subsection 8.5.2. Fire Resistive coatings and testing agencies must be approved by building code officials.

4.2~~0~~2 Fire-Retardant Coating: A coating labeled and formulated to retard ignition and flame spread, that has been fire tested and rated by a testing agency approved by building code officials for use in bringing building and construction materials into compliance with federal, state and local building code requirements. The fire-retardant coating and the testing agency must be approved by building code officials. The fire-retardant coating shall be tested in accordance with ASTM Designation E-84-~~07~~18b, incorporated by reference in subsection 8.5.1.

Effective January 1, 2010, the Fire Retardant coating category is eliminated and coatings with fire retardant properties will be subject to the VOC limit of their primary category (e.g., Flat, Nonflat, etc.).

4.2~~1~~3 Flat Coating: A coating that is not defined under any other definition in this rule and that registers gloss less than 15 on an 85-degree meter or less than 5 on a 60-degree meter according to ASTM Designation D-523-~~89 (1999)~~14 (2018), incorporated by reference in subsection 8.5.3.

4.2~~2~~4 Floor Coating: An opaque coating that is labeled and formulated for application to flooring, including, but not limited to, decks, porches, steps, garage floors, and other horizontal surfaces which may be subject to foot traffic.

4.2~~3~~5 Form-Release Compound: A coating labeled and formulated for application to a concrete form to prevent the freshly poured concrete from bonding to the form. The form may consist of wood, metal, or some material other than concrete.

~~4.24 Gonioapparent: A change in appearance with a change in the angle of illumination or the angle of view, as defined according to ASTM E-284-06b, incorporated by reference in subsection 8.5.13.~~

4.2~~5~~6 Graphic Arts Coating or Sign Paint: A coating labeled and formulated for hand-application by artists using brush, airbrush, or roller techniques to indoor and outdoor signs (excluding structural components) and murals, including lettering enamels, poster colors, copy blockers, and bulletin enamels.

4.2~~6~~7 High-Temperature Coating: A high performance coating labeled and formulated for application to substrates exposed continuously or intermittently to temperatures above 204°C (400°F).

4.2~~7~~8 Industrial Maintenance Coating: A high performance architectural coating, including primers, sealers, undercoaters, intermediate coats, and topcoats formulated for application to substrates, including floors, exposed to one or more of the following extreme environmental conditions listed in subsections 4.2~~7~~8.1 through 4.2~~7~~8.5, and labeled as specified in subsection 6.1.5:

4.2~~7~~8.1 Immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposure of interior surfaces to moisture condensation; or

4.2~~7~~8.2 Acute or chronic exposure to corrosive, caustic or acidic agents, or to chemicals, chemical fumes, or chemical mixtures or solutions; or

4.2~~7~~8.3 Frequent exposure to temperatures above 121°C (250°F); or

4.2~~7~~8.4 Frequent heavy abrasion, including mechanical wear and frequent scrubbing with industrial solvents, cleansers, or scouring agents; or

4.2~~7~~8.5 Exterior exposure of metal structures and structural components.

4.29 Interior Stain: A stain labeled and formulated exclusively for use on interior surfaces.

4.30 Intumescent: A material that swells as a result of heat exposure, thus increasing in volume and decreasing in density.

4.~~28~~31 Low Solids Coating: A coating containing 0.12 kilogram or less of solids per liter (1 pound or less of solids per gallon) of coating material as recommended for application by the manufacturer. The VOC content for Low Solids Coatings shall be calculated in accordance with subsection 4.6~~4~~5.

4.~~29~~32 Magnesite Cement Coating: A coating labeled and formulated for application to magnesite cement decking to protect the magnesite cement substrate from erosion by water.

4.3~~0~~3 Manufacturer's Maximum Thinning Recommendation: The maximum recommendation for thinning that is indicated on the label or lid of the coating container.

4.34 Market: To facilitate sales through third party vendors including, but not limited to, catalog or ecommerce sales that bring together buyers and sellers. For the purposes of this rule, market does not mean to generally promote or advertise coatings.

4.3~~1~~5 Mastic Texture Coating: A coating labeled and formulated to cover holes and minor cracks and to conceal surface irregularities, and is applied in a single coat of at least 10 mils (at least 0.010 inch) dry film thickness.

4.3~~2~~6 Medium Density Fiberboard (MDF): A composite wood product, panel, molding, or other building material composed of cellulosic fibers (usually wood) made by dry forming and pressing of a resinated fiber mat.

~~4.33 Metallic: Similar to the appearance of a gonioapparent material, as defined herein, containing metal flakes.~~

4.3~~4~~7 Metallic Pigmented Coating: A coating that is labeled and formulated to provide a metallic appearance. Metallic Pigmented coatings must contain at least 48 grams of elemental metallic pigment (excluding zinc) per liter of coating as applied (at least 0.4 pounds per gallon), when tested in accordance with SCAQMD Method 318-95, incorporated by reference in subsection 8.5.4. The Metallic Pigmented Coating category does not include coatings applied to roofs or Zinc-Rich Primers.

4.3~~5~~8 Multi-Color Coating: A coating that is packaged in a single container and that is labeled and formulated to exhibit more than one color when applied in a single coat.

4.3~~6~~9 Nonflat Coating: A coating that is not defined under any other definition in this rule and that registers a gloss of 15 or greater on an 85-degree meter and 5 or greater on a 60-degree meter according to ASTM Designation D-523-14 (2018)~~89 (1999)~~, incorporated by reference in subsection 8.5.3.

~~4.37 Nonflat - High Gloss Coating: A nonflat coating that registers a gloss of 70 or greater on a 60-degree meter according to ASTM Designation D 523-89 (1999), incorporated by reference in subsection 8.5.3. Nonflat – High Gloss coatings must be labeled in accordance with subsection 6.1.10.~~

4.~~38~~40 Particleboard: A composite wood product panel, molding, or other building material composed of cellulosic material (usually wood) in the form of discrete particles, as distinguished from fibers, flakes, or strands, which are pressed together with resin.

4.~~39~~41 Pearlescent: Exhibiting various colors depending on the angles of illumination and viewing, as observed in mother-of-pearl.

4.4~~0~~2 Plywood: A panel product consisting of layers of wood veneers or composite core pressed together with resin. Plywood includes panel products made by either hot or cold pressing (with resin) veneers to a platform.

4.4~~1~~3 Post-Consumer Coating: Finished coatings generated by a business or consumer that have served their intended end uses, and are recovered from or otherwise diverted from the waste stream for the purpose of recycling.

4.4~~2~~4 Pre-Treatment Wash Primer: A primer that contains a minimum of 0.5 percent acid, by weight, when tested in accordance with ASTM Designation D-1613~~-06~~17, incorporated by reference in subsection 8.5.5, that is labeled and formulated for application directly to bare metal surfaces to provide corrosion resistance and to promote adhesion of subsequent topcoats.

4.4~~3~~5 Primer, Sealer, and Undercoater: A coating labeled and formulated for one or more of the following purposes:

4.4~~3~~5.1 To provide a firm bond between the substrate and the subsequent coatings; or
4.4~~3~~5.2 To prevent subsequent coatings from being absorbed by the substrate; or
4.4~~3~~5.3 To prevent harm to subsequent coatings by materials in the substrate; or
4.4~~3~~5.4 To provide a smooth surface for the subsequent application of coatings; or
4.4~~3~~5.5 To provide a clear finish coat to seal the substrate; or
4.4~~3~~5.6 To block materials from penetrating into or leaching out of a substrate.

4.4~~4~~6 Reactive Penetrating Sealer: A clear or pigmented coating that is labeled and formulated for application to above-grade concrete and masonry substrates to provide protection from water and waterborne contaminants, including, but not limited to, alkalis, acids, and salts. Reactive Penetrating Sealers must penetrate into concrete and masonry substrates and chemically react to form covalent bonds with naturally occurring minerals in the substrate. Reactive Penetrating Sealers line the pores of concrete and masonry substrates with a hydrophobic coating, but do not form a surface film. Reactive Penetrating Sealers must meet all of the following criteria:

4.4~~4~~6.1 The Reactive Penetrating Sealer must improve water repellency at least 80 percent after application on a concrete or masonry substrate. This performance must be verified on standardized test specimens, in accordance with one or more of the following standards, incorporated by reference in subsection 8.5.~~20~~19: ASTM C67~~-07~~/C67M-18, or ASTM C97~~-02~~/97M-18, or ASTM C140~~-06~~/C140M-18a; and
4.4~~4~~6.2 The Reactive Penetrating Sealer must ~~not reduce the water vapor transmission rate by more than 2 percent after application on a concrete or masonry substrate. This performance must be verified on standardized test specimens, in accordance with ASTM E96/E96M-05,~~provide a breathable waterproof barrier for concrete or masonry surfaces that does not prevent or substantially retard water vapor transmission. This performance must be verified on standardized test specimens, in accordance with ASTM E96/96M-16 or ASTM D6490-99 (2014), incorporated by reference in subsection 8.5.2~~1~~0; and

4.4~~4~~6.3 Products labeled and formulated for vehicular traffic surface chloride screening applications must meet the performance criteria listed in the National Cooperative Highway Research Report 244 (1981), incorporated by reference in subsection 8.5.2~~2~~1.

Reactive Penetrating Sealers must be labeled in accordance with subsection 6.1.8.

4.4~~5~~7 Recycled Coating: An architectural coating formulated such that it contains a minimum of 50% by volume post-consumer coating, with a maximum of 50% by volume secondary industrial materials or virgin materials.

4.4~~6~~8 Residential: Areas where people reside or lodge, including, but not limited to, single and multiple family dwellings, condominiums, mobile homes, apartment complexes, motels, and hotels.

4.4~~7~~9 Roof Coating: A non-bituminous coating labeled and formulated for application to roofs for the primary purpose of preventing water penetration, reflecting ultraviolet light, or reflecting solar radiation.

4.~~48~~50 Rust Preventative Coating: A coating formulated to prevent the corrosion of metal surfaces for one or more of the following applications:

4.~~48~~50.1 Direct-to-metal coating; or
4.~~48~~50.2 Coating intended for application over rusty, previously coated surfaces.

The Rust Preventative category does not include the following:

4.~~48~~50.3 Coatings that are required to be applied as a topcoat over a primer; or
4.~~48~~50.4 Coatings that are intended for use on wood or any other non-metallic surface.

Rust Preventative coatings are for metal substrates only and must be labeled as such, in accordance with the labeling requirements in subsection 6.1.6.

4.~~49~~51 Secondary Industrial Materials: Products or by-products of the paint manufacturing process that are of known composition and have economic value but can no longer be used for their intended purpose.

4.5~~0~~2 Semitransparent Coating: A coating that contains binders and colored pigments and is formulated to change the color of the surface, but not conceal the grain pattern or texture.

4.5~~1~~3 Shellac: A clear or opaque coating formulated solely with the resinous secretions of the lac beetle (*Laciffer lacca*), and formulated to dry by evaporation without a chemical reaction.

4.5~~2~~4 Shop Application: Application of a coating to a product or a component of a product in or on the premises of a factory or a shop as part of a manufacturing, production, or repairing process (e.g., original equipment manufacturing coatings).

4.5~~3~~5 Solicit: To require for use or to specify, by written or oral contract.

4.5~~4~~6 Specialty Primer, Sealer, and Undercoater: A coating that is formulated for application to a substrate to block water-soluble stains resulting from: fire damage; smoke damage; or water damage.

Specialty Primers, Sealers, and Undercoaters must be labeled in accordance with subsection 6.1.7.

4.5~~5~~7 Stain: A semitransparent or opaque coating labeled and formulated to change the color of a surface but not conceal the grain pattern or texture.

4.5~~6~~8 Stone Consolidant: A coating that is labeled and formulated for application to stone substrates to repair historical structures that have been damaged by weathering or other decay mechanisms. Stone Consolidants must penetrate into stone substrates to create bonds between particles and consolidate deteriorated material. Stone Consolidants must be specified and used in accordance with ASTM E2167-01 (2008), incorporated by reference in subsection 8.5.2~~3~~2.

Stone Consolidants are for professional use only and must be labeled as such, in accordance with the labeling requirements in subsection 6.1.9.

4.5~~7~~9 Swimming Pool Coating: A coating labeled and formulated to coat the interior of swimming pools and to resist swimming pool chemicals. Swimming pool coatings include coatings used for swimming pool repair and maintenance.

4.60 Tile and Stone Sealers: A clear or pigmented sealer that is used for sealing tile, stone or grout to provide resistance against water, alkalis, acids, ultraviolet light or straining and which meet one of the following subcategories:

4.60.1 Penetrating sealers are polymer solutions that cross-link in the substrate and must meet the following criteria:

4.60.1.1 A fine particle structure to penetrate dense tile such as porcelain with absorption as low as 0.10 percent per ASTM C373-18, ASTM C97/97M-18, or ASTM C642-13, incorporated by reference in subsection 8.5.26,

4.60.1.2 Retain or increase static coefficient of friction per ANSI A137.1 (2012), incorporated by reference in subsection 8.5.27,

4.60.1.3 Not create a topical surface film on the tile or stone, and

4.60.1.4 Allow vapor transmission per ASTM E96/96M-16, incorporated by subsection 8.5.28.

4.60.2 Film forming sealers which leave a protective film on the surface.

4.~~58~~61 Tint Base: An architectural coating to which colorant is added after packaging in sale units to produce a desired color.

4.~~59~~62 Traffic Marking Coating: A coating labeled and formulated for marking and striping streets, highways, or other traffic surfaces, including, but not limited to, curbs, berms, driveways, parking lots, sidewalks, and airport runways. This coating category also includes Methacrylate Multicomponent Coatings used as traffic marking coatings. The VOC content of Methacrylate Multicomponent Coatings used as traffic marking coatings shall be analyzed by the procedures in 40 CFR Part 59, Subpart D, Appendix A, incorporated by reference in subsection 8.5.11.

4.6~~0~~3 Tub and Tile Refinish Coating: A clear or opaque coating that is labeled and formulated exclusively for refinishing the surface of a bathtub, shower, sink, or countertop. Tub and Tile Refinish coatings must meet all of the following criteria:

4.6~~0~~3.1 The coating must have a scratch hardness of 3H or harder and a gouge hardness of 4H or harder. This must be determined on bonderite 1000, in accordance with ASTM D3363-05 (2011)e2, incorporated by reference in subsection 8.5.1~~5~~4.; and

4.6~~0~~3.2 The coating must have a weight loss of 20 milligrams or less after 1000 cycles. This must be determined with CS-17 wheels on bonderite 1000, in accordance with ASTM D4060-~~07~~14, incorporated by reference in subsection 8.5.1~~6~~5; and

4.6~~0~~3.3 The coating must withstand 1000 hours or more of exposure with few or no #8 blisters. This must be determined on unscribed bonderite, in accordance with ASTM D4585-99, and

ASTM D714-02~~e1~~ (2017), incorporated by reference in subsection 8.5.1~~7~~6; and

4.6~~0~~3.4 The coating must have an adhesion rating of 4B or better after 24 hours of recovery. This must be determined on unscribed bonderite, in accordance with ASTM D4585~~-99~~/D4585M-18 and ASTM D3359~~-02~~17, incorporated by reference in subsection 8.5.1~~4~~3.

4.6~~1~~4 Veneer: Thin sheets of wood peeled or sliced from logs for use in the manufacture of wood products such as plywood, laminated veneer lumber, or other products.

4.6~~2~~5 Virgin Materials: Materials that contain no post-consumer coatings or secondary industrial materials.

4.6~~3~~6 Volatile Organic Compound (VOC): Any volatile compound containing at least one atom of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and excluding the following:

4.6~~3~~6.1 methane;
methylene chloride (dichloromethane);
1,1,1-trichloroethane (methyl chloroform);
trichlorofluoromethane (CFC-11);
dichlorodifluoromethane (CFC-12);
1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113);
1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114);
chloropentafluoroethane (CFC-115);
chlorodifluoromethane (HCFC-22);
1,1,1-trifluoro-2,2-dichloroethane (HCFC-123);
2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124);
1,1-dichloro-1-fluoroethane (HCFC-141b);
1-chloro-1,1-difluoroethane (HCFC-142b);
trifluoromethane (HFC-23);
pentafluoroethane (HFC-125);
1,1,2,2-tetrafluoroethane (HFC-134);
1,1,1,2-tetrafluoroethane (HFC-134a);
1,1,1-trifluoroethane (HFC-143a);
1,1-difluoroethane (HFC-152a);
cyclic, branched, or linear completely methylated siloxanes;
the following classes of perfluorocarbons:
4.6~~3~~6.1.1 cyclic, branched, or linear, completely fluorinated alkanes;
4.6~~3~~6.1.2 cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;

4.6~~3~~6.1.3 cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and

4.6~~3~~6.1.4 sulfur-containing perfluorocarbons with no unsaturations and with the sulfur bonds only to carbon and fluorine; and

4.6~~3~~6.2 the following low-reactive organic compounds which have been exempted by the U.S. EPA:
acetone;
ethane;
parachlorobenzotrifluoride (1-chloro-4-trifluoromethyl benzene);
perchloroethylene; and
methyl acetate.

4.6~~4~~7 VOC Actual: VOC Actual is the weight of VOC per volume of coating or colorant and it is calculated with the following equation:

$$\text{VOC Actual} = \frac{(Ws - Ww - Wec)}{(Vm)}$$

Where:

VOC Actual	=	the grams of VOC per liter of coating or colorant (also known as "Material VOC")
W_s	=	weight of volatiles, in grams
W_w	=	weight of water, in grams
W_{ec}	=	weight of exempt compounds, in grams
V_m	=	volume of coating or colorant, in liters

4.6~~5~~8 VOC Content: The weight of VOC per volume of coating or colorant. VOC Content is VOC Regulatory, as defined in subsection 4.6~~6~~9, for all coatings or colorants except those in the Low Solids category. For coatings or colorants in the Low Solids category, the VOC Content is VOC Actual, as defined in subsection 4.6~~4~~7. If the coating is a multi-component product, the VOC content is VOC Regulatory as mixed or catalyzed. If the coating contains silanes, siloxanes, or other ingredients that generate ethanol or other VOCs during the curing process, the VOC content must include the VOCs emitted during curing.

4.6~~6~~9 VOC Regulatory: VOC Regulatory is the weight of VOC per volume of coating or colorant, less the volume of water and exempt compounds. It is calculated with the following equation:

$$\text{VOC Regulatory} = \frac{(Ws - Ww - Wec)}{(Vm - Vw - Vec)}$$

Where:

VOC Regulatory	=	grams of VOC per liter of coating or colorant, less water and exempt compounds (also known as "Coating VOC")
W_s	=	weight of volatiles, in grams
W_w	=	weight of water, in grams
W_{ec}	=	weight of exempt compounds, in grams
V_m	=	volume of coating or colorant, in liters
V_w	=	volume of water, in liters
V_{ec}	=	volume of exempt compounds, in liters

4.~~67~~70 Waterproofing Membrane: A clear or opaque coating that is labeled and formulated for application to concrete and masonry surfaces to provide a seamless waterproofing membrane that prevents any penetration of liquid water into the substrate. Waterproofing Membranes are intended for the following waterproofing applications: below-grade surfaces, between concrete slabs, inside tunnels, inside concrete planters, and under flooring materials. Waterproofing Membranes must meet the following criteria:

4.~~67~~70.1 Coating must be applied in a single coat of at least 25 mils (at least 0.025 inch) dry film thickness; and

4.~~67~~70.2 Coatings must meet or exceed the requirements contained in ASTM C836~~-06~~/C836M-18, incorporated by reference in subsection 8.5.1~~8~~7.

The Waterproofing Membrane category does not include topcoats that are included in the Concrete/Masonry Sealer category (e.g., parking deck topcoats, pedestrian deck topcoats, etc.).

4.~~68~~71 Wood Coatings: Coatings labeled and formulated for application to wood substrates only. The Wood Coatings category includes the following clear and semitransparent coatings: lacquers; varnishes; sanding sealers; penetrating oils; clear stains; wood conditioners used as undercoats; and wood sealers used as topcoats. The Wood Coatings category also includes the following opaque wood coatings: opaque lacquers; opaque sanding sealers; and opaque lacquer undercoaters. The Wood Coatings category does not include the following: clear sealers that are labeled and formulated for use on concrete/masonry surfaces; or coatings intended for substrates other than wood.

Wood Coatings must be labeled "For Wood Substrates Only", in accordance with subsection 6.1.1~~1~~0.

4.~~69~~72 Wood Preservative: A coating labeled and formulated to protect exposed wood from decay or insect attack, that is registered with both the U.S. EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (7

United States Code (U.S.C.) Section 136, *et seq.*) and with the California Department of Pesticide Regulation.

4.7~~0~~3 Wood Substrate: A substrate made of wood, particleboard, plywood, medium density fiberboard, rattan, wicker, bamboo, or composite products with exposed wood grain. Wood Products do not include items comprised of simulated wood.

4.7~~1~~4 Zinc-Rich Primer: A coating that meets all of the following specifications:

4.7~~1~~4.1 Coating contains at least 65 percent metallic zinc powder or zinc dust by weight of total solids; and

4.7~~1~~4.2 Coating is formulated for application to metal substrates to provide a firm bond between the substrate and subsequent applications of coatings; and

4.7~~1~~4.3 Coating is intended for professional use only and is labeled as such, in accordance with the labeling requirements in subsection 6.1.1~~2~~1.

5. STANDARDS

5.1 **VOC Content Limits:** Except as provided in subsections 5.2 or 5.3, no person shall:

5.1.1 manufacture, blend, or repackage for use within the district; or
5.1.2 supply, sell, market, or offer for sale for use within the district; or
5.1.3 solicit for application or apply within the district, any architectural coating with a VOC content in excess of the corresponding limit specified in Table 1, after the specified effective date in Table 1. Limits are expressed as VOC Regulatory, thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.

5.2 **Most Restrictive VOC Limit:** If a coating meets the definition in Section 4 for one or more specialty coating categories that are listed in Table 1, then that coating is not required to meet the VOC limits for Flat~~,~~ or Nonflat~~, or Nonflat – High Gloss coatings~~, but is required to meet the VOC limit for the applicable specialty coating listed in Table 1.

With the exception of the specialty coating categories specified in subsections 5.2.1 through 5.2.12, if a coating is recommended for use in more than one of the specialty coating categories listed in Table 1, the most restrictive (or lowest) VOC content limit shall apply. This requirement applies to: usage recommendations that appear anywhere on the coating container, anywhere on any label or sticker affixed to the container, or in any sales, advertising, or technical literature supplied by a manufacturer or anyone acting on their behalf.

5.2.1 Metallic pigmented coatings.
5.2.2 Shellacs.
5.2.3 Pretreatment wash primers.
5.2.4 Industrial maintenance coatings.
5.2.5 Low-solids coatings.
5.2.6 Wood preservatives.
5.2.7 High temperature coatings.
5.2.8 Bituminous roof primers.
5.2.9 Specialty primers, sealers, and undercoaters.
5.2.10 Aluminum roof coatings.
5.2.11 Zinc-rich primers.
5.2.12 Wood Coatings.

5.3 **Sell-Through of Coatings:** A coating manufactured prior to the effective date specified for that coating in Table 1 may be sold, supplied, or offered for sale for up to three years after the specified effective date. In addition, a coating manufactured before the effective date specified for that coating in Table 1 may be applied at any time, both before and after the specified effective date, so long as the coating complied with the standards in effect at the time the coating was manufactured. This subsection 5.3 does not apply to any coating that does not display the date or date-code required by subsection 6.1.1.

5.4 **Painting Practices:** All architectural coating containers used to apply the contents therein to a surface directly from the container by pouring, siphoning, brushing, rolling, padding, ragging or other means, shall be closed when not in use. These architectural coating containers include, but are not limited to, drums, buckets, cans, pails, trays or other application containers. Containers of any VOC-containing materials used for thinning and cleanup shall also be closed when not in use.

5.5 **Thinning:** No person who applies or solicits the application of any architectural coating shall apply a coating that is thinned to exceed the applicable VOC limit specified in Table 1.

5.6 **Coatings Not Listed in Table 1:** For any coating that does not meet any of the definitions for the specialty coating~~s~~ categories listed in Table 1, the VOC content limit shall be determined by classifying the coating as a Flat~~,~~ or Nonflat~~, or Nonflat – High Gloss~~ coating, based on its gloss, as defined in subsections 4.2~~1~~3 and~~,~~ 4.3~~6~~9,~~ and 4.37,~~ and the corresponding Flat~~,~~ or Nonflat~~, or Nonflat – High Gloss~~ VOC limit in Table 1 shall apply.

5.7 **Colorants:** No person within the District shall, at the point of sale of any architectural coating subject to subsection 5.1, add to such coating any colorant that contains VOC in excess of the corresponding applicable VOC limit specified in Table 2. The point of sale includes retail outlets that add colorant to a coating container to obtain a specific color.

6. CONTAINER LABELING REQUIREMENTS

6.1 Each manufacturer of any architectural coating subject to this rule shall display the information listed in subsections 6.1.1 through 6.1.1~~2~~1 on the coating container (or label) in which the coating is sold or distributed.

6.1.1 **Date Code:** The date the coating was manufactured, or a date code representing the date, shall be indicated on the label, lid, or bottom of the container. If the manufacturer uses a date code for any coating, the manufacturer shall file an explanation of each code with the Executive Officer~~ of the ARB~~.

6.1.2 **Thinning Recommendations:** A statement of the manufacturer's recommendation regarding thinning of the coating shall be indicated on the label or lid of the container. This requirement does not apply to the thinning of architectural coatings with water. If thinning of the coating prior to use is not necessary, the recommendation must specify that the coating is to be applied without thinning.

6.1.3 **VOC Content:** Each container of any coating subject to this rule shall display one of the following values in grams of VOC per liter of coating:

6.1.3.1 Maximum VOC Content as determined from all potential product formulations; or
6.1.3.2 VOC Content as determined from actual formulation data; or
6.1.3.3 VOC Content as determined using the test methods in subsection 8.2.

If the manufacturer does not recommend thinning, the container must display the VOC Content, as supplied. If the manufacturer recommends thinning, the container must display the VOC Content, including the maximum amount of thinning solvent recommended by the manufacturer. If the coating is a multi-component product, the container must display the VOC content as mixed or catalyzed. If the coating contains silanes, siloxanes, or other ingredients that generate ethanol or other VOCs during the curing process, the VOC content must include the VOCs emitted during curing. VOC Content shall be determined as defined in subsections 4.6~~4~~7, 4.6~~5~~8, and 4.6~~6~~9.

6.1.4 **Faux Finishing Coatings:** ~~Effective January 1, 2010, t~~The labels of all Faux Finishing coatings shall prominently display the statement “This product can only be sold or used as part of a Faux Finishing coating system”.

6.1.5 **Industrial Maintenance Coatings:** ~~Effective January 1, 2010, t~~The labels of all Industrial Maintenance coatings shall prominently display the statement “For industrial use only” or “For professional use only”.

6.1.6 **Rust Preventative Coatings:** The labels of all rust preventative coatings shall prominently display the statement “For Metal Substrates Only.”

6.1.7 **Specialty Primers, Sealers, and Undercoaters:** The labels of all specialty primers, sealers, and undercoaters shall prominently display the statement “Specialty Primer, Sealer, Undercoater.” ~~Effective January 1, 2010, and until January 1, 2012, the labels of all specialty primers, sealers, and undercoaters shall prominently display one or more of the descriptions listed in subsection 6.1.7.1 through 6.1.7.3.~~

~~6.1.7.1 For fire-damaged substrates.~~
~~6.1.7.2 For smoke-damaged substrates.~~
~~6.1.7.3 For water-damaged substrates.~~

6.1.8 **Reactive Penetrating Sealers:** ~~Effective January 1, 2010, t~~The labels of all Reactive Penetrating Sealers shall prominently display the statement “Reactive Penetrating Sealer”.

6.1.9 **Stone Consolidants:** ~~Effective January 1, 2010, t~~The labels of all Stone Consolidants shall prominently display the statement “Stone Consolidant - For Professional Use Only”.

~~6.1.10 **Nonflat - High Gloss Coatings:** The labels of all Nonflat - High Gloss coatings shall prominently display the words “High Gloss.”~~

6.1.1~~1~~0 **Wood Coatings:** ~~Effective January 1, 2010, t~~The labels of all Wood Coatings shall prominently display the statement “For Wood Substrates Only”.

6.1.1~~2~~1 **Zinc Rich Primers**: ~~Effective January 1, 2010, t~~The labels of all Zinc Rich Primers shall prominently display the statement “For Professional Use Only”.

6.2 Effective January 1, 2022, each manufacturer of any colorant subject to this rule shall display the information listed in subsections 6.2.1 and 6.2.2 on the container (or label) in which the colorant is sold or distributed.

6.2.1 **Date Code**: The date the colorant was manufactured, or a date code representing the date, shall be indicated on the label, lid, or bottom of the container. If the manufacturer uses a date code for any colorant, the manufacturer shall file an explanation of each code with the Executive Officer.

6.2.2 **VOC Content:** Each container of any colorant subject to this rule shall display one of the following values in grams of VOC per liter of colorant:

6.2.2.1 Maximum VOC Content as determined from all potential product formulations; or
6.2.2.2 VOC Content as determined from actual formulation data; or
6.2.2.3 VOC Content as determined using the test methods in subsection 8.2.

If the colorant contains silanes, siloxanes, or other ingredients that generate ethanol or other VOCs during the curing process, the VOC content must include the VOCs emitted during curing. VOC Content shall be determined as defined in subsections 4.67, 4.68, and 4.69.

7. REPORTING REQUIREMENTS

7.1 **Sales Data:** A responsible official from each manufacturer shall upon request of the Executive Officer of the ARB, or his or her delegate, provide data concerning the distribution and sales of architectural coatings. The responsible official shall within 180 days provide information, including, but not limited to:

7.1.1 the name and mailing address of the manufacturer;
7.1.2 the name, address and telephone number of a contact person;
7.1.3 the name of the coating product as it appears on the label and the applicable coating category;
7.1.4 whether the product is marketed for interior or exterior use or both;
7.1.5 the number of gallons sold in California in containers greater than one liter (1.057 quart) and equal to or less than one liter (1.057 quart);
7.1.6 the VOC Actual content and VOC Regulatory content in grams per liter. If thinning is recommended, list the VOC Actual content and VOC Regulatory content after maximum recommended thinning. If containers less than one liter have a different VOC content than containers greater than one liter, list separately. If the coating is a multi-component product, provide the VOC content as mixed or catalyzed;

7.1.7 the names and CAS numbers of the VOC constituents in the product;

7.1.8 the names and CAS numbers of any compounds in the product specifically exempted from the VOC definition, as listed in subsection 4.6~~3~~6.1 or 4.6~~3~~6.2;

7.1.9 whether the product is marketed as solventborne, waterborne, or 100% solids;

7.1.10 description of resin or binder in the product;

7.1.11 whether the coating is a single-component or multi-component product;

7.1.12 the density of the product in pounds per gallon;

7.1.13 the percent by weight of: solids, all volatile materials, water, and any compounds in the product specifically exempted from the VOC definition, as listed in subsection 4.6~~3~~6.1 or 4.6~~3~~6.2; and

7.1.14 the percent by volume of: solids, water, and any compounds in the product specifically exempted from the VOC definition, as listed in subsection 4.6~~3~~6.1 or 4.6~~3~~6.2.

7.2 All sales data listed in subsections 7.1.1 to 7.1.14 shall be maintained by the responsible official for a minimum of three years. Sales data submitted by the responsible official to the Executive Officer of the ARB may be claimed as confidential, and such information shall be handled in accordance with the procedures specified in Title 17, California Code of Regulations Sections 91000-91022.

8. COMPLIANCE PROVISIONS AND TEST METHODS

8.1 **Calculation of VOC Content:** For the purpose of determining compliance with the VOC content limits in Table 1 or Table 2, the VOC content of a coating or colorant shall be determined as defined in subsection 4.6~~4~~7, 4.6~~5~~8, or 4.6~~6~~9. The VOC content of a tint base shall be determined without colorant that is added after the tint base is manufactured. If the manufacturer does not recommend thinning, the VOC Content must be calculated for the product as supplied. If the manufacturer recommends thinning, the VOC Content must be calculated including the maximum amount of thinning solvent recommended by the manufacturer. If the coating is a multi-component product, the VOC content must be calculated as mixed or catalyzed. If the coating contains silanes, siloxanes, or other ingredients that generate ethanol or other VOCs during the curing process, the VOC content must include the VOCs emitted during curing.

8.2 **VOC Content of Coatings:** The VOC content of coatings or colorants shall be determined by the following:

8.2.1 To determine the physical properties of a coating or colorant in order to perform the calculations in subsection 4.6~~4~~7 or 4.6~~6~~9, the reference method for VOC content is U.S. EPA Method 24, incorporated by reference in subsection 8.5.9, except as provided in subsections 8.3 and 8.4.

8.2.2 An alternative method to determine the VOC content of coatings or colorants is SCAQMD Method 304-91 (Revised 1996), incorporated by reference in subsection 8.5.10.

8.2.3 The exempt compounds content shall be determined by SCAQMD Method 303-91 (Revised 199~~3~~6), BAAQMD Method 43 (Revised ~~1996~~2005), or BAAQMD Method 41 (Revised ~~1995~~2005), as applicable, incorporated by reference in subsections 8.5.8, 8.5.6, and 8.5.7, respectively.

8.2.4 To determine the VOC content of a coating or colorant, the manufacturer may use U.S. EPA Method 24, or an alternative method as provided in subsection 8.3, formulation data, or any other reasonable means for predicting that the coating or colorant has been formulated as intended (e.g., quality assurance checks, record keeping). However, if there are any inconsistencies between the results of a Method 24 test and any other means for determining VOC content, the Method 24 test results will govern, except when an alternative method is approved as specified in subsection 8.3.

8.2.5 To determine the VOC content of a coating or colorant with a VOC content of 150 g/l or less, the manufacturer may use SCAQMD Method 313, incorporated by reference in subsection 8.5.29, ASTM D6886-18, incorporated by reference in subsection 8.5.30, or any other reasonable means for predicting that the coating or colorant has been formulated as intended (e.g., quality assurance checks, record keeping).

8.2.6 The District Air Pollution Control Officer (APCO) may require the manufacturer to conduct a Method 24 analysis.

8.3 **Alternative Test Methods:** Other test methods demonstrated to provide results that are acceptable for purposes of determining compliance with subsection 8.2, after review and approved in writing by the staffs of the District, the ARB, and the U.S. EPA, may also be used.

8.4 **Methacrylate Traffic Marking Coatings:** Analysis of methacrylate multicomponent coatings used as traffic marking coatings shall be conducted according to a modification of U.S. EPA Method 24 (40 CFR 59, subpart D, Appendix A), incorporated by reference in subsection 8.5.11. This method has not been approved for methacrylate multicomponent coatings used for other purposes than as traffic marking coatings or for other classes of multicomponent coatings.

8.5 **Test Methods:** The following test methods are incorporated by reference herein, and shall be used to test coatings subject to the provisions of this rule:

8.5.1 **Flame Spread Index:** The flame spread index of a fire-retardant coating shall be determined by ASTM E-84~~-07~~18b, "Standard Test Method for Surface Burning Characteristics of Building Materials" (see section 4, Fire-Retardant Coating).

8.5.2 **Fire Resistance Rating:** The fire resistance rating of a fire-resistive coating shall be determined by ASTM E-119~~-07~~18ce1, "Standard Test Methods for Fire Tests of Building Construction and Materials" (see section 4, Fire-Resistive Coating).

8.5.3 **Gloss Determination:** The gloss of a coating shall be determined by ASTM D-523~~-89~~14 (~~1999~~2018), "Standard Test Method for Specular Gloss" (see section 4, Flat Coating~~,~~ and Nonflat Coating~~, and Nonflat - High Gloss Coating~~).

8.5.4 **Metal Content of Coatings:** The metallic content of a coating shall be determined by SCAQMD Method 318-95, "Determination of Weight Percent Elemental Metal in Coatings by X-Ray Diffraction," *SCAQMD Laboratory Methods of Analysis for Enforcement Samples* (see section 4, Aluminum Roof, Faux Finishing, and Metallic Pigmented Coating).

8.5.5 **Acid Content of Coatings:** The acid content of a coating shall be determined by ASTM D-1613~~-06~~17, "Standard Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products" (see section 4, Pre-treatment Wash Primer).

8.5.6 **Exempt Compounds--Siloxanes:** Exempt compounds that are cyclic, branched, or linear completely methylated siloxanes, shall be analyzed as exempt compounds for compliance with section 8 by BAAQMD Method 43, "Determination of Volatile Methylsiloxanes in Solvent-Based Coatings, Inks, and Related Materials," *BAAQMD Manual of Procedures*, Volume III, adopted 11/6/96 (see section 4, Volatile Organic Compound, and subsection 8.2).

8.5.7 **Exempt Compounds--Parachlorobenzotrifluoride (PCBTF)**: The exempt compound parachlorobenzotrifluoride, shall be analyzed as an exempt compound for compliance with section 8 by BAAQMD Method 41, "Determination of Volatile Organic Compounds in Solvent Based Coatings and Related Materials Containing Parachlorobenzotrifluoride," *BAAQMD Manual of Procedures*, Volume III, adopted 12/20/95 (see section 4, Volatile Organic Compound, and subsection 8.2).

8.5.8 **Exempt Compounds:** The content of compounds exempt under U.S. EPA Method 24 shall be analyzed by SCAQMD Method 303-91 (Revised ~~1993~~1996), "Determination of Exempt Compounds," *SCAQMD Laboratory Methods of Analysis for Enforcement Samples* (see section 4, Volatile Organic Compound, and subsection 8.2).

8.5.9 **VOC Content of Coatings:** The VOC content of a coating shall be determined by U.S. EPA Method 24 as it exists in appendix A of 40 *Code of Federal Regulations* (CFR) part 60, "Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings" (see subsection 8.2).

8.5.10 **Alternative VOC Content of Coatings:** The VOC content of coatings may be analyzed either by U.S. EPA Method 24 or SCAQMD Method 304-91 (Revised 1996), "Determination of Volatile Organic Compounds (VOC) in Various Materials," *SCAQMD Laboratory Methods of Analysis for Enforcement Samples* (see subsection 8.2).

8.5.11 **Methacrylate Traffic Marking Coatings:** The VOC content of methacrylate multicomponent coatings used as traffic marking coatings shall be analyzed by the procedures in 40 CFR part 59, subpart D, appendix A, "Determination of Volatile Matter Content of Methacrylate Multicomponent Coatings Used as Traffic Marking Coatings" (see subsection 8.4).

8.5.12 **Hydrostatic Pressure for Basement Specialty Coatings**: ASTM D7088-~~04~~17, "Standard Practice for Resistance to Hydrostatic Pressure for Coatings Used in Below Grade Applications Applied to

Masonry” (see section 4, Basement Specialty Coating).

~~8.5.13 **Gonioapparent Characteristics for Coatings**: ASTM E-284-07, “Standard Terminology of Appearance” (see section 4, Gonioapparent).~~

8.5.1~~4~~3 **Tub and Tile Refinish Coating Adhesion:** ASTM D~~-~~4585~~-99~~/4585M-18, “Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation” and ASTM D3359~~-02~~17, “Standard Test Methods for Measuring Adhesion by Tape Test” (see section 4, Tub and Tile Refinish Coating).

8.5.1~~5~~4 **Tub and Tile Refinish Coating Hardness**: ASTM D~~-~~3363-05 (2011)e2, “Standard Test Method for Film Hardness by Pencil Test” (see section 4, Tub and Tile Refinish Coating).

8.5.1~~6~~5 **Tub and Tile Refinish Coating Abrasion Resistance**: ASTM D~~-~~4060-~~07~~14, “Standard Test Methods for Abrasion Resistance of Organic Coatings by the Taber Abraser” (see section 4, Tub and Tile Refinish Coating).

8.5.1~~7~~6 **Tub and Tile Refinish Coating Water Resistance**: ASTM D~~-~~4585~~-99~~/4585M-18, “Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation” and ASTM D714-02~~e1~~ (2017), “Standard Test Method for Evaluating Degree of Blistering of Paints” (see section 4, Tub and Tile Refinish Coating).

8.5.1~~8~~7 **Waterproofing Membrane**: ASTM C836~~-06~~/836M-18, “Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course” (see section 4, Waterproofing Membrane).

8.5.1~~9~~8 **Mold and Mildew Growth for Basement Specialty Coatings**: ASTM D3273-~~00~~16, “Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber” and ASTM D3274-~~95~~09 (2017), “Standard Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by ~~Microbial (~~Fungal or Algal~~)~~ Growth or Soil and Dirt Accumulation” (see section 4, Basement Specialty Coating).

8.5.~~20~~19 **Reactive Penetrating Sealer Water Repellency:** ASTM C67-~~07~~/C67M-18, “Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile”; or ASTM C97~~-02~~/97M-18, “Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone”; or ASTM C140~~-06~~/140M-18a, “Standard Test

Methods for Sampling and Testing Concrete Masonry Units and Related Units” (see section 4, Reactive Penetrating Sealer).

8.5.2~~1~~0 **Reactive Penetrating Sealer Water Vapor Transmission:** ASTM E96/E96M-~~05~~16, “Standard Test Method for Water Vapor Transmission of Materials”; or ASTM D6490-99 (2014), “Standard Test Method for Water Vapor Transmission of Nonfilm Forming Treatments Used on Cementitious Panels” (see section 4, Reactive Penetrating Sealer).

8.5.2~~2~~1 **Reactive Penetrating Sealer - Chloride Screening Applications:** National Cooperative Highway Research Report 244 (1981), “Concrete Sealers for the Protection of Bridge Structures” (see section 4, Reactive Penetrating Sealer).

8.55.2~~3~~2 **Stone Consolidants:** ASTM E2167-01 (2008), “Standard Guide for Selection and Use of Stone Consolidants” (see section 4, Stone Consolidant).

8.5.23 **Building Envelope Coating Air Permeance of Building Materials:** ASTM E2178-13, “Standard Test Method for Air Permeance of Building Materials” (see section 4, Building Envelope Coating).

8.5.24 **Building Envelope Coating Water Penetration Testing:** ASTM E331-00 (2016), “Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference” (see section 4, Building Envelope Coating).

8.5.25 **Building Envelope Coating Water Vapor Transmission:** ASTM E96/96M-16, “Standard Test Methods for Water Vapor Transmission of Materials” (see section 4, Building Envelope Coating).

8.5.26 **Tile and Stone Sealers Absorption:** ASTM C373-18, “Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tile and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products”; or ASTM C97/97M-18, “Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone”; or ASTM C642-13, “Standard Test Method for Density, Absorption, and Voids in Hardened Concrete” (see section 4, Tile and Stone Sealers).

8.5.27 **Tile and Stone Sealers – Static Coefficient of Friction:** ANSI A137.1 (2012), “American National Standard of

Specifications for Ceramic Tile" (see section 4, Tile and Stone Sealers).

8.5.28 **Tile and Stone Sealers Water Vapor Transmissions:** ASTM E96/96M-16, "Standard Test Methods for Water Vapor Transmission of Materials" (see section 4, Tile and Stone Sealers).

8.5.29 **VOC Content of Coatings:** South Coast AQMD Method 313, "Determination of Volatile Organic Compounds (VOC) by Gas Chromatography/Mass Spectrometry/Flame Ionization Detection (GS/MS/FID)" (see section 8.2, VOC Content of Coatings).

8.5.30 **VOC Content of Coatings:** ASTM D6886-18, "Standard Test Method for Determination of the Weight Percent Individual Volatile Organic Compounds in Waterborne Air-Dry Coatings by Gas Chromatography" (see section 8.2, VOC Content of Coatings).

Table 1
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS

Limits are expressed as VOC Regulatory, thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.

Coating Category	~~Effective 1/1/2010~~Current Limit	Effective 1/1/20~~12~~22
Flat Coatings	50	
Nonflat Coatings	100	50
~~**Nonflat - High Gloss Coatings**~~	~~150~~	
Specialty Coatings		
Aluminum Roof Coatings	400	100
Basement Specialty Coatings	400	
Bituminous Roof Coatings	50	
Bituminous Roof Primers	350	
Bond Breakers	350	
Building Envelope Coatings		50
Concrete Curing Compounds	350	
Concrete/Masonry Sealers	100	
Driveway Sealers	50	
Dry Fog Coatings	150	50
Faux Finishing Coatings	350	
Fire Resistive Coatings	350	150
Floor Coatings	100	50
Form-Release Compounds	250	100
Graphic Arts Coatings (Sign Paints)	500	
High Temperature Coatings	420	
Industrial Maintenance Coatings	250	
Low Solids Coatings[a]	120	
Magnesite Cement Coatings	450	
Mastic Texture Coatings	100	
Metallic Pigmented Coatings	500	
Multi-Color Coatings	250	
Pre-Treatment Wash Primers	420	
Primers, Sealers, and Undercoaters	100	
Reactive Penetrating Sealers	350	

Table 1
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS

Limits are expressed as VOC Regulatory, thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.

Coating Category	~~Effective 1/1/2010~~Current Limit	Effective 1/1/20~~12~~22
Recycled Coatings	250	
Roof Coatings	50	
Rust Preventative Coatings	250	
Shellacs: • Clear • Opaque	 730 550	
Specialty Primers, Sealers, and Undercoaters	100	
Stains: • Exterior/Dual • Interior	 250 250	 100
Stone Consolidants	450	
Swimming Pool Coatings	340	
Tile and Stone Sealers	100	
Traffic Marking Coatings	100	
Tub and Tile Refinish Coatings	420	
Waterproofing Membranes	250	100
Wood Coatings	275	
Wood Preservatives	350	
Zinc-Rich Primers	340	

a. Limit is expressed as VOC Actual.

Table 2
VOC CONTENT LIMITS FOR COLORANTS

Limits are expressed as VOC Regulatory.

Colorant Added To	**Effective 1/1/2022**
Architectural Coatings, excluding Industrial Maintenance Coatings	50
Solvent-Based Industrial Maintenance Coatings	600
Waterborne Industrial Maintenance Coatings	50
Wood Coatings	600

APPENDIX B:

2007 SUGGESTED CONTROL MEASURE FOR ARCHITECTURAL COATINGS

California Air Resources Board (ARB) Suggested Control Measure for Architectural Coatings

1. APPLICABILITY

1.1 Except as provided in subsection 3, this rule is applicable to any person who:

1.1.1 Supplies, sells, or offers for sale any architectural coating for use within the District; or
1.1.2 Manufactures, blends, or repackages any architectural coating for use within the District; or
1.1.3 Applies or solicits the application of any architectural coating within the District.

2. SEVERABILITY

2.1 Each provision of this rule shall be deemed severable, and in the event that any provision of this rule is held to be invalid, the remainder of this rule shall continue in full force and effect.

3. EXEMPTIONS

3.1 This rule does not apply to:

3.1.1 Any architectural coating that is supplied, sold, offered for sale, or manufactured for use outside of the District or for shipment to other manufacturers for reformulation or repackaging.
3.1.2 Any aerosol coating product.

3.2 With the exception of section 7, this rule does not apply to any architectural coating that is sold in a container with a volume of one liter (1.057 quart) or less.

4. DEFINITIONS

4.1 Adhesive: Any chemical substance that is applied for the purpose of bonding two surfaces together other than by mechanical means.

4.2 Aerosol Coating Product: A pressurized coating product containing pigments or resins that dispenses product ingredients by means of a propellant, and is packaged in a disposable can for hand-held application, or for use in specialized equipment for ground traffic/marking applications.

4.3 Aluminum Roof Coating: A coating labeled and formulated exclusively for application to roofs and containing at least 84 grams of elemental aluminum pigment per liter of coating (at least 0.7 pounds per gallon). Pigment content shall be determined in accordance with SCAQMD Method 318-95, incorporated by reference in subsection 8.5.4.

4.4 Appurtenance: Any accessory to a stationary structure coated at the site of installation, whether installed or detached, including, but not limited to: bathroom and kitchen fixtures; cabinets; concrete forms; doors; elevators; fences; hand railings; heating equipment, air conditioning equipment, and other fixed mechanical equipment or stationary tools; lampposts; partitions; pipes and piping systems; rain gutters and downspouts; stairways, fixed ladders, catwalks, and fire escapes; and window screens.

4.5 Architectural Coating: A coating to be applied to stationary structures or their appurtenances at the site of installation, to portable buildings at the site of installation, to pavements, or to curbs. Coatings applied in shop applications or to non-stationary structures such as airplanes, ships, boats, railcars, and automobiles, and adhesives are not considered architectural coatings for the purposes of this rule.

4.6 Basement Specialty Coating: A clear or opaque coating that is labeled and formulated for application to concrete and masonry surfaces to provide a hydrostatic seal for basements and other below-grade surfaces. Basement Specialty Coatings must meet the following criteria:

4.6.1 Coating must be capable of withstanding at least 10 psi of hydrostatic pressure, as determined in accordance with ASTM D7088-04, which is incorporated by reference in subsection 8.5.12; and

4.6.2 Coating must be resistant to mold and mildew growth and must achieve a microbial growth rating of 8 or more, as determined in accordance with ASTM D3273-00 and ASTM D3274-95, incorporated by reference in subsection 8.5.19.

4.7 Bitumens: Black or brown materials, including, but not limited to, asphalt, tar, pitch, and asphaltite that are soluble in carbon disulfide, consist mainly of hydrocarbons, and are obtained from natural deposits or as residues from the distillation of crude petroleum or coal.

4.8 Bituminous Roof Coating: A coating which incorporates bitumens that is labeled and formulated exclusively for roofing.

4.9 Bituminous Roof Primer: A primer which incorporates bitumens that is labeled and formulated exclusively for roofing and intended for the purpose of preparing a weathered or aged surface or improving the adhesion of subsequent surfacing components.

4.10 Bond Breaker: A coating labeled and formulated for application between layers of concrete to prevent a freshly poured top layer of concrete from bonding to the layer over which it is poured.

4.11 Coating: A material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, and stains.

4.12 Colorant: A concentrated pigment dispersion in water, solvent, and/or binder that is added to an architectural coating after packaging in sale units to produce the desired color.

4.13 Concrete Curing Compound: A coating labeled and formulated for application to freshly poured concrete to perform one or more of the following functions:

4.13.1 Retard the evaporation of water; or
4.13.2 Harden or dustproof the surface of freshly poured concrete.

4.14 Concrete/Masonry Sealer: A clear or opaque coating that is labeled and formulated primarily for application to concrete and masonry surfaces to perform one or more of the following functions:

4.14.1 Prevent penetration of water; or
4.14.2 Provide resistance against abrasion, alkalis, acids, mildew, staining, or ultraviolet light; or
4.14.3 Harden or dustproof the surface of aged or cured concrete.

4.15 Driveway Sealer: A coating labeled and formulated for application to worn asphalt driveway surfaces to perform one or more of the following functions:

4.15.1 Fill cracks; or
4.15.2 Seal the surface to provide protection; or
4.15.3 Restore or preserve the appearance.

4.16 Dry Fog Coating: A coating labeled and formulated only for spray application such that overspray droplets dry before subsequent contact with incidental surfaces in the vicinity of the surface coating activity.

4.17 Exempt Compound: A compound identified as exempt under the definition of Volatile Organic Compound (VOC), subsection 4.63. Exempt compounds content of a coating shall be determined by U.S. EPA Method 24 or South Coast Air Quality Management District (SCAQMD) Method

303-91 (Revised 1993), incorporated by reference in subsection 8.5.8.

4.18 Faux Finishing Coating: A coating labeled and formulated to meet one or more of the following criteria:

4.18.1 A glaze or textured coating used to create artistic effects, including, but not limited to: dirt, suede, old age, smoke damage, and simulated marble and wood grain; or

4.18.2 A decorative coating used to create a metallic, iridescent, or pearlescent appearance that contains at least 48 grams of pearlescent mica pigment or other iridescent pigment per liter of coating as applied (at least 0.4 pounds per gallon); or

4.18.3 A decorative coating used to create a metallic appearance that contains less than 48 grams of elemental metallic pigment per liter of coating as applied (less than 0.4 pounds per gallon), when tested in accordance with SCAQMD Method 318-95, incorporated by reference in subsection 8.5.4; or

4.18.4 A decorative coating used to create a metallic appearance that contains greater than 48 grams of elemental metallic pigment per liter of coating as applied (greater than 0.4 pounds per gallon) and which requires a clear topcoat to prevent the degradation of the finish under normal use conditions. The metallic pigment content shall be determined in accordance with SCAQMD Method 318-95, incorporated by reference in subsection 8.5.4; or

4.18.5 A clear topcoat to seal and protect a Faux Finishing coating that meets the requirements of subsection 4.18.1, 4.18.2, 4.18.3, or 4.18.4. These clear topcoats must be sold and used solely as part of a Faux Finishing coating system, and must be labeled in accordance with subsection 6.1.4.

4.19 Fire-Resistive Coating: A coating labeled and formulated to protect structural integrity by increasing the fire endurance of interior or exterior steel and other structural materials. The Fire Resistive category includes sprayed fire resistive materials and intumescent fire resistive coatings that are used to bring structural materials into compliance with federal, state, and local building code requirements. Fire Resistive coatings shall be tested in accordance with ASTM Designation E 119-07, incorporated by reference in subsection 8.5.2. Fire Resistive coatings and testing agencies must be approved by building code officials.

4.20 Fire-Retardant Coating: A coating labeled and formulated to retard ignition and flame spread, that has been fire tested and rated by a testing agency approved by building code officials for use in bringing building and construction materials into compliance with federal, state and local building code requirements. The fire-retardant coating and the testing agency must be approved by building code officials. The fire-retardant coating shall be tested in accordance with ASTM Designation E 84-07, incorporated by reference in subsection 8.5.1.

Effective January 1, 2010, the Fire Retardant coating category is eliminated and coatings with fire retardant properties will be subject to the VOC limit of their primary category (e.g., Flat, Nonflat, etc.).

4.21 Flat Coating: A coating that is not defined under any other definition in this rule and that registers gloss less than 15 on an 85-degree meter or less than 5 on a 60-degree meter according to ASTM Designation D 523-89 (1999), incorporated by reference in subsection 8.5.3.

4.22 Floor Coating: An opaque coating that is labeled and formulated for application to flooring, including, but not limited to, decks, porches, steps, garage floors, and other horizontal surfaces which may be subject to foot traffic.

4.23 Form-Release Compound: A coating labeled and formulated for application to a concrete form to prevent the freshly poured concrete from bonding to the form. The form may consist of wood, metal, or some material other than concrete.

4.24 Gonioapparent: A change in appearance with a change in the angle of illumination or the angle of view, as defined according to ASTM E-284-06b, incorporated by reference in subsection 8.5.13.

4.25 Graphic Arts Coating or Sign Paint: A coating labeled and formulated for hand-application by artists using brush, airbrush, or roller techniques to indoor and outdoor signs (excluding structural components) and murals, including lettering enamels, poster colors, copy blockers, and bulletin enamels.

4.26 High-Temperature Coating: A high performance coating labeled and formulated for application to substrates exposed continuously or intermittently to temperatures above 204°C (400°F).

4.27 Industrial Maintenance Coating: A high performance architectural coating, including primers, sealers, undercoaters, intermediate coats, and topcoats formulated for application to substrates, including floors, exposed to one or more of the following extreme environmental conditions listed in subsections 4.27.1 through 4.27.5, and labeled as specified in subsection 6.1.5:

4.27.1 Immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposure of interior surfaces to moisture condensation; or

4.27.2 Acute or chronic exposure to corrosive, caustic or acidic agents, or to chemicals, chemical fumes, or chemical mixtures or solutions; or

4.27.3 Frequent exposure to temperatures above 121ºC (250ºF); or

4.27.4 Frequent heavy abrasion, including mechanical wear and frequent scrubbing with industrial solvents, cleansers, or scouring agents; or

4.27.5 Exterior exposure of metal structures and structural components.

4.28 Low Solids Coating: A coating containing 0.12 kilogram or less of solids per liter (1 pound or less of solids per gallon) of coating material as recommended for application by the manufacturer. The VOC content for Low Solids Coatings shall be calculated in accordance with subsection 4.64.

4.29 Magnesite Cement Coating: A coating labeled and formulated for application to magnesite cement decking to protect the magnesite cement substrate from erosion by water.

4.30 Manufacturer's Maximum Thinning Recommendation: The maximum recommendation for thinning that is indicated on the label or lid of the coating container.

4.31 Mastic Texture Coating: A coating labeled and formulated to cover holes and minor cracks and to conceal surface irregularities, and is applied in a single coat of at least 10 mils (at least 0.010 inch) dry film thickness.

4.32 Medium Density Fiberboard (MDF): A composite wood product, panel, molding, or other building material composed of cellulosic fibers (usually wood) made by dry forming and pressing of a resinated fiber mat.

4.33 Metallic: Similar to the appearance of a gonioapparent material, as defined herein, containing metal flakes.

4.34 Metallic Pigmented Coating: A coating that is labeled and formulated to provide a metallic appearance. Metallic Pigmented coatings must contain at least 48 grams of elemental metallic pigment (excluding zinc) per liter of coating as applied (at least 0.4 pounds per gallon), when tested in accordance with SCAQMD Method 318-95, incorporated by reference in subsection 8.5.4. The Metallic Pigmented Coating category does not include coatings applied to roofs or Zinc-Rich Primers.

4.35 Multi-Color Coating: A coating that is packaged in a single container and that is labeled and formulated to exhibit more than one color when applied in a single coat.

4.36 Nonflat Coating: A coating that is not defined under any other definition in this rule and that registers a gloss of 15 or greater on an 85-degree meter and 5 or greater on a 60-degree meter according to ASTM Designation D 523-89 (1999), incorporated by reference in subsection 8.5.3.

4.37 Nonflat - High Gloss Coating: A nonflat coating that registers a gloss of 70 or greater on a 60-degree meter according to ASTM Designation D 523-89 (1999), incorporated by reference in subsection 8.5.3. Nonflat – High Gloss coatings must be labeled in accordance with subsection 6.1.10.

4.38 Particleboard: A composite wood product panel, molding, or other building material composed of cellulosic material (usually wood) in the form of discrete particles, as distinguished from fibers, flakes, or strands, which are pressed together with resin.

4.39 Pearlescent: Exhibiting various colors depending on the angles of illumination and viewing, as observed in mother-of-pearl.

4.40 Plywood: A panel product consisting of layers of wood veneers or composite core pressed together with resin. Plywood includes panel products made by either hot or cold pressing (with resin) veneers to a platform.

4.41 Post-Consumer Coating: Finished coatings generated by a business or consumer that have served their intended end uses, and are recovered from or otherwise diverted from the waste stream for the purpose of recycling.

4.42 Pre-Treatment Wash Primer: A primer that contains a minimum of 0.5 percent acid, by weight, when tested in accordance with ASTM Designation D 1613-06, incorporated by reference in subsection 8.5.5, that is labeled and formulated for application directly to bare metal surfaces to provide corrosion resistance and to promote adhesion of subsequent topcoats.

4.43 Primer, Sealer, and Undercoater: A coating labeled and formulated for one or more of the following purposes:

4.43.1 To provide a firm bond between the substrate and the subsequent coatings; or
4.43.2 To prevent subsequent coatings from being absorbed by the substrate; or
4.43.3 To prevent harm to subsequent coatings by materials in the substrate; or
4.43.4 To provide a smooth surface for the subsequent application of coatings; or

4.43.5 To provide a clear finish coat to seal the substrate; or
4.43.6 To block materials from penetrating into or leaching out of a substrate.

4.44 Reactive Penetrating Sealer: A clear or pigmented coating that is labeled and formulated for application to above-grade concrete and masonry substrates to provide protection from water and waterborne contaminants, including, but not limited to, alkalis, acids, and salts. Reactive Penetrating Sealers must penetrate into concrete and masonry substrates and chemically react to form covalent bonds with naturally occurring minerals in the substrate. Reactive Penetrating Sealers line the pores of concrete and masonry substrates with a hydrophobic coating, but do not form a surface film. Reactive Penetrating Sealers must meet all of the following criteria:

4.44.1 The Reactive Penetrating Sealer must improve water repellency at least 80 percent after application on a concrete or masonry substrate. This performance must be verified on standardized test specimens, in accordance with one or more of the following standards, incorporated by reference in subsection 8.5.20: ASTM C67-07, or ASTM C97-02, or ASTM C140-06; and
4.44.2 The Reactive Penetrating Sealer must not reduce the water vapor transmission rate by more than 2 percent after application on a concrete or masonry substrate. This performance must be verified on standardized test specimens, in accordance with ASTM E96/E96M-05, incorporated by reference in subsection 8.5.21; and
4.44.3 Products labeled and formulated for vehicular traffic surface chloride screening applications must meet the performance criteria listed in the National Cooperative Highway Research Report 244 (1981), incorporated by reference in subsection 8.5.22.

Reactive Penetrating Sealers must be labeled in accordance with subsection 6.1.8.

4.45 Recycled Coating: An architectural coating formulated such that it contains a minimum of 50% by volume post-consumer coating, with a maximum of 50% by volume secondary industrial materials or virgin materials.

4.46 Residential: Areas where people reside or lodge, including, but not limited to, single and multiple family dwellings, condominiums, mobile homes, apartment complexes, motels, and hotels.

4.47 Roof Coating: A non-bituminous coating labeled and formulated for application to roofs for the primary purpose of preventing water penetration, reflecting ultraviolet light, or reflecting solar radiation.

4.48 Rust Preventative Coating: A coating formulated to prevent the corrosion of metal surfaces for one or more of the following applications:

4.48.1 Direct-to-metal coating; or
4.48.2 Coating intended for application over rusty, previously coated surfaces.

The Rust Preventative category does not include the following:

4.48.3 Coatings that are required to be applied as a topcoat over a primer; or
4.48.4 Coatings that are intended for use on wood or any other non-metallic surface.

Rust Preventative coatings are for metal substrates only and must be labeled as such, in accordance with the labeling requirements in subsection 6.1.6.

4.49 Secondary Industrial Materials: Products or by-products of the paint manufacturing process that are of known composition and have economic value but can no longer be used for their intended purpose.

4.50 Semitransparent Coating: A coating that contains binders and colored pigments and is formulated to change the color of the surface, but not conceal the grain pattern or texture.

4.51 Shellac: A clear or opaque coating formulated solely with the resinous secretions of the lac beetle (*Laciffer lacca*), and formulated to dry by evaporation without a chemical reaction.

4.52 Shop Application: Application of a coating to a product or a component of a product in or on the premises of a factory or a shop as part of a manufacturing, production, or repairing process (e.g., original equipment manufacturing coatings).

4.53 Solicit: To require for use or to specify, by written or oral contract.

4.54 Specialty Primer, Sealer, and Undercoater: A coating that is formulated for application to a substrate to block water-soluble stains resulting from: fire damage; smoke damage; or water damage.

Specialty Primers, Sealers, and Undercoaters must be labeled in accordance with subsection 6.1.7.

4.55 Stain: A semitransparent or opaque coating labeled and formulated to change the color of a surface but not conceal the grain pattern or texture.

4.56 Stone Consolidant: A coating that is labeled and formulated for application to stone substrates to repair historical structures that have been damaged by weathering or other decay mechanisms. Stone Consolidants must penetrate into stone substrates to create bonds between particles and consolidate deteriorated material. Stone Consolidants must be specified and used in accordance with ASTM E2167-01, incorporated by reference in subsection 8.5.23.

Stone Consolidants are for professional use only and must be labeled as such, in accordance with the labeling requirements in subsection 6.1.9.

4.57 Swimming Pool Coating: A coating labeled and formulated to coat the interior of swimming pools and to resist swimming pool chemicals. Swimming pool coatings include coatings used for swimming pool repair and maintenance.

4.58 Tint Base: An architectural coating to which colorant is added after packaging in sale units to produce a desired color.

4.59 Traffic Marking Coating: A coating labeled and formulated for marking and striping streets, highways, or other traffic surfaces, including, but not limited to, curbs, berms, driveways, parking lots, sidewalks, and airport runways.

4.60 Tub and Tile Refinish Coating: A clear or opaque coating that is labeled and formulated exclusively for refinishing the surface of a bathtub, shower, sink, or countertop. Tub and Tile Refinish coatings must meet all of the following criteria:

4.60.1 The coating must have a scratch hardness of 3H or harder and a gouge hardness of 4H or harder. This must be determined on bonderite 1000, in accordance with ASTM D3363-05, incorporated by reference in subsection 8.5.15.; and

4.60.2 The coating must have a weight loss of 20 milligrams or less after 1000 cycles. This must be determined with CS-17 wheels on bonderite 1000, in accordance with ASTM D4060-07, incorporated by reference in subsection 8.5.16; and

4.60.3 The coating must withstand 1000 hours or more of exposure with few or no #8 blisters. This must be determined on unscribed bonderite, in accordance with ASTM D4585-99, and ASTM D714-02e1, incorporated by reference in subsection 8.5.17; and

4.60.4 The coating must have an adhesion rating of 4B or better after 24 hours of recovery. This must be determined on unscribed bonderite, in accordance with ASTM D4585-99 and ASTM D3359-02, incorporated by reference in subsection 8.5.14.

4.61 Veneer: Thin sheets of wood peeled or sliced from logs for use in the manufacture of wood products such as plywood, laminated veneer lumber, or other products.

4.62 Virgin Materials: Materials that contain no post-consumer coatings or secondary industrial materials.

4.63 Volatile Organic Compound (VOC): Any volatile compound containing at least one atom of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and excluding the following:

4.63.1 methane;
methylene chloride (dichloromethane);
1,1,1-trichloroethane (methyl chloroform);
trichlorofluoromethane (CFC-11);
dichlorodifluoromethane (CFC-12);
1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113);
1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114);
chloropentafluoroethane (CFC-115);
chlorodifluoromethane (HCFC-22);
1,1,1-trifluoro-2,2-dichloroethane (HCFC-123);
2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124);
1,1-dichloro-1-fluoroethane (HCFC-141b);
1-chloro-1,1-difluoroethane (HCFC-142b);
trifluoromethane (HFC-23);
pentafluoroethane (HFC-125);
1,1,2,2-tetrafluoroethane (HFC-134);
1,1,1,2-tetrafluoroethane (HFC-134a);
1,1,1-trifluoroethane (HFC-143a);
1,1-difluoroethane (HFC-152a);
cyclic, branched, or linear completely methylated siloxanes;
the following classes of perfluorocarbons:
4.63.1.1 cyclic, branched, or linear, completely fluorinated alkanes;
4.63.1.2 cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
4.63.1.3 cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
4.63.1.4 sulfur-containing perfluorocarbons with no unsaturations and with the sulfur bonds only to carbon and fluorine; and

4.63.2 the following low-reactive organic compounds which have been exempted by the U.S. EPA:
acetone;
ethane;
parachlorobenzotrifluoride (1-chloro-4-trifluoromethyl benzene);

perchloroethylene; and
methyl acetate.

