Personal Care Products Council
Committed to Safety, Quality & Innovation

February 10, 2020

Via Electronic Mail
Joe Calavita
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California Air Resources Board
Sacramento, CA 95812-0806
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RE: Comments on the Draft Proposed Amendments to ARB's Consumer Products Regulations

Dear Mr. Calavita:

The Personal Care Products Council (PCPC)[1] is pleased to submit the following comments on the California Air Resources Board (CARB) draft proposed rule for Article 2 of its Consumer Products Regulation. Our more than 600 member companies, that range from large manufacturers and marketers to independent producers, are involved in the manufacture and distribution of cosmetics, toiletries, fragrances, over-the-counter (OTC) drug products and ingredients in California and throughout the United States, and therefore have a strong interest in the scope and applicability of this regulation.

INTRODUCTION

Since the inception of California's Consumer Product Regulations in 1989, PCPC and its members have provided thoughtful feedback on CARB's rulemaking proposals to limit VOC emissions. PCPC hopes that its comments will continue to advance a practical and effective regulatory framework that promotes sustainable innovation while making meaningful improvements to the protection of human health and the environment.

CARB's current draft proposal seeks to establish or reduce VOC emission levels for important personal care product categories and make changes to other areas of importance to our member

[1]Based in Washington, D.C., the Council is the leading national trade association representing the global cosmetic and personal care products industry. Founded in 1894, the Council's more than 600 member companies manufacture, distribute, and supply the vast majority of finished personal care products marketed in the United States. As the makers of a diverse range of products that millions of consumers rely on every day, from sunscreens, toothpaste, and shampoo to moisturizer, lipstick, and fragrance, member companies are global leaders committed to product safety, quality, and innovation.

companies. The levels currently proposed pose formulation challenges, and alternative ingredients could result in impacts to product integrity, stability and safety, while also leading to the substitution of potentially more toxic or environmentally damaging ingredients. Consequently, in the spirit of cooperation and with a sincere desire to improve the proposed regulation, PCPC respectfully submits the following comments for your consideration.

PERSONAL CARE PRODUCT CATEGORIES:

Hair Finishing Spray

Hair Finishing Sprays, more commonly known as hair sprays, hold styled hair in place typically by applying a film former, or resin, to the hair. While the primary goal is to hold and keep the hair style in place while engaging in daily activities, consumers are known to touch up the style in the few seconds after application to ensure that the spray did not alter the previously styled hair. "Hair Finishing Spray" does not include products labeled for hair styling only.

From a technology point of view, it is critical to ensure that the resin in the product is solubilized and can be sprayed out evenly to provide the thinnest and most even layer possible. Because of the need to cover the hair completely, a spray format, either pump or aerosol, is the optimum method for evenly distributing the resin.

1. Proposed VOC Limits

a. 50% VOC limit by 2023

CARB has proposed an initial VOC limit of 50% for hair finishing spray, which would theoretically result in a VOC savings of 1.1 tons per day (tpd). In assessing whether such limits are feasible, manufacturers are considering different formulation options.

One way to potentially achieve the new VOC limit would be to reduce the amount of solvent (alcohol) in these products and increase the amount of water. Technical areas that require careful consideration include:

- Impact of replacing ethanol with water for both an aerosol and non-aerosol Hair Spray:
  - Unacceptable style retention / hold;
  - Longer dry time;
  - Larger droplet size, leading to spotty coverage of the hair;

- Increasing amounts of water will lead to greater hydrolysis of the polymer/resin, significantly reducing the effectiveness of the hair spray to hold the hair in place;
- Concentrating the resin phase and/or adding water in place of ethanol or propellant will both increase viscosity of the liquid in the can, which in turn creates courser/larger spray properties and increases the likelihood of clogging of the valve;
- Bulk susceptibility to microbiological issues will increase as water level increases.

- Additional impacts of replacing ethanol with water for an Aerosol hairspray:
  - Water is not soluble with most liqueified gas propellants. Spray sputter and foaming issues could result, leading to inadequate coverage of the hair and the potential to require more product to provide the required hold;
  - Safety issues can arise from increased levels of water, primarily due to the increased potential for can corrosion.

