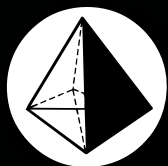


Petroleum Standards



AccuStandard[®]

PETROLEUM CRMs

AccuStandard's product portfolio for petroleum Certified Reference Materials (CRMs) offers high quality and cost effective standards for different petroleum testing applications, including: physical property testing, sulfur content in different petroleum matrices, oxygenates in gasoline, biofuel standards plus many other ASTM, EN and IP test methods.

These standards are made in accordance with our ISO17034 quality system which means they are subject to rigorous quality evaluation to provide reliability, quality compliance and accurate test results.

AccuStandard has been a long serving member of one of ASTM's largest committees D02, on Petroleum Products, Liquid Fuels, and Lubricants, and D16 on Aromatic, Industrial, Specialty and Related Chemicals. Serving on different technical subcommittees and working with fellow committee members has given us the opportunity to formulate products that meet the requirements of many of these test methods.

TIER 3 CRMs

The USEPA has developed a Tier 3 Standard as part of their effort to reduce vehicles emissions and improve air quality. This guideline requires federal gasoline to have no more than 10 ppm sulfur content down from 30 ppm. EPA has also required the use of specific ASTM methods to meet the Tier 3 testing and certification guidelines.

AccuStandard offers a wide selection of CRMs that are compliant with ASTM test methods for these required properties.

This includes testing for:

- Sulfur content
- Benzene and Aromatic content
- Olefins
- Oxygenates

ASTM TIER 3 Test Methods include:

- D86
- D1319
- D2622
- D3606
- D4815
- D5453
- D5769
- D5599
- D7039

CUSTOM FORMULATIONS

Custom Standards offer an efficient and economical option when our listed catalog products do not match your exact testing requirements. With decades of experience in manufacturing CRMs, AccuStandard can formulate quality custom standards that are uniquely made to meet your specific specifications. Our Custom CRMs follow our ISO17034 quality guidelines offering convenience but most importantly reliability and confidence. Our commitment to quality goes above and beyond by offering shelf life extension tests to custom CRMs included in our custom standard service.

Why buy AccuStandard's Custom Standards?

- Fast and knowledgeable quotation service
- Experienced Technical support to answer your questions
- Formulation is carefully evaluated for stability and compatibility
- Balances used are verified daily against NIST traceable weights
- Certificate of Analysis (COA) provided showing analytes certified value

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100 + ASTM Methods

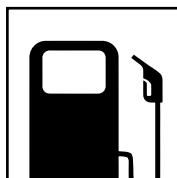
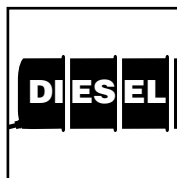
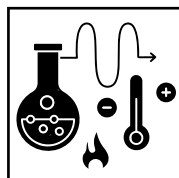
ISO 17034 • 17025 • 9001

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<https://www.accustandard.com/petrochemical-standards>

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TIER 3 Methods (Green Bold)



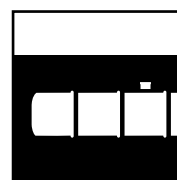
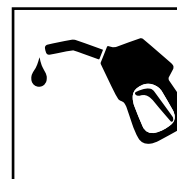
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INSTRUMENT ABBREVIATIONS

Gas chromatography (GC)	Energy Dispersive X-Ray Fluorescence (ED-XRF)
Mass spectrometry (MS)	Supercritical Fluid Chromatography (SFC)
Gas Chromatography-Mass Spectrometry (GC-MS)	Atomic Absorption (AA)
Gas Chromatography - Flame Ionization Detection (GC-FID)	Atomic Absorption Spectroscopy (AAS)
Gas Chromatography - Oxygenate Flame Ionization Detector (GC-OFID)	Inductively Coupled Plasma (ICP)
Gas chromatography - Vacuum Ultraviolet Spectroscopy (GC-VUV)	Inductively Coupled Plasma - Mass Spectrometry (ICP-MS)
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Custom Formulations
Available upon request
Please contact us

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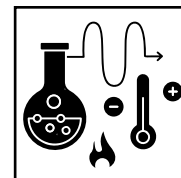
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Physical Property

ASTM Methods

AccuStandard is ISO 17034 scope includes Physical Standard methods for Flash Point, Distillation, Cloud Point, Freeze Point, Viscosity, and Water Content in petroleum products by Karl Fischer Titration. As a Reference Material Producer we follow strict guidelines for producing, certifying, labeling, and reporting uncertainty for these standards. Requirements include verifying stability and homogeneity, which goes above and beyond our ISO/IEC 17025 and ISO 17034 requirements.



ISO 17034 • 17025 • 9001

ASTM D56, D92, D93

Flash Point

Flash Point is the lowest temperature at which a heated liquid will form sufficient vapor to ignite when exposed to a flame source. For heavy oils or light hydrocarbons, we offer multiple flash point CRMs for your daily and routine checks that are suitable for ASTM D56, D92 and D93. Flash point is important for the determination of different fuel properties such as density, viscosity, specific heat and ignition point.

ASTM No.	Nominal Flash Point	Cat. No.	Unit	ASTM No.	Nominal Flash Point	Cat. No.	Unit
TCC D56	67 °C	ASTM-P-133-04	250 mL	PMCC D93	60 °C	ASTM-P-132-01	250 mL
COC D92	138 °C	ASTM-P-133-03	250 mL	PMCC D93	93 °C	ASTM-P-132-02	250 mL
COC D92	200 °C	ASTM-P-132-03	250 mL	PMCC D93	65 °C	ASTM-P-133-01	250 mL
COC D92	230 °C	ASTM-P-132-04	250 mL	PMCC D93	134 °C	ASTM-P-133-02	250 mL

ASTM D86

Distillation

TIER 3 STANDARDS

The automatic distillation apparatus duplicates the distillation conditions of the manual method. The increased reliance on the detectors requires an independent standard to verify that the apparatus is performing correctly. This synthetic blend of hydrocarbons boils in the temperature range specified in ASTM D86 distillation Groups 1 and 2. The fuel oil meets the Group 4 criteria.

Group 1 and 2 standards cover the boiling range from 129-368°F (54-187°C). Group 4 standard covers the range from 410-670°F (210-355°C).

Group	Description	Cat. No. ▲	Unit	Group	Description	Cat. No. ▲	Unit
1, 2	Synthetic Distillation Standard	ASTM-P-126-01	500 mL	4	Distillation Standard	ASTM-P-127-01	250 mL
						ASTM-P-127-02	500 mL

ASTM D445

Kinematic Viscosity Calibration

Kinematic Viscosity is the measurement of a liquid flow time using a calibrated viscometer tube in a controlled temperature bath. The Kinematic viscosity of petroleum products is important to determine the quality of the product, the applicability and the suitable storage conditions. AccuStandard is viscosity CRMs are made in accordance with ASTM Test Method D445 and cover a broad range of Viscosity values.

Viscosity @ 40°C	Cat. No.	Unit	Viscosity @ 40°C	Cat. No.	Unit
4 cSt	ASTM-P-128-01	500 mL	180 Cst	ASTM-P-128-05	500 mL
7 cSt	ASTM-P-128-02	500 mL	400 Cst	ASTM-P-128-07	500 mL
19 cSt	ASTM-P-128-03	500 mL	520 Cst	ASTM-P-128-06	500 mL
61 cSt	ASTM-P-128-04	500 mL			

ASTM D1015, D2386, D5972, D7153

Freezing Points for Aviation Fuel

Aviation fuel freezing point is the lowest temperature at which fuel remains free of solid hydrocarbon crystals.

Nominal Freezing Point	Cat. No. ▲	Unit
- 50 °C	ASTM-P-129-01	250 mL
- 45 °C	ASTM-P-129-02	250 mL



Physical Standards
continued on next page.

▲ Hazardous fee required for air shipments

Physical Property ASTM Methods

ASTM D1744, E1064, D4377

Water in Liquid Petroleum Products by Karl Fischer D4928, D6304

The Karl Fischer Coulometric titration is used to determine water content in Petroleum, Pharmaceutical as well as Food products. ASTM D4377 Karl Fischer CRMs are available as low as 60 PPM with versatile fill sizes that meet all your lab needs.

Water Content	Cat. No.	Unit	Water Content	Cat. No.	Unit
60 µg/g in Anisole	KF-0.6X-5ML-VAP	10 x 5 mL	5000 µg/g in Anisole : Isopropanol	KF-50X-2ML-VAP	10 x 2 mL
100 µg/g in Anisole	KF-1X-2ML-VAP	10 x 2 mL		KF-50X-5ML-VAP	10 x 5 mL
	KF-1X-5ML-VAP	10 x 5 mL		KF-50X-20ML-PAK	5 x 20 mL
	KF-1X-20ML-PAK	5 x 20 mL			
1000 µg/g in Anisole	KF-10X-2ML-VAP	10 x 2 mL			
	KF-10X-5ML-VAP	10 x 5 mL			
	KF-10X-20ML-PAK	5 x 20 mL			

Value Added Pak (VAP)
Provide multiple single units packaged together for consistency and cost savings.

ASTM D2500, D5771, D5772, D5773

Cloud Point Calibration

Cloud Point is the lowest temperature when a petroleum product becomes cloudy and hydrocarbon crystals start forming. Cloud Point is an important parameter to measure in order to determine quality and performance of petroleum products. Cloud Point CRMs cover a range from -20 °C up to +5 °C. They are available for immediate dispatch to meet your application needs. ▲

Cloud Point, (Approx. Value)	Cat. No. ▲	Unit	Cloud Point, (Approx. Value)	Cat. No. ▲	Unit
+ 5 °C	ASTM-P-131-01	250 mL	- 15 °C	ASTM-P-131-04	250 mL
- 2 °C	ASTM-P-131-02	250 mL	- 20 °C	ASTM-P-131-05	250 mL
- 10 °C	ASTM-P-131-03	250 mL			

ASTM D97, D5950

Pour Point Calibration

The Pour Point of a liquid is defined as the lowest temperature at which a petroleum product can be poured under certain testing criteria. Pour Point is an important characteristic to measure for Refineries and Petroleum Testing Labs to ensure a fuel meets the desired specifications.

Pour Point, (Approx. Value)	Cat. No. ▲	Unit	Pour Point, (Approx. Value)	Cat. No. ▲	Unit
- 50 °C	ASTM-P-135-01	250 mL	- 15 °C	ASTM-P-135-04	250 mL
- 25 °C	ASTM-P-135-02	250 mL	- 40 °C	ASTM-P-135-05	250 mL
- 5 °C	ASTM-P-135-03	250 mL			

ASTM D611

Aniline Point (Not offered as CRMs under our 17034 and 170205 scope)

Method 611(A)

Nominal Aniline Point	Cat. No.	Unit
0 °C	D-611-01	20 mL
30 °C	D-611-02	20 mL
55 °C	D-611-03	20 mL
68 °C	D-611-04	20 mL
94 °C	D-611-05	20 mL

Method 611(E)

Nominal Aniline Point	Cat. No.	Unit
43 °C	D-611E-01	20 mL
62 °C	D-611E-02	20 mL
77 °C	D-611E-03	20 mL
Pure Aniline	ASTM-P-134-PAK	5 x 20 mL

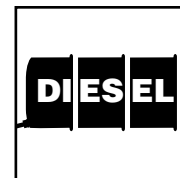
For routine purposes pure aniline is packaged in ampules under dry nitrogen. This minimizes the risk of oxidation.



▲ Hazardous fee required for air shipments

Sulfur ASTM Methods

These calibration standards are designed for the analysis of sulfur in a wide variety petroleum matrices. Sulfur standards are manufactured from the highest quality raw materials, including well characterized starting materials and the lowest sulfur matrices available. These standards are manufactured using balances that are calibrated by an outside ISO 17025 accredited laboratory and verified daily against reference mass standards directly traceable to NIST. The concentration of these working level Sulfur standards have established traceability links to NIST SRM's where available.



ASTM D2622, D3120, D3246, D4294, D5453, D6334, D6445

Sulfur Analysis

TIER 3 STANDARDS

Sulfur in Light Weight Mineral Oil (20 cSt)

Ready-to-Use

SWMO-LT-CAL-100ML-SET ▲ 19 x 100 mL

Concentration		Cat. No. 100 mL	Cat. No. 5 x 20 mL
µg/g	Wt.%		
Blank	0.000	SWMO-LT-BL-100ML	SWMO-LT-BL-20ML-PAK
100	0.010	SWMO-LT-1X-100ML	SWMO-LT-1X-20ML-PAK
200	0.020	SWMO-LT-2X-100ML	SWMO-LT-2X-20ML-PAK
300	0.030	SWMO-LT-3X-100ML	SWMO-LT-3X-20ML-PAK
400	0.040	SWMO-LT-4X-100ML	SWMO-LT-4X-20ML-PAK
500	0.050	SWMO-LT-5X-100ML	SWMO-LT-5X-20ML-PAK
750	0.075	SWMO-LT-7.5X-100ML	SWMO-LT-7.5X-20ML-PAK
1,000	0.10	SWMO-LT-10X-100ML	SWMO-LT-10X-20ML-PAK
1,500	0.15	SWMO-LT-15X-100ML	SWMO-LT-15X-20ML-PAK
3,000	0.30	SWMO-LT-30X-100ML	SWMO-LT-30X-20ML-PAK
5,000	0.50	SWMO-LT-50X-100ML	SWMO-LT-50X-20ML-PAK
7,000	0.70	SWMO-LT-70X-100ML	SWMO-LT-70X-20ML-PAK
10,000	1.00	SWMO-LT-100X-100ML	SWMO-LT-100X-20ML-PAK
15,000	1.50	SWMO-LT-150X-100ML	SWMO-LT-150X-20ML-PAK
20,000	2.00	SWMO-LT-200X-100ML	SWMO-LT-200X-20ML-PAK
30,000	3.00	SWMO-LT-300X-100ML	SWMO-LT-300X-20ML-PAK
40,000	4.00	SWMO-LT-400X-100ML	SWMO-LT-400X-20ML-PAK
50,000	5.00	SWMO-LT-500X-100ML	SWMO-LT-500X-20ML-PAK
60,000	6.00	SWMO-LT-600X-100ML	SWMO-LT-600X-20ML-PAK

Sulfur in #2 Diesel Fuel

Ready-to-Use

SETS SDF-CAL-100ML-SET ▲ SDF-CAL-20ML-SET
19 x 100 mL 19 x (5 x 20 mL)

Concentration		Cat. No. ▲ 100 mL	Cat. No. 5 x 20 mL
µg/g	Wt.%		
Blank	0.000	SDF-BL-100ML	SDF-BL-20ML-PAK
100	0.010	SDF-1X-100ML	SDF-1X-20ML-PAK
200	0.020	SDF-2X-100ML	SDF-2X-20ML-PAK
300	0.030	SDF-3X-100ML	SDF-3X-20ML-PAK
400	0.040	SDF-4X-100ML	SDF-4X-20ML-PAK
500	0.050	SDF-5X-100ML	SDF-5X-20ML-PAK
750	0.075	SDF-7.5X-100ML	SDF-7.5X-20ML-PAK
1,000	0.10	SDF-10X-100ML	SDF-10X-20ML-PAK
1,500	0.15	SDF-15X-100ML	SDF-15X-20ML-PAK
3,000	0.30	SDF-30X-100ML	SDF-30X-20ML-PAK
5,000	0.50	SDF-50X-100ML	SDF-50X-20ML-PAK
7,000	0.70	SDF-70X-100ML	SDF-70X-20ML-PAK
10,000	1.00	SDF-100X-100ML	SDF-100X-20ML-PAK
15,000	1.50	SDF-150X-100ML	SDF-150X-20ML-PAK
20,000	2.00	SDF-200X-100ML	SDF-200X-20ML-PAK
30,000	3.00	SDF-300X-100ML	SDF-300X-20ML-PAK
40,000	4.00	SDF-400X-100ML	SDF-400X-20ML-PAK
50,000	5.00	SDF-500X-100ML	SDF-500X-20ML-PAK
60,000	6.00	SDF-600X-100ML	SDF-600X-20ML-PAK

Sulfur in Heavy Weight Mineral Oil (75 cSt)

Ready-to-Use

SWMO-CAL-100ML-SET ▲ 19 x 100 mL

Concentration		Cat. No. 100 mL	Cat. No. 5 x 20 mL
µg/g	Wt.%		
Blank	0.000	SWMO-BL-100ML	SWMO-BL-20ML-PAK
100	0.010	SWMO-1X-100ML	SWMO-1X-20ML-PAK
200	0.020	SWMO-2X-100ML	SWMO-2X-20ML-PAK
300	0.030	SWMO-3X-100ML	SWMO-3X-20ML-PAK
400	0.040	SWMO-4X-100ML	SWMO-4X-20ML-PAK
500	0.050	SWMO-5X-100ML	SWMO-5X-20ML-PAK
750	0.075	SWMO-7.5X-100ML	SWMO-7.5X-20ML-PAK
1,000	0.10	SWMO-10X-100ML	SWMO-10X-20ML-PAK
1,500	0.15	SWMO-15X-100ML	SWMO-15X-20ML-PAK
3,000	0.30	SWMO-30X-100ML	SWMO-30X-20ML-PAK
5,000	0.50	SWMO-50X-100ML	SWMO-50X-20ML-PAK
7,000	0.70	SWMO-70X-100ML	SWMO-70X-20ML-PAK
10,000	1.00	SWMO-100X-100ML	SWMO-100X-20ML-PAK
15,000	1.50	SWMO-150X-100ML	SWMO-150X-20ML-PAK
20,000	2.00	SWMO-200X-100ML	SWMO-200X-20ML-PAK
30,000	3.00	SWMO-300X-100ML	SWMO-300X-20ML-PAK
40,000	4.00	SWMO-400X-100ML	SWMO-400X-20ML-PAK
50,000	5.00	SWMO-500X-100ML	SWMO-500X-20ML-PAK
60,000	6.00	SWMO-600X-100ML	SWMO-600X-20ML-PAK

Sulfur in Renewable Diesel Fuel #2

Ready-to-Use

SRD-CAL-SET ▲ 21 x 100 mL

µg/g	Cat. No. ▲	Unit
Blank	SRD-BL-100ML	100 mL
5	SRD-0.05X-100ML	100 mL
10	SRD-0.1X-100ML	100 mL
25	SRD-0.25X-100ML	100 mL
50	SRD-0.5X-100ML	100 mL
100	SRD-1X-100ML	100 mL
250	SRD-2.5X-100ML	100 mL
300	SRD-3X-100ML	100 mL
500	SRD-5X-100ML	100 mL
700	SRD-7X-100ML	100 mL
750	SRD-7.5X-100ML	100 mL
1,000	SRD-10X-100ML	100 mL
2,500	SRD-25X-100ML	100 mL
3,000	SRD-30X-100ML	100 mL
5,000	SRD-50X-100ML	100 mL
10,000	SRD-100X-100ML	100 mL
15,000	SRD-150X-100ML	100 mL
20,000	SRD-200X-100ML	100 mL
30,000	SRD-300X-100ML	100 mL
40,000	SRD-400X-100ML	100 mL
50,000	SRD-500X-100ML	100 mL

Sulfur in Light Distillate Kerosene

Ready-to-Use

SK-CAL-100ML-SET ▲ 12 x 100 mL

Concentration		Cat. No. ▲ 100 mL	Cat. No. 5 x 20 mL
µg/g	Wt.%		
Blank	0.000	SK-BL-100ML	SK-BL-20ML-PAK
100	0.010	SK-1X-100ML	SK-1X-20ML-PAK
300	0.030	SK-3X-100ML	SK-3X-20ML-PAK
500	0.050	SK-5X-100ML	SK-5X-20ML-PAK
750	0.075	SK-7.5X-100ML	SK-7.5X-20ML-PAK
1,000	0.10	SK-10X-100ML	SK-10X-20ML-PAK
2,000	0.20	SK-20X-100ML	SK-20X-20ML-PAK
3,000	0.30	SK-30X-100ML	SK-30X-20ML-PAK
4,000	0.40	SK-40X-100ML	SK-40X-20ML-PAK
5,000	0.50	SK-50X-100ML	SK-50X-20ML-PAK
10,000	1.00	SK-100X-100ML	SK-100X-20ML-PAK
20,000	2.00	SK-200X-100ML	SK-200X-20ML-PAK

Technical Note

Sulfur is introduced using di-n-butyl sulfide.

▲ Hazardous fee required for air shipments.

Sulfur in Heavy Distillate Kerosene
continued on next page.

Sulfur ASTM Methods

ASTM D2622, D3120, D3246, D4294, D5453, D6334, D6445

Sulfur Analysis (continued)

TIER 3 STANDARDS

Sulfur in Heavy Distillate Kerosene

SK-HD-CAL-100ML-SET ▲

21 x 100 mL

Concentration			Concentration		
µg/g	Wt.%	Cat. No. ▲	µg/g	Wt.%	Cat. No. ▲
Blank	0.000	SK-HD-BL-100ML	3,000	0.30	SK-HD-30X-100ML
100	0.010	SK-HD-1X-100ML	4,000	0.40	SK-HD-40X-100ML
200	0.020	SK-HD-2X-100ML	5,000	0.50	SK-HD-50X-100ML
300	0.030	SK-HD-3X-100ML	7,000	0.70	SK-HD-70X-100ML
400	0.040	SK-HD-4X-100ML	10,000	1.00	SK-HD-100X-100ML
500	0.050	SK-HD-5X-100ML	15,000	1.50	SK-HD-150X-100ML
750	0.075	SK-HD-7.5X-100ML	20,000	2.00	SK-HD-200X-100ML
1,000	0.10	SK-HD-10X-100ML	30,000	3.00	SK-HD-300X-100ML
1,500	0.15	SK-HD-15X-100ML	40,000	4.00	SK-HD-400X-100ML
2,000	0.20	SK-HD-20X-100ML	50,000	5.00	SK-HD-500X-100ML
			60,000	6.00	SK-HD-600X-100ML

Technical Note

Di-*n*-butyl sulfide starting material is used with a low sulfur Isooctane matrix for RFG/gasoline sulfur standards.