4.64 VOC Actual: VOC Actual is the weight of VOC per volume of coating and it is calculated with the following equation:

$$\text{VOC Actual} = \frac{(W_s - W_w - W_{ec})}{(V_m)}$$

Where:

VOC Actual	=	the grams of VOC per liter of coating (also known as “Material VOC”)
W_s	=	weight of volatiles, in grams
W_w	=	weight of water, in grams
W_{ec}	=	weight of exempt compounds, in grams
V_m	=	volume of coating, in liters

4.65 VOC Content: The weight of VOC per volume of coating. VOC Content is VOC Regulatory, as defined in subsection 4.66, for all coatings except those in the Low Solids category. For coatings in the Low Solids category, the VOC Content is VOC Actual, as defined in subsection 4.64. If the coating is a multi-component product, the VOC content is VOC Regulatory as mixed or catalyzed. If the coating contains silanes, siloxanes, or other ingredients that generate ethanol or other VOCs during the curing process, the VOC content must include the VOCs emitted during curing.

4.66 VOC Regulatory: VOC Regulatory is the weight of VOC per volume of coating, less the volume of water and exempt compounds. It is calculated with the following equation:

$$\text{VOC Regulatory} = \frac{(W_s - W_w - W_{ec})}{(V_m - V_w - V_{ec})}$$

Where:

VOC Regulatory	=	grams of VOC per liter of coating, less water and exempt compounds (also known as “Coating VOC”)
W_s	=	weight of volatiles, in grams
W_w	=	weight of water, in grams
W_{ec}	=	weight of exempt compounds, in grams
V_m	=	volume of coating, in liters
V_w	=	volume of water, in liters
V_{ec}	=	volume of exempt compounds, in liters

4.67 Waterproofing Membrane: A clear or opaque coating that is labeled and formulated for application to concrete and masonry surfaces to provide a seamless waterproofing membrane that prevents any penetration of liquid water into the substrate. Waterproofing Membranes are intended for the following waterproofing applications: below-grade surfaces, between concrete slabs, inside tunnels, inside concrete planters, and under flooring materials. Waterproofing Membranes must meet the following criteria:

4.67.1 Coating must be applied in a single coat of at least 25 mils (at least 0.025 inch) dry film thickness; and

4.67.2 Coatings must meet or exceed the requirements contained in ASTM C836-06, incorporated by reference in subsection 8.5.18.

The Waterproofing Membrane category does not include topcoats that are included in the Concrete/Masonry Sealer category (e.g., parking deck topcoats, pedestrian deck topcoats, etc.).

4.68 Wood Coatings: Coatings labeled and formulated for application to wood substrates only. The Wood Coatings category includes the following clear and semitransparent coatings: lacquers; varnishes; sanding sealers; penetrating oils; clear stains; wood conditioners used as undercoats; and wood sealers used as topcoats. The Wood Coatings category also includes the following opaque wood coatings: opaque lacquers; opaque sanding sealers; and opaque lacquer undercoaters. The Wood Coatings category does not include the following: clear sealers that are labeled and formulated for use on concrete/masonry surfaces; or coatings intended for substrates other than wood.

Wood Coatings must be labeled “For Wood Substrates Only”, in accordance with subsection 6.1.11.

4.69 Wood Preservative: A coating labeled and formulated to protect exposed wood from decay or insect attack, that is registered with both the U.S. EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (7 United States Code (U.S.C.) Section 136, *et seq.*) and with the California Department of Pesticide Regulation.

4.70 Wood Substrate: A substrate made of wood, particleboard, plywood, medium density fiberboard, rattan, wicker, bamboo, or composite products with exposed wood grain. Wood Products do not include items comprised of simulated wood.

4.71 Zinc-Rich Primer: A coating that meets all of the following specifications:

4.71.1 Coating contains at least 65 percent metallic zinc powder or zinc dust by weight of total solids; and

4.71.2 Coating is formulated for application to metal substrates to provide a firm bond between the substrate and subsequent applications of coatings; and

4.71.3 Coating is intended for professional use only and is labeled as such, in accordance with the labeling requirements in subsection 6.1.12.

5. STANDARDS

5.1 **VOC Content Limits:** Except as provided in subsections 5.2 or 5.3, no person shall:

5.1.1 manufacture, blend, or repackage for use within the district; or
5.1.2 supply, sell, or offer for sale for use within the district; or
5.1.3 solicit for application or apply within the district, any architectural coating with a VOC content in excess of the corresponding limit specified in Table 1, after the specified effective date in Table 1. Limits are expressed as VOC Regulatory, thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.

5.2 **Most Restrictive VOC Limit:** If a coating meets the definition in Section 4 for one or more specialty coating categories that are listed in Table 1, then that coating is not required to meet the VOC limits for Flat, Nonflat, or Nonflat – High Gloss coatings, but is required to meet the VOC limit for the applicable specialty coating listed in Table 1.

With the exception of the specialty coating categories specified in subsections 5.2.1 through 5.2.12, if a coating is recommended for use in more than one of the specialty coating categories listed in Table 1, the most restrictive (or lowest) VOC content limit shall apply. This requirement applies to: usage recommendations that appear anywhere on the coating container, anywhere on any label or sticker affixed to the container, or in any sales, advertising, or technical literature supplied by a manufacturer or anyone acting on their behalf.

5.2.1 Metallic pigmented coatings.
5.2.2 Shellacs.
5.2.3 Pretreatment wash primers.
5.2.4 Industrial maintenance coatings.
5.2.5 Low-solids coatings.
5.2.6 Wood preservatives.
5.2.7 High temperature coatings.
5.2.8 Bituminous roof primers.
5.2.9 Specialty primers, sealers, and undercoaters.
5.2.10 Aluminum roof coatings.

5.2.11 Zinc-rich primers.
5.2.12 Wood Coatings.

5.3 **Sell-Through of Coatings:** A coating manufactured prior to the effective date specified for that coating in Table 1 may be sold, supplied, or offered for sale for up to three years after the specified effective date. In addition, a coating manufactured before the effective date specified for that coating in Table 1 may be applied at any time, both before and after the specified effective date, so long as the coating complied with the standards in effect at the time the coating was manufactured. This subsection 5.3 does not apply to any coating that does not display the date or date-code required by subsection 6.1.1.

5.4 **Painting Practices:** All architectural coating containers used to apply the contents therein to a surface directly from the container by pouring, siphoning, brushing, rolling, padding, ragging or other means, shall be closed when not in use. These architectural coating containers include, but are not limited to, drums, buckets, cans, pails, trays or other application containers. Containers of any VOC-containing materials used for thinning and cleanup shall also be closed when not in use.

5.5 **Thinning:** No person who applies or solicits the application of any architectural coating shall apply a coating that is thinned to exceed the applicable VOC limit specified in Table 1.

5.6 **Coatings Not Listed in Table 1:** For any coating that does not meet any of the definitions for the specialty coatings categories listed in Table 1, the VOC content limit shall be determined by classifying the coating as a Flat, Nonflat, or Nonflat – High Gloss coating, based on its gloss, as defined in subsections 4.21, 4.36, and 4.37, and the corresponding Flat, Nonflat, or Nonflat – High Gloss VOC limit in Table 1 shall apply.

6. CONTAINER LABELING REQUIREMENTS

6.1 Each manufacturer of any architectural coating subject to this rule shall display the information listed in subsections 6.1.1 through 6.1.12 on the coating container (or label) in which the coating is sold or distributed.

6.1.1 **Date Code:** The date the coating was manufactured, or a date code representing the date, shall be indicated on the label, lid, or bottom of the container. If the manufacturer uses a date code for any coating, the manufacturer shall file an explanation of each code with the Executive Officer of the ARB.

6.1.2 **Thinning Recommendations:** A statement of the manufacturer's recommendation regarding thinning of the coating shall be indicated on the label or lid of the container. This requirement does not apply to the thinning of architectural coatings with water. If thinning of the coating prior to use is not necessary, the recommendation must specify that the coating is to be applied without thinning.

6.1.3 **VOC Content:** Each container of any coating subject to this rule shall display one of the following values in grams of VOC per liter of coating:

6.1.3.1 Maximum VOC Content as determined from all potential product formulations; or
6.1.3.2 VOC Content as determined from actual formulation data; or
6.1.3.3 VOC Content as determined using the test methods in subsection 8.2.

If the manufacturer does not recommend thinning, the container must display the VOC Content, as supplied. If the manufacturer recommends thinning, the container must display the VOC Content, including the maximum amount of thinning solvent recommended by the manufacturer. If the coating is a multi-component product, the container must display the VOC content as mixed or catalyzed. If the coating contains silanes, siloxanes, or other ingredients that generate ethanol or other VOCs during the curing process, the VOC content must include the VOCs emitted during curing. VOC Content shall be determined as defined in subsections 4.64, 4.65, and 4.66.

6.1.4 **Faux Finishing Coatings:** Effective January 1, 2010, the labels of all Faux Finishing coatings shall prominently display the statement "This product can only be sold or used as part of a Faux Finishing coating system".

6.1.5 **Industrial Maintenance Coatings:** Effective January 1, 2010, the labels of all Industrial Maintenance coatings shall prominently display the statement "For industrial use only" or "For professional use only".

6.1.6 **Rust Preventative Coatings:** The labels of all rust preventative coatings shall prominently display the statement "For Metal Substrates Only."

6.1.7 **Specialty Primers, Sealers, and Undercoaters:** Effective January 1, 2010, and until January 1, 2012, the labels of all specialty primers, sealers, and undercoaters shall prominently display one or more of the descriptions listed in subsection 6.1.7.1 through 6.1.7.3.

6.1.7.1 For fire-damaged substrates.
6.1.7.2 For smoke-damaged substrates.
6.1.7.3 For water-damaged substrates.

6.1.8 **Reactive Penetrating Sealers:** Effective January 1, 2010, the labels of all Reactive Penetrating Sealers shall prominently display the statement “Reactive Penetrating Sealer”.

6.1.9 **Stone Consolidants:** Effective January 1, 2010, the labels of all Stone Consolidants shall prominently display the statement “Stone Consolidant - For Professional Use Only”.

6.1.10 **Nonflat - High Gloss Coatings:** The labels of all Nonflat - High Gloss coatings shall prominently display the words “High Gloss.”

6.1.11 **Wood Coatings:** Effective January 1, 2010, the labels of all Wood Coatings shall prominently display the statement “For Wood Substrates Only”.

6.1.12 **Zinc Rich Primers**: Effective January 1, 2010, the labels of all Zinc Rich Primers shall prominently display the statement “For Professional Use Only”.

7. REPORTING REQUIREMENTS

7.1 **Sales Data:** A responsible official from each manufacturer shall upon request of the Executive Officer of the ARB, or his or her delegate, provide data concerning the distribution and sales of architectural coatings. The responsible official shall within 180 days provide information, including, but not limited to:

7.1.1 the name and mailing address of the manufacturer;
7.1.2 the name, address and telephone number of a contact person;
7.1.3 the name of the coating product as it appears on the label and the applicable coating category;
7.1.4 whether the product is marketed for interior or exterior use or both;
7.1.5 the number of gallons sold in California in containers greater than one liter (1.057 quart) and equal to or less than one liter (1.057 quart);
7.1.6 the VOC Actual content and VOC Regulatory content in grams per liter. If thinning is recommended, list the VOC Actual content and VOC Regulatory content after maximum recommended thinning. If containers less than one liter have a different VOC content than

containers greater than one liter, list separately. If the coating is a multi-component product, provide the VOC content as mixed or catalyzed;

7.1.7 the names and CAS numbers of the VOC constituents in the product;

7.1.8 the names and CAS numbers of any compounds in the product specifically exempted from the VOC definition, as listed in subsection 4.63.1 or 4.63.2;

7.1.9 whether the product is marketed as solventborne, waterborne, or 100% solids;

7.1.10 description of resin or binder in the product;

7.1.11 whether the coating is a single-component or multi-component product;

7.1.12 the density of the product in pounds per gallon;

7.1.13 the percent by weight of: solids, all volatile materials, water, and any compounds in the product specifically exempted from the VOC definition, as listed in subsection 4.63.1 or 4.63.2; and

7.1.14 the percent by volume of: solids, water, and any compounds in the product specifically exempted from the VOC definition, as listed in subsection 4.63.1 or 4.63.2.

7.2 All sales data listed in subsections 7.1.1 to 7.1.14 shall be maintained by the responsible official for a minimum of three years. Sales data submitted by the responsible official to the Executive Officer of the ARB may be claimed as confidential, and such information shall be handled in accordance with the procedures specified in Title 17, California Code of Regulations Sections 91000-91022.

8. COMPLIANCE PROVISIONS AND TEST METHODS

8.1 **Calculation of VOC Content:** For the purpose of determining compliance with the VOC content limits in Table 1, the VOC content of a coating shall be determined as defined in subsection 4.64, 4.65, or 4.66. The VOC content of a tint base shall be determined without colorant that is added after the tint base is manufactured. If the manufacturer does not recommend thinning, the VOC Content must be calculated for the product as supplied. If the manufacturer recommends thinning, the VOC Content must be calculated including the maximum amount of thinning solvent recommended by the manufacturer. If the coating is a multi-component product, the VOC content must be calculated as mixed or catalyzed. If the coating contains silanes, siloxanes, or other ingredients that generate ethanol or other VOCs during the curing process, the VOC content must include the VOCs emitted during curing.

8.2 **VOC Content of Coatings:** To determine the physical properties of a coating in order to perform the calculations in subsection 4.64 or 4.66, the reference method for VOC content is U.S. EPA Method 24, incorporated by reference in subsection 8.5.9, except as provided in subsections 8.3 and 8.4. An alternative method to determine the VOC content of coatings is SCAQMD Method 304-91 (Revised 1996), incorporated by reference in subsection 8.5.10. The exempt compounds content shall be determined by SCAQMD Method 303-91 (Revised 1993), BAAQMD Method 43 (Revised 1996), or BAAQMD Method 41 (Revised 1995), as applicable, incorporated by reference in subsections 8.5.8, 8.5.6, and 8.5.7, respectively. To determine the VOC content of a coating, the manufacturer may use U.S. EPA Method 24, or an alternative method as provided in subsection 8.3, formulation data, or any other reasonable means for predicting that the coating has been formulated as intended (e.g., quality assurance checks, record keeping). However, if there are any inconsistencies between the results of a Method 24 test and any other means for determining VOC content, the Method 24 test results will govern, except when an alternative method is approved as specified in subsection 8.3. The District Air Pollution Control Officer (APCO) may require the manufacturer to conduct a Method 24 analysis.

8.3 **Alternative Test Methods:** Other test methods demonstrated to provide results that are acceptable for purposes of determining compliance with subsection 8.2, after review and approved in writing by the staffs of the District, the ARB, and the U.S. EPA, may also be used.

8.4 **Methacrylate Traffic Marking Coatings:** Analysis of methacrylate multicomponent coatings used as traffic marking coatings shall be conducted according to a modification of U.S. EPA Method 24 (40 CFR 59, subpart D, Appendix A), incorporated by reference in subsection 8.5.11. This method has not been approved for methacrylate multicomponent coatings used for other purposes than as traffic marking coatings or for other classes of multicomponent coatings.

8.5 **Test Methods:** The following test methods are incorporated by reference herein, and shall be used to test coatings subject to the provisions of this rule:

8.5.1 **Flame Spread Index:** The flame spread index of a fire-retardant coating shall be determined by ASTM E 84-07, “Standard Test Method for Surface Burning Characteristics of Building Materials” (see section 4, Fire-Retardant Coating).

8.5.2 **Fire Resistance Rating:** The fire resistance rating of a fire-resistive coating shall be determined by ASTM E 119-07, “Standard Test Methods for Fire Tests of Building Construction Materials” (see section 4, Fire-Resistive Coating).

8.5.3 **Gloss Determination:** The gloss of a coating shall be determined by ASTM D 523-89 (1999), "Standard Test Method for Specular Gloss" (see section 4, Flat Coating, Nonflat Coating, and Nonflat - High Gloss Coating).

8.5.4 **Metal Content of Coatings:** The metallic content of a coating shall be determined by SCAQMD Method 318-95, "Determination of Weight Percent Elemental Metal in Coatings by X-Ray Diffraction," *SCAQMD Laboratory Methods of Analysis for Enforcement Samples* (see section 4, Aluminum Roof, Faux Finishing, and Metallic Pigmented Coating).

8.5.5 **Acid Content of Coatings:** The acid content of a coating shall be determined by ASTM D 1613-06, "Standard Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products" (see section 4, Pre-treatment Wash Primer).

8.5.6 **Exempt Compounds--Siloxanes:** Exempt compounds that are cyclic, branched, or linear completely methylated siloxanes, shall be analyzed as exempt compounds for compliance with section 8 by BAAQMD Method 43, "Determination of Volatile Methylsiloxanes in Solvent-Based Coatings, Inks, and Related Materials," *BAAQMD Manual of Procedures*, Volume III, adopted 11/6/96 (see section 4, Volatile Organic Compound, and subsection 8.2).

8.5.7 **Exempt Compounds--Parachlorobenzotrifluoride (PCBTF)**: The exempt compound parachlorobenzotrifluoride, shall be analyzed as an exempt compound for compliance with section 8 by BAAQMD Method 41, "Determination of Volatile Organic Compounds in Solvent Based Coatings and Related Materials Containing Parachlorobenzotrifluoride," *BAAQMD Manual of Procedures*, Volume III, adopted 12/20/95 (see section 4, Volatile Organic Compound, and subsection 8.2).

8.5.8 **Exempt Compounds:** The content of compounds exempt under U.S. EPA Method 24 shall be analyzed by SCAQMD Method 303-91 (Revised 1993), "Determination of Exempt Compounds," *SCAQMD Laboratory Methods of Analysis for Enforcement Samples* (see section 4, Volatile Organic Compound, and subsection 8.2).

8.5.9 **VOC Content of Coatings:** The VOC content of a coating shall be determined by U.S. EPA Method 24 as it exists in appendix A of 40 *Code of Federal Regulations* (CFR) part 60, "Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings" (see subsection 8.2).

8.5.10 **Alternative VOC Content of Coatings:** The VOC content of coatings may be analyzed either by U.S. EPA Method 24 or SCAQMD Method 304-91 (Revised 1996), "Determination of Volatile Organic Compounds (VOC) in Various Materials," *SCAQMD Laboratory Methods of Analysis for Enforcement Samples* (see subsection 8.2).

8.5.11 **Methacrylate Traffic Marking Coatings:** The VOC content of methacrylate multicomponent coatings used as traffic marking coatings shall be analyzed by the procedures in 40 CFR part 59, subpart D, appendix A, "Determination of Volatile Matter Content of Methacrylate Multicomponent Coatings Used as Traffic Marking Coatings" (see subsection 8.4).

8.5.12 **Hydrostatic Pressure for Basement Specialty Coatings**: ASTM D7088-04, "Standard Practice for Resistance to Hydrostatic Pressure for Coatings Used in Below Grade Applications Applied to Masonry" (see section 4, Basement Specialty Coating).

8.5.13 **Gonioapparent Characteristics for Coatings**: ASTM E-284-07, "Standard Terminology of Appearance" (see section 4, Gonioapparent).

8.5.14 **Tub and Tile Refinish Coating Adhesion:** ASTM D 4585-99, "Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation" and ASTM D3359-02, "Standard Test Methods for Measuring Adhesion by Tape Test" (see section 4, Tub and Tile Refinish Coating).

8.5.15 **Tub and Tile Refinish Coating Hardness**: ASTM D 3363-05, "Standard Test Method for Film Hardness by Pencil Test" (see section 4, Tub and Tile Refinish Coating).

8.5.16 **Tub and Tile Refinish Coating Abrasion Resistance**: ASTM D 4060-07, "Standard Test Methods for Abrasion Resistance of Organic Coatings by the Taber Abraser" (see section 4, Tub and Tile Refinish Coating).

8.5.17 **Tub and Tile Refinish Coating Water Resistance**: ASTM D 4585-99, "Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation" and ASTM D714-02e1, "Standard Test Method for Evaluating Degree of Blistering of Paints" (see section 4, Tub and Tile Refinish Coating).

8.5.18 **Waterproofing Membrane**: ASTM C836-06, "Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course" (see section 4, Waterproofing Membrane).

8.5.19 **Mold and Mildew Growth for Basement Specialty Coatings**: ASTM D3273-00, "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber" and ASTM D3274-95, "Standard Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Microbial (Fungal or Algal) Growth or Soil and Dirt Accumulation" (see section 4, Basement Specialty Coating).

8.5.20 **Reactive Penetrating Sealer Water Repellency:** ASTM C67-07, "Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile"; or ASTM C97-02, "Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone"; or ASTM C140-06, "Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units" (see section 4, Reactive Penetrating Sealer).

8.5.21 **Reactive Penetrating Sealer Water Vapor Transmission:** ASTM E96/E96M-05, "Standard Test Method for Water Vapor Transmission of Materials" (see section 4, Reactive Penetrating Sealer).

8.5.22 **Reactive Penetrating Sealer - Chloride Screening Applications:** National Cooperative Highway Research Report 244 (1981), "Concrete Sealers for the Protection of Bridge Structures" (see section 4, Reactive Penetrating Sealer).

8.5.23 **Stone Consolidants:** ASTM E2167-01, "Standard Guide for Selection and Use of Stone Consolidants" (see section 4, Stone Consolidant).

Table 1
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS

Limits are expressed as VOC Regulatory, thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.

Coating Category	Effective 1/1/2010	Effective 1/1/2012
Flat Coatings	50	
Nonflat Coatings	100	
Nonflat - High Gloss Coatings	150	
Specialty Coatings		
Aluminum Roof Coatings	400	
Basement Specialty Coatings	400	
Bituminous Roof Coatings	50	
Bituminous Roof Primers	350	
Bond Breakers	350	
Concrete Curing Compounds	350	
Concrete/Masonry Sealers	100	
Driveway Sealers	50	
Dry Fog Coatings	150	
Faux Finishing Coatings	350	
Fire Resistive Coatings	350	
Floor Coatings	100	
Form-Release Compounds	250	
Graphic Arts Coatings (Sign Paints)	500	
High Temperature Coatings	420	
Industrial Maintenance Coatings	250	
Low Solids Coatings[a]	120	
Magnesite Cement Coatings	450	
Mastic Texture Coatings	100	
Metallic Pigmented Coatings	500	
Multi-Color Coatings	250	
Pre-Treatment Wash Primers	420	
Primers, Sealers, and Undercoaters	100	
Reactive Penetrating Sealers	350	
Recycled Coatings	250	

Table 1
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS

Limits are expressed as VOC Regulatory, thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.

Coating Category	Effective 1/1/2010	Effective 1/1/2012
Roof Coatings	50	
Rust Preventative Coatings		250
Shellacs: • Clear • Opaque	 730 550	
Specialty Primers, Sealers, and Undercoaters		100
Stains	250	
Stone Consolidants	450	
Swimming Pool Coatings	340	
Traffic Marking Coatings	100	
Tub and Tile Refinish Coatings	420	
Waterproofing Membranes	250	
Wood Coatings	275	
Wood Preservatives	350	
Zinc-Rich Primers	340	

a. Limit is expressed as VOC Actual.

APPENDIX C:

AMBIENT AIR QUALITY STANDARDS AND NONATTAINMENT AREAS

AIR QUALITY STANDARDS

1. Current Ozone and Particulate Matter Standards

To protect California's population from the harmful effects of ozone and PM, federal and State air quality standards for these contaminants have been established. These standards are shown in Table C-1.

CARB adopted new PM standards in June of 2002, responding to requirements of the Children's Environmental Health Protection Act (Senate Bill 25, Escutia 1999). This Act requires the evaluation of all health-based ambient air quality standards to determine if the standards adequately protect human health, particularly that of infants and children. The subsequent review of the PM standards resulted in the recommendation of more health-protective ambient air quality standards for PM_{10} and a new standard for $PM_{2.5}$. The new PM standards became effective in 2003.

For ozone, CARB approved a new eight-hour standard of 0.070 ppm and retained the one-hour ozone standard of 0.09 ppm in April 2005. These updated standards resulted from an extensive review of the scientific literature, which indicated that significant harmful health effects could occur among both adults and children if exposed to levels above these standards.

Table C-1
Ambient Air Quality Standards for Ozone, PM_{10}, and $PM_{2.5}$

Pollutant	Averaging Time	State Standard	National Primary Standard	National Secondary Standard
Ozone	1 Hour	0.09 ppm ($180\ \mu g/m^3$)	----	----
	8 Hour	0.070 ppm ($137\ \mu g/m^3$)	0.07 ppm ($137\ \mu g/m^3$)	Same as Primary Standard
PM_{10}	24 Hour	$50\ \mu g/m^3$	$150\ \mu g/m^3$	Same as Primary Standard
	Annual Arithmetic Mean	$20\ \mu g/m^3$	----	
$PM_{2.5}$	24 Hour	----	$35\ \mu g/m^3$	Same as Primary Standard
	Annual Arithmetic Mean	$12\ \mu g/m^3$	$12\ \mu g/m^3$	$15\ \mu g/m^3$

2. California Clean Air Act

The California Clean Air Act (CCAA) was enacted in 1988 and has the fundamental goal that all areas of California are to attain the State ambient air quality standard for ozone by the earliest practicable date. The State and federal eight-hour ozone standard is equivalent. As specified in the CCAA, CARB has designated areas of California to be in "attainment" or "nonattainment" for the State ozone standard. Local districts that are nonattainment for the State ozone standard are required by the CCAA to prepare plans, which must be designed to achieve and maintain the standard by the earliest practicable date. In developing their plans each district determines which measures are necessary to include, as well as the specific details of each included measure.

3. Status of Air Quality – State Standards

State law indicates that the California Legislature intends progress toward clean air to be made as quickly as possible. The CCAA specifically declares that it is the intent of the Legislature that the state air quality standards be achieved "...by the earliest practicable date..." (Health and Safety Code, sections 40910 and 40913(a)). Unhealthy levels of ozone and PM are not limited to urban areas, but can be found in nearly every county in California as seen in Figures C-1, C-2, and C-3. These figures highlight areas that exceed the State ambient air quality standards (i.e. "nonattainment areas").

The 35 districts in California have air quality planning responsibilities. Of the 35 districts, 30 are nonattainment for the State 1-hour/8-hour ozone standard, 31 are nonattainment for the State 24-hour/annual PM10 standard, and 11 are nonattainment for the State annual PM2.5 standard. For the State ozone and PM_{10} standards, a district is designated "nonattainment" for ozone if it does not meet either the 1-hour or 8-hour standard and "nonattainment" for PM_{10} if it does not meet either the 24-hour or annual standard. Tables C-1, C-2, and C-3 lists the air basins that have been designated "nonattainment" because they exceed State standards for ozone or PM. Of the 30 ozone nonattainment districts, all but eight already have an architectural coatings rule. These eight districts are the Great Basin Unified, Amador County, Calaveras County, Mariposa County, Tuolumne County, Northern Sierra, Siskiyou County, and Glenn County Districts. Some of these districts are impacted by upwind districts and will have no requirements to adopt an architectural coating rule based on the proposed SCM. Of the 31 PM10 nonattainment districts, all but ten have an architectural rule. These ten districts include the above eight ozone nonattainment districts with the exception of Amador County and Siskiyou County and the addition of the North Coast Unified, Mendocino County, Modoc County, and Lassen County Districts. The only PM2.5 nonattainment district without an architectural rule is the Northern Sierra AQMD.

Area Designations for the State Ambient Air Quality Standards

The following maps and tables show the area designations for each pollutant with a State standard set forth in the California Code of Regulations, title 17, section 60200. Each area is identified as attainment, nonattainment, nonattainment-transitional, or unclassified for each pollutant, as shown below:

Attainment	A
Nonattainment	N
Nonattainment-Transitional	NA-T
Unclassified	U

In general, CARB designates areas by air basin for pollutants with a regional impact by county for pollutants with a more local impact. However, when there are areas within an air basin or county with distinctly different air quality deriving from sources and conditions not affecting the entire air basin or county, CARB may designate a small area. Generally, when boundaries of the designated area differ from the air basin or county boundaries, the description of the specific area is referenced at the bottom of the summary table.

FIGURE C-1

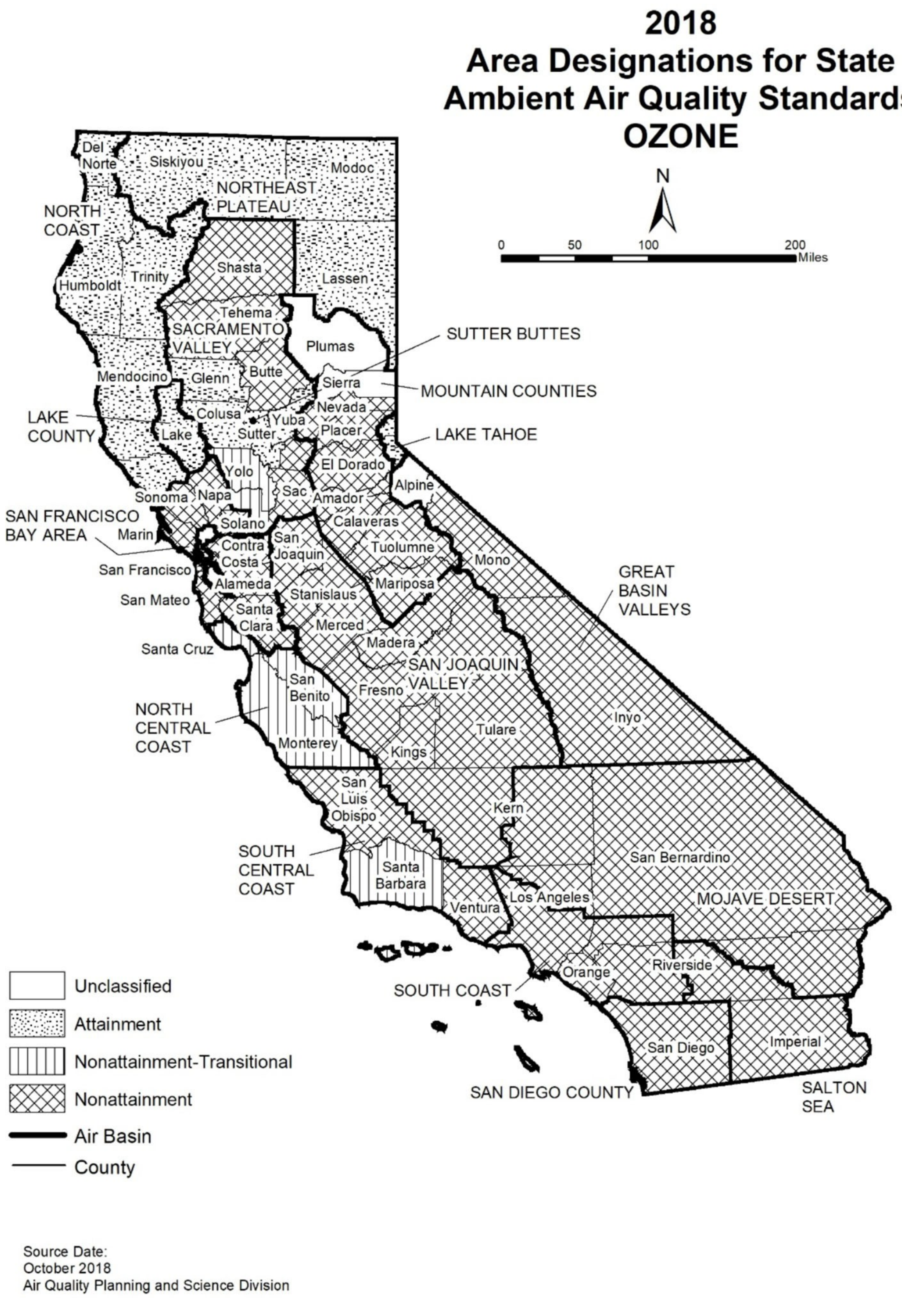


Table C-1

California Ambient Air Quality Standards
Area Designations for Ozone (1)

	N	NA-T	U	A		N	NA-T	U	A
GREAT BASIN VALLEYS AIR BASIN					NORTHEAST PLATEAU AIR BASIN				X
Alpine County			X		SACRAMENTO VALLEY AIR BASIN				
Inyo County	X				Colusa and Glenn Counties				X
Mono County	X				Sutter/Yuba Counties				
LAKE COUNTY AIR BASIN				X	Sutter Buttes	X			
LAKE TAHOE AIR BASIN				X	Remainder of Sutter County				X
MOJAVE DESERT AIR BASIN	X				Yuba County				X
MOUNTAIN COUNTIES AIR BASIN					Yolo/Solano Counties		X		
Amador County	X				Remainder of Air Basin	X			
Calaveras County	X				SALTON SEA AIR BASIN	X			
El Dorado County (portion)	X				SAN DIEGO AIR BASIN	X			
Mariposa County	X				SAN FRANCISCO BAY AREA AIR BASIN	X			
Nevada County	X				SAN JOAQUIN VALLEY AIR BASIN	X			
Placer County (portion)	X				SOUTH CENTRAL COAST AIR BASIN				
Plumas County			X		San Luis Obispo County	X			
Sierra County			X		Santa Barbara County		X		
Tuolumne County	X				Ventura County	X			
NORTH CENTRAL COAST AIR BASIN		X			SOUTH COAST AIR BASIN	X			
NORTH COAST AIR BASIN				X					

(1) AB 3048 (Olberg) and AB 2525 (Miller) signed into law in 1996, made changes to Health and Safety Code, section 40925.5. One of the changes allows nonattainment districts to become nonattainment-transitional for ozone by operation of law.

Figure C-2


2018
Area Designations for State
Ambient Air Quality Standards
PM10
Del Norte
Siskiyou
Modoc
NORTHEAST PLATEAU
NORTH COAST
Trinity
Shasta
Lassen
Humboldt
Tehema
SACRAMENTO VALLEY
Plumas
Mendocino
Glenn
Butte
Sierra
MOUNTAIN COUNTIES
LAKE COUNTY
Colusa
Yuba
Nevada
Placer
LAKE TAHOE
Lake
Sutter
Yolo
El Dorado
Sonoma
Napa
Sac
Alpine
Yosemite NP
SAN FRANCISCO BAY AREA
Solano
Amador
Calaveras
Marin
Contra Costa
San Joaquin
Tuolumne
Mono
San Francisco
Alameda
Stanislaus
Mariposa
GREAT BASIN VALLEYS
San Mateo
Santa Clara
Merced
Madera
Santa Cruz
SAN JOAQUIN VALLEY
San Benito
Fresno
Inyo
NORTH CENTRAL COAST
Monterey
Tulare
Kings
San Luis Obispo
Kern
MOJAVE DESERT
Santa Barbara
Los Angeles
San Bernardino
SOUTH CENTRAL COAST
Ventura
Riverside
Orange
SOUTH COAST
San Diego
Imperial
SAN DIEGO COUNTY
SALTON SEA
N
0
50
100
200
Miles
Unclassified
Attainment
Nonattainment
Air Basin
County
Source Date:
October 2018
Air Quality Planning and Science Division

Table C-2

California Ambient Air Quality Standards
Area Designation for Suspended Particulate Matter (PM_{10})

	N	U	A		N	U	A
GREAT BASIN VALLEYS AIR BASIN	X			NORTH CENTRAL COAST AIR BASIN	X		
LAKE COUNTY AIR BASIN			X	NORTH COAST AIR BASIN			
LAKE TAHOE AIR BASIN	X			Del Norte, Sonoma (portion) and Trinity Counties			X
MOJAVE DESERT AIR BASIN	X			Remainder of Air Basin	X		
MOUNTAIN COUNTIES AIR BASIN				NORTHEAST PLATEAU AIR BASIN			
Amador County		X		Siskiyou County			X
Calaveras County	X			Remainder of Air Basin		X	
El Dorado County (portion)	X			SACRAMENTO VALLEY AIR BASIN			
Mariposa County				Shasta County			X
- Yosemite National Park	X			Remainder of Air Basin	X		
- Remainder of County		X		SALTON SEA AIR BASIN	X		
Nevada County	X			SAN DIEGO AIR BASIN	X		
Placer County (portion)	X			SAN FRANCISCO BAY AREA AIR BASIN	X		
Plumas County	X			SAN JOAQUIN VALLEY AIR BASIN	X		
Sierra County	X			SOUTH CENTRAL COAST AIR BASIN	X		
Tuolumne County		X		SOUTH COAST AIR BASIN	X		

Figure C-3

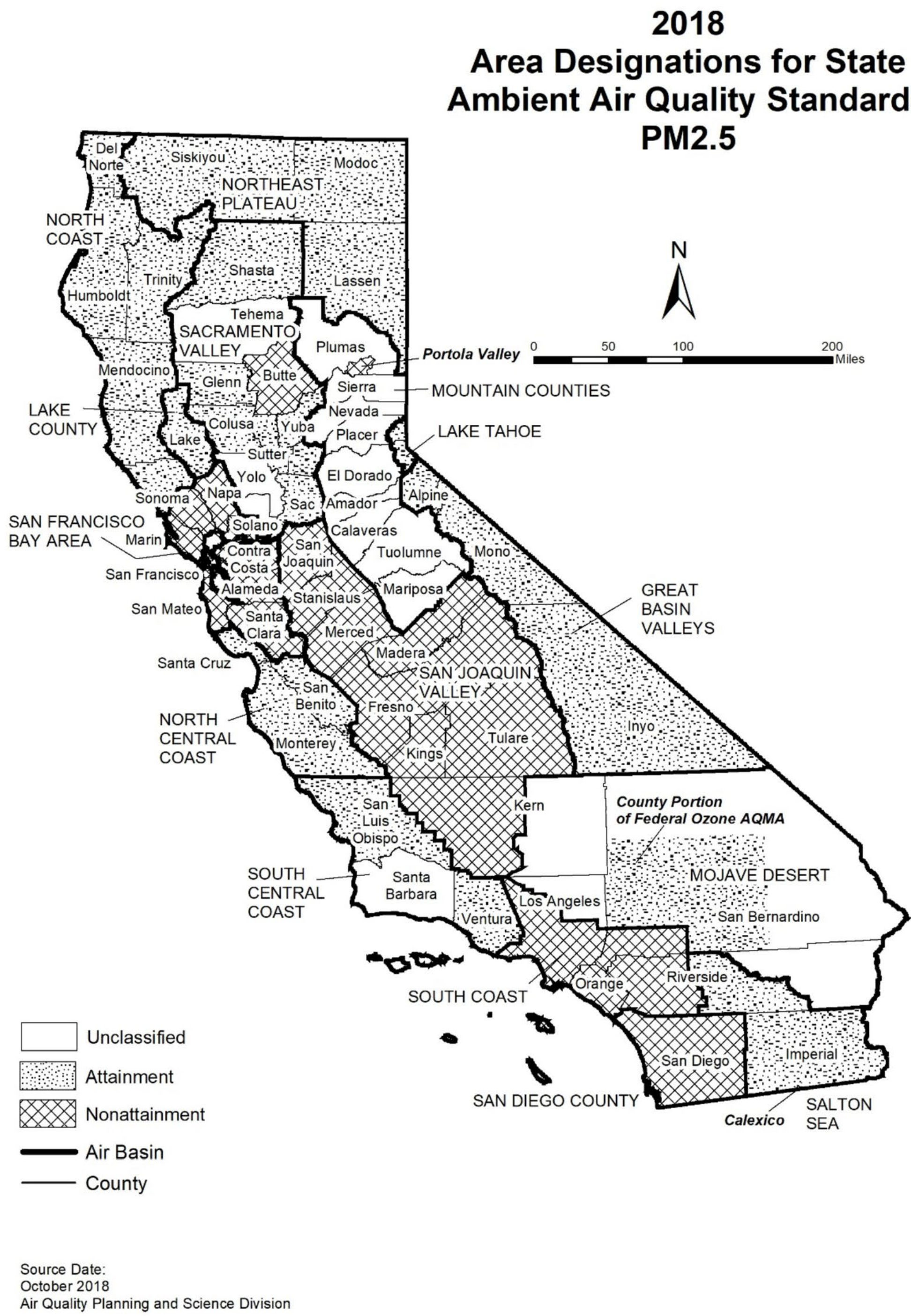

2018
Area Designations for State
Ambient Air Quality Standards
PM2.5
Del Norte
Siskiyou
Modoc
NORTHEAST PLATEAU
NORTH COAST
Shasta
Lassen
Trinity
Humboldt
Tehema
SACRAMENTO VALLEY
Plumas
Portola Valley
Butte
Mendocino
Glenn
Sierra
MOUNTAIN COUNTIES
LAKE COUNTY
Colusa
Nevada
Yuba
Lake
Placer
LAKE TAHOE
Sutter
Yolo
El Dorado
Sonoma
Napa
Alpine
Sac
Amador
SAN FRANCISCO BAY AREA
Marin
Solano
Calaveras
San Joaquin
Tuolumne
Mono
Contra Costa
San Francisco
Alameda
Mariposa
Stanislaus
GREAT BASIN VALLEYS
San Mateo
Santa Clara
Merced
Madera
Santa Cruz
SAN JOAQUIN VALLEY
San Benito
Fresno
NORTH CENTRAL COAST
Inyo
Monterey
Tulare
Kings
Kern
County Portion of Federal Ozone AQMA
San Luis Obispo
MOJAVE DESERT
SOUTH CENTRAL COAST
Santa Barbara
Los Angeles
Ventura
San Bernardino
Riverside
Orange
SOUTH COAST
Imperial
San Diego
SAN DIEGO COUNTY
SALTON SEA
Calexico
N
0
50
100
200
Miles
Unclassified
Attainment
Nonattainment
Air Basin
County
Source Date:
October 2018
Air Quality Planning and Science Division

Table C-3

California Ambient Air Quality Standards
Area Designations for Fine Particulate Matter ($PM_{2.5}$)

	N	U	A		N	U	A
GREAT BASIN VALLEYS AIR BASIN			X	SALTON SEA AIR BASIN			
LAKE COUNTY AIR BASIN			X	Imperial County			
LAKE TAHOE AIR BASIN			X	- City of Calexico (3)	X		
MOJAVE DESERT AIR BASIN				Remainder of Air Basin			X
San Bernardino County				SAN DIEGO AIR BASIN	X		
- County portion of federal Southeast Desert Modified AQMA for Ozone (1)			X	SAN FRANCISCO BAY AREA AIR BASIN	X		
				SAN JOAQUIN VALLEY AIR BASIN	X		
Remainder of Air Basin		X		SOUTH CENTRAL COAST AIR BASIN			
MOUNTAIN COUNTIES AIR BASIN				San Luis Obispo County			X
Plumas County				Santa Barbara County		X	
- Portola Valley (2)	X			Ventura County			X
Remainder of Air Basin		X		SOUTH COAST AIR BASIN	X		
NORTH CENTRAL COAST AIR BASIN			X				
NORTH COAST AIR BASIN			X				
NORTHEAST PLATEAU AIR BASIN			X				
SACRAMENTO VALLEY AIR BASIN							
Butte County	X						
Colusa County			X				
Glenn County			X				
Placer County (portion)			X				
Sacramento County			X				
Shasta County			X				
Sutter and Yuba Counties			X				
Remainder of Air Basin		X					

(1) California Code of Regulations, title 17, section 60200(b)
(2) California Code of Regulations, title 17, section 60200(c)
(3) California Code of Regulations, title 17, section 60200(a)

In many of the nonattainment air basins, substantial additional emission reductions will be necessary in order to achieve and maintain the State ozone standard. The SCM will be available for adoption by the above districts in order to reduce VOC emissions and attain or maintain the State ozone and PM standards.

4. Status of Air Quality – Federal Standards

Federal law also indicates that the U.S. Congress intends progress toward clean air to be made as quickly as possible. The federal Clean Air Act declares that the federal air quality standards are to be achieved “...as expeditiously as practicable...” (Federal Clean Air Act, sections 172(a)(2), 181(a), and 188(c)).

Thirty-five counties or portions of counties are designated as nonattainment for the federal 8-Hour Ozone standard with attainment dates ranging from 2007 to 2021. Table C-1 lists the air basins that have been designated "nonattainment" because they exceed federal standards for ozone. The San Joaquin Valley and South Coast air basins are expected to have until 2023 to attain the federal standard, by invoking the "bump-up" provision in the federal Clean Air Act.

For particulate matter, the South Coast Air Basin and the San Joaquin Valley Air Basin are the only two areas in the State that exceed the annual federal PM 2.5 standard. These areas are required by federal law to develop SIPs describing how they will attain the standards by 2015. The U.S. EPA further requires that all necessary emission reductions be achieved one calendar year sooner – by 2014 – in recognition of the annual average form of the standard. The Owens Valley is the only federal PM10 nonattainment area. It did not meet its December 31, 2006 attainment date and must submit plan revisions by December 31, 2007 detailing how it will reach attainment.

Area Designations for the National Ambient Air Quality Standards

The following maps and tables show the area designations for each pollutant with a national ambient air quality standard. Additional information about the federal area designations is available on the U.S. EPA website:

https://www.epa.gov/green-book

Over the last several years, U.S. EPA has been reviewing the levels of the various national standards. The agency has already promulgated new standard levels for some pollutants and is considering revising the levels of others. Information about the status of these reviews is available on the U.S. EPA website:

https://www.epa.gov/criteria-air-pollutants

<u>Designation Categories</u>

Ozone and Fine Suspended Particulate Matter ($PM_{2.5}$). The U.S. EPA uses two categories to designate areas with respect to these standards

- Nonattainment
- Unclassifiable/Attainment

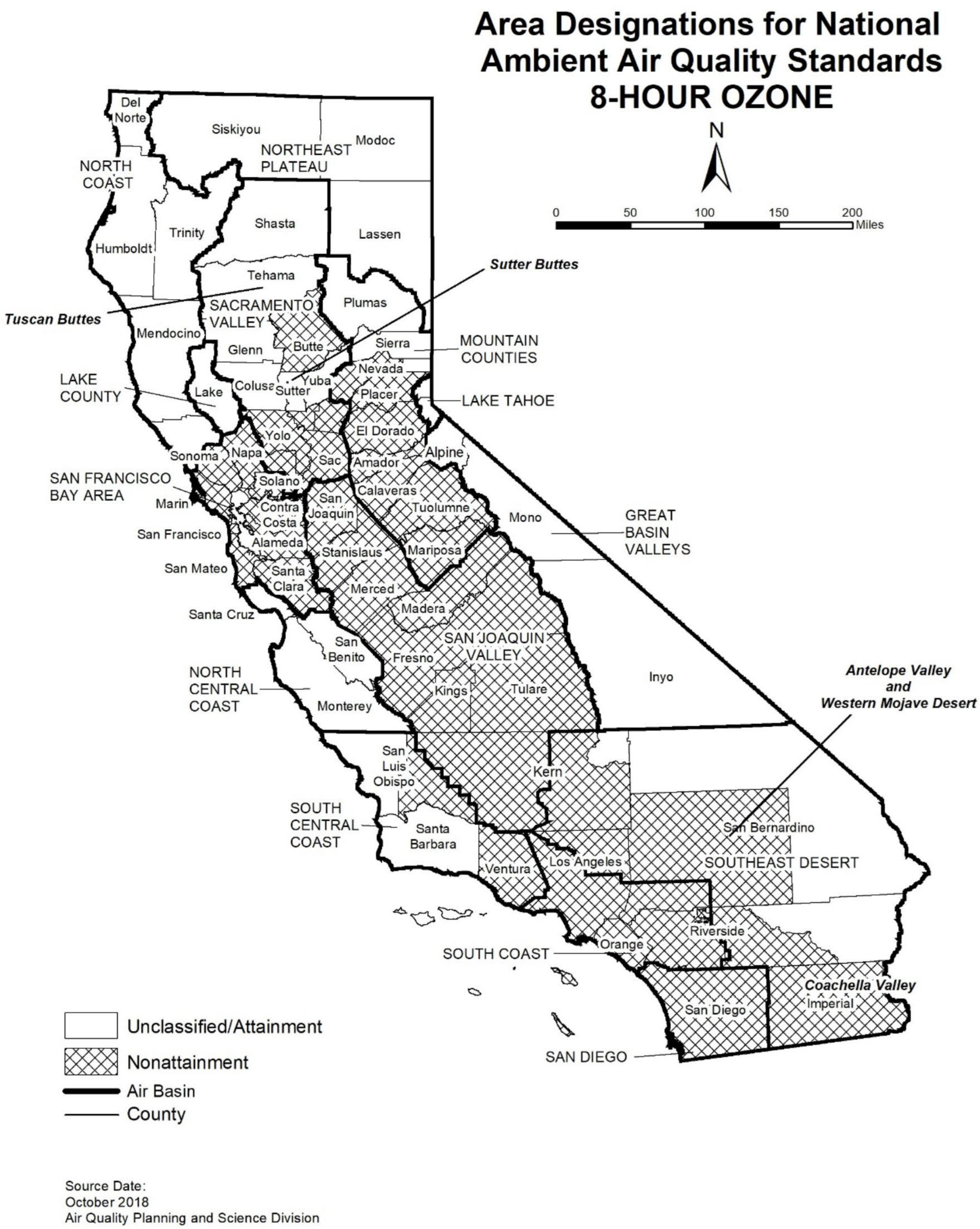
The national 1-hour ozone standard was revoked effective June 15, 2005, and the area designations map reflects the 2015 national 8-hour ozone standard 0.070 ppm. Original designations were finalized on August 3, 2018.

On December 14, 2012, the U.S. EPA established a new national annual primary $PM_{2.5}$ standard of 12.0 $\mu g/m^3$. New area designations reflecting this revised standard became final in December 2014. The current designation map reflects the most recently revised (2012) annual standard of 12.0 $\mu g/m^3$ as well as the 24-hour standard of 35 $\mu g/m^3$, revised in 2006.

Suspended Particulate Matter (PM_{10}). The U.S. EPA uses three categories to designate areas with respect to PM_{10}:

- Attainment
- Nonattainment
- Unclassified

Figure C-4



Area Designations for National Ambient Air Quality Standards 8-HOUR OZONE
N
0
50
100
150
200
Miles
Del Norte
Siskiyou
Modoc
NORTHEAST PLATEAU
NORTH COAST
Trinity
Shasta
Lassen
Humboldt
Tehama
Plumas
Sutter Buttes
Tuscan Buttes
SACRAMENTO VALLEY
Mendocino
Glenn
Butte
Sierra
MOUNTAIN COUNTIES
Nevada
LAKE COUNTY
Lake
Colusa
Sutter
Yuba
Placer
LAKE TAHOE
Yolo
El Dorado
Sonoma
Napa
Sac
Amador
Alpine
SAN FRANCISCO BAY AREA
Solano
Calaveras
Marin
Contra Costa
San Joaquin
Tuolumne
Mono
GREAT BASIN VALLEYS
San Francisco
Alameda
Stanislaus
Mariposa
San Mateo
Santa Clara
Merced
Madera
Santa Cruz
San Benito
SAN JOAQUIN VALLEY
Fresno
Inyo
NORTH CENTRAL COAST
Kings
Tulare
Monterey
Antelope Valley and Western Mojave Desert
San Luis Obispo
Kern
SOUTH CENTRAL COAST
Santa Barbara
San Bernardino
Ventura
Los Angeles
SOUTHEAST DESERT
Riverside
SOUTH COAST
Orange
Coachella Valley
San Diego
Imperial
SAN DIEGO
Unclassified/Attainment
Nonattainment
Air Basin
County
Source Date:
October 2018
Air Quality Planning and Science Division

Table C-4

National Ambient Air Quality Standards
Area Designations for 8-Hour Ozone*

	N	U/A		N	U/A
GREAT BASIN VALLEYS AIR BASIN		X	SACRAMENTO VALLEY AIR BASIN (cont.)		
LAKE COUNTY AIR BASIN		X	Yolo County (2)	X	
LAKE TAHOE AIR BASIN		X	Yuba County		X
MOUNTAIN COUNTIES AIR BASIN			SAN DIEGO COUNTY	X	
Amador County	X		SAN FRANCISCO BAY AREA AIR BASIN	X	
Calaveras County	X		SAN JOAQUIN VALLEY AIR BASIN	X	
El Dorado County (portion) (2)	X		SOUTH CENTRAL COAST AIR BASIN (1)		
Mariposa County	X		San Luis Obispo County		
Nevada County			- Eastern San Luis Obispo County	X	
- Western Nevada County	X		- Remainder of County		X
- Remainder of County		X	Santa Barbara County		X
Placer County (portion) (2)	X		Ventura County		
Plumas County		X	- Area excluding Anacapa and San Nicolas Islands	X	
Sierra County		X	- Channel Islands (1)		X
Tuolumne County	X		SOUTH COAST AIR BASIN (1)	X	
NORTH CENTRAL COAST AIR BASIN		X	SOUTHEAST DESERT AIR BASIN		
NORTH COAST AIR BASIN		X	Kern County (portion)	X	
NORTHEAST PLATEAU AIR BASIN		X	- Indian Wells Valley		X
SACRAMENTO VALLEY AIR BASIN			Imperial County	X	
Butte County	X		Los Angeles County (portion)	X	
Colusa County		X	Riverside County (portion)		
Glenn County		X	- Coachella Valley	X	
Sacramento Metro Area (2)	X		- Non-AQMA portion		X
Shasta County		X	San Bernardino County		
Sutter County			- Western portion (AQMA)	X	
- Sutter Buttes	X		- Eastern portion (non-AQMA)		X
- Southern portion of Sutter County (2)	X				
- Remainder of Sutter County		X			
Tehama County					
- Tuscan Buttes	X				
- Remainder of Tehama County		X			

*Definitions and references for all areas can be found in 40 CFR, Chapter 1, Part 81.305.

NOTE: This map and table reflect the 2015 8-hour ozone standard of 0.070 ppm.

(1) South Central Coast Air Basin Channel Islands:
Santa Barbara County includes Santa Cruz, San Miguel, Santa Rosa, and Santa Barbara Islands.
Ventura County includes Anacapa and San Nicolas Islands.
South Coast Air Basin:
Los Angeles County includes San Clemente and Santa Catalina Islands.

(2) For this purpose, the Sacramento Metro Area comprises all of Sacramento and Yolo Counties, the Sacramento Valley Air Basin portion of Solano County, the southern portion of Sutter County, and the Sacramento Valley and Mountain Counties Air Basins portions of Placer and El Dorado counties.

Figure C-5

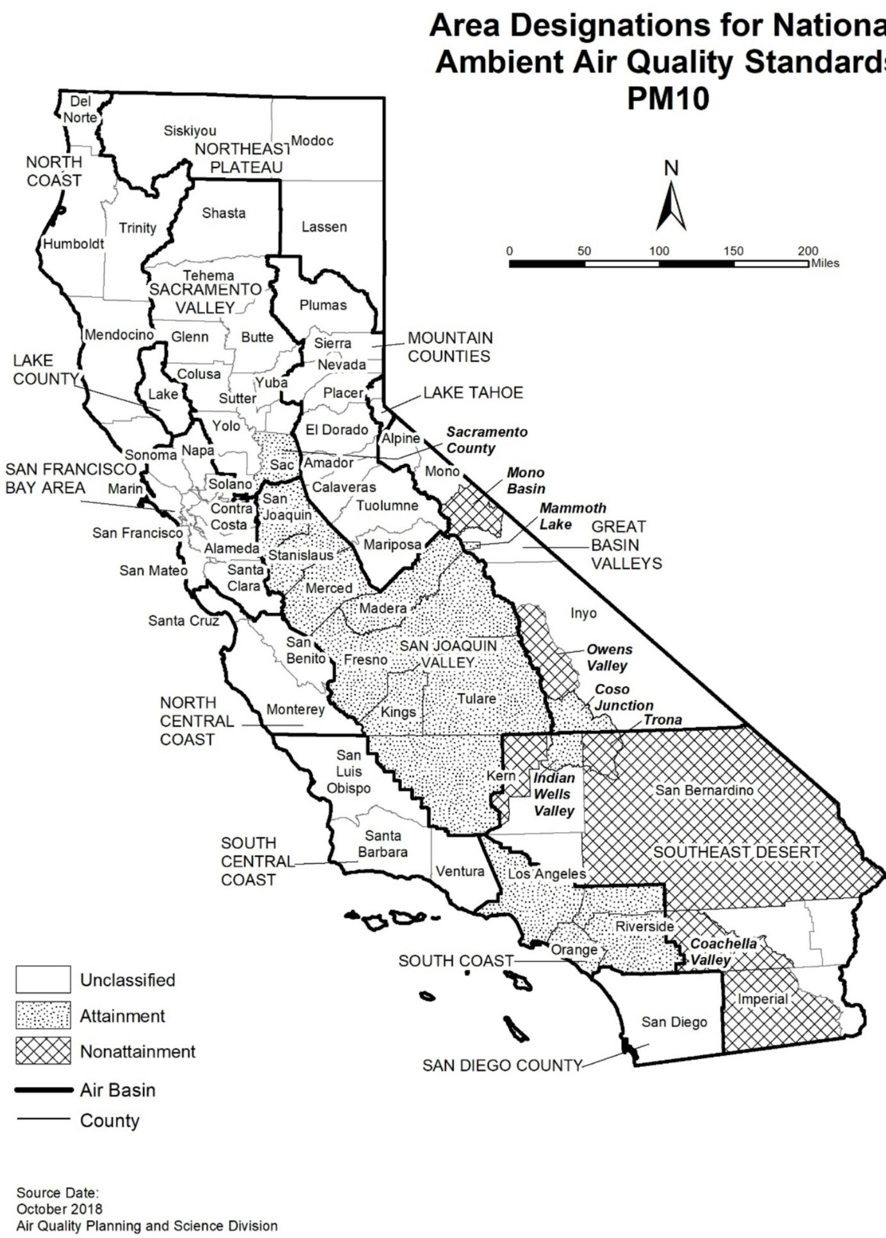

Area Designations for National Ambient Air Quality Standards PM10
N
0 50 100 150 200 Miles
Del Norte
Siskiyou
NORTHEAST PLATEAU
Modoc
NORTH COAST
Shasta
Lassen
Trinity
Humboldt
Tehema
SACRAMENTO VALLEY
Plumas
Mendocino
Glenn
Butte
Sierra
MOUNTAIN COUNTIES
Nevada
LAKE COUNTY
Colusa
Yuba
Lake
Sutter
Placer
LAKE TAHOE
Yolo
El Dorado
Alpine
Sacramento County
Sonoma
Napa
Sac
Amador
SAN FRANCISCO BAY AREA
Marin
Solano
Calaveras
Mono
Mono Basin
San Joaquin
Contra Costa
Tuolumne
Mammoth Lake
San Francisco
GREAT BASIN VALLEYS
Alameda
Mariposa
Stanislaus
San Mateo
Santa Clara
Merced
Madera
Inyo
Santa Cruz
San Benito
Fresno
SAN JOAQUIN VALLEY
Owens Valley
NORTH CENTRAL COAST
Monterey
Kings
Tulare
Coso Junction
Trona
San Luis Obispo
Kern
Indian Wells Valley
San Bernardino
SOUTH CENTRAL COAST
Santa Barbara
SOUTHEAST DESERT
Ventura
Los Angeles
Riverside
Orange
Coachella Valley
SOUTH COAST
Imperial
San Diego
SAN DIEGO COUNTY
Unclassified
Attainment
Nonattainment
Air Basin
County
Source Date:
October 2018
Air Quality Planning and Science Division

Table C-5

National Ambient Air Quality Standards
Area Designations for Suspended Particulate Matter (PM_{10})*

	N	U	A		N	U	A
GREAT BASIN VALLEYS AIR BASIN				SAN DIEGO COUNTY		X	
Alpine County		X		SAN FRANCISCO BAY AREA AIR BASIN		X	
Inyo County				SAN JOAQUIN VALLEY AIR BASIN			X
- Owens Valley Planning Area	X			SOUTH CENTRAL COAST AIR BASIN		X	
- Coso Junction			X	SOUTH COAST AIR BASIN			X
- Remainder of County		X		SOUTHEAST DESERT AIR BASIN			
Mono County				Eastern Kern County			
- Mammoth Lake Planning Area			X	- Indian Wells Valley			X
- Mono Lake Basin	X			- Portion within San Joaquin Valley Planning Area	X		
- Remainder of County		X		- Remainder of County		X	
LAKE COUNTY AIR BASIN		X		Imperial County			
LAKE TAHOE AIR BASIN		X		- Imperial Valley Planning Area	X		
MOUNTAIN COUNTIES AIR BASIN				- Remainder of County		X	
Placer County (portion) (2)		X		Los Angeles County (portion)		X	
Remainder of Air Basin		X		Riverside County (portion)			
NORTH CENTRAL COAST AIR BASIN		X		- Coachella Valley (3)	X		
NORTH COAST AIR BASIN		X		- Non-AQMA portion		X	
NORTHEAST PLATEAU AIR BASIN		X		San Bernardino County			
SACRAMENTO VALLEY AIR BASIN				- Trona	X		
Butte County		X		- Remainder of County	X		
Colusa County		X					
Glenn County		X					
Placer County (portion) (2)		X					
Sacramento County (1)			X				
Shasta County		X					
Solano County (portion)		X					
Sutter County		X					
Tehama County		X					
Yolo County		X					
Yuba County		X					

*Definitions and references for all areas can be found in 40 CFR, Chapter 1, Part 81.305.

(1) Air Quality in Sacramento County meets the national PM_{10} standards. The request for redesignation to attainment was approved by U.S. EPA in September 2013.
(2) U.S. EPA designation puts the Sacramento Valley Air Basin portion of Placer County in the Mountain Counties Air Basin
(3) Air quality in Coachella Valley meets the national PM_{10} standards. A request for redesignation to attainment has been submitted to U.S. EPA.

Figure C-6


Area Designations for National
Ambient Air Quality Standards
PM2.5
N
0 50 100 150 200 Miles
Del Norte
Siskiyou
Modoc
NORTH COAST
NORTHEAST PLATEAU
Humboldt
Trinity
Shasta
Lassen
Tehama
SACRAMENTO VALLEY
Plumas
Butte
Glenn
Sierra
MOUNTAIN COUNTIES
Mendocino
Nevada
LAKE COUNTY
Colusa
Yuba
Placer
Lake
Sutter
LAKE TAHOE
El Dorado
Yolo
Sonoma
Alpine
Napa
Sacramento
Amador
GREAT BASIN VALLEYS
SAN FRANCISCO BAY AREA
Solano
Calaveras
Marin
Tuolumne
Contra Costa
San Joaquin
Mono
Alameda
Stanislaus
Mariposa
San Mateo
Santa Clara
Merced
Madera
Santa Cruz
Fresno
NORTH CENTRAL COAST
San Benito
SAN JOAQUIN VALLEY
Inyo
Tulare
Monterey
Kings
San Luis Obispo
Kern
San Bernardino
SOUTH CENTRAL COAST
Santa Barbara
SOUTHEAST DESERT
Ventura
Los Angeles
Riverside
SOUTH COAST
Orange
San Diego
Imperial
SAN DIEGO COUNTY
Unclassified/Attainment
Nonattainment
Air Basin
County
Source Date:
October 2018
Air Quality Planning and Science Division

Table C-6

National Ambient Air Quality Standards
Area Designations for Fine Particulate Matter ($PM_{2.5}$)*

	N	U/A		N	U/A
GREAT BASIN VALLEYS AIR BASIN		X	SAN DIEGO COUNTY		X
LAKE COUNTY AIR BASIN		X	SAN FRANCISCO BAY AREA AIR BASIN (2)	X	
LAKE TAHOE AIR BASIN		X	SAN JOAQUIN VALLEY AIR BASIN	X	
MOUNTAIN COUNTIES AIR BASIN			SOUTH CENTRAL COAST AIR BASIN		X
Plumas County			SOUTH COAST AIR BASIN (3)	X	
- Portola Valley Portion of Plumas	X		SOUTHEAST DESERT AIR BASIN		
- Remainder of Plumas County		X	Imperial County (portion) (4)	X	
Remainder of Air Basin		X	Remainder of Air Basin		X
NORTH CENTRAL COAST AIR BASIN		X			
NORTH COAST AIR BASIN		X			
NORTHEAST PLATEAU AIR BASIN		X			
SACRAMENTO VALLEY AIR BASIN					
Sacramento Metro Area (1)	X				
Sutter County		X			
Yuba County (portion)		X			
Remainder of Air Basin		X			

* Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305. This map reflects the 2006 24-hour PM2.5 standard as well as the 1997 and 2012 $PM_{2.5}$ annual standards.

(1) For this purpose, Sacramento Metro Area comprises all of Sacramento and portions of El Dorado, Placer, Solano, and Yolo Counties. Air quality in this area meets the national $PM_{2.5}$ standards. A Determination of Attainment for the 2006 24-hour $PM_{2.5}$ standard was made by U.S. EPA in June 2017.
(2) Air Quality in this area meets the national $PM_{2.5}$ standards. A Determination of Attainment for the 2006 24-hour $PM_{2.5}$ standard was made by U.S. EPA in June 2017.
(3) Those lands of the Santa Rosa Band of Cahulla Mission Indians in Riverside County are designated Unclassifiable/Attainment.
(4) That portion of Imperial County encompassing the urban and surrounding areas of Brawley, Calexico, El Centro, Heber, Holtville, Imperial, Seeley, and Westmorland. Air quality in this area meets the national $PM_{2.5}$ standards. A Determination of Attainment for the 2006 24-hour $PM_{2.5}$ standard was made by U.S. EPA in June 2017.

