



## PROCEDURE FOR THE MANAGEMENT OF FUEL ANALYSIS DATA

SOP MV-FUELS-135  
Version 3.1  
Effective Date: December 1, 2019

Fuels Analysis and Methods Evaluation Section  
Chemical Analysis and Emissions Research Branch  
Mobile Source Laboratory Division

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## 1.0 Introduction

- 1.1 The Fuel Analysis and Method Evaluation Section (FAMES) of the Emissions Compliance, Automotive Regulations & Science (ECARS) Division performs various analyses on gasoline and diesel fuels. This document describes the generation and storage of the analytical data. It also describes the review and approval process for the release of the data. All analyses are done in support of programs for client divisions and agencies as needed.
- 1.2 Each analysis generates hard copies and/or electronic files. The data are then converted to the appropriate reporting formats and are subsequently stored. For clients other than Enforcement Division (ED), a data coordinator compiles the results from individual analyses prior to management's approval. The section manager or acting manager reviews and approves the release of the data.
- 1.3 Data generated for ED is submitted directly by the individual analysts to the inspection coordinator.

## 2.0 Sample analyses

### 2.1 Gasoline Samples

- 2.1.1 Gasoline samples are received from the Emissions Compliance, ECARS, Mobile Source Control Division (MSCD), ED, or other clients. The detailed sample login protocol is described in SOP MV-FUEL-122.
- 2.1.2 Below is a list of gasoline analyses performed by FAMES:
1. RVP (SOP MV-FUEL-125)
  2. Distillation (SOP MV-FUEL-128)
  3. Density (SOP MV-FUEL-126)
  4. Total Aromatics (SOP MV-FUEL-121)
  5. Oxygenates (SOP MV-FUEL-115)
  6. Olefins (SOP MV-FUEL-131 and 134)
  7. Sulfur (SOP MV-FUEL-123)
  8. Screening (SOP MV-FUEL-133)
  9. Carbon/Hydrogen/Oxygen fraction (SOP MV-FUEL-131)

## 2.2 Diesel Samples

2.2.1 Diesel samples are received from ECARS, MSCD, ED, or other sources. The detailed sample login protocol is described in SOP MV-FUEL-122.

2.2.2 Below is a list of diesel analyses performed by FAMES:

1. Diesel Aromatics (SOP MV-FUEL-117)
2. Sulfur (SOP MV-FUEL-123)
3. Red Dye in Diesel (SOP MV-FUEL-154)
4. Screening (SOP MV-FUEL-133)
5. Nitrogen (SOP MV-FUEL-143)
6. Diesel Aromatics and Biodiesel Content (SOP MV-FUEL-160)

## 2.3 Marine Gas Oil / Marine Diesel Oil Samples (MGO/MDO)

2.3.1 MGO/MDO samples are received from ED, or other sources. The detailed sample login protocol is described in SOP MV-FUEL-122. They are analyzed for sulfur by SOP MV-FUEL-150.

## 3.0 General Protocol for Managing and Releasing Data

3.1 Each analysis generates hard copies and/or electronic files. The data are converted to the appropriate reporting format and stored. The procedure for releasing data is different depending on the source of the samples.

### 3.2 Data from in-house samples

3.2.1 After the data have been collected, the analyst reviews the results for errors. If necessary, the data are corrected. Then the analyst tabulates the results on a spreadsheet.

3.2.2 The tabulated results are given to the Data Coordinator. The Coordinator reviews and compiles all results for the sample(s). Then the results are submitted to the section manager for approval and subsequently released.

### 3.3 Data from Enforcement Division samples.

3.3.1 After the data has been collected, the analyst tabulates the results on a spreadsheet.

3.3.2 The data are then reviewed by the analyst, making certain that all QC criteria are met, and reported directly to the Enforcement Division

inspection coordinator.

#### **4.0 General Data Storage**

4.1 Storage of data can vary depending on the instrument. Certain analyses can generate a hard copy only and others can store data in electronic format. Storage of data generally falls within two categories, hard copy storage and electronic format storage.

4.2 Storage of hard copy data

4.2.1 Software generated hard copies of data are stored in Manila folders labeled with the name of the analysis and the date of the analysis.

4.2.2 The files are then stored in archive boxes kept in the laboratory for at least two years. The files are then sent to archive in Sacramento where they are stored for at least ten years.

4.2.3 Hard copy is the primary form in which analytical results are archived.

4.3 Storage of electronic data

4.3.1 Software-generated data are stored in files on the hard drive of the instrument PC. The files are periodically copied onto ECARS's file server for backup. The data files on the server are backed up onto compact disks annually and deleted from the server. These compact disks are stored in the office of the data coordinator.

4.3.2 Data files are generally named by sample name and analysis date for easy reference.

#### **5.0 Specific Data Collection and Management for Individual Analyses**

5.1 Data generated by Reid Vapor Pressure Analysis

5.1.1 This section applies to the Determination of Reid Vapor Pressure Equivalent of Gasoline [SOP MV-FUEL-125].

5.1.2 Due to the limited memory capabilities of the Grabner minivaps, the data can only be stored temporarily on the instrument. The results are printed out or exported to Excel spreadsheets, depending on the instrument model, after the analysis is completed.