ASTM D2622, D6334, D6445

Sulfur Calibration

TIER 3 STANDARDS

Sulfur Calibration Standards used on XRF Energy Dispersive or Wavelength Instruments

D-2622-LL-CAL-100ML-SET ▲

10 x 100 mL

Individual bottles in Isooctane:Toluene (75:25)

Low Level

Sulfur Conc.	Sulfur Wt.%	Cat. No. ▲	Unit
Blank	0.0	D-2622-LL-BL-100ML	100 mL
5 µg/g	0.0005	D-2622-LL-5X-100ML	100 mL
10 µg/g	0.0010	D-2622-LL-10X-100ML	100 mL
30 µg/g	0.0030	D-2622-LL-30X-100ML	100 mL
50 µg/g	0.0050	D-2622-LL-50X-100ML	100 mL
75 µg/g	0.0075	D-2622-LL-75X-100ML	100 mL
100 µg/g	0.010	D-2622-LL-100X-100ML	100 mL
300 µg/g	0.030	D-2622-LL-300X-100ML	100 mL
500 µg/g	0.050	D-2622-LL-500X-100ML	100 mL
1000 µg/g	0.100	D-2622-LL-1000X-100ML	100 mL

Mid Level Additions

Sulfur Conc.	Sulfur Wt.%	Cat. No. ▲	Unit
200 µg/g	0.020	D-2622-LL-200X-100ML	100 mL
400 µg/g	0.040	D-2622-LL-400X-100ML	100 mL
600 µg/g	0.060	D-2622-LL-600X-100ML	100 mL
700 µg/g	0.070	D-2622-LL-700X-100ML	100 mL
800 µg/g	0.080	D-2622-LL-800X-100ML	100 mL
900 µg/g	0.090	D-2622-LL-900X-100ML	100 mL
1100 µg/g	0.110	D-2622-LL-1100X-100ML	100 mL
1200 µg/g	0.120	D-2622-LL-1200X-100ML	100 mL

Technical Note

Thiophene and 2-Methylthiophene are used as starting material.

ASTM D2622, D4294

Sulfur Calibration

TIER 3 STANDARDS

Sulfur Calibration Standards for Gasoline and Reformulated Gasoline Analysis

STP-CAL-100ML-SET ▲

13 x 100 mL

Individual bottles in Isooctane

Sulfur Conc.	Sulfur Wt.%	Cat. No. ▲	Unit	Sulfur Conc.	Sulfur Wt.%	Cat. No. ▲	Unit
Blank	0.0	STP-BL-100ML	100 mL	300 µg/g	0.030	STP-30X-100ML	100 mL
10 µg/g	0.001	STP-1X-100ML	100 mL	400 µg/g	0.040	STP-40X-100ML	100 mL
20 µg/g	0.002	STP-2X-100ML	100 mL	600 µg/g	0.060	STP-60X-100ML	100 mL
30 µg/g	0.003	STP-3X-100ML	100 mL	1000 µg/g	0.10	STP-100X-100ML	100 mL
50 µg/g	0.005	STP-5X-100ML	100 mL	2000 µg/g	0.20	STP-200X-100ML	100 mL
100 µg/g	0.010	STP-10X-100ML	100 mL	3000 µg/g	0.30	STP-300X-100ML	100 mL
200 µg/g	0.020	STP-20X-100ML	100 mL				

Technical Note

Di-*n*-butyl sulfide starting material is used with a low sulfur Isooctane matrix for RFG/gasoline sulfur standards.

ASTM D5453

Total Sulfur in Light Hydrocarbons, Motor Fuels & Oils by Ultraviolet Fluorescence

TIER 3 STANDARDS

Low Level Sulfur Set

D-5453-LL-SET

5 x 2 mL

At stated in Isooctane

Sulfur Blank	2 mL
Sulfur @ 0.5 ng/µL	2 mL
Sulfur @ 2.5 ng/µL	2 mL
Sulfur @ 5.0 ng/µL	2 mL
Sulfur @ 10.0 ng/µL	2 mL

Mid Level Sulfur Set

D-5453-ML-SET

6 x 2 mL

At stated in Isooctane

Sulfur Blank	2 mL
Sulfur @ 5.0 ng/µL	2 mL
Sulfur @ 25 ng/µL	2 mL
Sulfur @ 50 ng/µL	2 mL
Sulfur @ 100 ng/µL	2 mL
Sulfur @ 200 ng/µL	2 mL

High Level Sulfur Set

D-5453-HL-SET

5 x 2 mL

At stated in Isooctane

Sulfur Blank	2 mL
Sulfur @ 100 ng/µL	2 mL
Sulfur @ 250 ng/µL	2 mL
Sulfur @ 500 ng/µL	2 mL
Sulfur @ 1000 ng/µL	2 mL

▲ Hazardous fee required for air shipments.

As the matrix may contain some native sulfur, we encourage purchasing sulfur blanks for calibration.

Sulfur

ASTM Methods

ASTM D6428

Sulfur by Combustion and Electrochemical Detection

D-6428-R1-100ML-SET

7 x 100 mL

D-6428-R2-100ML-SET

6 x 100 mL

D-6428-R1-SET

7 x 1 mL

D-6428-R2-SET

6 x 1 mL

Each in Isooctane

Each in Isooctane

	D-6428-R1-100ML-SET	D-6428-R1-SET
Sulfur Blank	D-6428-BL-100ML	D-6428-BL
Sulfur @ 0.1 µg/g	D-6428-0.1X-100ML	D-6428-0.1X
Sulfur @ 0.5 µg/g	D-6428-0.5X-100ML	D-6428-0.5X
Sulfur @ 1.0 µg/g	D-6428-1X-100ML	D-6428-1X
Sulfur @ 2.5 µg/g	D-6428-2.5X-100ML	D-6428-2.5X
Sulfur @ 5.0 µg/g	D-6428-5X-100ML	D-6428-5X
Sulfur @ 10 µg/g	D-6428-10X-100ML	D-6428-10X

	D-6428-R2-100ML-SET	D-6428-R2-SET
Sulfur Blank	D-6428-BL-100ML	D-6428-BL
Sulfur @ 10 µg/g	D-6428-10X-100ML	D-6428-10X
Sulfur @ 25 µg/g	D-6428-25X-100ML	D-6428-25X
Sulfur @ 50 µg/g	D-6428-50X-100ML	D-6428-50X
Sulfur @ 75 µg/g	D-6428-75X-100ML	D-6428-75X
Sulfur @ 100 µg/g	D-6428-100X-100ML	D-6428-100X

Technical Note

Standards are prepared by adding well characterized sulfur compounds gravimetrically to the matrix. Since the matrix may contain some native sulfur, a blank must be used for background correction and should be purchased with the standard.

Available only as a sets

ASTM D3120 & D3246

Sulfur Calibration

TIER 3 STANDARDS

Sulfur Calibration Set

D-3120-92-CAL-SET

8 x 1 mL

Available only as a set

Individual bottles in Isooctane

Sulfur Conc.	Sulfur Wt.%	Cat. No.	Unit	Sulfur Conc.	Sulfur Wt.%	Cat. No.	Unit
Blank	0.0	D-3120-92-BL	1 mL	30 µg/g	0.0030	D-3120-92-30X	1 mL
1 µg/g	0.0001	D-3120-92-1X	1 mL	50 µg/g	0.0050	D-3120-92-50X	1 mL
3 µg/g	0.0003	D-3120-92-3X	1 mL	75 µg/g	0.0075	D-3120-92-75X	1 mL
10 µg/g	0.0010	D-3120-92-10X	1 mL	100 µg/g	0.010	D-3120-92-100X	1 mL

ASTM D2622 & D4294

Sulfur Petroleum Products

Sulfur in Crude Oil Standards

SCO-CAL-100ML-SET ▲

8 x 100 mL

Individual bottles in Crude oil

µg/g	Wt.%	Cat. No. ▲	Unit
1,000	0.10	SCO-10X-100ML	100 mL
2,500	0.25	SCO-25X-100ML	100 mL
5,000	0.50	SCO-50X-100ML	100 mL
10,000	1.00	SCO-100X-100ML	100 mL
20,000	2.00	SCO-200X-100ML	100 mL
30,000	3.00	SCO-300X-100ML	100 mL
40,000	4.00	SCO-400X-100ML	100 mL
50,000	5.00	SCO-500X-100ML	100 mL

Sulfur in Residual Oil Standards

SRO-CAL-100ML-SET

7 x 100 mL

Individual bottles Residual oil

µg/g	Wt.%	Cat. No.	Unit
3,500	0.35	SRO-35X-100ML	100 mL
7,000	0.70	SRO-70X-100ML	100 mL
10,000	1.00	SRO-100X-100ML	100 mL
15,000	1.50	SRO-150X-100ML	100 mL
20,000	2.00	SRO-200X-100ML	100 mL
30,000	3.00	SRO-300X-100ML	100 mL
40,000	4.00	SRO-400X-100ML	100 mL

ASTM Methods

Sulfur in Aromatic Hydrocarbons

Total Sulfur in Aromatic Compounds by Hydrogenolysis & Rateometric Colorimetry

ASTM-P-0010-PAK

5 x 1 mL

1000 µg/mL in Toluene

Sulfur (as Thiophene)

Trace Quantities of Sulfur in Liquid Aromatic Hydrocarbons by Oxidative Microcoulometry

ASTM-P-0020-PAK

5 x 1 mL

1000 µg/mL in Xylenes

Sulfur (as Dibenzothiophene)

Low Level Sulfur Calibration Set

ASTM-SSTDA-B-SET

10 x 2 mL

At stated conc. in Isooctane

µg/g	Cat. No.	Unit	µg/g	Cat. No.	Unit
Blank	ASTM-SSTDA-BL	2 mL	Blank	ASTM-SSTDB-BL	2 mL
0.5	ASTM-SSTDA-01	2 mL	5.0	ASTM-SSTDB-04	2 mL
1.0	ASTM-SSTDA-02	2 mL	10.0	ASTM-SSTDB-05	2 mL
2.5	ASTM-SSTDA-03	2 mL	25.0	ASTM-SSTDB-06	2 mL
5.0	ASTM-SSTDA-04	2 mL	50.0	ASTM-SSTDB-07	2 mL

Available only as a set

ASTM D3120 & D3246

Trace Quantities of Sulfur in Light Liquid Petroleum Hydrocarbons by Oxidative Microcoulometry

Sulfur Calibration Set

D-3120-92-CAL-SET

8 x 1 mL

In Isooctane

Sulfur Conc.	Sulfur Wt.%	Cat. No.	Sulfur Conc.	Sulfur Wt.%	Cat. No.
Blank	—	D-3120-92-BL	30 µg/g	0.0030	D-3120-92-30X
1 µg/g	0.0001	D-3120-92-1X	50 µg/g	0.0050	D-3120-92-50X
3 µg/g	0.0003	D-3120-92-3X	75 µg/g	0.0075	D-3120-92-75X
10 µg/g	0.0010	D-3120-92-10X	100 µg/g	0.010	D-3120-92-100X

▲ Hazardous fee required for air shipments.

Technical Note

Prepared by adding well characterized sulfur compounds gravimetrically to the matrix. Since the matrix may contain some native sulfur, a blank must be used for background correction and is recommended that it be purchased with the standard.

ASTM Methods

ASTM D1319

Calibration Standards by Fluorescent Indicator Adsorption (FIA)

Olefin FIA Calibration Curve

FIA-CAL-SET

	7 x 1 mL						
	Level 1 Target	Level 2 Vol.%	Level 3 Vol.%	Level 4 Vol.%	Level 5 Vol.%	Level 6 Vol.%	Level 7 Vol.%
Total Olefins	2.0	4.0	5.0	6.0	8.0	10.0	12.0
Total Paraffins	57.0	55.0	52.0	51.0	45.0	45.0	40.0
Total Aromatics	23.0	24.0	25.0	26.0	29.0	28.0	30.0
Total Oxygenate	18.0	17.0	18.0	17.0	18.0	17.0	18.0

Level	Cat. No.	Unit
1	FIA-CAL-01	1 mL
2	FIA-CAL-02	1 mL
3	FIA-CAL-03	1 mL
4	FIA-CAL-04	1 mL
5	FIA-CAL-05	1 mL
6	FIA-CAL-06	1 mL
7	FIA-CAL-07	1 mL

FIA Olefin Standard

FIA-OLE	Unit
FIA-OLE-5ML	1 x 1 mL 1 x 5 mL
At stated Vol. %	3 comps.
1-Pentene	33.3
2,3-Dimethyl-2-butene	33.3
1-Heptene	33.3

FIA Paraffin Standard

FIA-PAR	Unit
FIA-PAR-5ML	1 x 1 mL 1 x 5 mL
At stated Vol. %	8 comps.
<i>n</i> -Pentane	8 2,3-Dimethylpentane 14
<i>n</i> -Hexane	9 Isooctane 19
Cyclohexane	15 <i>n</i> -Octane 14
<i>n</i> -Heptane	14 <i>n</i> -Decane 7

FIA Aromatic Standard

FIA-ARO	Unit
FIA-ARO-5ML	1 x 1 mL 1 x 5 mL
At stated Vol. %	10 comps.
Benzene	4 <i>m</i> -Xylene 16
Toluene	32 1,2,4-Trimethylbenzene 8
Ethylbenzene	8 1,3,5-Trimethylbenzene 8
<i>p</i> -Xylene	8 1,2,4,5-Tetramethylbenzene 4
<i>o</i> -Xylene	8 Naphthalene 4

Technical Note

These standards have been prepared for the determination of aromatics, olefins, oxygenates and saturates in petroleum fractions by Fluorescent Indicator Adsorption (FIA) IP designation 156/95.

The certificate for the FIA calibration curve lists both the volume percents for the hydrocarbon types and the individual volume percents for each analyte in the functional group.

The weight fraction for each hydrocarbon type and individual analyte is also listed on the certificate.

D1319 Meets EPA Guidelines for RFG Analysis

ASTM D3230

Determination of Salts in Crude Oil

Mixed Salt Solution

D-3230-89-1

100 mL

D-3230-89-5

500 mL

At stated conc. (µg/mL) in Alcohol Solution (1-butanol : MeOH) (ratio 63:37) 3 comps.

Calcium chloride	10	Sodium chloride	70
Magnesium chloride	20		

ASTM D3237

Lead in Gasoline by AA Spectroscopy

Lead Standard Calibration Curve

D-3237-CAL-SET

4 x 100 mL

Set includes the following Catalog Numbers:

Description	Cat. No.	Unit
Blank 1% Aliquot 336/MIBK	D-3237-01	100 mL
0.02 g Pb / gal (5.3 mg Pb/ L) in 1% Aliquot 336 / MIBK	D-3237-02	100 mL
0.05 g Pb / gal (13.2 mg Pb/ L) in 1% Aliquot 336 / MIBK	D-3237-03	100 mL
0.10 g Pb / gal (26.4 mg Pb/ L) in 1% Aliquot 336 / MIBK	D-3237-04	100 mL

Technical Note

D3237 Meets EPA guidelines for RFG Analysis.

ASTM D3524

Diesel Fuel Diluent in Used Diesel Engine Oils by GC

Calibration Curve

D-3524-CAL-5ML-SET

6 x 5 mL

D-3524-CAL-10ML-SET

6 x 10 mL

Analyte	Target	Std. 1	Std. 2	Std. 3	Std. 4	Std. 5	Std. 6
		Wt.%	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%
# 2 Diesel	10	7.5	5.0	2.5	1.0	0	
SAE 30W Motor oil	90	92.5	95	97.5	99	100	

Internal Standard

D-3524-IS-10ML

1 x 10 mL

D-3524-IS-10ML-PAK

SAVE 5 x 10 mL

At stated Wt. % in *n*-Heptane

2 comps.

<i>n</i> -Decane	1.0	<i>n</i> -Octadecane	0.2
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Column Resolution Mix

D-3524-CR

1 x 1 mL

D-3524-CR-PAK

SAVE 5 x 1 mL

1.0 each %v/v in *n*-Heptane

2 comps.

<i>n</i> -Hexadecane	<i>n</i> -Octadecane
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Mid Level Daily QC Solution

D-3524-QC-10ML

1 x 10 mL

At stated Wt. %

2 comps.

# 2 Diesel	5.0
SAE 30W Motor oil	95.0

ASTM Methods

ASTM D3606

Benzene and Toluene in Finished Motor & Aviation Gasoline by GC

TIER 3 STANDARDS

ASTM Method D3606 was developed to quantify benzene and toluene in finished motor and aviation spark ignition fuels. An additional updated standard is provided for the 7 level calibration set which includes ethanol at approximately 10% v/v for all 7 levels.

Aromatics Calibration Set without Internal Standards

D-3606-25ML-SET

7 x 25 mL

Analyte	Calibration Range	Std. 1 Target	Std. 1 Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %	Std. 6 Vol. %	Std. 7 Vol. %
Benzene	0.06 - 5.0	5.00		2.50	1.25	0.67	0.33	0.12	0.06
Toluene	0.5 - 20	20.00		15.00	10.00	5.00	2.50	1.00	0.50
Isooctane		75.00		82.50	88.75	94.33	97.17	98.88	99.44

These are target concentrations, actual analytical values will be reported on the COA.

Daily Gasoline Refinery Quality Control Standards

Calibration Set with Internal Standard: MEK

D-3606-IS-SET

7 x 1 mL

D-3606-IS-2ML-SET

7 x 2 mL

Analyte	Calibration Range	Std. 1 Target	Std. 1 Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %	Std. 6 Vol. %	Std. 7 Vol. %
Benzene	0.06 - 5.0	4.8		2.4	1.2	0.64	0.32	0.12	0.06
Toluene	0.5 - 20	19.2		14.4	9.6	4.80	2.40	0.96	0.48
Methyl ethyl ketone (ISTD)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Isooctane		72.0		79.2	85.2	90.56	93.28	94.92	95.46

With Internal Standard: MEK

D-3606-QC-IS-10ML

1 x 10 mL

D-3606-QC-IS-10ML-PAK

5 x 10 mL

Each at stated Vol. %

4 comps.

Benzene	0.64
Toluene	4.80
Methyl ethyl ketone (ISTD)	4.0
Isooctane	90.56
	100

Calibration Set with Internal Standard: sec-Butanol

D-3606-IS2-SET

7 x 1 mL

Analyte	Calibration Range	Std. 1 Target	Std. 1 Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %	Std. 6 Vol. %	Std. 7 Vol. %
Benzene	0.06 - 5.0	4.8		2.4	1.2	0.64	0.32	0.12	0.06
Toluene	0.5 - 20	19.2		14.4	9.6	4.80	2.40	0.96	0.48
sec-Butanol (ISTD)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Isooctane		72.0		79.2	85.2	90.56	93.28	94.92	95.46

With Internal Standard:

sec-Butanol

D-3606-QC-IS2-25ML

1 x 25 mL

D-3606-QC-IS2-25ML-PAK

5 x 25 mL

Each at stated Vol. %

4 comps.

Benzene	0.64
Toluene	4.80
sec-Butanol (Internal Std.)	4.0
Isooctane	90.56
	100

Calibration Set with Internal Standard: sec-Butanol

D-3606-IS2-R1-SET

7 x 1 mL

Analyte	Calibration Range	Std. 1 Target	Std. 1 Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %	Std. 6 Vol. %	Std. 7 Vol. %
Benzene	0.06 - 5.0	5		4.2	3.4	2.6	1.7	0.9	0.1
Toluene	0.5 - 20	20		17	14	11	8	5	2
Isooctane		75		78.8	82.6	86.4	90.3	94.1	97.9
sec-Butanol (ISTD)		4		4	4	4	4	4	4

Calibration Set with Internal Standard: sec-Butanol

D-3606-IS2-R2-SET

7 x 1 mL

Analyte	Calibration Range	Std. 1 Target	Std. 1 Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %	Std. 6 Vol. %	Std. 7 Vol. %
Benzene	0.06 - 5.0	4.8		2.4	1.2	0.64	0.32	0.12	0.06
Toluene	0.5 - 20	19.2		14.4	9.6	4.8	2.4	0.96	2.48
Ethanol		9.6		9.6	9.6	9.6	9.6	9.6	9.6
sec-Butanol (ISTD)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Isooctane		62.4		69.6	75.6	80.96	83.68	85.32	85.86

Without Internal Standard

D-3606-QC-25ML

1 x 25 mL

D-3606-QC-25ML-PAK

5 x 25 mL

Each at stated Vol. %

3 comps.

Benzene	0.67
Toluene	5.00
Isooctane	94.33
	100

Calibration Set with Internal Standard: MIBK

D-3606-IS3-SET

7 x 2 mL

Analyte	Calibration Range	Std. 1 Target	Std. 1 Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %	Std. 6 Vol. %	Std. 7 Vol. %
Benzene	0.06 - 5.0	5		2.5	1.3	0.67	0.33	0.12	0.06
Toluene	0.5 - 20	20		15.0	10.0	5.0	2.5	1.0	0.5
MIBK (ISTD)		4		4.0	4.0	4.0	4.0	4.0	4.0
Isooctane		71		75.8	84.7	90.33	93.17	94.88	95.44

ASTM Methods

ASTM D3798

Analysis of p-Xylene by GC

p-Xylene Impurity Standards

With Internal Standard

D-3798-IS
D-3798-IS-PAK
At stated Wt. %

1 x 1 mL
SAVE 5 x 1 mL
11 comps.

<i>n</i> -Pentane	0.15	<i>o</i> -Xylene	0.15
<i>n</i> -Octane	0.15	Cumene	0.15
Benzene	0.15	Propylbenzene	0.15
Toluene	0.15		
Ethylbenzene	0.15	Total Analytes	100
<i>p</i> -Xylene	98.65	plus <i>n</i> -Undecane* (ISTD)	0.500
<i>m</i> -Xylene	0.15		

Without Internal Standard

D-3798-10ML
D-3798-10ML-PAK
At stated Wt. %

1 x 10 mL
SAVE 5 x 10 mL
10 comps.

<i>n</i> -Pentane	0.15	<i>p</i> -Xylene	98.65
<i>n</i> -Octane	0.15	<i>m</i> -Xylene	0.15
Benzene	0.15	<i>o</i> -Xylene	0.15
Toluene	0.15	Cumene	0.15
Ethylbenzene	0.15	Propylbenzene	0.15

Technical Note

Other internal standards can be used in conjunction with the bulk packaged D-3798 (1 x 10 mL) to meet your specific application. To eliminate making standards, contact our Technical Service Department with your custom formulation for a quotation. See back of catalog for details.

ASTM D3831

Manganese in Gasoline by AA Spectroscopy

Manganese Stock Solution

D-3831-1

1.0 g Mn / gal (264.2 mg Mn / L) in Methyl isobutyl ketone

1 x 100 mL

Manganese

D-3831-R1-1

400 mg/L in Methyl isobutyl ketone

1 x 100 mL

Manganese

ASTM D4291

Trace Ethylene Glycol in Used Engine Oil

D-4291-93

D-4291-93-PAK
2000 µg/mL in water

1 x 1 mL

SAVE 5 x 1 mL

Ethylene glycol

ASTM D4420

Aromatics in Finished Gasoline by GC

Aromatics in Gasoline by GC/TC

D-4420-CAL-SET

Analyte	Std. 1	Std. 2	Std. 3	Std. 4	Std. 5	7 x 1 mL	
	Target	Target	Target	Target	Target	Std. 6	Std. 7
	Vol. %	Vol. %	Vol. %	Vol. %	Vol. %	Vol. %	Vol. %
Benzene	0.05	0.10	0.25	0.75	1.25	2.50	5.00
Toluene	0.5	1.00	2.50	5.00	10.00	15.00	25.00
Total Xylenes (C ₈ aromatics)	5	10.00	15.00	20.00	25.00	1.00	3.00
<i>n</i> -Butylbenzene (C ₉ + aromatics)	30.00	25.00	20.00	10.00	5.00	15.00	2.50
Isooctane	64.45	63.90	62.25	64.25	58.75	66.50	64.50

D-4420-94

D-4420-94-PAK
At stated Vol. %

1 x 1 mL
SAVE 5 x 1 mL
5 comps.