5. Improving Air Quality

Over the past 40 years, air pollution control agencies in California have been working diligently to improve air quality. Much of the effort was directed towards the more traditional sources of air pollution such as mobile sources (e.g., cars, trucks, etc.) and stationary sources (e.g., factories, power plants, etc.). While there have been dramatic gains in reducing emissions from these traditional sources, there is a need for further reductions from other sources of emissions, including architectural coatings, to continue to make progress toward meeting the State and Federal ambient air quality standards and protecting the public health of California citizens. Emissions from all other sources, including architectural coatings, have become more significant as emissions from the traditional sources are further reduced. Therefore, the emissions from these sources must be evaluated for further reductions.

Architectural coatings comprise an important source of emissions in California because they are widely distributed, emit VOCs when used, and contribute to the air pollution problem in California. Although each container of paint may seem to be a small source of emissions, when the total number of users in California is aggregated, the total VOC emissions become significant. Implementation of the proposed SCM will continue the progress toward meeting California's air quality goals.

6. State Implementation Plan Commitments

For areas with unhealthy levels of air pollutants, clean air laws require districts to develop plans to describe how they will attain ambient air quality standards. The CCAA requires districts that have been designated nonattainment for the State ambient air quality standards to prepare and submit plans for attaining and maintaining the standards (see Health and Safety Code §40910 *et seq*.). In addition, the federal Clean Air Act requires that districts designated nonattainment for the federal ambient air quality standards prepare State Implementation Plans (SIPs) to demonstrate attainment with the federal standards. SIPs are a compilation of several documents, including new and previously submitted plans, programs (e.g., monitoring, modeling, permitting, etc.), district rules, State regulations and federal controls. State law makes CARB the lead agency for submittal of California's SIPs. Local air districts and other agencies (e.g., Bureau of Automotive Repair) prepare SIP elements and submit them to CARB for review and approval. ARB forwards the compiled SIP revisions to U.S. EPA for approval.

There are 15 non-attainment areas for the federal ozone standard and 2 non-attainment areas for the PM2.5 standard. For these areas, Ozone SIPs and PM2.5 SIPs must be adopted and sent to the U.S. EPA by June 2007 and April 2008, respectively. The SIPs must show how each area will attain the federal standards. To do this, the SIPs will identify the amount of emissions that must be reduced in each area to meet the standard and the emission controls needed to reduce the necessary emissions.

Emission reductions from district rules, including architectural coatings rules, are an essential part of California's effort to attain air quality standards for ozone.

CARB staff believes that the proposed SCM will achieve reductions that assist districts in making progress meeting attainment of both the Ozone and PM air quality standards. The emission reductions from the SCM are estimated to be about 2.5 tpd statewide, excluding South Coast AQMD.

References

Air Resources Board. The California Almanac of Emissions and Air Quality, 2006 Edition. Online, Internet at http://www.arb.ca.gov/aqd/almanac/almanac.htm. 2006. (ARB, 2006a)

Air Resources Board. "Area Designations and Maps". Online Internet at http://www.arb.ca.gov/regact/area06/adisor.pdf and http://www.arb.ca.gov/regact/area06/appc.pdf. September, 2006. (ARB, 2006b)

Air Resources Board. "2005 Architectural Coatings Survey, Draft Report." September, 2006. (ARB, 2006c)

United States Environmental Protection Agency. "Classifications of 8-Hour Ozone Nonattainment Areas". Online internet at http://www.epa.gov/air/oaqps/greenbk/gnc.html. August 16, 2007. (U.S. EPA, 2007)

APPENDIX D:

SUMMARY OF CURRENT VOC LIMITS

Summary of Architectural Coating Rules in California

Limits Currently Effective, Except as Noted

NOTE: This summary is provided for comparison purposes ONLY and should not be used as a replacement for existing rules. Please refer to the official rule language for compliance purposes.

Volatile Organic Compound (VOC) limits below are in grams per liter, less water and exempt compounds (divide grams/liter by 119.95 to obtain pounds/gallon)

	Federal	State																						
	U.S. EPA	CARB	Antelope	Bay Area	Butte	Colusa	Eastern Kern	El Dorado	Feather River	Imperial	Mojave	Monterey	Northern Sonoma	Placer	Sacra-mento	San Diego	San Joaquin	San Luis Obispo	Santa Barbara	Shasta	South Coast [a]	Tehama	Ventura	Yolo-Solano
	63 FR 176: 48848	SCM	1113	8-3	230	2.26	410.1A	215	3.15	424	1113	426	485	218	442	67.0.1	4601	433	323.1	3:31	1113	4:39	74.2	2.14
Adopted	Sep 98	Jun 77	Jul 97	Mar 78	July 79	1979	Apr 72	Sep 94	June 91	Nov 82	Feb 79	May 79	Apr-02	Jun 79	Dec 78	Nov 77	Apr 91	Mar-02	Oct 71	May-02	Sep 77	Aug-02	Jun 79	Nov-01
Last Amended	eff 9-99	Oct-07	Jun-13	Jul-09	Aug-02	Jul-02	Mar-10	Jun-17	Aug-14	Feb-10	Apr-12	Aug-12	Apr-02	Oct-10	Sep-15	Jun-15	Dec-09	Mar-02	Jun-14	Jul-05	Feb-16	Feb-14	Jan-10	Oct-16
Coating Category																								
Aluminum Roof Coatings								400																400
Antenna	530				530	530							530					530		530		530		
Anti-Fouling	450				400	400						400	400					400		400		400		
Anti-Graffiti	600							250													50 to 100			
Basement Specialty		400	400	400			400	400	400	400	400	400		400	400	400	400		400				400	400
Bituminous and Mastics	500																							
Bituminous Roof Coatings		50	50	50	300	300	50	50	50	50	50	50	300	50	50	50	50	300	50	300		300	50	50
Bituminous Roof Primers		350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
Bond Breakers	600	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
Building Envelope Coating																					50			
Calcimine Recoaters	475																							
Chalkboard Resurfacers	450																							
Concrete Curing Compounds	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	100	350	350	350
Concrete Curing Compounds for Roadways and Bridges																					350			
Concrete Curing and Sealing Compounds	700																							
Concrete/Masonry Sealers		100	100	100			100	100	100	100	100	100		100	100	100	100		100				100	100
Concrete Protective	400																							
Concrete Surface Retarders	780																				50			
Conversion Varnishes	725																							
Driveway Sealers		50	50	50			50	50	50	50	50	50		50	50	50	50		50		50		50	50
Dry Fog	400	150	150	150	400	400	150	150	150	150	150	150	400	150	150	150	150	400	150	400	50	400	150	150
Extreme High Durability	800																							
Faux Finishing/Glazing (Japans)	700	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	50 to 350	350	350	350
Fire Proofing, Exterior																					150			
Fire Resistive		350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350		350	350	350
Fire Retardant, Clear					650	650							650					650		650		650		
Fire Retardant, Opaque (Pigmented)					350	350							350					350		350		350		
Fire Retardant/Resistive, Clear	850																							
Fire Retardant/Resistive, Opaque	450																							
Flat		50	50	50	100	100	50	50	50	100	50	50	100	50	50	50	50	100	50	100	50	100	50	50
Flats, Exterior	250																							
Flats, Interior	250																							
Flats, Specialty																								
Floor	400	100	100	100	250	250	100	100	100	100	100	100	250	100	100	100	100	250	100	250	50	250	100	100
Flow	650				420	420							420					420		420		420		
Form Release Compounds	450	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	100	250	250	250
Graphic Arts (Sign Paints)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	200	500	500	500
Heat Reactive	420																							
High Temperature (Industrial Maintenance)	650							420													420			
High Temperature		420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420		420	420	420
Impacted Immersion	780																							
Industrial Maintenance	450	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	100	250	250	250
Industrial Maintenance Primers and Topcoats																								
Lacquers (including lacquer sanding sealers)					550	550							550					550		550		550		550
Lacquers, Clear Brushing					680	680							680					680		680	275	680		
Lacquers, Clear																					275			
Lacquers, Clear or Pigmented (Including Lacquer Sanding Sealers)	680																							
Lacquers, Pigmented																					275			
Low Solids Coatings**		120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Low Solids Stains**	120							120																

Summary of Architectural Coating Rules in California

	Federal	State																						
	U.S. EPA	CARB	Antelope	Bay Area	Butte	Colusa	Eastern Kern	El Dorado	Feather River	Imperial	Mojave	Monterey	Northern Sonoma	Placer	Sacra-mento	San Diego	San Joaquin	San Luis Obispo	Santa Barbara	Shasta	South Coast [a]	Tehama	Ventura	Yolo-Solano
	63 FR 176: 48848	SCM	1113	8-3	230	2.26	410.1A	215	3.15	424	1113	426	485	218	442	67.0.1	4601	433	323.1	3:31	1113	4:39	74.2	2.14
Adopted	Sep 98	Jun 77	Jul 97	Mar 78	July 79	1979	Apr 72	Sep 94	June 91	Nov 82	Feb 79	May 79	Apr-02	Jun 79	Dec 78	Nov 77	Apr 91	Mar-02	Oct 71	May-02	Sep 77	Aug-02	Jun 79	Nov-01
Last Amended	eff 9-99	Oct-07	Jun-13	Jul-09	Aug-02	Jul-02	Mar-10	Jun-17	Aug-14	Feb-10	Apr-12	Aug-12	Apr-02	Oct-10	Sep-15	Jun-15	Dec-09	Mar-02	Jun-14	Jul-05	Feb-16	Feb-14	Jan-10	Oct-16
Coating Category																								
Low Solids Wood Preservatives**	120							120																
Magnesite Cement	600	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450
Mastic Texture	300	100	100	100	300	300	100	100	100	100	100	100	300	100	100	100	100	300		300	100	300	100	100
Metallic Pigmented	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	150	500	500	500
Multi-Color	580	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Nonferrous Ornamental Metal Lacquers and Surface Protectants	870																							
Nonflat Coatings		100	100	100	150	150	100	100	100	100	100	100	150	100	100	100	100	150		150	50	150	100	100
Nonflat High Gloss Coatings		150	150	150	250	250	150	150	150	150	150	150	250	150	150	150	150	250		250	50	250	150	150
Non Flats, Interior	380																							
Non Flats, Exterior	380																							
Nuclear (Industrial Maintenance)	450																							
Pre-Treatment Wash Primers	780	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Primers and Undercoaters	350																							
Primers, Sealers, and Undercoaters		100	100	100	200	200	100	100	100	100	100	100	200	100	100	100	100	200	100	200	100	200	100	100
Quick Dry Enamels	450				250	250		400					250					250		250		250		
Quick Dry Primers, Sealers, and Undercoaters	450				200	200							200					200		200		200		
Reactive Penetrating Sealers		350	350	350			350	350	350	350	350	350		350	350	350	350		350		350		350	350
Recycled Coatings		250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	150	250	250	250
Repair and Maintenance Thermoplastic	650																							
Roof	250	50	50	50	250	250	50	50	50	50	50	50	250	50	50	50	50	250	50	250	50	250	50	50
Roof, Aluminum		400	400	400			400		400	400	400	400		400	400	400	400		400		100		400	
Rust Preventative	400	250	250	250	400	400	250	250	250	250	250	250	400	250	250	250	400 [250 1/1/12]	400	250	400	100	400	250	250
Sanding Sealers																					275			
Sanding Sealers (Non-Lacquer)	550				350	350		350					350					350		350		350		
Sealers (Including Clear Wood Sealers)	400																							
Shellacs, Clear	730	730	730	730	730	730	730	730	730	730	730	750	730	730	730	730	730	730	730	730	730	730	730	730
Shellacs, Opaque	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550
Shellacs, Pigmented																								
Specialty Primers																					100			
Specialty Primers, Sealers, and Undercoaters		100	100	100	350	350	100	100		100	100	100	350	100	100	100	100	350		350		350	100	100
Stains		250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	100	250	250	250
Stains, Clear	550																							
Stains, Interior																					250			
Stains, Semitransparent	550																							
Stains, Opaque	350																							
Stain Controllers	720																							
Stone Consolidants		450	450	450			450	450	450	450	450	450		450	450	450	450		450				450	450
Swimming Pool	600	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340
Swimming Pool Repair & Maintenance					340	340							340					340		340	340	340		
Temperature-Indicator Safety					550	550							550					550		550		550		
Thermoplastic Rubber and Mastics	550																							
Traffic Marking	150	100	100	100	150	150	100	100	100	100	100	100	150	100	100	100	100	150	100	150	100	150	100	100
Tub and Tile Refinish		420	420	420			420	420	420	420	420	420		420	420	420	420		420				420	420
Varnishes	450				350	350							350					350		350	275	350		
Waterproofing Membranes		250	250	250			250	250	250	250	250	250		250	250	250	250		250				250	250
Waterproofing Sealers					250	250							250					250		250	100	250		
Waterproofing Sealers, Concrete/Masonry					400	400							400					400		400	100	400		
Water Proofing Sealers and Treatments, Clear	600																							
Water Proofing Sealers and Treatments, Opaque	600																							
Wood Coatings		275	275	275			275	275	275	275	275	275		275	275	275	275		275				275	275

Summary of Architectural Coating Rules in California

	Federal	State																						
	U.S. EPA	CARB	Antelope	Bay Area	Butte	Colusa	Eastern Kern	El Dorado	Feather River	Imperial	Mojave	Monterey	Northern Sonoma	Placer	Sacra-mento	San Diego	San Joaquin	San Luis Obispo	Santa Barbara	Shasta	South Coast [a]	Tehama	Ventura	Yolo-Solano
	63 FR 176: 48848	SCM	1113	8-3	230	2.26	410.1A	215	3.15	424	1113	426	485	218	442	67.0.1	4601	433	323.1	3:31	1113	4:39	74.2	2.14
Adopted	Sep 98	Jun 77	Jul 97	Mar 78	July 79	1979	Apr 72	Sep 94	June 91	Nov 82	Feb 79	May 79	Apr-02	Jun 79	Dec 78	Nov 77	Apr 91	Mar-02	Oct 71	May-02	Sep 77	Aug-02	Jun 79	Nov-01
Last Amended	eff 9-99	Oct-07	Jun-13	Jul-09	Aug-02	Jul-02	Mar-10	Jun-17	Aug-14	Feb-10	Apr-12	Aug-12	Apr-02	Oct-10	Sep-15	Jun-15	Dec-09	Mar-02	Jun-14	Jul-05	Feb-16	Feb-14	Jan-10	Oct-16
Coating Category																								
Wood Preservatives		350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
Wood Preservatives, Below Ground	550																				350			
Wood Preservatives, Clear and Semitransparent	550																							
Wood Preservatives, Opaque	350																							
Zinc Rich Primers		340	340	340			340	340	340	340	340	340		340	340	340	340		340				340	340
Zinc Rich Industrial Maintenance Primers																					100			
Zone Marking	450																							

Notes:

*The specified limit applies unless the manufacturer submits a report pursuant to Rule 1113 (g)(2).

**Low solids coatings are expressed in grams VOC per liter of coating, including water and exempt compouds

Parentheses indicate VOC limits that apply due to the 250 grams per liter default provision, but the limits are not specifically stated in the rule.

Brackets indicate future effective dates and VOC limits.

The EPA rule states that if a coating is not defined in the table above, it falls into the flat (250 g/l) or nonflat (380 g/l) category based on the gloss level, and the applicable limit applies.

The ARB 2000 SCM and many district rules state that if a coating is not defined in the table above, it falls into the flat (100 g/l 1/1/2003) or nonflat (150 g/l 1/1/2003) category based on the gloss level, and the applicable limit applies.

California districts not mentioned in this table are subject to the VOC limits in the U.S. EPA National Architectural Coating Rule

[a] Please note that effective January 1, 2014, The South Coast Air Quality Management District also has VOC limits for colorants. Please refer to Rule 1113.

APPENDIX E:

VOC Calculations and Emissions Reduction Methodology

VOC Content

The following equations were used to produce data for the 2014 Survey.

$$\mathrm{VOC}_{\mathrm{Actual}} = \frac{W_{vm} - W_{w} - W_{e}}{V_{c}} \qquad \mathrm{VOC}_{\mathrm{Regulatory}} = \frac{W_{vm} - W_{w} - W_{e}}{V_{c} - V_{w} - V_{e}}$$

$$(\textit{Also known as Material VOC}) \qquad (\textit{Also known as Coating VOC})$$

$$\mathrm{VOC}_{\mathrm{Regulatory\ (Low\ Solids)}} = \frac{W_{vm} - W_{w} - W_{e}}{V_{c}}$$

Where:

- W_{vm} = Total weight of volatile materials (VOC+water+exempt compounds) in the coating, in grams
- W_{w} = Weight of water in the coating, in grams
- W_{e} = Weight of exempt compounds in the coating, in grams
- V_{c} = Total volume of the coating, in liters
- V_{w} = Volume of water in the coating, in liters
- V_{e} = Volume of exempt compounds in the coating, in liters

VOC Regulatory After Recommended Thinning

The following equation was used to calculate VOC Regulatory after the coatings are thinned with VOC containing solvents.

$$\mathrm{VOC}_{\mathrm{Regulatory\ (After\ Recommended\ Thinning)}} = \frac{\mathrm{Volume}_{\mathrm{Coating}} \times \mathrm{VOC}_{\mathrm{Regulatory}} + \mathrm{Volume}_{\mathrm{Thinner}} \times \mathrm{VOC}_{\mathrm{Thinner}}}{\mathrm{Volume}_{\mathrm{Coating}} + \mathrm{Volume}_{\mathrm{Thinner}}}$$

Percent by Volume Solids of Coating

The following two equations were used to calculate the percent volume solids of coating. The choice of equation depends on the type of information that is known about the coating.

1) If the weight and density of all of the solid (nonvolatile) materials are known, then the following equation may be used:

$$\text{\% by Volume Solids of Coating} = \frac{\text{Weight of Solids}}{\text{Density of Solids} \times \text{Volume of Coating Material}} \times 100$$

2) If instead, only the volatile components of a coating (VOC, water and exempt compound) are known, the percent volume of solids may be estimated by the following equation.

$$\text{\% by Volume of Solids of Coating} = \left(1 - \frac{W_w}{D_w \times V_c} - \frac{W_{voc}}{D_{voc} \times V_c} - \frac{W_e}{D_e \times V_c}\right) \times 100$$

Where:

W_w	=	Weight of water in the coating, in grams	D_w	=	Density of water, in grams per liter
W_{voc}	=	Weight of VOC in the coating, in grams	D_{voc}	=	Density of VOC, in grams per liter
W_e	=	Weight of exempt compounds in the coating, in grams	D_e	=	Density of exempt compounds, in grams per liter
V_c	=	Total volume of coating in liters			

Sales Weighted Average

The Sales Weighted Average (SWA) is an average value for grouped coatings, calculated by weighting the individual values by their sales. For grouped coatings in this survey, the SWA should be used to report the following entries on the Product Information Form: coating density, weight percent of solids, weight percent of volatile material, weight percent of water, weight percent of exempts, volume percent of solids, volume percent of water, and volume percent of exempts. The following equation can be used to calculate Sales Weighted Average.

$$\mathrm{SWA} = \frac{\left(\left(\mathrm{Value}_1 \ \mathrm{x} \ \mathrm{Sales}_1\right) + \left(\mathrm{Value}_2 \ \mathrm{x} \ \mathrm{Sales}_2\right) + \left(\mathrm{Value}_n \ \mathrm{x} \ \mathrm{Sales}_n\right)\right)}{\left(\mathrm{Sales}_1 + \mathrm{Sales}_2 + \mathrm{Sales}_n\right)}$$

Where:

$Value_{(1,2,...n)}$	=	Coating characteristic values (e.g., coating density, VOC Actual, VOC Regulatory, etc.) for products 1,2,...n
$Sales_{(1,2,...n)}$	=	Sales for products 1,2,...n

Conversion Factors

VOC content:
To convert pounds/gallon to grams/liter multiply by 119.83

Density:
1 pound/gallon = 0.11983 kilograms/liter or 119.83 grams/liter

Specific Gravity :
To convert specific gravity to pounds/gallon multiply by 8.345
To convert specific gravity to grams/liter multiply by 1000

Units of Volume:
1 fl oz = 0.029574 liters
1 liquid pint = 0.47318 liters
1 liquid quart = 2 liquid pints = 0.94635 liters
1 gallon = 4 liquid quarts = 3.7854 liters

Units of Mass:

Unit	ounce(oz)	pound(lb)	gram(g)	kilogram(kg)
1 oz =	1	0.0625	28.3495	0.02834
1 lb =	16	1	453.592	0.45359

Emission Reductions Calculations

ARB staff estimated emission reductions based on 2013 sales data, as reported in the 2014 Survey. For each category with a proposed reduction in VOC limit, ARB staff calculated the expected emission reductions for each product that was reported in that category. For each reported product in the survey,

[Emission Reductions] = [Pre-Limit Emissions] – [Post-Limit Emissions]

where
"Pre-Limit Emissions" are calculated directly from survey data for each product, as reported

[Pre-Limit Emissions, lbs VOC] = [VOC_{ACTUAL}, lb VOC/gal coating]*[Sales Volume, gals coating]

"Post-Limit Emissions" are estimates based on the potential impact of the lower $VOC_{REGULATORY}$ limit. When the $VOC_{REGULATORY}$ limit is lowered, some coatings will need to be reformulated and, consequently, they will have a new VOC_{ACTUAL} value. It's possible to predict a new VOC_{ACTUAL} value using the following equation:

$$[\text{NEW } VOC_{ACTUAL}] = \frac{[\text{Avg. VOC Density, g/l}]*[VOC_{REGULATORY}\text{ Limit, g/l}]*[\text{Vol. \% Solids}]}{([\text{Avg. VOC Density, g/l}]-[VOC_{REGULATORY}\text{ Limit, g/l}])}$$

where
Average VOC Density = 880 grams/liter
$VOC_{REGULATORY}$ Limit = New $VOC_{REGULATORY}$ Limit, grams/liter
Vol. % Solids = Volume Percent Solids, as reported for each product

[Post-Limit Emissions, lbs VOC] = [NEW VOC_{ACTUAL}, lb VOC/gal coating]*[Sales Volume, gals coating]

ARB staff used the following assumptions and protocols to perform emission reduction calculations:

- When estimating "Post-Limit Emissions", we assumed that the volume percent of solids remained constant for each product after it was reformulated to meet the proposed VOC limit.
- When estimating "Post-Limit Emissions", we assumed that the sales volume remained constant for each product after it was reformulated to meet the proposed VOC limit.
- When estimating "Post-Limit Emissions", we assumed a portion of the VOC in each product was replaced by either water or exempt compounds after the product was reformulated to meet the proposed VOC limit.

- If a product was noncompliant and had a high VOC content that exceeded the limit in the 2007 SCM, we assumed the emission reductions would only occur in areas that have not incorporated the 2007 SCM limits.
- If a product was “overcompliant” and had a low VOC content that was below the limit in the 2007 SCM, but above the proposed limit, we only calculated emission reductions from the product’s actual VOC content down to the proposed VOC limit.
- If a product was “overcompliant” and had a low VOC content that was already below the proposed limit, no emission reductions were calculated.
- Emission reductions were only calculated for products sold in large containers (greater than one liter), because small containers (one liter or less) are exempt from the SCM VOC limits.

Example Emissions Reduction Calculation

Step 1: Identify the available data.

Product	VOC_{ACTUAL} (g/l)	$VOC_{REGULATORY}$ (g/l)	Volume % Solids	Sales Volume (gals)
#1	78	190	33%	10,000
#2	110	220	39%	7,500
#3	350	350	55%	5,000
#4	55	140	34%	2,500

Step 2: Calculate emission reductions for each product.

Eqn. 1: [Pre-Limit Emissions, lbs VOC] = [VOC_{ACTUAL}, lb VOC/gal coating]*[Sales Volume, gals coating]

Eqn. 2:
$$[\text{NEW } VOC_{ACTUAL}, \text{g/l}] = \frac{[\text{Dvoc, g/l}]*[VOC_{REGULATORY} \text{ Limit, g/l}]*[\text{Vs}]}{([\text{Dvoc, g/l}]-[VOC_{REGULATORY} \text{ Limit, g/l}])}$$

where

Dvoc = Average VOC Density, which is assumed to be approximately 880 grams/liter
$VOC_{REGULATORY}$ Limit = New $VOC_{REGULATORY}$ Limit, grams/liter
Vs = Volume Percent Solids, %

To convert from units of (grams/liter) to (lbs/gal):

$$[VOC_{ACTUAL},\ \frac{\textit{lbs VOC}]}{\textit{gal coating}} = \frac{[VOC_{ACTUAL},\ \textit{grams VOC}]}{\textit{liter coating}} * \frac{[1 \text{ lb VOC}]}{[454\ \textit{grams VOC}\text{i}} * \frac{[3.785 \text{ liters coating}]}{[1 \text{ gal coating}]}$$

Eqn. 3: [Post-Limit Emissions, lbs VOC] = [NEW VOC_{ACTUAL}, lb VOC/gal]*[Sales Volume, gals coating]

Eqn.4: [Emission Reductions] = [Pre-Limit Emissions] – [Post-Limit Emissions]

Example Calculation for Product #1:

[Pre-Limit Emissions] = [78 grams/liter]*[1 lb/454 grams]*[3.785 liters/gal]*[10,000 gals] = 6,503 lbs VOC

Assume the New $VOC_{REGULATORY}$ Limit is 150 g/l.

$$[\text{NEW } VOC_{ACTUAL}] = \frac{[880 \text{ g/l}]*[150 \text{ g/l}]*[33\%]}{([880 \text{ g/l}]-[150 \text{ g/l}])} = 60 \text{ g/l}$$

[Post-Limit Emissions] = [60 g/l]*[1 lb/454 grams]*[3.785 liters/gallon]*[10,000 gals] = 5,002 lbs VOC

[Emission Reductions] = [6,503] – [5,002] = 1,501 lbs VOC

A summary of the emission reduction calculations for Products #1- #4 is provided below. All products are in the same coating category with a new $VOC_{REGULATORY}$ Limit of 150 g/l.

Product	**Pre-Limit Emissions (lbs VOC)**	**NEW VOC_{ACTUAL} (g/l)**	**Post-Limit Emissions (lbs VOC)**	**Emission Reduction (lbs VOC)**
#1	6,503	60	5,002	1,501
#2	6,878	71	4,440	2,438
#3	14,590	100	4,169	10,421
#4	1,146	No reductions were calculated for Product #4, because it already complied with the new $VOC_{REGULATORY}$ limit.		0
TOTAL:	29,117			14,360

<u>Step 3: Determine Overall Emission Reduction Percentage.</u>

For these four products, the overall emission reduction percentage:

$$[\% \text{ Reduction}] = \frac{([29{,}117] - [14{,}360])}{[29{,}117]} = 51\%$$

APPENDIX F:

SCM WORKSHOP NOTICE

CALIFORNIA
AIR RESOURCES BOARD

Mary D. Nichols, Chair
Jared Blumenfeld, CalEPA Secretary
Gavin Newsom, Governor

January 30, 2019

To All Interested Parties:

The California Air Resources Board (CARB) staff invites you to participate in a public workshop to discuss proposed amendments to the Architectural Coatings Suggested Control Measure (SCM). The SCM is a model rule used by California air pollution control districts to develop architectural coatings rules. Currently, fifteen air districts have rules based on the SCM that the Board approved in 2007. A further six districts have rules based on an earlier SCM approved by the Board in 2000.

At the workshop, staff will be proposing lower VOC limits for some existing categories, modifications to some category definitions, and two new coating categories. Staff will also discuss proposed VOC limits for colorants added to architectural coatings. A handout for the workshop is available from our coatings web page.

The workshop will be held at the time and location shown below:

Date:	Tuesday, February 19, 2019
Time:	9:00 a.m.-12:00 p.m.
Location:	Cal/EPA Headquarters Building Sierra Hearing Room 1001 I Street Sacramento, California, 95814

Directions to the California Environmental Protection Agency's (Cal/EPA) headquarters and public transit can be found at the Cal/EPA website: https://calepa.ca.gov/headquarters-sacramento/location/.

For those unable to attend in person, this workshop will be webcast. Webcast links are posted at https://video.calepa.ca.gov/. CARB staff recommends that you do not run other programs while viewing the webcast, as it may interrupt or lower the quality of the signal.

Materials for this workshop, including a meeting agenda, will be posted to our program web page prior to the workshop. Notification will be sent via the Architectural Coatings email list serve when the materials become available.

To receive notices of upcoming activities on the Architectural Coatings Program, please sign up for the list serve:
https://public.govdelivery.com/accounts/CARB/subscriber/new?topic_id=arch-ctgs

Summary: CARB's Architectural Coatings Program assists air districts in reducing the amount of smog-forming volatile organic compounds (VOCs) emitted from the use of architectural coatings in California. Architectural coatings include house paints, stains, industrial maintenance coatings, traffic coatings, and many other products. Control of VOC emissions from architectural coatings is the responsibility of the air districts, and CARB provides assistance by developing a SCM. The Board approved an SCM for architectural coatings in 1977 and amended it in 1985, 1989, 2000, and 2007. Currently, fifteen air districts have implemented the 2007 SCM. Based on a survey CARB conducted in 2014, VOC emissions from architectural coatings have decreased from 95 tons per day (tpd) in 2004 to 30 tpd in 2013.

General information about the Architectural Coatings Program is available at the following address: https://www.arb.ca.gov/coatings/arch/arch.htm.

If you require special accommodation or need this document in an alternate format or language, please contact Ms. Candace Clawson at (916) 322-6021 or candace.clawson@arb.ca.gov as soon as possible. TIY/TDD/Speech to Speech users may dial 711 for California Relay Service.

Staff welcomes and encourages your participation in this effort. If you have questions, please contact Mr. Glen Villa, Air Resources Engineer, at (916) 324-8177 or at glen.villa@arb.ca.gov or Mr. Jose Gomez, Manager, Technical Development Section, at (916) 324-8033 or at jose.gomez@arb.ca.gov.

Sincerely,

/s/

Ravi Ramalingam, Chief
Consumer Products and Air Quality Assessment Branch
Air Quality Planning and Science Division

cc: Mr. Jose Gomez, Manager
Technical Development Section
Air Quality Planning and Science Division

Mr. Glen Villa, Air Resources Engineer
Technical Development Section
Air Quality Planning and Science Division

APPENDIX G:

ECONOMIC ANALYSIS DETAILS

Summary of Economic Analysis Methodology

Summary

The total cost of the proposed SCM to affected businesses is estimated to be $1.4 million per year in annualized nonrecurring costs and $1.6 million per year in recurring costs. This equates to $3 million dollars annually over the project horizon. This represents the cost of raw materials, research and development, equipment, testing, and training to architectural coatings manufacturers.

This appendix covers the methodology used in the Economic Analysis presented in Chapter 7. The methodology is similar to what was used in previous CARB regulations (CARB, 1990; CARB, 1991; CARB, 1997a; CARB, 1999; CARB, 2000b; CARB, 2004; CARB, 2005b; CARB, 2007a, 2007b) and follows guidelines recommended by Cal/EPA for economic analysis (Cal/EPA, 1996).

Methodology

For this analysis, we considered the impact to architectural coatings manufacturers. Although other entities such as distributors, retailers, end users and raw material suppliers may be impacted, coating manufacturers will be the primary entities affected.

First, we analyzed data from the 2014 Architectural Coatings Survey to determine complying and noncomplying volume for the 10 categories that have a proposed change to the VOC limit. We assumed that costs would not be incurred for coatings in a category that did not have a proposed limit. In addition, we determined the number of noncomplying products and the expected emission reductions for each of these categories based on the survey data. This data is summarized in Table G-1.

Table G-1 Survey Data Inputs for Cost Calculations				
Coating Category	**Proposed Limit (g/l)**	**Emission Reductions (Tons/Day)**	**# of Non-Compliant Products**	**# of Non-Compliant Gallons per Year**
Aluminum Roof	100	0.18	15	62,544
Building Envelope Coatings	50	0.01	10	13,010
Dry Fog Coatings	50	0.03	28	120,898
Fire Resistive Coatings	150	0.01	3	5,472
Floor Coatings	50	0.01	226	188,919
Form-Release Compounds	100	0.07	15	36,567
Nonflat Coatings	50	0.37	604	2,112,210
Nonflat-High Gloss Coatings	50	0.02	246	144,473
Stains (Exterior/Dual)	100	0.39	521	347,125
Waterproofing Membranes	100	0.10	24	158,397
Total		**1.19**	**1,692**	**3,189,616**

Staff used an established set of per product reformulation costs in 2007 dollars for each phase of bringing a reformulated product into the market. These costs were grown using a well-established method of rationing chemical engineering plant cost indices (Peters and Timmerhaus, 1980). For the purposes of this analysis, we assumed that half of the non-complying products would be reformulated due to the proposed limits of the SCM.

Table G-2 summarizes the nonrecurring and recurring costs by category. We used an average where applicable.

Table G-2 Non-Recurring and Recurring Cost		
Coating Category	**Nonrecurring Cost to Reformulate (Dollars per Product)**	**Non-Raw Material Recurring Costs (Dollars per Year per Product)**
Aluminum Roof	$12,557	$29,139
Building Envelope Coatings	$7,920	$19,426
Dry Fog Coatings	$7,920	$54,393
Fire Resistive Coatings	$7,920	$5,828
Floor Coatings	$16,086	$439,030
Form-Release Compounds	$7,920	$29,139
Nonflat Coatings	$4,336	$1,173,338
Nonflat-High Gloss Coatings	$5,097	$477,883
Stains (Exterior/Dual)	$7,920	$1,012,101
Waterproofing Membranes	$7,920	$46,623

Based on the CARB survey, product data sheets and discussions with manufacturers, staff determined the ingredients of typical complying and non-complying formulations for the 10 categories.

Data on the raw materials were obtained from chemical manufacturers, distributors of raw materials, indices, 2007 CARB SCM for Architectural Coatings and 2013 CARB Initial Statement of Reasons for the Proposed Amendments to the Antiperspirants and Deodorants Regulation, the Consumer Products Regulation, the Aerosol Coating Products Regulation, the Tables of MIR Values, Test Method 310, and Proposed Repeal of the Hairspray Credit Program (CARB 2007a, 2007b; CARB 2013). Resin costs are the primary influence on raw materials cost for most coatings. There are a variety of resins with differing costs. Therefore, resins have the most variable impact on raw materials cost. Resin costs were taken from Plastic News 2019 prices as the highest value (Plastics News, 2019a, 2019b).

In cases where there were no data available for an ingredient, a default price of $1.50 per pound was used.

Staff compared the difference in raw material costs between typical complying and non-complying formulations. From this comparison, we determined manufacturer cost or cost savings in raw materials if changing from a typical non-compliant coating to a typical compliant coating. These costs are summarized in Table G-3.

Table G-3
Raw Material Cost Differential Between Complying and Non-Complying Products

Coating Category	Raw Material Cost of a Typical Complying Formulation	Raw Material Cost of a Typical Non-Complying Formulation	Difference of Raw Material Cost of Complying and Non-Complying per Gallon
Aluminum Roof	$2.52	$4.56	-$2.04
Building Envelope Coatings	$9.02	$7.35	$1.67
Dry Fog Coatings	$8.91	$11.52	-$2.61
Fire Resistive Coatings	$13.44	$16.54	-$3.10
Floor Coatings	$7.30	$8.69	-$1.39
Form-Release Compounds	$10.30	$9.17	$1.13
Nonflat Coatings	$7.20	$7.70	-$0.50
Nonflat-High Gloss Coatings	$7.20	$7.03	$0.17
Stains (Exterior/Dual)	$7.50	$9.68	-$2.18
Waterproofing Membranes	$24.75	$19.89	$4.86

These costs were multiplied by the non-complying volume to determine the recurring raw material related cost of the proposed limits.

The recurring costs from Table G-2 were multiplied by the number of products that would need to be reformulated for each category. The total annual cost is the sum of the raw material related costs, the recurring non-raw material costs and annualized non-recurring costs. These calculations are summarized in Table G-4.

Table G-4
Calculated Annual Cost

Coating Category	Annual Recurring Costs (Raw Material) Dollars per Year	Annual Recurring Costs (Non-raw Material) Dollars per Year	Annualized Nonrecurring Cost Dollars per Year	Total Annual Cost per Year
Aluminum Roof	-$127,591	$29,139	$21,752	-$76,700
Building Envelope Coatings	$21,727	$19,426	$9,146	$50,299
Dry Fog Coatings	-$315,543	$54,393	$25,609	-$235,541
Fire Resistive Coatings	-$16,964	$5,828	$2,744	-$8,392
Floor Coatings	-$262,598	$439,030	$419,857	$596,289
Form-Release Compounds	$41,320	$29,139	$13,719	$84,179
Nonflat Coatings	-$1,056,105	$1,173,338	$302,430	$419,663
Nonflat-High Gloss Coatings	$24,560	$477,883	$144,809	$647,252
Stains (Exterior/Dual)	-$756,733	$1,012,101	$476,508	$731,877
Waterproofing Membranes	$769,809	$46,623	$21,950	$838,382
Total	**-$1,678,117**	**$3,286,901**	**$1,438,524**	**$3,047,307**

The cost effectiveness is determined by taking the total annual cost of a category and dividing by the annual emission reduction. Assuming all costs are passed on to consumers, we calculated the cost increase per gallon. The cost increase per gallon to end users is determined by taking the total cost of the category, dividing by the number of non-compliant gallons, and multiplying by a factor of 4X. This represents the assumption that the cost of a product is doubled from the manufacturer to the distributor, and is doubled again from the distributor to the end user. Taking the raw material costs for complying and non-complying products, and using the same 4X multiplier gives cost increase per gallon. This data is summarized in Table G-5.

Table G-5 Calculated Cost-Effectiveness and Cost Increase Per Gallon				
Coating Category	**Individual Cost Effectiveness for Each Limit (Dollars per Pound VOC Reduced)**	**Cost Increase to Consumers per Gallon (4X)**	**Typical Non-Complying Cost per Gallon**	**Typical Complying Cost per Gallon**
Aluminum Roof	-$0.39	-$4.91	$18.24	$10.08
Building Envelope Coatings	$10.67	$15.46	$29.40	$36.08
Dry Fog Coatings	-$6.51	-$7.79	$46.08	$35.64
Fire Resistive Coatings	-$0.76	-$6.13	$66.16	$53.76
Floor Coatings	$19.93	$12.63	$34.76	$29.20
Form-Release Compounds	$0.65	$9.21	$36.68	$41.20
Nonflat Coatings	$0.86	$0.79	$30.80	$28.80
Nonflat-High Gloss Coatings	$5.41	$17.92	$28.12	$28.80
Stains (Exterior/Dual)	$1.50	$8.43	$38.72	$30.00
Waterproofing Membranes	$5.64	$21.17	$79.56	$99.00
Weighted Average	**$1.85**	**$3.82**		

Resin costs is the primary variable influence on raw material costs. Therefore, staff conducted a sensitivity analysis to determine the impacts on the annual costs from assumed changes to resin costs. This analysis consisted of one baseline and three assumed increases in resin prices. Table G-6 shows, with a 50% increase in compliant resin price, the overall cost-effectiveness of the proposed limits is still consistent with past CARB regulations shown earlier in Table 7-3.

We assumed the resin costs for compliant coatings would increase. There are a variety of resins with differing costs. Therefore, resins have the most variable impact on raw material costs. The resin portion of a coating represents approximately 20% to 50% of the total raw material costs of a gallon of coating. With current ingredient prices as the baseline, we conducted cost-effectiveness calculations at 10%, 20%, and 50% increases in compliant resin costs. The 10% and 20% resin price increases are consistent with the socioeconomic impacts analysis conducted by the SCAQMD. To be conservative, staff used the 20% resin price increase assumption. This applies wherever we refer to the “average” cost-effectiveness of each limit and the overall cost-effectiveness. For purposes of the sensitivity analysis, the 50% assumed resin price increase is an extreme upper boundary. It is not suggested by any information available to staff as reflective of projected actual resin prices when the proposed limits become effective.

Table G-6
Cost-Effectiveness of Proposed Limits Under Sensitivity Analysis

	Baseline	10% Increase	20% Increase	50% Increase
Coating Category	**RCM = 1.0**	**RCM = 1.1**	**RCM = 1.2**	**RCM = 1.5**
Aluminum Roof	-$0.39	-$0.39	-$0.39	-$0.39
Building Envelope Coatings	$8.85	$9.76	$10.67	$13.70
Dry Fog Coatings	-$6.51	-$6.51	-$6.51	-$6.51
Fire Resistive Coatings	-$0.76	-$0.76	-$0.76	-$0.76
Floor Coatings	$16.14	$18.03	$19.93	$26.24
Form-Release Compounds	$0.65	$0.65	$0.65	$0.65
Nonflat Coatings	$0.86	$0.86	$0.86	$0.86
Nonflat-High Gloss Coatings	$5.41	$5.41	$5.41	$5.41
Stains (Exterior/Dual)	$1.50	$1.50	$1.50	$1.50
Waterproofing Membranes	$2.19	$3.91	$5.64	$10.91
Overall Cost-Effectiveness	**$1.46**	**$1.66**	**$1.85**	**$2.45**

On the following pages, we present typical formulations for complying and non-complying products. As noted earlier, these formulations were developed based on survey data, product datasheets, and input from manufacturers. The formulations shown have an assumed 20% increase in resin prices for the future complying product. Staff used varies sources to determine the remaining raw material costs (Bloomberg, 2019; Plastics News, 2019a, 2019b; GDOT, 2019; Echemi, 2019; CARB, 2013; CARB 2007b).

Category	Aluminum Roof	Assumed Resin Cost Multiplier (RCM)	1.2

Physical Properties

	Typical Non-Compliant	Typical Compliant
Weight % VOC:	40%	2.5%
VOC Limit (g/l):	150	100
VOC Reg. for Sample Formulation (g/l):	400	100
Density (lbs/gallon):	8.0	9.0

Formulation and Cost Comparison

			Typical Non-compliant		Typical Compliant	
Component (A)	Unit Cost ($/lb) (B)	RCM (C)	Wt% (D)	Cost (B) X (D)	Wt% (E)	Cost (B) X (C) X (E)
Petroleum Aliphatic Hydrocarbon Solvent	$0.66		35.0%	$0.23	2.5%	$0.02
Petroleum Aromatic Hydrocarbon Solvent	$0.65		5.0%	$0.03		
Petroleum Asphalt	$0.25		40.0%	$0.10	15.0%	$0.04
Aluminum	$0.87		15.0%	$0.13	7.0%	$0.06
Non-volatile and Solids	$1.50		5.0%	$0.08	10.5%	$0.16
Water	$0.00				65.0%	$0.00
	SUM		100%		100%	

	Typical Non-compliant	Typical Compliant
Total Cost, $/Pound	$0.57	$0.28
% Cost Differential Relative to Current Product		-50.9%
Total Cost, $/Gallon	$4.56	$2.52
Total Cost Differential per Gallon Relative to Current Product		-$2.04

Assumptions:

(1) Cost of "Additives" Remains at $1.50 per pound
(2) Average unit size = 1 gallons
(3) RCM: Assumed Compliant Resin Cost Multiplier.
RCM = 1.0 unless otherwise specified.

Category	Building Envelope	Assumed Resin Cost Multiplier (RCM)	1.2

Physical Properties

	Typical Non-Compliant	Typical Compliant
Weight % VOC:	7%	1.5%
VOC Limit (g/l):	NA	50
VOC Reg. for Sample Formulation (g/l):	220	49
Density (lbs/gallon):	10.5	11.0

Formulation and Cost Comparison

			Typical Non-compliant		Typical Compliant	
Component (A)	Unit Cost ($/lb) (B)	RCM (C)	Wt% (D)	Cost (B) X (D)	Wt% (E)	Cost (B) X (C) X (E)
Water	$0.00		50.0%	$0.00	45.0%	$0.00
Glycol	$1.08		1.0%	$0.01		
Petroleum Hydrocarbon Solvent(s)	$0.66		5.0%	$0.03	0.5%	$0.00
Hydrocarbon Solvent (VOC)	$1.35		0.5%	$0.01	1.0%	$0.01
Non-volatile and Solids	$1.50		43.5%	$0.65	28.0%	$0.42
Acrylic Resin	$1.30	1.2			25.0%	$0.39
	SUM		100%		100%	

	Typical Non-compliant	Typical Compliant
Total Cost, $/Pound	$0.70	$0.82
% Cost Differential Relative to Current Product		17.1%
Total Cost, $/Gallon	$7.35	$9.02
Total Cost Differential per Gallon Relative to Current Product		$1.67

Assumptions:

(1) Cost of "Additives" Remains at $1.50 per pound
(2) Average unit size = 1 gallons
(3) RCM: Assumed Compliant Resin Cost Multiplier.
RCM = 1.0 unless otherwise specified.

Category	Dry Fog	Assumed Resin Cost Multiplier (RCM)	1.2

Physical Properties

	Typical Non-Compliant	Typical Compliant
Weight % VOC:	5%	1.0%
VOC Limit (g/l):	150	50
VOC Reg. for Sample Formulation (g/l):	132	33
Density (lbs/gallon):	12.0	11.0

Formulation and Cost Comparison

			Typical Non-compliant		Typical Compliant	
Component (A)	Unit Cost ($/lb) (B)	RCM (C)	Wt% (D)	Cost (B) X (D)	Wt% (E)	Cost (B) X (C) X (E)
Water	$0.00		35.5%	$0.00	46.0%	$0.00
2,2,4-Trimethyl-1,3-Pentanediol Isobutyrate (Texanol)	$0.91		1.0%	$0.01	0.5%	$0.00
Hydrocarbon Solvent (VOC)	$1.35		3.5%	$0.05	0.5%	$0.01
Non-volatile and Solids	$1.50		60.0%	$0.90	53.0%	$0.80
	SUM		100%		100%	

	Typical Non-compliant	Typical Compliant
Total Cost, $/Pound	$0.96	$0.81
% Cost Differential Relative to Current Product		-15.6%
Total Cost, $/Gallon	$11.52	$8.91
Total Cost Differential per Gallon Relative to Current Product		-$2.61

Assumptions:

(1) Cost of "Additives" Remains at $1.50 per pound
(2) Average unit size = 1 gallons
(3) RCM: Assumed Compliant Resin Cost Multiplier.
RCM = 1.0 unless otherwise specified.

Category **Fire Resistive** Assumed Resin Cost Multiplier (RCM) 1.2

Physical Properties

	Typical Non-Compliant	Typical Compliant
Weight % VOC:	25%	3.0%
VOC Limit (g/l):	350	150
VOC Reg. for Sample Formulation (g/l):	337	67
Density (lbs/gallon):	11.3	12.0

Formulation and Cost Comparison

Component (A)	Unit Cost ($/lb) (B)	RCM (C)	Typical Non-compliant Wt% (D)	Typical Non-compliant Cost (B) X (D)	Typical Compliant Wt% (E)	Typical Compliant Cost (B) X (C) X (E)
Hydrocarbon Solvent (VOC)	$1.35		25.0%	$0.34	3.0%	$0.04
Non-volatile and Solids	$1.50		75.0%	$1.13	72.0%	$1.08
Water	$0.00				25.0%	$0.00
	SUM		100%		100%	

	Typical Non-compliant	Typical Compliant
Total Cost, $/Pound	$1.47	$1.12
% Cost Differential Relative to Current Product		-23.8%
Total Cost, $/Gallon	$16.54	$13.44
Total Cost Differential per Gallon Relative to Current Product		-$3.10

Assumptions:

(1) Cost of "Additives" Remains at $1.50 per pound
(2) Average unit size = 1 gallons
(3) RCM: Assumed Compliant Resin Cost Multiplier.
RCM = 1.0 unless otherwise specified.

Category	**Floor**	Assumed Resin Cost Multiplier (RCM)	1.2

Physical Properties

	Typical Non-Compliant	Typical Compliant
Weight % VOC:	3%	1.5%
VOC Limit (g/l):	100	50
VOC Reg. for Sample Formulation (g/l):	95	48
Density (lbs/gallon):	11.0	10.0

Formulation and Cost Comparison

			Typical Non-compliant		Typical Compliant	
Component (A)	Unit Cost ($/lb) (B)	RCM (C)	Wt% (D)	Cost (B) X (D)	Wt% (E)	Cost (B) X (C) X (E)
Acrylic Resin	$1.30	1.2	23.0%	$0.30	25.0%	$0.39
Non-volatile and Solids	$1.50		30.0%	$0.45	21.0%	$0.32
Water	$0.00		44.0%	$0.00	52.5%	$0.00
Hydrocarbon Solvent (VOC)	$1.35		3.0%	$0.04	1.5%	$0.02
	SUM		100%		100%	

	Typical Non-compliant	Typical Compliant
Total Cost, $/Pound	$0.79	$0.73
% Cost Differential Relative to Current Product		-7.6%
Total Cost, $/Gallon	$8.69	$7.30
Total Cost Differential per Gallon Relative to Current Product		-$1.39

Assumptions:

(1) Cost of "Additives" Remains at $1.50 per pound
(2) Average unit size = 1 gallons
(3) RCM: Assumed Compliant Resin Cost Multiplier.
RCM = 1.0 unless otherwise specified.

Category	**Form Release**	Assumed Resin Cost Multiplier (RCM)	1.2

Physical Properties

	Typical Non-Compliant	Typical Compliant
Weight % VOC:	29%	10.0%
VOC Limit (g/l):	250	100
VOC Reg. for Sample Formulation (g/l):	243	87
Density (lbs/gallon):	7.0	7.3

Formulation and Cost Comparison

			Typical Non-compliant		Typical Compliant	
Component (A)	Unit Cost ($/lb) (B)	RCM (C)	Wt% (D)	Cost (B) X (D)	Wt% (E)	Cost (B) X (C) X (E)
Light Aliphatic Hydrocarbon Solvent	$0.66		17.0%	$0.11		
Medium Aliphatic Hydrocarbon Solvent	$0.96		10.0%	$0.10		
Petroleum Hydrocarbon Solvent(s)	$0.66				10.0%	$0.07
Hydrocarbon Solvent (VOC)	$1.35		2.0%	$0.03		
Non-volatile and Solids	$1.50		71.0%	$1.07	90.0%	$1.35
	SUM		100%		100%	

	Typical Non-compliant	Typical Compliant
Total Cost, $/Pound	$1.31	$1.42
% Cost Differential Relative to Current Product		8.4%
Total Cost, $/Gallon	$9.17	$10.30
Total Cost Differential per Gallon Relative to Current Product		$1.13

Assumptions:

(1) Cost of "Additives" Remains at $1.50 per pound
(2) Average unit size = 1 gallons
(3) RCM: Assumed Compliant Resin Cost Multiplier.
RCM = 1.0 unless otherwise specified.

Category	Nonflat	Assumed Resin Cost Multiplier (RCM)	1.2

Physical Properties

	Typical Non-Compliant	Typical Compliant
Weight % VOC:	4%	1.5%
VOC Limit (g/l):	100	50
VOC Reg. for Sample Formulation (g/l):	100	48
Density (lbs/gallon):	10.0	10.0

Formulation and Cost Comparison

			Typical Non-compliant		Typical Compliant	
Component (A)	Unit Cost ($/lb) (B)	RCM (C)	Wt% (D)	Cost (B) X (D)	Wt% (E)	Cost (B) X (C) X (E)
Glycol	$1.08		1.4%	$0.02	0.7%	$0.01
Glycol Ether	$1.50		0.5%	$0.01		
2,2,4-Trimethyl-1,3-Pentanediol Isobutyrate (Texanol)	$0.91		1.0%	$0.01		
Aggregated VOCs < 0.1%	$1.50		0.1%	$0.00	0.1%	$0.00
Hydrocarbon Solvent (VOC)	$1.35		1.0%	$0.01	0.7%	$0.01
Water	$0.00		48.0%	$0.00	52.0%	$0.00
Non-volatile and Solids	$1.50		48.0%	$0.72	46.5%	$0.70
	SUM		100%		100%	

	Typical Non-compliant	Typical Compliant
Total Cost, $/Pound	$0.77	$0.72
% Cost Differential Relative to Current Product		-6.5%
Total Cost, $/Gallon	$7.70	$7.20
Total Cost Differential per Gallon Relative to Current Product		-$0.50

Assumptions:

(1) Cost of "Additives" Remains at $1.50 per pound
(2) Average unit size = 1 gallons
(3) RCM: Assumed Compliant Resin Cost Multiplier.
RCM = 1.0 unless otherwise specified.

Category	Nonflat-High Gloss	Assumed Resin Cost Multiplier (RCM)	1.2

Physical Properties

	Typical Non-Compliant	Typical Compliant
Weight % VOC:	6%	1.5%
VOC Limit (g/l):	150	50
VOC Reg. for Sample Formulation (g/l):	149	48
Density (lbs/gallon):	9.5	10.0

Formulation and Cost Comparison

			Typical Non-compliant		Typical Compliant	
Component (A)	Unit Cost ($/lb) (B)	RCM (C)	Wt% (D)	Cost (B) X (D)	Wt% (E)	Cost (B) X (C) X (E)
Hydrocarbon Solvent (VOC)	$1.35		5.4%	$0.07	1.4%	$0.02
Aggregated VOCs < 0.1%	$1.50		0.1%	$0.00	0.1%	$0.00
Water	$0.00		50.0%	$0.00	52.0%	$0.00
Non-volatile and Solids	$1.50		44.5%	$0.67	46.5%	$0.70
	SUM		100%		100%	

	Typical Non-compliant	Typical Compliant
Total Cost, $/Pound	$0.74	$0.72
% Cost Differential Relative to Current Product		-2.7%
Total Cost, $/Gallon	$7.03	$7.20
Total Cost Differential per Gallon Relative to Current Product		$0.17

Assumptions:

(1) Cost of "Additives" Remains at $1.50 per pound
(2) Average unit size = 1 gallons
(3) RCM: Assumed Compliant Resin Cost Multiplier.
RCM = 1.0 unless otherwise specified.

Category	Stains (Exterior/Dual)	Assumed Resin Cost Multiplier (RCM)	1.2

Physical Properties

	Typical Non-Compliant	Typical Compliant
Weight % VOC:	60%	3.0%
VOC Limit (g/l):	NA	100
VOC Reg. for Sample Formulation (g/l):	539	87
Density (lbs/gallon):	7.5	10.0

Formulation and Cost Comparison

Component (A)	Unit Cost ($/lb) (B)	RCM (C)	Typical Non-compliant Wt% (D)	Typical Non-compliant Cost (B) X (D)	Typical Compliant Wt% (E)	Typical Compliant Cost (B) X (C) X (E)
Petroleum Aliphatic Hydrocarbon Solvent	$0.66		23.0%	$0.15		
Petroleum Aromatic Hydrocarbon Solvent	$0.65		1.5%	$0.01		
Hydrocarbon Solvent (VOC)	$1.35		2.5%	$0.03	0.5%	$0.01
Glycol	$1.08				2.0%	$0.02
2,2,4-Trimethyl-1,3-Pentanediol Isobutyrate (Texanol)	$0.91				0.5%	$0.00
Non-volatile and Solids	$1.50		73.0%	$1.10	48.0%	$0.72
Water	$0.00				49.0%	$0.00
	SUM		100%		100%	

	Typical Non-compliant	Typical Compliant
Total Cost, $/Pound	$1.29	$0.75
% Cost Differential Relative to Current Product		-41.9%
Total Cost, $/Gallon	$9.68	$7.50
Total Cost Differential per Gallon Relative to Current Product		-$2.18

Assumptions:

(1) Cost of "Additives" Remains at $1.50 per pound
(2) Average unit size = 1 gallons
(3) RCM: Assumed Compliant Resin Cost Multiplier.
RCM = 1.0 unless otherwise specified.

Category	**Waterproofing Membrane**	Assumed Resin Cost Multiplier (RCM)	1.2

Physical Properties

	Typical Non-Compliant	Typical Compliant
Weight % VOC:	20%	9.0%
VOC Limit (g/l):	250	100
VOC Reg. for Sample Formulation (g/l):	244	97
Density (lbs/gallon):	10.2	9.0

Formulation and Cost Comparison

			Typical Non-compliant		Typical Compliant	
Component (A)	Unit Cost ($/lb) (B)	RCM (C)	Wt% (D)	Cost (B) X (D)	Wt% (E)	Cost (B) X (C) X (E)
Petroleum Hydrocarbon Solvent(s)	$0.66		20.0%	$0.13	7.0%	$0.05
Hydrocarbon Solvent (VOC)	$1.35				2.0%	$0.03
Polyurethane Resin	$3.06	1.2	40.0%	$1.22	60.0%	$2.20
Non-volatile and Solids	$1.50		40.0%	$0.60	31.0%	$0.47
	SUM		100%		100%	

	Typical Non-compliant	Typical Compliant
Total Cost, $/Pound	$1.95	$2.75
% Cost Differential Relative to Current Product		41.0%
Total Cost, $/Gallon	$19.89	$24.75
Total Cost Differential per Gallon Relative to Current Product		$4.86

Assumptions:

(1) Cost of "Additives" Remains at $1.50 per pound
(2) Average unit size = 1 gallons
(3) RCM: Assumed Compliant Resin Cost Multiplier.
RCM = 1.0 unless otherwise specified.

REFERENCES

Bloomberg. Precious and Industrial Metals – 3Mo Aluminum. March 2019: https://www.bloomberg.com/markets/commodities/futures/metals. (Bloomberg, 2019)

California Air Resources Board. Technical Support Document. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products. (a.k.a. Phase I Consumer Products Regulation). August 1990. (CARB, 1990)

California Air Resources Board. Technical Support Document. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products – Phase II. October 1991. (CARB, 1991)

California Air Resources Board. Executive Summary and Technical Support Document. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation. (a.k.a. Mid-Term Measures I). June 6, 1997. (CARB, 1997a)

California Air Resources Board. Introduction and Executive Summary and Technical Support Document. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation. (a.k.a. Mid-Term Measures II). September 10, 1999. (CARB, 1999)

California Air Resources Board. Staff Report for the Proposed Suggested Control Measure Architectural Coatings. June 2000. (CARB, 2000b)

California Air Resources Board. Initial Statement of Reasons for the Proposed Amendments to the California Aerosol Coatings Products, Antiperspirants and Deodorants, and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measure for Para-Dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products. May 7, 2004. (CARB, 2004)

California Air Resources Board. Staff Report for the Proposed Suggested Control Measure for Automotive Coatings. October 2005. (CARB, 2005b)

California Air Resources Board. Staff Report For Proposed Amendments to the Suggested Control Measure For Architectural Coatings. September 2007. (CARB, 2007a)

California Air Resources Board. Technical Support Document For Proposed Amendments to the Suggested Control Measure For Architectural Coatings. September 2007. (CARB, 2007b)

California Air Resources Board. Staff Report: Initial Statement of Reasons for Proposed Rulemaking. Proposed Amendments to the Antiperspirants and Deodorants Regulations, the Consumer Products Regulation, the Tables of MIR Values, Test Method 310, and Proposed Repeal of the Hairspray Credit Program. August 7, 2013. (CARB, 2013).

California Environmental Protection Agency, Memorandum from Peter M. Rooney, Undersecretary, to Cal/EPA Executive Officers and Directors. Economic Analysis Requirements for the Adoption of Administrative Regulations. Appendix C (Cal/EPA Guidelines for Evaluation Alternatives to Proposed Major Regulations). December 6, 1996. (Cal/EPA, 1996)

Echemi. Texanol. March 2019: http://www.echemi.com/searchGoods/pd20160629114300155-c-12.html. (Echemi, 2019).

Georgia Department of Transportation. Asphalt and Fuel Index – Asphalt Cement Price Index. March 2019: http://www.dot.ga.gov/PS/Materials/AsphaltFuelIndex. (GDOT, 2019).

Peters, M.S. and Timmerhaus, K.D. Plant Design and Economics for Chemical Engineers. 3rd Edition, McGraw-Hill Book Company, pp. 159-162. 1980. (Peters and Timmerhaus, 1980)

Plastic News. Commodity Thermosplastics – Current Resin Pricing. March 2019: https://www.plasticsnews.com/resin/commodity-thermoplastics/current-pricing. (Plastic News, 2019a).

Plastic News. Engineering Thermosplastics – Current Resin Pricing. March 2019: https://www.plasticsnews.com/resin/engineering-thermoplastics/current-pricing. (Plastic News, 2019b).

APPENDIX H:

2014 ARCHITECTURAL COATINGS SURVEY DATA SUMMARY

Data Summary - 2014 Architectural Coatings Survey
Table H-1: Number of Companies by Category

Coating Category	Total Sales (Gallons)	No. of Companies
Aluminum Roof	208,760	7
Basement Specialty Coatings	PD	PD
Bituminous Roof Coatings	2,106,442	7
Bituminous Roof Primers	34,758	9
Bond Breakers	PD	PD
Building Envelope Coatings	79,224	9
Concrete Curing Compounds	1,316,050	15
Concrete/Masonry Sealer	2,819,790	69
Driveway Sealer	320,652	4
Dry Fog Coatings	362,987	7
Faux Finishing Coatings	178,824	15
Fire Resistive Coatings	16,403	4
Flat Coatings	27,082,572	32
Floor Coatings	783,426	33
Form-Release Compounds	219,983	6
Graphic Arts Coatings (Sign Paints)	1,707	4
High Temperature Coatings	10,890	9
Industrial Maintenance Coatings	1,883,610	40
Low Solids Coatings	456,692	18
Magnesite Cement Coatings	PD	PD
Mastic Texture Coatings	56,730	11
Metallic Pigmented Coatings	23,148	13
Multi-Color Coatings	PD	PD
Nonflat Coatings	30,697,959	26
Nonflat-High Gloss Coatings	983,489	21
Primers, Sealers, and Undercoaters	9,703,314	55
Reactive Penetrating Sealer	24,130	7
Recycled	PD	PD
Roof	2,916,960	23
Rust Preventative	583,638	18
Shellacs (Clear)	PD	PD
Shellacs (Opaque)	PD	PD
Specialty Primers, Sealers, and Undercoaters	310,438	10
Stains (Exterior/Dual)	1,413,729	24
Stains (Interior)	623,849	18
Stone Consolidant	PD	PD
Swimming Pool Coatings	36,451	4
Traffic Marking	1,040,073	17
Tub and Tile Refinish	PD	PD
Waterproofing Membranes	487,163	4
Wood Coatings	1,822,249	36
Wood Preservatives	89,422	7
Zinc-Rich Primer	35,241	9
Total:	**89,071,627**	**150**

Notes: 1. PD is Protected Data. Fewer than four companies reported sales.

Data Summary - 2014 Architectural Coatings Survey
Table H-2: Sales by Category

SCM Category	2013 Sales Including Quarts (Gallons)			% SB	% WB	% Int	% Ext	% Dual
	Total	Solvent-borne	Water-borne					
Aluminum Roof	208,760	62,549	146,211	30	70	0	100	0
Basement Specialty Coatings	PD	PD	PD	PD	PD	PD	PD	PD
Bituminous Roof Coatings	2,106,442	PD	PD	PD	PD	0	100	0
Bituminous Roof Primers	34,758	15,538	19,220	45	55	0	100	0
Bond Breakers	PD	PD	PD	PD	PD	PD	PD	PD
Building Envelope Coatings	79,224	PD	PD	PD	PD	1	62	37
Concrete Curing Compounds	1,316,050	3,849	1,312,201	0	100	0	57	43
Concrete/Masonry Sealer	2,819,790	504,986	2,314,804	18	82	3	48	48
Driveway Sealer	320,652	-	320,652	0	100	0	100	0
Dry Fog Coatings	362,987	PD	PD	PD	PD	99	1	0
Faux Finishing Coatings	178,824	9,261	169,563	5	95	62	33	5
Fire Resistive Coatings	16,403	PD	PD	PD	PD	37	1	61
Flat Coatings	27,082,572	PD	PD	PD	PD	53	38	9
Floor Coatings	783,426	54,087	729,339	7	93	10	5	85
Form-Release Compounds	219,983	97,383	122,600	44	56	0	41	59
Graphic Arts Coatings (Sign Paints)	1,707	PD	PD	PD	PD	30	0	70
High Temperature Coatings	10,890	PD	PD	PD	PD	4	33	64
Industrial Maintenance Coatings	1,883,610	1,145,007	735,312	61	39	4	57	39
Low Solids Coatings	456,692	15,618	441,074	3	97	5	74	21
Magnesite Cement Coatings	PD	PD	PD	PD	PD	PD	PD	PD
Mastic Texture Coatings	56,730	14,440	42,289	25	75	0	55	44
Metallic Pigmented Coatings	23,148	20,609	2,539	89	11	9	7	84
Multi-Color Coatings	PD	PD	PD	PD	PD	PD	PD	PD
Nonflat Coatings	30,697,959	105,273	30,592,686	0	100	69	22	10
Nonflat-High Gloss Coatings	983,489	36,724	946,765	4	96	15	14	71
Primers, Sealers, and Undercoaters	9,703,314	114,101	9,589,213	1	99	49	7	44
Reactive Penetrating Sealer	24,130	4,564	19,566	19	81	0	4	96
Recycled	PD	PD	PD	PD	PD	PD	PD	PD
Roof	2,916,960	96,609	2,820,352	3	97	0	90	10
Rust Preventative	583,638	498,535	85,103	85	15	0	5	95
Shellacs (Clear)	PD	PD	PD	PD	PD	PD	PD	PD
Shellacs (Opaque)	PD	PD	PD	PD	PD	PD	PD	PD
Specialty Primers, Sealers, and Undercoaters	310,438	138,645	171,794	45	55	19	2	80
Stains (Exterior/Dual)	1,413,729	304,754	1,108,975	22	78	0	94	6
Stains (Interior)	623,849	455,012	168,836	73	27	100	0	0

SCM Category	2013 Sales Including Quarts (Gallons)			% SB	% WB	% Int	% Ext	% Dual
	Total	Solvent-borne	Water-borne					
Stone Consolidant	PD	PD	PD	PD	PD	PD	PD	PD
Swimming Pool Coatings	36,451	18,344	18,107	50	50	0	62	38
Traffic Marking	1,040,073	67,424	972,650	6	94	1	91	8
Tub and Tile Refinish	PD	PD	PD	PD	PD	PD	PD	PD
Waterproofing Membranes	487,163	PD	PD	PD	PD	0	38	62
Wood Coatings	1,822,249	1,049,534	772,715	58	42	67	28	5
Wood Preservatives	89,422	PD	PD	PD	PD	0	100	0
Zinc-Rich Primer	35,241	32,469	2,772	92	8	4	52	44
Total:	**89,071,627**	**5,701,299**	**83,367,037**	**6%**	**94%**	**48%**	**34%**	**18%**

Notes: 1. PD is Protected Data. Fewer than four companies reported sales.