Another way explored to potentially achieve the new VOC limit would be to move to a non-VOC propellant. Technical areas that require careful consideration include:

- Compressed gas propellants generally deliver coarser/larger droplet size sprays
  - Changing spray properties from beginning to end of can may result in poor spray to no spray at midpoint to end of can.
- Increasing the use of HFC-152a, to replace the VOC propellants and solvents, is a likely scenario to reduce VOC emissions, since it is already in widespread use for this category.
- Using more HFC-152a would add a significant environmental impact due to increased global warming potential and increase costs.
  - Using additional HFC-152a would have global implications, since HFC is not permitted in many countries.
  - Additional levels of HFC-152a could result in an unstable product due to increased can pressures.

b. 45% VOC limit by 2027

The issues highlighted in a proposed reduction to a 50% VOC limit would, at least in the near future, be exacerbated by a further lowering of the VOC target.

We respectfully request that CARB reconsider such a drastic VOC reduction for this product category, as it would be difficult to achieve without negatively impacting the performance of a consumer acceptable product.

2. Claims

We support clarifying the distinctions between 'hair styling products' and 'hair finishing spray' by codifying the 2011 CARB Advisory within product category definitions.

Recognizing that consumers currently do 'touch-up' their hair style after applying hair spray, such modest claims should be permitted as long as it is clear that the purpose of the hair spray is to provide hold to the already styled hair.

Hair sprays only provide a coating to the hair to hold the style in place, whereas styling aids are added to the entire body of hair, from the scalp to the ends of the hair.

No Rinse Shampoo (Dry Shampoo) and Dry Conditioner

CARB has expressed a desire to regulate Dry Conditioner technologies as part of this rulemaking process and include the category with the No Rinse Shampoo product category.

As both of these new product types currently have no VOC standard, hydrocarbon propellants are being used for various reasons, including the need to dry very quickly without using water in the product. For example, the absorbent clays used in several formulas will likely clump together if water is introduced to the product.

1. VOC Limits

a. 50% VOC limit by 2023

As CARB is aware from the survey data, most dry shampoos currently on the market are formulated at, on average, 90% VOCs or higher. We would recommend a more step-wise approach for this new category, with a gradual (rather than drastic) reduction in VOCs over time to allow for innovation and acclimation by consumers over time.

The technical challenges for such a drastic VOC reduction as CARB is proposing include:

- For aerosol spray products, formulators cannot introduce water because the formulations are anhydrous (any water will prevent the product from performing as required).

- The solvents used must quickly evaporate, in order for each technology to avoid ruining the existing style of the hair. Replacing propellant with slower evaporating solvent will make the hair wet and potentially ruin the style.
- There is a significant safety risk when lowering the VOC of the current products because of increased pressure in the can. This result is dictated by the fact that these current aerosol products:
  - have a higher propellant level to replace (than hairspray, for example), and
  - the excluded propellant options (e.g. HFC-152a) are at a higher vapor pressure than the current propellants used.
- For aerosol spray products, a reduction in VOC from current levels ($\geq$ 90%) to 50% will likely result in increased use of HFC's, typically HFC-152a, to meet the new requirements. There are significant consequences to increasing HFC-152a usage, including:
  - increased environmental impact, since HFC's are greenhouse gases;
  - lack of consumer acceptability; and
  - HFC-152a is not permitted currently in many parts of the world.

b. 45% VOC limit by 2027

For Dry Shampoos, the potential savings of only 0.2 tpd of VOC for such a drastic reduction seems disproportionate, and we would respectfully request that CARB eliminate this second compliance date and proposed additional reduction for this category.

2. Definitions

The current No Rinse Shampoo definition does not apply to the Dry Conditioner product category or technologies; therefore, separate definitions should be developed and agreed to during the rulemaking process.

PCPC recommends renaming the "No Rinse Shampoo" category to "Dry Shampoo" to better reflect how consumers refer to it. We also propose amending the definition to ensure precision in classifying the product category:

> *"Dry Shampoo" means a product designed or labeled to be applied to dry hair to clean, absorb oil, or eliminate odor and is subsequently combed, brushed, or toweled from the hair for the purpose of renewing, refreshing*

or bringing back volume or to maintain personal hygiene. "Dry Shampoo" does not include dry conditioners.

While not a formal proposal, CARB offered a possible definition for "Dry Conditioner" (as a "conversation starter"), which PCPC member companies are currently reviewing. We appreciate CARB's willingness to offer suggested definitions for discussion, and we will provide feedback and comment to CARB on this proposed definition in the weeks ahead.