Benzene	3.00
Toluene	10.00
Total Xylenes (C ₈ aromatics)	15.00
<i>n</i> -Butylbenzene (C ₉ + aromatics)	15.00
Isooctane	57.00

ASTM D4629

Trace Nitrogen in Liquid Petroleum Hydrocarbons by Syringe/Inlet Oxidative Combustion and Chemiluminescence Detection. IP 379/88

D4629 is used to determine trace total nitrogen naturally found in liquid hydrocarbons boiling from 50 to 400°C with viscosities 0.2 - 10 cSt. This method monitors feed stocks for nitrogen to prevent the poisoning of some process catalysts when trace nitrogenous materials are present.

Nitrogen Calibration Set - Low Boiling Solvents

D-4629-LB-CAL-R1-SET

Nitrogen introduced using Pyridine

Each in Isooctane	Cat. No.	Unit	Each in Isooctane	Cat. No.	Unit
Isooctane Blank	D-4629-91-LB-BL	1 mL	Nitrogen @ 25 µg/mL	D-4629-91-LB-25X	1 mL
Nitrogen @ 0.3 µg/mL	D-4629-91-LB-0.3X	1 mL	Nitrogen @ 50 µg/mL	D-4629-91-LB-50X	1 mL
Nitrogen @ 1 µg/mL	D-4629-91-LB-1X	1 mL	Nitrogen @ 75 µg/mL	D-4629-91-LB-75X	1 mL
Nitrogen @ 10 µg/mL	D-4629-91-LB-10X	1 mL	Nitrogen @ 100 µg/mL	D-4629-91-LB-100X	1 mL

8 x 1 mL

Stock Nitrogen Solution Low Boiling Solvents

D-4629-91-LB-CON 1 x 1 mL
D-4629-91-LB-CON-PAK SAVE 5 x 1 mL
1000 µg/mL in Isooctane

Nitrogen introduced using Pyridine

Nitrogen Calibration Set - High Boiling Solvents

D-4629-HB-CAL-R1-SET

Nitrogen introduced using Carbazole

Each in Toluene	Cat. No.	Unit	Each in Toluene	Cat. No.	Unit
Toluene Blank	D-4629-91-HB-BL	1 mL	Nitrogen @ 25 µg/mL	D-4629-91-HB-25X	1 mL
Nitrogen @ 0.3 µg/mL	D-4629-91-HB-0.3X	1 mL	Nitrogen @ 50 µg/mL	D-4629-91-HB-50X	1 mL
Nitrogen @ 1 µg/mL	D-4629-91-HB-1X	1 mL	Nitrogen @ 75 µg/mL	D-4629-91-HB-75X	1 mL
Nitrogen @ 10 µg/mL	D-4629-91-HB-10X	1 mL	Nitrogen @ 100 µg/mL	D-4629-91-HB-100X	1 mL

8 x 1 mL

Stock Nitrogen Solution High Boiling Solvents

D-4629-91-HB-CON 1 x 1 mL
D-4629-91-HB-CON-PAK SAVE 5 x 1 mL
1000 µg/mL in Toluene:Acetone (9:1)

Nitrogen introduced using Carbazole

ASTM D4629 continued on next page.

ASTM Methods

ASTM D4629

Trace Nitrogen in Liquid Petroleum Hydrocarbons (continued)

Nitrogen Calibration Set - Low Level

ASTM-P-0070-SET

Nitrogen introduced using Aniline

6 x 1 mL

Each in Isooctane	Cat. No.	Each in Isooctane	Cat. No.
Isooctane Blank	ASTM-P-0070-BL	Nitrogen @ 2.0 µg/g	ASTM-P-0070-4X
Nitrogen @ 0.5 µg/g	ASTM-P-0070-1X	Nitrogen @ 5.0 µg/g	ASTM-P-0070-10X
Nitrogen @ 1.0 µg/g	ASTM-P-0070-2X	Nitrogen @ 10.0 µg/g	ASTM-P-0070-20X

Low Level Nitrogen & Sulfur Calibration Set

ASTM-P-0071-SET

The Nitrogen is introduced using Aniline and the Sulfur is introduced using di-n-butyl sulfide

4 x 1 mL

Concentration in Benzene	Cat. No.	Unit
Benzene Blank	ASTM-P-0071-BL	1 mL
Nitrogen @ 0.25 µg/g & Sulfur @ 0.25 µg/g	ASTM-P-0071-01	1 mL
Nitrogen @ 0.50 µg/g & Sulfur @ 0.50 µg/g	ASTM-P-0071-02	1 mL
Nitrogen @ 1.00 µg/g & Sulfur @ 1.00 µg/g	ASTM-P-0071-03	1 mL

Technical Note

Standards are prepared by adding well characterized nitrogen compounds gravimetrically to the matrix. Since the matrix may contain some native nitrogen, a blank must be used for background correction and should be purchased with the standard.

ASTM D4815

MtBE, EtBE, TAME, DIPE, Tertiary-amyl & C1 to C4 Alcohols in Gasoline by GC

TIER 3 STANDARDS

Oxygenate Quantitative Calibration Mixtures

Without Internal Standard

D-4815-10ML-SET

5 x 10 mL

Analyte	Target Concentrations				
	Std. 1 Wt. %	Std. 2 Wt. %	Std. 3 Wt. %	Std. 4 Wt. %	Std. 5 Wt. %
Ethanol	3.00	0.10	6.00	9.00	12.00
t-Butanol	0.10	3.00	6.00	8.00	12.00
Methyl t-butyl ether (MtBE)	20.0	15.00	10.00	5.00	0.10
t-Pentanol	1.25	5.00	2.50	3.75	0.10
Isooctane/Xylene (65:35)	75.65	76.90	75.50	74.25	75.80

Quantitative Peak ID and Retention Time Mixture (Core Mix)

D-4815-RT

D-4815-RT-PAK

At stated Wt. %

1 x 1 mL

SAVE 5 x 1 mL

16 comps.

Methylcyclopentane	4.00
Methanol	7.30
Ethanol	7.30
Isopropanol	7.30
tert-Butanol	7.30
n-Propanol	7.30
Methyl tert-butyl ether (MtBE)	4.00
sec-Butanol	7.30
Isopropyl ether	4.00
Isobutanol	7.30
Ethyl tert-butyl ether (EtBE)	4.00
tert-Pentanol	7.30
1,2-Dimethoxyethane (ISTD)	6.00
n-Butanol	7.30
Benzene	5.00
tert-Amyl methyl ether (TAME)	7.30
	100

With Internal Standard

D-4815-IS-SET

D-4815-IS-SET-PAK

5 x 1 mL

SAVE 5 x (5 x 1 mL)

Analyte	Calibration Range	Target Concentrations				
		Std. 1 Wt. %	Std. 2 Wt. %	Std. 3 Wt. %	Std. 4 Wt. %	Std. 5 Wt. %
Ethanol	0.1 - 11.40	2.85	0.095	5.70	8.55	11.40
t-Butanol	0.1 - 11.40	0.095	2.85	5.70	7.60	11.40
Methyl t-butyl ether (MtBE)	0.1 - 19.0	19.00	14.25	9.50	4.75	0.095
t-Pentanol	0.1 - 4.79	1.19	4.75	2.38	3.56	0.095
1,2-Dimethoxyethane (DME) (Internal Standard)		5.00	5.00	5.00	5.00	5.00
Isooctane/Xylene (65:35)		71.87	73.06	71.73	70.54	72.01
Total Oxygenates & Internal Standard		28.14	26.95	28.28	29.46	28.00

Valve Timing Mixture

D-4815-VT

D-4815-VT-PAK

At stated Wt. %

1 x 1 mL

SAVE 5 x 1 mL

5 comps.

Methylcyclopentane	10.00
Isopropyl ether	10.00
Ethyl tert-butyl ether (EtBE)	10.00
Methyl tert-butyl ether (MtBE)	10.00
n-Hexane	60.00

Oxygenate Internal Standard

M-GRO-IS-5ML

M-GRO-IS-5ML-PAK

1 x 5 mL

SAVE 5 x 5 mL

1,2-Dimethoxyethane (neat)

Oxygenate Free Refinery Gasoline

Blank

RFA-BLNK-10ML

RFA-BLNK-10ML-PAK

1 x 10 mL

SAVE 5 x 10 mL

RFA Gasoline (neat)

ASTM D4929

Organic Chloride Content in Crude Oil - Test Method B Combustion & Microcoulometry

Working Level Chlorine Standard

D-4929-94

D-4929-94-PAK

1 x 5 mL

SAVE 5 x 5 mL

10 µg/mL in Isooctane

Chlorine

Stock Chlorine Standard

D-4929-94-100X

D-4929-94-100X-PAK

1000 µg/mL in Isooctane

1 x 5 mL

SAVE 5 x 5 mL

Chlorine

Chlorine in Lube Oils

ASTM-P-0092-100ML-SET

Each in 75 cSt Mineral oil

7 x 100 mL

Cat. No.	Chlorine Wt. %	Chlorine µg/g	Unit
ASTM-P-0092-BL-100ML	Blank	Blank	100 mL
ASTM-P-0092-0.1X-100ML	0.001	10	100 mL
ASTM-P-0092-1X-100ML	0.01	100	100 mL
ASTM-P-0092-5X-100ML	0.05	500	100 mL
ASTM-P-0092-10X-100ML	0.1	1,000	100 mL
ASTM-P-0092-100X-100ML	1	10,000	100 mL
ASTM-P-0092-500X-100ML	5	50,000	100 mL

ASTM Methods

ASTM D5059

Lead in Gasoline by X-Ray Spectroscopy IP Designation 228/79

Part A - Lead in Gasoline Standards

D-5059-A-CAL-100ML-SET ▲

7 x 100 mL

At stated conc. (g/gal) in Isooctane

Lead Concentration		mg Pb/mL	Cat. No. ▲	Unit
g Pb/US gal	g Pb/ UK gal			
0.0000	0.000	0.000	D-5059-A-01-100ML	100 mL
0.1000	0.120	0.026	D-5059-A-02-100ML	100 mL
1.0000	1.200	0.264	D-5059-A-03-100ML	100 mL
2.0000	2.400	0.528	D-5059-A-04-100ML	100 mL
3.0000	3.600	0.793	D-5059-A-05-100ML	100 mL
4.0000	4.800	1.057	D-5059-A-06-100ML	100 mL
5.0000	6.000	1.321	D-5059-A-07-100ML	100 mL

Internal Standard

D-5059-IS-100ML

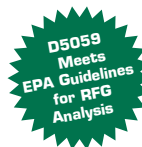
1 x 100 mL

D-5059-IS-10ML-PAK

5 x 10 mL

0.793 mg/mL in Mineral Oil

Bismuth



Technical Note

AccuStandard has formulated D5059 standards to measure the lead content in gasoline for both high and low concentrations using bismuth as an internal standard. The 100 mL quantities are designed for laboratories analyzing many samples while the 10 mL ampules are for laboratories that have limited requests for the test method. Should you require bulk quantities of the internal standard packaged in single-use ampules, contact our Technical Service Department for a quotation.

Part C - Lead in Gasoline Standards

D-5059-C-CAL-100ML-SET ▲

7 x 100 mL

At stated conc. (g/gal) in Isooctane

Lead Concentration		mg Pb/mL	Cat. No. ▲	Unit
g Pb/US gal	g Pb/ UK gal			
0.0000	0.000	0.000	D-5059-C-01-100ML	100 mL
0.0010	0.001	0.264	D-5059-C-02-100ML	100 mL
0.0050	0.006	1.321	D-5059-C-03-100ML	100 mL
0.0100	0.012	2.642	D-5059-C-04-100ML	100 mL
0.0500	0.060	13.209	D-5059-C-05-100ML	100 mL
0.1000	0.120	26.417	D-5059-C-06-100ML	100 mL
0.3000	0.360	79.252	D-5059-C-07-100ML	100 mL

ASTM D5134

Petroleum Naphthas through n-Nonane by Capillary GC

Qualitative Reference Petroleum Set

D-5134-92-SET

3 x 1 mL

Qualitative Reference Standards	Cat. No.	Unit
Alkylate Standard neat fraction approx. 30 comps. identified	D-5134-92-ALK	1 mL
Naphtha Standard neat fraction approx. 70 comps. identified	D-5134-92-NAP	1 mL
Reformate Standard neat fraction approx. 100 comps. identified	D-5134-92-REF	1 mL

Column Evaluation Mix

D-5134-92-CEM

1 x 1 mL

At stated Wt. %

7 comps.

Toluene	0.5	4-Methylheptane	1.0
n-Heptane	1.0	n-Octane	1.0
2,3,3-Trimethylpentane	1.0	2-Methylpentane	94.5
2-Methylheptane	1.0		

Linearity Check Mix

D-5134-92-LCM-PAK

5 x 50 mg

10 Wt. % each

10 comps.

Benzene	2-Methylheptane
2,4-Dimethylheptane	2-Methylhexane
2,4-Dimethylhexane	n-Nonane
n-Heptane	n-Octane
n-Hexane	Toluene

ASTM D5184

Aluminum and Silicon in Fuel Oils by Ashing, Fusion, ICP-AES Spectrometry & AA Spectrometry

Tartaric Acid / Hydrochloric Acid Solution

D-5184-91-TA-5 ▲

1 x 500 mL

Tartaric acid @ 0.5% w/v in 4% HCl

Aluminum Standard Solution

D-5184-91-AL-1 ▲

1 x 100 mL

D-5184-91-AL-5 ▲

1 x 500 mL

Aluminum @ 1000 µg/mL in 5 % HCl tr. HNO₃

Silicon Standard Solution

D-5184-91-SI-1

1 x 100 mL

D-5184-91-SI-5

1 x 500 mL

Silicon @ 1000 µg/mL in water tr. NaOH tr. HF

ASTM D5186

Aromatic Content & Polynuclear Aromatic Content of Diesel Fuels & Aviation Turbine Fuels by SFC

Performance Solution

D-5186-96-PM

1 x 1 mL

D-5186-96-PM-PAK

SAVE 5 x 1 mL

At stated Wt. %

4 comps.

n-Hexadecane	75	Tetralin	3.0
Naphthalene	2.0	Toluene	20

Detector Linearity Check Solution Set

D-5186-96-DLC-SET

2 x 1 mL

#2 Diesel Fuel in n-Hexadecane

25% w/w

D-5186-96-DLC-25X

50% w/w

D-5186-96-DLC-50X

Docosane

D-5186-91-PM-0.4X

1 x 1 mL

20 Wt. % in Toluene

▲ Hazardous fee required for air shipments.

ASTM Methods

ASTM D5188

Vapor - Liquid Ratio Temperature

Performance Check Samples

Daily monitoring of instrument performance

Volume / Liquid Temp	Cat. No.	Set
36.1°C (96.9°F)	ASTM-P-125-01-VAP	5 x 20 mL
68.0°C (155.7°F)	ASTM-P-125-02-VAP	5 x 20 mL

ASTM D5191 & D5482

Vapor Pressure

Vapor Pressure Quality Control Samples

Vapor Pressure	Cat. No.	Set
68.3kPa (9.91 psi)	ASTM-P-124-01-VAP	10 x 10 mL
51.1kPa (7.41 psi)	ASTM-P-124-03-VAP	10 x 10 mL
46.7kPa (6.77 psi)	ASTM-P-124-04-VAP	10 x 10 mL
22.5kPa (3.26 psi)	ASTM-P-124-05-VAP	10 x 10 mL
7.1kPa (1.03 psi)	ASTM-P-124-06-VAP	10 x 10 mL

Value Added PAK

Packaged in ready to use quantities.

Technical Note

Consists of pure solvents with known vapor pressures.

ASTM D5307

Boiling Range Distribution of Crude Petroleum by GC

Quantitative Paraffins Standard

D-5307-QUANT 1 x 2 mL
D-5307-QUANT-PAK SAVE 5 x 2 mL
 Equal Wt. % 16 comps.

<i>n</i> -Decane	<i>n</i> -Octadecane
<i>n</i> -Undecane	<i>n</i> -Eicosane
<i>n</i> -Dodecane	<i>n</i> -Tetracosane
<i>n</i> -Tridecane	<i>n</i> -Octacosane
<i>n</i> -Tetradecane	<i>n</i> -Dotriacontane
<i>n</i> -Pentadecane	<i>n</i> -Hexatriacontane
<i>n</i> -Hexadecane	<i>n</i> -Tetracontane
<i>n</i> -Heptadecane	<i>n</i> -Tetratetracontane

Internal Standard

D-5307-IS-10ML 1 x 10 mL
D-5307-IS-10ML-PAK SAVE 5 x 10 mL
 At stated Wt. % 4 comps.

<i>n</i> -Tetradecane	25
<i>n</i> -Pentadecane	25
<i>n</i> -Hexadecane	25
<i>n</i> -Heptadecane	25

Column Resolution Mix

D-5307-CR 1 x 1 mL
D-5307-CR-PAK SAVE 5 x 1 mL
 At stated Wt. % 3 comps.

<i>n</i> -Hexadecane	1.0
<i>n</i> -Octadecane	1.0
<i>n</i> -Octane	98.0

Qualitative Paraffins Standard

D-5307-QUAL 1 x 1 mL
D-5307-QUAL-PAK SAVE 5 x 1 mL
 At stated Wt. % 7 comps.

<i>n</i> -Propane	10	<i>n</i> -Heptane	15
<i>n</i> -Butane	15	<i>n</i> -Octane	15
<i>n</i> -Pentane	18	<i>n</i> -Nonane	15
<i>n</i> -Hexane	18		

Save 20% on a pack of 5



ASTM D5441

Analysis of Methyl tert-butyl ether (MtBE) by GC

ASTM Committee D02 on Petroleum Products and Lubricants has issued the Standard Method D5441 for the determination of the purity of methyl tert-butyl ether (MtBE) by Gas Chromatography. This method provides a procedure to measure impurities in MtBE such as C₄ to C₁₂ olefins, methyl, isopropyl and tert-butyl alcohols, methyl sec-butyl and methyl tert-amyl ethers, acetone, and methyl ethyl ketones. The presence of these impurities in MtBE can have a direct effect upon the value of the MtBE as a gasoline additive. The following reference standards have been formulated to meet the method specifications. Different packaging sizes are available to meet various sample testing capacities.

MtBE Contaminant Standard

Low Concentration

D-5441 1 x 1 mL
D-5441-PAK **SAVE** 5 x 1 mL

D-5441-5ML 1 x 5 mL
D-5441-5ML-PAK **SAVE** 5 x 5 mL
0.1 Wt.% each in MtBE 12 comps

TAME	2-Methyl-2-butene
<i>t</i> -Butanol	2,2',4,6,6'-Pentamethyl-3-heptene
EtBE	<i>n</i> -Pentane
4,4-Dimethyl-2-neopentyl-1-pentene	<i>cis</i> -2-Pentene
Methanol	<i>trans</i> -2-Pentene
2-Methylbutane	2,4,4-Trimethyl-1-pentene

MtBE Contaminant Standard

High Concentration

D-5441-10X 1 x 1 mL
D-5441-10X-PAK **SAVE** 5 x 1 mL

D-5441-10X-5ML 1 x 5 mL
D-5441-10X-5ML-PAK **SAVE** 5 x 5 mL
1 Wt.% each in MtBE 12 comps.

TAME	2-Methyl-2-butene
<i>t</i> -Butanol	2,2',4,6,6'-Pentamethyl-3-heptene
EtBE	<i>n</i> -Pentane
4,4-Dimethyl-2-neopentyl-1-pentene	<i>cis</i> -2-Pentene
Methanol	<i>trans</i> -2-Pentene
2-Methylbutane	2,4,4-Trimethyl-1-pentene

Qualitative Standard

D-5441-QUAL 1 x 1 mL
0.1 Wt.% each in *n*-Dodecane 33 comps.

Methanol	MtBE
Isobutylene	2,3-Dimethyl-1-butene
<i>n</i> -Butane	<i>cis</i> -4-Methyl-2-pentene
<i>trans</i> -2-Butene	2-Methylpentane
<i>cis</i> -2-Butene	Methyl ethyl ketone
3-Methyl-1-butene	3-Methylpentane
Acetone	<i>sec</i> -Butyl methyl ether
Isopentane	EtBE
Isopropanol	TAME
1-Pentene	3,5-Dimethyl-1-hexene
2-Methyl-1-butene	2,4,4-Trimethyl-1-pentene
<i>n</i> -Pentane	2,4,4-Trimethyl-2-pentene
<i>trans</i> -2-Pentene	3,4,4-Trimethyl- <i>trans</i> -2-pentene
<i>t</i> -Butanol	2,3,4-Trimethyl-2-pentene
<i>cis</i> -2-Pentene	4,4-Dimethyl-2-neopentyl-1-pentene
2-Methyl-2-butene	2,2',4,6,6'-Pentamethyl-3-heptene
Cyclopentene	

Quantitative Standard

D-5441-QUANT-R1 1 x 1 mL
0.1 Wt.% each in *n*-Dodecane 29 comps.

Methanol (0.04 Wt.%)	<i>cis</i> -4-Methyl-2-pentene
3-Methyl-1-butene	2-Methylpentane
Acetone	Methyl ethyl ketone
2-Methylbutane	3-Methylpentane
Isopropanol	<i>sec</i> -Butyl methyl ether
1-Pentene	EtBE
2-Methyl-1-butene	TAME
<i>n</i> -Pentane	3,5-Dimethyl-1-hexene
<i>trans</i> -2-Pentene	Diisobutylene
<i>t</i> -Butanol	2,4,4-Trimethyl-2-pentene
<i>cis</i> -2-Pentene	3,4,4-Trimethyl- <i>trans</i> -2-pentene
2-Methyl-2-butene	2,3,4-Trimethyl-2-pentene
Cyclopentene	4,4-Dimethyl-2-neopentyl-1-pentene
MtBE	2,2',4,6,6'-Pentamethyl-3-heptene
2,3-Dimethyl-1-butene	

MtBE Resolution Test Mix

D-5441-RES 1 x 1 mL
D-5441-RES-PAK **SAVE** 5 x 1 mL

D-5441-RES-5ML 1 x 5 mL
D-5441-RES-5ML-PAK **SAVE** 5 x 5 mL
1 Wt.% each in MtBE 3 comps.

<i>trans</i> -2-Pentene	<i>cis</i> -Pentene
<i>t</i> -Butanol	

ASTM Methods

ASTM D5442

Analysis of Petroleum Waxes by GC

Quantitative Wax Standard

D-5442

D-5442-PAK

At stated Wt.% in Cyclohexane

1 x 1 mL
SAVE 5 x 1 mL
16 comps.