2. SB is Solvent-borne, WB is Water-borne, Int is Interior, Ext is Exterior and Dual is DualExposure.

Data Summary - 2014 Architectural Coatings Survey
Table H-3: Sales By Category Based on Container Size (Gallons)

Coating Category	Total (Including Quarts)	Small Containers (≤ 1 quart)	Large Containers (> quart)	% Small Containers
Aluminum Roof	208,760	PD	PD	PD
Basement Specialty Coatings	PD	PD	PD	PD
Bituminous Roof Coatings	2,106,442	PD	PD	PD
Bituminous Roof Primers	34,758	PD	PD	PD
Bond Breakers	PD	PD	PD	PD
Building Envelope Coatings	79,224	PD	PD	PD
Concrete Curing Compounds	1,316,050	PD	PD	PD
Concrete/Masonry Sealer	2,819,790	209,498	2,610,292	7%
Driveway Sealer	320,652	-	320,652	0%
Dry Fog Coatings	362,987	-	362,987	0%
Faux Finishing Coatings	178,824	46,398	132,427	26%
Fire Resistive Coatings	16,403	-	16,403	0%
Flat Coatings	27,082,572	723,582	26,358,990	3%
Floor Coatings	783,426	26,998	756,428	3%
Form-Release Compounds	219,983	-	219,983	0%
Graphic Arts Coatings (Sign Paints)	1,707	PD	PD	PD
High Temperature Coatings	10,890	4,135	6,755	38%
Industrial Maintenance Coatings	1,883,610	17,253	1,866,358	1%
Low Solids Coatings	456,692	53,142	403,550	12%
Magnesite Cement Coatings	PD	PD	PD	PD
Mastic Texture Coatings	56,730	PD	PD	PD
Metallic Pigmented Coatings	23,148	8,237	14,911	36%
Multi-Color Coatings	PD	PD	PD	PD
Nonflat Coatings	30,697,959	1,724,345	28,973,615	6%
Nonflat-High Gloss Coatings	983,489	89,142	894,347	9%
Primers, Sealers, and Undercoaters	9,703,314	271,576	9,431,738	3%
Reactive Penetrating Sealer	24,130	PD	PD	PD
Recycled	PD	PD	PD	PD
Roof	2,916,960	145	2,916,816	0%
Rust Preventative	583,638	193,295	390,342	33%
Shellacs (Clear)	PD	PD	PD	PD
Shellacs (Opaque)	PD	PD	PD	PD
Specialty Primers, Sealers, and Undercoaters	310,438	102,647	207,791	33%
Stains (Exterior/Dual)	1,413,729	137,592	1,276,137	10%
Stains (Interior)	623,849	444,955	178,894	71%
Stone Consolidant	PD	PD	PD	PD
Swimming Pool Coatings	36,451	PD	PD	PD
Traffic Marking	1,040,073	PD	PD	PD
Tub and Tile Refinish	PD	PD	PD	PD
Waterproofing Membranes	487,163	PD	PD	PD
Wood Coatings	1,822,249	411,980	1,410,269	23%
Wood Preservatives	89,422	PD	PD	PD
Zinc-Rich Primer	35,241	5,100	30,142	14%
Total:	**89,071,627**	**4,511,501**	**84,560,126**	**5%**

Notes: 1. PD is Protected Data. Fewer than four companies reported sales.

Data Summary - 2014 Architectural Coatings Survey
Table H-4: VOC Emissions By Container Size (Tons/Day)

Coating Category	Total (Including Quarts)	Small Containers (≤ 1 quart)		Large Containers (> 1 quart)	
		SB	WB	SB	WB
Aluminum Roof	0.31	PD	PD	PD	PD
Basement Specialty Coatings	PD	PD	PD	PD	PD
Bituminous Roof Coatings	0.07	PD	PD	PD	PD
Bituminous Roof Primers	0.1	PD	PD	PD	PD
Bond Breakers	PD	PD	PD	PD	PD
Building Envelope Coatings	0.01	PD	PD	PD	PD
Concrete Curing Compounds	0.9	PD	PD	PD	PD
Concrete/Masonry Sealer	1.45	0.52	0.02	0.43	0.48
Driveway Sealer	0.02	0	0	0	0.02
Dry Fog Coatings	0.11	0	0	0.02	0.09
Faux Finishing Coatings	0.13	0.04	0.03	0	0.06
Fire Resistive Coatings	0.02	0	0	0.02	0
Flat Coatings	3.65	0.04	0.1	0.01	3.5
Floor Coatings	0.29	0.09	0	0.03	0.17
Form-Release Compounds	0.21	0	0	0.17	0.04
Graphic Arts Coatings (Sign Paints)	0	PD	PD	PD	PD
High Temperature Coatings	0.04	0.02	0	0.02	0
Industrial Maintenance Coatings	2.12	0.01	0	1.77	0.34
Low Solids Coatings	0.37	0.11	0.01	0	0.25
Magnesite Cement Coatings	PD	PD	PD	PD	PD
Mastic Texture Coatings	0.07	PD	PD	PD	PD
Metallic Pigmented Coatings	0.1	0.04	0	0.06	0
Multi-Color Coatings	PD	PD	PD	PD	PD
Nonflat Coatings	4.62	0.29	0.29	0.15	3.89
Nonflat-High Gloss Coatings	0.41	0.08	0.02	0.08	0.23
Primers, Sealers, and Undercoaters	2.39	0.25	0.06	0.23	1.85
Reactive Penetrating Sealer	0.05	PD	PD	PD	PD
Recycled	PD	PD	PD	PD	PD
Roof	0.62	0	0	0.08	0.54
Rust Preventative	1.41	0.89	0	0.5	0.02
Shellacs (Clear)	PD	PD	PD	PD	PD
Shellacs (Opaque)	PD	PD	PD	PD	PD
Specialty Primers, Sealers, and Undercoaters	0.6	0.45	0	0.13	0.02
Stains (Exterior/Dual)	1.13	0.1	0.06	0.78	0.19
Stains (Interior)	2.68	2.48	0.02	0.14	0.04
Stone Consolidant	PD	PD	PD	PD	PD
Swimming Pool Coatings	0.08	PD	PD	PD	PD
Traffic Marking	0.68	PD	PD	PD	PD
Tub and Tile Refinish	PD	PD	PD	PD	PD
Waterproofing Membranes	0.55	PD	PD	PD	PD
Wood Coatings	3.43	1.55	0.09	1.38	0.41
Wood Preservatives	0.34	PD	PD	PD	PD
Zinc-Rich Primer	0.1	0.02	0	0.08	0
Total:	**30.45**	**7.18**	**0.7**	**8.63**	**13.94**
% of Total Emissions		**24%**	**2%**	**28%**	**46%**

Notes:
1. PD is Protected Data. Fewer than four companies reported sales.
2. SB is Solvent-borne, WB is Water-borne.

Data Summary - 2014 Architectural Coatings Survey
Table H-5: Sales-Weighted-Average VOC Regulatory (Including Quarts)

Coating Category	SWA VOC REGULATORY (g/l)					
	All	SB	WB	Int	Ext	Dual
Aluminum Roof	146	399	38	212	146	0
Basement Specialty Coatings	PD	PD	PD	PD	PD	PD
Bituminous Roof Coatings	4	PD	PD	0	4	0
Bituminous Roof Primers	241	316	181	0	241	0
Bond Breakers	PD	PD	PD	PD	PD	PD
Building Envelope Coatings	27	PD	PD	86	43	1
Concrete Curing Compounds	124	186	124	0	150	91
Concrete/Masonry Sealer	93	198	70	116	49	134
Driveway Sealer	12	0	12	0	12	53
Dry Fog Coatings	58	PD	PD	58	56	85
Faux Finishing Coatings	145	636	118	187	44	280
Fire Resistive Coatings	132	PD	PD	9	36	209
Flat Coatings	32	PD	PD	24	40	41
Floor Coatings	59	197	49	165	49	48
Form-Release Compounds	117	156	86	0	147	96
Graphic Arts Coatings (Sign Paints)	350	PD	PD	422	0	320
High Temperature Coatings	406	PD	PD	258	402	416
Industrial Maintenance Coatings	125	145	94	35	132	125
Low Solids Coatings	177	615	161	513	191	50
Magnesite Cement Coatings	PD	PD	PD	PD	PD	PD
Mastic Texture Coatings	104	307	34	34	124	79
Metallic Pigmented Coatings	421	458	125	118	360	457
Multi-Color Coatings	PD	PD	PD	PD	PD	PD
Nonflat Coatings	33	366	32	26	45	59
Nonflat-High Gloss Coatings	71	391	58	84	93	64
Primers, Sealers, and Undercoaters	51	366	48	36	60	67
Reactive Penetrating Sealer	207	267	193	0	251	205
Recycled	PD	PD	PD	PD	PD	PD
Roof	36	79	35	0	39	14
Rust Preventative	232	264	50	388	178	235
Shellacs (Clear)	PD	PD	PD	PD	PD	PD
Shellacs (Opaque)	PD	PD	PD	PD	PD	PD
Specialty Primers, Sealers, and Undercoaters	180	373	25	206	211	174
Stains (Exterior/Dual)	100	252	58	0	100	90
Stains (Interior)	392	506	83	392	0	0
Stone Consolidant	PD	PD	PD	PD	PD	PD
Swimming Pool Coatings	264	294	233	0	281	236
Traffic Marking	89	72	91	25	91	76
Tub and Tile Refinish	PD	PD	PD	PD	PD	PD
Waterproofing Membranes	99	PD	PD	0	116	88
Wood Coatings	253	321	160	313	96	304
Wood Preservatives	374	PD	PD	0	374	240
Zinc-Rich Primer	264	285	17	93	275	265

Notes:
1. PD is Protected Data. Fewer than four companies reported sales.
2. SB is Solvent-borne, WB is Water-borne, Int is Interior, Ext is Exterior and Dual is Dual Exposure.
3. For Low Solids coatings, VOC Regulatory equals VOC Actual.

Data Summary - 2014 Architectural Coatings Survey
Table H-6: Sales-Weighted-Average VOC Actual (Including Quarts)

Coating Category	SWA VOC ACTUAL(g/l)					
	All	SB	WB	Int	Ext	Dual
Aluminum Roof	128	399	12	33	128	0
Basement Specialty Coatings	PD	PD	PD	PD	PD	PD
Bituminous Roof Coatings	3	PD	PD	0	3	0
Bituminous Roof Primers	234	316	168	0	234	0
Bond Breakers	PD	PD	PD	PD	PD	PD
Building Envelope Coatings	14	PD	PD	26	23	1
Concrete Curing Compounds	60	119	60	0	74	41
Concrete/Masonry Sealer	45	165	19	27	32	59
Driveway Sealer	4	0	4	0	4	23
Dry Fog Coatings	26	PD	PD	26	24	39
Faux Finishing Coatings	60	392	42	72	22	161
Fire Resistive Coatings	130	PD	PD	5	20	209
Flat Coatings	12	PD	PD	8	16	16
Floor Coatings	33	197	20	119	21	23
Form-Release Compounds	86	156	30	0	85	86
Graphic Arts Coatings (Sign Paints)	320	PD	PD	422	0	276
High Temperature Coatings	370	PD	PD	225	319	404
Industrial Maintenance Coatings	99	137	40	19	98	109
Low Solids Coatings	69	615	50	431	56	33
Magnesite Cement Coatings	PD	PD	PD	PD	PD	PD
Mastic Texture Coatings	93	307	20	34	114	67
Metallic Pigmented Coatings	411	457	36	30	351	455
Multi-Color Coatings	PD	PD	PD	PD	PD	PD
Nonflat Coatings	13	365	12	11	17	23
Nonflat-High Gloss Coatings	37	390	23	44	39	35
Primers, Sealers, and Undercoaters	22	363	17	13	33	29
Reactive Penetrating Sealer	193	267	176	0	251	190
Recycled	PD	PD	PD	PD	PD	PD
Roof	19	76	17	0	20	10
Rust Preventative	211	244	21	387	167	214
Shellacs (Clear)	PD	PD	PD	PD	PD	PD
Shellacs (Opaque)	PD	PD	PD	PD	PD	PD
Specialty Primers, Sealers, and Undercoaters	168	365	10	195	209	161
Stains (Exterior/Dual)	69	251	19	0	71	43
Stains (Interior)	376	504	31	376	0	0
Stone Consolidant	PD	PD	PD	PD	PD	PD
Swimming Pool Coatings	204	293	114	0	253	125
Traffic Marking	57	42	58	21	59	44
Tub and Tile Refinish	PD	PD	PD	PD	PD	PD
Waterproofing Membranes	98	PD	PD	0	116	87
Wood Coatings	165	244	57	200	70	218
Wood Preservatives	337	PD	PD	0	337	240
Zinc-Rich Primer	258	279	13	66	272	257

Notes:
1. PD is Protected Data. Fewer than four companies reported sales.
2. SB is Solvent-borne, WB is Water-borne, Int is Interior, Ext is Exterior and Dual is Dual Exposure.

Data Summary - 2014 Architectural Coatings Survey
Table H-7: Complying Market Share - 2007 SCM Limits (Large Containers Only)

Coating Category	VOC Limit (g/l)	SWA VOC Reg (g/l)	Total No. of Products	No. of Complying Products	% of Complying Products	Total Sales (Gallons)	Sales of Complying Products (Gallons)	% of Complying Sales
Aluminum Roof	400	146	21	16	76	208,747	194,461	93
Basement Specialty Coatings	PD	PD	PD	PD	PD	PD	PD	PD
Bituminous Roof Coatings	50	4	22	16	73	2,106,408	2,088,887	99
Bituminous Roof Primers	350	241	15	13	87	34,739	32,717	94
Bond Breakers	PD	PD	PD	PD	PD	PD	PD	PD
Building Envelope Coatings	880	27	20	20	100	79,223	79,223	100
Concrete Curing Compounds	350	124	107	92	86	1,315,957	1,296,168	99
Concrete/Masonry Sealer	100	75	795	527	66	2,610,292	2,202,134	84
Driveway Sealer	50	12	16	15	94	320,652	319,832	100
Dry Fog Coatings	150	58	56	48	86	362,987	355,148	98
Faux Finishing Coatings	350	106	403	317	79	132,427	132,346	100
Fire Resistive Coatings	350	132	10	10	100	16,403	16,403	100
Flat Coatings	50	31	2,539	2,320	91	26,358,990	25,358,158	96
Floor Coatings	100	49	514	343	67	756,428	740,440	98
Form-Release Compounds	250	117	25	13	52	219,983	189,139	86
Graphic Arts Coatings (Sign Paints)	500	334	105	105	100	974	974	100
High Temperature Coatings	420	351	76	66	87	6,755	6,039	89
Industrial Maintenance Coatings	250	125	3,168	2,490	79	1,866,358	1,676,832	90
Low Solids Coatings	120	174	152	101	66	403,550	223,517	55
Magnesite Cement Coatings	PD	PD	PD	PD	PD	PD	PD	PD
Mastic Texture Coatings	100	100	34	24	71	54,442	41,860	77
Metallic Pigmented Coatings	500	396	95	94	99	14,911	14,902	100
Multi-Color Coatings	PD	PD	PD	PD	PD	PD	PD	PD
Nonflat Coatings	100	32	3,842	3,285	86	28,973,615	28,391,614	98
Nonflat-High Gloss Coatings	150	65	539	330	61	894,347	831,533	93
Primers, Sealers, and Undercoaters	100	49	943	717	76	9,431,738	9,118,147	97
Reactive Penetrating Sealer	350	204	22	18	82	23,852	23,609	99
Recycled	PD	PD	PD	PD	PD	PD	PD	PD
Roof	50	36	558	467	84	2,916,816	2,779,781	95
Rust Preventative	250	147	357	57	16	390,342	303,046	78

Coating Category	VOC Limit (g/l)	SWA VOC Reg (g/l)	Total No. of Products	No. of Complying Products	% of Complying Products	Total Sales (Gallons)	Sales of Complying Products (Gallons)	% of Complying Sales
Shellacs (Clear)	PD	PD	PD	PD	PD	PD	PD	PD
Shellacs (Opaque)	PD	PD	PD	PD	PD	PD	PD	PD
Specialty Primers, Sealers, and Undercoaters	100	77	59	16	27	207,791	174,597	84
Stains (Exterior/Dual)	250	93	971	714	74	1,276,137	1,226,301	96
Stains (Interior)	250	124	1,020	249	24	178,894	156,861	88
Stone Consolidant	PD	PD	PD	PD	PD	PD	PD	PD
Swimming Pool Coatings	340	262	79	74	94	33,664	33,038	98
Traffic Marking	100	89	294	278	95	1,038,631	1,032,699	99
Tub and Tile Refinish	PD	PD	PD	PD	PD	PD	PD	PD
Waterproofing Membranes	250	99	80	76	95	485,497	448,514	92
Wood Coatings	275	213	1,509	900	60	1,410,269	1,205,208	85
Wood Preservatives	350	374	59	32	54	85,017	29,568	35
Zinc-Rich Primer	340	248	51	43	84	30,142	29,512	98
		Total:	**18,695**	**14,017**	**75%**	**84,560,126**	**81,057,481**	**96%**

Notes:
1. PD is Protected Data. Fewer than four companies reported sales.

Data Summary - 2014 Architectural Coatings Survey
Table H-8: Small Containers Summary (≤ 1 quart)

Coating Category	Sales (Gallons)	VOC Emissions (Tons/Day)	SWA VOC Regulatory	SWA VOC Actual
Aluminum Roof	13	0	301	301
Basement Specialty Coatings	PD	PD	PD	PD
Bituminous Roof Coatings	34	0	197	197
Bituminous Roof Primers	19	0	249	160
Bond Breakers	PD	PD	PD	PD
Building Envelope Coatings	1	0	86	28
Concrete Curing Compounds	93	0	56	56
Concrete/Masonry Sealer	209,498	1	313	225
Driveway Sealer	0	0	0	0
Dry Fog Coatings	0	0	0	0
Faux Finishing Coatings	46,398	0	257	125
Fire Resistive Coatings	0	0	0	0
Flat Coatings	723,582	0	39	17
Floor Coatings	26,998	0	332	297
Form-Release Compounds	0	0	0	0
Graphic Arts Coatings (Sign Paints)	732	0	372	348
High Temperature Coatings	4,135	0	495	494
Industrial Maintenance Coatings	17,253	0	104	84
Low Solids Coatings	53,142	0	195	183
Magnesite Cement Coatings	PD	PD	PD	PD
Mastic Texture Coatings	2,288	0	195	195
Metallic Pigmented Coatings	8,237	0	467	463
Multi-Color Coatings	PD	PD	PD	PD
Nonflat Coatings	1,724,345	1	56	29
Nonflat-High Gloss Coatings	89,142	0	134	102
Primers, Sealers, and Undercoaters	271,576	0	133	100
Reactive Penetrating Sealer	278	0	448	448
Recycled	PD	PD	PD	PD
Roof	145	0	74	70
Rust Preventative	193,295	1	405	404
Shellacs (Clear)	PD	PD	PD	PD
Shellacs (Opaque)	PD	PD	PD	PD
Specialty Primers, Sealers, and Undercoaters	102,647	0	390	381
Stains (Exterior/Dual)	137,592	0	161	96
Stains (Interior)	444,955	3	499	491

Coating Category	Sales (Gallons)	VOC Emissions (Tons/Day)	SWA VOC Regulatory	SWA VOC Actual
Stone Consolidant	PD	PD	PD	PD
Swimming Pool Coatings	2,787	0	292	277
Traffic Marking	1,442	0	39	30
Tub and Tile Refinish	PD	PD	PD	PD
Waterproofing Membranes	1,666	0	0	0
Wood Coatings	411,980	2	389	349
Wood Preservatives	4,405	0	363	265
Zinc-Rich Primer	5,100	0	359	343
Total:	**4,511,501**	7.9		

Notes:

1. PD is Protected Data. Fewer than four companies reported sales.

Data Summary - 2014 Architectural Coatings Survey
Table H-9: Volume Percent for Each Substrate Type (Large Containers Only)

				Concrete, Stone, Masonry, etc.							Metal			Wood					
Substrate Name	Substrate Not Specified	Acoustical Materials	Asphalt	All Concrete	Brick	Cinder Block, Concrete Block	Stone	Stucco	Tilt up/ Poured Concrete	Drywall/ Plaster	All Metal	Ferrous	Non-ferrous	All Wood	Not painted, Smooth	Not painted, Rough	Painted or Stained	Plywood	Other
Aluminum Roof																			
0-50 g/l	-	-	50%	-	-	-	-	-	-	-	29%	-	21%	-	-	-	-	-	-
51-100 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
201-250 g/l	-	-	-	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	50%	-
251-300 g/l	-	-	20%	20%	20%	20%	-	-	-	-	20%	-	-	-	-	-	-	-	-
351-400 g/l	-	-	48%	3%	-	-	-	-	-	-	18%	-	31%	-	-	-	-	-	-
401-450 g/l	-	-	50%	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	-
Basement Specialty Coatings																			
51-100 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
101-150 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
351-400 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Bituminous Roof Coatings																			
0-50 g/l	-	-	22%	-	-	-	-	-	-	-	-	-	17%	-	-	-	-	-	61%
151-200 g/l	-	-	21%	21%	19%	19%	-	-	-	-	21%	-	-	-	-	-	-	-	-
201-250 g/l	-	-	41%	14%	14%	14%	-	-	-	-	14%	-	1%	-	-	-	-	-	-
251-300 g/l	-	-	20%	20%	20%	20%	-	-	-	-	20%	-	-	-	-	-	-	-	-
Bituminous Roof Primers																			
0-50 g/l	-	-	-	33%	-	-	-	-	-	-	33%	-	-	33%	-	-	-	-	-
201-250 g/l	-	-	50%	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
251-300 g/l	-	-	33%	33%	-	-	-	-	-	-	33%	-	-	-	-	-	-	-	-
301-350 g/l	-	-	42%	19%	-	1%	-	-	-	-	18%	-	19%	-	-	-	-	-	-
401-450 g/l	-	-	-	33%	-	-	-	-	-	-	33%	-	-	33%	-	-	-	-	-
51-100 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
551-600 g/l	-	-	-	33%	-	-	-	-	-	-	33%	-	-	33%	-	-	-	-	-
Bond Breakers																			
51-100 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
651-700 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Building Envelope Coatings																			
0-50 g/l	-	-	-	54%	-	11%	8%	-	3%	-	11%	-	-	12%	-	-	-	-	-
51-100 g/l	-	2%	-	9%	-	-	-	-	-	1%	-	-	-	4%	-	-	-	-	85%
101-150 g/l	-	-	-	20%	-	-	-	-	-	20%	-	-	-	-	20%	20%	-	20%	-
151-200 g/l	-	-	-	50%	-	-	-	-	-	-	-	-	-	50%	-	-	-	-	-
Concrete Curing Compounds																			
0-50 g/l	-	-	-	99%	-	-	-	-	1%	-	-	-	-	-	-	-	-	-	-
51-100 g/l	-	-	-	63%	-	-	-	-	37%	-	-	-	-	-	-	-	-	-	-
101-150 g/l	-	-	-	4%	-	-	-	-	96%	-	-	-	-	-	-	-	-	-	-
151-200 g/l	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	86%	-	-	-	-	14%	-	-	-	-	-	-	-	-	-	-
251-300 g/l	-	-	-	99%	-	-	-	-	1%	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351-400 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Substrate Name	Substrate Not Specified	Acoustical Materials	Asphalt	Concrete, Stone, Masonry, etc.						Drywall/ Plaster	Metal			Wood					Other
				All Concrete	Brick	Cinder Block, Concrete Block	Stone	Stucco	Tilt up/ Poured Concrete		All Metal	Ferrous	Non-ferrous	All Wood	Not painted, Smooth	Not painted, Rough	Painted or Stained	Plywood	
401-450 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-
601-650 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
651-700 g/l	-	-	-	36%	-	-	-	-	64%	-	-	-	-	-	-	-	-	-	-
700 g/l +	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Concrete/Masonry Sealer																			
0-50 g/l	-	-	17%	55%	1%	11%	1%	1%	12%	-	1%	-	-	1%	-	-	-	1%	-
51-100 g/l	-	-	-	71%	4%	-	3%	10%	4%	1%	4%	-	-	1%	-	-	-	-	1%
101-150 g/l	-	-	-	87%	1%	1%	2%	-	2%	-	-	-	-	6%	-	-	-	-	-
151-200 g/l	-	-	-	85%	-	1%	-	-	-	-	3%	-	-	3%	-	-	-	-	9%
201-250 g/l	-	-	-	50%	1%	4%	-	1%	43%	-	-	-	-	1%	-	-	-	-	-
251-300 g/l	-	-	-	67%	30%	-	-	1%	1%	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	-	-	67%	8%	8%	8%	-	10%	-	-	-	-	-	-	-	-	-	-
351-400 g/l	-	-	-	99%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
451-500 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
551-600 g/l	-	-	-	97%	1%	1%	-	-	-	-	-	-	-	-	1%	1%	-	1%	-
601-650 g/l	-	-	-	75%	4%	4%	4%	-	13%	-	-	-	-	-	-	-	-	-	-
651-700 g/l	-	-	-	90%	1%	1%	1%	-	7%	-	-	-	-	-	-	-	-	-	-
700 g/l +	-	-	-	57%	1%	1%	21%	-	-	-	-	-	-	-	-	-	-	-	20%
Driveway Sealer																			
0-50 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51-100 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dry Fog Coatings																			
0-50 g/l	2%	49%	-	3%	-	-	-	-	-	33%	7%	-	-	6%	-	-	-	-	-
51-100 g/l	-	73%	-	1%	-	-	-	-	-	12%	1%	-	-	13%	-	-	-	-	-
101-150 g/l	-	32%	-	9%	-	-	-	-	-	9%	42%	-	-	9%	-	-	-	-	-
301-350 g/l	-	19%	-	-	-	-	-	-	-	81%	-	-	-	-	-	-	-	-	-
351-400 g/l	-	2%	-	16%	-	-	-	-	-	49%	16%	-	-	16%	-	-	-	-	-
Faux Finishing Coatings																			
0-50 g/l	-	-	-	71%	-	-	-	-	-	27%	-	-	-	1%	-	-	-	1%	-
51-100 g/l	-	-	-	-	-	-	-	-	-	57%	-	2%	-	27%	-	-	10%	-	4%
101-150 g/l	-	-	-	-	-	-	-	-	-	85%	-	-	-	-	-	-	15%	-	-
151-200 g/l	-	-	-	-	-	-	-	-	-	-	93%	-	-	-	4%	-	4%	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	97%	-	-	-	-	-	-	3%	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	85%	-	-	-	15%	-	-	-	-	-
301-350 g/l	-	-	-	15%	-	-	-	-	-	70%	3%	-	-	3%	7%	-	-	-	-
401-450 g/l	-	-	-	-	-	-	-	-	-	33%	33%	-	-	33%	-	-	-	-	-
501-550 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
601-650 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
700 g/l +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
Fire Resistive Coatings																			
0-50 g/l	76%	-	-	-	-	-	-	-	-	-	20%	-	-	3%	-	-	-	-	-
51-100 g/l	-	3%	-	-	-	-	-	-	-	-	97%	-	-	-	-	-	-	-	-

				Concrete, Stone, Masonry, etc.							Metal			Wood					
Substrate Name	Substrate Not Specified	Acoustical Materials	Asphalt	All Concrete	Brick	Cinder Block, Concrete Block	Stone	Stucco	Tilt up/ Poured Concrete	Drywall/ Plaster	All Metal	Ferrous	Non-ferrous	All Wood	Not painted, Smooth	Not painted, Rough	Painted or Stained	Plywood	Other
301-350 g/l	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
Flat Coatings																			
0-50 g/l	26%	1%	-	11%	1%	2%	1%	3%	-	37%	7%	-	-	10%	-	-	-	-	1%
51-100 g/l	-	-	-	23%	-	1%	-	16%	-	8%	25%	-	-	23%	-	-	-	-	4%
101-150 g/l	33%	-	-	65%	-	-	-	-	-	-	1%	-	-	1%	-	-	-	-	-
151-200 g/l	-	-	-	33%	-	-	-	-	-	33%	-	-	-	33%	-	-	-	-	-
301-350 g/l	-	-	-	-	-	-	-	-	-	12%	38%	-	-	12%	-	-	-	-	38%
351-400 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	50%
Floor Coatings																			
0-50 g/l	-	-	1%	50%	1%	1%	1%	-	1%	-	4%	-	-	11%	15%	-	15%	-	-
51-100 g/l	-	-	22%	42%	-	-	-	-	-	-	1%	-	-	3%	11%	-	11%	-	9%
101-150 g/l	-	-	12%	56%	-	-	-	-	-	-	12%	-	-	20%	-	-	-	-	-
151-200 g/l	-	-	-	91%	-	-	-	-	-	-	-	-	-	8%	-	-	-	-	-
201-250 g/l	-	-	-	53%	-	2%	-	-	2%	-	-	10%	-	33%	-	-	-	-	-
251-300 g/l	-	-	1%	1%	-	-	-	-	-	-	1%	-	-	97%	-	-	-	-	-
301-350 g/l	-	-	-	73%	-	-	-	-	-	-	-	-	-	27%	-	-	-	-	-
351-400 g/l	-	-	-	37%	-	-	-	-	-	-	31%	-	-	31%	-	-	-	-	-
401-450 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
451-500 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	44%	-	-	-	-	56%
700 g/l +	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
Form-Release Compounds																			
0-50 g/l	-	-	-	96%	-	-	-	-	4%	-	-	-	-	-	-	-	-	-	-
51-100 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101-150 g/l	-	-	-	-	-	-	-	-	-	-	50%	-	-	50%	-	-	-	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	50%	-	-	50%	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	-	50%	-	-	50%	-	-	-	-	-
401-450 g/l	-	-	-	-	-	-	-	-	-	-	50%	-	-	50%	-	-	-	-	-
451-500 g/l	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	-	-	-	-	-	-	-	50%	-	-	50%	-	-	-	-	-
651-700 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
700 g/l +	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Graphic Arts Coatings (Sign Paints)																			
151-200 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
201-250 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
251-300 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
301-350 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
351-400 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
401-450 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
451-500 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
High Temperature Coatings																			
0-50 g/l	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
51-100 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
151-200 g/l	-	-	-	15%	-	-	-	-	-	-	71%	15%	-	-	-	-	-	-	-

				Concrete, Stone, Masonry, etc.							Metal			Wood					
Substrate Name	Substrate Not Specified	Acoustical Materials	Asphalt	All Concrete	Brick	Cinder Block, Concrete Block	Stone	Stucco	Tilt up/ Poured Concrete	Drywall/ Plaster	All Metal	Ferrous	Non-ferrous	All Wood	Not painted, Smooth	Not painted, Rough	Painted or Stained	Plywood	Other
251-300 g/l	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
301-350 g/l	-	-	-	-	-	-	-	-	-	-	99%	1%	-	-	-	-	-	-	-
351-400 g/l	-	-	-	-	-	-	-	-	-	-	8%	92%	-	-	-	-	-	-	-
401-450 g/l	-	-	-	-	-	-	-	-	-	-	26%	74%	-	-	-	-	-	-	-
451-500 g/l	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
601-650 g/l	-	-	-	50%	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	-
Industrial Maintenance Coatings																			
0-50 g/l	18%	-	2%	42%	-	2%	-	-	-	1%	26%	3%	-	2%	-	-	2%	1%	1%
51-100 g/l	4%	-	1%	40%	-	1%	-	2%	1%	1%	29%	14%	-	2%	-	-	-	-	5%
101-150 g/l	12%	-	15%	20%	-	6%	-	-	-	3%	40%	2%	-	2%	-	-	-	-	-
151-200 g/l	3%	-	-	18%	-	-	-	-	-	-	64%	8%	-	7%	-	-	-	-	-
201-250 g/l	3%	-	-	29%	-	-	-	-	-	1%	48%	14%	-	3%	-	-	1%	2%	-
251-300 g/l	20%	-	7%	25%	-	1%	-	-	-	-	25%	21%	-	-	-	-	-	-	-
301-350 g/l	10%	-	-	16%	-	1%	-	-	1%	-	69%	1%	-	1%	-	-	-	-	-
351-400 g/l	42%	-	-	6%	-	-	-	-	-	-	50%	-	-	2%	-	-	-	-	-
401-450 g/l	58%	-	-	27%	-	-	-	-	-	-	15%	-	-	-	-	-	-	-	-
451-500 g/l	12%	-	-	78%	-	3%	-	-	-	-	2%	5%	-	-	-	-	-	-	-
501-550 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
551-600 g/l	-	-	-	98%	-	-	-	-	-	-	2%	-	-	-	-	-	-	-	-
601-650 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
651-700 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
700 g/l +	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Solids Coatings																			
0-50 g/l	-	-	-	12%	13%	21%	19%	-	28%	1%	-	-	-	6%	-	-	-	-	-
51-100 g/l	-	-	-	1%	-	-	-	-	-	-	-	-	-	99%	-	-	-	-	-
101-150 g/l	-	-	-	-	-	-	-	-	94%	-	2%	-	-	2%	-	-	-	-	-
151-200 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	26%	12%	12%	12%	-	12%	-	-	-	-	26%	-	-	-	-	-
251-300 g/l	-	-	-	24%	-	-	-	-	6%	-	9%	24%	-	34%	-	-	-	-	3%
301-350 g/l	-	-	-	3%	24%	24%	24%	-	24%	-	-	-	-	-	-	-	-	-	-
700 g/l +	-	-	-	-	-	2%	-	-	93%	-	-	-	-	5%	-	-	-	-	-
Magnesite Cement Coatings																			
401-450 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Mastic Texture Coatings																			
0-50 g/l	-	-	-	45%	-	33%	-	11%	-	-	10%	-	-	1%	-	-	-	-	-
51-100 g/l	-	-	33%	33%	-	-	-	-	-	-	-	-	-	33%	-	-	-	-	-
151-200 g/l	-	-	-	55%	-	-	-	-	-	-	45%	-	-	-	-	-	-	-	-
201-250 g/l	1%	-	33%	33%	-	-	-	-	-	-	33%	-	-	-	-	-	-	-	-
251-300 g/l	-	-	36%	-	-	-	-	63%	-	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401-450 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metallic Pigmented Coatings																			
0-50 g/l	-	-	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	50%	-	-

				Concrete, Stone, Masonry, etc.							Metal			Wood					
Substrate Name	Substrate Not Specified	Acoustical Materials	Asphalt	All Concrete	Brick	Cinder Block, Concrete Block	Stone	Stucco	Tilt up/ Poured Concrete	Drywall/ Plaster	All Metal	Ferrous	Non-ferrous	All Wood	Not painted, Smooth	Not painted, Rough	Painted or Stained	Plywood	Other
51-100 g/l	-	-	-	-	-	-	-	-	-	45%	9%	-	-	45%	-	-	-	-	-
101-150 g/l	-	-	-	4%	-	-	-	-	-	29%	39%	-	-	4%	-	-	24%	-	-
151-200 g/l	-	-	-	10%	-	-	-	-	-	10%	10%	61%	-	10%	-	-	-	-	-
201-250 g/l	-	-	-	33%	-	-	-	-	-	33%	-	-	-	33%	-	-	-	-	-
251-300 g/l	-	-	-	50%	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-
301-350 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351-400 g/l	7%	-	-	-	-	-	-	-	-	-	93%	-	-	-	-	-	-	-	-
401-450 g/l	23%	-	-	8%	-	1%	-	-	1%	8%	47%	-	-	10%	-	-	-	3%	-
451-500 g/l	-	-	-	3%	-	-	-	-	-	-	6%	91%	-	-	-	-	-	-	-
601-650 g/l	-	-	-	50%	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	-
Multi-Color Coatings																			
201-250 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Nonflat Coatings																			
0-50 g/l	18%	1%	-	11%	-	-	1%	5%	1%	34%	9%	-	1%	16%	1%	-	1%	1%	-
51-100 g/l	-	1%	-	5%	-	-	-	1%	-	49%	5%	-	-	39%	-	-	-	-	-
101-150 g/l	2%	-	-	24%	-	-	-	1%	-	26%	23%	-	-	24%	-	-	-	-	-
151-200 g/l	-	-	-	48%	-	-	-	-	-	3%	-	48%	-	-	-	-	-	-	-
201-250 g/l	88%	-	-	3%	-	-	-	-	-	3%	3%	-	-	3%	-	-	-	-	-
251-300 g/l	18%	-	-	26%	-	-	-	-	-	3%	22%	12%	-	20%	-	-	-	-	-
301-350 g/l	-	-	-	24%	-	-	-	-	-	24%	24%	-	-	26%	-	-	-	1%	-
351-400 g/l	-	-	-	25%	-	-	-	-	-	25%	25%	-	-	25%	-	-	-	-	-
401-450 g/l	5%	23%	-	24%	-	-	-	-	-	24%	1%	1%	-	24%	-	-	-	-	-
451-500 g/l	-	-	-	25%	-	-	-	-	-	25%	25%	-	-	25%	-	-	-	-	-
Nonflat-High Gloss Coatings																			
0-50 g/l	12%	2%	-	16%	-	7%	7%	7%	-	17%	8%	-	7%	17%	-	-	-	-	1%
51-100 g/l	-	-	-	8%	-	-	-	-	-	63%	19%	1%	-	9%	-	-	-	-	-
101-150 g/l	37%	-	-	13%	-	-	-	-	-	17%	15%	-	-	15%	-	-	2%	-	-
151-200 g/l	51%	-	-	9%	-	-	-	-	-	9%	9%	-	-	21%	-	-	-	-	-
201-250 g/l	29%	-	-	5%	5%	6%	2%	-	-	5%	12%	-	3%	11%	-	-	9%	12%	-
251-300 g/l	99%	-	-	-	-	-	-	-	1%	-	-	-	-	-	-	-	-	-	-
301-350 g/l	93%	-	-	2%	-	-	-	-	-	2%	2%	-	-	-	-	-	-	-	-
351-400 g/l	88%	-	-	3%	-	-	-	-	-	2%	3%	-	-	3%	-	-	-	-	-
401-450 g/l	-	-	-	9%	-	-	-	-	-	34%	24%	-	-	34%	-	-	-	-	-
Primers, Sealers, and Undercoaters																			
0-50 g/l	9%	-	-	17%	6%	6%	6%	1%	-	32%	5%	-	1%	16%	-	-	-	-	1%
51-100 g/l	59%	-	-	12%	-	2%	-	1%	-	13%	5%	-	-	8%	1%	-	-	-	-
101-150 g/l	87%	-	-	1%	-	1%	-	-	-	9%	1%	-	-	-	-	-	-	1%	-
151-200 g/l	-	-	-	2%	-	-	-	-	-	87%	-	-	-	11%	-	-	-	-	-
201-250 g/l	-	3%	-	83%	-	2%	-	-	-	-	10%	-	-	-	-	-	-	2%	-
251-300 g/l	61%	-	-	11%	-	9%	-	-	-	-	9%	-	-	-	-	-	-	9%	-
301-350 g/l	4%	-	-	17%	-	15%	-	-	-	-	37%	-	-	9%	-	-	-	17%	-
351-400 g/l	-	-	-	12%	-	-	-	-	-	2%	11%	72%	-	2%	-	-	-	-	-
401-450 g/l	-	-	-	62%	-	-	-	-	-	9%	20%	-	-	9%	-	-	-	-	-

				Concrete, Stone, Masonry, etc.							Metal			Wood					
Substrate Name	Substrate Not Specified	Acoustical Materials	Asphalt	All Concrete	Brick	Cinder Block, Concrete Block	Stone	Stucco	Tilt up/ Poured Concrete	Drywall/ Plaster	All Metal	Ferrous	Non-ferrous	All Wood	Not painted, Smooth	Not painted, Rough	Painted or Stained	Plywood	Other
451-500 g/l	-	-	-	98%	-	-	-	-	-	-	2%	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	57%	-	-	-	-	-	-	-	-	-	42%	-	-	-	-	-
551-600 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
651-700 g/l	-	-	-	1%	-	99%	-	-	-	-	-	-	-	-	-	-	-	-	-
700 g/l +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reactive Penetrating Sealer																			
0-50 g/l	-	-	-	85%	-	-	-	-	15%	-	-	-	-	-	-	-	-	-	-
101-150 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
151-200 g/l	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	46%	-	-	-	-	7%	-	-	-	-	46%	-	-	-	-	-
301-350 g/l	-	-	-	-	25%	25%	25%	-	25%	-	-	-	-	-	-	-	-	-	-
551-600 g/l	-	-	-	50%	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-
601-650 g/l	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-
651-700 g/l	-	-	-	-	25%	25%	25%	-	25%	-	-	-	-	-	-	-	-	-	-
Recycled																			
0-50 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
51-100 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Roof																			
0-50 g/l	-	-	28%	10%	-	-	-	7%	3%	-	15%	-	10%	-	-	-	-	4%	22%
51-100 g/l	-	-	33%	14%	13%	11%	8%	-	-	-	18%	-	-	-	-	-	-	3%	-
101-150 g/l	-	-	-	25%	-	25%	-	-	-	-	25%	-	-	-	-	-	-	25%	-
151-200 g/l	-	-	-	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	50%	-
201-250 g/l	-	-	10%	31%	1%	21%	-	-	-	-	17%	-	1%	-	-	-	-	19%	-
251-300 g/l	-	-	25%	25%	-	-	-	-	-	-	25%	-	-	-	-	-	-	-	25%
401-450 g/l	-	-	-	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	50%
501-550 g/l	-	-	33%	-	-	-	-	-	33%	-	33%	-	-	-	-	-	-	-	-
Rust Preventative																			
0-50 g/l	8%	-	-	-	-	-	-	-	-	-	67%	24%	-	-	-	-	-	-	-
51-100 g/l	4%	-	-	24%	-	-	-	-	-	-	48%	-	-	24%	-	-	-	-	-
101-150 g/l	-	-	-	2%	-	-	-	-	-	2%	93%	-	-	2%	-	-	-	-	-
151-200 g/l	-	-	-	-	-	-	-	-	-	-	2%	85%	13%	-	-	-	-	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	69%	31%	-	-	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	-	53%	47%	-	-	-	-	-	-	-
301-350 g/l	-	-	-	-	-	-	-	-	-	-	96%	4%	-	-	-	-	-	-	-
351-400 g/l	-	-	-	-	-	-	-	-	-	-	82%	16%	1%	-	-	-	-	-	-
401-450 g/l	-	-	-	1%	-	-	-	-	-	-	50%	-	-	49%	-	-	-	-	-
451-500 g/l	-	-	-	-	14%	14%	-	-	14%	-	-	14%	-	-	14%	14%	14%	-	-
Shellacs (Clear)																			
551-600 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
651-700 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
700 g/l +	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Shellacs (Opaque)																			
501-550 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD

				Concrete, Stone, Masonry, etc.							Metal			Wood					
Substrate Name	Substrate Not Specified	Acoustical Materials	Asphalt	All Concrete	Brick	Cinder Block, Concrete Block	Stone	Stucco	Tilt up/ Poured Concrete	Drywall/ Plaster	All Metal	Ferrous	Non-ferrous	All Wood	Not painted, Smooth	Not painted, Rough	Painted or Stained	Plywood	Other
Specialty Primers, Sealers, and Undercoaters																			
0-50 g/l	40%	-	-	4%	-	-	-	-	-	6%	4%	-	-	23%	-	-	-	24%	-
51-100 g/l	-	-	-	1%	-	-	-	-	-	1%	1%	94%	-	1%	-	-	-	-	2%
201-250 g/l	-	-	-	50%	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	-
301-350 g/l	1%	1%	13%	14%	-	-	-	-	-	29%	8%	6%	-	29%	-	-	-	-	-
401-450 g/l	3%	-	19%	19%	-	-	-	-	-	19%	20%	-	-	20%	-	-	-	-	-
Stains (Exterior/Dual)																			
0-50 g/l	-	-	-	4%	-	-	-	-	1%	-	-	-	-	93%	1%	1%	-	1%	-
51-100 g/l	1%	-	-	5%	-	-	-	-	-	2%	-	-	-	89%	1%	1%	-	1%	-
101-150 g/l	24%	-	-	64%	-	-	-	-	-	-	-	-	-	12%	-	-	-	-	-
151-200 g/l	-	-	-	6%	-	-	-	-	-	-	-	-	-	59%	12%	12%	-	12%	-
201-250 g/l	-	-	-	1%	-	-	-	-	-	-	-	-	-	17%	21%	21%	20%	20%	-
251-300 g/l	-	-	-	27%	6%	6%	6%	6%	6%	-	-	-	-	45%	-	-	-	-	-
301-350 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
351-400 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
451-500 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	99%	-	-	-	-	-
501-550 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	92%	3%	3%	-	3%	-
Stains (Interior)																			
0-50 g/l	-	18%	-	23%	-	-	-	-	-	18%	18%	-	-	24%	-	-	-	-	-
51-100 g/l	-	19%	-	22%	-	-	-	-	-	19%	19%	-	-	23%	-	-	-	-	-
101-150 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	84%	8%	-	8%	-	-
151-200 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	63%	18%	-	18%	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	72%	20%	1%	7%	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
351-400 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	98%	-	-	-	-	2%
451-500 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
501-550 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	48%	52%	-	-	-	-
601-650 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
700 g/l +	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
Stone Consolidant																			
401-450 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Swimming Pool Coatings																			
51-100 g/l	-	-	-	50%	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-
101-150 g/l	91%	-	-	9%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
151-200 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	51%	-	-	-	-	25%	25%	-	-	-	-	-	-	-	-	-
251-300 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	-	-	92%	-	1%	-	-	6%	-	-	-	-	-	-	-	-	-	1%
551-600 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Traffic Marking																			
0-50 g/l	4%	-	39%	44%	-	-	-	-	-	-	2%	-	-	10%	-	-	-	-	-
51-100 g/l	-	-	49%	48%	-	-	-	-	2%	-	-	-	-	1%	-	-	-	-	-
101-150 g/l	-	-	70%	12%	-	-	-	-	18%	-	-	-	-	-	-	-	-	-	-
251-300 g/l	-	-	33%	33%	-	-	-	-	-	-	-	-	-	33%	-	-	-	-	-

Substrate Name	Substrate Not Specified	Acoustical Materials	Asphalt	Concrete, Stone, Masonry, etc.						Drywall/ Plaster	Metal			Wood					Other
				All Concrete	Brick	Cinder Block, Concrete Block	Stone	Stucco	Tilt up/ Poured Concrete		All Metal	Ferrous	Non-ferrous	All Wood	Not painted, Smooth	Not painted, Rough	Painted or Stained	Plywood	
401-450 g/l	-	-	50%	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waterproofing Membranes																			
0-50 g/l	-	-	1%	58%	-	8%	-	-	-	-	-	-	-	1%	-	-	-	32%	-
51-100 g/l	-	-	-	65%	-	2%	-	-	-	-	-	-	-	-	-	-	-	33%	-
101-150 g/l	-	-	24%	38%	-	-	-	-	-	-	-	-	-	-	-	-	-	38%	-
151-200 g/l	-	-	6%	6%	-	44%	-	-	-	-	-	-	-	-	-	-	-	44%	-
201-250 g/l	-	-	-	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	50%	-
251-300 g/l	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	-	-	45%	-	10%	-	-	-	-	-	-	-	-	-	-	-	45%	-
Wood Coatings																			
0-50 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	9%	46%	46%	-	-	-
51-100 g/l	2%	-	-	-	-	-	-	-	-	-	-	-	-	90%	3%	-	4%	-	-
101-150 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	18%	41%	21%	20%	-	-
151-200 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	44%	27%	1%	28%	-	-
201-250 g/l	2%	-	-	-	-	-	-	-	-	-	-	-	-	37%	32%	1%	27%	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	45%	33%	-	21%	-	-
301-350 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	35%	35%	1%	29%	-	-
351-400 g/l	-	-	-	98%	-	-	-	-	-	-	-	-	-	2%	-	-	-	-	-
401-450 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	63%	16%	6%	15%	-	-
451-500 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	74%	17%	1%	7%	-	-
501-550 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	89%	4%	2%	4%	-	-
551-600 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
601-650 g/l	44%	-	-	-	-	-	-	-	-	-	8%	-	-	33%	5%	5%	5%	-	-
651-700 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	85%	12%	1%	1%	-	-
700 g/l +	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
Wood Preservatives																			
0-50 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
51-100 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	99%	-	-	-	-	-
301-350 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	70%	15%	15%	-	-	-
401-450 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
451-500 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50%	50%	-	-	-
501-550 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
551-600 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-
Zinc-Rich Primer																			
0-50 g/l	-	-	-	-	-	-	-	-	-	-	40%	60%	-	-	-	-	-	-	-
51-100 g/l	3%	-	-	11%	-	-	-	-	-	-	43%	42%	-	-	-	-	-	-	-
101-150 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	-	96%	4%	-	-	-	-	-	-	-
301-350 g/l	-	-	-	-	-	-	-	-	-	-	98%	2%	-	-	-	-	-	-	-
351-400 g/l	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
451-500 g/l	-	-	-	-	-	-	-	-	-	-	99%	-	1%	-	-	-	-	-	-

Notes:
1. PD is Protected Data. Fewer than 4 companies reported sales.

Data Summary - 2014 Architectural Coatings Survey
Table H-10: Volume Percent for Each Resin Type (Large Containers Only)

Resin Name	Resin Not Specified	Acrylic	Acrylic Copolymer	Alkyd	Amines, Amides	Cellulosic	Chlorinated Rubber	Epoxy	Oleoresin	Phenolic	Polyester	Polyvinyl Acetate	Shellac	Silicone, Silane, Siloxane	Styrene-butadiene	Urethane, Polyurethane	Polyvinyl Chloride	Vinyl Toluene	Vinyl Acrylic Copolymer	Asphaltic/ Bituminous	Oil (e.g.,linseed, tung)	Other
Aluminum Roof																						
0-50 g/l	42%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58%	-	-
51-100 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-
201-250 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50%	-	-	-	-	50%	-	-
351-400 g/l	61%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39%	-	-
401-450 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-
Basement Specialty Coatings																						
51-100 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
101-150 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
351-400 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Bituminous Roof Coatings																						
0-50 g/l	34%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66%	-	-
151-200 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47%	-	-	-	-	53%	-	-
201-250 g/l	3%	-	-	-	-	-	-	-	-	-	-	-	-	-	13%	36%	-	-	-	49%	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50%	-	-	-	-	50%	-	-
Bituminous Roof Primers																						
0-50 g/l	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-
301-350 g/l	38%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62%	-	-
401-450 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-
51-100 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
551-600 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-
Bond Breakers																						
51-100 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
651-700 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Building Envelope Coatings																						
0-50 g/l	44%	-	43%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13%
51-100 g/l	7%	1%	1%	-	-	1%	1%	-	-	-	-	-	-	-	88%	-	-	-	1%	1%	-	-
101-150 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
151-200 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Concrete Curing Compounds																						
0-50 g/l	72%	-	4%	-	-	-	-	-	-	-	-	-	-	1%	-	-	-	-	-	-	-	22%
51-100 g/l	58%	1%	1%	35%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1%	-	-	4%
101-150 g/l	-	44%	53%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2%
151-200 g/l	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	-	14%	86%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
251-300 g/l	-	-	1%	61%	-	-	-	-	-	-	-	-	-	-	16%	-	-	-	-	-	-	22%
301-350 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351-400 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
401-450 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
601-650 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
651-700 g/l	-	28%	-	72%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
700 g/l +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Concrete/Masonry Sealer																						
0-50 g/l	1%	8%	3%	6%	-	3%	-	1%	-	-	-	-	10%	3%	5%	6%	-	-	1%	47%	-	6%
51-100 g/l	-	57%	6%	-	-	4%	-	1%	-	-	-	-	-	4%	1%	16%	-	-	-	1%	2%	9%
101-150 g/l	-	63%	32%	-	-	-	-	-	-	-	-	-	-	2%	-	2%	-	-	-	-	-	-
151-200 g/l	-	61%	20%	-	-	1%	-	-	-	-	-	-	-	8%	-	9%	-	-	-	-	-	-
201-250 g/l	-	57%	2%	-	-	2%	-	-	-	-	-	-	-	34%	-	4%	-	-	-	-	2%	-
251-300 g/l	-	21%	-	1%	-	-	-	-	-	-	1%	-	-	61%	-	1%	-	-	-	15%	-	-
301-350 g/l	1%	8%	19%	-	-	-	-	39%	-	-	-	-	-	27%	-	6%	-	-	-	-	-	-
351-400 g/l	-	87%	13%	-	-	-	-	-	-	-	-	-	-	1%	-	-	-	-	-	-	-	-
451-500 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Resin Name	Resin Not Specified	Acrylic	Acrylic Copolymer	Alkyd	Amines, Amides	Cellulosic	Chlorinated Rubber	Epoxy	Oleoresin	Phenolic	Polyester	Polyvinyl Acetate	Shellac	Silicone, Silane, Siloxane	Styrene-butadiene	Urethane, Polyurethane	Polyvinyl Chloride	Vinyl Toluene	Vinyl Acrylic Copolymer	Asphaltic/ Bituminous	Oil (e.g., linseed, tung)	Other
501-550 g/l	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
551-600 g/l	-	95%	1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4%
601-650 g/l	-	75%	13%	-	-	-	-	-	-	-	-	-	-	12%	-	-	-	-	-	-	-	-
651-700 g/l	-	48%	50%	-	-	-	-	-	-	-	-	-	-	2%	-	-	-	-	-	-	-	-
700 g/l +	-	1%	1%	-	-	-	-	-	-	-	-	-	-	2%	-	-	-	-	-	-	-	96%
Driveway Sealer																						
0-50 g/l	98%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2%	-	-
51-100 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-
Dry Fog Coatings																						
0-50 g/l	-	33%	10%	-	-	12%	-	-	-	-	-	-	-	-	-	1%	-	-	44%	-	1%	-
51-100 g/l	-	48%	-	-	-	26%	-	-	-	-	-	-	-	-	-	-	-	-	26%	-	-	-
101-150 g/l	-	69%	-	-	-	16%	-	-	-	-	-	-	-	-	-	-	-	-	15%	-	-	-
301-350 g/l	-	10%	-	90%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351-400 g/l	-	66%	-	2%	-	-	-	32%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Faux Finishing Coatings																						
0-50 g/l	-	97%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3%	-	-	-
51-100 g/l	-	57%	-	-	-	-	-	2%	-	-	-	-	-	-	-	2%	-	-	39%	-	-	-
101-150 g/l	-	46%	-	-	-	-	-	-	-	-	-	24%	-	-	-	-	-	-	30%	-	-	-
151-200 g/l	-	93%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7%
201-250 g/l	-	85%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9%	-	6%	-
251-300 g/l	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	93%	-	7%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401-450 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50%	-
601-650 g/l	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-
700 g/l +	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fire Resistive Coatings																						
0-50 g/l	3%	-	38%	-	-	-	-	-	-	-	-	-	-	-	38%	-	-	-	20%	-	-	-
51-100 g/l	-	3%	3%	-	-	-	-	95%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flat Coatings																						
0-50 g/l	-	48%	11%	-	-	9%	-	1%	-	-	-	5%	-	-	-	4%	-	-	18%	-	1%	2%
51-100 g/l	-	93%	-	-	-	2%	-	-	-	-	-	-	-	-	-	-	-	-	4%	-	1%	-
101-150 g/l	-	47%	-	-	-	42%	-	-	-	-	-	-	-	-	-	-	-	-	11%	-	-	-
151-200 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-
301-350 g/l	-	-	-	25%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75%	-	-	-
351-400 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-
Floor Coatings																						
0-50 g/l	-	75%	5%	-	1%	1%	-	10%	-	-	-	-	-	-	-	1%	-	5%	-	-	1%	-
51-100 g/l	-	88%	4%	-	3%	-	-	4%	-	-	-	-	-	-	-	1%	-	-	-	-	-	-
101-150 g/l	-	47%	8%	8%	-	-	-	36%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
151-200 g/l	-	56%	43%	-	-	-	-	-	-	-	-	-	-	-	-	1%	-	-	-	-	-	-
201-250 g/l	-	25%	-	5%	14%	-	-	53%	-	-	-	-	-	-	-	3%	-	-	-	-	-	-
251-300 g/l	-	20%	1%	-	-	-	-	-	-	-	-	-	-	-	-	80%	-	-	-	-	-	-
301-350 g/l	-	21%	-	26%	-	-	-	-	-	-	-	-	-	-	-	53%	-	-	-	-	-	-
351-400 g/l	-	-	-	96%	-	-	-	-	-	-	-	-	-	-	-	3%	-	-	-	-	-	-
401-450 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
451-500 g/l	-	56%	-	-	-	-	-	-	-	-	-	-	-	-	-	44%	-	-	-	-	-	-
700 g/l +	-	-	-	-	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50%
Form-Release Compounds																						
0-50 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97%	3%
51-100 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101-150 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
201-250 g/l	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-
401-450 g/l	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-
451-500 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
501-550 g/l	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-
651-700 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Resin Name	Resin Not Specified	Acrylic	Acrylic Copolymer	Alkyd	Amines, Amides	Cellulosic	Chlorinated Rubber	Epoxy	Oleoresin	Phenolic	Polyester	Polyvinyl Acetate	Shellac	Silicone, Silane, Siloxane	Styrene-butadiene	Urethane, Polyurethane	Polyvinyl Chloride	Vinyl Toluene	Vinyl Acrylic Copolymer	Asphaltic/ Bituminous	Oil (e.g., linseed, tung)	Other
700 g/l +	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Graphic Arts Coatings (Sign Paints)																						
151-200 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
201-250 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
251-300 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
301-350 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
351-400 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
401-450 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
451-500 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
High Temperature Coatings																						
0-50 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51-100 g/l	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
151-200 g/l	-	15%	-	-	-	-	-	15%	-	-	-	-	-	71%	-	-	-	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
351-400 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	8%	-	92%	-	-	-	-	-	-
401-450 g/l	-	-	-	5%	-	-	-	-	-	-	-	-	-	91%	-	-	-	-	-	3%	-	-
451-500 g/l	-	50%	-	-	-	-	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	-
601-650 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial Maintenance Coatings																						
0-50 g/l	1%	16%	4%	-	3%	4%	-	28%	5%	-	1%	-	-	1%	-	34%	-	-	-	-	-	4%
51-100 g/l	-	40%	-	5%	3%	4%	-	20%	2%	-	-	-	-	-	-	23%	-	-	1%	-	-	-
101-150 g/l	1%	16%	1%	-	3%	8%	-	16%	-	-	-	-	-	1%	-	48%	-	-	-	-	3%	3%
151-200 g/l	-	26%	1%	3%	3%	14%	-	16%	-	-	-	-	-	-	-	32%	-	-	-	-	-	4%
201-250 g/l	-	19%	3%	9%	2%	3%	-	26%	11%	-	-	-	-	1%	-	25%	-	-	-	1%	-	1%
251-300 g/l	5%	10%	-	17%	-	1%	-	13%	8%	-	3%	-	-	14%	-	30%	-	-	-	-	-	-
301-350 g/l	2%	19%	-	39%	1%	-	-	2%	5%	9%	3%	-	-	1%	-	8%	-	-	-	-	12%	-
351-400 g/l	-	16%	-	2%	1%	-	-	9%	-	1%	11%	-	-	-	-	16%	-	-	-	-	-	45%
401-450 g/l	-	4%	-	69%	9%	-	-	9%	-	-	-	-	-	-	-	7%	2%	-	-	-	-	-
451-500 g/l	-	6%	-	2%	38%	-	-	38%	-	-	-	-	-	-	-	10%	-	-	-	-	-	5%
501-550 g/l	-	-	-	-	50%	-	-	39%	-	-	-	-	-	-	-	12%	-	-	-	-	-	-
551-600 g/l	-	-	-	2%	22%	-	-	22%	-	-	-	-	-	-	-	54%	-	-	-	-	-	-
601-650 g/l	-	-	42%	-	-	-	-	-	-	-	-	-	-	-	58%	-	-	-	-	-	-	-
651-700 g/l	-	-	-	-	50%	-	-	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
700 g/l +	-	-	-	-	46%	-	-	46%	-	-	-	-	-	-	-	-	8%	-	-	-	-	-
Low Solids Coatings																						
0-50 g/l	-	14%	35%	6%	-	-	-	-	-	-	-	-	-	30%	7%	-	-	-	-	-	1%	7%
51-100 g/l	1%	26%	-	-	-	-	-	-	25%	-	-	-	-	-	-	24%	-	-	-	-	25%	-
101-150 g/l	-	-	-	-	-	-	-	-	98%	-	-	-	-	2%	-	-	-	-	-	-	-	-
151-200 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	48%	-	-	-	-	-	-	-	52%
251-300 g/l	-	73%	-	-	-	-	-	-	22%	-	-	-	-	-	-	-	-	-	-	-	-	6%
301-350 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
700 g/l +	-	-	-	-	-	-	-	-	5%	-	-	-	-	-	-	-	-	-	-	-	4%	91%
Magnesite Cement Coatings																						
401-450 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Mastic Texture Coatings																						
0-50 g/l	-	58%	8%	10%	-	9%	-	-	-	-	-	-	-	-	-	9%	-	-	6%	-	-	-
51-100 g/l	-	-	50%	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
151-200 g/l	-	-	-	-	-	-	-	90%	-	-	-	-	-	-	5%	-	-	-	-	5%	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49%	-	-	-	-	49%	-	-
251-300 g/l	-	-	-	63%	-	-	-	1%	-	-	-	-	-	-	-	-	-	-	-	36%	-	-
301-350 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401-450 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
Metallic Pigmented Coatings																						
0-50 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-
51-100 g/l	-	69%	22%	-	-	-	-	9%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101-150 g/l	-	-	-	17%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49%	-	-	35%

Resin Name	Resin Not Specified	Acrylic	Acrylic Copolymer	Alkyd	Amines, Amides	Cellulosic	Chlorinated Rubber	Epoxy	Oleoresin	Phenolic	Polyester	Polyvinyl Acetate	Shellac	Silicone, Silane, Siloxane	Styrene-butadiene	Urethane, Polyurethane	Polyvinyl Chloride	Vinyl Toluene	Vinyl Acrylic Copolymer	Asphaltic/ Bituminous	Oil (e.g., linseed, tung)	Other
151-200 g/l	-	-	-	-	-	-	-	20%	20%	-	-	-	-	-	-	20%	-	-	39%	-	-	-
201-250 g/l	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	-	-	-	-	50%	-
301-350 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351-400 g/l	-	50%	-	4%	-	-	-	-	-	-	-	-	-	-	-	46%	-	-	-	-	-	-
401-450 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37%	-	-	-	-	25%	38%
451-500 g/l	-	-	-	93%	-	-	-	-	7%	-	-	-	-	-	-	-	-	-	-	-	-	-
601-650 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Multi-Color Coatings																						
201-250 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Nonflat Coatings																						
0-50 g/l	-	56%	10%	2%	-	3%	-	1%	-	-	-	3%	-	-	-	3%	-	-	18%	-	-	4%
51-100 g/l	-	80%	4%	-	-	4%	-	1%	-	-	-	-	-	-	1%	1%	-	-	5%	-	3%	-
101-150 g/l	-	96%	-	-	-	1%	-	-	-	-	-	-	-	-	-	1%	-	-	1%	-	1%	-
151-200 g/l	-	1%	-	-	-	1%	-	97%	-	-	-	-	-	-	-	1%	-	-	-	-	-	-
201-250 g/l	-	28%	-	72%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
251-300 g/l	-	59%	-	18%	-	-	-	15%	-	-	-	-	-	-	-	8%	-	-	-	-	-	-
301-350 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351-400 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401-450 g/l	-	3%	-	97%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
451-500 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonflat-High Gloss Coatings																						
0-50 g/l	-	73%	4%	11%	-	1%	-	-	-	-	-	1%	-	-	-	5%	-	-	2%	-	2%	-
51-100 g/l	-	35%	2%	-	-	11%	-	-	3%	-	-	-	-	-	13%	14%	-	-	11%	-	11%	-
101-150 g/l	-	88%	9%	-	-	-	-	-	-	-	-	-	-	-	-	2%	-	-	-	-	2%	-
151-200 g/l	12%	60%	-	-	-	13%	-	1%	-	-	-	-	-	-	-	13%	-	-	-	-	-	1%
201-250 g/l	-	47%	-	14%	-	10%	-	-	-	-	-	-	-	19%	-	11%	-	-	-	-	-	-
251-300 g/l	-	-	-	98%	-	-	-	1%	-	-	-	-	-	-	-	-	-	-	-	-	2%	-
301-350 g/l	-	5%	-	88%	-	-	-	-	-	-	-	-	-	-	-	7%	-	-	-	-	-	-
351-400 g/l	-	-	-	20%	18%	-	-	18%	-	-	18%	-	-	18%	-	-	-	-	10%	-	-	-
401-450 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Primers, Sealers, and Undercoaters																						
0-50 g/l	-	66%	1%	1%	-	4%	-	2%	-	-	-	6%	-	-	-	2%	-	-	19%	-	-	-
51-100 g/l	-	52%	7%	-	-	1%	-	1%	-	-	-	-	-	-	-	1%	-	-	6%	-	-	32%
101-150 g/l	-	68%	23%	-	-	-	-	3%	-	-	-	6%	-	-	-	-	-	-	-	-	-	-
151-200 g/l	-	11%	-	1%	1%	-	-	1%	-	-	-	-	-	-	-	-	-	-	86%	-	-	-
201-250 g/l	-	-	-	8%	8%	-	-	14%	-	-	-	-	63%	-	-	8%	-	-	-	-	-	-
251-300 g/l	-	2%	-	36%	-	1%	-	-	-	1%	-	-	-	-	-	35%	25%	-	1%	-	-	-
301-350 g/l	-	-	-	34%	-	-	-	4%	-	-	-	-	-	-	-	60%	-	-	-	-	1%	-
351-400 g/l	-	-	-	88%	3%	-	-	9%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401-450 g/l	-	-	-	47%	26%	-	-	26%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
451-500 g/l	-	-	-	2%	49%	-	-	49%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	21%	28%	-	-	28%	-	-	-	-	-	-	-	23%	-	-	-	-	-	-
551-600 g/l	-	-	-	-	50%	-	-	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
651-700 g/l	-	1%	-	-	-	-	-	-	-	-	-	-	-	-	-	99%	-	-	-	-	-	-
700 g/l +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-
Reactive Penetrating Sealer																						
0-50 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	71%	-	-	-	-	-	-	-	29%
101-150 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
151-200 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
301-350 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	50%
551-600 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
601-650 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
651-700 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	50%
Recycled																						
0-50 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
51-100 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD

Resin Name	Resin Not Specified	Acrylic	Acrylic Copolymer	Alkyd	Amines, Amides	Cellulosic	Chlorinated Rubber	Epoxy	Oleoresin	Phenolic	Polyester	Polyvinyl Acetate	Shellac	Silicone, Silane, Siloxane	Styrene-butadiene	Urethane, Polyurethane	Polyvinyl Chloride	Vinyl Toluene	Vinyl Acrylic Copolymer	Asphaltic/ Bituminous	Oil (e.g.,linseed, tung)	Other
Roof																						
0-50 g/l	-	77%	18%	-	-	-	-	-	-	-	-	-	-	-	-	2%	-	-	1%	1%	-	-
51-100 g/l	-	1%	71%	9%	-	-	-	-	-	-	-	-	-	-	-	20%	-	-	-	-	-	-
101-150 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
151-200 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	55%	-	45%	-	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
401-450 g/l	-	-	-	-	-	-	-	-	50%	-	-	-	-	-	-	-	-	-	-	50%	-	-
501-550 g/l	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rust Preventative																						
0-50 g/l	-	47%	-	35%	-	-	-	-	6%	-	-	-	-	-	-	7%	-	-	-	-	5%	-
51-100 g/l	-	6%	-	55%	-	-	-	-	-	-	-	-	-	2%	-	-	-	-	-	-	37%	-
101-150 g/l	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
151-200 g/l	-	92%	-	2%	-	-	-	-	-	-	-	-	-	7%	-	-	-	-	-	-	-	-
201-250 g/l	-	50%	16%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34%	-	-	-
251-300 g/l	-	-	-	78%	-	-	-	-	-	22%	-	-	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	-	-	76%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24%	-
351-400 g/l	-	-	-	79%	-	-	-	-	-	-	-	-	-	-	-	16%	-	-	-	-	-	4%
401-450 g/l	-	20%	-	44%	-	-	-	2%	-	-	-	-	-	-	-	34%	-	-	-	-	-	-
451-500 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shellacs (Clear)																						
551-600 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
651-700 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
700 g/l +	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Shellacs (Opaque)																						
501-550 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Specialty Primers, Sealers, and Undercoaters																						
0-50 g/l	-	27%	27%	44%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2%	-	-	-
51-100 g/l	-	6%	-	94%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
301-350 g/l	-	1%	1%	55%	-	-	-	-	4%	-	-	-	-	-	-	-	-	-	-	-	38%	-
401-450 g/l	-	-	-	3%	-	-	-	-	-	-	-	-	-	-	-	-	-	3%	-	-	-	95%
Stains (Exterior/Dual)																						
0-50 g/l	2%	76%	1%	15%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1%	-	4%	-
51-100 g/l	-	75%	4%	17%	-	3%	-	-	-	-	-	-	-	-	-	1%	-	-	-	-	-	-
101-150 g/l	-	75%	6%	-	3%	5%	-	-	-	-	-	-	-	5%	-	6%	-	-	-	-	-	-
151-200 g/l	-	8%	1%	88%	-	3%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	1%	-	96%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1%	1%
251-300 g/l	-	22%	34%	34%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11%	-
301-350 g/l	-	3%	-	94%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3%	-
351-400 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
451-500 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	99%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1%	-
Stains (Interior)																						
0-50 g/l	-	35%	5%	-	-	30%	-	-	-	-	-	-	-	-	-	30%	-	-	-	-	-	-
51-100 g/l	-	29%	-	-	-	23%	-	-	-	-	-	-	-	-	-	2%	-	-	23%	-	23%	-
101-150 g/l	-	9%	-	-	-	-	-	-	-	7%	-	-	-	-	-	-	-	-	-	-	84%	-
151-200 g/l	-	17%	-	6%	-	-	-	-	5%	17%	-	-	-	-	-	26%	-	-	-	1%	29%	-
201-250 g/l	-	4%	3%	64%	-	-	-	-	-	-	-	-	-	-	-	1%	-	-	-	-	24%	3%
251-300 g/l	-	-	8%	92%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351-400 g/l	-	49%	-	-	-	-	-	-	-	-	-	-	-	-	-	49%	-	-	-	-	-	2%
451-500 g/l	-	-	-	27%	-	-	-	-	27%	-	-	-	-	-	-	27%	-	-	-	19%	-	-
501-550 g/l	-	-	-	67%	-	-	-	-	19%	-	-	-	-	-	-	4%	-	-	-	9%	1%	-
601-650 g/l	-	-	-	5%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95%	-
700 g/l +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
Stone Consolidant																						
401-450 g/l	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD

Resin Name	Resin Not Specified	Acrylic	Acrylic Copolymer	Alkyd	Amines, Amides	Cellulosic	Chlorinated Rubber	Epoxy	Oleoresin	Phenolic	Polyester	Polyvinyl Acetate	Shellac	Silicone, Silane, Siloxane	Styrene-butadiene	Urethane, Polyurethane	Polyvinyl Chloride	Vinyl Toluene	Vinyl Acrylic Copolymer	Asphaltic/ Bituminous	Oil (e.g.,linseed, tung)	Other
Swimming Pool Coatings																						
51-100 g/l	-	-	-	-	25%	-	-	25%	-	-	-	-	-	25%	-	-	-	-	-	-	25%	-
101-150 g/l	-	45%	-	-	-	-	-	-	-	-	-	-	-	45%	9%	-	-	-	-	-	-	-
151-200 g/l	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	62%	-	-	-	-	-	38%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
251-300 g/l	-	-	10%	-	-	-	-	90%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	3%	-	-	-	-	-	93%	-	-	-	-	-	-	3%	-	-	1%	-	-	-	-
551-600 g/l	-	-	-	-	-	-	50%	-	50%	-	-	-	-	-	-	-	-	-	-	-	-	-
Traffic Marking																						
0-50 g/l	-	37%	1%	10%	2%	10%	-	7%	2%	-	-	-	-	-	-	-	-	-	23%	-	-	8%
51-100 g/l	-	86%	-	1%	-	6%	-	-	2%	-	-	-	-	-	-	-	-	-	-	-	-	4%
101-150 g/l	-	20%	-	5%	-	-	-	1%	-	-	-	40%	-	-	-	-	-	-	-	-	-	35%
251-300 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401-450 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waterproofing Membranes																						
0-50 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96%	-	-	-	4%	-	-
51-100 g/l	-	-	-	-	-	-	-	7%	-	-	-	-	-	-	1%	91%	-	-	-	1%	-	-
101-150 g/l	-	-	-	-	-	-	-	2%	-	-	-	-	-	-	-	27%	-	-	-	71%	-	-
151-200 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88%	-	-	-	12%	-	-
201-250 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
301-350 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Wood Coatings																						
0-50 g/l	-	93%	-	2%	-	-	-	-	2%	-	-	-	-	-	-	-	-	-	-	-	2%	-
51-100 g/l	-	5%	-	2%	-	-	-	-	80%	-	-	-	-	-	-	9%	-	-	-	-	2%	-
101-150 g/l	-	13%	23%	-	-	-	-	6%	6%	-	-	-	-	-	-	53%	-	-	-	-	-	-
151-200 g/l	-	5%	4%	25%	-	-	-	-	7%	-	-	-	-	-	-	52%	-	-	-	6%	-	2%
201-250 g/l	-	10%	3%	18%	1%	13%	-	-	2%	-	-	-	-	1%	-	42%	-	-	-	2%	3%	4%
251-300 g/l	-	7%	1%	27%	-	31%	-	3%	1%	-	-	-	-	-	-	15%	-	-	3%	-	3%	9%
301-350 g/l	-	3%	-	18%	-	1%	-	32%	2%	-	-	-	-	1%	1%	41%	-	-	-	-	2%	-
351-400 g/l	-	2%	-	-	-	-	-	77%	-	-	-	-	-	-	-	20%	-	-	-	-	-	-
401-450 g/l	-	-	-	7%	-	4%	-	-	6%	-	-	-	-	-	-	83%	-	-	-	-	-	-
451-500 g/l	-	-	-	2%	-	59%	-	-	-	-	-	-	-	-	-	35%	-	-	2%	-	2%	-
501-550 g/l	-	1%	-	28%	1%	43%	-	1%	2%	-	-	-	-	-	-	3%	-	-	-	-	2%	20%
551-600 g/l	-	-	-	35%	-	-	-	-	65%	-	-	-	-	-	-	-	-	-	-	-	-	-
601-650 g/l	-	-	-	28%	11%	32%	-	-	17%	-	-	-	-	-	-	-	-	-	-	-	11%	-
651-700 g/l	-	-	-	31%	-	59%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9%
700 g/l +	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wood Preservatives																						
0-50 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
51-100 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
301-350 g/l	-	12%	-	88%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401-450 g/l	-	-	-	-	11%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89%	-
451-500 g/l	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501-550 g/l	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
551-600 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc-Rich Primer																						
0-50 g/l	89%	-	11%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51-100 g/l	-	-	-	3%	-	-	-	6%	6%	-	-	-	-	-	-	48%	-	-	-	-	11%	26%
101-150 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201-250 g/l	-	-	-	44%	-	-	-	-	-	-	-	-	-	-	-	56%	-	-	-	-	-	-
251-300 g/l	-	-	-	-	-	-	-	4%	-	-	-	-	-	-	-	-	-	-	-	-	52%	43%
301-350 g/l	51%	-	-	-	-	-	-	37%	5%	-	-	-	-	-	-	8%	-	-	-	-	-	-
351-400 g/l	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
451-500 g/l	-	-	-	-	-	27%	-	-	72%	-	-	-	-	-	1%	-	-	-	-	-	-	-

Notes:
1. PD is Protected Data. Fewer than 4 companies reported sales.

Data Summary - 2014 Architectural Coatings Survey
VOC Distribution Histograms (Large Containers Only)

No figure is provided for **Basement Specialty Coatings** because data are protected.

Figure H-1
Aluminum Roof Coatings

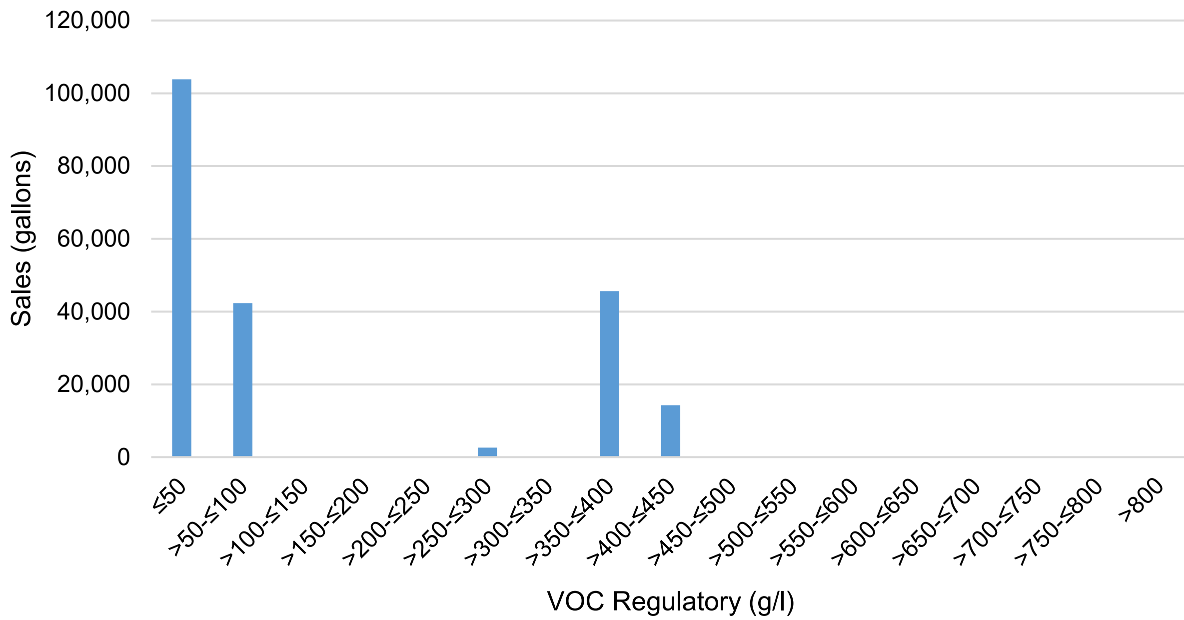
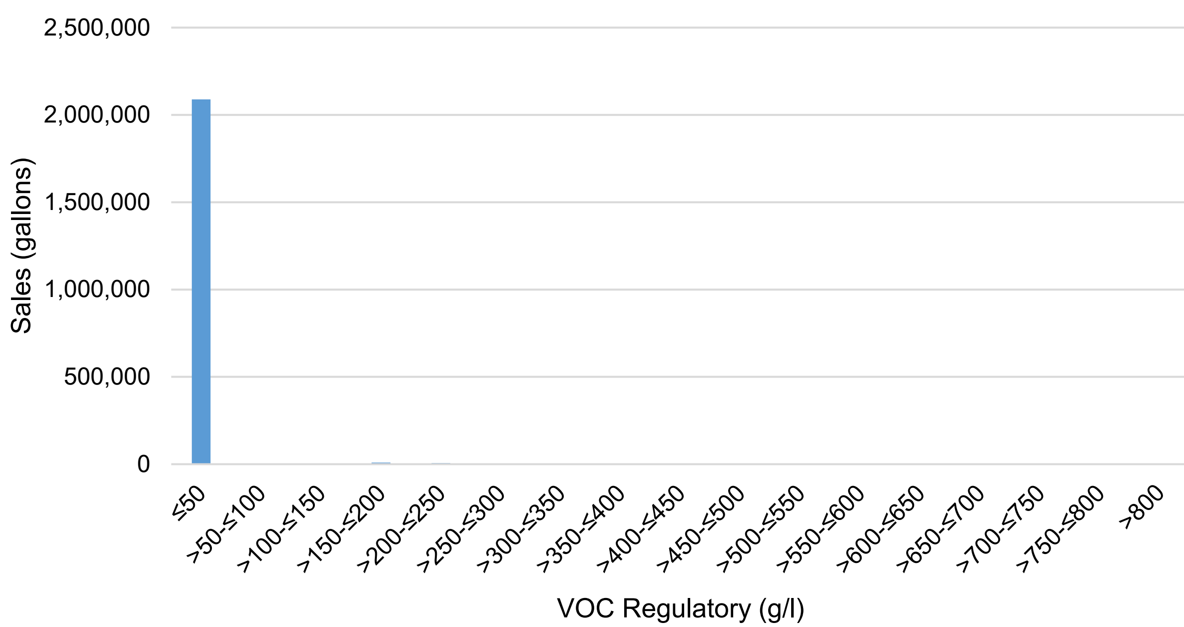


Figure H-2
Bituminous Roof Coatings



No figure is provided for **Bond Breakers** because data are protected.

Figure H-3
Bituminous Roof Primers

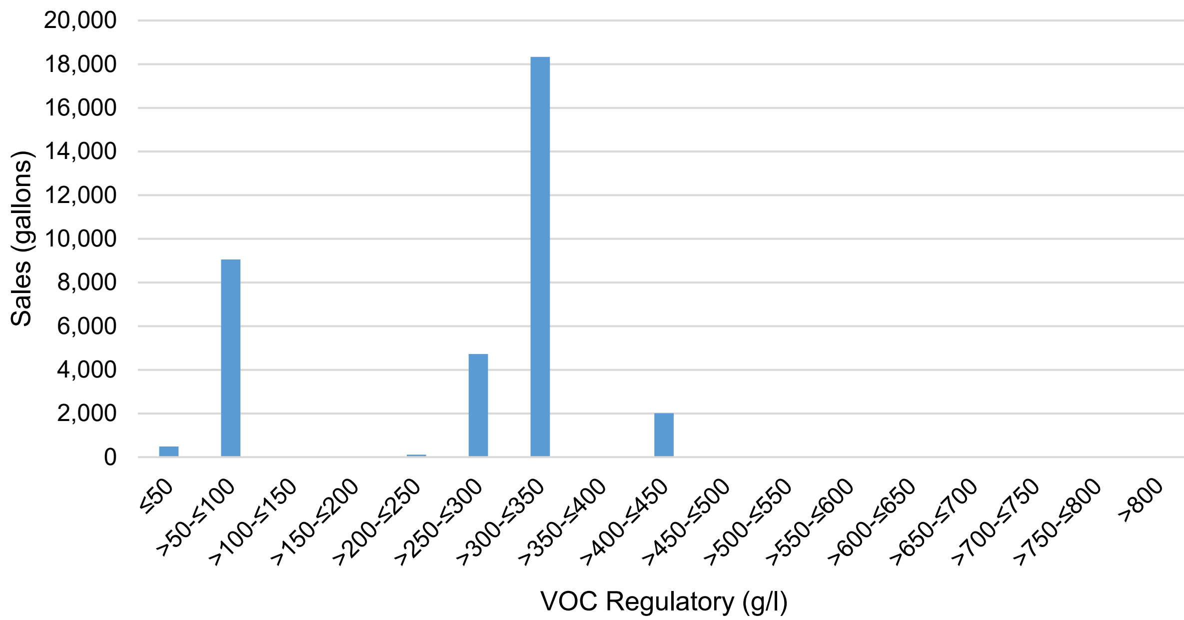


Figure H-4
Building Envelope Coatings

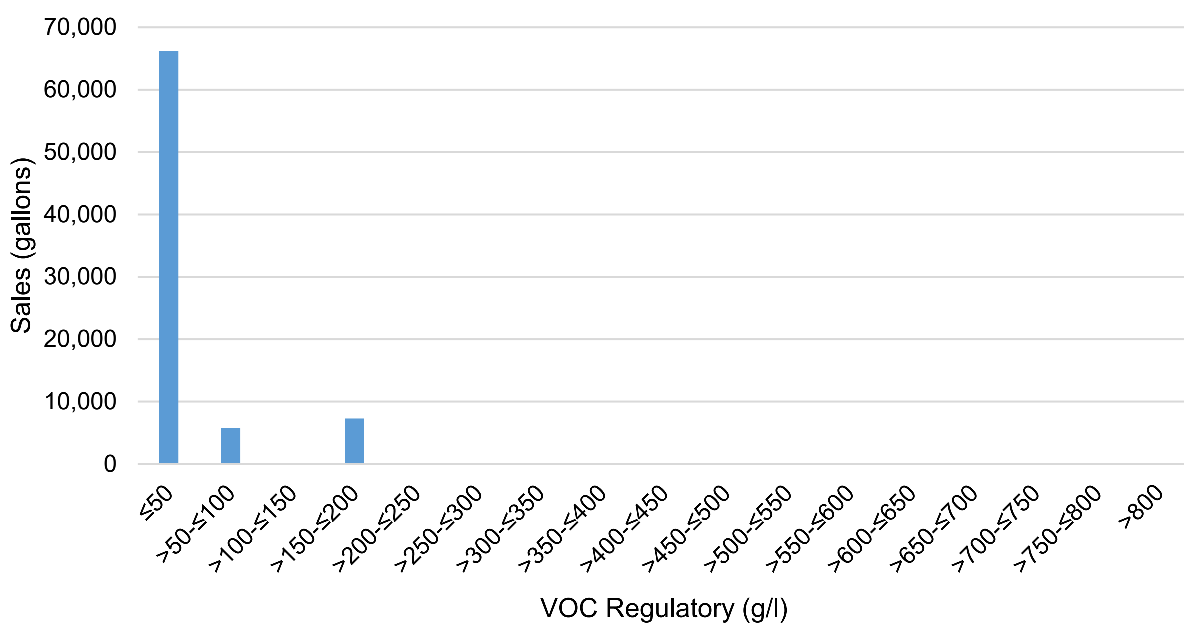


Figure H-5
Concrete Curing Compounds

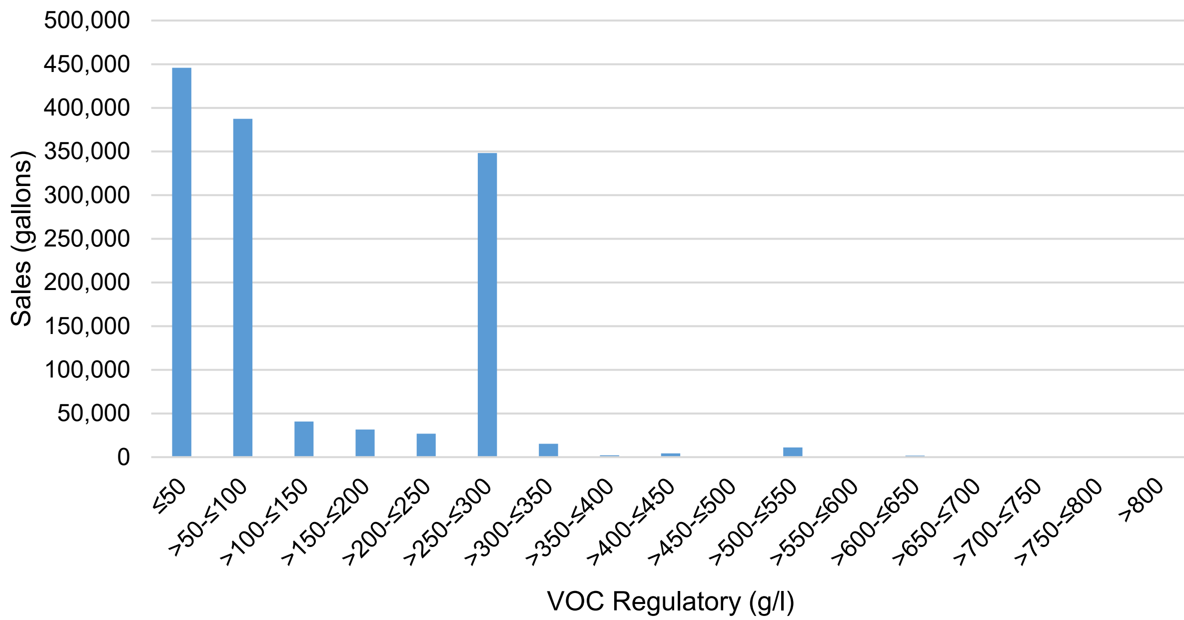


Figure H-6
Concrete/Masonry Sealers

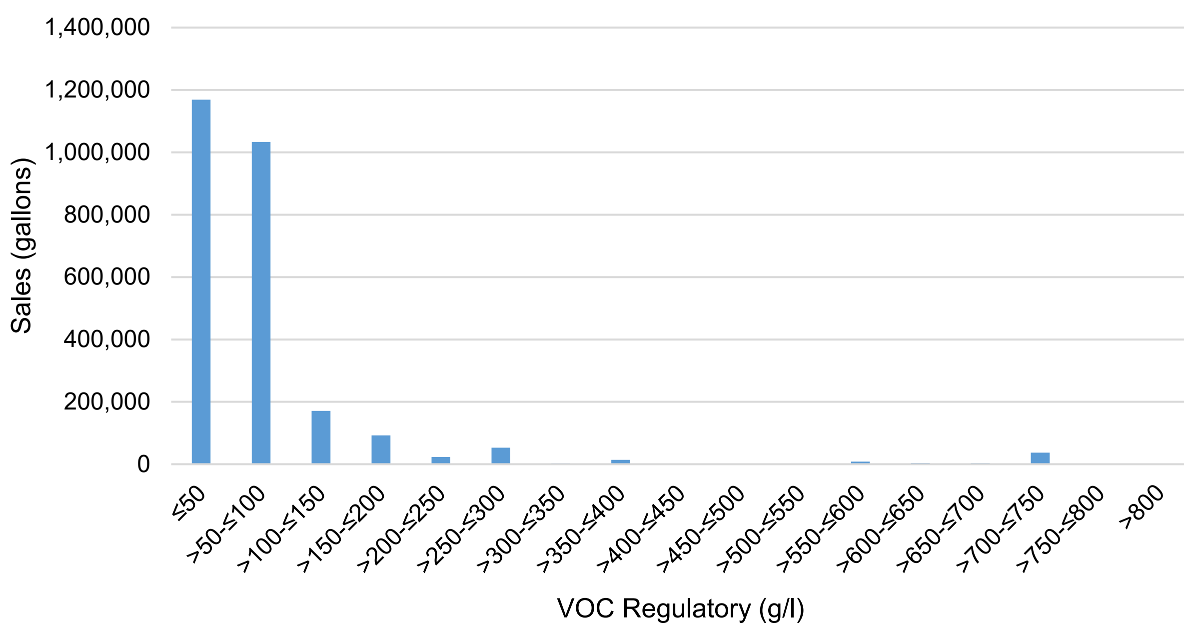


Figure H-7
Driveway Sealers

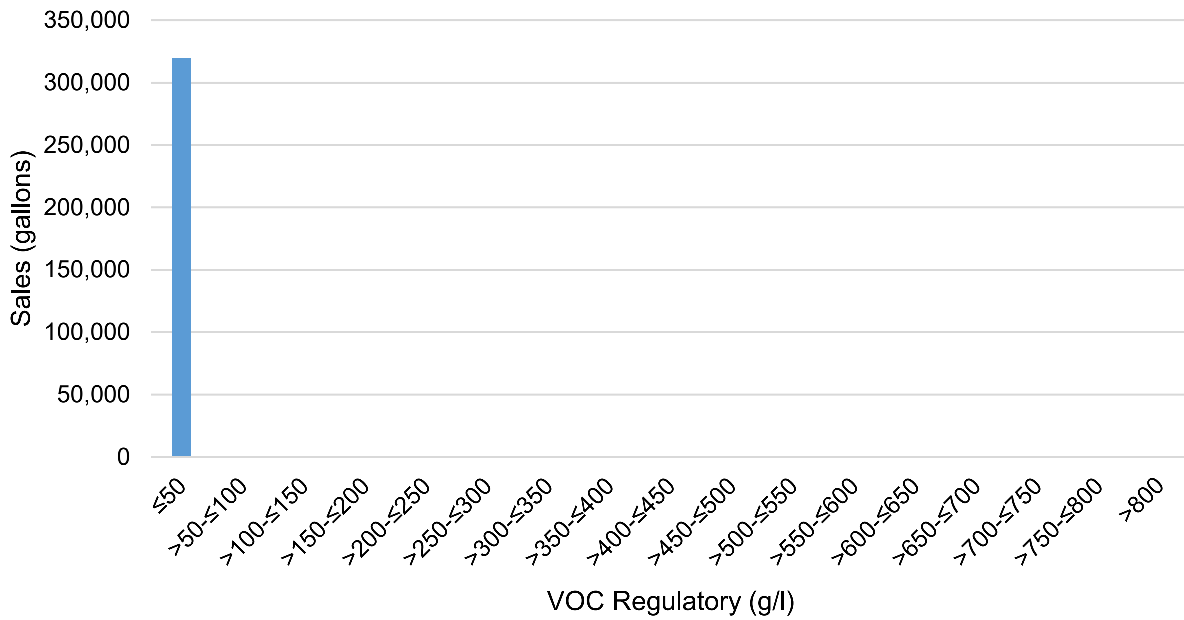


Figure H-8
Dry Fog Coatings

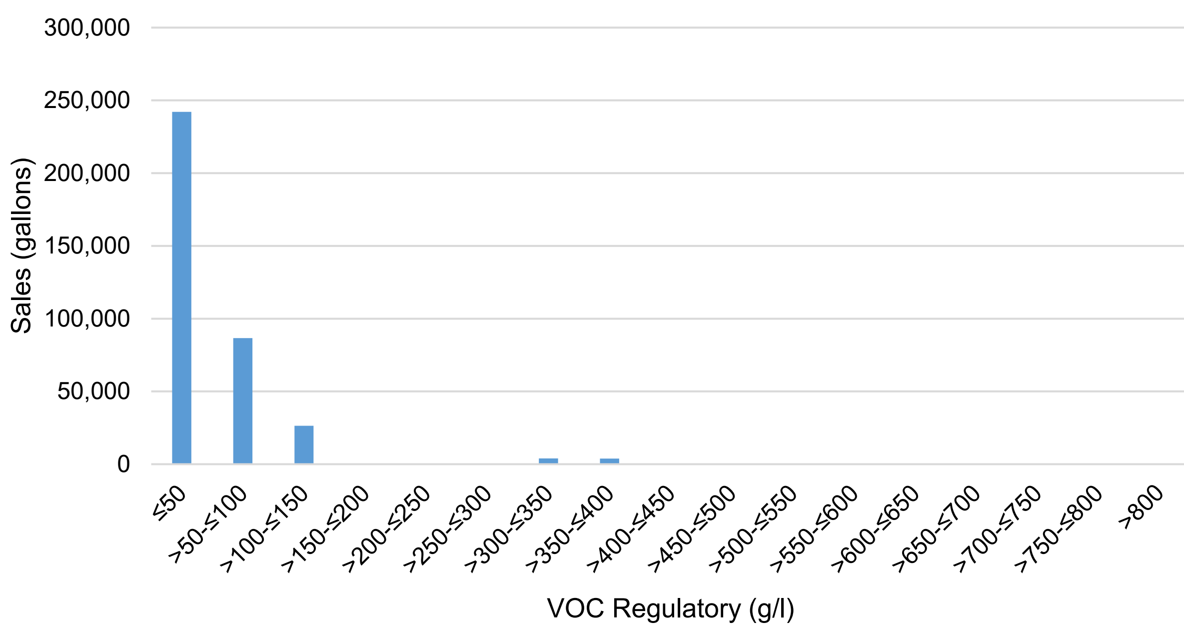


Figure H-9
Faux Finishing Coatings

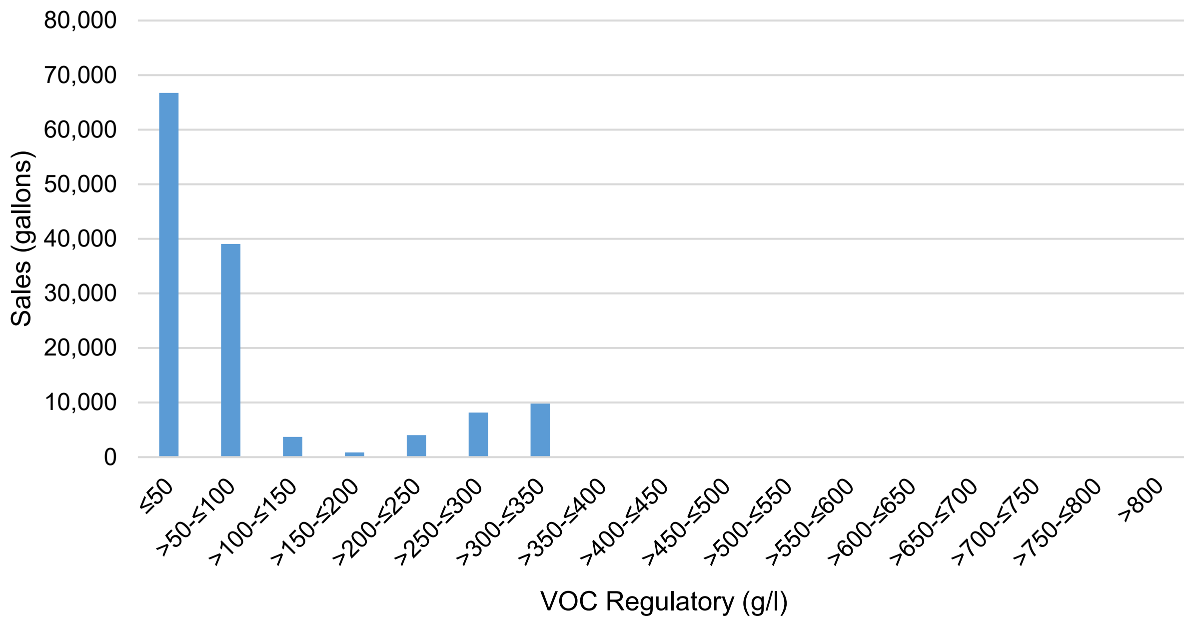


Figure H-10
Fire Resistive Coatings

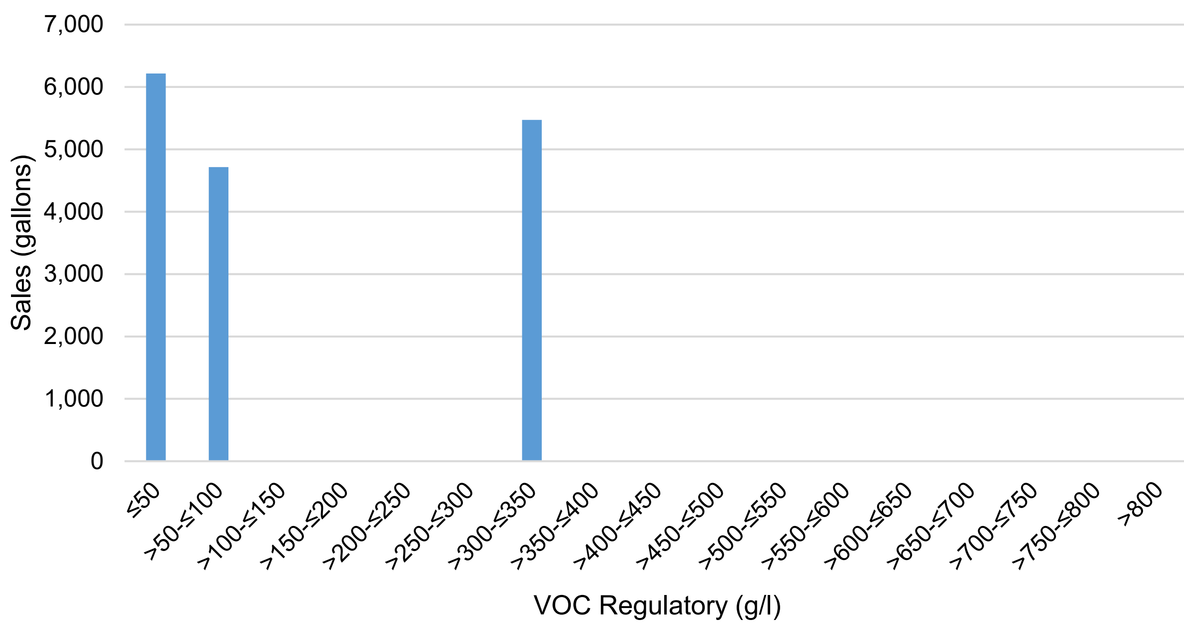


Figure H-11
Flat Coatings

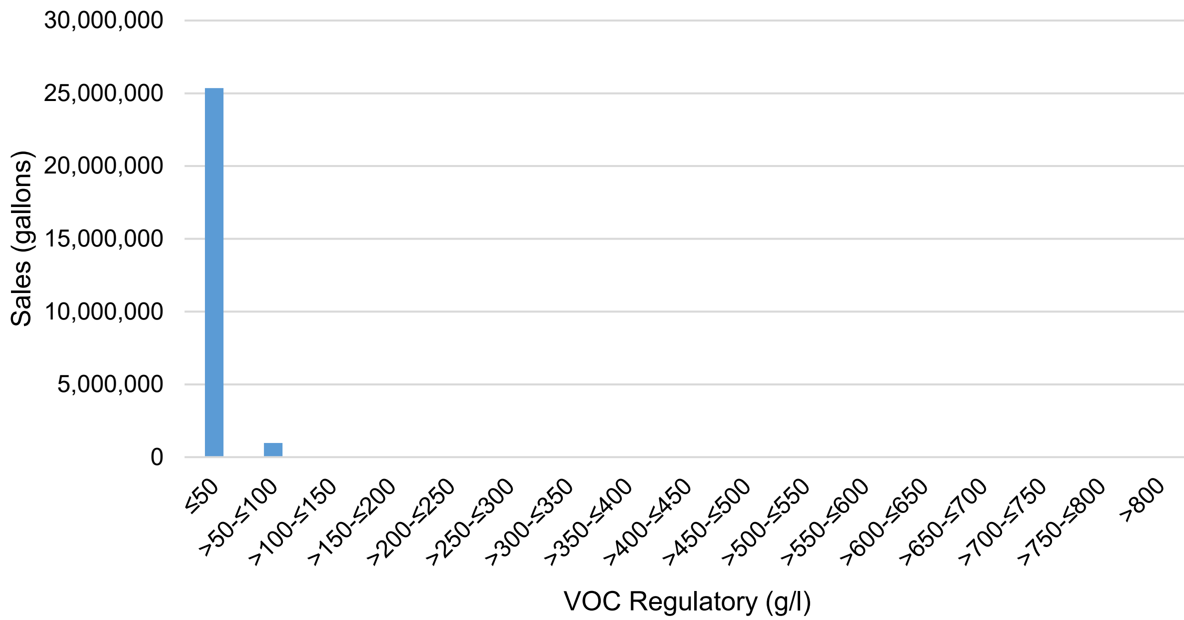
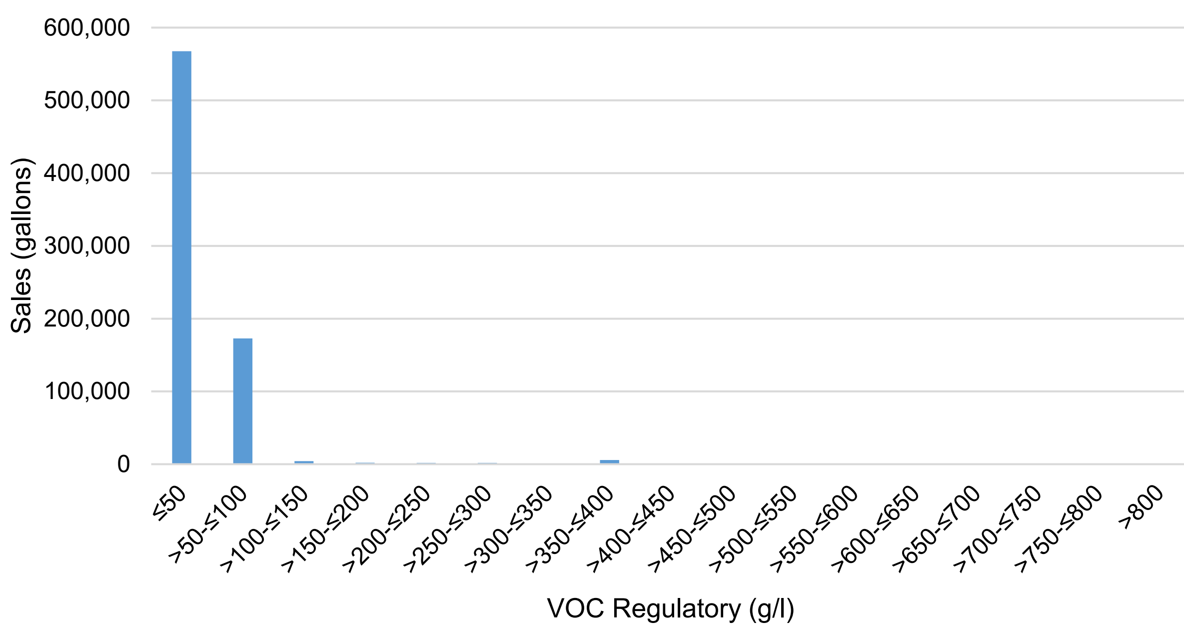


Figure H-12
Floor Coatings



No figure is provided for **Graphic Arts Coatings (Sign Paints)** because data are protected.

Figure H-13
Form-Release Compounds

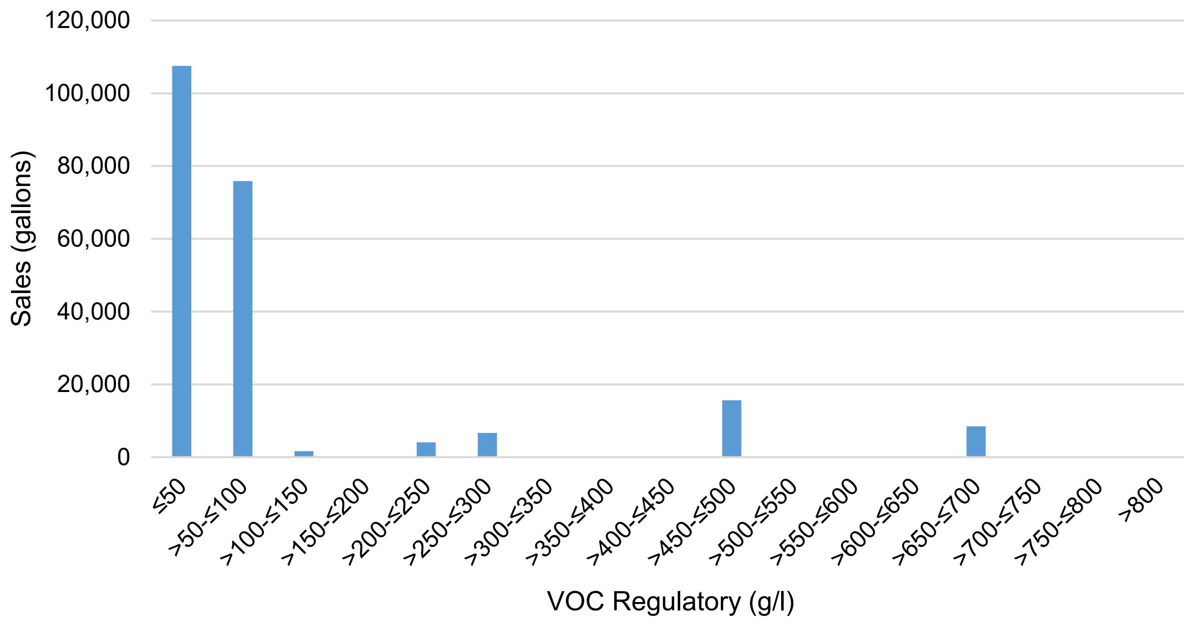


Figure H-14
High Temperature Coatings

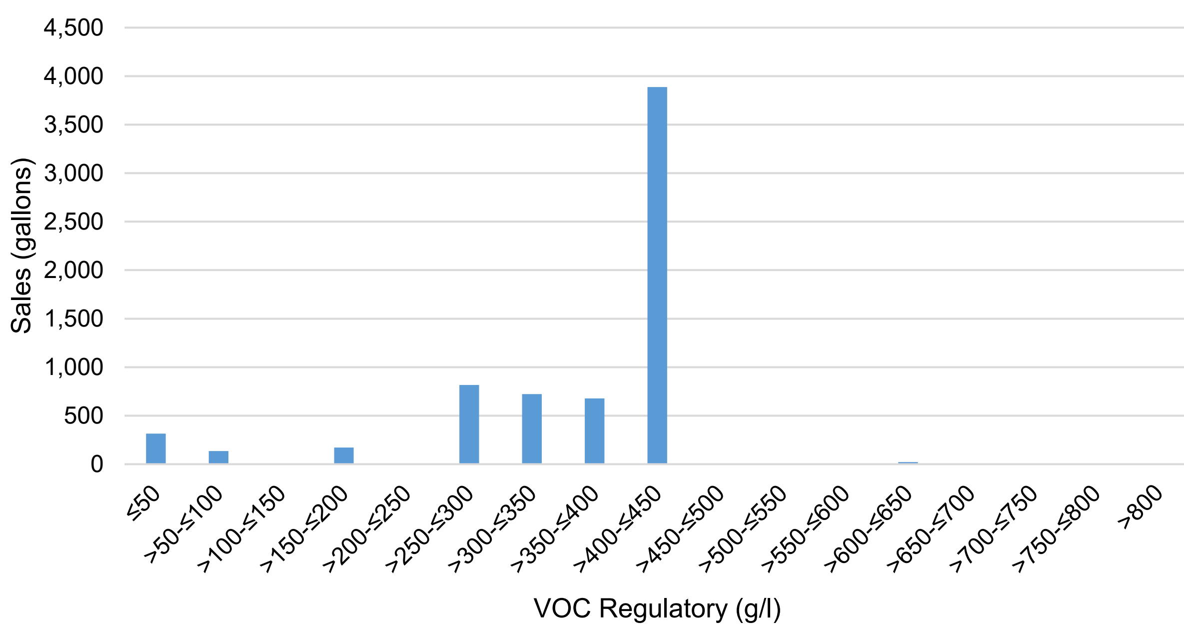


Figure H-15
Industrial Maintenance Coatings

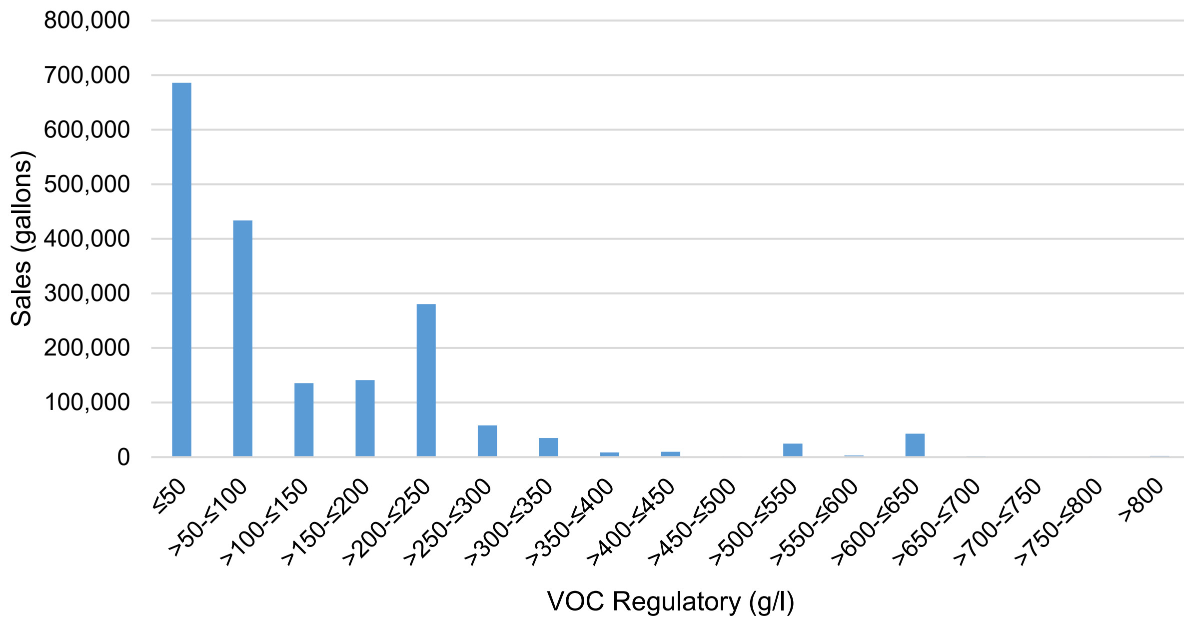
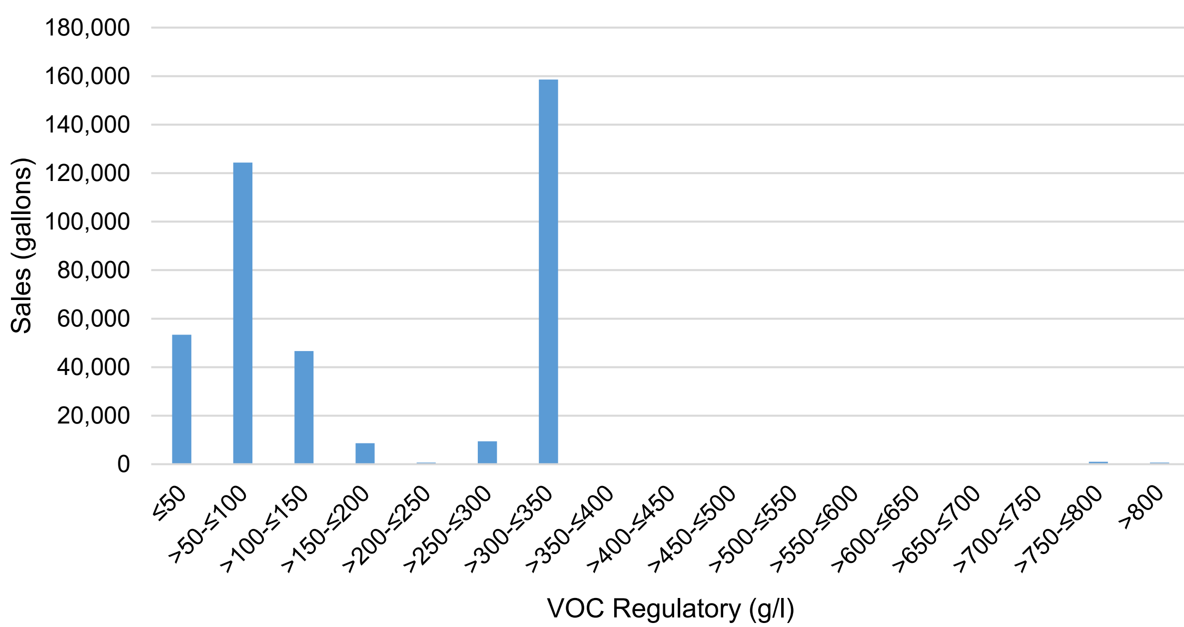


Figure H-16
Low Solids Coatings



No figure is provided for **Magnesite Cement Coatings** because data are protected.

Figure H-17
Mastic Texture Coatings

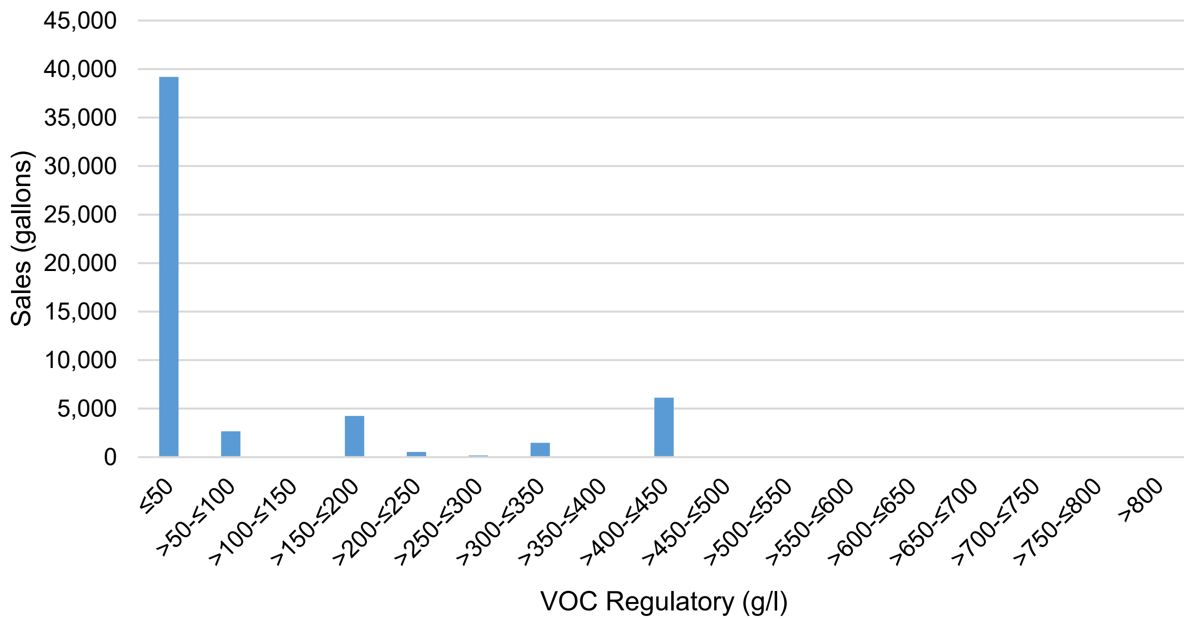
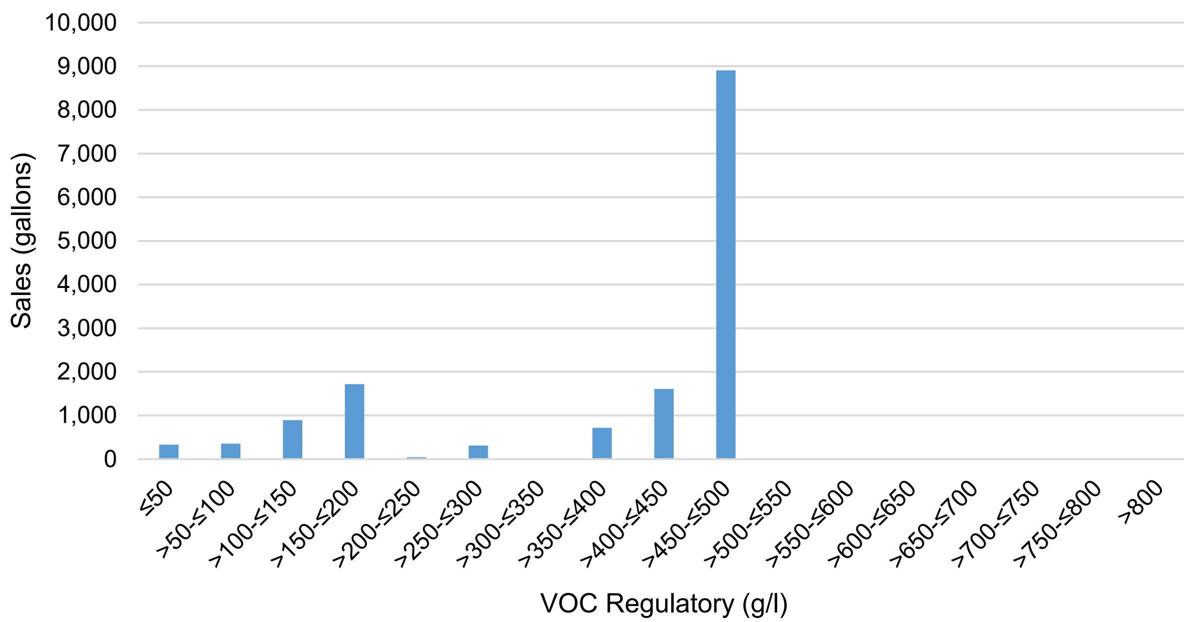


Figure H-18
Metallic Pigmented Coatings



No figure is provided for **Multi-Color Coatings** because data are protected.

Figure H-19
Nonflat Coatings

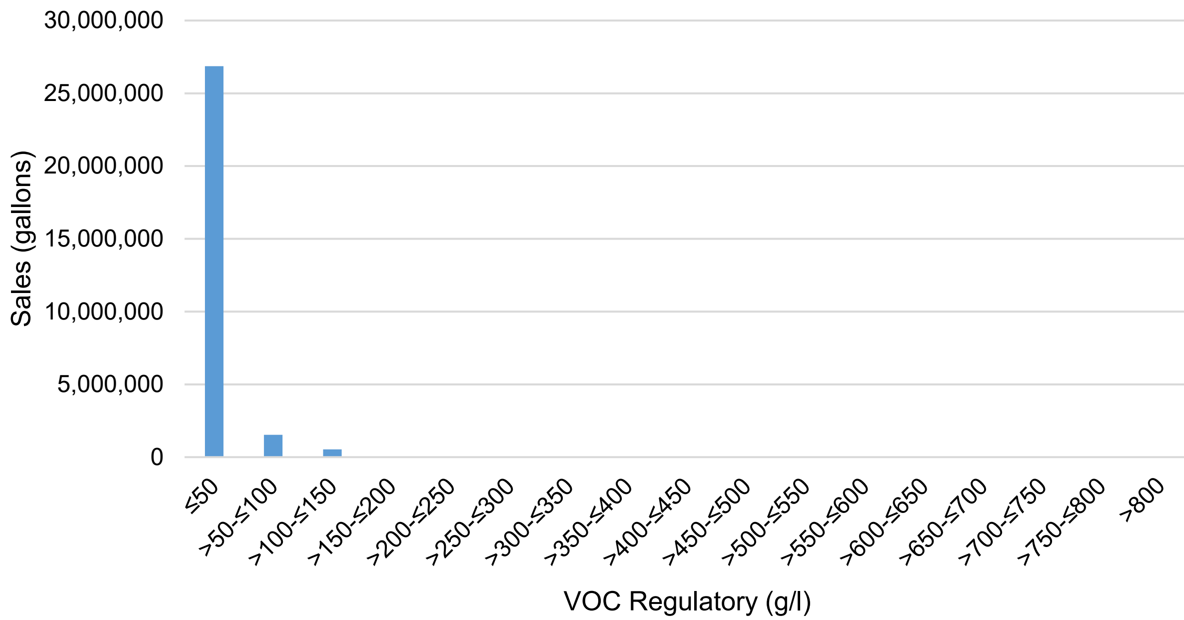
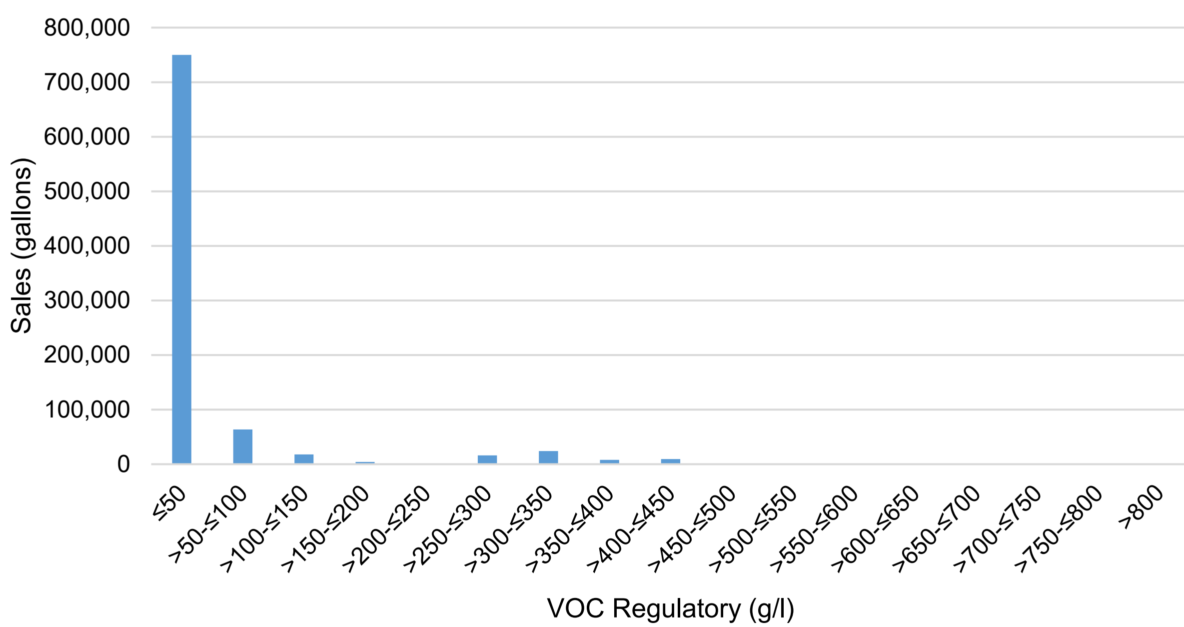


Figure H-20
Nonflat-High Gloss Coatings



No figure is provided for **Pre-Treatment Wash Primers** because sales data was not reported.

Figure H-21
Primers, Sealers, and Undercoaters

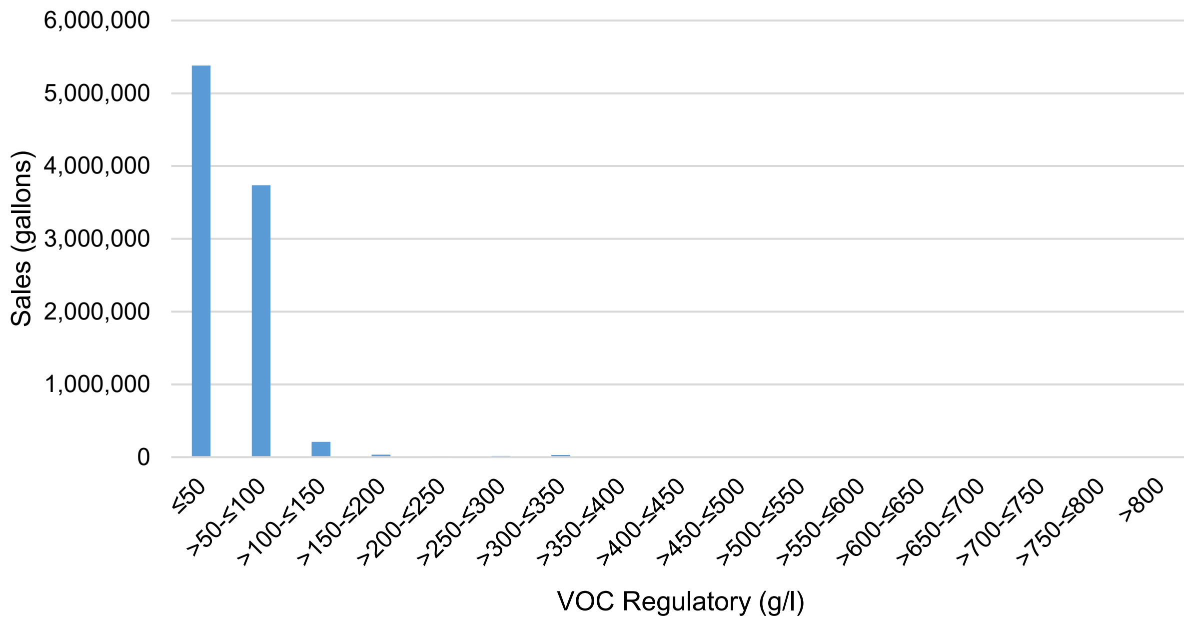
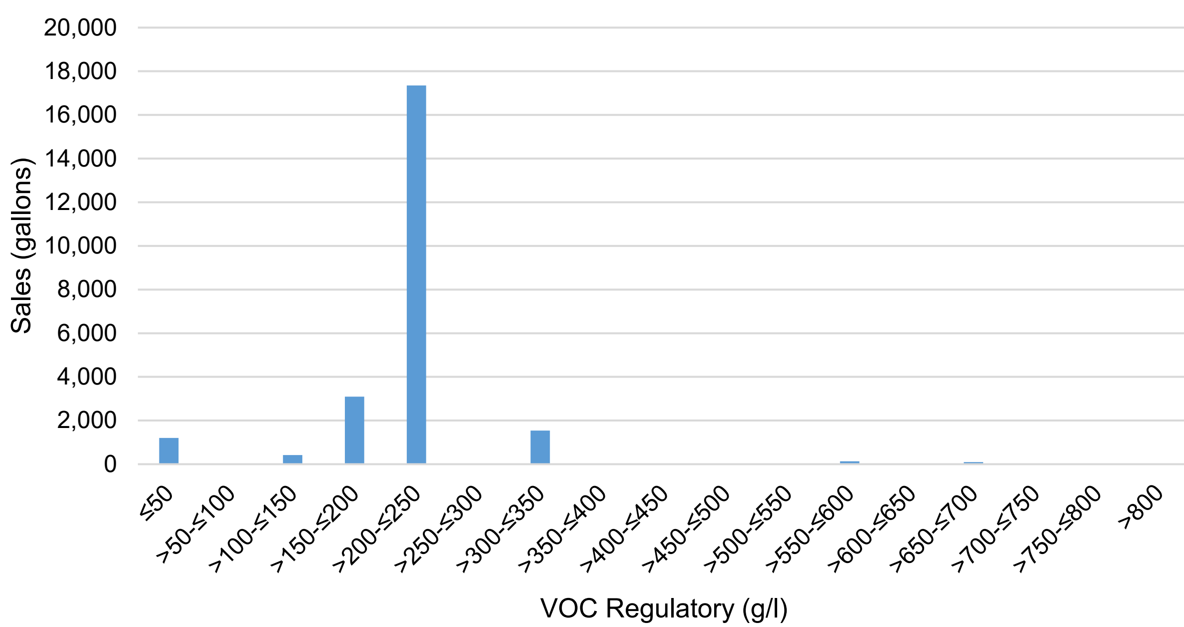


Figure H-22
Reactive Penetrating Sealers



No figure is provided for **Recycled Coatings** because data are protected.