Personal Fragrance Products < 20% Fragrance (PFP)

The PFP category includes several types of consumer products ranging from deodorant body sprays to aftershave to fine fragrance products. As such, compliance with CARB's proposed VOC limits for this category will be more difficult for certain types of products than others. In particular, fine fragrance products (e.g., colognes, perfumes, etc.) would find compliance with the proposed limits to be challenging because any reformulation to lower the current ethanol level could significantly detract from the quality and olfactory character of the products, many of which are iconic brands and formulas.

In order to more fully assess the impact of any potential reformulation, PCPC has requested additional data from CARB regarding VOC averages and ranges in order to further evaluate fine fragrance, after shave, EDP/EDT/cologne, body spray, and fragrance mist. Once we have this data, we will be in a better position to discuss available options.

Fine Fragrances:

The basic components of fine fragrances are, essentially, fragrance compounds, ethanol and water. There is very little else in their formulation. Requiring fine fragrances to adhere to the lowest VOC levels expressed in CARB's proposal could hurt the industry to the extent that some companies may halt distribution and sale of such products in California. One result of these actions is that the presence and sale of counterfeit fine fragrance products in California could significantly increase as consumer strive to obtain products with the properties they desire.

This is due to the critical importance of ethanol to the overall quality, safety and acceptability of the product. Because the alcohol base is so critical to the olfactory quality of the product and the long-lasting effect of the finished perfume it could be considered as part of the overall fragrance of the product rather than a solvent which could potentially be replace by other hydrocarbons. Ethanol is the diffusing agent that creates the "sillage" – it carries the scent away from the skin. The fragrance notes develop to their fullest extent only as the ethanol evaporates.

In fact, for a fine fragrance containing 20% or less of fragrance compound to display its odour characteristics, it needs around 75% ethanol. Previous reformulation trials (when the industry went from 80% to 75%) showed that decreasing beyond this level adversely altered (a) the consumer experience and (b) both the olfactive and the aesthetic characteristics of the finished fragrance. Lowering beyond 75% may lead consumers to not recognize their fragrance anymore; the fragrance may not diffuse in the same manner; and its stability could be compromised depending on the ingredients replacing some of the ethanol in the product.

Just adding water to the product is not the answer to lower VOC since, as CARB is aware, ethanol and water are not at all interchangeable precisely because of water's low volatility. The more ethanol decreases and water increases, the less the consumer "smells".

Simply increasing the amount of water in the product to lower the VOC/ethanol levels will create additional problems besides significantly slowing the drying of the fragrance product to providing unacceptable fragrance notes to consumers.

Specifically, increasing the amount of water (while decreasing the amount of ethanol) means the fragrance compound won't be adequately solubilized and the resulting solution is likely to be hazy rather than "transparent." Increased water levels also seriously increase the risk of microbiological contamination, potentially requiring new preservative systems.

The industry has explored other solvents as potential full or partial replacements for alcohol, but none have the characteristics of ethanol: high volatility, quick evaporation, clean odor characteristic, and ability to solubilize both polar and non-polar components (allowing optimal mixing with both perfumery ingredients and water). All other potential solvents (triethylcitrate, dipropylene glycol, diethylphtalate, etc.) have lower volatility, and lower solubility in water. And many perfumery ingredients are less soluble in them than in ethanol.

Body Sprays, Deodorant Body Sprays, Aftershaves and Fragrance Mists:

These categories are currently regulated as Personal Fragrance Products. They could all be defined more precisely and regulated separately; and PCPC will offer CARB suggested definitions in the weeks ahead.

Reducing the VOC levels in these products will require the addition of water or non-VOC solvents to replace either propellant and/or ethanol. Increasing the amount of water (while decreasing the amount of ethanol) means the fragrance compound may not be adequately solubilized. This could lead to instability of the fragrance and may not be homogenous during filling, which would lead to spray issues during use. For Deodorant Body Spray aerosols, these instabilities can lead to the generation of multiple liquid phases and unacceptable can pressures which exceed the current can capability. The issues will also be critical for non-aerosol product

forms, where there are no propellants to replace. Many non-aerosol products still require significant levels of alcohol to provide the olfactory and drying characteristics desired by consumers.

Sunset of 2% Fragrance Exemption by 2027

We respectfully request that CARB staff withdraw the proposal to "sunset" the 2% fragrance exemption for Article 2 products only in 2027. Fragrance is a critical component of many consumer products. As noted previously, all fragrance oils contain volatile compounds, which are necessary to diffuse the fragrance, because fragrance must evaporate to create a scent that the product user can perceive.