<i>n</i> -Dodecane	0.02	<i>n</i> -Octacosane	0.12
<i>n</i> -Tetradecane	0.03	<i>n</i> -Triacontane	0.10
<i>n</i> -Hexadecane	0.04	<i>n</i> -Dotriacontane	0.08
<i>n</i> -Octadecane	0.05	<i>n</i> -Hexatriacontane	0.06
<i>n</i> -Eicosane	0.06	<i>n</i> -Tetracontane	0.05
<i>n</i> -Docosane	0.08	<i>n</i> -Tetratetracontane	0.04
<i>n</i> -Tetracosane	0.10	<i>n</i> -Pentacontane	0.03
<i>n</i> -Hexacosane	0.12	<i>n</i> -Hexacontane	0.02

Column Resolution Standard

D-5442-CR-PAK

At stated Wt.% in Cyclohexane

5 x 1 mL
2 comps.

<i>n</i> -Eicosane	0.05
<i>n</i> -Tetracontane	0.05

Hydrocarbon Standard Brownfield Regulation

D-5442-R1

100 µg/mL each in Cyclohexane

1 x 1 mL
18 comps.

<i>n</i> -Decane	<i>n</i> -Octacosane
<i>n</i> -Dodecane	<i>n</i> -Triacontane
<i>n</i> -Tetradecane	<i>n</i> -Dotriacontane
<i>n</i> -Hexadecane	<i>n</i> -Tetracontane
<i>n</i> -Octadecane	<i>n</i> -Hexatriacontane
<i>n</i> -Eicosane	<i>n</i> -Octatriacontane
<i>n</i> -Docosane	<i>n</i> -Tetracontane
<i>n</i> -Tetracosane	<i>n</i> -Tetratetracontane
<i>n</i> -Hexacosane	<i>n</i> -Pentacontane

Retention Time Standard Mix 1

D-5442-RT1

Equal Wt.%

500 mg
12 comps.

<i>n</i> -Hexadecane (c16)	<i>n</i> -Octacosane (c28)
<i>n</i> -Octadecane (c18)	<i>n</i> -Triacontane (c30)
<i>n</i> -Eicosane (c20)	<i>n</i> -Dotriacontane (c32)
<i>n</i> -Docosane (c22)	<i>n</i> -Hexatriacontane (c36)
<i>n</i> -Tetracosane (c24)	<i>n</i> -Tetracontane (c40)
<i>n</i> -Hexacosane (c26)	<i>n</i> -Tetratetracontane (c44)

Retention Time Standard Mix 2

D-5442-RT2

Equal Wt.%

500 mg
16 comps.

<i>n</i> -Dodecane (c12)	<i>n</i> -Octacosane (c28)
<i>n</i> -Tetradecane (c14)	<i>n</i> -Triacontane (c30)
<i>n</i> -Hexadecane (c16)	<i>n</i> -Dotriacontane (c32)
<i>n</i> -Octadecane (c18)	<i>n</i> -Hexatriacontane (c36)
<i>n</i> -Eicosane (c20)	<i>n</i> -Tetracontane (c40)
<i>n</i> -Docosane (c22)	<i>n</i> -Tetratetracontane (c44)
<i>n</i> -Tetracosane (c24)	<i>n</i> -Pentacontane (c50)
<i>n</i> -Hexacosane (c26)	<i>n</i> -Hexacontane (c60)

Standards of Interest

See ASTM Methods D3710, D5307, and D6352 for additional calibration standards for hydrocarbon analysis.

ASTM D5443

Paraffin, Naphthene & Aromatic Hydrocarbon Type Analysis in Petro Distillates 200°C by Multi-Dimen. GC

Hydrocarbon Test Mix

D-5443-93-HTM

At stated Wt.%

1 x 1 mL
28 comps.

Cyclopentane	1.00	1,2-Dimethylcyclohexane	5.00	<i>trans</i> -Decahydronaphthelene	4.25
<i>n</i> -Pentane	1.00	Isooctane	5.00	<i>n</i> -Tetradecane	4.50
Cyclohexane	2.00	<i>n</i> -Octane	5.00	Ethylbenzene	4.50
2,3-Dimethylbutane	2.00	1,2,4-Trimethylcyclohexane	4.25	<i>o</i> -Xylene	4.25
<i>n</i> -Hexane	2.00	<i>n</i> -Nonane	4.50	<i>n</i> -Propylbenzene	5.00
<i>n</i> -Hexene	1.50	<i>n</i> -Decane	4.25	1,2,4-Trimethylbenzene	4.50
Methylcyclohexane	4.25	<i>n</i> -Undecane	3.50	1,2,3-Trimethylbenzene	5.00
4-Methyl-1-hexene	1.50	<i>n</i> -Dodecane	3.25	1,2,4,5-Tetramethylbenzene	5.00
<i>n</i> -Heptane	3.50	Benzene	2.25	Pentamethylbenzene	5.00
		Toluene	2.25		

ASTM D5501

Ethanol Content of Denatured Fuel Ethanol by GC

Denatured Fuel Ethanol Calibration Set

D-5501-94-SET

7 x 1 mL

Analyte	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6	LEVEL 7
	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%
Ethanol	92	93	94	95	96	97	98
Methanol	0.6	0.5	0.4	0.3	0.2	0.1	0.05
Heptane	7.4	6.5	5.6	4.7	3.8	2.9	1.95

ASTM Method D5501-12

D-5501-12-SET

5 x 1 mL

Analyte	D-5501-12-01	D-5501-12-02	D-5501-12-03	D-5501-12-04	D-5501-12-05
	1 mL	1 mL	1 mL	1 mL	1 mL
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%
Ethanol	20	50	75	90	99.4
Methanol	0.6	0.5	0.3	0.2	0.1
Heptane	10	10	10	4	0.5
Isooctane	69.4	39.5	14.8	5.8	0

Technical Note

Additional oxygenate calibration, check standards, and independent reference standards can be found in ASTM method D4815 or D5622. The required QA/QC procedures in EPA methods stipulate a calibration check standard be used once per analytical batch or per 10 sample set. AccuStandard has bulk packaged check standards to meet this increased usage.

ASTM Methods

ASTM D5580

Benzene, Toluene, Ethylbenzene, m/p-Xylene, o-Xylene, C9 & Heavier & Total Aromatics in Finished Gas by GC

Aromatics Quantitative Calibration Mixes

Without Internal Standard

D-5580-95-CAL-10ML-SET

5 x 10 mL

Analyte	Calibration range	Std. 1 Wt. %	Std. 2 Wt. %	Std. 3 Wt. %	Std. 4 Wt. %	Std. 5 Wt. %
Benzene	0.10 - 5.00	0.10	0.50	1.00	2.00	5.00
Toluene	1.00 - 15.00	15.00	10.00	5.00	2.50	1.00
Ethylbenzene	0.50 - 10.00	0.50	1.00	2.50	5.00	10.00
o-Xylene	0.50 - 10.00	1.00	2.50	10.00	5.00	0.50
1,2,4-Trimethylbenzene	0.50 - 10.00	1.00	10.00	0.50	5.00	2.50
Isooctane		82.40	76.00	81.00	80.50	81.00

With Internal Standard

D-5580-95-CAL-IS-SET

5 x 1 mL

Analyte	Calibration range	Std. 1 Wt. %	Std. 2 Wt. %	Std. 3 Wt. %	Std. 4 Wt. %	Std. 5 Wt. %
Benzene	0.09 - 4.50	0.09	0.45	0.90	1.80	4.50
Toluene	0.90 - 13.50	13.50	9.00	4.50	2.25	0.90
Ethylbenzene	0.45 - 9.00	0.45	0.90	2.25	4.50	9.00
o-Xylene	0.45 - 9.00	0.90	2.25	9.00	4.50	0.45
1,2,4-Trimethylbenzene	0.45 - 9.00	0.90	9.00	0.45	4.50	2.25
2-Hexanone (Internal Standard)		10.00	10.00	10.00	10.00	10.00
Isooctane		74.16	68.40	72.90	72.45	72.90

Standard 2 D-5580-95-CAL-IS-2 1 mL

Technical Note

The configuration of the instrument valve time switching and the pre-column incorporated determines which QA/QC standard provides optimum performance when analyzing gasolines samples by Method D5580. Use of the D5580 standards in conjunction with the real world gasoline standards can provide added assurance that the analytical results generated are reproducible and the analytical system is performing to method specifications.

Valve Timing Calibration Mixes

With Internal Standard

M-GRA-VT-IS-AS

1 x 1 mL

M-GRA-VT-IS-AS-PAK

SAVE 5 x 1 mL

At stated Wt. %

6 comps.

Benzene	4.5
Toluene	4.5
Ethylbenzene	9.0
o-Xylene	9.0
2-Hexanone (ISTD)	10.0
Isooctane	63.0

Without Internal Standard

M-GRA-VT-AS-10ML

1 x 10 mL

M-GRA-VT-AS-10ML-PAK

SAVE 5 x 10 mL

At stated Wt. %

5 comps.

Benzene	5.0
Toluene	5.0
Ethylbenzene	10.0
o-Xylene	10.0
Isooctane	70.0

Internal Standard

M-GRA-IS-AS-5ML

1 x 5 mL

M-GRA-IS-AS-5ML-PAK

SAVE 5 x 5 mL

2-Hexanone (neat)

Selectivity Check Standard

M-GRA-SCS-AS

1 x 1 mL

M-GRA-SCS-AS-PAK

SAVE 5 x 1 mL

1.5 Wt. % in Isooctane

n-Dodecane

Daily Quality Control Standards

Without Internal Standard

D-5580-QC-R1-10ML

1 x 10 mL

D-5580-QC-R1-10ML-PAK

SAVE 5 x 10 mL

At stated Wt. %

14 comps.

n-Hexane	12	Toluene	9
n-Heptane	20	Ethylbenzene	2
n-Octane	15	p-Xylene	3
n-Decane	10	o-Xylene	2
n-Dodecane	1	1,2,4-Trimethylbenzene	3
Isooctane	20	1,2,4,5-Tetramethylbenzene	1
Benzene	1	Naphthalene	1

Without Internal Standard

D-5580-QC-10ML

1 x 10 mL

D-5580-QC-10ML-PAK

SAVE 5 x 10 mL

At stated Wt. %

14 comps.

n-Hexane	12	Toluene	9
n-Heptane	20	Ethylbenzene	2
n-Octane	15	p-Xylene	3
n-Decane	10	o-Xylene	2
n-Tridecane	1	1,2,4-Trimethylbenzene	3
Isooctane	20	1,2,4,5-Tetramethylbenzene	1
Benzene	1	Naphthalene	1

Oxygenates Calibration Curves
With Internal Standard
M-GRO-CAL-IS-SET
M-GRO-CAL-IS-SET-PAK

 8 x 1 mL
 SAVE 5 x (8 x 1 mL)

Analyte	Calibration Range	Std. 1 Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%	Std. 6 Wt.%	Std. 7 Wt.%	Std. 8 Wt.%
Methanol	0.1 - 5.0	---	0.1	2.5	---	5	0.5	1	---
Ethanol	1.0 - 12.0	12	---	3	---	8	5	1	---
Isopropanol	0.1 - 2.0	2	1	---	0.1	0.3	---	0.5	---
t-Butanol	0.1 - 2.0	0.5	0.1	1	---	2	0.3	---	---
Propanol	0.2 - 2.0	2	---	0.7	0.2	1	---	0.4	---
MtBE	1.0 - 17.0	5	17	---	---	1	2.5	10	---
sec-Butanol	0.1 - 2.5	1	---	0.5	0.1	---	2.5	0.7	---
Diisopropyl ether	0.1 - 2.0	---	0.5	0.3	0.1	2	1	---	---
Isobutanol	0.1 - 2.0	2	0.5	---	1	0.1	0.3	---	---
EtBE	1.0 - 18.0	---	3.5	18	7.5	---	1	12	---
t-Pentanol	0.1 - 2.0	0.3	1	---	0.5	0.1	2	---	---
Butanol	0.1 - 2.0	1	---	0.3	---	0.5	0.1	2	---
TAME	1.0 - 18.0	---	3.5	1	18	7.5	12	---	---
1,2-Dimethoxyethane (ISTD)		4	4	4	4	4	4	4	---
RFA Gasoline		70.2	68.8	68.7	68.5	68.5	68.8	68.4	100
Total oxygenates and ISTD		29.8	31.2	31.3	31.5	31.5	31.2	31.6	0

With Internal Standard
M-GRO-CAL-IS-R1-SET

8 x 1 mL

Analyte	Calibration Range	Std. 1 Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%	Std. 6 Wt.%	Std. 7 Wt.%	Std. 8 Wt.%
Methanol	0.1 - 5.0	---	0.1	2.5	---	5	0.5	1	---
Ethanol	1.0 - 12.0	12	---	3	---	8	5	1	---
Isopropanol	0.1 - 2.0	2	1	---	0.1	0.3	---	0.5	---
t-Butanol	0.1 - 2.0	0.5	0.1	1	---	2	0.3	---	---
Propanol	0.2 - 2.0	2	---	0.7	0.2	1	---	0.4	---
MtBE	1.0 - 17.0	5	17	---	---	1	2.5	10	---
sec-Butanol	0.1 - 2.5	1	---	0.5	0.1	---	2.5	0.7	---
Diisopropyl ether	0.1 - 2.0	---	0.5	0.3	0.1	2	1	---	---
Isobutanol	0.1 - 2.0	2	0.5	---	1	0.1	0.3	---	---
EtBE	1.0 - 18.0	---	3.5	18	7.5	---	1	12	---
t-Pentanol	0.1 - 2.0	0.3	1	---	0.5	0.1	2	---	---
Butanol	0.1 - 2.0	1	---	0.3	---	0.5	0.1	2	---
TAME	1.0 - 18.0	---	3.5	1	18	7.5	12	---	---
1,2-Dimethoxyethane (ISTD)		4	4	4	4	4	4	4	---
RFA Gasoline		74.2	72.8	72.7	72.5	72.5	72.8	72.4	100
Total oxygenates and ISTD		28.6	30.0	30.1	30.3	30.3	30.0	30.4	0

Technical Note

The revised set formulation is made by adding all the oxygenates, RFA Gasoline and the Internal Standard.

Without Internal Standard
M-GRO-CAL-SET

8 x 10 mL

Analyte	Calibration Range	Std. 1 Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%	Std. 6 Wt.%	Std. 7 Wt.%	Std. 8 Wt.%
Methanol	0.1 - 5.0	---	0.1	2.5	---	5	0.5	1	---
Ethanol	1.0 - 12.0	12	---	3	---	8	5	1	---
Isopropanol	0.1 - 2.0	2	1	---	0.1	0.3	---	0.5	---
t-Butanol	0.1 - 2.0	0.5	0.1	1	---	2	0.3	---	---
Propanol	0.2 - 2.0	2	---	0.7	0.2	1	---	0.4	---
MtBE	1.0 - 17.0	5	17	---	---	1	2.5	10	---
sec-Butanol	0.1 - 2.5	1	---	0.5	0.1	---	2.5	0.7	---
Diisopropyl ether	0.1 - 2.0	---	0.5	0.3	0.1	2	1	---	---
Isobutanol	0.1 - 2.0	2	0.5	---	1	0.1	0.3	---	---
EtBE	1.0 - 18.0	---	3.5	18	7.5	---	1	12	---
t-Pentanol	0.1 - 2.0	0.3	1	---	0.5	0.1	2	---	---
Butanol	0.1 - 2.0	1	---	0.3	---	0.5	0.1	2	---
TAME	1.0 - 18.0	---	3.5	1	18	7.5	12	---	---
RFA Gasoline		74.2	72.8	72.7	72.5	72.5	72.8	72.4	100
Total oxygenates		25.8	27.2	27.3	27.5	27.5	27.2	27.6	0

Technical Note

This certified oxygenate calibration curve can be used in combination with other aromatic standards for combined oxygenate/aromatic analysis to change the amount of internal standard added, or to incorporate alternative internal standard analytes.

ASTM Methods

ASTM D5599

Oxygenates in Gas by GC & O-FID (continued)

TIER 3 STANDARDS

Daily QC Standard

Without Internal Standard

M-GRO-QC-10ML 1 x 10 mL
 M-GRO-QC-10ML-PAK SAVE 5 x 10 mL
 At stated Wt.% 14 comps.

Methanol	1	Isopropyl ether	3
Ethanol	1	Isobutanol	1
Isopropanol	1	EtBE	3
<i>t</i> -Butanol	1	<i>t</i> -Amyl alcohol	1
<i>n</i> -Propanol	1	<i>n</i> -Butanol	1
MtBE	3	TAME	3
<i>sec</i> -Butanol	1	RFA Gasoline	79

Revised Daily QC Standard

Without Internal Standard

M-GRO-QC-R-10ML 1 x 10 mL
 M-GRO-QC-R-10ML-PAK SAVE 5 x 10 mL
 At stated Wt.% 14 comps.

Methanol	1	Isopropyl ether	1
Ethanol	1	Isobutanol	1
Isopropanol	1	EtBE	3
<i>t</i> -Butanol	1	<i>t</i> -Amyl alcohol	1
<i>n</i> -Propanol	1	<i>n</i> -Butanol	1
MtBE	3	TAME	3
<i>sec</i> -Butanol	1	RFA Gasoline	81

Daily QC Standard

With Internal Standard

M-GRO-QC-IS-5ML 1 x 5 mL
 M-GRO-QC-IS-5ML-PAK SAVE 5 x 5 mL
 At stated Wt.% 15 comps.

Methanol	1	Isopropyl ether	3
Ethanol	1	Isobutanol	1
Isopropanol	1	EtBE	3
<i>t</i> -Butanol	1	<i>t</i> -Amyl alcohol	1
<i>n</i> -Propanol	1	<i>n</i> -Butanol	1
MtBE	3	TAME	3
<i>sec</i> -Butanol	1	RFA Gasoline	79

1,2-Dimethoxyethane (Internal Std.) is combined in a 4 to 100 Wt. ratio

Revised Daily QC Standard

With Internal Standard

M-GRO-QC-R-IS-5ML 1 x 5 mL
 M-GRO-QC-R-IS-5ML-PAK SAVE 5 x 5 mL
 At stated Wt.% 15 comps.

Methanol	1	Diisopropyl ether	1
Ethanol	1	Isobutanol	1
Isopropanol	1	EtBE	3
<i>t</i> -Butanol	1	<i>t</i> -Pentanol	1
<i>n</i> -Propanol	1	<i>n</i> -Butanol	1
MtBE	3	TAME	3
<i>sec</i> -Butanol	1	RFA Gasoline	81

1,2-Dimethoxyethane (Internal Std.) is combined in a 4 to 100 Wt. ratio

Gasoline Refinery Blank

With Internal Standard

M-GRO-BLNK-IS-10ML 1 x 10 mL
 M-GRO-BLNK-IS-10ML-PAK SAVE 5 x 10 mL
 At stated Wt.% 2 comps.

1,2-Dimethoxyethane (ISTD)	4
RFA Gasoline	96

O-FID/EPA Gasoline Refinery

Internal Standard

M-GRO-IS-5ML 1 x 5 mL
 M-GRO-IS-5ML-PAK SAVE 5 x 5 mL

1,2-Dimethoxyethane (neat)

Standards of Interest

Additional Oxygenate calibration, check standards, and independent reference standards can be found in ASTM method D4815 or D5622. The required QA/QC procedures in EPA methods stipulate a calibration check standard be used once per analytical batch or per 10 sample set. We have bulk packaged check standards to meet this increased usage.

O-FID Gasoline Refinery Blank

RFA-BLNK-10ML 1 x 10 mL
 RFA-BLNK-10ML-PAK SAVE 5 x 10 mL

RFA Gasoline (neat)

Save 20% on a pack of 5



ASTM Methods

ASTM D5599

Oxygenates in Gas by GC & O-FID (continued)

TIER 3 STANDARDS

EPA O-FID Quantitative Calibration Mixes

Without Internal Standard

M-GRO-CAL-EPA-10ML-SET

5 x 10 mL

	Calibration Range	Std. 1 Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%
Methanol	0.30 - 12.00	6.00	12.00	3.00	0.30	9.00
Ethanol	0.30 - 12.00	0.30	3.00	6.00	9.00	12.00
t-Butanol	0.30 - 12.00	0.30	6.00	9.00	12.00	3.00
MtBE	0.30 - 15.00	15.00	7.50	11.25	3.75	0.30
RFA Gasoline		78.40	71.50	70.75	74.95	75.70

Technical Note

EPA O-FID Oxygenate Petrochemical Standards

This second oxygenate version has been formulated to meet the specific analyte requirements of the EPA methodology.

With Internal Standard

M-GRO-CAL-IS-EPA-SET

5 x 1 mL

	Calibration Range	Std. 1 Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%
Methanol	0.29 - 11.40	5.70	11.40	2.85	0.29	8.55
Ethanol	0.29 - 11.40	0.29	2.85	5.70	8.55	11.40
t-Butanol	0.29 - 11.40	0.29	5.70	8.55	11.40	2.85
MtBE	0.29 - 14.29	14.25	7.13	10.69	3.56	0.29
1,2-Dimethoxyethane (ISTD)		5.00	5.00	5.00	5.00	5.00
RFA Gasoline		74.48	67.93	67.31	71.20	71.92

EPA O-FID Quantitative Calibration Check Standard

Without Internal Standard

M-GRO-EPA-CC-10ML

1 x 10 mL

M-GRO-EPA-CC-10ML-PAK

SAVE 5 x 10 mL

At stated Wt. %

5 comps.

Methanol	4.0	MtBE	12.0
Ethanol	8.0	RFA gasoline	71.0
t-Butanol	5.0		

EPA O-FID Quantitative Calibration Check Standard

With Internal Standard

M-GRO-EPACC-IS-5ML

1 x 5 mL

M-GRO-EPACC-IS-5ML-PAK

SAVE 5 x 5 mL

At stated Wt. %

6 comps.

Methanol	3.80	RFA gasoline	67.45
Ethanol	7.60	1,2-Dimethoxyethane	5.0
tert-Butanol	4.75	(Internal Standard)	
MtBE	11.40		

EPA O-FID Spiking Solution

M-GRO-EPA-SP-5ML

1 x 5 mL

M-GRO-EPA-SP-5ML-PAK

SAVE 5 x 5 mL

At stated Wt. %

4 comps.