Figure H-23
Roof Coatings

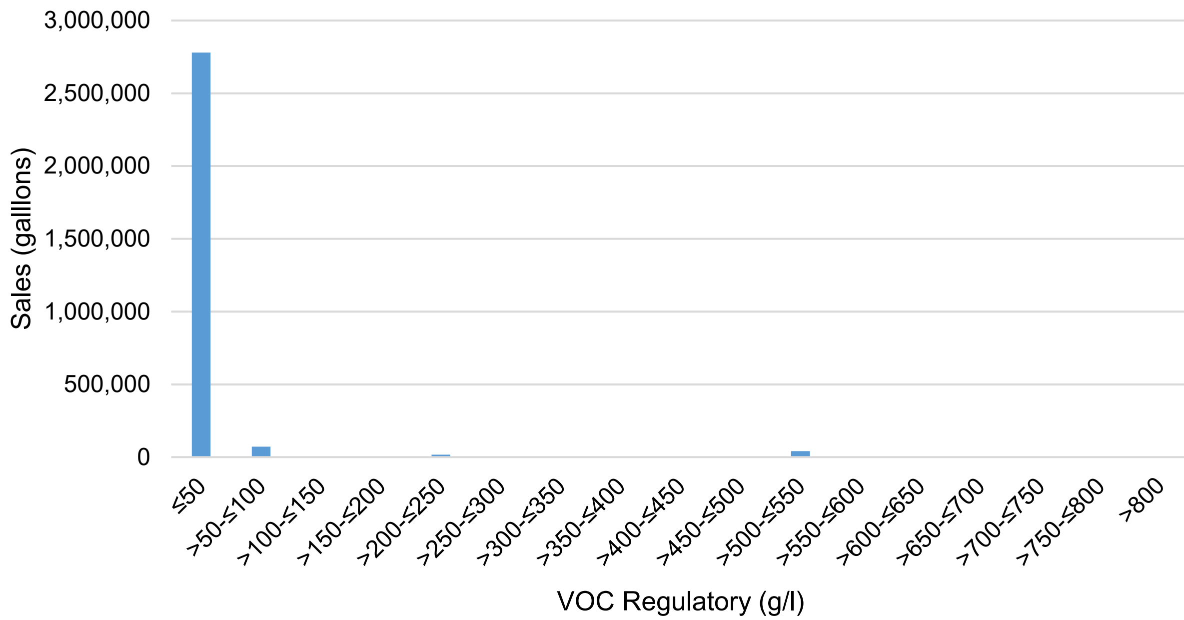
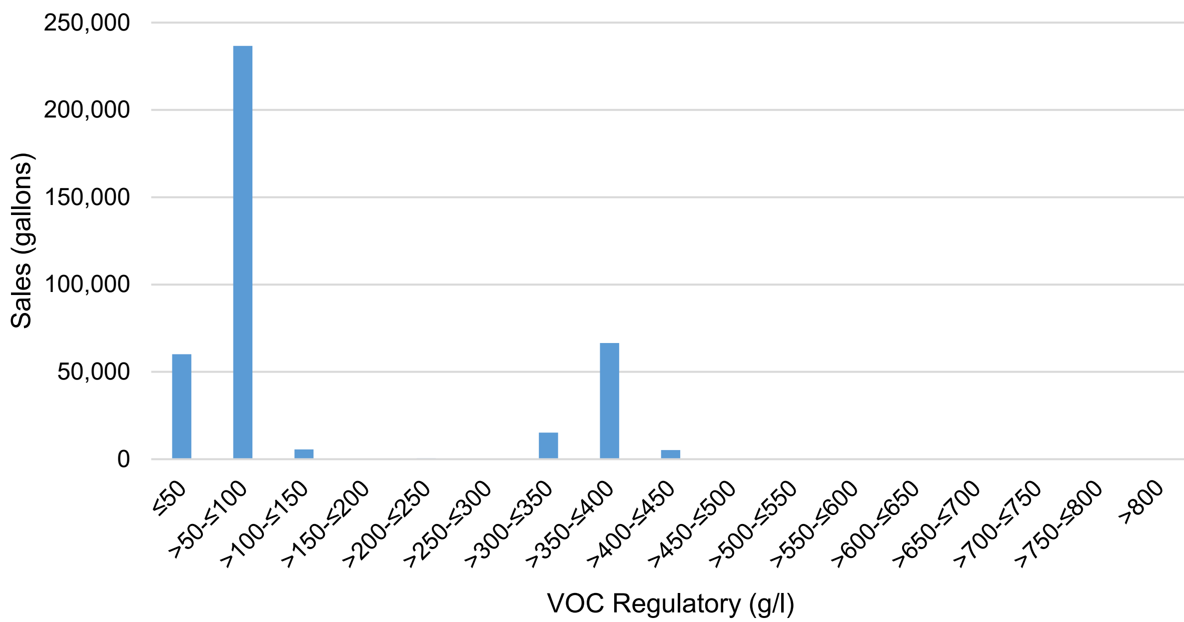


Figure H-24
Rust Preventative Coatings



No figure is provided for **Shellacs (Clear) and Shellacs (Opaque)** because data are protected.

Figure H-25
Specialty Primers, Sealers, and Undercoaters

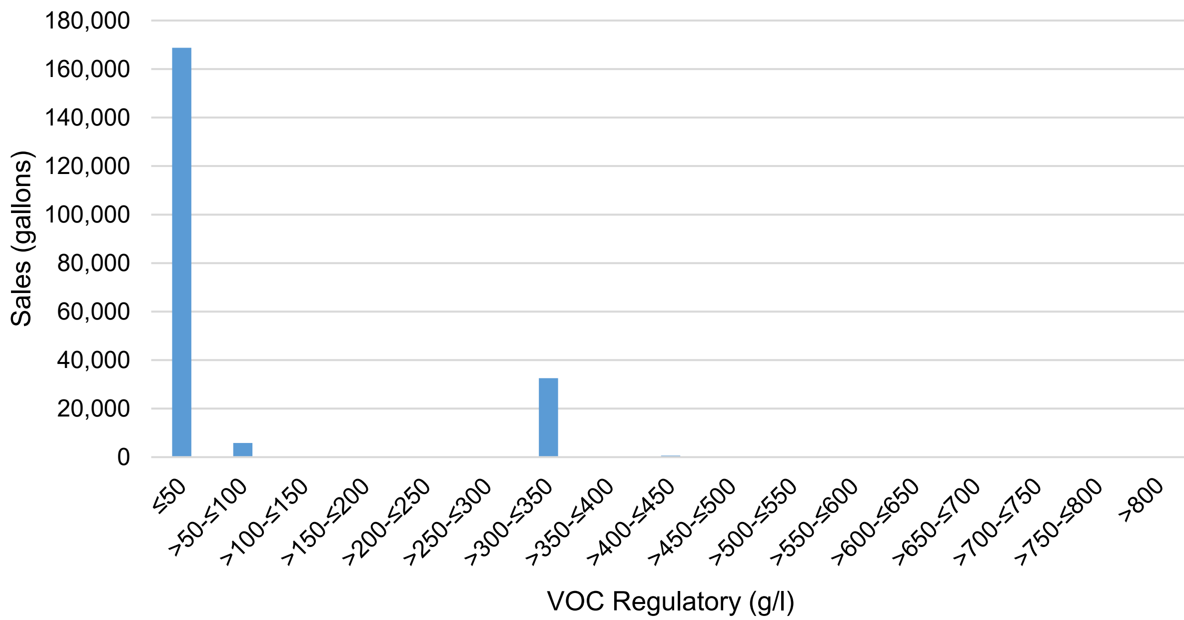
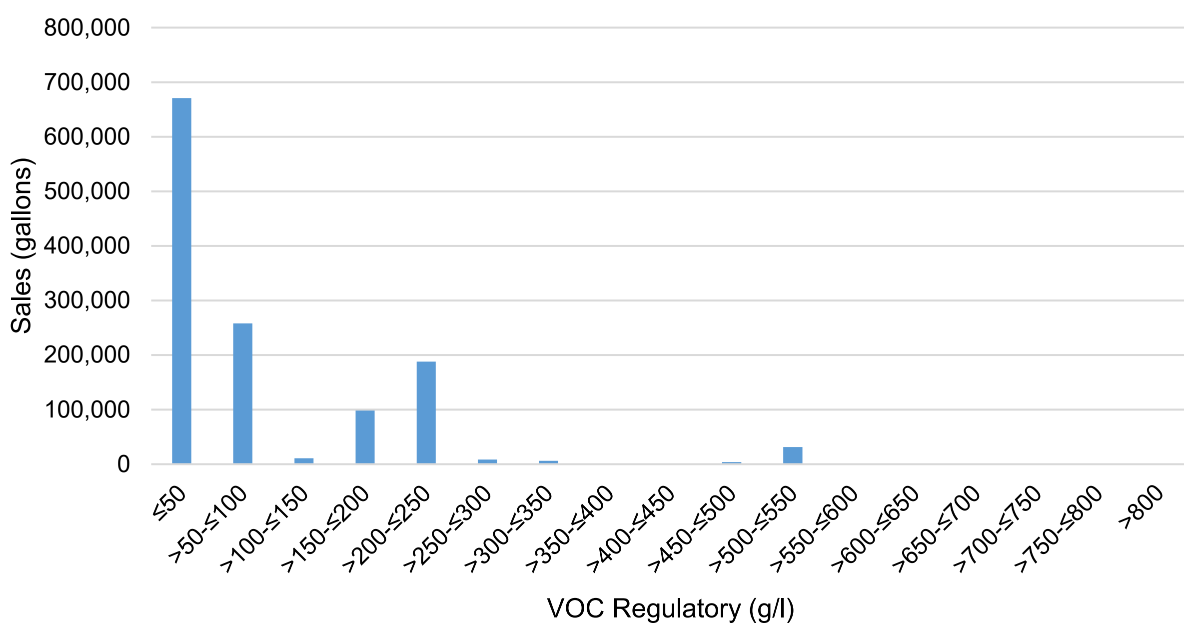


Figure H-26
Stains



No figure is provided for **Stone Consolidants** because data are protected.

Figure H-27
Stains: Interior

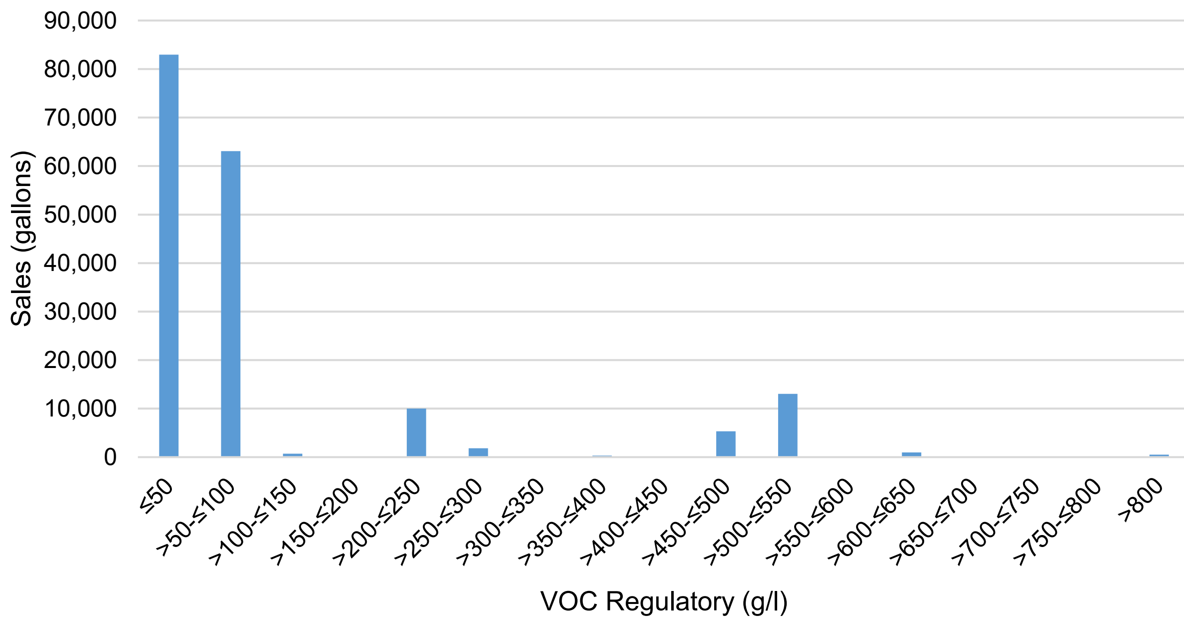


Figure H-28
Swimming Pool Coatings

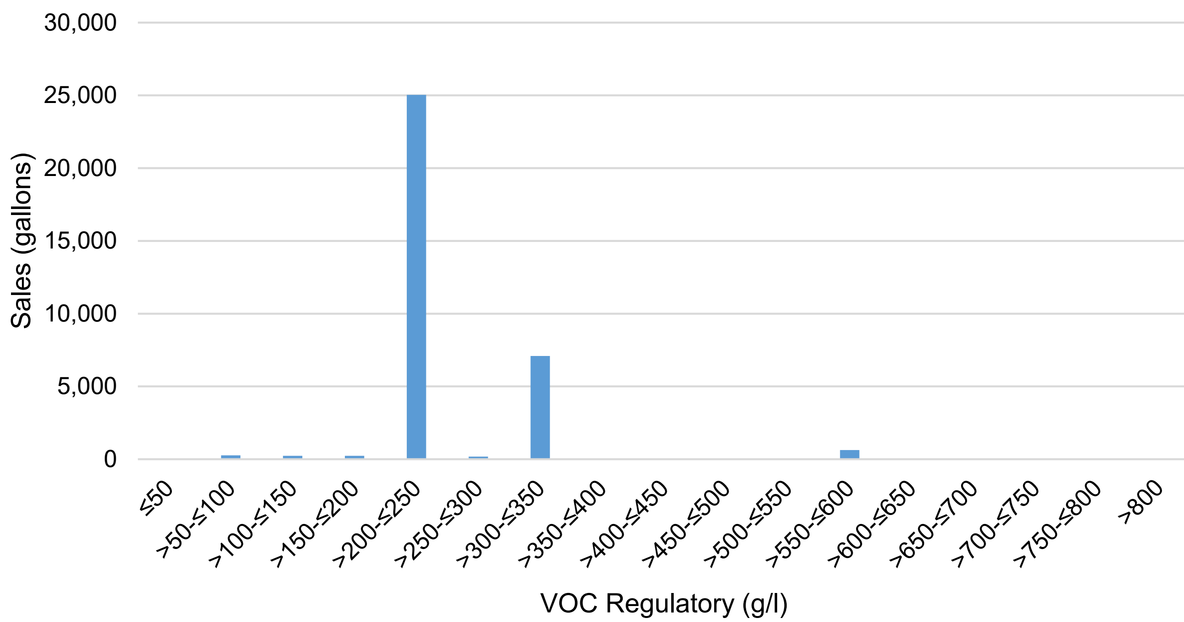


Figure H-29
Traffic Marking Coatings

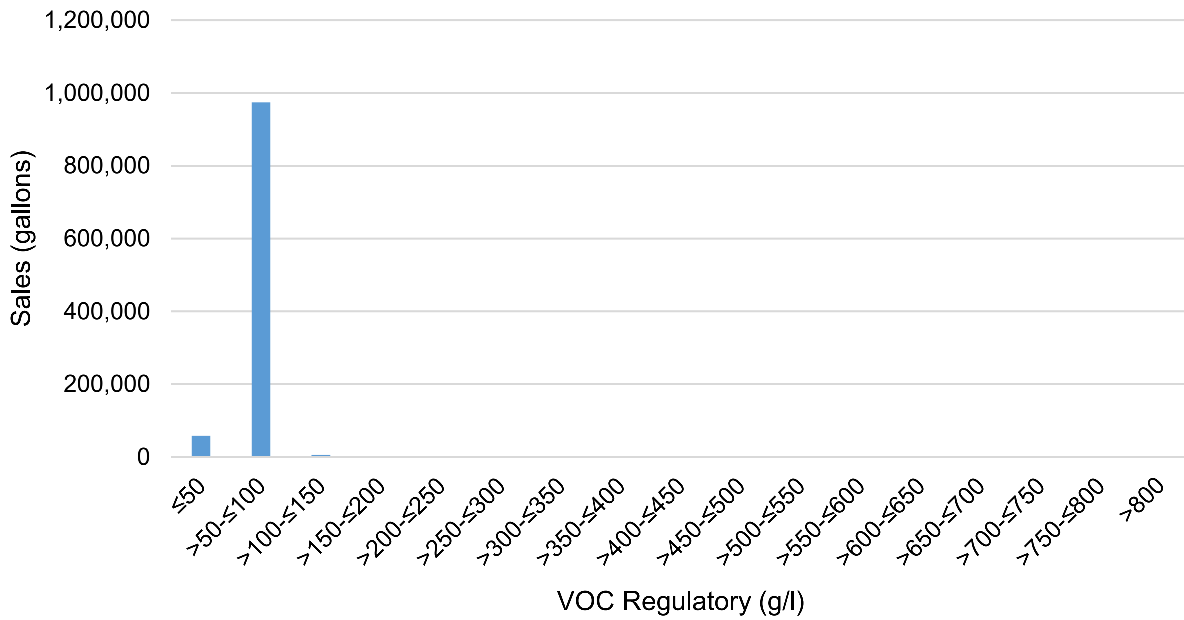


Figure H-30
Waterproofing Membranes

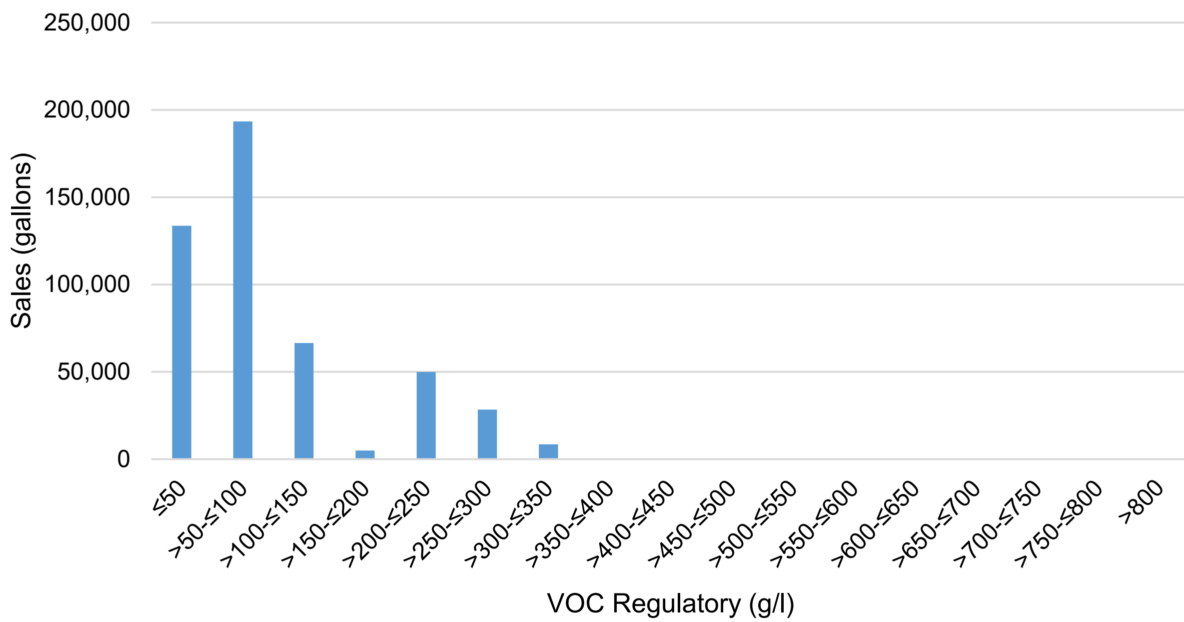


Figure H-31
Wood Coatings

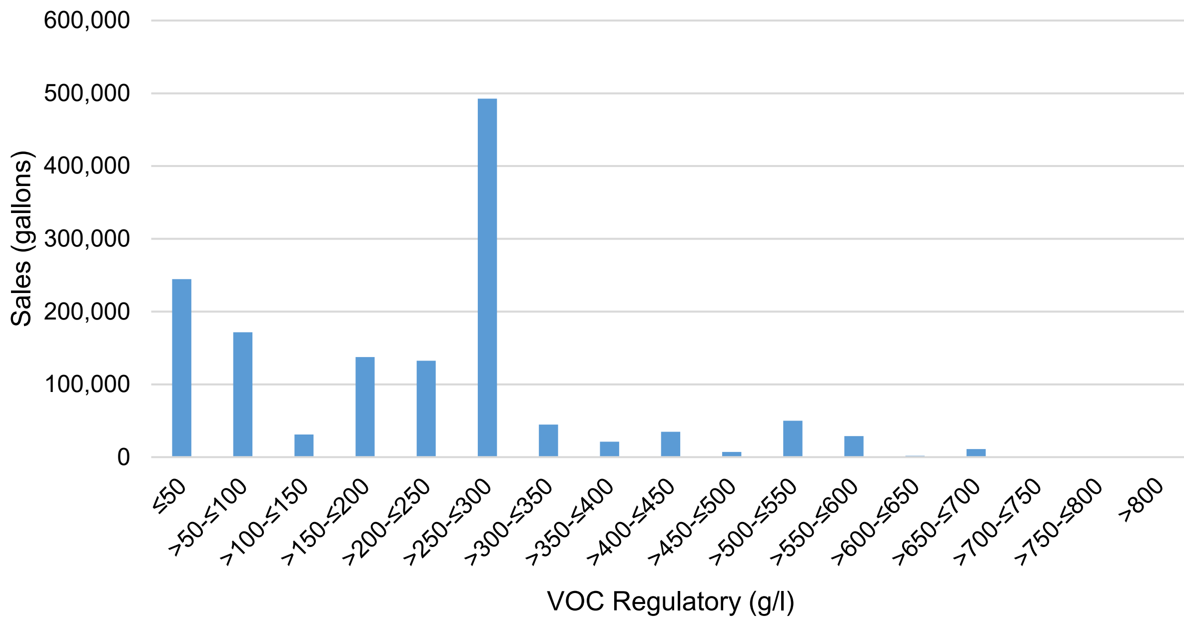


Figure H-32
Wood Preservatives

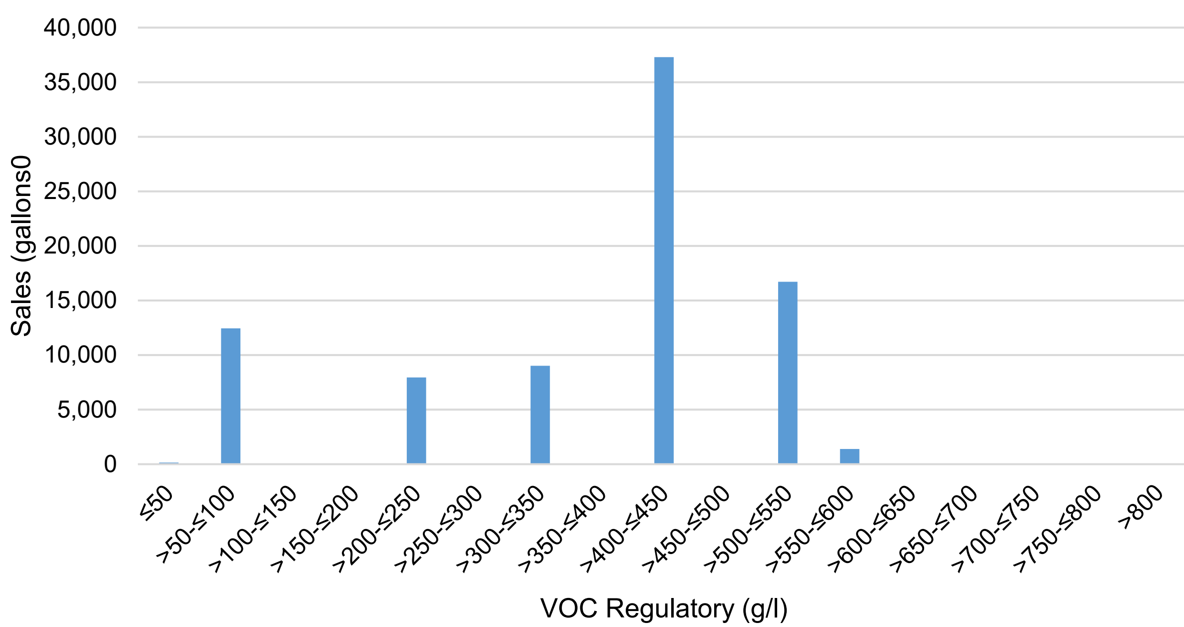
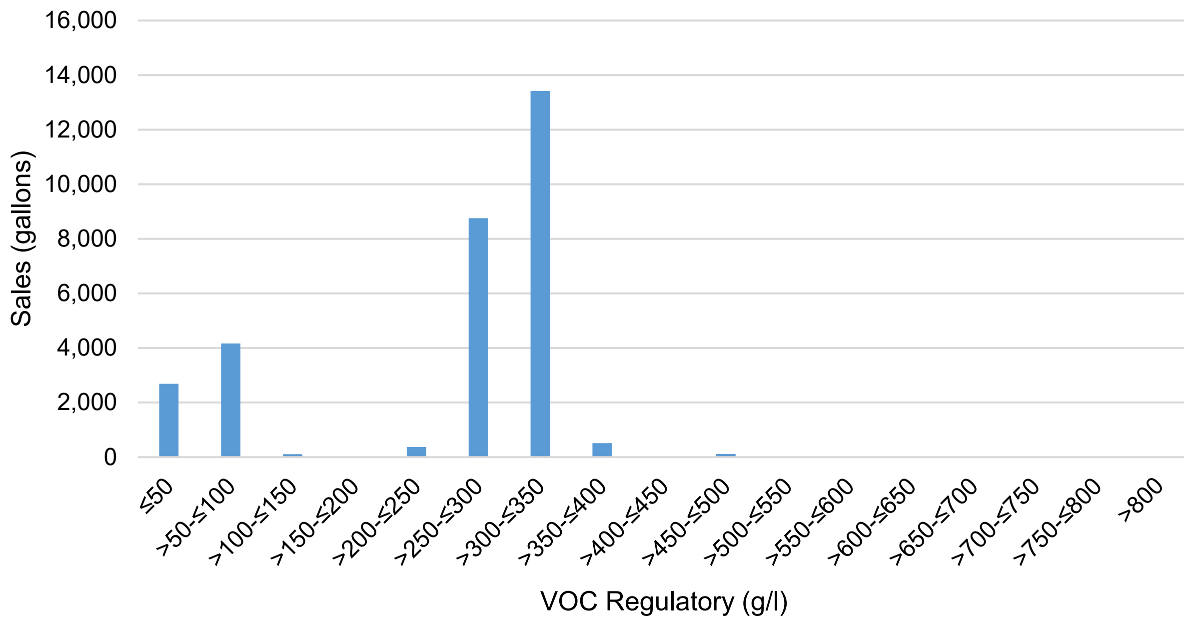


Figure H-33
Zinc-Rich Primer



Data Summary - 2014 Architectural Coatings Survey
Cumulative Percent Graphs of Sales Volume vs. VOC (Large Containers Only)

No figure is provided for **Basement Specialty Coatings** because data are protected.

Figure H-34
Aluminum Roof Coatings

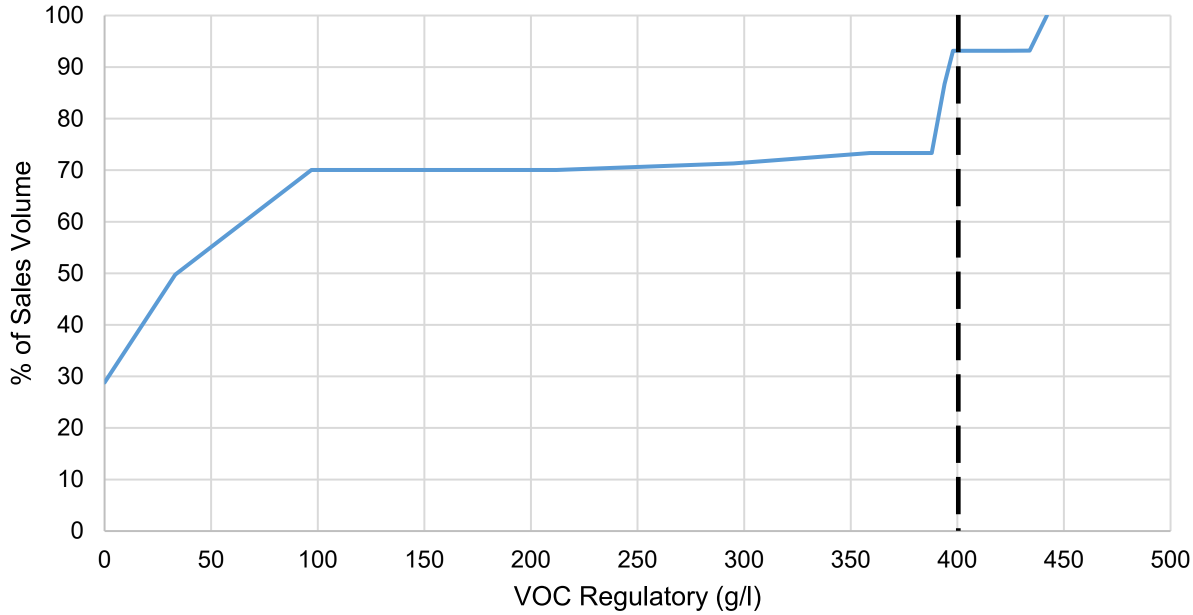
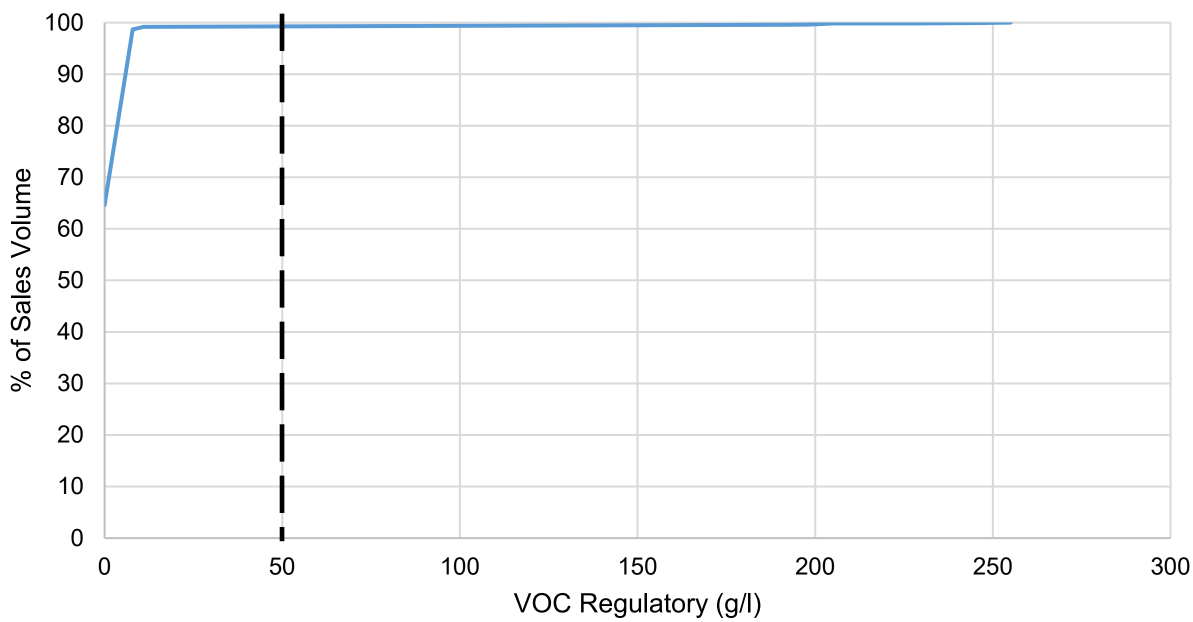


Figure H-35
Bituminous Roof Coatings



No figure is provided for **Bond Breakers** because data are protected.

Figure H-36
Bituminous Roof Primers

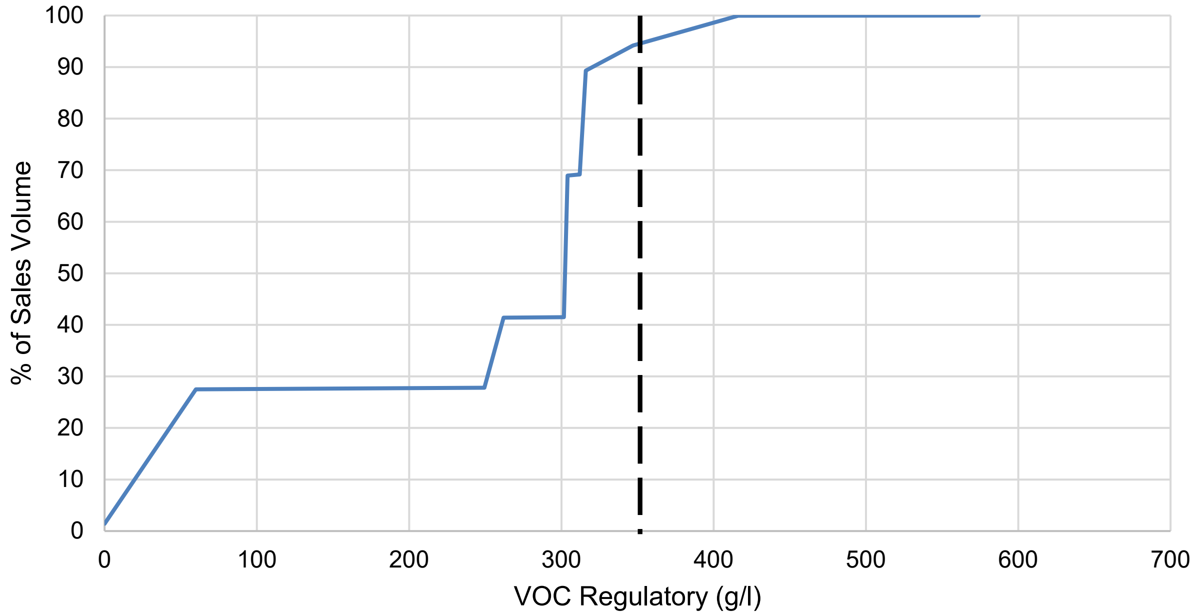


Figure H-37
Building Envelope Coatings

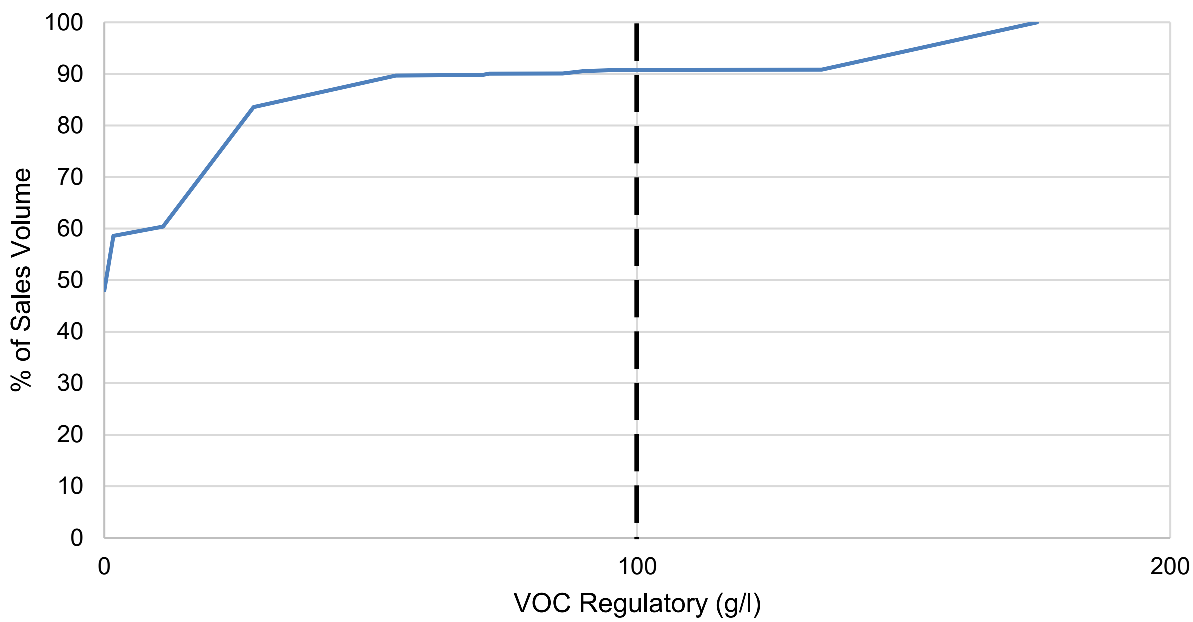


Figure H-38
Concrete Curing Compounds

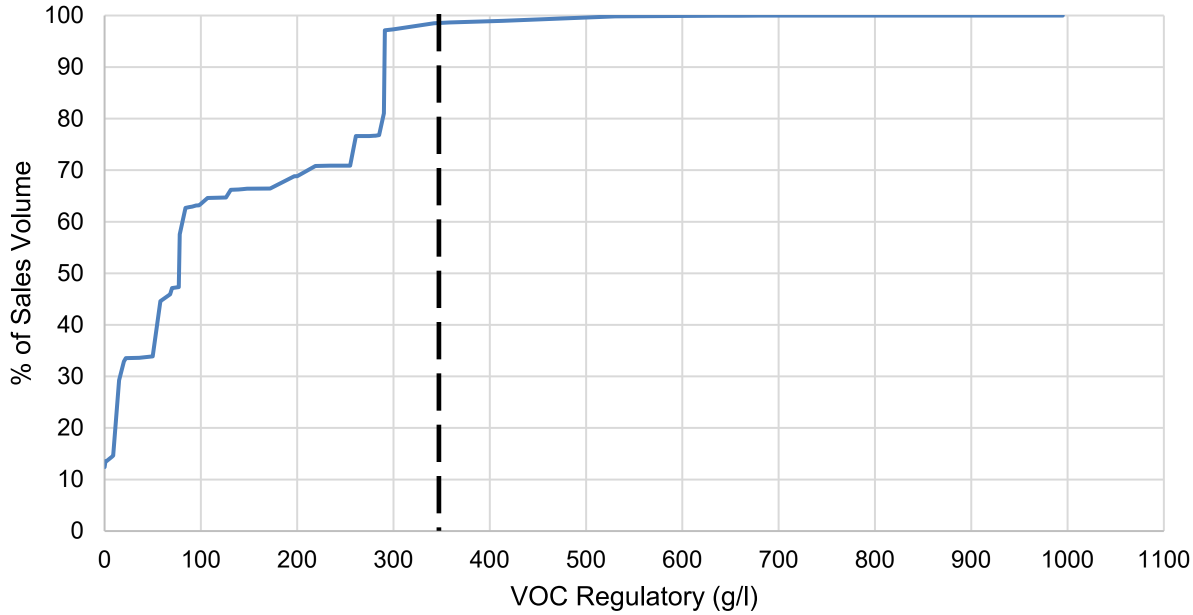


Figure H-39
Concrete/Masonry Sealers

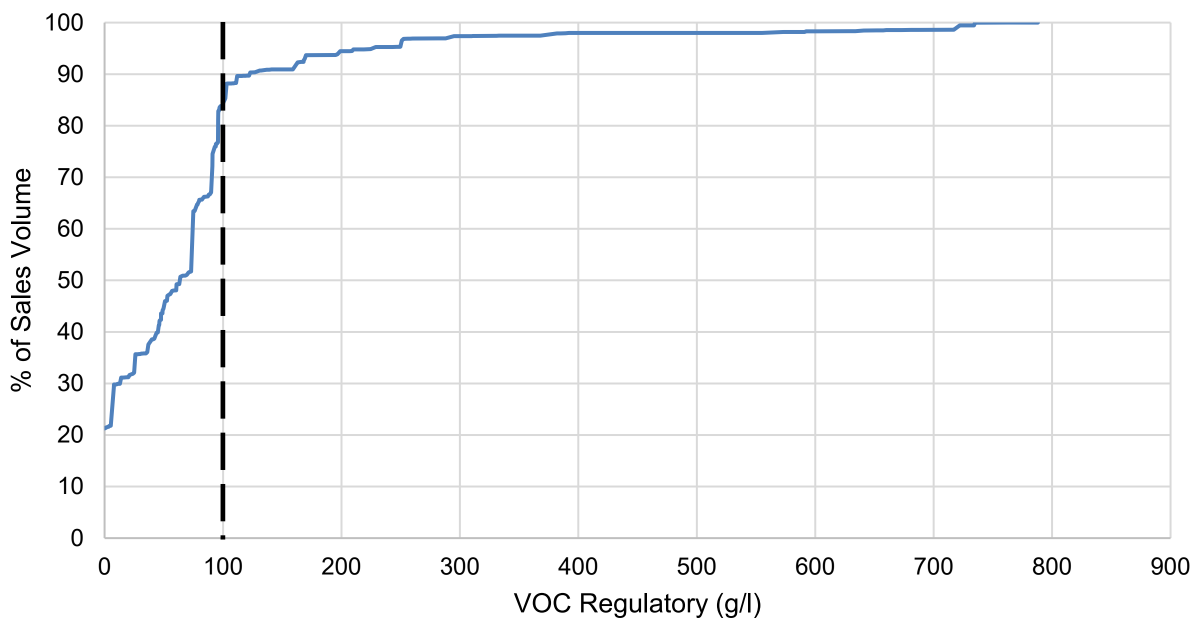


Figure H-40
Driveway Sealers

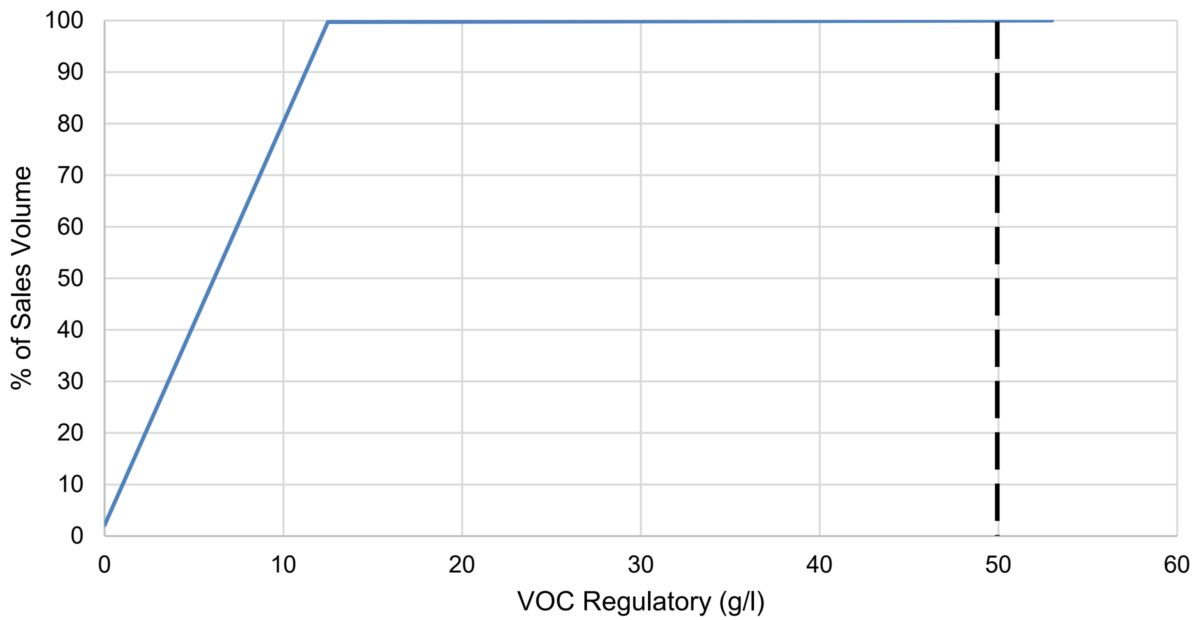


Figure H-41
Dry Fog Coatings

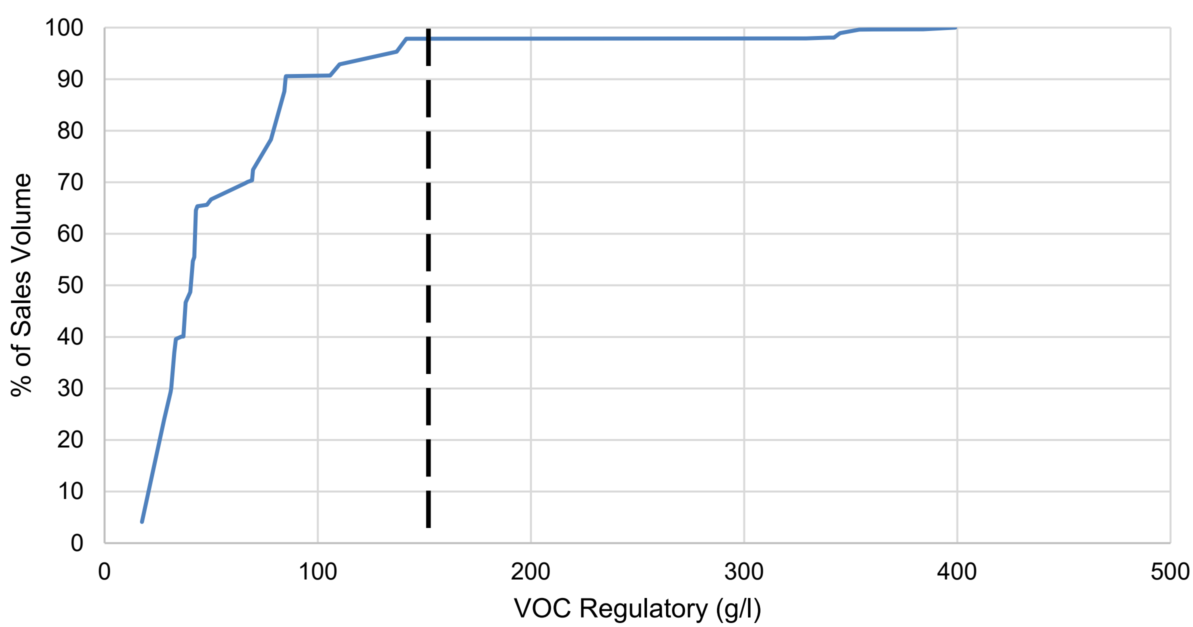


Figure H-42
Faux Finishing Coatings

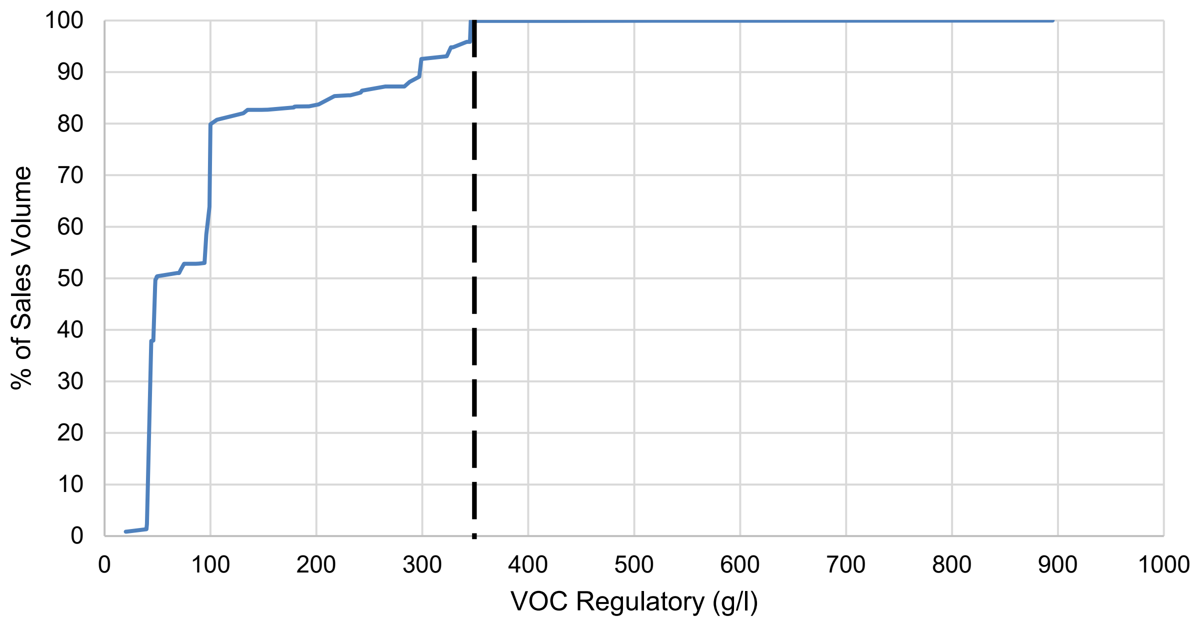


Figure H-43
Fire Resistive Coatings

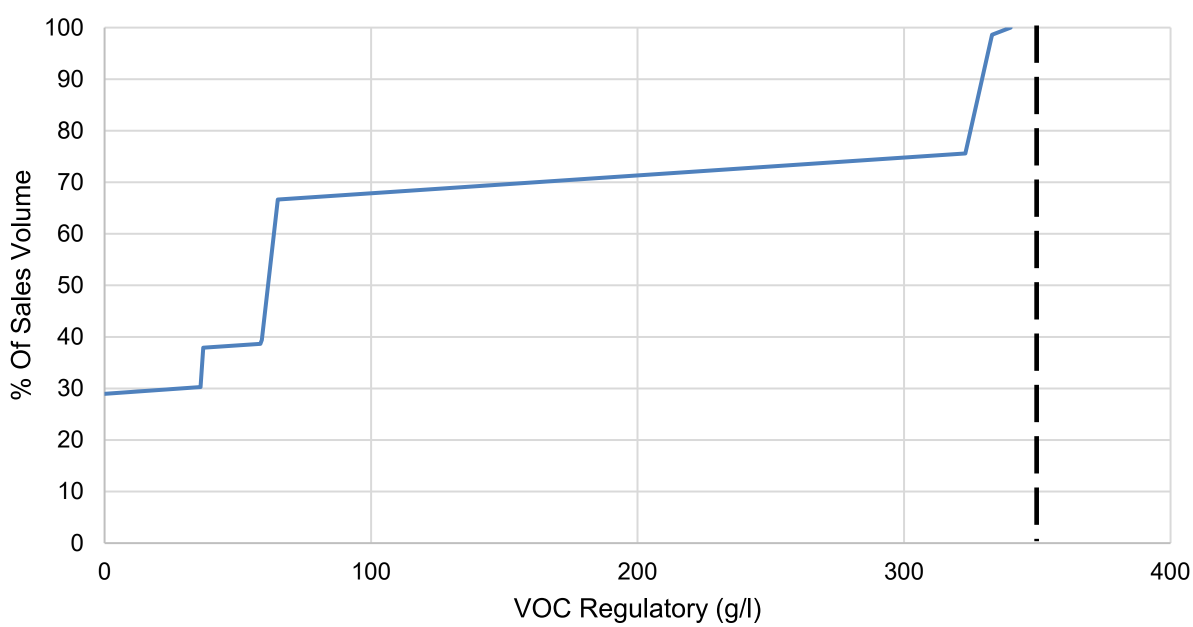


Figure H-44
Flat Coatings

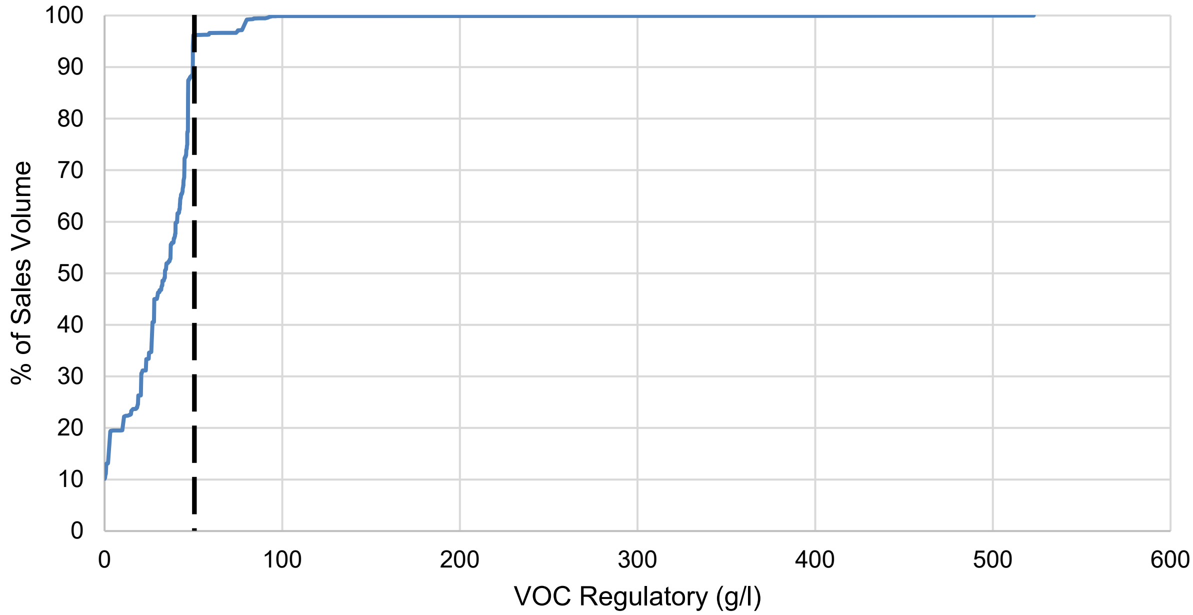
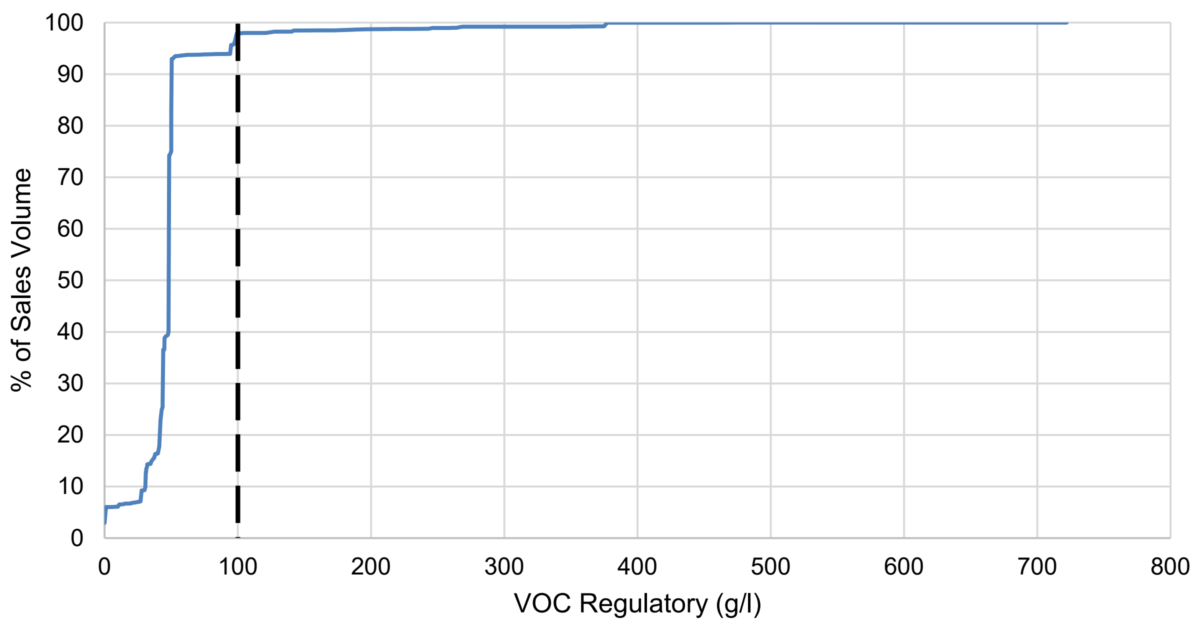


Figure H-45
Floor Coatings



No figure is provided for **Graphic Arts Coatings (Sign Paints)** because data are protected.

Figure H46
Form-Release Compounds

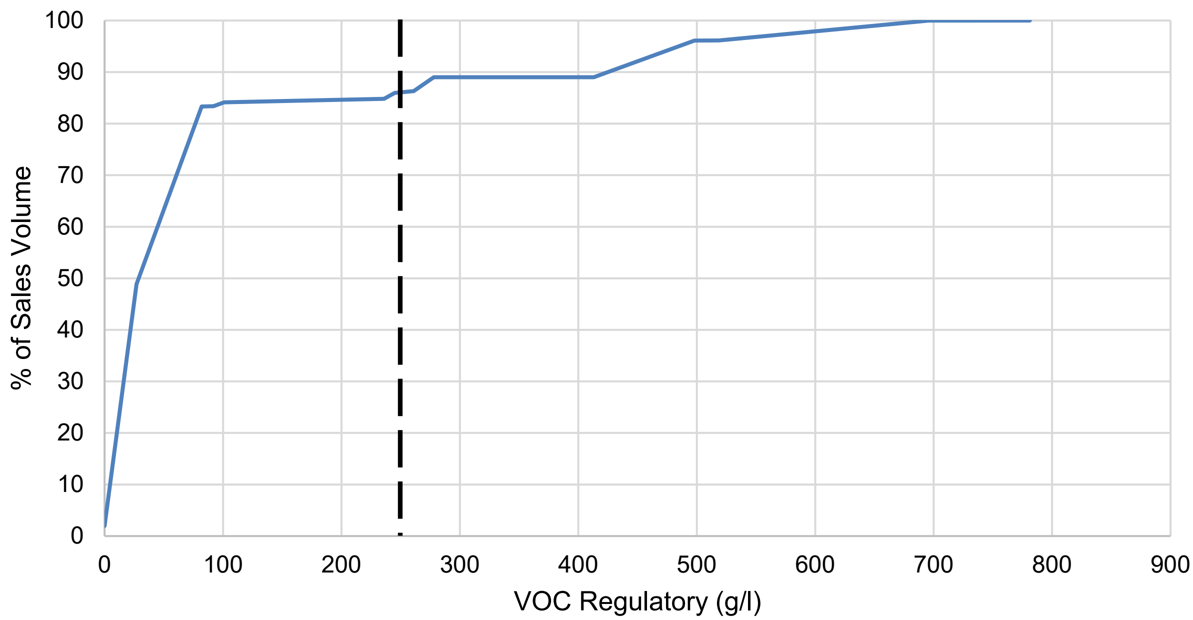


Figure H-47
High Temperature Coatings

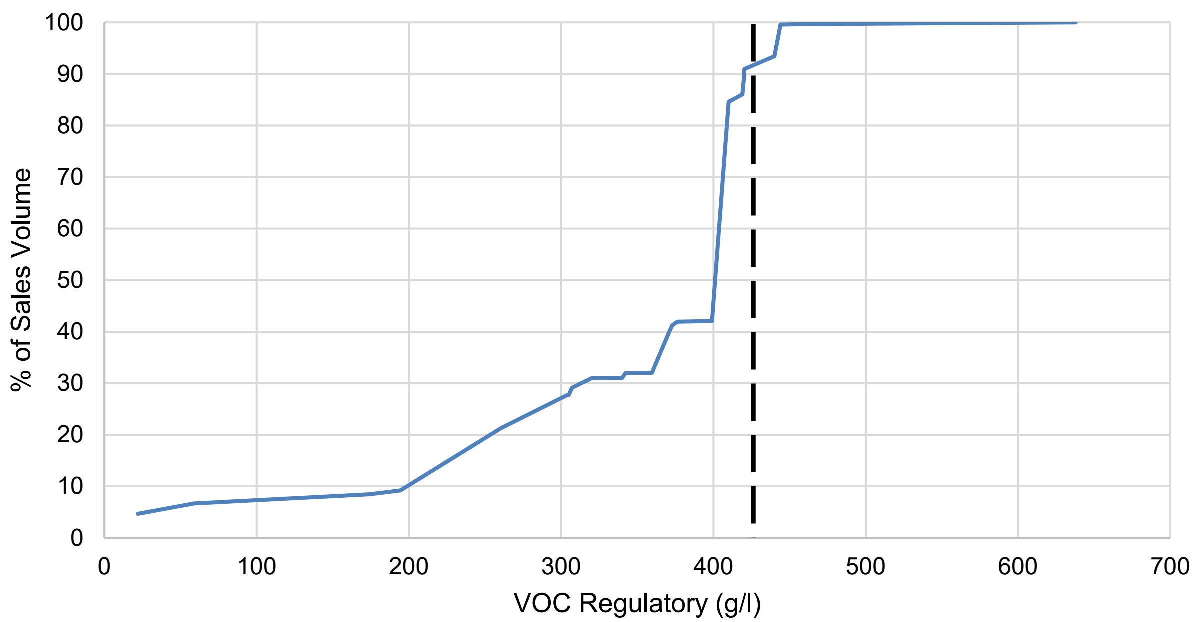


Figure H-48
Industrial Maintenance Coatings

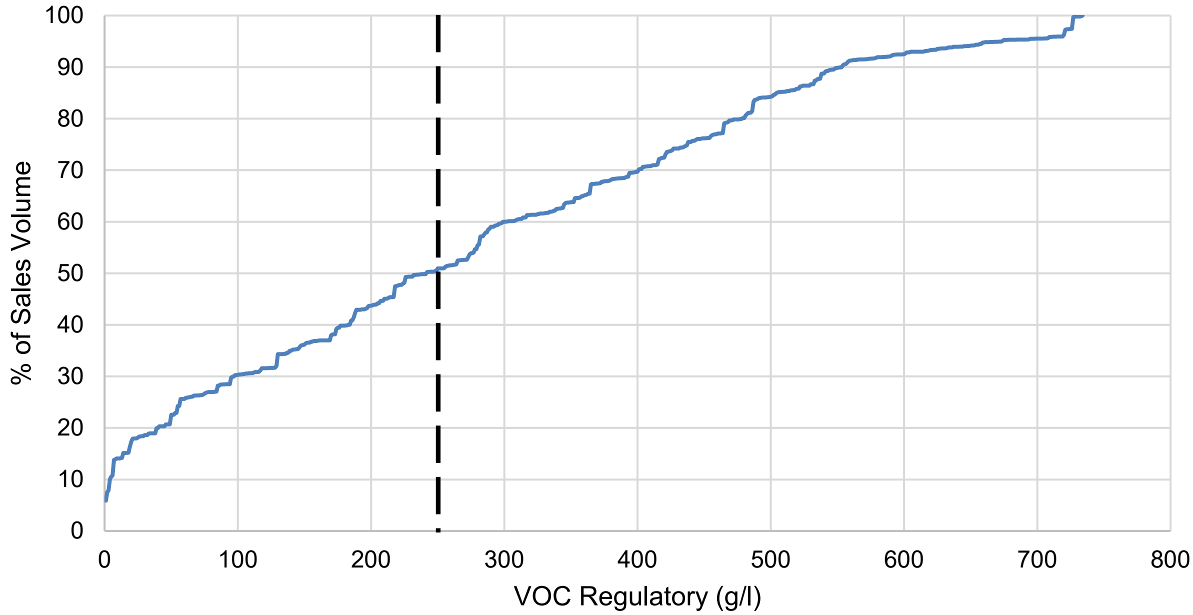
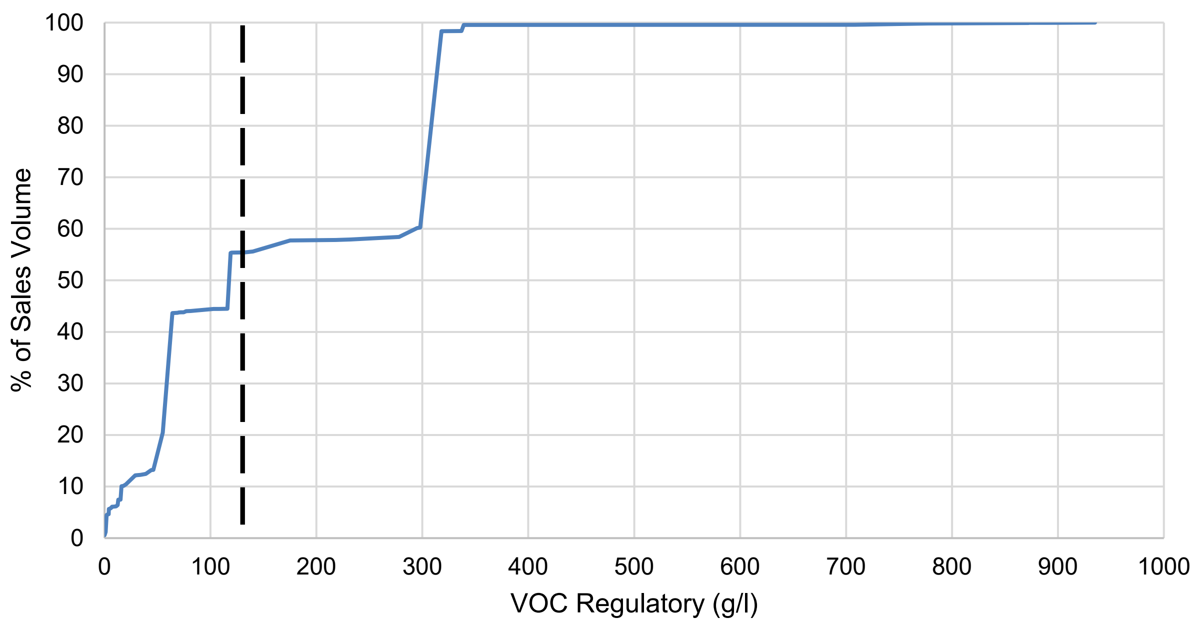


Figure H-49
Low Solids Coatings



No figure is provided for **Magnesite Cement Coatings** because data are protected.