CARB's proposal to eliminate the 2 percent exemption by January 1, 2027 may have unintended consequences. Furthermore, the current regulations impose a meaningful constraint on how fragrance is formulated through the combined vapor pressure requirement (i.e., 2 mm of Hg at 20°C). If CARB eliminates the 2% exemption, a manufacturer, thereby no longer subject to the combined vapor pressure constraint, could substitute higher vapor pressure molecules that have significantly greater impacts on air quality in order to achieve the intended scent while still reducing overall VOC content.

Alternative Propellants: HFO 1234ze

When PCPC met with CARB staff on November 21, 2019, there was some discussion around the potential viability of HFO 1234ze as an alternative propellant. As you know, HFO 1234ze is a single-source propellant that has certain desirable characteristics as well as certain drawbacks.

However, its use presents several formulation challenges for manufacturers, specifically with regard to product compatibility and performance. In certain aerosol products, HFO 1234ze can react with polymers, neutralizers and fragrances, any one of which could lead to can liner degradation, an increase in corrosion potential, a decrease in the pH of formulations, and an increase the fluoride concentration. Nevertheless, manufacturers continue to conduct safety and stability testing for formulations using this ingredient to see if it might be more compatible with certain aerosol products. Investigation of this compound across the breadth of formulations in the aerosol industry is ongoing and will allow conversion to such new compounds as data are generated. This will likely be on a product by product basis managed by formulators and marketers.

In addition, since HFO 1234ze is currently the property of only one producer, with certain levels of patent protection, it is not in the best interests of the State to force companies to use it. Companies may not be allowed to legally incorporate it into their products, thus minimizing or eliminating competition in entire categories.

"Commercially and Technologically Feasible"

The draft proposed rulemaking presents a number of formulation challenges across multiple cosmetic categories for our industry, and meeting the 2023 limits as currently proposed will be difficult, much less the 2027 limits. Regardless, we respectfully request that CARB staff conduct a technology assessment in 2027 to determine whether the second round of VOC limits comply with the statutory requirement that the regulation must be "commercially and technologically feasible." As CARB makes this assessment, it should change the proposed effective date from 2027 to 2030.

Maximum Incremental Reactivity (MIR)

MIR values and targets are currently used by CARB in Article 3 of the Regulation for Aerosol Coating Products.

Using MIR for products regulated under Article 2 could provide increased flexibility to product formulators to develop new formulations to attain known reduction of global warming potential in consumer products, while minimizing increases in the use of greenhouse gases, such as HFC-152A. In particular, products which use significant levels of ethanol in the formulation and do not depend entirely on the benefits of ethanol for the acceptability of the product could theoretically be able to see significant reductions in ozone forming potential be replacing some of the ethanol with lower MIR ingredients.

The use of MIR instead of mass-based VOC limits for specific product categories may have promise for some categories. We strongly urge CARB to consider an MIR-based approach as an alternative to the proposed VOC reduction targets, which satisfies the needs of both industry and the state. That is, CARB should offer the option to companies whether to use MIR or mass-based VOC limits for its product categories.

In an effort to facilitate this possible alternative approach, PCPC is taking steps to develop acceptable analytical test methods to assist CARB is assessing product compliance. We would be happy to discuss our efforts with you.

Reformulation Timeline:

We believe it is also important for CARB to be aware of the time it takes to reformulate a product. To assist in this, we are providing a useful link to an "infographic" of the reformulation timeline for cosmetic products: https://cosmeticsinfo.org/product-reformulation. Typical product reformulations take anywhere between 30 and 54 months. As many of the categories being assessed require massive technological innovation to meet the proposed limits, reformulation may take even longer.

As PCPC member companies work to meet CARB's proposed compliance deadline, there is a strong possibility that product choice and categories may be temporarily unavailable for California residents as the R&D and safety testing process is conducted.

CONCLUSION

While PCPC largely views the proposal as a positive step toward improving air quality, there remain several difficult provisions in the revised proposed regulation – particularly with regard to the technical feasibility of the proposed VOC limits for personal care product categories – which we are committed to resolving with CARB staff.

To that end, PCPC urges you to consider our comments to avoid unintended consequences, creating barriers to innovation, and detrimentally impacting the California and U.S. economy, without substantially advancing protection of public health and the environment.

Sincerely,

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Personal Care Products Council

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