Methanol	14.3	t-Butanol	14.3
Ethanol	28.6	MtBE	42.8

Oxygenate Free Gasoline Refinery

Blank

RFA-BLNK-10ML

1 x 10 mL

RFA-BLNK-10ML-PAK

SAVE 5 x 10 mL

RFA Gasoline (neat)

Internal Standard

M-GRO-IS-5ML

1 x 10 mL

M-GRO-IS-5ML-PAK

SAVE 5 x 10 mL

1,2-Dimethoxyethane (neat)



ASTM Methods

ASTM D5622

Total Oxygen in Gasoline & MeOH Fuels by Reductive Pyrolysis

Description (2 x 10 mL, plus an RFA gasoline blank)	Oxygenate Wt. %	Cat. No.	Unit
Ethanol in Oxygenate free RFA gasoline	5.0	ASTM-P-0061-SET	3 x 10 mL
Ethanol in Oxygenate free RFA gasoline	10.0	ASTM-P-0062-SET	3 x 10 mL
TAME in Oxygenate free RFA gasoline	10.0	ASTM-P-0063-SET	3 x 10 mL
TAME in Oxygenate free RFA gasoline	15.0	ASTM-P-0064-SET	3 x 10 mL
EtBE in Oxygenate free RFA gasoline	10.0	ASTM-P-0065-SET	3 x 10 mL
EtBE in Oxygenate free RFA gasoline	15.0	ASTM-P-0066-SET	3 x 10 mL
MtBE in Oxygenate free RFA gasoline	10.0	ASTM-P-0067-SET	3 x 10 mL
MtBE in Oxygenate free RFA gasoline	15.0	ASTM-P-0068-SET	3 x 10 mL
Methanol & <i>t</i> -Butanol in Oxygenate free RFA gasoline	10.0 & 5.0	ASTM-P-0069-SET	3 x 10 mL

Oxygenate Free Gasoline Refinery Blank

RFA-BLNK-10ML 1 x 10 mL
RFA Gasoline (neat)

ASTM D5623

Sulfur Compounds in Light Petroleum Liquids by GC & Sulfur Selective Detection

ASTM-P-0091-10X-SET

Approx. 2.0 mg/mL each in Toluene

22 x 1 mL

Compound	Cat. No.	Unit	Compound	Cat. No.	Unit
Hydrogen sulfide	ASTM-P-0091-01-10X	1 mL	Thiophene	ASTM-P-0091-12-10X	1 mL
Carbonyl sulfide (Carbon oxysulfide)	ASTM-P-0091-02-10X	1 mL	2-Methyl-1-propanethiol (Isobutyl mercaptan)	ASTM-P-0091-13-10X	1 mL
Methyl mercaptan (Methanethiol)	ASTM-P-0091-03-10X	1 mL	Diethyl sulfide	ASTM-P-0091-14-10X	1 mL
Ethyl mercaptan (Ethanethiol)	ASTM-P-0091-04-10X	1 mL	1-Butanethiol (Butyl mercaptan)	ASTM-P-0091-15-10X	1 mL
Methyl sulfide (Dimethyl sulfide)	ASTM-P-0091-05-10X	1 mL	Methyl disulfide (Dimethyl disulfide)	ASTM-P-0091-16-10X	1 mL
Carbon disulfide	ASTM-P-0091-06-10X	1 mL	2-Methylthiophene	ASTM-P-0091-17-10X	1 mL
2-Propanethiol (Isopropyl mercaptan)	ASTM-P-0091-07-10X	1 mL	3-Methylthiophene	ASTM-P-0091-18-10X	1 mL
2-Methyl-2-propanethiol (<i>t</i> -butyl mercaptan)	ASTM-P-0091-08-10X	1 mL	Diethyl disulfide (Ethyl disulfide)	ASTM-P-0091-19-10X	1 mL
1-Propanethiol (Propyl mercaptan)	ASTM-P-0091-09-10X	1 mL	3-Methylbenzo[b]thiophene	ASTM-P-0091-20-10X	1 mL
Ethyl methyl sulfide	ASTM-P-0091-10-10X	1 mL	5-Methylbenzo[b]thiophene	ASTM-P-0091-21-10X	1 mL
1-Methyl-1-propanethiol (2-butanethiol)	ASTM-P-0091-11-10X	1 mL	Diphenyl sulfide	ASTM-P-0091-22-10X	1 mL

Technical Note

This set of qualitative Sulfur Standards is formulated for research evaluation of the presence of the sulfur analytes or their breakdown products.

ASTM D5762

Nitrogen in Petroleum & Petroleum Products by Boat-Inlet Chemiluminescence

Nitrogen Calibration Set

D-5762-95-CAL-SET

6 x 1 mL

Nitrogen introduced using Acridine

Description	Cat. No.	Unit
Xylene Blank	D-5762-95-BL	1 mL
Nitrogen @ 1.0 µg/mL in Xylene	D-5762-95-1X	1 mL
Nitrogen @ 5.0 µg/mL in Xylene	D-5762-95-5X	1 mL
Nitrogen @ 10 µg/mL in Xylene	D-5762-95-10X	1 mL
Nitrogen @ 50 µg/mL in Xylene	D-5762-95-50X	1 mL
Nitrogen @ 100 µg/mL in Xylene	D-5762-95-100X	1 mL

Nitrogen Calibration Set - Low Level

ASTM-P-0070-SET

6 x 1 mL

Nitrogen introduced using Aniline

Description	Cat. No.	Unit
Isooctane Blank	ASTM-P-0070-BL	1 mL
Nitrogen @ 0.5 µg/g in Isooctane	ASTM-P-0070-1X	1 mL
Nitrogen @ 1.0 µg/g in Isooctane	ASTM-P-0070-2X	1 mL
Nitrogen @ 2.0 µg/g in Isooctane	ASTM-P-0070-4X	1 mL
Nitrogen @ 5.0 µg/g in Isooctane	ASTM-P-0070-10X	1 mL
Nitrogen @ 10.0 µg/g in Isooctane	ASTM-P-0070-20X	1 mL

Low Level Nitrogen & Sulfur Calibration Set

ASTM-P-0071-SET

4 x 1 mL

The Nitrogen is introduced using Aniline, the Sulfur is introduced using di-*n*-butyl sulfide

Description	Cat. No.	Unit
Benzene Blank	ASTM-P-0071-BL	1 mL
Nitrogen @ 0.25 µg/g & Sulfur @ 0.25 µg/g in Benzene	ASTM-P-0071-01	1 mL
Nitrogen @ 0.50 µg/g & Sulfur @ 0.50 µg/g in Benzene	ASTM-P-0071-02	1 mL
Nitrogen @ 1.00 µg/g & Sulfur @ 1.00 µg/g in Benzene	ASTM-P-0071-03	1 mL

Stock Nitrogen Standard

D-5762-95-500X-PAK

5 x 1 mL

Nitrogen @ 500 µg/mL in Xylene (Acridine @ 6397 µg/mL)

Technical Note

Standards are prepared by adding well characterized nitrogen and/or sulfur compounds gravimetrically to the matrix. Since the matrix may contain some native nitrogen and/or sulfur, a blank must be used for background correction and should be purchased with the standard.

ASTM D5769

Benzene, Toluene & Total Aromatics in Finished Gasoline by GC-MS

TIER 3 STANDARDS

Quality Control Standards to determine benzene, toluene, and total aromatics in finished gasoline, including gasolines containing oxygenated blending components by GC-MS.

Calibration Curve with No Internal Standard

Six Level Calibration Curve without Internal Standard

D-5769-CAL6-5ML-SET

D-5769-CAL6-10ML-SET

6 x 5 mL

6 x 10 mL

Core Calibration Mix 24 comps.	Std. 1 Target Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%	Std. 6 Wt.%
Benzene	5.25	2.95	1.575	0.8144	0.4143	4.16
Toluene	19.67	11.06	5.898	3.0505	1.5519	16.41
Ethylbenzene	5.18	2.91	1.552	0.8026	0.4083	4.10
<i>m</i> -Xylene	6.19	3.48	1.856	0.9598	0.4883	4.91
<i>p</i> -Xylene	6.19	3.48	1.856	0.9598	0.4883	4.91
<i>o</i> -Xylene	6.30	3.54	1.890	0.9776	0.4973	5.00
Isopropylbenzene	3.09	1.74	0.925	0.4786	0.2435	2.45
<i>n</i> -Propylbenzene	3.09	1.74	0.926	0.4787	0.2435	2.45
3-Ethyltoluene	3.10	1.74	0.928	0.4801	0.2442	2.45
4-Ethyltoluene	3.08	1.73	0.925	0.4782	0.2433	2.44
1,3,5-Trimethylbenzene	3.10	1.74	0.929	0.4804	0.2444	2.46
2-Ethyltoluene	3.15	1.77	0.945	0.4890	0.2488	2.50
1,2,4-Trimethylbenzene	5.23	2.94	1.567	0.8104	0.4123	4.14
1,2,3-Trimethylbenzene	3.20	1.80	0.960	0.4965	0.2526	2.54
Indan	3.45	1.94	1.034	0.5350	0.2722	2.73
1,4-Diethylbenzene	3.09	1.74	0.925	0.4786	0.2435	2.45
<i>n</i> -Butylbenzene	3.08	1.73	0.923	0.4776	0.2430	2.44
1,2-Diethylbenzene	3.15	1.77	0.945	0.4885	0.2485	2.50
1,2,4,5-Tetramethylbenzene	2.12	1.19	0.635	0.3284	0.1671	1.68
1,2,3,5-Tetramethylbenzene	2.12	1.19	0.637	0.3295	0.1676	1.68
Naphthalene	2.37	1.34	0.712	0.3683	0.1874	1.88
1-Methylnaphthalene	2.37	1.34	0.712	0.3683	0.1874	1.88
2-Methylnaphthalene	2.43	1.37	0.730	0.3773	0.1919	1.93
Isooctane	-----	43.77	70.015	84.4922	92.1105	19.92

Five Level Calibration Curve Without Internal Standard

D-5769-CAL-5ML-SET

5 x 5 mL (Std. 1 - 5)

D-5769-CAL-10ML-SET

5 x 10 mL (Std. 1 - 5)

Additional Calibration Level Without Internal Standard

D-5769-ADD-5ML

1 x 5 mL (Std. 6)

D-5769-ADD-10ML

1 x 10 mL (Std. 6)

Technical Note

A sixth standard has been formulated to improve the linearity at the high end of the calibration curve. This can be helpful in the quantification of gasoline containing high levels of toluene.

Calibration Amounts

Each analyte is weighed. Actual weights and weight percents are provided on CD.



Daily Quality Control Standard Without Internal Standard

D-5769-QC-15ML

1 x 15 mL

D-5769-QC-15ML-PAK

5 x 15 mL

D-5769-QC-10ML

1 x 10 mL

D-5769-QC-10ML-PAK

SAVE 5 x 10 mL

At stated Wt. %

14 comps.

<i>n</i> -Hexane	12	Toluene	9
<i>n</i> -Heptane	17	Ethylbenzene	3
<i>n</i> -Octane	17	<i>m</i> -Xylene	3
<i>n</i> -Decane	12	<i>o</i> -Xylene	3
<i>n</i> -Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	2
Benzene	1	Naphthalene	1

4 component Deuterated Internal Standard

M-GRA-IS-R-10ML

1 x 10 mL

M-GRA-IS-R-10ML-PAK

SAVE 5 x 10 mL

At stated Wt. %

4 comps.

Benzene-d ₆	16.67
Ethylbenzene-d ₁₀	16.65
Naphthalene-d ₈	8.77
Toluene-d ₈	57.91

3 component Deuterated Internal Standard

M-GRA-IS-5ML

1 x 5 mL

M-GRA-IS-5ML-PAK

SAVE 5 x 5 mL

At stated Wt. %

3 comps.

Benzene-d ₆	40
Ethylbenzene-d ₁₀	40
Naphthalene-d ₈	20



Calibration Curve with 3 Component Internal Standard

Six Level Calibration Curve with Internal Standard

D-5769-CAL6-IS-SET
6 x 1 mL

Core Calibration Mix 24 Comps.	Std. 1 Target Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%	Std. 6 Wt.%
Benzene	5.25	2.95	1.575	0.8144	0.4143	4.16
Toluene	19.67	11.06	5.898	3.0505	1.5519	16.41
Ethylbenzene	5.18	2.91	1.552	0.8026	0.4083	4.10
<i>m</i> -Xylene	6.19	3.48	1.856	0.9598	0.4883	4.91
<i>p</i> -Xylene	6.19	3.48	1.856	0.9598	0.4883	4.91
<i>o</i> -Xylene	6.30	3.54	1.890	0.9776	0.4973	5.00
Isopropylbenzene	3.09	1.74	0.925	0.4786	0.2435	2.45
<i>n</i> -Propylbenzene	3.09	1.74	0.926	0.4787	0.2435	2.45
3-Ethyltoluene	3.10	1.74	0.928	0.4801	0.2442	2.45
4-Ethyltoluene	3.08	1.73	0.925	0.4782	0.2433	2.44
1,3,5-Trimethylbenzene	3.10	1.74	0.929	0.4804	0.2444	2.46
2-Ethyltoluene	3.15	1.77	0.945	0.4890	0.2488	2.50
1,2,4-Trimethylbenzene	5.23	2.94	1.567	0.8104	0.4123	4.14
1,2,3-Trimethylbenzene	3.20	1.80	0.960	0.4965	0.2526	2.54
Indan	3.45	1.94	1.034	0.5350	0.2722	2.73
1,4-Diethylbenzene	3.09	1.74	0.925	0.4786	0.2435	2.45
<i>n</i> -Butylbenzene	3.08	1.73	0.923	0.4776	0.2430	2.44
1,2-Diethylbenzene	3.15	1.77	0.945	0.4885	0.2485	2.50
1,2,4,5-Tetramethylbenzene	2.12	1.19	0.635	0.3284	0.1671	1.68
1,2,3,5-Tetramethylbenzene	2.12	1.19	0.637	0.3295	0.1676	1.68
Naphthalene	2.37	1.34	0.712	0.3683	0.1874	1.88
1-Methylnaphthalene	2.37	1.34	0.712	0.3683	0.1874	1.88
2-Methylnaphthalene	2.43	1.37	0.730	0.3773	0.1919	1.93
Isooctane	-----	43.77	70.015	84.4922	92.1105	19.92

Internal Standard

3 Comps.	Target Wt.%	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%
Benzene-d ₆	2	2	2	2	2	2
Ethylbenzene-d ₁₀	2	2	2	2	2	2
Naphthalene-d ₈	1	1	1	1	1	1

Daily Quality Control Standard

With Internal Standard
D-5769-QC-IS-15ML
1 x 15 mL
D-5769-QC-IS-15ML-PAK
SAVE 5 x 15 mL
D-5769-QC-IS-5ML
1 x 5 mL
D-5769-QC-IS-5ML-PAK
SAVE 5 x 5 mL
At stated Wt.%
17 comps.

<i>n</i> -Hexane	12	Toluene	9
<i>n</i> -Heptane	17	Ethylbenzene	3
<i>n</i> -Octane	17	<i>m</i> -Xylene	3
<i>n</i> -Decane	12	<i>o</i> -Xylene	3
<i>n</i> -Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	2
Benzene	1	Naphthalene	1

Includes
M-GRA-IS (3 comp. mix) added in 5 to 100 weight ratio

Resolution Standard

M-GRA-RES
1 x 1 mL
M-GRA-RES-PAK
SAVE 5 x 1 mL
At stated Wt.%
3 comps.

1,3,5-Trimethylbenzene	3.0
1-Methyl-2-ethylbenzene	3.0
Isooctane	94.0

Deuterated Internal Standard Mix

M-GRA-IS-5ML
1 x 5 mL
M-GRA-IS-5ML-PAK
SAVE 5 x 5 mL
At stated Wt.%
3 comps.

Benzene-d ₆	40	Naphthalene-d ₈	20
Ethylbenzene-d ₁₀	40		

Sensitivity Test Solution

M-GRA-ST
1 x 1 mL
M-GRA-ST-PAK
SAVE 5 x 1 mL
100 µg/mL in Isooctane

1,4-Diethylbenzene

Fragmentation Pattern Standard

M-GRA-FP
1 x 1 mL
M-GRA-FP-PAK
SAVE 5 x 1 mL
3.0 Wt. % in Isooctane

1,2,3-Trimethylbenzene

Mass Scan Range Standard

M-GRA-MSR
1 x 1 mL
M-GRA-MSR-PAK
SAVE 5 x 1 mL
3.0 Wt. % in Isooctane

Toluene

Five Level Calibration Curve with ISTD

D-5769-CAL-IS-SET
5 x 1 mL
(Std. 1 to Std 5)

Additional Calibration Level with ISTD

D-5769-ADD-IS
1 x 1 mL
(Std. 6)

Technical Note

A sixth standard has been formulated to improve the linearity at the high end of the calibration curve. This can be helpful in the quantification of gasoline containing high levels of toluene.

Calibration Amounts

Each analyte is weighed. Actual weights and weight percents are provided on CD.



The M-GRA-IS Internal Standard mix is added on top of the 24 core comps. to formulate a complete calibration solution containing 27 comps.

With 4 Component Internal Standard (includes Toluene-d₈)

Six Level Calibration Curve with Deuterated Toluene

With Internal Standard

D-5769-CAL6-IS-R-SET
6 x 1 mL

Core Calibration Mix 24 Comps.	Target Wt.%	Std. 1 Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%	Std. 6 Wt.%
Benzene	5.25	2.95	1.575	0.8144	0.4143	4.16	
Toluene	19.67	11.06	5.898	3.0505	1.5519	16.41	
Ethylbenzene	5.18	2.91	1.552	0.8026	0.4083	4.10	
<i>m</i> -Xylene	6.19	3.48	1.856	0.9598	0.4883	4.91	
<i>p</i> -Xylene	6.19	3.48	1.856	0.9598	0.4883	4.91	
<i>o</i> -Xylene	6.30	3.54	1.890	0.9776	0.4973	5.00	
Isopropylbenzene	3.09	1.74	0.925	0.4786	0.2435	2.45	
<i>n</i> -Propylbenzene	3.09	1.74	0.926	0.4787	0.2435	2.45	
3-Ethyltoluene	3.10	1.74	0.928	0.4801	0.2442	2.45	
4-Ethyltoluene	3.08	1.73	0.925	0.4782	0.2433	2.44	
1,3,5-Trimethylbenzene	3.10	1.74	0.929	0.4804	0.2444	2.46	
2-Ethyltoluene	3.15	1.77	0.945	0.4890	0.2488	2.50	
1,2,4-Trimethylbenzene	5.23	2.94	1.567	0.8104	0.4123	4.14	
1,2,3-Trimethylbenzene	3.20	1.80	0.960	0.4965	0.2526	2.54	
Indan	3.45	1.94	1.034	0.5350	0.2722	2.73	
1,4-Diethylbenzene	3.09	1.74	0.925	0.4786	0.2435	2.45	
<i>n</i> -Butylbenzene	3.08	1.73	0.923	0.4776	0.2430	2.44	
1,2-Diethylbenzene	3.15	1.77	0.945	0.4885	0.2485	2.50	
1,2,4,5-Tetramethylbenzene	2.12	1.19	0.635	0.3284	0.1671	1.68	
1,2,3,5-Tetramethylbenzene	2.12	1.19	0.637	0.3295	0.1676	1.68	
Naphthalene	2.37	1.34	0.712	0.3683	0.1874	1.88	
1-Methylnaphthalene	2.37	1.34	0.712	0.3683	0.1874	1.88	
2-Methylnaphthalene	2.43	1.37	0.730	0.3773	0.1919	1.93	
Isooctane	-----	43.77	70.015	84.4922	92.1105	19.92	

Internal Standard

4 Comps.	Target Wt.%	Wt.%	Wt.%	Wt.%	Wt.%	Wt.%
Benzene-d ₆	2	2	2	2	2	2
Ethylbenzene-d ₁₀	2	2	2	2	2	2
Naphthalene-d ₈	1	1	1	1	1	1
Toluene-d ₈	7	7	7	7	7	7

Daily Quality Control Standard

With Internal Standard

D-5769-QC-IS-R-5ML
1 x 5 mL
D-5769-QC-IS-R-5ML-PAK
SAVE 5 x 5 mL
D-5769-QC-IS-15ML
1 x 15 mL
At stated Wt. %
18 comps.

<i>n</i> -Hexane	12	Toluene	9
<i>n</i> -Heptane	17	Ethylbenzene	3
<i>n</i> -Octane	17	<i>m</i> -Xylene	3
<i>n</i> -Decane	12	<i>o</i> -Xylene	3
<i>n</i> -Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	2
Benzene	1	Naphthalene	1

Includes M-GRA-IS-R (4 comp.) added in 12 to 100 weight ratio

Deuterated Internal Standard Mix

M-GRA-IS-R-10ML
1 x 10 mL
M-GRA-IS-R-10ML-PAK
SAVE 5 x 10 mL
At stated Wt. %
4 comps.

Benzene-d ₆	16.67	Naphthalene-d ₈	8.77
Ethylbenzene-d ₁₀	16.65	Toluene-d ₈	57.91

Five Level Calibration Curve with ISTD

D-5769-CAL-IS-R-SET
5 x 1 mL
(Std. 1 to Std 5)

Additional Calibration Level with ISTD

D-5769-ADD-IS-R
1 x 1 mL
(Std. 6)

Technical Note

A sixth standard has been formulated to improve the linearity at the high end of the calibration curve. This can be helpful in the quantification of gasoline containing high levels of toluene.

Calibration Amounts

Each analyte is weighed. Actual weights and weight percents are provided on CD.



The M-GRA-IS-R Internal Standard mix is added on top of the 24 core comps. to formulate a complete calibration solution containing 28 comps.

Sensitivity Test Solution

M-GRA-ST
1 x 1 mL
M-GRA-ST-PAK
SAVE 5 x 1 mL
100 µg/mL in Isooctane

1,4-Diethylbenzene

Resolution Standard

M-GRA-RES
1 x 1 mL
M-GRA-RES-PAK
SAVE 5 x 1 mL
At stated Wt. %
3 comps.

1,3,5-Trimethylbenzene	3.0
1-Methyl-2-ethylbenzene	3.0
Isooctane	94.0

Fragmentation Pattern Standard

M-GRA-FP
1 x 1 mL
M-GRA-FP-PAK
SAVE 5 x 1 mL
3.0 Wt. % in Isooctane

1,2,3-Trimethylbenzene

These standards and methods are used in the monitoring of total aromatics according to the methods and amendments to the US Clean Air Act. Amendments containing more stringent specifications are in effect and can be found listed under this method.