Figure H-50
Mastic Texture Coatings

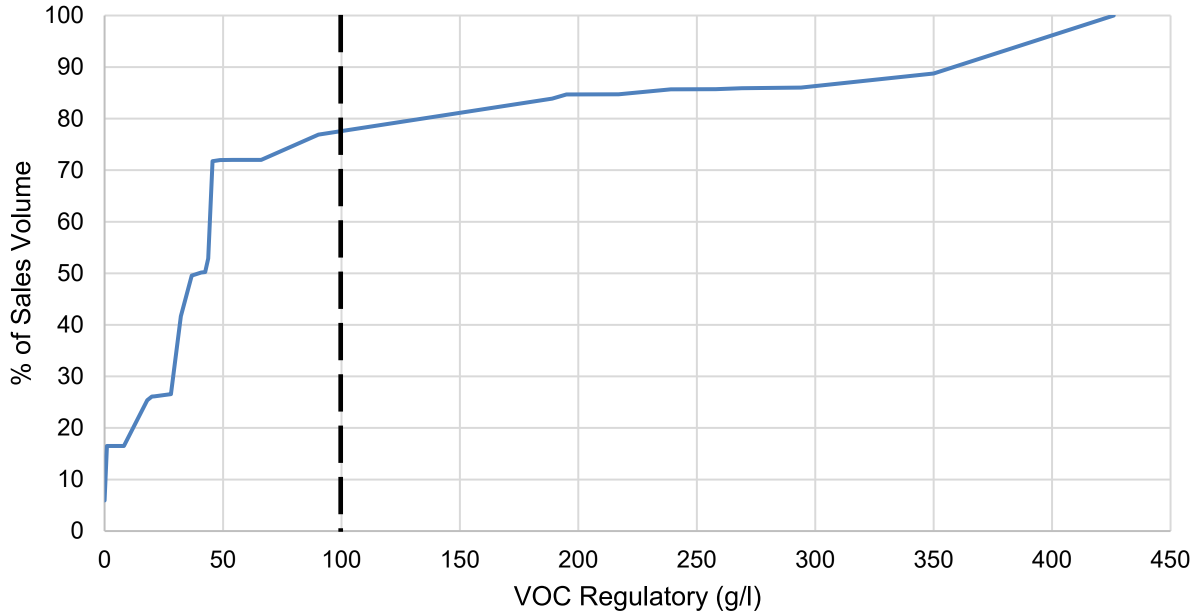
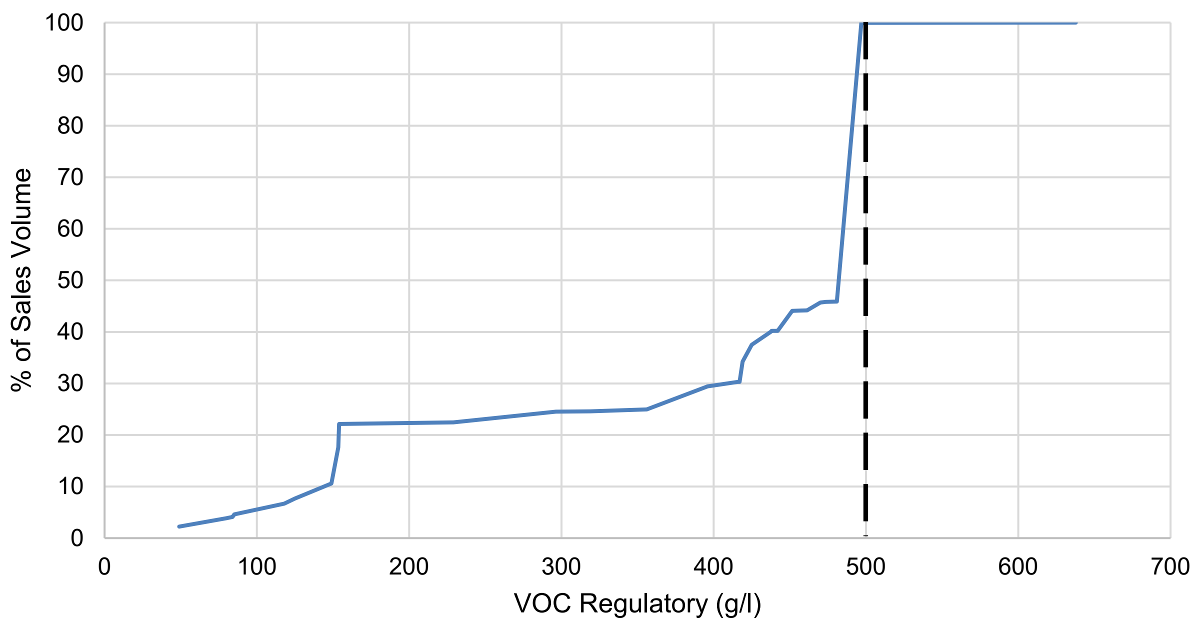


Figure H-51
Metallic Pigmented Coatings



No figure is provided for **Multi-Color Coatings** because data are protected.

Figure H-52
Nonflat Coatings

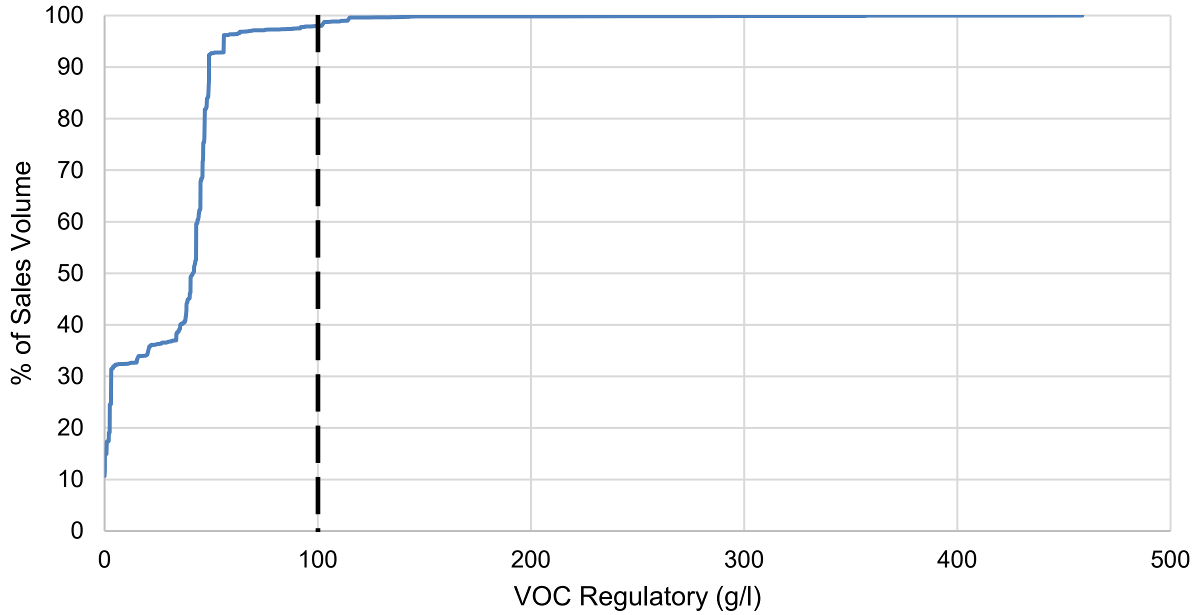
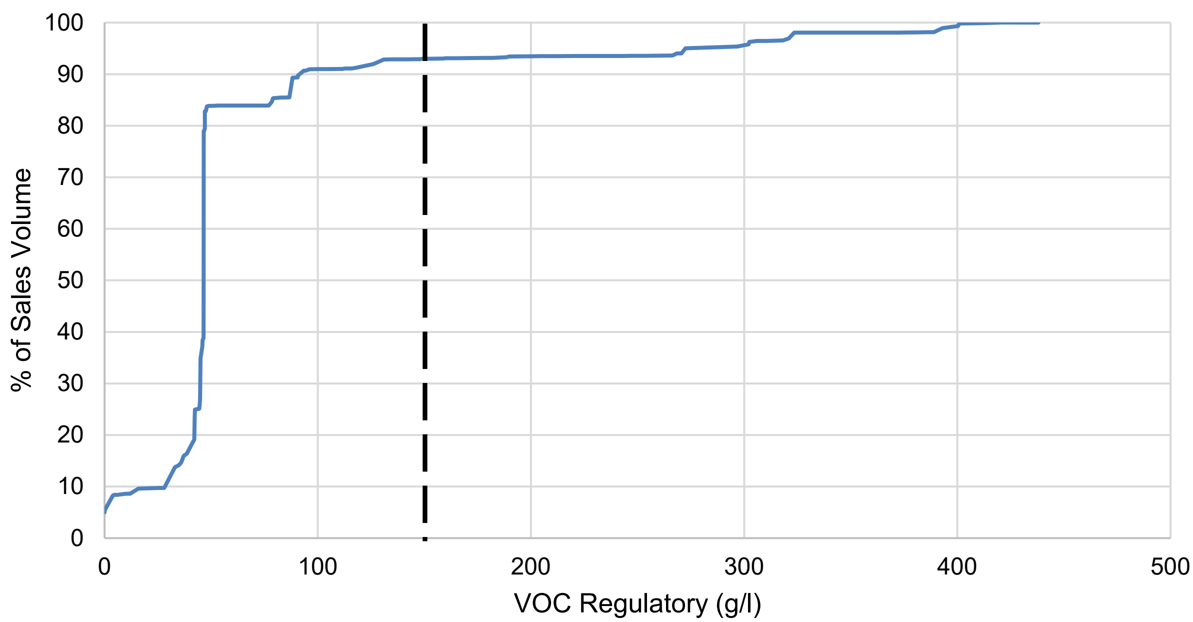


Figure H-53
Nonflat-High Gloss Coatings



No figure is provided for **Pre-Treatment Wash Primers** because sales data was not reported.

Figure H-54
Primers, Sealers, and Undercoaters

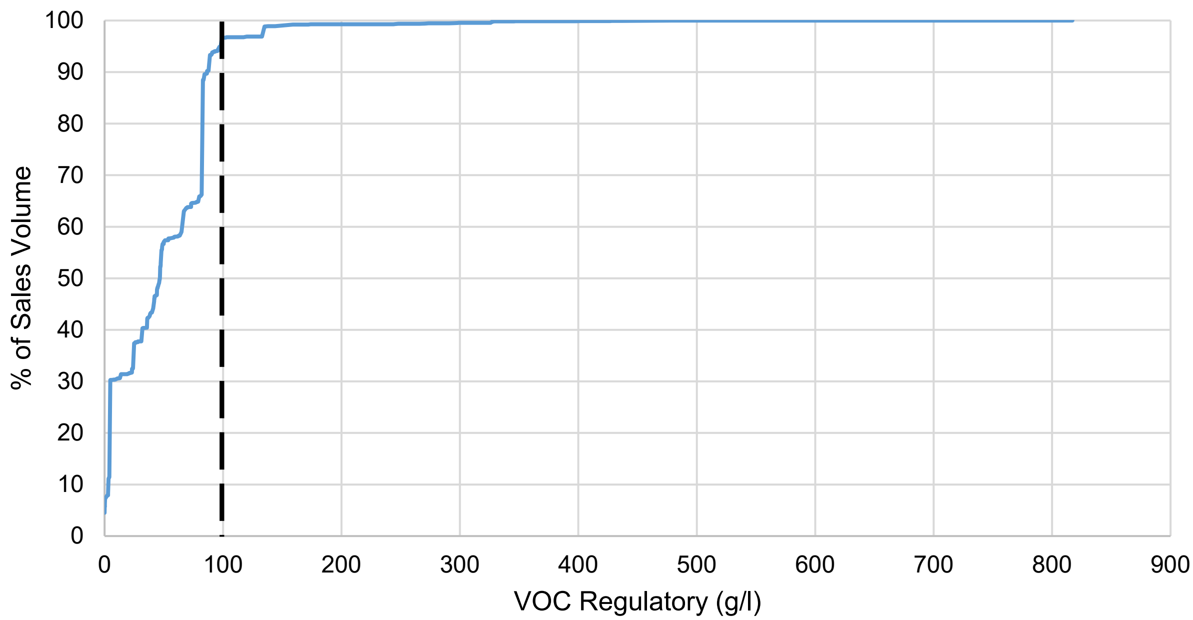
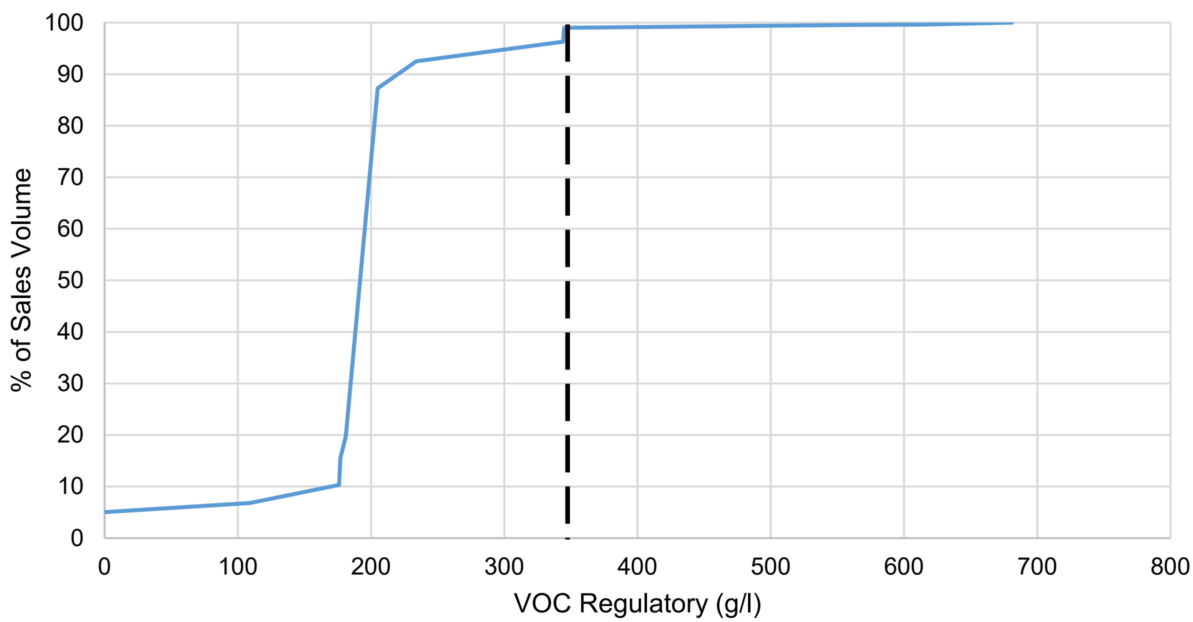


Figure H-55
Reactive Penetrating Sealers



No figure is provided for **Recycled Coatings** because data are protected.

Figure H-66
Roof Coatings

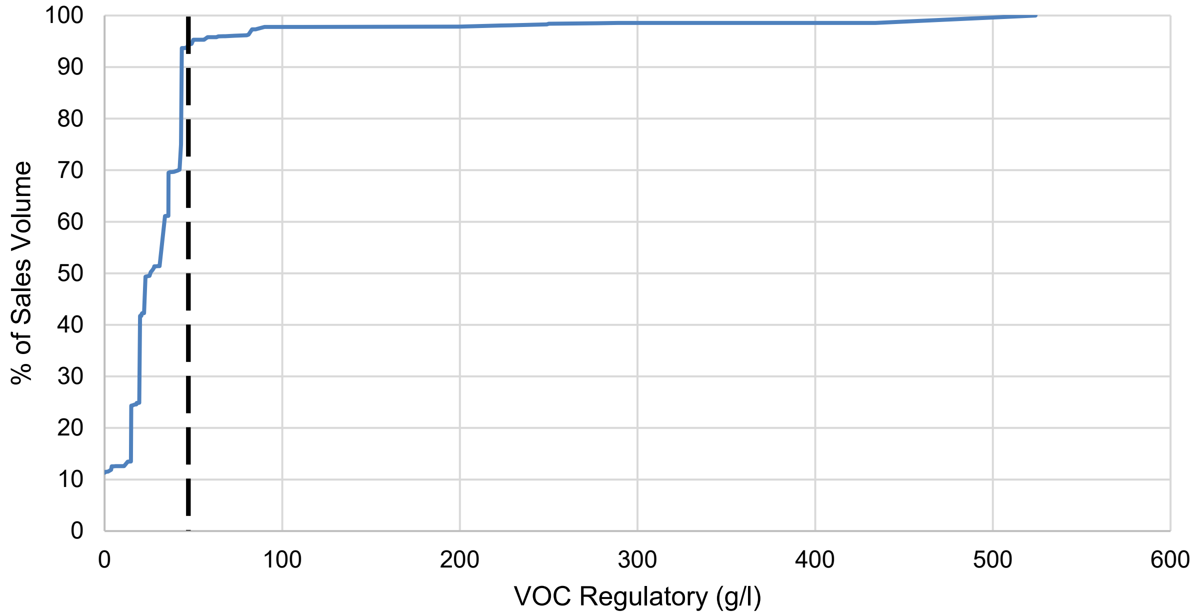
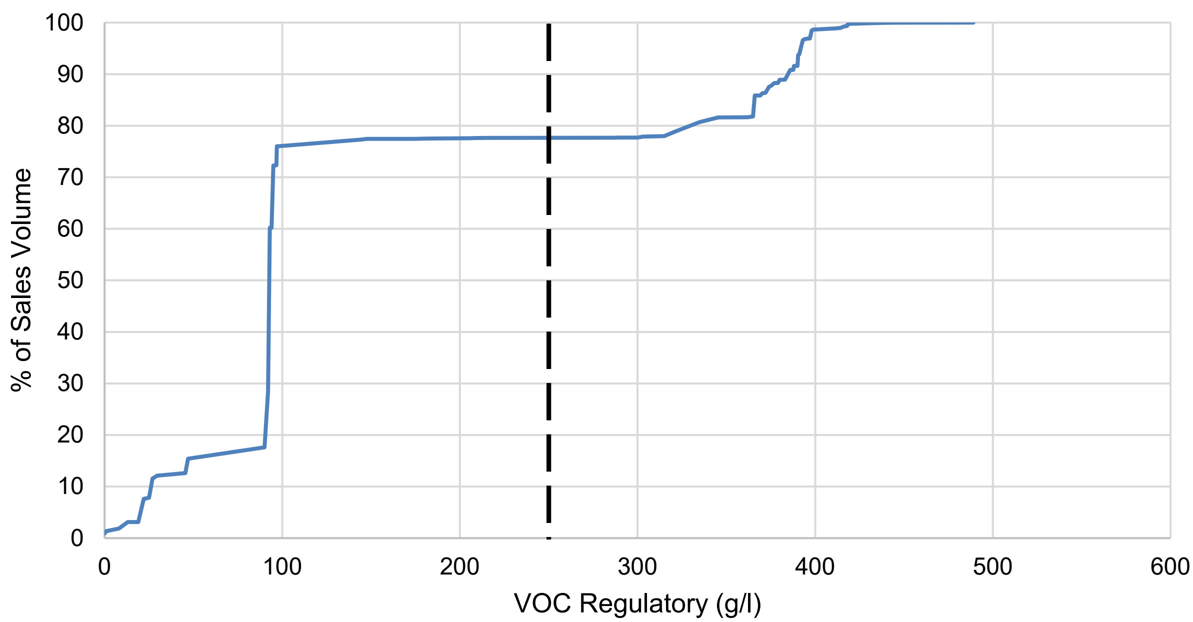


Figure H-57
Rust Preventative Coatings



No figure is provided for **Shellacs (Clear) and Shellacs (Opaque)** because data are protected.

Figure H-58
Specialty Primers, Sealers, and Undercoaters

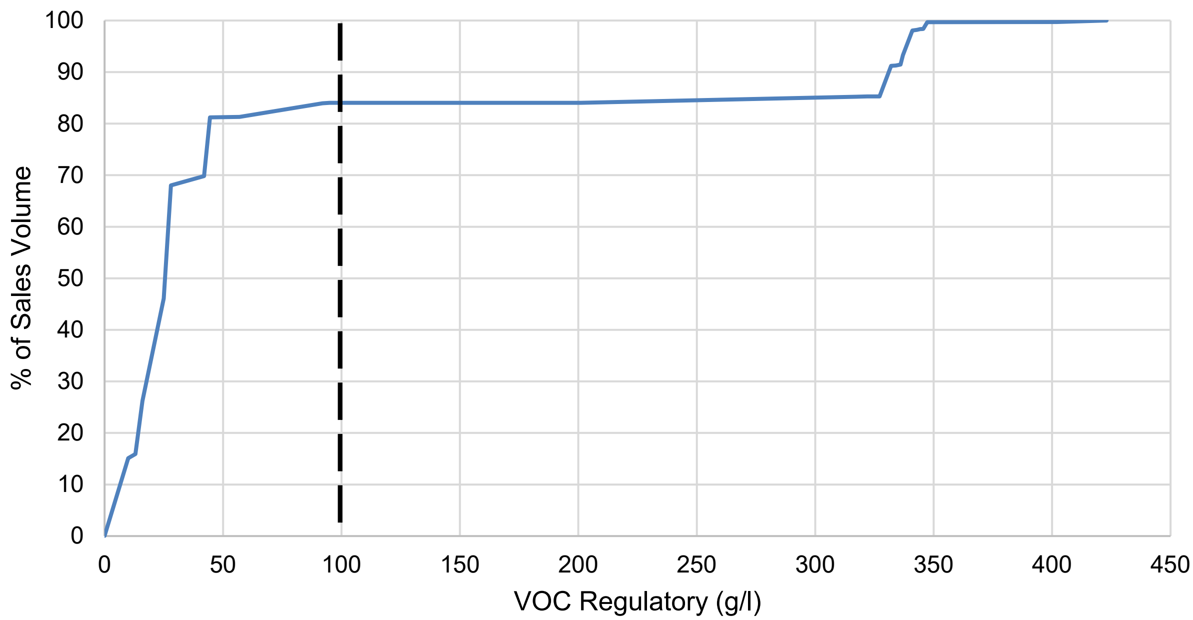
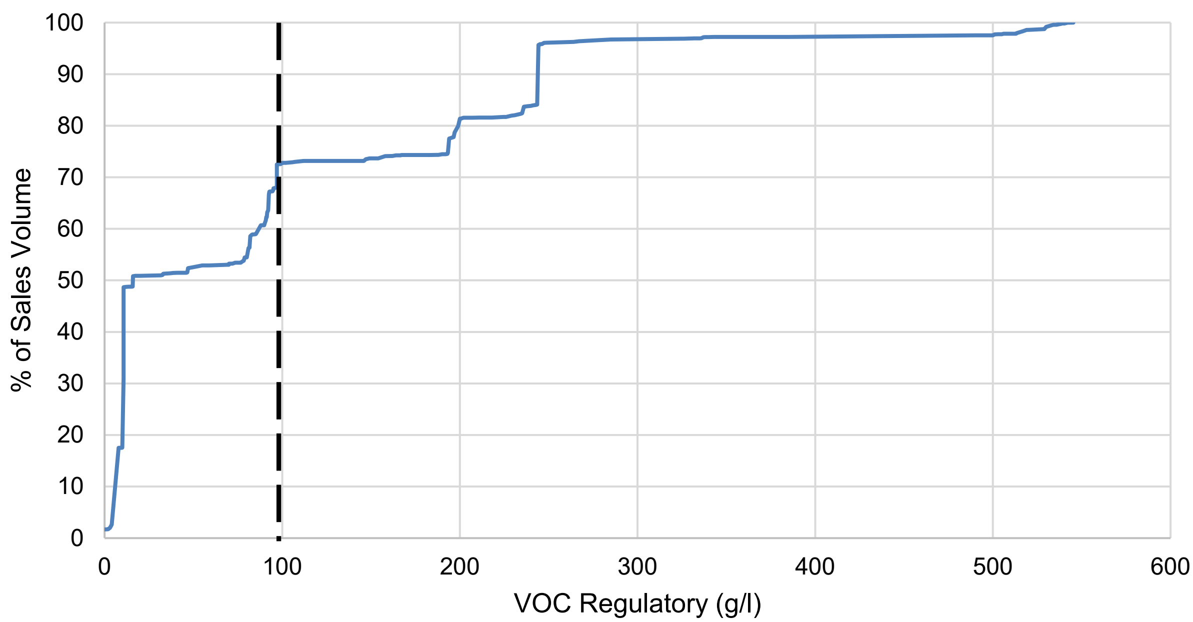


Figure H-59
Stains



No figure is provided for **Stone Consolidants** because data are protected.

Figure H-60
Stains - Interior

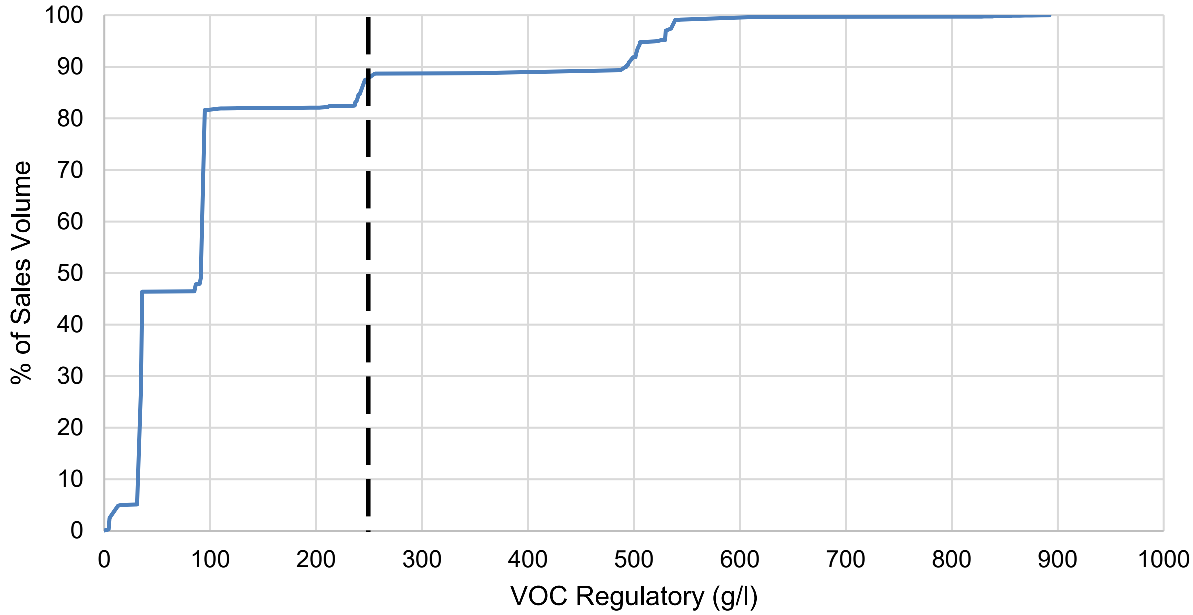


Figure H-61
Swimming Pool Coatings

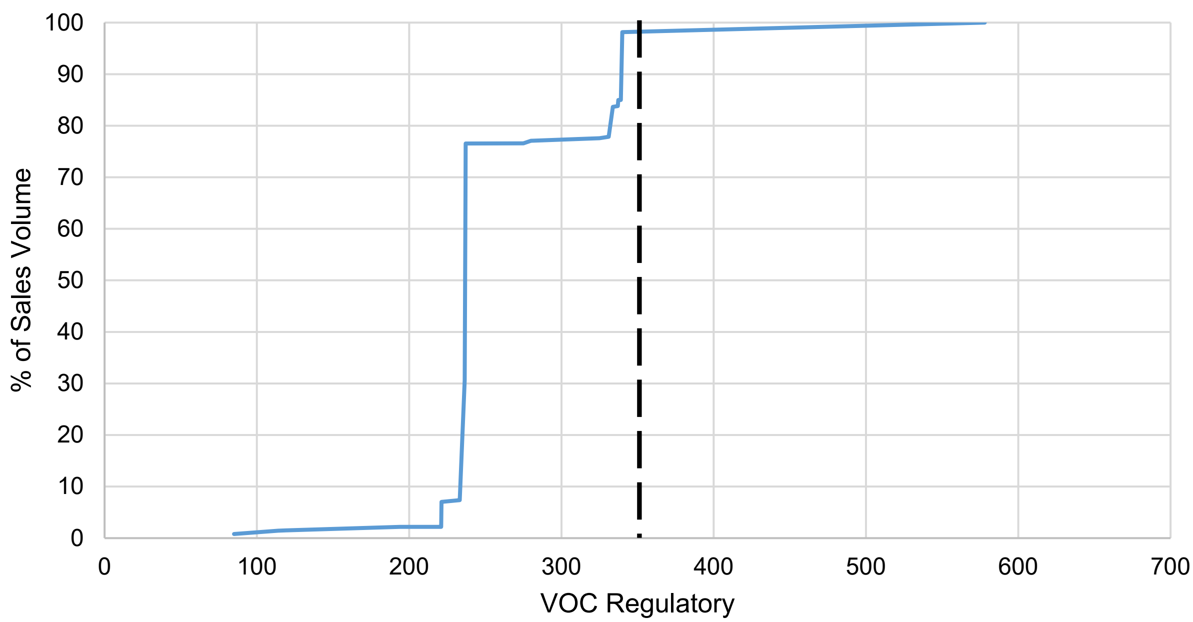


Figure H-62
Traffic Marking Coatings

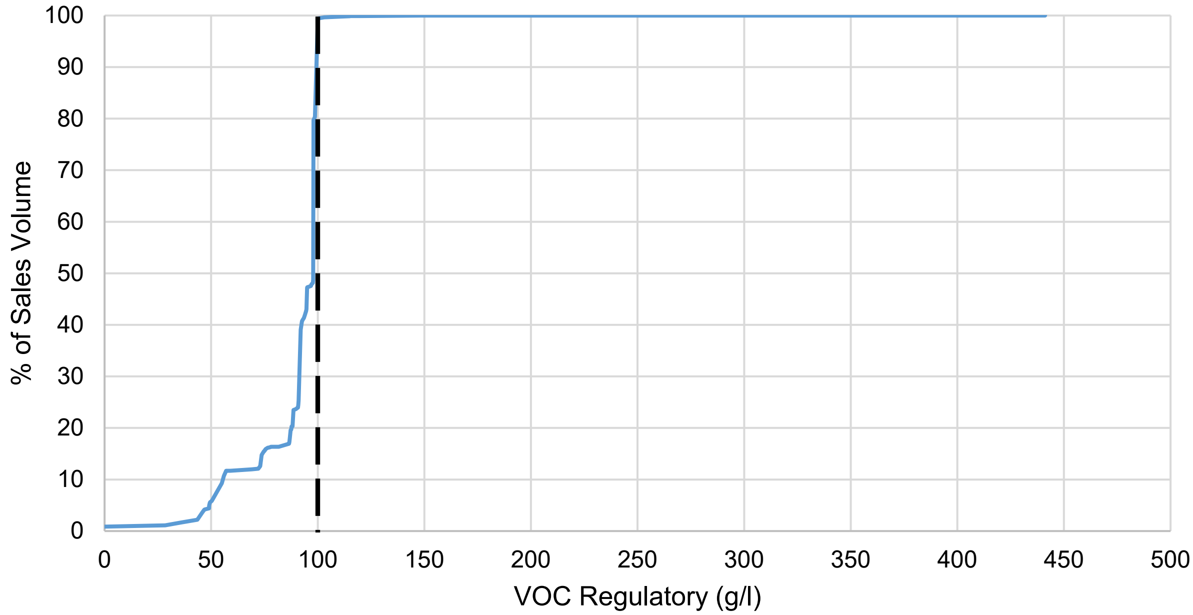


Figure H-63
Waterproofing Membranes

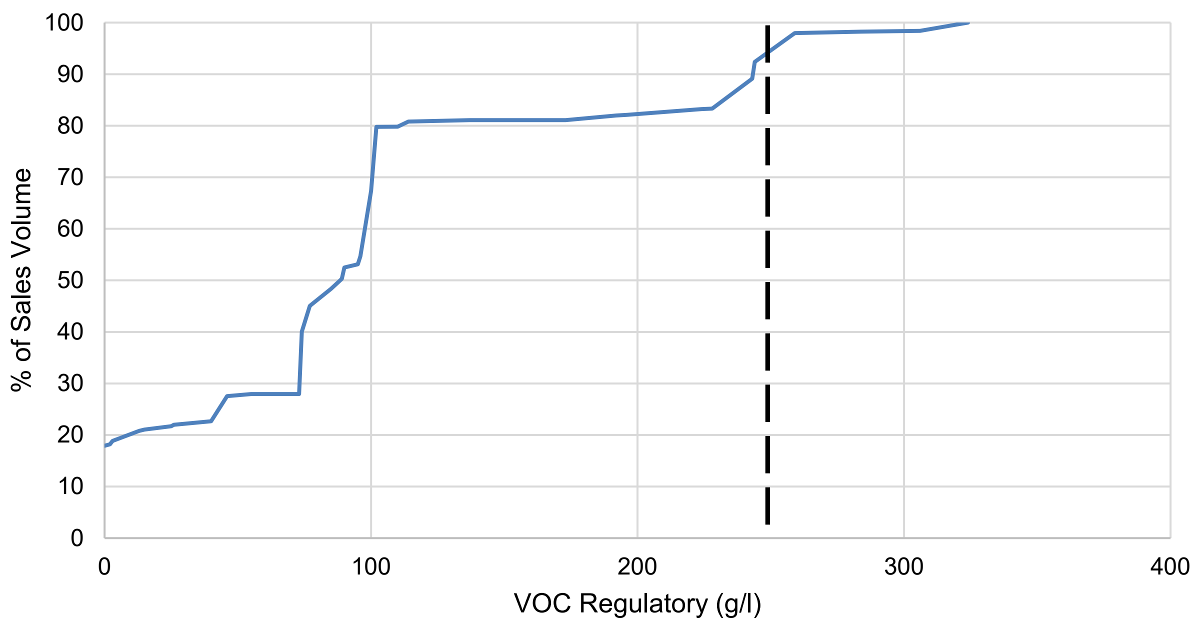


Figure H-64
Wood Coatings

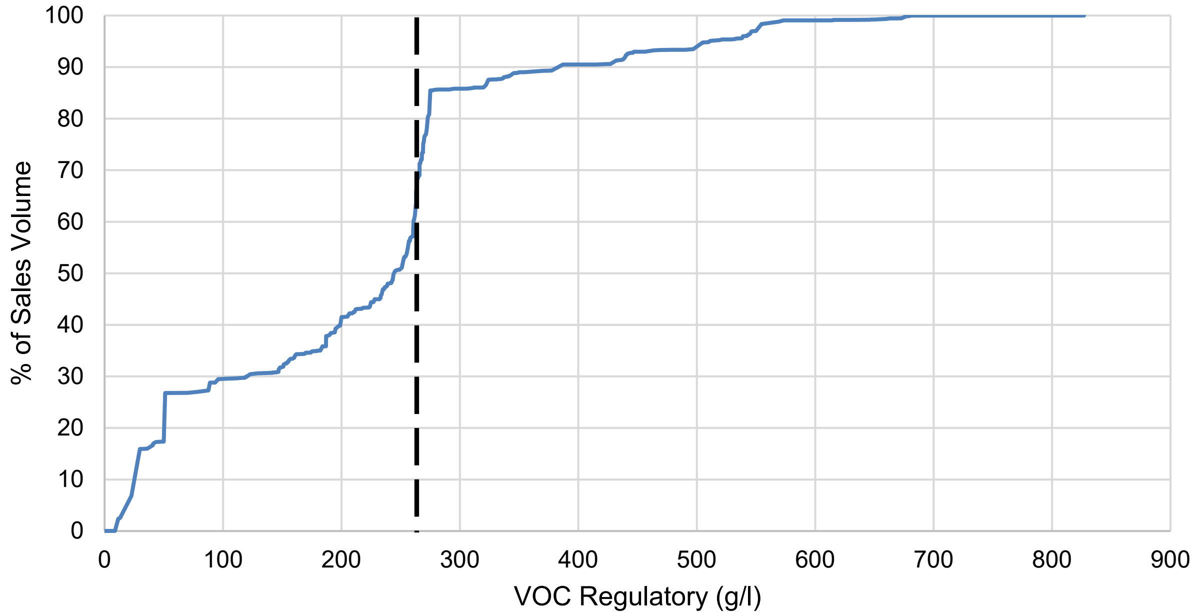


Figure H-65
Wood Preservatives

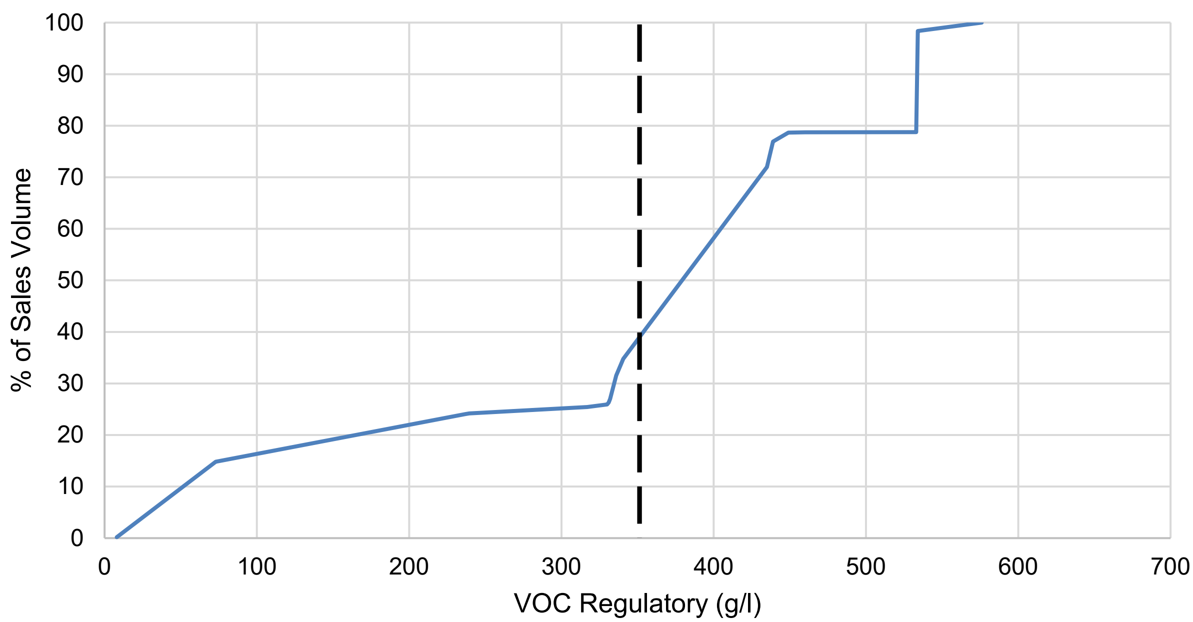
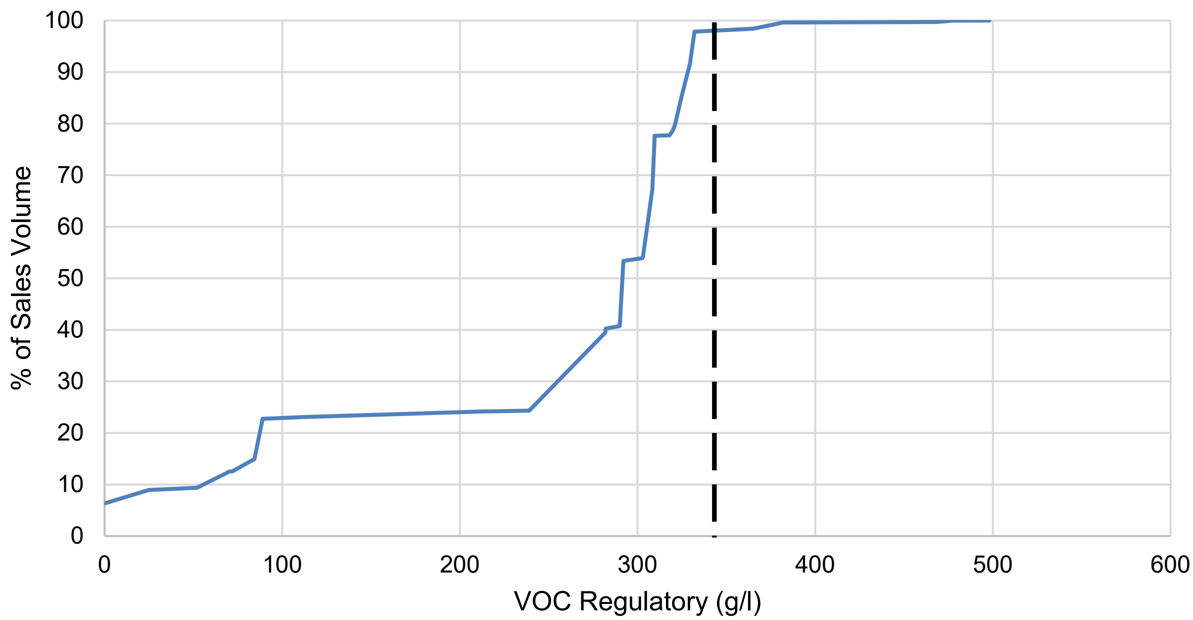


Figure H-66
Zinc-Rich Primer



APPENDIX I:

2014 ARCHITECTURAL COATINGS SURVEY INSTRUCTIONS

2014 Architectural Coatings Survey Reporting Tool Instructions

Completion and Submittal of the Survey is Mandatory Pursuant to California State Law

Due Date: May, 1, 2015

These instructions are provided to aid survey respondents in completing the survey. The survey must be completed electronically using the Architectural Coatings Reporting Tool (ACRT) available at http://www.arb.ca.gov/coatings/arch/survey/2014/2014survey.htm

Send Survey Questions to: Archcoatsurvey@arb.ca.gov

STAFF CONTACTS

- Jose Gomez at (916) 324-8033 or jose.gomez@arb.ca.gov ,
- Nancy Adams at (916) 324-8174 or nancy.adams@arb.ca.gov ,
- Glen Villa at (916) 324-8177 or glen.villa@arb.ca.gov,
- Minh Pham at (916) 324-0226 or minh.pham@arb.ca.gov.

TABLE OF CONTENTS

SURVEY OVERVIEW

PURPOSE OF THE SURVEY

The purpose of the 2014 Architectural Coatings Survey (2014 Survey) is to gather current information on the volatile organic compound (VOC) content of architectural coatings. Architectural coatings are defined as coatings applied on-site to stationary structures and their attached appurtenances, and do not include coatings applied in a factory or shop.

The 2014 Survey is primarily intended for paint manufacturers who sell architectural coatings in California. The reporting year is 2013. If your company is not a paint manufacturer, but your company name is listed as “manufactured for” or “distributed by” on the product label, you are responsible for completing the requested information in this survey. You are encouraged to coordinate your response with the appropriate manufacturer of your product to avoid double reporting of sales data. Holding companies or subsidiaries may also need to report for this survey.

WHAT IS NEW IN THE 2014 SURVEY

The 2014 Survey is very similar to the 2005 Architectural Coatings survey with a few exceptions. The electronic submittal format is new, and will allow you to import most of the required data, and perform data checks with supplied quality control features. The 2014 Survey also differs from the 2005 Survey in that:

- Product labels for all product categories, except Flat Coatings, will need to be submitted
- Information on colorants used to tint coatings at the point of sale is required to be submitted
- The polymer and paraffin content for the floor coating, concrete/masonry sealers, and waterproof concrete/masonry sealer categories is required
- Additional product categories have been added to gather data on coatings currently for sale in California

WHO MUST COMPLETE THE SURVEY

If your company manufactures architectural coatings in any of the categories listed on Page 33, and sold or distributed any of these products in California in the year 2013, you are required to complete the survey. Pursuant to California state law, completion and submittal of this survey is mandatory.

In addition, if you sold an architectural coating in California that you do not believe can be classified as one of the coating categories on Page 33, you are required to complete the survey and identify your coating as “Other.” Please specify what the coating is in the comment section. If your company is not a paint manufacturer, but your company name is listed as “manufactured for” or “distributed by” on the product label, you are responsible for either completing the survey, or ensuring that the manufacturer of your products includes your products in their survey submission. Parent companies and holding companies may need to either complete the survey, or oversee reporting by their subsidiaries. Please refer to the list below for the types of products that do not need to be reported.

Types of Products to Report (see Supplemental Information for Definitions (page 21) and Category Codes (page 33)

Report coatings that are field applied to:

- Stationary structures or their appurtenances, portable buildings, pavements, and curbs

  Appurtenance - Any accessory to a stationary structure coated at the site of installation, whether installed or detached, including but not limited to: catwalks elevators, cabinets and kitchen fixtures, concrete forms, doors, fences, hand railings, lampposts, bathroom, heating equipment, air conditioning equipment, fixed mechanical equipment or stationary tools, pipes and piping systems, rain gutters and downspouts, stairways, fixed ladders, fire escapes, window screens, partitions

Report colorants used to tint architectural coatings at the point of sale.
If you don't manufacture the colorant used to tint your architectural coatings at the point of sale, you may need to coordinate with the colorant supplier(s)/manufacturer(s) to complete the colorant portion of the survey. If colorant is added to the architectural coating prior to packaging in sale units, the colorant added to the coating would not be reported separately from that of the other product ingredients and no separate colorant information form is required.

What Not to Report

- Aerosol coatings
- Adhesives & Sealants
- Automotive coatings
- Pleasure craft coatings
- Consumer products
- Caulk or Caulking Compounds
- Furniture & appliance coatings
- Marine coatings
- Shop applied coatings
- Original Equipment Manufacturer coatings
- Aerospace coatings
- Paving asphalt, emulsified asphalt, or cutback asphalt used in building or repairing: streets, highways, roads, parking lots, runways, airfields, sanitary landfills, extruded curbs impounded liners

If you do not meet any of the criteria for completing the survey as described above, you need only complete the **"Reasons for not completing the 2014 Architectural Coatings Survey"** by going to **the ARB webpage and completing the form here:**
http://www.arb.ca.gov/coatings/arch/survey/2014/2014survey.htm

The survey reporting period is calendar year 2013. The survey is being conducted electronically. ARB is providing the Architectural Coatings Reporting Tool (ACRT) to facilitate the completion and submittal of the 2014 Survey. The ACRT is available for download at: http://www.arb.ca.gov/coatings/arch/survey/2014/2014survey.htm

There are four parts to this survey:

- Company Information: Each company/respondent to this survey will complete this information once;
- Product Information: Provide the requested information for each product or group of products;
- Ingredient Information: Provide the ingredients for each product or group of products reported; and
- Colorant Information: If you manufacture your own colorants used to tint your coatings at the point of sale, or purchase colorants that are used to tint your coatings at the point of sale, provide the requested information for each colorant sold in 2013.

  The following would be required to complete the Colorant Information Form:

  Architectural coatings manufacturers who also manufacture colorants for tinting their own coatings at the point of sale

  Architectural coatings manufacturers who do not manufacture colorants but supply colorants manufactured by others to tint their coatings at the point of sale

  The following would not be required to complete the Colorant Information Form:

  Architectural coatings manufacturers who do not provide coatings tinted at the point of sale

  Architectural coatings manufacturers who also manufacture colorants for use in tinting coatings other than their own at the point of sale

  Colorant manufacturers who do not manufacture architectural coatings that are tinted at the point of sale

Note: For each reported product or group of products reported on the Product Information Form, there must be a corresponding Ingredient Information Form. For each product or group of products, please provide a representative label for all product categories other than Flat Coatings.

USING THE ARCHITECTURAL COATINGS REPORTING (ACRT) TO COMPLETE THE SURVEY

OBTAINING A COPY OF ACRT

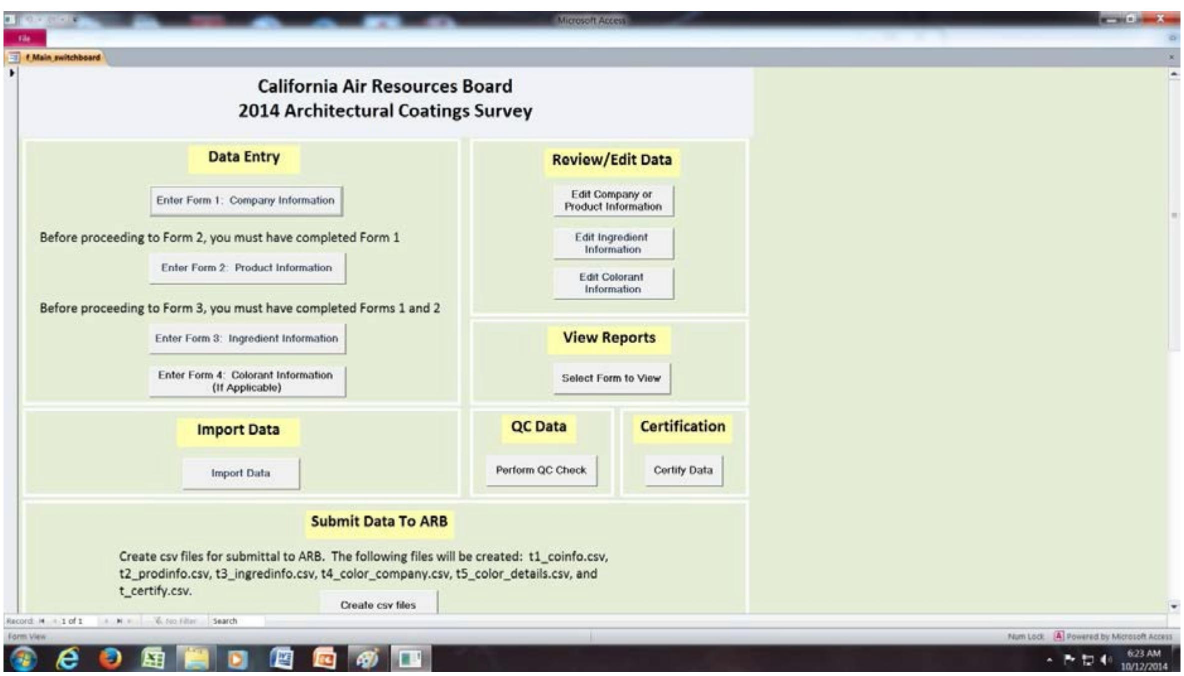
If you do not have Microsoft Access or do not have the 2010 or 2013 version of Microsoft Access, please see "Instructions for Downloading Microsoft Access Runtime" that will guide you through the steps needed to download a free version of Microsoft Runtime that will allow you to use the ACRT.

Before downloading the ACRT, please review the "Instructions for Downloading Microsoft Access Runtime" to determine if you need the 32- or 64-bit version. The 32- or 64-bit version refers to the Office program version your computer runs. The document has step by step directions for determining whether your Office program is a 32 or 64 bit version.

To download the ACRT go to http://www.arb.ca.gov/coatings/arch/survey/2014/2014survey.htm right click on the link: "Architectural Coatings Reporting Tool" and save onto your desktop *(choose either 32 bit or 64 bit version)*.

GENERAL DESCRIPTION OF THE ACRT

The ACRT will enable you to enter your survey information and generate files that you can submit to ARB. All requested information can be interactively entered into the ACRT and some can be imported into the ACRT from company specific databases.

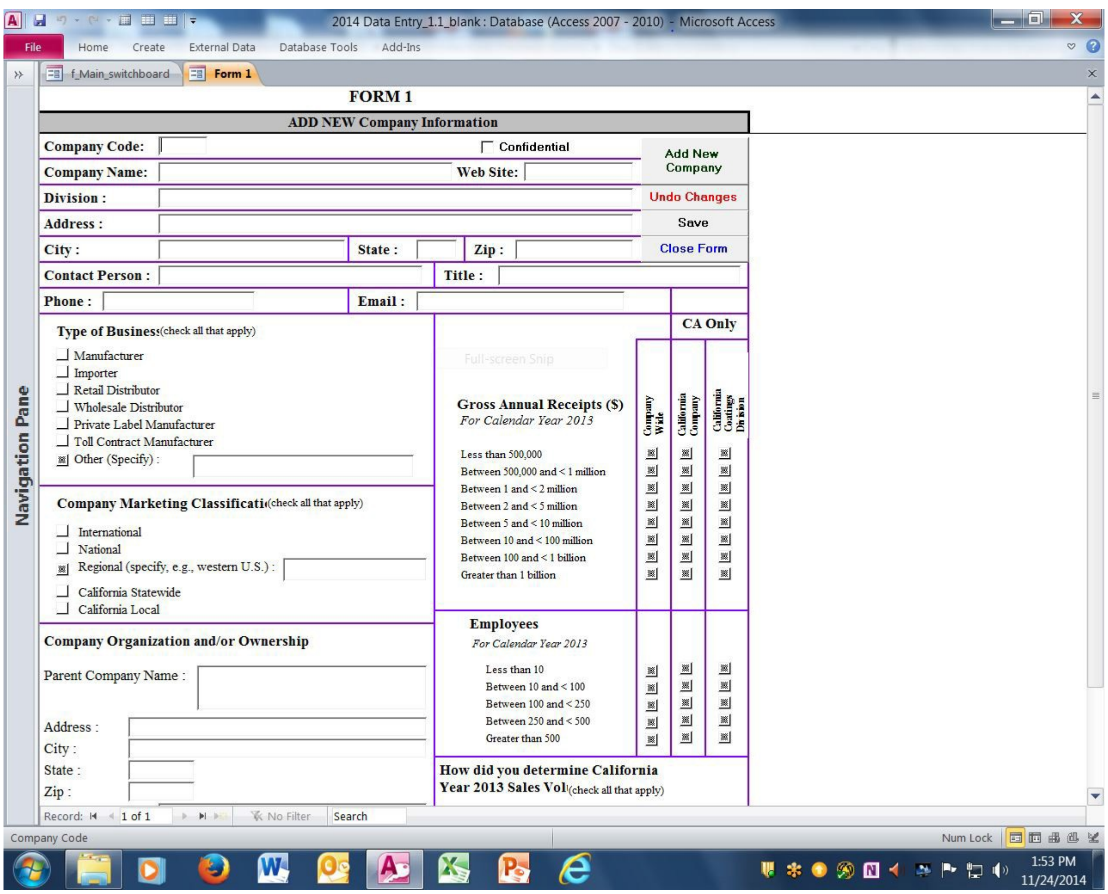


An excel template of the data fields required for the product information and the ingredient information is available here:
http://www.arb.ca.gov/coatings/arch/survey/2014/2014survey.htm
This template can be used to populate the product information and the ingredient information. The template can be used to save the files in CSV format, which can then be imported to the ACRT.

The ACRT allows you to review your data, backup your data, and certify that your data is complete and accurate. Once you complete the certification step, CSV files are generated for submission to ARB.

INSTRUCTIONS FOR COMPLETING COMPANY INFORMATION

The first step in completing your survey is to enter your company information. All information on the Company Information screen must be manually entered. This information cannot be imported. Company Information must be completed before entering product and ingredient information.



- The “Add New Company” button on the upper right portion of the form will allow you to complete another Company Information Form, and a new Company Code must be entered.
- The “Undo Changes” button will clear the form of all previously input information.
- The “Save” button will save all previously input information, and the form will remain open.
- The “Close Form” button will save all previously input information, and close the form.

Note: If you need to edit information, do so through the “Review/Edit Data” screens

The requested Company Information will assist ARB in characterizing the types of businesses that are included in the survey.

Company Code: Enter a company code. The code can be any four alphanumeric characters. *If you are completing surveys for multiple companies, please complete a separate file for each company by using the ACRT.*

Designating information as confidential: If you wish to designate any information contained in your survey data as **CONFIDENTIAL INFORMATION**, indicate as such in the ACRT interactive screens or complete the confidential field in the excel template.

Company Name: Enter the name of your company.

Web Site: Enter your company web site address, for example, “www.paintcompany.com.”

Address: Enter mailing address of company.

Contact Person: Name of person to be contacted if there are questions about the survey responses.

Title: Business title of the contact person.

Phone: Telephone number of contact person.

Email: Email of contact person.

Type of Business: Check the box that describes the type of business conducted by your company. (Check all that apply.)

Manufacturer – A company/person that produces, packages, or repackages architectural coatings for sale or distribution in the State of California.
Importer – A company/person that brings architectural coatings into the United States for sale or distribution within the State of California.
Retail Distributor – A company/person who sells or supplies architectural coatings directly at the retail level.

Wholesale Distributor – A company/person who sells or supplies architectural coatings for the purposes of resale or distribution in commerce at the wholesale level.
Private Label Manufacturer – A company/person that manufactures architectural coatings for sale under another company's name.
Toll Manufacturer – A company/person that manufactures architectural coatings based on the formula of another company and places the other company's name on the product label.

Company Marketing Classification: Check the box that describes your company's primary marketing classification. (Check all that apply.)
International – Two or more nations. For example, United States, Canada, and Mexico.
National – The United States.
Regional – A portion of the United States. For example, western U.S., consisting of California, Oregon, Washington, and Arizona.
California Statewide – The State of California.
California Local – A portion of the State of California. For example, Southern California or the San Francisco Bay Area.

Company Organization and/or Ownership: If your company is a "division of," or "subsidiary of," or has a "Parent Company," please specify. Holding companies or subsidiaries may also need to respond to this survey.

Gross Annual Receipts: Check the box that identifies the gross annual receipts generated by your company. This means the total income of the company before expenses are deducted. If available, check the box which identifies the gross annual receipts generated by your company in California and/or your California coatings division. This means the portion of total income derived from California sales or your California coatings division sales. Include secondary products related to coatings sales.

Employees: Check the box that indicates the total number of employees (including part-time and temporary staff) of the company. If available, check the box which identifies the number of employees in California and/or your California coatings division (including part-time and temporary staff).

How did you determine Calendar Year 2013 California Sales Volume?: Identify the method used to determine California sales volume.

INSTRUCTIONS FOR ENTERING PRODUCT AND INGREDIENT INFORMATION

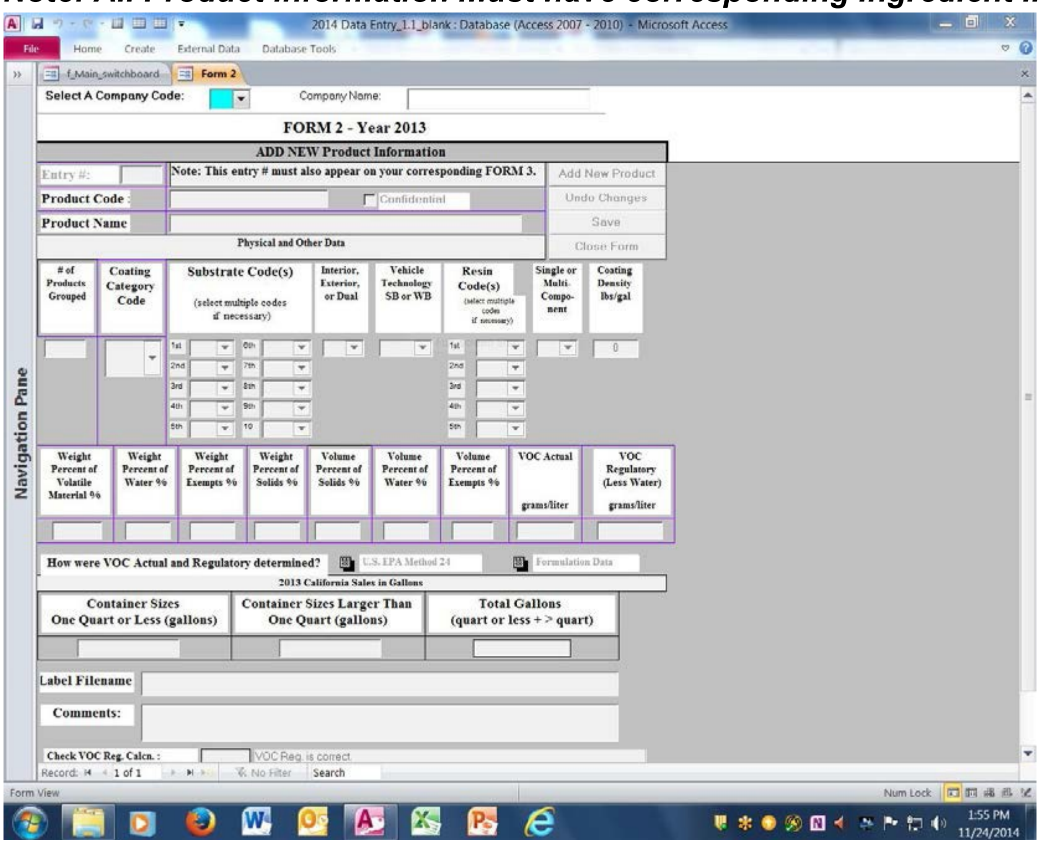
Product information and ingredient information can be entered into the ACRT two ways. You may enter it using the interactive screens or you may import your data directly into the reporting tool using the excel template provided here: http://www.arb.ca.gov/coatings/arch/survey/2014/2014survey.htm

If you use the excel template, please save the file as a CSV and use the import function in the ACRT to upload your data. Save each worksheet as a CSV file (i.e., productinfo.csv and ingredientinfo.csv). These files may be saved to a location of your choice.

To upload your product data into the ACRT, please use the “Import Product Information” button and follow the instructions. To upload the ingredient data, please use the “Import Ingredient Information” button and follow the instructions.

Product Information and Ingredient Information may also be entered manually. Instructions for manually entering Product Information follows and instructions for manually entering Ingredient Information may be found on page 13 of these instructions.

Note: All Product Information must have corresponding Ingredient Information.



INSTRUCTIONS FOR MANUALLY ENTERING PRODUCT INFORMATION

Entry #: Each product reported must be numbered sequentially, beginning with number "1." This entry number must also appear on corresponding Ingredient Information.

Product Code: Enter product code. If you are grouping products, enter the product code for the sales leader of the group.

Product Name: Enter the product/label name for the product code above.

Number of Products Grouped: In reporting products for this survey, products can be reported either individually or as a group. Enter "1" if you are reporting one product individually. You may group products only if all of the following conditions are met:

(1) The products belong to the same category (e.g., flats); and
(2) The products have the same vehicle technology (i.e., solvent-borne or water-borne), resin type, substrate, interior or exterior use recommendation, and single – or multi-component form; and
(3) VOC Regulatory range cannot exceed 25 grams/liter. That is, the highest VOC Regulatory minus lowest VOC Regulatory of the group cannot exceed 25 grams/liter.

Coating Category Code: Select a coating category code from the drop down menu. See Supplemental Information for Coating Category Codes.

Substrate Code(s): Select a substrate code (more than one is allowed if applicable). A substrate code must be entered for all products. If no code is entered, a response of "All Substrates" will be assumed. See Supplemental Information for Substrate Codes.

Interior/Exterior/Dual: Enter recommended exposure - interior or exterior. Enter "Dual" for dual purpose interior/exterior products.

Vehicle Technology: Identify the vehicle technology of the coating - Solvent-borne (SB) or Water-borne (WB).

Solvent-borne: A coating that contains less than 50 percent water by weight in its volatile fraction. It is generally cleaned up with solvent.

Water-borne: A coating that contains 50 percent or more water by weight in its volatile fraction. It is generally cleaned up with water.

Resin/Binder Code(s): Select a resin/binder type from the drop down menu. You can enter multiple resin codes. See Supplemental Information for Resin/Binder Codes.

Single or Multi-Component: Identify whether coating is single or multi-component. VOC content for multi-component coatings are as mixed, applied or fully reacted.

Note: Use "Sales Weighted Average" (SWA) for the following data fields if you have chosen to group coatings. See Supplemental Information for an example of how to calculate the sales weighted average.

Coating Density: Enter the density of the coating in pounds per gallon (lbs/gal).

Weight Percent of Volatile Material: Weight of volatile material (VOC+water+exempts) as percent of total coating weight. See Supplemental Information for definitions of VOC (volatile organic compound) and VOC content.

Weight Percent of Water: Weight of water as percent of total coating weight.

Weight Percent of Exempts: Weight of exempt compounds as percent of total coating weight.

Weight Percent of Solids: Enter the solids content of the coating as percent of total coating weight.

Volume Percent of Solids: Enter the solids content of the coating as percent of total coating volume.

Volume Percent of Water: Volume of water as percent of total coating volume.

Volume Percent of Exempts: Volume of exempt compounds as percent of total coating volume.

VOC Actual: Also known as Material VOC. Enter the VOC content of the coating(s), as supplied, in grams of VOC per liter of coating. This is the weight of all volatile materials less the weight of water and less the weight of exempt compounds per the entire volume of the coating. This is NOT the same as VOC Regulatory. See Supplemental Information for an example of how to calculate VOC Actual.

VOC Regulatory (Less Water): Also known as Coating VOC. Enter the VOC content of the coating(s), as supplied, in grams of VOC per liter of coating, less water, less exempt compounds, and less any colorant added to the tint bases. This may be determined from the formulation data or previously determined by EPA Method 24, 40 CFR Part 60, as amended in Federal Register Vol. 57, No. 133, July 10, 1992, or ASTM D 3960-92. See Supplemental Information for an example of how to calculate VOC Regulatory.

Note: VOC content for multi-component coatings are as mixed, applied or fully reacted.

How were VOC Actual and Regulatory Determined? Check U.S. EPA Method 24 or Formulation Data.

Estimating California Sales: If California specific sales data are not available, sales may be estimated using national or regional sales figures that are apportioned appropriately. If you use population as a basis for determining sales, please use the U.S. Resident Population estimates provided in the Supplemental Information portion of these instructions.

Container Sizes One Quart or Less (gallons): Enter California sales volume in gallons.

Container Sizes Larger than One Quart (gallons): Enter California sales volume in gallons.

Total Gallons: This field is completed automatically from the entries for the two types of container size.

Label Filename: Please be certain the label file name is spelled correctly and is identical to that of the file. If using the ACRT, you can use the "Select File Label" button or manually input the file name. If not using the ACRT, the file name must be input manually.

Comments: Enter any information that will help clarify entries made on the Product Information Form.

Note: For multi-component coatings, report the as mixed or applied volume.

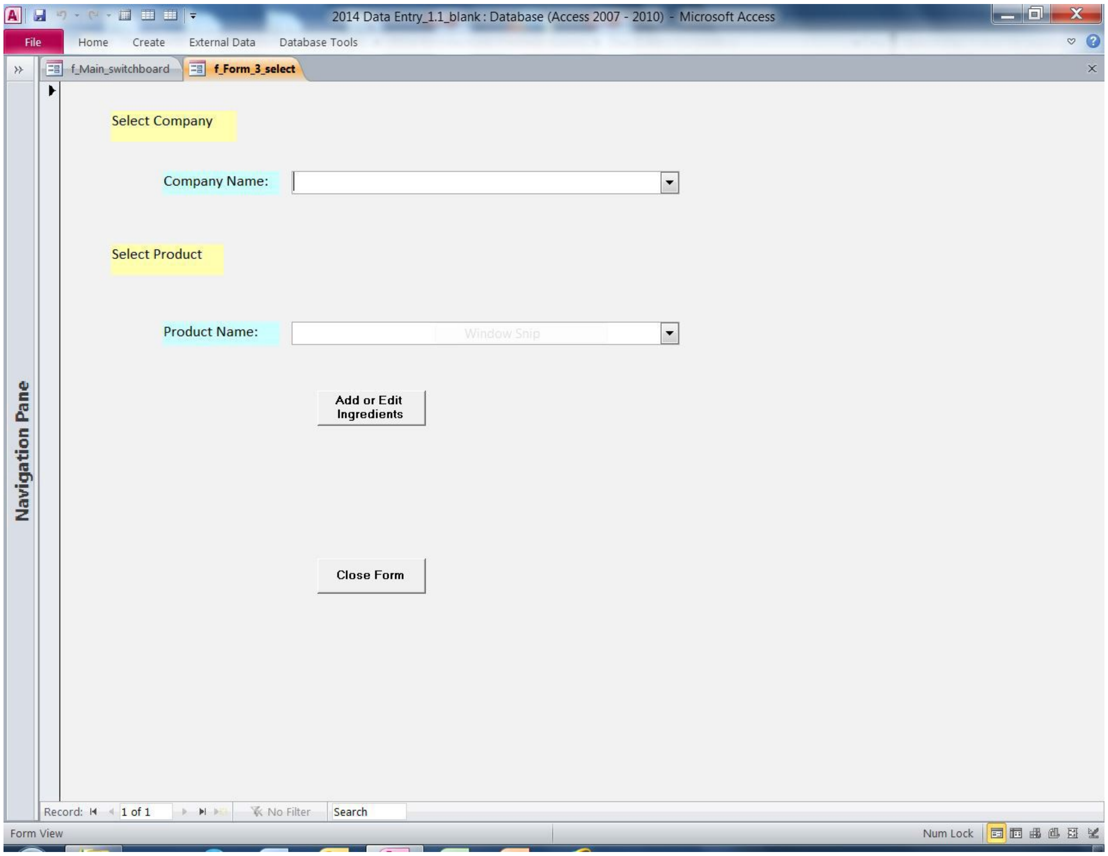
INSTRUCTIONS FOR MANUALLY ENTERING INGREDIENT INFORMATION

Note: All Ingredient Information must have corresponding Product Information.