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- 5.1.3 The hard copies or Excel spreadsheets are submitted to the appropriate coordinator.
- 5.2 Data generated by automated distillation
- 5.2.1 This section applies to the Determination of Distillation Points of Liquid Fuels by Automated Distillation [SOP MV-FUEL-128]
- 5.2.2 Data is generated by automated distillation software on a connected computer or built directly into the instrument.
- 5.2.3 Data generated by this instrument are stored in a single database file. This file is stored on the hard drive of the data collection PC, or within the instrument's hardware.
- 5.2.4 Hard copies of the results are printed out by the analyst.
- 5.2.5 The analyst evaluates the results for errors.
- 5.2.6 Once evaluated, the results are tabulated in a spreadsheet and submitted to the Data Coordinator.
- 5.3 Data generated by the digital density meter
- 5.3.1 This section applies to the Determination of Density of Liquid Fuels [SOP MV-FUEL-126].
- 5.3.2 Data results are displayed by a digital readout. The results are written in the instrument notebook.
- 5.3.3 There is no electronic format storage for this instrument. Hard copies are unavailable except in the form of a notebook. All results are hand written into the density meter notebook.
- 5.4 Data generated by chromatography methods
- 5.4.1 This section applies to the following methods:
- Determination of Benzene and Total Aromatics by Gas Chromatography (GC) [SOP MV-FUEL-121]
  - Determination of Ethers and Alcohol in Gasoline by Gas Chromatography (GC) [SOP MV-FUEL-115]

- Determination of Olefins in Gasoline by Reformulyzer [SOP MV-FUEL-131]
- Determination of Olefins in Gasoline by Supercritical Fluid Chromatography and Flame Ionization Detector [SOP MV-FUEL-134]
- Procedure for the Analysis of Polynuclear Aromatic Hydrocarbons and Total Aromatic Hydrocarbon in Diesel Fuels by Super Critical Fluid Chromatography and Flame Ionization Detector. [SOP MV-FUEL-117]

5.4.2 Data files are generated by the instrument's control software.

5.4.3 Filenames are generated by the software and are derived from the sample names. These files are stored on the hard drive of the data collection PC.

5.4.4 Hard copies of the results are printed out by the analyst.

5.4.5 The analyst evaluates the printed results and notes any corrections on the hard copy.

5.4.6 Once the corrections are made, the results are tabulated in a spreadsheet and submitted to the appropriate Coordinator.

5.4.7 The hard copies are kept in a folder labeled with the name of the analysis and the dates on which the samples were run. The folders are filed in chronological order, with one folder typically being used for each quarter. Data in electronic format are stored on the hard drive of the instrument PC.

5.5 Data generated by UV Fluorescence

5.5.1 This section applies to SOP MV-FUEL-123 and MV-FUEL-143.

5.5.2 Data are generated by the instrument software.

5.5.3 The data files are named according to the date and sample ID. These files are stored on the hard drive of the instrument PC.

5.5.4 Hard copies of the result tables are printed out by the analyst.

5.5.5 The analyst evaluates the results and applies a density correction. Then

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the raw data, densities, and corrected concentrations are entered into a notebook. The results are tabulated on a spreadsheet.

5.5.6 The hard copies are kept in a folder labeled with the name of the analysis and the dates on which the sample was run. The folders are filed in chronological order, with one folder typically being used for each quarter. Data in electronic format are stored on the hard drive of the instrument PC.

### 5.6 Data generated by X-ray Spectrometry

5.6.1 This section applies to SOP MV-FUEL-150.

5.6.2 Data is generated by the instrument software.

5.6.3 The results are stored on the instrument PC and a hard copy is printed.

5.6.4 Then the results are manually entered into a spreadsheet and submitted to the Data Coordinator.

5.6.4 The hard copies are filed by date.

### 5.7 Data generated by UV/VIS Spectrometry

5.7.1 This section applies to SOP MV-FUEL-154.

5.7.2 The instrument measures absorbance at a single wavelength. The red dye concentration is reported by the instrument.

5.7.3 The results are tabulated into a spreadsheet and submitted to the Data Coordinator.

## 6.0 Revision History

6.1 Version No. 1.0 Effective Date: May 2000 Approval Date: May 2000

6.2 Version No. 2.0 Effective Date: Sept 2002 Approval Date: Sept 2002

6.3 Revision No. 2.1 Effective Date: 12/1/2002 Approval Date: 12/1/2002

6.4 Revision No. 2.2 Effective Date: 12/1/ 2014 Approval Date: 12/1/ 2014

6.5 Version 3.0 Effective Date: May 1, 2017

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### Significant changes:

Uniform format adapted, references to method SOP MV-FUEL-153  
Carbon/Hydrogen removed since the method is no longer in use by FAMES.  
References to mandatory storing of data on ECARS servers and CDs removed  
SOP MV-FUEL-154 and MV-FUEL-160 added  
Instrument-specific details removed from RVP and distillation analyses

6.6 Version 3.1      Effective Date: December 1, 2019

SOP format updated for ADA compliance