Calibration Curve with 3 Component Deuterated Internal Standard Added

Aromatics Calibration Standards Kit

Internal Standard Version

M-GRA-CAL-IS-SET

Core Calibration Mix 24 Comps.	Target Vol. %	5 x 1 mL				
		Std. 1 Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %
Benzene	3	1.50	0.75	0.375	0.1875	
Toluene	19	9.50	4.75	2.375	1.1875	
Ethylbenzene	5	2.50	1.25	0.625	0.3125	
<i>m</i> -Xylene	6	3.00	1.50	0.750	0.3750	
<i>p</i> -Xylene	6	3.00	1.50	0.750	0.3750	
<i>o</i> -Xylene	6	3.00	1.50	0.750	0.3750	
Isopropylbenzene	3	1.50	0.75	0.375	0.1875	
<i>n</i> -Propylbenzene	3	1.50	0.75	0.375	0.1875	
3-Ethyltoluene	3	1.50	0.75	0.375	0.1875	
4-Ethyltoluene	3	1.50	0.75	0.375	0.1875	
1,3,5-Trimethylbenzene	3	1.50	0.75	0.375	0.1875	
2-Ethyltoluene	3	1.50	0.75	0.375	0.1875	
1,2,4-Trimethylbenzene	5	2.50	1.25	0.625	0.3125	
1,2,3-Trimethylbenzene	3	1.50	0.75	0.375	0.1875	
Indan	3	1.50	0.75	0.375	0.1875	
1,4-Diethylbenzene	3	1.50	0.75	0.375	0.1875	
<i>n</i> -Butylbenzene	3	1.50	0.75	0.375	0.1875	
1,2-Diethylbenzene	3	1.50	0.75	0.375	0.1875	
1,2,4,5-Tetramethylbenzene	2	1.00	0.50	0.250	0.1250	
1,2,3,5-Tetramethylbenzene	2	1.00	0.50	0.250	0.1250	
Naphthalene	2	1.00	0.50	0.250	0.1250	
Pentamethylbenzene	2	1.00	0.50	0.250	0.1250	
1-Methylnaphthalene	2	1.00	0.50	0.250	0.1250	
2-Methylnaphthalene	2	1.00	0.50	0.250	0.1250	
Isooctane	--	47.5	71.25	83.15	89.05	

Internal Standard

Benzene-d ₆	2	2	2	2	2
Ethylbenzene-d ₁₀	2	2	2	2	2
Naphthalene-d ₈	1	1	1	1	1

Optional Sixth Standard

Internal Standard Added

M-GRA-ADD-IS

Core Calibr. Mix 24 Comps.	Optional Std. 6 Target Vol. %	1 x 1 mL	
		Vol. %	Weight
Benzene	2.25		
Toluene	15		
Ethylbenzene	3.75		
<i>m</i> -Xylene	4.50		
<i>p</i> -Xylene	4.50		
<i>o</i> -Xylene	4.50		
Isopropylbenzene	2.25		
<i>n</i> -Propylbenzene	2.25		
3-Ethyltoluene	2.25		
4-Ethyltoluene	2.25		
1,3,5-Trimethylbenzene	2.25		
2-Ethyltoluene	2.25		
1,2,4-Trimethylbenzene	3.75		
1,2,3-Trimethylbenzene	2.25		
Indan	2.25		
1,4-Diethylbenzene	2.25		
<i>n</i> -Butylbenzene	2.25		
1,2-Diethylbenzene	2.25		
1,2,4,5-Tetramethylbenzene	4.0		
1,2,3,5-Tetramethylbenzene	1.5		
Naphthalene	1.5		
Pentamethylbenzene	1.5		
1-Methylnaphthalene	1.5		
2-Methylnaphthalene	1.5		
Isooctane	20.5		

Internal Standard

Benzene-d ₆	2
Ethylbenzene-d ₁₀	2
Naphthalene-d ₈	1

Calibration Amounts

Each analyte is weighed. Actual weights and weight percents are provided on CD.



The M-GRA-IS ISTD mix is added on top of the 24 core comps. to formulate a complete calibration solution containing 27 comps.

Daily Quality Control Standard

Without Internal Standard

M-GRA-QC-10ML
M-GRA-QC-10ML-PAK

At stated Wt. %

1 x 10 mL
SAVE 5 x 10 mL
 13 comps.

<i>n</i> -Hexane	12	Toluene	9
<i>n</i> -Heptane	17	Ethylbenzene	3
<i>n</i> -Octane	17	<i>m</i> -Xylene	3
<i>n</i> -Decane	12	<i>o</i> -Xylene	3
<i>n</i> -Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	3
Benzene	1		

Daily Quality Control Standard

With Internal Standard

M-GRA-QC-IS-5ML
M-GRA-QC-IS-5ML-PAK

At stated Wt. %

1 x 5 mL
SAVE 5 x 5 mL
 16 comps.

<i>n</i> -Hexane	12	Toluene	9
<i>n</i> -Heptane	17	Ethylbenzene	3
<i>n</i> -Octane	17	<i>m</i> -Xylene	3
<i>n</i> -Decane	12	<i>o</i> -Xylene	3
<i>n</i> -Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	3
Benzene	1		
		13 comp. Core Mix	100

Internal Standard

Benzene-d ₆	2
Ethylbenzene-d ₁₀	2
Naphthalene-d ₈	1

ASTM/EPA Sensitivity Test Solution

M-GRA-ST
M-GRA-ST-PAK

100 µg/mL in Isooctane

1 x 1 mL
SAVE 5 x 1 mL

1,4-Diethylbenzene

3 Comp. Deuterated Internal Std. Mix

M-GRA-IS-5ML
M-GRA-IS-5ML-PAK

At stated Wt. %

1 x 5 mL
SAVE 5 x 5 mL
 3 comps.

Benzene-d ₆	40	Naphthalene-d ₈	20
Ethylbenzene-d ₁₀	40		

Aromatics for Analysis by GC-MS (Daily QC Standards) Sets

Original Formulations

M-GRA-K1-SET

Set

Revision 5 F

M-GRA-K2-SET

Set

Set includes:

Set includes:	Units
M-GRA-CAL-IS-SET	5 x 1 mL
M-GRA-QC-IS-5ML	1 x 5 mL
M-GRA-IS-5ML	1 x 5 mL
M-GRA-ST	1 x 1 mL

Set includes:

Set includes:	Units
M-GRA-CAL-IS-SET	5 x 1 mL
M-GRA-ADD-IS	1 x 1 mL
M-GRA-QC-IS-5ML	1 x 5 mL
M-GRA-IS-5ML	1 x 5 mL
M-GRA-ST	1 x 1 mL

Calibration Curve with 4 Component Deuterated Internal Standard Added

Aromatics Calibration Standards Kit

With Internal Standard

M-GRA-CAL-R-IS-R-SET

Core Calibration Mix 24 comps.	5 x 1 mL				
	Std. 1 Target Wt.%	Std. 2 Wt.%	Std. 3 Wt.%	Std. 4 Wt.%	Std. 5 Wt.%
Benzene	3.13	1.78	0.95	0.490	0.2490
Toluene	19.65	11.11	5.90	3.058	1.5547
Ethylbenzene	5.12	2.92	1.55	0.805	0.4090
<i>m</i> -Xylene	6.27	3.50	1.86	0.962	0.4891
<i>p</i> -Xylene	6.33	3.50	1.86	0.962	0.4891
<i>o</i> -Xylene	6.51	3.56	1.89	0.980	0.4891
Isopropylbenzene	3.06	1.74	0.93	0.480	0.2439
<i>n</i> -Propylbenzene	3.04	1.74	0.93	0.480	0.2440
3-Ethyltoluene	3.08	1.75	0.93	0.481	0.2446
4-Ethyltoluene	3.05	1.74	0.93	0.479	0.2437
1,3,5-Trimethylbenzene	3.07	1.75	0.93	0.481	0.2448
2-Ethyltoluene	3.14	1.78	0.95	0.490	0.2492
1,2,4-Trimethylbenzene	5.18	2.95	1.57	0.812	0.4130
1,2,3-Trimethylbenzene	3.19	1.81	0.96	0.498	0.2530
Indan	3.46	1.95	1.04	0.536	0.2726
1,4-Diethylbenzene	3.04	1.74	0.93	0.480	0.2439
<i>n</i> -Butylbenzene	3.05	1.74	0.92	0.479	0.2434
1,2-Diethylbenzene	3.22	1.78	0.95	0.490	0.2489
1,2,4,5-Tetramethylbenzene	2.10	1.20	0.64	0.329	0.1674
1,2,3,5-Tetramethylbenzene	2.09	1.20	0.64	0.330	0.1679
Naphthalene	2.35	1.34	0.71	0.369	0.1877
Pentamethylbenzene	2.16	1.23	0.66	0.340	0.1727
1-Methylnaphthalene	2.23	1.34	0.71	0.369	0.1877
2-Methylnaphthalene	2.41	1.37	0.73	0.378	0.1922
Isooctane	----	43.47	69.96	84.441	92.0905
Internal Standard	<i>At stated Wt. %</i>				
Benzene-d ₆	16.57	16.57	16.57	16.57	16.57
Ethylbenzene-d ₁₀	16.76	16.76	16.76	16.76	16.76
Naphthalene-d ₈	8.78	8.78	8.78	8.78	8.78
Toluene-d ₈	57.88	57.88	57.88	57.88	57.88

Optional Sixth Standard

With Internal Standard

M-GRA-ADD-IS-R
1 x 1 mL

Core Calibr. Mix 24 comps.	Optional Std. 6 Target Wt.%
	Benzene
Toluene	16.29
Ethylbenzene	4.07
<i>m</i> -Xylene	4.87
<i>p</i> -Xylene	4.87
<i>o</i> -Xylene	4.96
Isopropylbenzene	2.43
<i>n</i> -Propylbenzene	2.43
3-Ethyltoluene	2.44
4-Ethyltoluene	2.43
1,3,5-Trimethylbenzene	2.44
2-Ethyltoluene	2.48
1,2,4-Trimethylbenzene	4.11
1,2,3-Trimethylbenzene	2.52
Indan	2.71
1,4-Diethylbenzene	2.43
<i>n</i> -Butylbenzene	2.42
1,2-Diethylbenzene	2.48
1,2,4,5-Tetramethylbenzene	4.44
1,2,3,5-Tetramethylbenzene	1.67
Naphthalene	1.87
Pentamethylbenzene	1.72
1-Methylnaphthalene	1.87
2-Methylnaphthalene	1.91
Isooctane	17.67
M-GRA-IS-R (ISTD)	<i>At stated Wt. %</i>
Benzene-d ₆	16.57
Ethylbenzene-d ₁₀	16.76
Naphthalene-d ₈	8.78
Toluene-d ₈	57.88

Technical Note

This set of calibration solutions was formulated to improve the quantification of toluene by using toluene-d₈ as an additional ISTD.

The M-GRA-IS-R ISTD mix is add ton top of the 24 core comps. to formulate a complete calibration solution containing 28 comps.

Daily Quality Control Standard

Without Internal Standard

M-GRA-QC-10ML
1 x 10 mL
M-GRA-QC-10ML-PAK
SAVE 5 x 10 mL
At stated Wt. %
13 comps.

<i>n</i> -Hexane	12	Toluene	9
<i>n</i> -Heptane	17	Ethylbenzene	3
<i>n</i> -Octane	17	<i>m</i> -Xylene	3
<i>n</i> -Decane	12	<i>o</i> -Xylene	3
<i>n</i> -Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	3
Benzene	1		

Deuterated Internal Standard Mix

M-GRA-IS-R-10ML
1 x 10 mL
M-GRA-IS-R-10ML-PAK
SAVE 5 x 10 mL
At stated Wt. %
4 comps.

Benzene-d ₆	16.67	Naphthalene-d ₈	8.77
Ethylbenzene-d ₁₀	16.65	Toluene-d ₈	57.91

ASTM/EPA Sensitivity Test Solution

M-GRA-ST
1 x 1 mL
M-GRA-ST-PAK
SAVE 5 x 1 mL
100 µg/mL in Isooctane

1,4-Diethylbenzene

Daily Quality Control Standard

With Internal Standard

M-GRA-QC-IS-R-5ML
1 x 5 mL
M-GRA-QC-IS-R-5ML-PAK
SAVE 5 x 5 mL
At stated Wt. %
17 comps.

<i>n</i> -Hexane	12	Toluene	9
<i>n</i> -Heptane	17	Ethylbenzene	3
<i>n</i> -Octane	17	<i>m</i> -Xylene	3
<i>n</i> -Decane	12	<i>o</i> -Xylene	3
<i>n</i> -Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	3
Benzene	1		
		Core Mix (13 comps.)	100

Internal Standard

Benzene-d ₆	2
Ethylbenzene-d ₁₀	2
Naphthalene-d ₈	1
Toluene-d ₈	7

The M-GRA-IS-R ISTD mix is added on top of the 13 core comp to formulate a 17 comp QC-IS-R solution.

Aromatics for Analysis by GC-MS (Daily QC Standards) Set

4 Component ISTD Formulations

M-GRA-K4-SET
Set
Set includes:
Units

M-GRA-CAL-R-IS-R-SET	5 x 1 mL
M-GRA-ADD-IS-R	1 x 1 mL
M-GRA-QCR-IS-R-5ML	1 x 5 mL
M-GRA-IS-R-10ML	1 x 10 mL
M-GRA-ST	1 x 1 mL

ASTM Methods

ASTM D5769

Benzene, Toluene & Total Aromatics in Finished Gasoline by GC-MS (continued)

TIER 3 STANDARDS

Special QA/QC Formulations

Daily QC Standard

Without Internal Standard

M-GRA-QC-R-10ML 1 x 10 mL
M-GRA-QC-R-10ML-PAK SAVE 5 x 10 mL
 At stated Wt. % 15 comps.

<i>n</i> -Hexane	12	Ethylbenzene	3
<i>n</i> -Heptane	17	<i>m</i> -Xylene	3
<i>n</i> -Octane	17	<i>o</i> -Xylene	3
<i>n</i> -Decane	12	1,2,4-Trimethylbenzene	3
<i>n</i> -Dodecane	5	1,2,4,5-Tetramethylbenzene	1
Isooctane	12	Pentamethylbenzene	1
Benzene	1	1-Methylnaphthalene	1
Toluene	9		

For use with any M-GRA Calibration Curve

Daily QC Standard

With Internal Standard M-GRA-IS-R

M-GRA-QCR-IS-R-5ML 1 x 5 mL
M-GRA-QCR-IS-R-5ML-PAK SAVE 5 x 5 mL
 At stated Wt. % 19 comps.

<i>n</i> -Hexane	12	Ethylbenzene	3
<i>n</i> -Heptane	17	<i>m</i> -Xylene	3
<i>n</i> -Octane	17	<i>o</i> -Xylene	3
<i>n</i> -Decane	12	1,2,4-Trimethylbenzene	3
<i>n</i> -Dodecane	5	1,2,4,5-Tetramethylbenzene	1
Isooctane	12	Pentamethylbenzene	1
Benzene	1	1-Methylnaphthalene	1
Toluene	9		

Includes M-GRA-IS-R (4 comp.) combined with the above Core Mix (15 comp.) in a 12 to 100 weight ratio.

Deuterated Internal Standard

M-GRA-IS-R-10ML 1 x 10 mL
M-GRA-IS-R-10ML-PAK SAVE 5 x 10 mL
 At stated Wt. % 4 comps.

Benzene-d ₆	16.67
Ethylbenzene-d ₁₀	16.65
Naphthalene-d ₈	8.77
Toluene-d ₈	57.91

Deuterated Internal Standard

M-GRA-IS-5ML 1 x 5 mL
M-GRA-IS-5ML-PAK SAVE 5 x 5 mL
 At stated Wt. % 3 comps.

Benzene-d ₆	40	Naphthalene-d ₈	20
Ethylbenzene-d ₁₀	40		

ASTM D5769

Additional Internal, Deuterated and Quality Control

TIER 3 STANDARDS

Deuterated Internal Standard

ASTM-P-0140-IS 1 x 10 mL
ASTM-P-0140-IS-PAK SAVE 5 x 10 mL
 At stated Wt. % 4 comps.

Benzene-d ₆	2	Naphthalene-d ₈	1
Ethylbenzene-d ₁₀	2	Isooctane	balance

Deuterated Internal Standard

ASTM-P-0140-IS2 1 x 10 mL
ASTM-P-0140-IS2-PAK SAVE 5 x 10 mL
 At stated Wt. % 5 comps.

Benzene-d ₆	2	Toluene-d ₈	7
Ethylbenzene-d ₁₀	2	Isooctane	balance
Naphthalene-d ₈	1		

Performance Evaluation Standard

ASTM-P-0140-PES 1 x 1 mL
ASTM-P-0140-PES-PAK SAVE 5 x 1 mL
 At stated Wt. % 11 comps.

Benzene	1
1,2-Diethylbenzene	0.005
1,3,5-Trimethylbenzene	1
1-Methyl-2-ethylbenzene	1
Styrene	0.1
Indene	0.1
Biphenyl	0.1
1,2,4,5-Tetramethylbenzene	1
1,2,3,5-Tetramethylbenzene	1
Hexadecane	1
Isooctane:Toluene (50:50)	balance

Composition of Daily QC Standard

ASTM-P-0140-QC 1 x 10 mL
ASTM-P-0140-QC-PAK SAVE 5 x 10 mL
 At stated Wt. % 9 comps.

Benzene	1
Toluene	10
Ethylbenzene	3
1,3-Dimethylbenzene	6
1,2-Dimethylbenzene	3
1,2,4-Trimethylbenzene	3
1,2-Diethylbenzene	0.02
Naphthalene	1
Isooctane	balance

ASTM D5986

Oxygenates, Benzene, Toluene, C8-C12, Aromatics & Total Aromatics in Finished Gasolines by GC-FTIR

Daily QC Standard

Without Internal Standard

M-GRA-QC-10ML 1 x 10 mL
M-GRA-QC-10ML-PAK SAVE 5 x 10 mL
 At stated Wt. % 13 comps.

<i>n</i> -Hexane	12	Toluene	9
<i>n</i> -Heptane	17	Ethylbenzene	3
<i>n</i> -Octane	17	<i>m</i> -Xylene	3
<i>n</i> -Decane	12	<i>o</i> -Xylene	3
<i>n</i> -Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	3
Benzene	1		

Technical Note

This quality control standard was formulated to meet Section 11 of ASTM D-5986 specification which stipulates "analyze the quality control reference material before every batch of samples. Bracket the samples with the reference materials".

ASTM D6258

Solvent Red 164 Dye Concentration in Diesel Fuels

Stock Solvent Red 26 Standard

D-6258-CONC-5ML

1 x 5 mL

Solvent Red 26 @ 300 µg/mL in Xylene

Technical Note

Although Solvent Red 164 is the dye used in fuel, Solvent Red 26 has an identical spectrum profile.

D-6258 Calibration Curve

D-6258-5ML-SET

6 x 5 mL

	Cat. No	Unit
Xylene Blank	D-6258-BL	1 x 5 mL
Solvent Red 26 Dye @ 3 µg/mL in Xylene	D-6258-01	1 x 5 mL
Solvent Red 26 Dye @ 6 µg/mL in Xylene	D-6258-02	1 x 5 mL
Solvent Red 26 Dye @ 9 µg/mL in Xylene	D-6258-03	1 x 5 mL
Solvent Red 26 Dye @ 12 µg/mL in Xylene	D-6258-04	1 x 5 mL
Solvent Red 26 Dye @ 15 µg/mL in Xylene	D-6258-05	1 x 5 mL

ASTM D6296

Total Olefins in Spark-Ignition Engine Fuels by Multidimensional GC

System Setup & Verification Standard Set

D-6296-VER-SET

2 x 1 mL

D-6296-VER-SET-PAK

5 x (2 x 1 mL)

D-6296-VER1, D-6296-VER2

System Setup and Verification 1

D-6296-VER1

1 x 1 mL

At stated Wt. %

2 comps.

MtBE 5
Isooctane 95

System Setup and Verification 2

D-6296-VER2

1 x 1 mL

At stated Wt. %

2 comps.

EtBE 5
Isooctane 95

Calibration Standard with MtBE

D-6296-CAL1

1 x 1 mL

D-6296-CAL1-PAK

SAVE 5 x 1 mL

At stated Wt. %

10 comps.

1-Pentene 1.0
1-Hexene 1.0
1-Heptene 1.0
1-Octene 1.0
1-Nonene 1.0
1-Decene 1.0
n-Undecane 1.0
n-Dodecane 1.0
Isooctane 87.0
MtBE 5.0

Calibration Standard with EtBE

D-6296-CAL2

1 x 1 mL

D-6296-CAL2-PAK

SAVE 5 x 1 mL

At stated Wt. %

11 comps.

1-Pentene 1.0
1-Hexene 1.0
1-Heptene 1.0
1-Octene 1.0
1-Nonene 1.0
1-Decene 1.0
n-Decane 1.0
n-Undecane 1.0
n-Dodecane 1.0
Isooctane 86.0
EtBE 5.0

Isooctane Blank Compensation Standard

D-6296-BL

1 x 5 mL

Isooctane (neat)

ASTM D6352

Boiling Range Distribution of Petroleum Distillates from 174 to 700°C by GC

Polywax 500®

ASTM-P-0051N-2G

2 grams

Polywax 500

Polywax 655®

ASTM-P-0053N-2G

2 grams

Polywax 655

Polywax 850®

ASTM-P-0137N-2G

2 grams

Polywax 850

Polywax 1000®

ASTM-P-0138N-2G

2 grams

Polywax 1000

Hydrocarbon Window Defining Std.

DRH-008S-R2

1 x 1 mL

DRH-008S-R2-PAK

SAVE 5 x 1 mL

500 µg/mL each in Chloroform

n-Octane
n-Nonane
n-Decane
n-Undecane
n-Dodecane
n-Tridecane
n-Tetradecane
n-Pentadecane
n-Hexadecane
n-Heptadecane
n-Octadecane
Pristane
n-Nonadecane
Phytane
n-Eicosane
n-Heneicosane
n-Docosane
n-Tricosane

n-Tetracosane
n-Pentacosane
n-Hexacosane
n-Heptacosane
n-Octacosane
n-Nonacosane
n-Triacontane
n-Hentriacontane
n-Dotriacontane
n-Tritriacontane
n-Tetracontane
n-Pentatriacontane
n-Hexatriacontane
n-Heptatriacontane
n-Octatriacontane
n-Nonatriacontane
n-Tetracontane

Calibration Mix

DRH-002N

100 mg

DRH-002N-10X

1 gm

At stated Wt. %

17 comps.

n-Hexane 6
n-Heptane 6
n-Octane 8
n-Nonane 8
n-Decane 12
n-Undecane 12
n-Dodecane 12
n-Tetradecane 12
n-Hexadecane 10

n-Octadecane 5
n-Eicosane 2
n-Tetracosane 2
n-Octacosane 1
n-Dotriacontane 1
n-Hexatriacontane 1
n-Tetracontane 1
n-Tetracontane 1

Column Test Mixture

D-2887

1 x 1 mL

10 mg/mL in *n*-Octane

2 comps.

n-Hexadecane

n-Octadecane

ASTM D6379

Aromatic Hydrocarbon Types in Aviation Fuels & Petroleum Distillates - HPLC method with Refractive Index

System Resolution Standards

D-6379-SRS

1 x 1 mL

D-6379-SRS-PAK

SAVE 5 x 1 mL

At stated conc. (mg/mL) in *n*-Heptane

3 comps.

Cyclohexane 10
o-Xylene 0.5
1-Methylnaphthalene 0.05

D-6379-SRS-R1

1 x 1 mL

D-6379-SRS-R1-PAK

SAVE 5 x 1 mL

At stated conc. (mg/mL) in *n*-Heptane

3 comps.