- *Enter the percent by weight to the nearest 0.1% for each ingredient in the final product*
- *BIN numbers are only to be reported for hydrocarbon solvents (e.g., mineral spirits, Stoddard Solvent, VM&P Naphtha).*
- *List VOCs and Exempt Compounds that individually amount to 0.1% or greater by weight of the final product.*

Provide requested Ingredient Information for single or grouped products. If you are grouping products, provide Ingredient Information that will represent your sales leader or best representative product of the group. Provide all volatile ingredients which are part of the product formulation. Complete one Ingredient Information Form for each product or group of products reported.

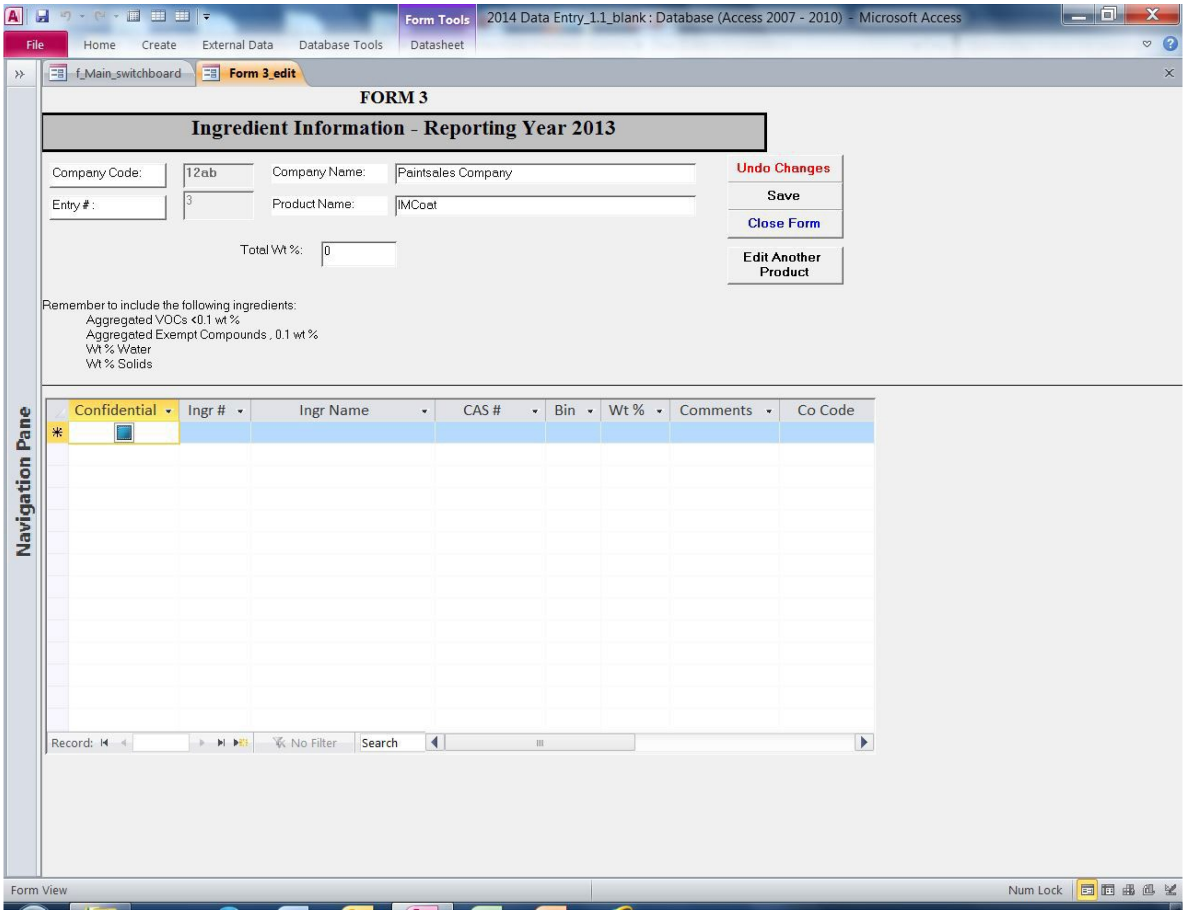
Note: For grouped products, report the ingredients of the sales leader or best representative product in the group.



Company Name: Use the pull-down menu to select the company name entered on the Company Information and Product Information forms.

Product Name: Use the pull-down menu to select the product name entered on the corresponding Product Information form.

Click on the "Add or Edit Ingredients" button to go to the next Ingredient Information screen.



Note: The top portion of this form (Company Code, Company Name, Entry # and Product Name) will auto-populate based previously input data.

- The “Undo Changes” button will clear the form of all previously input information.
- The “Save” button will save all previously input information, and the form will remain open.
- The “Close Form” button will save all previously input information, and close the form.
- The “Edit Another Product” button will allow you to make changes to the ingredient information for a previously input product.

Confidential: If you wish to designate the information on this Ingredient Information Form as confidential, please check this box.

Ingredient #: Number each ingredient sequentially.

Ingredient Name: Enter the chemical name of the ingredient. Chemical names must be distinguished from trade names. For example, the chemical name of SD 40 Alcohol is ethanol. Enter the trade name of the ingredient if the chemical name is unknown. If the ingredient is proprietary or a mixture (e.g., hydrocarbon solvents) identify the trade name and manufacturer/primary supplier.

Note: The volatile portions of resin solutions, colorants or additives must be included. For example, do not include the volatile portion of a resin solution as a solid.

CAS#: Please enter the Chemical Abstract Service (CAS) number for the ingredient.

BIN #: If available, provide the reactivity bin number for hydrocarbon solvents (e.g., mineral spirits, Stoddard Solvent, VM&P naphtha). Do not group different CAS numbers under one BIN number. See Supplemental Information for hydrocarbon solvent information and BIN numbers and for reactivity BIN numbers for aliphatic and aromatic hydrocarbon solvents.

Weight Percent (of total material): Enter the percent by weight to the nearest 0.1% for each ingredient in the final product. If the volatile portion is a mixture of known components, list the components separately with their individual weight percentages in the final product. If the components of a mixture cannot be determined, list the ingredient as a single entity. For example, you may not know the individual ingredients of petroleum distillates or biocides down to 0.1 weight percent. In this case identify the trade name, manufacturer, and weight percent of mixture.

Reporting Level - List volatiles that individually amount to 0.1 weight percent or greater by weight of the final product.

Aggregated VOCs < 0.1 Weight Percent: Aggregate each of the remaining VOCs that individually account for less than 0.1 weight percent of the final product and enter the sum.

Aggregated Exempt Compounds < 0.1 Weight Percent: Aggregate each of the remaining volatiles that are exempt VOCs that individually account for less than 0.1 weight percent of the final product and enter the sum.

Water: Enter the weight percent water.

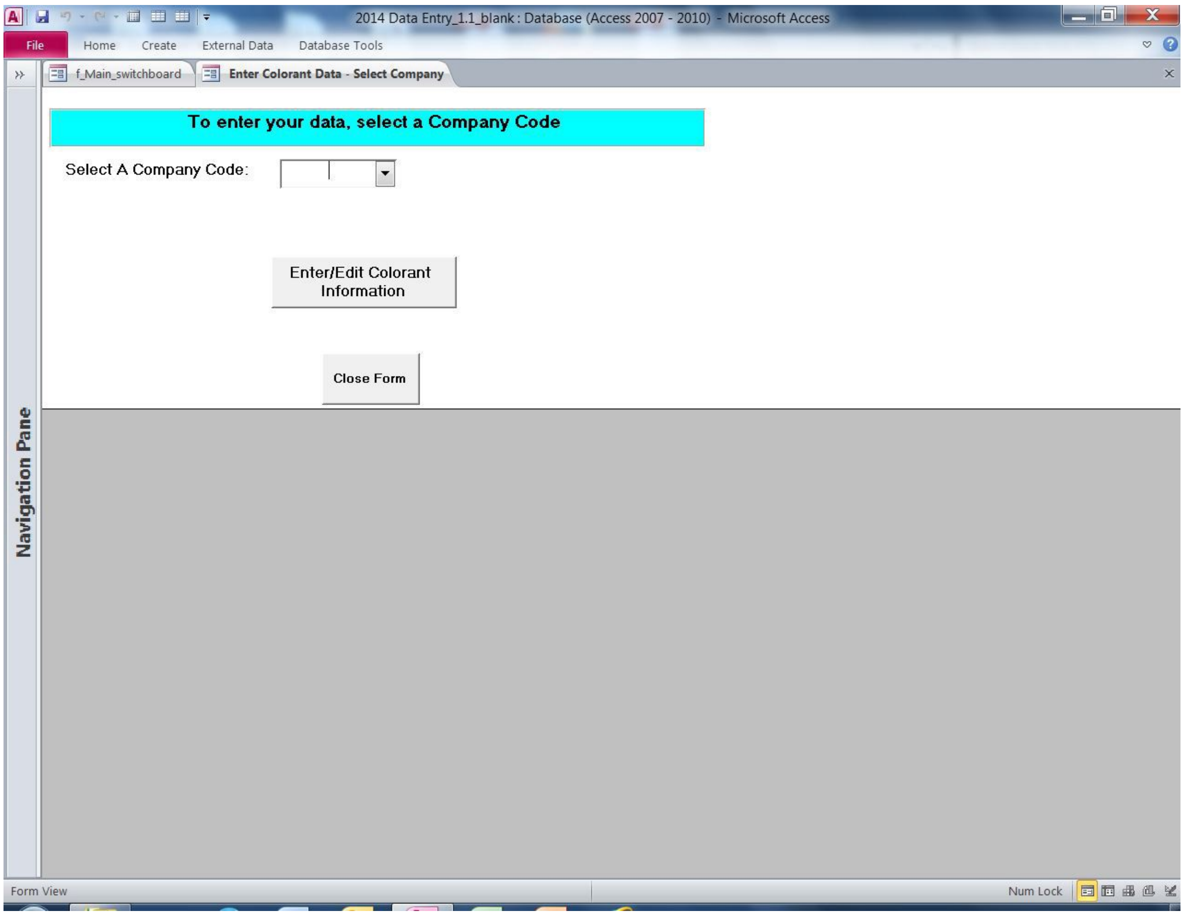
Solids: Enter the weight percent solids.

Total of All Ingredients: this field is completed automatically from the individual ingredient entries. The sum of all volatiles and solids in the table must equal 100 percent by weight. If this value does not sum to 100, please check the component percentages. The weight percent should match those on the Product Information sheet.

Comments: Enter any information that will help clarify entries made for the Ingredient Information.

INSTRUCTIONS FOR COLORANT INFORMATION

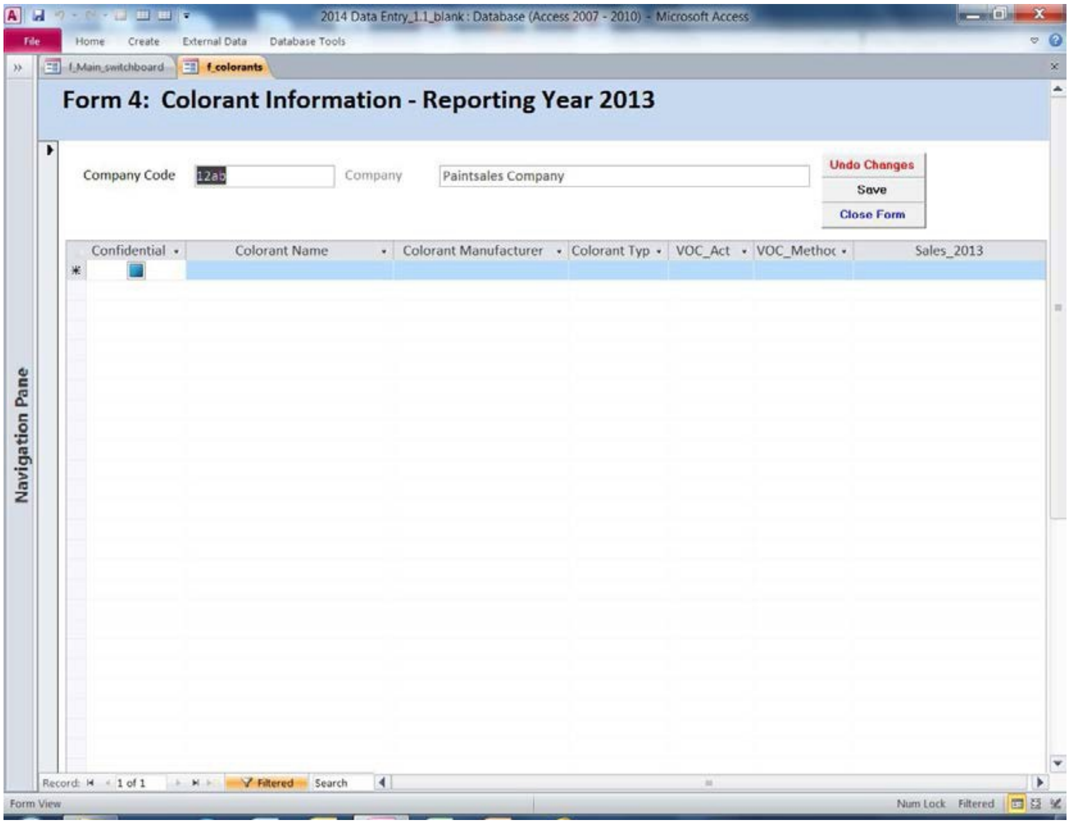
Select the Enter Colorant Information button if you are required to report colorant information for coatings tinted at point of sale. Please see page 5 of these instructions to determine if you are responsible for completing the Colorant Information Form. **Note: Ingredient information and labels are not required for colorants.**



Provide the requested information described below.

Company Code: Enter the same company code as entered on the Company Information Form.

Click on the "Enter/Edit Colorant Information" button to go to the next Colorant Information screen.



Confidential: If you wish to designate the information on this Colorant Information Form as confidential, please check this box.

Colorant Name: Specify the colorant name.

Manufacturer: Indicate the name of the manufacturer producing the colorant.

Colorant Type: Indicate if the colorant you are reporting is a universal colorant, colorant used only in solvent borne coatings, or a colorant used only in waterborne coatings.

VOC Actual: Also known as Material VOC. Enter the VOC content of the coating(s), as supplied, in grams of VOC per liter of coating. This is the weight of all volatile materials less the weight of water and less the weight of exempt compounds per the entire volume of the coating. This is NOT the same as VOC Regulatory. See Supplemental Information for an example of how to calculate VOC Actual.

VOC Method: Please indicate the method you used to determine VOC Actual- either U.S. EPA Method 24 or Formulation Data.

Sales 2013 (Gallons): Enter the California sales of the colorant, in gallons, for reporting year 2013.

Sales Method: Sales can be determined from one or more of the following:

Direct California retail sales
Direct California wholesale distribution
Prorated from national retail sales
Prorated from national wholesale distribution
Other (explain in next field)

Other Sales Method Explanation: Explain method for determining sales if not using one of the sales methods described above. If California specific sales data are not available, sales may be estimated using national or regional sales figures that are apportioned appropriately. If you use population as a basis for determining sales, please use the U.S. Resident Population estimates provided in the Supplemental Information portion of these instructions.

Comments: Enter any information that will help clarify entries made on the Colorant Information Form.

INSTRUCTIONS FOR BACKING UP DATA

Backup Data

To save entered data to your computer at any time during data entry, click "Backup Survey" button on the main screen, then click on "Backup Data" "Backup Menu" screen in ACRT. Then, the first popup window will prompt you to select where you want the files to be saved and the second popup window will prompt you to confirm the backup by clicking "Ok." Backed up files can later be uploaded back into the ACRT if needed.

Note: Files backed up using the "Backup Data" button are not checked by ACRT for completeness or other errors and should not be used to submit data to ARB.

When complete, click "Back to Main Menu" to return to the main screen.

Restore Data

A user can restore data by uploading files saved (backed up) on the computer earlier. To do this, click "Restore Data" button and select correct files when prompted by the popup window. Click "Ok" in the next popup window to confirm the upload.

When complete, click "Back to Main Menu" to return to the main screen.

Reset Database

The user can delete all entered product and ingredient information by clicking on “Reset Database” button. Upon clicking on the button, the popup window will be displayed, notifying the user that all information will be deleted. Click “OK” to confirm the deletion.

Warning: "Reset Database" will delete all information in the database. Once the data is deleted it will not be possible to restore it unless the user backed up the data earlier on the computer.

CERTIFICATION OF COMPLETED SURVEY

Once all your data is complete please go to the certification screen by clicking on “Certify Data” from the main screen.

Certification: Please have an authorized company officer or corporate counsel certify that the Company Information, Product Information, Ingredient Information, and Colorant Information are complete and accurate.

PREPARE YOUR FILES FOR SUBMITTAL TO ARB

Select create CSV files. This will generate the following files: t1_coinfo.csv, t2_prodinfo.csv, t3_ingredinfo.csv, t4_color_details.csv, and t_certify.csv, which, you will submit to ARB.

Before the files are generated the ACRT will check the data for completeness. If data is missing, a series of error reports will be created to aid you in identifying and correcting the errors.

If errors are found, please go back to the review/edit data screens and make any necessary corrections. Then repeat the process.

Once the data passes the QC checks the files will be generated.

Upload your csv data files and label files to ARB using the Upload Portal that will be available beginning January 1, 2015. Please visit the architectural coatings survey webpage http://www.arb.ca.gov/coatings/arch/survey/2014/2014survey.htm for instruction on the upload process

SUPPLEMENTAL INFORMATION

DEFINITIONS

Adhesive: Any product that is used to bond one surface to another by attachment. ****DO NOT REPORT****

Aerosol Coating Product: A pressurized coating product containing pigments or resins that dispenses product ingredients by means of a propellant, and is packaged in a disposable aerosol container for hand-held application, or for use in specialized equipment for ground traffic/marking applications. ****DO NOT REPORT****

Air and Water Resistive Barrier Coatings: A coating labeled and formulated to Provide air barrier materials which have an air permeance not to exceed 0.004 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.004 cfm/ft^2 @ 1.57 psf), [0.02 liters per square meter per second under a pressure differential of 75 Pa (0.02 $L/(s \cdot m^2)$ @ 75 Pa)] when tested in accordance with ASTM E2178; and/or a coating labeled and formulated to resist liquid water that has penetrated a cladding system. Water resistance shall be tested in accordance with ASTM E331. Water vapor permeance shall be tested in accordance with ASTM E96/E96M-10.

Aluminum Roof Coating: A coating labeled and formulated exclusively for application to roofs and containing at least 84 grams of elemental aluminum pigment per liter of coating (at least 1.7 pounds per gallon). Pigment content shall be determined in accordance with SCAQMD Method 318-95.

Antenna Coating: A coating labeled and formulated exclusively for application to equipment and associated structural appurtenances that are used to receive or transmit electromagnetic signals.

Antifouling Coating: A coating labeled and formulated for application to submerged stationary structures and their appurtenances to prevent or reduce the attachment of marine or freshwater biological organisms. To qualify as an antifouling coating, the coating must be registered with both the U.S. Environmental Protection Agency (U.S. EPA) under the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. Section 136, *et seq*.) and with the California Department of Pesticide Regulation.

Appurtenance: Any accessory to a stationary structure coated at the site of installation, whether installed or detached, including but not limited to: bathroom and kitchen fixtures; cabinets; concrete forms; doors; elevators; fences; hand railings; heating equipment, air conditioning equipment, and other fixed mechanical equipment or stationary tools; lampposts; partitions; pipes and piping systems; rain gutters and downspouts; stairways, fixed ladders, catwalks, and fire escapes; and window screens.

Architectural Coating: A coating to be applied to stationary structures or their appurtenances at the site of installation, to portable buildings at the site of installation, to pavements, or to curbs. Coatings applied in shop applications or to non-stationary structures such as airplanes, ships, boats, railcars, and automobiles, and adhesives are not considered architectural coatings.

Basement Specialty Coating: A clear or opaque coating that is labeled and formulated for application to concrete or masonry surfaces to provide a hydrostatic seal for basements and other below-grade surfaces. Basement Specialty Coatings must meet the following criteria:

- Coating must be capable of withstanding at least 10 psi of hydrostatic pressure, as determined in accordance with ASTM D7088-04, and
- Coating must be resistant to mold and mildew growth and must achieve a microbial growth rating of 8 or more, as determined in accordance with ASTM D3273-00 and ASTM D3274-95.

Bitumens: Black or brown materials including, but not limited to, asphalt, tar, pitch, and asphaltite that are soluble in carbon disulfide, consist mainly of hydrocarbons, and are obtained from natural deposits or as residues from the distillation of crude petroleum or coal.

Bituminous Roof Coating: A coating which incorporates bitumens that is labeled and formulated exclusively for roofing.

Bituminous Roof Primer: A primer which incorporates bitumens that is labeled and formulated exclusively for roofing and intended for the purpose of preparing a weathered or aged surface or improving the adhesion of subsequent surfacing components.

Bond Breaker: A coating labeled and formulated for application between layers of concrete to prevent a freshly poured top layer of concrete from bonding to the layer over which it is poured.

Caulk or Caulking Compound: Used to fill voids with plastic or semiplastic materials to provide a seal against moisture or solvent intrusion. Commonly used for sealing joints in buildings and other structures where structural movement may occur. It is usually available in two consistencies: “gun grade” for use with a caulking gun, and “knife grade” for application with a putty knife; extruded preformed shapes are also available. ****DO NOT REPORT****

Clear Brushing Lacquers: Clear wood finishes, excluding clear lacquer sanding sealers, formulated with nitrocellulose or synthetic resins to dry by solvent evaporation without chemical reaction and to provide a solid, protective film, which are intended exclusively for application by brush.

Coating: A material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, and stains.

Colorant: A concentrated pigment dispersion in water, solvent, and/or binder that is added to an architectural coating after packaging in sale units to produce the desired color.

Concrete Curing Compound: A coating labeled and formulated for application to freshly poured concrete to perform one or more of the following functions:
- Retard the evaporation of water, or
- Harden or dustproof the surface of freshly poured concrete.

Concrete/Masonry Sealer: A clear or opaque coating that is labeled and formulated primarily for application to concrete and masonry surfaces to perform one or more of the following functions:
- Prevent penetration of water; or
- Provide resistance against abrasion, alkalis, acids, mildew, staining, or ultraviolet light; or
- Harden or dustproof the surface of aged or cured concrete.

Note: Polymer and paraffin content for this product category must be reported on the Ingredient Information Form.

Consumer Products: “Consumer Product” means a chemically formulated product used by household and institutional consumers including, but not limited to, detergents; cleaning compounds; metal polishes; floor polish or wax; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; multi-purpose solvents, aerosol paints; and automotive specialty products; but does not include other paint products, furniture coatings, or architectural coatings. As used in this article, the term “consumer product” shall also refer to aerosol adhesives, including aerosol adhesives used for consumer, industrial, and commercial uses. ****DO NOT REPORT****

Driveway Sealer: A coating labeled and formulated for application to worn asphalt driveway surfaces to perform one or more of the following functions:
- Fill cracks; or
- Seal the surface to provide protection; or
- Restore or preserve the appearance.

Dry Fog Coating: A coating labeled and formulated only for spray application such that overspray droplets dry before subsequent contact with incidental surfaces in the vicinity of the surface coating activity.

Exempt Compound: A compound identified as exempt under the definition of Volatile Organic Compound (VOC). Exempt compounds content of a coating shall be determined by U.S. EPA Method 24 or South Coast Air Quality Management District (SCAQMD) Method 303-91 (Revised August 1996).

Faux Finishing Coating: A coating labeled and formulated as a stain or glaze to create artistic effects including, but not limited to, dirt, old age, smoke damage, and simulated marble and wood grain. A coating labeled and formulated to meet one or more of the following criteria:

- A glaze or textured coating used to create artistic effects, including, but not limited to: dirt, suede, old age, smoke damage, and simulated marble and wood grain; or
- A decorative coating used to create a metallic, iridescent, or pearlescent appearance that contains at least 48 grams of pearlescent mica pigment or other iridescent pigment per liter of coating as applied (at least 0.4 pounds per gallon); or
- A decorative coating used to create a metallic appearance that contains less than 48 grams of elemental metallic pigment per liter of coating as applied (less than 0.4 pounds per gallon), when tested in accordance with SCAQMD Method 318-95 or
- A decorative coating used to create a metallic appearance that contains greater than 48 grams of elemental metallic pigment per liter of coating as applied (greater than 0.4 pounds per gallon) and which requires a clear topcoat to prevent the degradation of the finish under normal use conditions. The metallic pigment content shall be determined in accordance with SCAQMD Method 318-95 or
- A clear topcoat to seal and protect a Faux Finishing coating. These clear topcoats must be sold and used solely as part of a Faux Finishing coating system, and must be labeled “This product can only be sold or used as part of a Faux Finishing coating system”.

Fire-Resistive Coating: A coating labeled and formulated to protect structural integrity by increasing the fire endurance of interior or exterior steel and other structural materials. The Fire Resistive category includes sprayed fire resistive materials and intumescent fire resistive coatings that are used to bring structural materials into compliance with federal, state, and local building code requirements. Fire Resistive coatings shall be tested in accordance with ASTM Designation E 119-07. Fire Resistive coatings and testing agencies must be approved by building code officials.

Fire-Retardant Coating: A coating labeled and formulated to retard ignition and flame spread, that has been fire tested and rated by a testing agency approved by building code officials for use in bringing building and construction materials into compliance with federal, state, and local building code requirements. The fire-retardant coating and the testing agency must be approved by building code officials. The fire-retardant coating shall be tested in accordance with ASTM Designation E 84-99.

Flat Coating: A coating that is not defined under any other definition in this rule and that registers gloss less than 15 on an 85-degree meter or less than 5 on a 60-degree meter according to ASTM Designation D 523-89 (1999).

Floor Coating: An opaque coating that is labeled and formulated for application to flooring, including, but not limited to, decks, porches, steps, garage floors, and other horizontal surfaces which may be subject to foot traffic. ***Note: Polymer and paraffin content for this product category must be reported on the Ingredient Information Form.***

Floor Polish or Wax: A wax, polish, or any other product designed to polish, protect, or enhance floor surfaces by leaving a protective coating that is designed to be periodically replenished. “Floor Polish or Wax” does not include “spray buff products”, products designed solely for the purpose of cleaning floors, floor finish strippers, products designed for unfinished wood floors, and coatings subject to architectural coatings regulations. ****DO NOT REPORT****

Flow Coating: A coating labeled and formulated exclusively for use by electric power companies or their subcontractors to maintain the protective coating systems present on utility transformer units.

Form-Release Compound: A coating labeled and formulated for application to a concrete form to prevent the freshly poured concrete from bonding to the form. The form may consist of wood, metal, or some material other than concrete.

Graphic Arts Coating or Sign Paint: A coating labeled and formulated for hand-application by artists using brush, airbrush, or roller techniques to indoor and outdoor signs (excluding structural components) and murals, including lettering enamels, poster colors, copy blockers, and bulletin enamels.

High-Temperature Coating: A high performance coating labeled and formulated for application to substrates exposed continuously or intermittently to temperatures above 204°C (400°F).

Industrial Maintenance Coating: A high performance architectural coating, including primers, sealers, undercoaters, intermediate coats, and topcoats, formulated for application to substrates exposed to one or more of the following extreme environmental conditions listed below, and labeled “For industrial use only” or “For professional use only”:

- Immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposure of interior surfaces to moisture condensation;
- Acute or chronic exposure to corrosive, caustic or acidic agents, or to chemicals, chemical fumes, or chemical mixtures or solutions;
- Frequent exposure to temperatures above 121°C (250°F);
- Frequent heavy abrasion, including mechanical wear and repeated (frequent) scrubbing with industrial solvents, cleansers, or scouring agents; or
- Exterior exposure of metal structures and structural components.

Lacquer: A clear or opaque wood coating, including clear lacquer sanding sealers, formulated with cellulosic or synthetic resins to dry by evaporation without chemical reaction and to provide a solid, protective film.

Low Solids Coating: A coating containing 0.12 kilogram or less of solids per liter (1 pound or less of solids per gallon) of coating material as recommended for application by the manufacturer.

Magnesite Cement Coating: A coating labeled and formulated for application to magnesite cement decking to protect the magnesite cement substrate from erosion by water.

Mastic Texture Coating: A coating labeled and formulated to cover holes and minor cracks and to conceal surface irregularities, and is applied in a single coat of at least 10 mils (0.010 inch) dry film thickness.

Metallic Pigmented Coating: A coating that is labeled and formulated to provide a metallic appearance. Metallic Pigmented coatings must contain at least 48 grams of elemental metallic pigment (excluding zinc) per liter of coating as applied (at least 0.4 pounds per gallon), when tested in accordance with SCAQMD Method 318-95. The Metallic Pigmented Coating category does not include coatings applied to roofs or Zinc-Rich Primers.

Multi-Color Coating: A coating that is packaged in a single container and that exhibits more than one color when applied in a single coat.

Multi-purpose Solvent: For products manufactured on or after January 1, 2008, and before January 1, 2015: any liquid product designed or labeled to be used for dispersing, dissolving, or removing contaminants or other organic materials. "Multi-purpose Solvent" also includes:

- Products that do not display specific use instructions on the product container or packaging;
- Products that do not specify an end-use function or application on the product container or packaging;
- Solvents used in institutional facilities, except for laboratory reagents used in analytical, educational, research, scientific or other laboratories;
- "Paint clean-up" products; and
- Products labeled to prepare surfaces for painting.

For the purposes of this definition only, "Paint clean-up" means any liquid product labeled for cleaning oil-based or water-based paint, lacquer, varnish, or related coatings from, but not limited to, painting equipment or tools, plastics, or metals. "Multi-purpose Solvent" does not include:

- Solvents used in cold cleaners, vapor degreasers, conveyorized degreasers or film cleaning machines;
- Solvents labeled exclusively for the clean-up of application equipment used for polyaspartic and polyurea coatings;
- Solvents that are incorporated into, or used exclusively in the manufacture or construction of, the goods or commodities at the site of the establishment;
- Products that are labeled exclusively to clean a specific contaminant, on a single substrate, in specific situations.

DO NOT REPORT

Nonflat Coating: A coating that is not defined under any other definition in this rule and that registers a gloss of 15 or greater on an 85-degree meter and 5 or greater on a 60-degree meter according to ASTM Designation D 523-89 (1999).

Nonflat – High Gloss Coating: A nonflat coating that registers a gloss of 70 or greater on a 60-degree meter according to ASTM Designation D 523-89 (1999). The labels of all Nonflat – High Gloss coatings shall prominently display the words “High Gloss.”

Nonflat – Low Gloss Coating: A nonflat coating that registers a gloss of 5 or above, but less than 20 on a 60-degree meter according to ASTM Designation D 523-89 (Reapproved 1999).

Nonflat – Medium Gloss Coating: A nonflat coating that registers a gloss of 20 or above, but less than 70 on a 60-degree meter according to ASTM Designation D 523-89 (Reapproved 1999).

Nonindustrial Use: Nonindustrial use means any use of architectural coatings except in the construction or maintenance of any of the following: facilities used in the manufacturing of goods and commodities; transportation infrastructure, including highways, bridges, airports, and railroads; facilities used in mining activities, including petroleum extraction; and utilities infrastructure, including power generation and distribution, and water treatment and distribution systems.

OEM coatings: Original equipment manufacturer coatings, which include automotive, marine, furniture, and appliance, as well as many other miscellaneous industrial or job shop applications. ****DO NOT REPORT****

Post-Consumer Coating: Finished coatings generated by a business or consumer that have served their intended end uses, and are recovered from or otherwise diverted from the waste stream for the purpose of recycling.

Pre-Treatment Wash Primer: A primer that contains a minimum of 0.5 percent acid, by weight, when tested in accordance with ASTM Designation D 1613-96, that is labeled and formulated for application directly to bare metal surfaces to provide corrosion resistance and to promote adhesion of subsequent topcoats.

Primer, Sealer, and Undercoater: A coating labeled and formulated for one or more of the following purposes:
- To provide a firm bond between the substrate and the subsequent coatings; or
- To prevent subsequent coatings from being absorbed by the substrate; or
- To prevent harm to subsequent coatings by materials in the substrate; or
- To provide a smooth surface for the subsequent application of coatings; or
- To provide a clear finish coat to seal the substrate; or
- To block materials from penetrating into or leaching out of a substrate.

Quick-Dry Enamel: A nonflat coating that is labeled as “Quick Dry” and that is formulated to have the following characteristics:
- Is capable of being applied directly from the container under normal conditions with ambient temperatures between 16 and 27^{o}C (60 and 80^{o}F);

- When tested in accordance with ASTM Designation D 1640-95, sets to touch in 2 hours or less, is tack free in 4 hours or less, and dries hard in 8 hours or less by the mechanical test method; and
- Has a dried film gloss of 70 or above on a 60-degree meter.

Quick-Dry Primer, Sealer, and Undercoater: A primer, sealer, or undercoater that is dry to the touch in 30 minutes and can be recoated in 2 hours when tested in accordance with ASTM Designation D 1640- 95.

Reactive Penetrating Sealer: A clear or pigmented coating that is labeled and formulated for application to above-grade concrete and masonry substrates to provide protection from water and waterborne contaminants, including, but not limited to, alkalis, acids, and salts. Reactive Penetrating Sealers must penetrate into concrete and masonry substrates and chemically react to form covalent bonds with naturally occurring minerals in the substrate. Reactive Penetrating Sealers line the pores of concrete and masonry substrates with a hydrophobic coating, but do not form a surface film. Reactive Penetrating Sealers must meet all of the following criteria:

- The Reactive Penetrating Sealer must improve water repellency at least 80 percent after application on a concrete or masonry substrate. This performance must be verified on standardized test specimens, in accordance with one or more of the following standards: ASTM C67-07, or ASTM C97-02, or ASTM C140-06; and
- The Reactive Penetrating Sealer must not reduce the water vapor transmission rate by more than 2 percent after application on a concrete or masonry substrate. This performance must be verified on standardized test specimens, in accordance with ASTM E96/E96M-05; and
- Products labeled and formulated for vehicular traffic surface chloride screening applications must meet the performance criteria listed in the National Cooperative Highway Research Report 244 (1981).

Reactive Penetrating Sealers must be labeled “Reactive Penetrating Sealer”.

Recycled Coating: An architectural coating formulated such that it contains a minimum of 50 percent by volume post-consumer coating, with a maximum of 50 percent by volume secondary industrial materials or virgin materials.

Residential: Areas where people reside or lodge, including, but not limited to, single and multiple family dwellings, condominiums, mobile homes, apartment complexes, motels, and hotels.

Roof Coating: A non-bituminous coating labeled and formulated for application to roofs for the primary purpose of preventing water penetration, reflecting ultraviolet light, or reflecting solar radiation.

Rust Preventative Coating: A coating formulated to prevent the corrosion of metal surfaces for one or more of the following applications:

- Direct-to-metal coating; or

- Coating intended for application over rusty, previously coated surfaces.

The Rust Preventative category does not include the following:

- Coatings that are required to be applied as a topcoat over a primer; or
- Coatings that are intended for use on wood or any other nonmetallic surface.

Rust Preventative coatings are for metal substrates only and shall prominently display the statement “For Metal Substrates Only”.

Sanding Sealer: A clear or semi-transparent wood coating labeled and formulated for application to bare wood to seal the wood and to provide a coat that can be abraded to create a smooth surface for subsequent applications of coatings. A sanding sealer that also meets the definition of a lacquer is not included in this category, but is included in the lacquer category.

Sealant: Any material with adhesive properties that is formulated primarily to fill, seal, or waterproof gaps or joints between two surfaces. ****DO NOT REPORT****

Shellac: A clear or opaque coating formulated solely with the resinous secretions of the lac beetle (*Laciffer lacca*), and formulated to dry by evaporation without a chemical reaction.

Shop Application: Application of a coating to a product or a component of a product in or on the premises of a factory or a shop as part of a manufacturing, production, or repairing process (e.g., original equipment manufacturing coatings).

Specialty Primer, Sealer, and Undercoater: A coating that is formulated for application to a substrate to block water-soluble stains resulting from: fire damage; smoke damage; or water damage.

Stain: A clear, semitransparent, or opaque coating labeled and formulated to change the color of a surface but not conceal the grain pattern or texture.

Stone Consolidant: A coating that is labeled and formulated for application to stone substrates to repair historical structures that have been damaged by weathering or other decay mechanisms. Stone Consolidants must penetrate into stone substrates to create bonds between particles and consolidate deteriorated material. Stone Consolidants must be specified and used in accordance with ASTM E2167-01. Stone Consolidants are for professional use only and must be labeled “Stone Consolidant - For Professional Use Only”.

Swimming Pool Coating: A coating labeled and formulated to coat the interior of swimming pools and to resist swimming pool chemicals. Swimming pool coatings include coatings used for swimming pool repair and maintenance.

Swimming Pool Repair and Maintenance Coating: A rubber based coating labeled and formulated to be used over existing rubber based coatings for the repair and maintenance of swimming pools.

Temperature-Indicator Safety Coating: A coating labeled and formulated as a color-changing indicator coating for the purpose of monitoring the temperature and safety of the substrate, underlying piping, or underlying equipment, and for application to substrates exposed continuously or intermittently to temperatures above 204°C (400°F).

Tint Base: An architectural coating to which colorant is added after packaging in sale units to produce a desired color.

Traffic Marking Coating: A coating labeled and formulated for marking and striping streets, highways, or other traffic surfaces including, but not limited to, curbs, berms, driveways, parking lots, sidewalks, and airport runways.

Tub and Tile Refinish Coating: A clear or opaque coating that is labeled and formulated exclusively for refinishing the surface of a bathtub, shower, sink, or countertop. Tub and Tile Refinish coatings must meet all of the following criteria:

- The coating must have a scratch hardness of 3H or harder and a gouge hardness of 4H or harder. This must be determined on bonderite 1000, in accordance with ASTM D3363-05; and
- The coating must have a weight loss of 20 milligrams or less after 1000 cycles. This must be determined with CS-17 wheels on bonderite 1000, in accordance with ASTM D4060-07; and
- The coating must withstand 1000 hours or more of exposure with few or no #8 blisters. This must be determined on unscribed bonderite, in accordance with ASTM D4585-99, and ASTM D714-02e; and
- The coating must have an adhesion rating of 4B or better after 24 hours of recovery. This must be determined on unscribed bonderite, in accordance with ASTM D4585-99 and ASTM D3359-02.

Varnish: A clear or semi-transparent wood coating, excluding lacquers and shellacs, formulated to dry by chemical reaction on exposure to air. Varnishes may contain small amounts of pigment to color a surface, or to control the final sheen or gloss of the finish.

Volatile Organic Compound (VOC): Any volatile compound containing at least one atom of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and excluding the following:

- methane;
- methylene chloride (dichloromethane);
- 1,1,1-trichloroethane (methyl chloroform);
- trichlorofluoromethane (CFC-11);
- dichlorodifluoromethane (CFC-12);
- 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113);
- 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114);
- chloropentafluoroethane (CFC-115);
- chlorodifluoromethane (HCFC-22);
- 1,1,1-trifluoro-2,2-dichloroethane (HCFC-123);

- 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124);
- 1,1-dichloro-1-fluoroethane (HCFC-141b);
- 1-chloro-1,1-difluoroethane (HCFC-142b);
- trifluoromethane (HFC-23);
- pentafluoroethane (HFC-125);
- 1,1,2,2-tetrafluoroethane (HFC-134);
- 1,1,1,2-tetrafluoroethane (HFC-134a);
- 1,1,1-trifluoroethane (HFC-143a);
- 1,1-difluoroethane (HFC-152a);
- ethoxy-nonafluorobutane (HFE 7200);
- trans-1,3,3,3-tetrafluoropropene (HFO-1234ze);
- cyclic, branched, or linear completely methylated siloxanes;
- the following classes of perfluorocarbons:
  (A) cyclic, branched, or linear, completely fluorinated alkanes;
  (B) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
  (C) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
  (D) sulfur-containing perfluorocarbons with no unsaturations and with the sulfur bonds only to carbon and fluorine; and
  - the following low-reactive organic compounds which have been exempted by the U.S. EPA:
    acetone;
    ethane;
    parachlorobenzotrifluoride (1-chloro-4-trifluoromethylbenzene);
    perchloroethylene; and
    methyl acetate.

VOC Content: The weight of VOC per volume of coating, calculated according to the procedures specified in “VOC Calculations and Conversions.” See “VOC Calculations” in Supplemental Information.

Waterproofing Membrane: A clear or opaque coating that is labeled and formulated for application to concrete and masonry surfaces to provide a seamless waterproofing membrane that prevents any penetration of liquid water into the substrate. Waterproofing Membranes are intended for the following waterproofing applications: below-grade surfaces, between concrete slabs, inside tunnels, inside concrete planters, and under flooring materials. Waterproofing Membranes must meet the following criteria:

- Coating must be applied in a single coat of at least 25 mils (at least 0.025 inch) dry film thickness; and
- Coatings must meet or exceed the requirements contained in ASTM C836-06.

The Waterproofing Membrane category does not include topcoats that are included in the Concrete/Masonry Sealer category (e.g., parking deck topcoats, pedestrian deck topcoats, etc.).

Waterproofing Concrete / Masonry Sealer: A clear or pigmented film-forming coating that is labeled and formulated for sealing concrete and masonry to provide resistance against water, alkalis, acids, ultraviolet light, and staining. ***Note: Polymer and paraffin content for this product category must be reported on the Ingredient Information Form.***

Waterproofing Sealer: A coating labeled and formulated for application to a porous substrate for the primary purpose of preventing the penetration of water.

Wood Preservative: A coating labeled and formulated to protect exposed wood from decay or insect attack, that is registered with both the U.S. EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (7 United States Code (U.S.C.) Section 136, *et seq.*) and with the California Department of Pesticide Regulation.

Zinc-Rich Primer: A coating that meets all of the following specifications:

- Coating contains at least 65 percent metallic zinc powder or zinc dust by weight of total solids; and
- Coating is formulated for application to metal substrates to provide a firm bond between the substrate and subsequent applications of coatings; and
- Coating is intended for professional use only and is labeled “For Professional Use Only”.

COATING CATEGORY CODES

Category	Code	Category	Code
Antenna Coatings	1	Quick Dry Enamel	31
Antifouling Coatings	2	Quick Dry Primers, Sealers. Undercoaters	32
Bituminous Roof Coatings	3	Recycled Coatings	33
Bituminous Roof Primers	4	Roof Coatings	34
Bond Breaker Coatings	5	Rust Preventative Coatings	35
Clear Brushing Lacquers	6	Sanding Sealers (other than lacquer sanding sealers)	36
Concrete Curing Compounds	7	Shellacs – Clear	37
Dry Fog Coatings	8	Shellacs – Opaque	38
Faux Finishing Coatings	9	Specialty Primers, Sealers, and Undercoaters	39
Fire Resistive Coatings	10	Stains – Clear/Semitransparent	40
Fire Retardant Coatings - Clear	11	Stains - Opaque	41
Fire Retardant Coatings - Opaque	12	Swimming Pool Coatings	42
Flat Coatings	13	Swimming Pool Maintenance & Repair Coatings	43
Floor Coatings	14	Temperature Indicator Safety Coatings	44
Flow Coatings	15	Traffic Marking Coatings	45
Form Release Compounds	16	Varnishes - Clear	46
Graphic Arts Coatings (Sign Paints)	17	Varnishes – Semitransparent	47
High Temperature Coatings	18	Waterproofing Sealers	48
Industrial Maintenance Coatings	19	Waterproofing Concrete/Masonry Sealers	49
Lacquers (including lacquer sanding sealers)	20	Wood Preservatives	50
Low Solids Coatings	21	Other (specify on Product Information form)	51
Magnesite Cement Coatings	22	Driveway Sealers	52
Mastic Texture Coatings	23	Aluminum Roof Coatings	53
Metallic Pigmented Coatings	24	Basement Specialty Coatings	54
Multi-Color Coatings	25	Concrete/Masonry Sealers	55
Nonflat Coatings - Low Gloss	26	Reactive Penetrating Sealers	56
Nonflat Coatings – Medium Gloss	27	Stone Consolidants	57
Nonflat Coatings - High Gloss	28	Tub and Tile Refinish Coatings	58
Pre-Treatment Wash Primers	29	Waterproofing Membranes	59
Primers, Sealers, and Undercoaters	30	Zinc-Rich Primers	60
		Air and Water Resistive Barrier Coatings	61

Possible Reporting Categories For Other National Rule (1) Categories	
National Rule Category	**Possible Reporting Category**
Anti-Graffiti	Industrial Maintenance or Flat/Nonflat
Bituminous and Mastic	Roof, Bituminous Roof or Primer, Primer ,Sealer. Undercoater, Concrete / Masonry Sealers, Industrial Maintenance
Calcimine Recoater	Flat or Specialty Primer / Sealer / Undercoater

Chalkboard Resurfacers	Industrial Maintenance
Concrete Curing and Sealing	Concrete Curing Compounds or Concrete / Masonry Sealers
Concrete Protective	Concrete / Masonry Sealers
Concrete Surface Retarder	Other
Conversion Varnish	Wood Coatings
Extreme High Durability	Industrial Maintenance
Heat Reactive	Industrial Maintenance (generally an OEM coating)
Impacted Immersion	Industrial Maintenance
Nonferrous Ornamental Metal Lacquers and Surface Protectants	Wood Coatings or Rust Preventative
Nuclear	Industrial Maintenance
Repair and Maintenance Thermoplastic	Industrial Maintenance
Stain Controllers	Low Solid or Primer, Sealer, Undercoater
Thermoplastic Rubber and Mastics	Roof
Zone Marking	Traffic

1. National Volatile Organic Compound Emission Standards for Architectural Coatings (40 CFR Part 59, Subpart D)

Note: This reference table is provided as general guidance only and is not intended to be used as a definitive determination by the California Air Resources Board.

SUBSTRATE CODES

Substrate Codes Substrate	Code
All Substrates	0
Acoustical Materials: Ceiling Texture, Acoustic Tile, etc.	1
Asphalt	2
Concrete, Stone, Masonry, etc. (Includes codes 4 through 8)	3
Brick	4
Cinder Block, Concrete Block	5
Stone	6
Stucco	7
Tilt up and poured in place concrete	8
Drywall / Plaster: Textured and Untextured	9
Metal: (Includes codes 11 and 12)	10
Ferrous: Iron, Steel	11
Nonferrous: Galvanized, Aluminum, Alloys, etc.	12
Wood: (Includes codes 14 through 17)	13
Not painted, smooth	14
Not painted, rough sawn	15
Previously painted or stained	16
Plywood, Synthetic Wood, Hardboard, T-111 Siding, Masonite, Chipboard, Compressed Wood (wood chip or wood fiber based building materials)	17
Other: Specify	18

RESIN/BINDER CODES

Resin/Binder Codes					
Resin/Binder	**Code**	**Resin/Binder**	**Code**	**Resin/Binder**	**Code**
Acrylic	1	Oleoresin	8	Urethane, Polyurethane	15
Acrylic Copolymer	2	Phenolic	9	Polyvinyl Chloride (PVC)	16
Alkyd	3	Polyester (Not Alkyd)	10	Vinyl Toluene	17
Amines, Amides	4	Polyvinyl Acetate (PVA)	11	Vinyl Acrylic Copolymer	18
Cellulosic	5	Shellac	12	Other: Specify	19
Chlorinated Rubber	6	Silicone, Silane, Siloxane	13	Asphaltic \ Bituminous	20
Epoxy	7	Styrene-butadiene	14	Oil (e.g., linseed, tung)	21

VOC CALCULATIONS AND CONVERSION FACTORS

VOC Content

The following equations can be used to calculate entries contained in the product information and colorant information forms of this survey.

$$VOC_{Actual} = \frac{W_{vm} - W_w - W_e}{V_c}$$

$(Also\ known\ as\ Material\ VOC)$

$$VOC_{Regulatory} = \frac{W_{vm} - W_w - W_e}{V_c - V_w - V_e}$$

$(Also\ known\ as\ Coating\ VOC)$

$$VOC_{Regulatory\ (Low\ Solids)} = \frac{W_{vm} - W_w - W_e}{V_c}$$

Where:

- W_{vm} = Total weight of volatile materials (VOC+water+exempt compounds) in the coating, in grams
- W_w = Weight of water in the coating, in grams
- W_e = Weight of exempt compounds in the coating, in grams
- V_c = Total volume of the coating, in liters
- V_w = Volume of water in the coating, in liters
- V_e = Volume of exempt compounds in the coating, in liters

Note: If you are using BatchMaster, Material VOC and Coating VOC can be found in MSDS / Compliance (Section III – Physical / Chemical Characteristics).

VOC REGULATORY AFTER RECOMMENDED THINNING

The following equation can be used to calculate VOC Regulatory after the coatings are thinned with VOC containing solvents.

$$VOC_{Regulatory\ (After\ Recommended\ Thinning)} = \frac{Volume_{Coating} \times VOC_{Regulatory} + Volume_{Thinner} \times VOC_{Thinner}}{Volume_{Coating} + Volume_{Thinner}}$$

PERCENT BY VOLUME SOLIDS OF COATING

The following are two equations that can be used to calculate the percent volume solids of coating. The choice of equation depends on the type of information that is known about the coating.

1) If the weight and density of all of the solid (nonvolatile) materials are known, then the following equation may be used:

$$\text{\% by Volume Solids of Coating} = \frac{\text{Weight of Solids}}{\text{Density of Solids x Volume of Coating Material}} \text{ x } 100$$

2) If instead, only the volatile components of a coating (VOC, water and exempt compound) are known, the percent volume of solids may be estimated by the following equation.

$$\text{\% by Volume of Solids of Coating} = \left\{1 - \frac{W_w}{D_w \text{ x } V_c} - \frac{W_{voc}}{D_{voc} \text{ x } V_c} - \frac{W_e}{D_e \text{ x } V_c}\right\} \text{ x } 100$$

Where:

W_w	=	Weight of water in the coating, in grams	D_w	=	Density of water, in grams per liter
W_{voc}	=	Weight of VOC in the coating, in grams	D_{voc}	=	Density of VOC, in grams per liter
W_e	=	Weight of exempt compounds in the coating, in grams	D_e	=	Density of exempt compounds, in grams per liter
V_c	=	Total volume of coating in liters			

SALES WEIGHTED AVERAGE

The Sales Weighted Average (SWA) is an average value for grouped coatings, calculated by weighting the individual values by their sales. For grouped coatings in this survey, the SWA should be used to report the following entries on the Product Information Form: coating density, weight percent of solids, weight percent of volatile material, weight percent of water, weight percent of exempts, volume percent of solids, volume percent of water, and volume percent of exempts. The following equation can be used to calculate Sales Weighted Average.

$$\text{SWA} = \frac{((\text{Value}_1 \text{ x } \text{Sales}_1) + (\text{Value}_2 \text{ x } \text{Sales}_2) + (\text{Value}_n \text{ x } \text{Sales}_n))}{(\text{Sales}_1 + \text{Sales}_2 + \text{Sales}_n)}$$

Where:

Value$_{(1,2,...n)}$ = Coating characteristic values (e.g., coating density, VOC Actual, VOC Regulatory, etc.) for products 1,2,...n

Sales$_{(1,2,...n)}$ = Sales for products 1,2,...n

CONVERSION FACTORS

VOC content:
To convert pounds/gallon to grams/liter multiply by 119.83

Density:
1 pound/gallon = 0.11983 kilograms/liter or 119.83 grams/liter

Specific Gravity :
To convert specific gravity to pounds/gallon multiply by 8.345
To convert specific gravity to grams/liter multiply by 1000

Units of Volume:
1 fl oz = 0.029574 liters
1 liquid pint = 0.47318 liters
1 liquid quart = 2 liquid pints = 0.94635 liters
1 gallon = 4 liquid quarts = 3.7854 liters

Units of Mass:

Unit	ounce(oz)	pound(lb)	gram(g)	kilogram(kg)
1 oz =	1	0.0625	28.3495	0.02834
1 lb =	16	1	453.592	0.45359

U.S RESIDENT POPULATION FOR 2013

United States Total = 316,128,839

STATE	POPULATION	%	RANK
Alabama	4,833,722	1.5	23
Alaska	735,132	0.2	47
Arizona	6,626,624	2.1	15
Arkansas	2,959,373	0.9	33
California	**38,332,521**	**12.1**	**1**
Colorado	5,268,367	1.7	22
Connecticut	3,596,080	1.1	29
Delaware	925,749	0.3	45
District of Columbia	646,449	0.2	(X)
Florida	19,552,860	6.2	4
Georgia	9,992,167	3.2	8
Hawaii	1,404,054	0.4	40
Idaho	1,612,136	0.5	39
Illinois	12,882,135	4.1	5
Indiana	6,570,902	2.1	16
Iowa	3,090,416	1.0	30
Kansas	2,893,957	0.9	34
Kentucky	4,395,295	1.4	26
Louisiana	4,625,470	1.5	25
Maine	1,328,302	0.4	41
Maryland	5,928,814	1.9	19
Massachusetts	6,692,824	2.1	14
Michigan	9,895,622	3.1	9
Minnesota	5,420,380	1.7	21
Mississippi	2,991,207	0.9	31
Missouri	6,044,171	1.9	18

STATE	POPULATION	%	RANK
Montana	1,015,165	0.3	44
Nebraska	1,868,516	0.6	37
Nevada	2,790,136	0.9	35
New Hampshire	1,323,459	0.4	42
New Jersey	8,899,339	2.8	11
New Mexico	2,085,287	0.7	36
New York	19,651,127	6.2	3
North Carolina	9,848,060	3.1	10
North Dakota	723,393	0.2	48
Ohio	11,570,808	3.7	7
Oklahoma	3,850,568	1.2	28
Oregon	3,930,065	1.2	27
Pennsylvania	12,773,801	4.0	6
Rhode Island	1,051,511	0.3	43
South Carolina	4,774,839	1.5	24
South Dakota	844,877	0.3	46
Tennessee	6,495,978	2.1	17
Texas	26,448,193	8.4	2
Utah	2,900,872	0.9	33
Vermont	626,630	0.2	49
Virginia	8,260,405	2.6	12
Washington	6,971,406	2.2	13
West Virginia	1,854,304	0.6	38
Wisconsin	5,742,713	1.8	20
Wyoming	582,658	0.2	50

X = Not Applicable

Source: Population Division, U.S. Census Bureau
Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2013
Release Date: December 2013

HYDROCARBON SOLVENT INFORMATION AND BIN NUMBERS

A BIN number is a classification scheme that represents the overall photochemical reactivity of a group of solvents with similar characteristics. Although most of the large chemical suppliers are aware of BIN numbers, you may encounter some that are unfamiliar with the term. Many suppliers include the BIN number on their product literature. Depending on the level of detail of the literature that accompanies shipments of the solvent, you may be able to determine the BIN number without further consulting your supplier. For your convenience, we have compiled a list of some common hydrocarbon solvents and their BIN numbers below. You can also use the list of BIN numbers for aliphatic and aromatic hydrocarbon solvents found immediately below this table, if your supplier can not provide a BIN number and your hydrocarbon solvent is not listed below. Please note that BIN numbers are required only for hydrocarbon solvents, not for VOCs such as alcohols, glycol ethers, ketones or acetates.

Manufacturer		
	Trade Name	BIN #
American Refining Group		
	Kensol 30	15
Ashland, Incorporated		
	142 Solvent 66	11
	Hi Sol® 10	22
	Hi Sol® 15	23
	Kwik-Dri®	6
	Lacolene®	6
	Low Odor Base Solvent®	16
	Mineral Spirits 66 (1% Aromatic)	11
	Mineral Spirits 66 (7.5% Aromatic)	14
	Mineral Spirits NE	15
	Odorless Mineral Spirits	12
	VM&P Naphtha	6
	Xylenes	21
Calumet Lubricants		
	142 Flash	11
	Calprint 35	16
	Calprint 38	16
	Calprint 600 Solvent	20
	Hexane	1
	Iso-Hexane	2
	LVP 100	11
	LVP 200	16
	LVP 300	16
	LVP 400	20
	Mineral Spirits	15
	Mineral Spirits (<1%)	11
	VM&P (<1%)	6
Chemcentral		
	Aromatic 100	22
	Aromatic 150	23
	Aromatic 200	24
	Xylenes	21

Manufacturer	Trade Name	BIN #
Chemcentral (continued)		
	140 Solvent	11
	Heptane	1
	Hexane	1
	Mineral Spirits	15
	Odorless Mineral Spirits	11
	VM&P Naphtha	6
Chevron Phillips Chemical Company		
	Soltrol® 10 Fluid	7
	Soltrol® 100 Fluid	7
	Soltrol® 130 Fluid	12
	Soltrol® 170 Fluid	11
	Soltrol® 220 Fluid	16
CITGO		
	142 Solvent 66/3	11
	170 Solvent	11
	Camping Fuel	4
	Citgo Mineral Seal Oil	19
	Heptane	2
	Hexane	1
	Lactol Spirits	10
	Mineral Spirits 150	11
	Mineral Spirits 66/3	11
	Mineral Spirits 75	9
	Naphthol Spirits 66/3	6
	Regular Mineral Spirits	15
	Roto Solv	9
	Rubber Solvent	4
	Solv G	23
	Special Lactolite	6
	Special Naphtholite 66/3	6
	Super Hi Flash Naphtha	22
	Textile Spirits	1
	Xylenes	21
Conoco Phillips		
	Pentanes	1
	Hexanes	1
	Iso-hexanes	2
	Heptanes	1
Crompton Witco Refined Products		
	PD-23	17
	PD-26	17
	PD-28	17
Exxonmobil Chemical Company		
	1520 Naphtha	1
	2024 Naphtha	9
	Aromatic 100 Fluid	22
	Aromatic 150 Fluid	23
	Aromatic 200 Fluid	24

Manufacturer	Trade Name	BIN #
Exxonmobil Chemical Company (continued)		
	Exxsol® D110 Fluid	16
	Exxsol® D130 Fluid	16
	Exxsol® D3135 Naphtha	6
	Exxsol® D40 Fluid	11
	Exxsol® D80 Fluid	11
	Exxsol® D95 Fluid	N/A*
	Exxsol® DSP 75/100 Naphtha	1
	Exxsol® DSP 115/145 Naphtha	6
	Exxsol® Hexane Fluid	2
	Exxsol® Heptane Fluid	2
	Exxsol® Methylpentane Naphtha	2
	Isopar® C Fluid	7
	Isopar® E Fluid	7
	Isopar® G Fluid	7
	Isopar® H Fluid	12
	Isopar® K Fluid	12
	Isopar® K Naphtha	12
	Isopar® L Fluid	11
	Isopar® M Fluid	16
	Isopar® V Fluid	16
	Norpar® 12 Fluid	12
	Norpar® 13 Fluid	12
	Norpar® 14 Fuid	17
	Norpar® 15 Fluid	17
	OMS	12
	RS Naphtha	5
	Varsol® 1 Fluid	15
	Varsol® 1 Naphtha	15
	Varsol® 110 Fluid	20
	Varsol® 140 Naphtha	15
	Varsol® 18 Fluid	14
	Varsol® 18 Naphtha	9
	Varsol® 3135 Naphtha	10
	Varsol® DX 140 Naphtha	14
	Xylenes	21
Flint Hills Resources		
	Sure-Sol® 100	22
	Sure-Sol® 150	23
	Sure-Sol® 150ND	23
	Xylenes	21
Gary-Williams Energy Corporation		
	100W	15
Marathon Ashland Petroleum LLC		
	90 Solvent	6
	142 Solvent	11
	Kwik-Dri®	6
	Lacolene®	6
	Low Odor Base Solvent®	16

Manufacturer		
	Trade Name	BIN #
Marathon Ashland Petroleum LLC (continued)		
	Mineral Spirits Rule 66	11
	Non-Exempt Mineral Spirits	15
	VM&P Naphtha	6
Penreco		
	Conosol® 215	16
	Conosol® 260	16
	Conosol® 340	16
	Conosol® 38V	16
	Conosol® 46V	16
	Conosol® 50V	16
	Conosol® 90	11
	Conosol® C-145	13
	Conosol® C-170	13
	Conosol® C-200	18
	Conosol® HDW	16
	Drakesol® 165	11
	Drakesol® 205	16
	Drakesol® 220	16
	Drakesol® 260	16
	Drakesol® 305	16
	Magiesol® 38LX	13
	Magiesol® 40	11
	Magiesol® 44	16
	Magiesol® 47	16
	Magiesol® 47LX	18
	Magiesol® 52	16
	Magiesol® 55LX	16
	Magiesol® 60	16
	Magiesol® 65LX	16
	Penreco® 144ES	14
	Penreco® 150-B	15
	Penreco® 170ES	14
	Penreco® LVT200	18
Sasol North America, Incorporated		
	C1316 Paraffin	17
	LINPAR® 1416-V Paraffin	17
	LPA® Solvent	11
	LPA®-142 Solvent	11
	LPA®-150 Solvent	11
	LPA®-170 Solvent	11
	LPA®-210 Solvent	16
	LPA®-210 Solvent	16
	MR Solvent	15
	ODC® Solvent	11
	ODC®-15 Solvent	15
	Sasol® 47 Solvent	16
Shell Chemicals		
	Heptane - Cotton Valley	1

Manufacturer		
	Trade Name	BIN #
Shell Chemicals (continued)		
	Heptane – Lemont	2
	SHELLSOL® 15	15
	SHELLSOL® 16	15
	SHELLSOL® 7EC	14
	SHELLSOL® 9	15
	SHELLSOL® A100	22
	SHELLSOL® A150	23
	SHELLSOL® B HT	1
	SHELLSOL® D38	6
	SHELLSOL® D40	11
	SHELLSOL® D43	11
	SHELLSOL® D60	11
	SHELLSOL® D80	11
	SHELLSOL® OMS	12
	SHELLSOL® TC	7
	SHELLSOL® W HT	6
	VM&P Naphtha	6
Whitaker Oil Company		
	142 Flash Solvent (D-60)	11
	Aromatic 100	22
	Aromatic 150	23
	Heptane	2
	Hexane	1
	LPA® 142 Solvent	11
	LPA® 170 Solvent	11
	LPA® 210 Solvent	16
	LPA® Solvent	11
	Mineral Spirits (D-38)	6
	Mineral Spirits, Odorless	12
	Mineral Spirits, Rule 66 (D-40)	11
	Rubber Solvent	4
	VM&P Naphtha HT	6
	Xylenes	21

*No Bin number needed; report only Trade Name and Manufacturer.

REACTIVITY BIN NUMBERS FOR ALIPHATIC AND AROMATIC HYDROCARBON SOLVENTS

If hydrocarbon solvents (e.g., mineral spirits, Stoddard Solvent, VM&P naphtha) are ingredients in your product, your solvent supplier should be able to tell you what the BIN number is for the solvent. The BIN numbers are defined as follows:

Aliphatic Hydrocarbon Solvents

Bin	Average Boiling Point*** (degrees F)	Criteria	MIR Value
1	80-205	Alkanes (< 2% Aromatics)	1.42
2	80-205	N- & Iso-Alkanes (ε 90% and < 2% Aromatics)	1.31
3	80-205	Cyclo-Alkanes (ε 90% and < 2% Aromatics)	1.63
4	80-205	Alkanes (2 to < 8% Aromatics)	1.47
5	80-205	Alkanes (8 to 22% Aromatics)	1.56
6	>205-340	Alkanes (< 2% Aromatics)	1.17
7	>205-340	N- & Iso-Alkanes (ε 90% and < 2% Aromatics)	1.03
8	>205-340	Cyclo-Alkanes (ε 90% and < 2% Aromatics)	1.44
9	>205-340	Alkanes (2 to < 8% Aromatics)	1.44
10	>205-340	Alkanes (8 to 22% Aromatics)	1.98
11	>340-460	Alkanes (< 2% Aromatics)	0.70
12	>340-460	N- & Iso-Alkanes (ε 90% and < 2% Aromatics)	0.62
13	>340-460	Cyclo-Alkanes (ε 90% and < 2% Aromatics)	0.86
14	>340-460	Alkanes (2 to < 8% Aromatics)	0.99
15	>340-460	Alkanes (8 to 22% Aromatics)	1.57
16	>460-580	Alkanes (< 2% Aromatics)	0.52
17	>460-580	N- & Iso-Alkanes (ε 90% and < 2% Aromatics)	0.48
18	>460-580	Cyclo-Alkanes (ε 90% and < 2% Aromatics)	0.60
19	>460-580	Alkanes (2 to < 8% Aromatics)	0.66
20	>460-580	Alkanes (8 to 22% Aromatics)	0.95

***Average Boiling Point = (Initial Boiling Point + Dry Point) / 2

Aromatic Hydrocarbon Solvents

Bin	Boiling Range (degrees F)	Criteria	MIR Value
21	280-290	Aromatic Content (ε98%)	7.64
22	320-350	Aromatic Content (ε98%)	7.60
23	355-420	Aromatic Content (ε98%)	6.85
24	450-535	Aromatic Content (ε98%)	3.82