Cyclohexane 10
o-Xylene 5
1-Methylnaphthalene 0.5

Calibration Curves (Alternative Conc.)

D-6379-SET

4 x 1 mL

D-6379-SET-PAK

SAVE 5 x (4 x 1 mL)

At stated conc. (mg/mL) in *n*-Heptane

Analyte	Std. 1	Std. 2	Std. 3	Std. 4
Cyclohexane	5	2	0.5	0.1
<i>o</i> -Xylene	15	5	1.0	0.1
1-Methylnaphthalene	5	1.0	0.2	0.05

D-6379-10X-SET

4 x 1 mL

D-6379-10X-SET-PAK

5 x (4 x 1 mL)

Analyte	Std. 1	Std. 2	Std. 3	Std. 4
Cyclohexane	50	20	5	1
<i>o</i> -Xylene	150	50	10	1
1-Methylnaphthalene	50	10	2	0.5

ASTM Methods

ASTM D6550

Olefin Content of Gasolines by SFC

TIER 3 STANDARDS

Stock Olefin Calibration Standard

D-6550-CONC

D-6550-CONC-5ML

At stated Wt. %

1 x 1 mL

1 x 5 mL

15 comps.

1-Nonene	2.5	2-Methyl-1,3-butadiene	5	2-Methyl-2-pentene	10
Cyclohexene	5	4-Methyl-1-pentene	5	1-Heptene	10
1-Hexene	5	1,5-Hexadiene	3	2-Methyl-1-octene	2.5
1-Octene	5	3-Methyl-1,3-pentadiene	2	2-Methyl-1-heptene	5
1-Decene	5	2-Methyl-1-butene	25	5-Methyl-1-hexene	10

ASTM D6591-11 (IP 391)

Aromatic Hydrocarbon Types in Middle Distillates - HPLC method with Refractive Index Detection

System Performance Standard

ASTM-P-0135

1 x 5 mL

ASTM-P-0135-PAK

SAVE 5 x 5 mL

At stated conc. (mg/mL) in n-Heptane

4 comps.

Cyclohexane	10
o-Xylene	5.0
Dibenzothiophene	0.5
9-Methylanthracene	0.5

IP 391-95 Calibration Curve

ASTM-P-0136-SET

4 x 1 mL

At stated conc.(mg/mL) in n-Heptane

Analyte	Std. 1	Std. 2	Std. 3	Std. 4
Cyclohexane	50	20	5	1
o-Xylene	40	10	2.5	0.5
1-Methyl naphthalene	40	10	2.5	0.2
Phenanthrene	4	2	0.5	0.1

ASTM D6733

Spark ignition Engine Individual Components by GC

ASTM D6733 System Performance Mix

D-6733-SPM

1 mL

2% each by weight in Hexane

7 comps.

n-Pentane	2-Methylheptane
n-Heptane	4-Methylheptane
n-Octane	Toluene
n-Dodecane	

ASTM D7039

Sulfur content in fuel by XRF

Low Level Calibration Set

D-7039-LL-SET

6 x 1 mL

in (µg/g) Isooctane:Toluene (75:25)

Blank	Level 1	Level 2	Level 3	Level 4	Level 5
D-7039-LL-BK	-01	-02	-03	-04	-05
	5	10	20	40	50

High Level Calibration Set

D-7039-HL-SET

6 x 1 mL

in Isooctane:Toluene (75:25)

Blank	Level 1	Level 2	Level 3	Level 4	Level 5
D-7039-HL-BK	-01	-02	-03	-04	-05
	100	200	300	400	500

ASTM D7096

Gasoline Boiling Range Distribution by GC

D-7096-SET

2 x 1 mL (D-7096-01, D-7096-02)

D-7096-01

At stated conc. Wt. %

1 x 1 mL

17 comps.

D-7096-02

100 µg/mL in Isooctane:Ethanol (97:3)

1 x 1 mL

3 comps.

2-Methylbutane	2.5	Toluene	15.5	n-Dodecane	3.5	n-Propane	n-Butane
n-Pentane	3	n-Octane	7	n-Tridecane	4.5	2-Methylpropane	
2-Methylpentane	4	p-Xylene	16	n-Tetradecane	3		
n-Hexane	3	n-Propylbenzene	6.5	n-Pentadecane	5		
2,4-Dimethylpentane	5.5	n-Decane	4.5	n-Hexadecane	3		
n-Heptane	7.5	n-Butylbenzene	6				

ASTM Methods

ASTM D7423

Oxygenates and Hydrocarbons by GC-MS

D7423 Calibration Standard

D-7423-TP-CAL-SET

At stated conc. (µg/g) in Isooctane

7 x 1 mL
24 comps.

Blank	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
D-7423-TP-CAL	-01	-02	-03	-04	-05	-06
Acetaldehyde	10	25	50	75	100	200
Acetone	10	25	50	75	100	200
Allyl alcohol	10	25	50	75	100	200
Butanal	10	25	50	75	100	200
1-Butanol	10	25	50	75	100	200
t-Butanol	10	25	50	75	100	200
sec-Butanol	10	25	50	75	100	200
Diethyl ether	10	25	50	75	100	200
Dimethyl ether	10	25	50	75	100	200
EtBE	10	25	50	75	100	200
Ethanol	10	25	50	75	100	200
Isobutanol	10	25	50	75	100	200
Isobutyraldehyde	10	25	50	75	100	200
Isopropanol	10	25	50	75	100	200
Isopropyl ether	10	25	50	75	100	200
Isovaleraldehyde	10	25	50	75	100	200
Methanol	10	25	50	75	100	200
Methyl ethyl ketone	10	25	50	75	100	200
MtBE	10	25	50	75	100	200
Pentanal	10	25	50	75	100	200
Propanal	10	25	50	75	100	200
1-Propanol	10	25	50	75	100	200
Propyl ether	10	25	50	75	100	200
TAME	10	25	50	75	100	200

D7423 Oxygenate Standard

D-7423

Equal w/w%

1 mL
24 comps.

Acetaldehyde	Isobutyraldehyde
Acetone	Isopropanol
Allyl alcohol	Isopropyl ether
Butanal	Isovaleraldehyde
1-Butanol	Methanol
t-Butanol	Methyl ethyl ketone
sec-Butanol	MtBE
Diethyl ether	Pentanal
Dimethyl ether	Propanal
EtBE	1-Propanol
Ethanol	Propyl ether
Isobutanol	TAME

ASTM D7576

Total Aromatics in Denatured Ethanol

D-7576-SET

5 x 1 mL

At stated Wt.% (Prepared by weight)

Compounds	D-7576-01	D-7576-02	D-7576-03	D-7576-04	D-7576-05
Benzene	0.02	0.04	0.06	0.08	0.1
Toluene	0.05	0.1	0.2	0.4	0.6
Ethylbenzene	0.02	0.05	0.1	0.15	0.2
o-Xylene	0.02	0.05	0.1	0.15	0.2
1,2,4-Trimethylbenzene	0.05	0.1	0.2	0.4	0.6
2-Hexanone	1.0	1.0	1.0	1.0	1.0
Ethanol	98.8	98.7	98.3	97.8	97.3

Technical Note

This standard covers the determination of benzene and total aromatics in finished denatured fuel ethanol by gas chromatography.

D-7576-R1-SET

5 x 1 mL

At state % v/v (Prepared by volume)

Compounds	D-7576-01-R1	D-7576-02-R1	D-7576-03-R1	D-7576-04-R1	D-7576-05-R1
Benzene	0.02	0.04	0.06	0.08	0.1
Toluene	0.05	0.1	0.2	0.4	0.6
Ethylbenzene	0.02	0.05	0.1	0.15	0.2
o-Xylene	0.02	0.05	0.1	0.15	0.2
1,2,4-Trimethylbenzene	0.05	0.1	0.2	0.4	0.6
2-Hexanone	1.0	1.0	1.0	1.0	1.0
Ethanol	98.8	98.7	98.3	97.8	97.3

ASTM D7900

Light Hydrocarbons by GC

ASTM D7900 Valve Timing Mixture

D-7900-VTM

1 mL

At stated conc. (%w/w).

n-Pentane	1	n-Nonane	1
n-Hexane	1	n-Decane	1
n-Heptane	1	n-Hexadecane	94
n-Octane	1		

ASTM Methods

ASTM D8071

Hydrocarbon Analysis by GC-VUV

Hydrocarbon Analysis

ASTM-P-VUV-01-SVM

At stated conc. by %w/w

						1 mL	
						28 comps.	
Cyclopentane	1.1	4-Methyl-1-hexene	1.6	n-Decane	4.5	Ethylbenzene	4.5
n-Pentane	1.1	n-Heptane	3.5	n-Undecane	3.5	o-Xylene	4
Cyclohexane	2.1	1,2-Dimethylcyclohexane	5	n-Dodecane	3.5	n-Propylbenzene	5
2,3-Dimethylbutane	2.1	Isooctane	5	Benzene	2.2	1,2,4-Trimethylbenzene	4.5
n-Hexane	2.1	n-Octane	5	Toluene	2.2	1,2,3-Trimethylbenzene	5
1-Hexene	1.5	1,2,4-Trimethylcyclohexane	4	trans-Decahydronaphthalene	4	1,2,4,5-Tetramethylbenzene	5
Methylcyclohexane	4	n-Nonane	4.5	n-Tetradecane	4.5	Pentamethylbenzene	5

ASTM D8305

Aromatic Hydrocarbons and Polynuclear Aromatic Hydrocarbons in Aviation Fuel

ASTM D8305 Performance Mix

D-8305-PM

At stated conc. (%w/w)

		1 mL	
		4 comps.	
n-Hexadecane	75	Tetralin	3
Toluene	20	Naphthalene	2

ASTM D8368

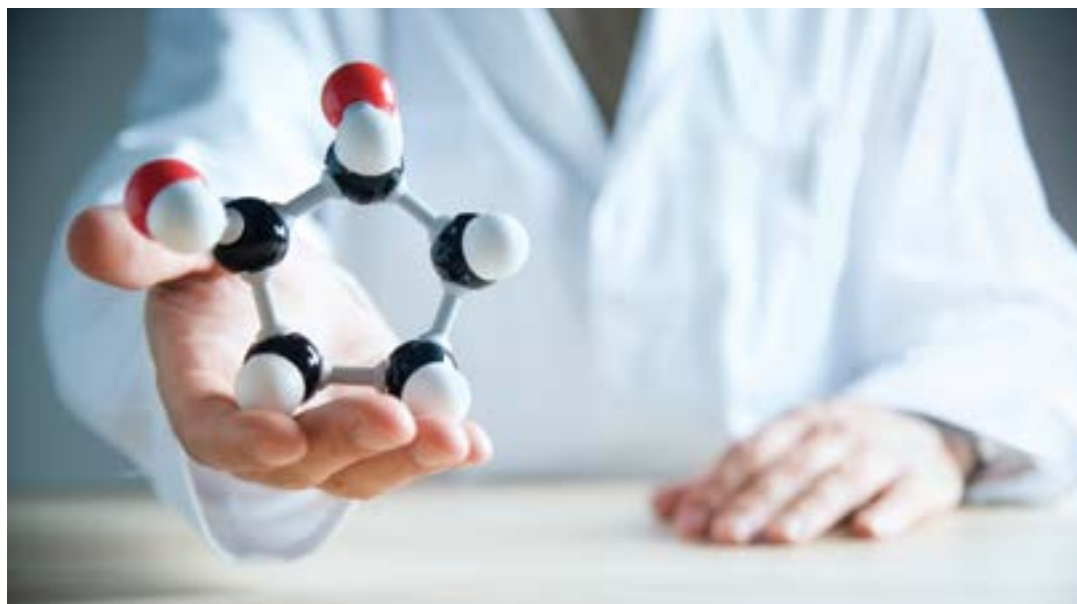
FAME in Diesel by GC-VUV

FAME in Diesel

ASTM-P-VUV-02-SVM

2500 µg/g in Dichloromethane

				1 mL
				28 comps.
n-Heptane	n-Tetradecane	n-Nonadecane	n-Hexacosane	
n-Octane	n-Pentadecane	n-Eicosane	n-Heptacosane	
n-Nonane	n-Hexadecane	n-Heneicosane	n-Octacosane	
n-Decane	Methyl hexadecanoate	n-Docosane	Naphthalene	
n-Undecane	n-Heptadecane	n-Tricosane	2-Methylnaphthalene	
n-Dodecane	n-Octadecane	n-Tetracosane	1,2,4-Trimethylbenzene	
n-Tridecane	Linoleic acid methyl ester	n-Pentacosane	Phenanthrene	



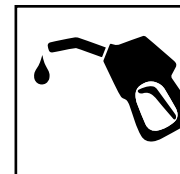
Detailed Hydrocarbon Analysis

PIANO

ASTM D6729, D6730, D6733, D8071

Paraffins, Isoparaffins, Aromatics, Napthenes, Olefins (PIANO)

AccuStandard offers a petroleum naphtha-based PIANO mixture. This mix is used to determine hydrocarbon components in spark-ignition engine fuels, including oxygenated blends of ethanol and *tert*-butyl methyl ether, with boiling ranges to 225°C in accordance with ASTM Methods D6729, D6730, D6733 and D8071.



Two hundred and ten (210) individual hydrocarbons have been identified with a total of 263 compounds separated into the appropriate chemical class within the PIANO designation. These compounds comprise the master list. Each entry contains the Total Ion Chromatogram peak number, retention time, percent of the total and compound name.

To simplify component identification, all compounds have been grouped into chemical classes with the paraffin and isoparaffin classes combined to optimize the format. Each entry contains the same information as the master list. The identified components in each chemical class include:

- 62 paraffins/isoparaffins
- 54 aromatics
- 51 naphthenes
- 43 olefins

The master list is further categorized via extracted ion plots utilizing key ions for each chemical class. The retention time of each component in the extracted ion plot can be compared to the master list for identification.

The analysis of the mix was performed on a 100 meter methyl siloxane phase capillary column with a 1.0 µm film (QuadRex Corporation, Bethany, CT) in an attempt to improve low boiling range component separation.

As in other published analyses, the complexity of the petroleum product resulted in a number of co-elutions and chromatographic peaks that cannot be identified with an acceptable degree of certainty. Consequently, the analysis and data are subject to the same disclaimers enumerated in ASTM Method D6729 regarding the estimation of bulk hydrocarbon group-type composition. The chromatograms provided have been integrated to optimize the usefulness of the analysis and reduce the number of unidentified components present on the chromatogram.

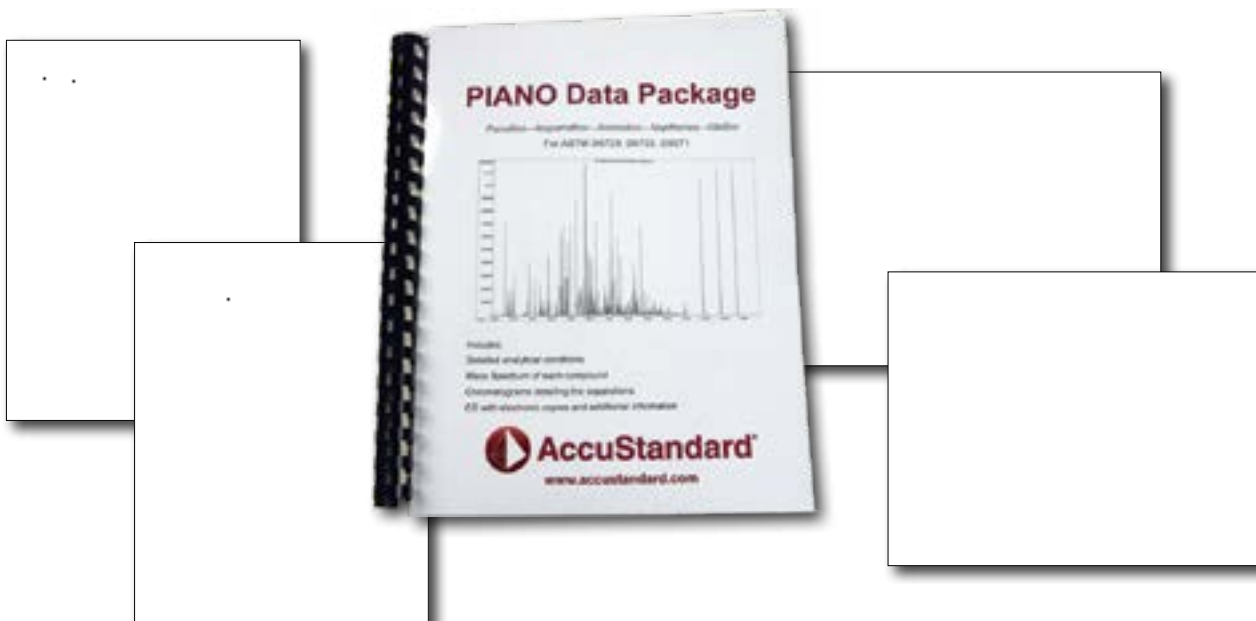
The identification of each hydrocarbon was based on the following:

1. Mass spectrum library search of NIST08 and Wiley WN08 libraries
4. Analysis of individual standards
2. Mass spectrum library search of an in-house generated library
5. Interpretation of mass spectra target ions
3. Comparison of elution data from ASTM Methods D6729 and 6730

PIANO Gasoline PIANO PIANO-PAK 1 x 0.5 mL SAVE 5 x 0.5 mL	PIANO Gasoline (with Ethanol) PIANO-ETOH PIANO-ETOH-PAK 1 x 0.5 mL SAVE 5 x 0.5 mL	PIANO Gasoline (with MtBE) PIANO-MTBE PIANO-MTBE-PAK 1 x 0.5 mL SAVE 5 x 0.5 mL
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Complete data package of the PIANO Mix is provided with each order.

Data package includes: detailed analytical conditions, Mass Spectrum of each compound, chromatograms detailing separations, and flash drive containing data package.



Detailed Hydrocarbon Analysis

Simulated Distillation

Simulated Distillation (SIM DIS) standards used for normal and high temperature analytical requirements when generating boiling point versus retention time calibration curves. Since normal paraffins above Alkane C60 are not readily available, Polywax 500, 655, 850, and 1000 standards have been incorporated to perform SIM DIS analysis of heavy petroleum fractions with boiling points up to 1350°F.

This SIM DIS (Simulated Distillation or GCD) method is used to determine the boiling range distribution of gasoline and gasoline components. For instance, ASTM D3710 is used for petroleum products and fractions with a final boiling point of 500°F (260°C) or lower. By having an insight into the composition of the gasoline blend, essential data for the calculation of vapor pressure and a prediction of the D86 distillation curve can be made.

ASTM D2789

Hydrocarbon Types in Low Olefinic Gas by MS

Hydrocarbon Mixture

D-2789-CTM
D-2789-CTM-PAK

At stated Vol. %

2-Methylpentane	7.2	<i>cis</i> -1,2-Dimethylcyclohexane	15.5
2,4-Dimethylpentane	9.4	Benzene	7.7
<i>n</i> -Octane	16.6	Toluene	10
Methylcyclopentane	7.1	<i>p</i> -Xylene	16.5
Methylcyclohexane	10		

1 x 1 mL
SAVE 5 x 1 mL
9 comps.

ASTM D2887

Boiling Range Distribution of Petroleum Fractions by GC

Calibration Mixture

DRH-002N
DRH-002N-10X

At stated Wt. %

<i>n</i> -Hexane	6	<i>n</i> -Octadecane	5
<i>n</i> -Heptane	6	<i>n</i> -Eicosane	2
<i>n</i> -Octane	8	<i>n</i> -Tetracosane	2
<i>n</i> -Nonane	8	<i>n</i> -Octacosane	1
<i>n</i> -Decane	12	<i>n</i> -Dotriacontane	1
<i>n</i> -Undecane	12	<i>n</i> -Hexatriacontane	1
<i>n</i> -Dodecane	12	<i>n</i> -Tetracontane	1
<i>n</i> -Tetradecane	12	<i>n</i> -Tetratetracontane	1
<i>n</i> -Hexadecane	10		

100 mg
1 gm
17 comps.

Hydrocarbon Window Defining Standard

DRH-008S-R2
DRH-008S-R2-PAK

500 µg/mL each in Chloroform

<i>n</i> -Octane	<i>n</i> -Tetracosane
<i>n</i> -Nonane	<i>n</i> -Pentacosane
<i>n</i> -Decane	<i>n</i> -Hexacosane
<i>n</i> -Undecane	<i>n</i> -Heptacosane
<i>n</i> -Dodecane	<i>n</i> -Octacosane
<i>n</i> -Tridecane	<i>n</i> -Nonacosane
<i>n</i> -Tetradecane	<i>n</i> -Triacontane
<i>n</i> -Pentadecane	<i>n</i> -Hentriacontane
<i>n</i> -Hexadecane	<i>n</i> -Dotriacontane
<i>n</i> -Heptadecane	<i>n</i> -Tetracontane
Phytane	<i>n</i> -Tetracontane
Pristane	<i>n</i> -Tetracontane
<i>n</i> -Nonadecane	<i>n</i> -Tetracontane
Phytane	<i>n</i> -Tetracontane
<i>n</i> -Eicosane	<i>n</i> -Tetracontane
<i>n</i> -Heneicosane	<i>n</i> -Tetracontane
<i>n</i> -Docosane	<i>n</i> -Tetracontane
<i>n</i> -Tricosane	<i>n</i> -Tetracontane

1 x 1 mL
SAVE 5 x 1 mL
35 comps.

Fuel Oil Degradation/Retention Time Mix for Quantification of

C₁₇/Pristane & C₁₈/Phytane ratios

DRH-005S-10X

2.0 mg/mL each in CH₂Cl₂:CS₂ (1:1)

DRH-005S-R1-10X
DRH-005S-R1-10X-PAK
2.0 mg/mL each in Chloroform

Heptadecane
Octadecane
Phytane (2,6,10,14-Tetramethylhexadecane)
Pristane (2,6,10,14-Tetramethylpentadecane)

Technical Note

Pristane and phytane are included in the hydrocarbon window defining standard with C₈ to C₄₀ odd and even alkanes. Measuring the C₁₇/pristane and C₁₈/phytane ratios can be used to estimate fuel oil degradation.

A fuel oil degradation mix containing just the four required analytes to determine the C₁₇/pristane and C₁₈/phytane ratio (DRH-005S-10X).

Column Test Mixture

D-2887
10 mg/mL in *n*-Octane

n-Hexadecane *n*-Octadecane

1 x 1 mL
2 comps.

Reference Gas Oil Sample Lot #2

D-2887-REFOIL

1 x 1 mL

Calibration Solutions

DRH-002S-R1
DRH-002S-R1-PAK

At stated conc. (µg/mL) in Chloroform

<i>n</i> -Hexane	600	<i>n</i> -Octadecane	500
<i>n</i> -Heptane	600	<i>n</i> -Eicosane	200
<i>n</i> -Octane	800	<i>n</i> -Tetracosane	200
<i>n</i> -Nonane	800	<i>n</i> -Octacosane	100
<i>n</i> -Decane	1200	<i>n</i> -Dotriacontane	100
<i>n</i> -Undecane	1200	<i>n</i> -Hexatriacontane	100
<i>n</i> -Dodecane	1200	<i>n</i> -Tetracontane	100
<i>n</i> -Tetradecane	1200	<i>n</i> -Tetratetracontane	100
<i>n</i> -Hexadecane	1000		

1 x 1 mL
SAVE 5 x 1 mL
17 comps.

DRH-002S-R2
DRH-002S-R2-PAK

0.1 Wt. % each in Chloroform

<i>n</i> -Tetratetracontane	<i>n</i> -Octadecane
<i>n</i> -Tetracontane	<i>n</i> -Hexadecane
<i>n</i> -Hexatriacontane	<i>n</i> -Tetradecane
<i>n</i> -Dotriacontane	<i>n</i> -Dodecane
<i>n</i> -Octacosane	<i>n</i> -Undecane
<i>n</i> -Tetracosane	<i>n</i> -Decane
<i>n</i> -Eicosane	<i>n</i> -Nonane

1 x 1 gm
SAVE 5 x 1 gm
20 comps.

Reference Oil - Batch 3

D-2887-REFOIL-B3

1 mL

Reference gas oil

Technical Note

Due to the difference in consensus values between Batch 2 and Batch 3, it is highly recommended to update your method using the current Round Robin consensus analysis provided with this batch.

 Reformulated to ship by Air

Detailed Hydrocarbon Analysis

Simulated Distillation

ASTM D2887

Boiling Range Distribution of Petroleum Fractions by GC (continued)

Boiling Range Distribution of Petroleum Fractions by GC

Calibration Solution



DRH-002S-R1
DRH-002S-R1-PAK

At stated conc. (µg/mL) in Chloroform

<i>n</i> -Hexane	600	<i>n</i> -Undecane	1200	<i>n</i> -Octadecane	500	<i>n</i> -Dotriacontane	100
<i>n</i> -Heptane	600	<i>n</i> -Dodecane	1200	<i>n</i> -Eicosane	200	<i>n</i> -Hexatriacontane	100
<i>n</i> -Octane	800	<i>n</i> -Tetradecane	1200	<i>n</i> -Tetracosane	200	<i>n</i> -Tetracontane	100
<i>n</i> -Nonane	800	<i>n</i> -Hexadecane	1000	<i>n</i> -Octacosane	100	<i>n</i> -Tetratetracontane	100
<i>n</i> -Decane	1200						

1 x 1 mL
SAVE 5 x 1 mL
17 comps.

Polywax 850®

ASTM-P-0137N-2G

2 grams

Polywax 850

Polywax 1000®

ASTM-P-0138N-2G

2 grams

Polywax 1000

Polywax 500®

ASTM-P-0051N-2G

2 grams

Polywax 500

Polywax 655®

ASTM-P-0053N-2G

2 grams

Polywax 655

Stock SIM DIS Paraffin Solution

ASTM-P-0050

1 x 5 mL

At stated Wt. %

14 comps.

<i>n</i> -Pentane	6.66	<i>n</i> -Dodecane	13.33
<i>n</i> -Hexane	6.66	<i>n</i> -Tetradecane	6.66
<i>n</i> -Heptane	6.66	<i>n</i> -Pentadecane	6.66
<i>n</i> -Octane	6.66	<i>n</i> -Hexadecane	6.66
<i>n</i> -Nonane	6.66	<i>n</i> -Heptadecane	6.66
<i>n</i> -Decane	6.66	<i>n</i> -Octadecane	6.66
<i>n</i> -Undecane	6.66	<i>n</i> -Eicosane	6.66

Working Level SIM DIS Paraffin Solution with Polywax 500

ASTM-P-0052

1 x 1 mL

ASTM-P-0052-PAK

SAVE 5 x 1 mL

At stated Wt. % in Carbon disulfide

15 comps.

<i>n</i> -Pentane	0.0333	<i>n</i> -Tetradecane	0.0333
<i>n</i> -Hexane	0.0333	<i>n</i> -Pentadecane	0.0333
<i>n</i> -Heptane	0.0333	<i>n</i> -Hexadecane	0.0333
<i>n</i> -Octane	0.0333	<i>n</i> -Heptadecane	0.0333
<i>n</i> -Nonane	0.0333	<i>n</i> -Octadecane	0.0333
<i>n</i> -Decane	0.0333	<i>n</i> -Eicosane	0.0333
<i>n</i> -Undecane	0.0333	Polywax 500	0.5
<i>n</i> -Dodecane	0.0666		



Can not ship by air. When possible alternate solvents can be used. Contact our Technical Service Dept. for other options.

Standards of Interest

See ASTM Methods D3710, D5307, D5442, D6352, D7169 for additional calibration standards for hydrocarbon analysis.

ASTM D3710

Boiling Range Distribution of Gasoline & Gasoline Fractions by GC

Qualitative Calibration Standard

D-3710-QUAL

1 x 1 mL

D-3710-QUAL-PAK

SAVE 5 x 1 mL

At stated Wt. %

19 comps.

<i>n</i> -Butane	4.5	<i>n</i> -Octane	5.4
<i>n</i> -Butylbenzene	3.2	<i>n</i> -Pentadecane	2.2
<i>n</i> -Decane	3.2	<i>n</i> -Pentane	7.6
2,4-Dimethylpentane	5.4	<i>n</i> -Propane	1.5
<i>n</i> -Dodecane	3.2	<i>n</i> -Propylbenzene	4.3
<i>n</i> -Heptane	9.7	<i>n</i> -Tetradecane	2.2
<i>n</i> -Hexane	5.4	Toluene	10.8
2-Methylbutane	9.7	<i>n</i> -Tridecane	2.2
2-Methylpentane	5.4	<i>p</i> -Xylene	13
2-Methylpropane	1.5		

Quantitative Calibration Standard

D-3710

1 x 1 mL

D-3710-PAK

SAVE 5 x 1 mL

At stated Wt. %

16 comps.

<i>n</i> -Butylbenzene	3.5	<i>n</i> -Octane	5.8
<i>n</i> -Decane	3.5	<i>n</i> -Pentadecane	2.3
2,4-Dimethylpentane	5.8	<i>n</i> -Pentane	8.1
<i>n</i> -Dodecane	3.5	<i>n</i> -Propylbenzene	4.7
<i>n</i> -Heptane	10.5	<i>n</i> -Tetradecane	2.3
<i>n</i> -Hexane	5.8	Toluene	11.6
2-Methylbutane	10.5	<i>n</i> -Tridecane	2.3
2-Methylpentane	5.8	<i>p</i> -Xylene	14.0

ASTM D6293

Oxygenates & Paraffin, Olefin, Naphthene, Aromatics (O-PONA) Hydrocarbon types in Low-Olefin Spark-Ignition Engine Fuels by GC

O-PONA System Validation Mixture

ASTM-P-0080

1 x 1 mL

ASTM-P-0080-PAK

SAVE 5 x 1 mL

At stated Wt. %

33 comps.

Cyclopentane	1.5	Benzene	2.5
<i>n</i> -Pentane	1.5	Toluene	2.5
Cyclohexane	2.0	<i>trans</i> -Decahydronaphthelene	3.5
2,3-Dimethylbutane	2.0	<i>n</i> -Tetradecane	2.0
<i>n</i> -Hexane	2.0	Ethylbenzene	3.5
1-Hexene	1.5	<i>o</i> -Xylene	3.0
Methylcyclohexane	3.5	<i>n</i> -Propylbenzene	3.5
4-Methyl-1-hexene	1.5	1,2,4-Trimethylbenzene	3.0
<i>n</i> -Heptane	3.0	1,2,3-Trimethylbenzene	2.0
1,2-Dimethylcyclohexane	4.5	1,2,4,5-Tetramethylbenzene	2.0
Isocotane	4.0	Pentamethylbenzene	2.5
<i>n</i> -Octane	4.0	Ethanol	5.0
1,2,4-Trimethylcyclohexane	3.5	<i>t</i> -Butanol	4.0
<i>n</i> -Nonane	3.0	MtBE	8.0
<i>n</i> -Decane	3.5	ETBE	3.0
<i>n</i> -Undecane	2.0	TAME	5.0
<i>n</i> -Dodecane	2.0		

O-PONA Olefin Mix

ASTM-P-0081

1 x 1 mL

ASTM-P-0081-PAK

SAVE 5 x 1 mL

At stated Wt. % in Hexane:Heptane (50:50) 5 comps.

1-Pentene	5.0	1-Octene	2.0
1-Hexene	2.0	1-Nonene	3.0
1-Heptene	2.0		

O-PONA Paraffin Mixes

ASTM-P-0082

1 x 1 mL

ASTM-P-0082-PAK

SAVE 5 x 1 mL

At stated Wt. % in Hexane:Heptane (50:50) 2 comps.

<i>n</i> -Nonane	5.0	<i>n</i> -Decane	2.0
------------------	-----	------------------	-----

ASTM-P-0082-R1

1 x 1 mL

ASTM-P-0082-R1-PAK

SAVE 5 x 1 mL

At stated Wt. % in Hexane:Heptane (50:50) 2 comps.

<i>n</i> -Nonane	3.0	<i>n</i> -Decane	3.0
------------------	-----	------------------	-----



Reformulated to ship by Air

Detailed Hydrocarbon Analysis

Simulated Distillation

ASTM D6730

Individual Component in Spark Ignition Engine Fuel by GC

D6730 System Evaluation Mix

D-6730-SEM

At stated conc. by Wt. %

Ethanol	8.0 wt %	Benzene	1.0 wt %	n-Octane	2.0 wt %	n-Decane	1.0 wt %
n-Pentane	2.0 wt %	Cyclohexane	28.9 wt %	Ethylbenzene	25 wt %	n-Undecane	0.5 wt %
t-Butanol	0.5 wt %	3-Ethylpentane	0.2 wt %	p-Xylene	1.0 wt %	1,2,3,5-Tetramethylbenzene	0.25 wt %
2-Methyl-2-butene	2.5 wt %	trans-1,2-Dimethylcyclopentane	0.5 wt %	2,3-Dimethylheptane	0.2 wt %	Naphthalene	0.5 wt %
2,3-Dimethylbutane	0.5 wt %	n-Heptane	2.0 wt %	n-Nonane	2.0 wt %	n-Dodecane	0.25 wt %
MtBE	10.0 wt %	2,3,3-Trimethylpentane	0.5 wt %	5-Methylnonane	0.2 wt %	1-Methylnaphthalene	0.25 wt %
n-Hexane	2.0 wt %	Toluene	7.0 wt %	o-Ethyltoluene	0.5 wt %	n-Tridecane	0.25 wt %
1-Methylcyclopentene	0.5 wt %						

1 mL
29 comps.

ASTM D6839

Hydrocarbon Types, Oxygenated Compounds, Benzene, and Toluene in Spark Ignition Engine Fuels by GC

System Validation Mixture by GC-VUV - Hydrocarbon Analysis

ASTM-P-VUV-01-SVM

At stated conc. by %w/w

			1 mL
			28 comps.
Cyclopentane	1.1	n-Decane	4.5
n-Pentane	1.1	n-Undecane	3.5
Cyclohexane	2.1	n-Dodecane	3.5
2,3-Dimethylbutane	2.1	Benzene	2.2
n-Hexane	2.1	Toluene	2.2
1-Hexene	1.5	trans-Decahydronaphthalene	4
Methylcyclohexane	4	n-Tetradecane	4.5
4-Methyl-1-hexene	1.6	Ethylbenzene	4.5
n-Heptane	3.5	o-Xylene	4
1,2-Dimethylcyclohexane	5	n-Propylbenzene	5
Isooctane	5	1,2,4-Trimethylbenzene	4.5
n-Octane	5	1,2,3-Trimethylbenzene	5
1,2,4-Trimethylcyclohexane	4	1,2,4,5-Tetramethylbenzene	5
n-Nonane	4.5	Pentamethylbenzene	5

System Validation Mixture by GC-VUV - Hydrocarbon Analysis

ASTM-P-VUV-02-SVM

2500 µg/g each in Dichloromethane

			1 mL
			28 comps.
n-Heptane		n-Nonadecane	
n-Octane		n-Eicosane	
n-Nonane		n-Heneicosane	
n-Decane		n-Docosane	
n-Undecane		n-Tricosane	
n-Dodecane		n-Tetracosane	
n-Tridecane		n-Pentacosane	
n-Tetradecane		n-Hexacosane	
n-Pentadecane		n-Heptacosane	
n-Hexadecane		n-Octacosane	
Methyl hexadecanoate		Naphthalene	
n-Heptadecane		2-Methylnaphthalene	
n-Octadecane		1,2,4-Trimethylbenzene	
Linoleic acid methyl ester		Phenanthrene	

ASTM D7169

Boiling Point Distribution by High Temperature by GC

D7169 Relative Response Mix

D-7169-RRM

Each at 12.5 %w/w

		100 mg
		8 comps.
n-Decane	n-Octacosane	
n-Tetradecane	n-Dotriacontane	
n-Octadecane	n-Tetracontane	
n-Eicosane	n-Pentacontane	

D7169 Retention Time Mix

D-7169-RT

Varied %w/w

						500 mg
						18 comps.
n-Pentane	7 %w/w	n-Undecane	7 %w/w	n-Heptadecane	7 %w/w	
n-Hexane	7 %w/w	n-Dodecane	7 %w/w	n-Octadecane	2 %w/w	
n-Heptane	7 %w/w	n-Tridecane	7 %w/w	n-Nonadecane	2 %w/w	
n-Octane	7 %w/w	n-Tetradecane	7 %w/w	n-Eicosane	2 %w/w	
n-Nonane	7 %w/w	n-Pentadecane	7 %w/w	n-Tetracontane	2 %w/w	
n-Decane	7 %w/w	n-Hexadecane	7 %w/w	Polywax 655	1 %w/w	

Miscellaneous Petroleum

Skinner List for Refinery Waste

Semi-Volatiles

Base/Neutral Extractables

M-005B

M-005B-PAK

0.2 mg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL

M-005B-10X

M-005B-10X-PAK

2.0 mg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
27 comps.

Anthracene	7,12-Dimethylbenz[a]anthracene
Benz[a]anthracene	Dimethyl phthalate
Benzo[b]fluoranthene	Di- <i>n</i> -butyl phthalate
Benzo[k]fluoranthene	Di- <i>n</i> -octyl phthalate
Benz[a]pyrene	Indene
bis(2-Ethylhexyl)phthalate	Fluoranthene
Butyl benzyl phthalate	6-Methylchrysene
Chrysene	1-Methylnaphthalene
Dibenz[a,h]acridine	Naphthalene
Dibenz[a,h]anthracene	Phenanthrene
<i>o</i> -Dichlorobenzene	Pyrene
<i>m</i> -Dichlorobenzene	Pyridine
<i>p</i> -Dichlorobenzene	Quinoline
Diethyl phthalate	

Acid Extractables

M-005A

M-005A-PAK

0.2 mg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL

M-005A-10X

M-005A-10X-PAK

2.0 mg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
8 comps.

<i>o</i> -Cresol	2,4-Dinitrophenol
<i>m</i> -Cresol	4-Nitrophenol
<i>p</i> -Cresol	Phenol
2,4-Dimethylphenol	Thiophenol

Volatiles

M-005V

M-005V-PAK

0.2 mg/mL each in MeOH

1 x 1 mL
SAVE 5 x 1 mL

M-005V-10X

M-005V-10X-PAK

2.0 mg/mL each in MeOH

1 x 1 mL
SAVE 5 x 1 mL
14 comps.

Benzene	Ethylene dibromide
Carbon disulfide	Methyl ethyl ketone
Chlorobenzene	Styrene
Chloroform	Toluene
1,2-Dichloroethane	<i>o</i> -Xylene
1,4-Dioxane	<i>m</i> -Xylene
Ethyl benzene	<i>p</i> -Xylene

ASTM E1387 & E1618

Resolution Check for Fire Debris Analysis

ASTM E1387 Resolution Check Mix

ASTM-E1387

ASTM-E1387-PAK

2.0 mg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
13 comps.

Decane	Hexadecane	Tetradecane
Dodecane	Hexane	Toluene
Eicosane	Octadecane	1,2,4-Trimethylbenzene
2-Ethyltoluene	Octane	<i>p</i> -Xylene
3-Ethyltoluene		

ASTM E1618 Test Mix for Fire Debris Analysis

ASTM-E1618

ASTM-E1618-PAK

0.05 Vol.% each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
13 comps.

<i>n</i> -Decane	<i>n</i> -Hexadecane	<i>n</i> -Tetradecane
<i>n</i> -Dodecane	<i>n</i> -Hexane	Toluene
<i>n</i> -Eicosane	<i>n</i> -Octadecane	1,2,4-Trimethylbenzene
<i>o</i> -Ethyltoluene	<i>n</i> -Octane	<i>p</i> -Xylene
<i>m</i> -Ethyltoluene		

Custom Formulations

Custom CRMs are a fast and economical way to meet your specific laboratory needs. We have decades of experience to formulate stable, reliable, and quality custom standards.

**Talk to one of our
Quotation Specialists**



UOP Standards

UOP (Universal Oil Products) methods were developed to assist the refining industry in analyzing refinery feeds, products and process streams for composition, purity and physical and chemical properties. In addition to the products listed below, we can custom formulate products to fit your exact needs. Please contact our Technical Service Department for additional information.

Method 543 Standard

Non-Aromatic Hydrocarbons in High-Purity

Aromatics by GC.

UOP-M-543-PAK

5 x 1 mL

At stated Wt. %

2 comps.

n-Dodecane 70 Toluene 30

Method 551 Standard

Hexanes and Lower-Boiling Hydrocarbons in Olefin-Free Gasolines by GC. May also be used for UOP Method 690 - Octanes and Lower Boiling Hydrocarbons in Olefin-Free Gasolines by GC.

UOP-M-551-PAK

5 x 1 mL

Equal Wt. %

7 comps.

n-Hexane o-Xylene
Benzene *m*-Xylene
Toluene *p*-Xylene
Ethylbenzene

Method 660 Standard

UOP-M-660-PAK

5 x 1 mL

1% in Water

UOP-M-660-10X-PAK

5 x 1 mL

10% in Water

UOP-M-660-0.1X-PAK

5 x 1 mL

0.1% in Water

Tetramethylene sulfone

Method 720 Standard

Impurities in High Purity *p*-Xylene by GC.

UOP-M-720-PAK

5 x 1 mL

At stated Wt. %

5 comps.

o-Xylene 0.1 *n*-Undecane 1.0
m-Xylene 0.1 *p*-Xylene 98.7
Ethylbenzene 0.1

Method 744 Standard

Aromatics in Hydrocarbons by GC.

UOP-M-744-PAK

5 x 1 mL

At stated Wt. %

8 comps.

n-Heptane 25 *o*-Xylene 6.6
Benzene 15 *p*-Xylene 6.7
Toluene 20 *o*-Ethyltoluene 10
m-Xylene 6.7 1,2,3,4-Tetramethylbenzene 10

Method 831 Standard

UOP-M-831-PAK

5 x 1 mL

10 µg/g each in Sulfolane

5 comps.

Benzene Isopropylbenzene
Toluene *n*-Nonane
Ethylbenzene

Method 868 Standard

Trace Saturates in High Purity Aromatics by GC.

UOP-M-868-PAK

5 x 1 mL

Stated conc. (µg/g) in Toluene

10 comps.

n-Butylcyclohexane 500
n-Propylcyclohexane 400
n-Decane 500
n-Nonane 500
n-Octane 300
n-Hexane 100
Ethylcyclohexane 300
Cyclohexane 100
n-Heptane 200
Methylcyclohexane 200

Method 931 Standard

Trace Impurities in Mixed Xylenes by GC.

UOP-M-931-PAK

5 x 1 mL

At stated Wt. %

5 comps.

Benzene 2.0 *n*-Undecane 2.0
Toluene 2.0 *n*-Heptane 92.0
o-Ethyltoluene 2.0



Biofuels

ASTM, EN and IP standard test methods have been developed to monitor the properties of chemical impurities and physical properties for the application of testing biofuels and biofuel blends. The source materials used to produce these fuels include plant oils, ethyl alcohol (usually from corn) and vegetable waste products.



- Physical properties such as viscosity and flash point
- Chemical classes such as Glycerins, FAMES, and Hydrocarbon fraction
- All products are derived from ASTM, EN and IP Standard Methods

Refinery and Consumer Grade Biofuels

Compound	Conc.	Matrix	Cat. No.	Unit	Compound	Conc.	Matrix	Cat. No.	Unit
Biofuel 20	0.5 mg/mL	CH ₂ Cl ₂	BF-FU-030-D	2 mL	Biofuel 100 (Refinery grade)	0.5 mg/mL	CH ₂ Cl ₂	BF-FU-032-D	2 mL
	20 mg/mL	CH ₂ Cl ₂	BF-FU-030-D-40X	2 mL		20 mg/mL	CH ₂ Cl ₂	BF-FU-032-D-40X	2 mL
Biofuel 100 (Consumer grade)	0.5 mg/mL	CH ₂ Cl ₂	BF-FU-029-D	2 mL					
	20 mg/mL	CH ₂ Cl ₂	BF-FU-029-40X	2 mL					

ASTM D5453 & D6751

Sulfur as Di-n-butyl sulfide in Biodiesel

Sulfur in Biodiesel 5%

ppm (µg/g)	% Wt.	Cat. No. ▲	Unit
0	0	BF-5453-B5-BL	100 mL
5	0.0005	BF-5453-B5-5X-SET	2 x 100 mL
10	0.001	BF-5453-B5-10X-SET	2 x 100 mL
15	0.0015	BF-5453-B5-15X-SET	2 x 100 mL
30	0.003	BF-5453-B5-30X	100 mL
50	0.005	BF-5453-B5-50X	100 mL
75	0.0075	BF-5453-B5-75X	100 mL
100	0.01	BF-5453-B5-100X	100 mL
200	0.02	BF-5453-B5-200X	100 mL
500	0.05	BF-5453-B5-500X	100 mL

Sulfur in Biodiesel 100%

ppm (µg/g)	% Wt.	Cat. No.	Unit
0	0	BF-5453-B100-BL	100 mL
5	0.0005	BF-5453-B100-5X-SET	2 x 100 mL
10	0.001	BF-5453-B100-10X-SET	2 x 100 mL
15	0.0015	BF-5453-B100-15X-SET	2 x 100 mL
30	0.003	BF-5453-B100-30X	100 mL
50	0.005	BF-5453-B100-50X	100 mL
75	0.0075	BF-5453-B100-75X	100 mL
100	0.01	BF-5453-B100-100X	100 mL
200	0.02	BF-5453-B100-200X	100 mL
500	0.05	BF-5453-B100-500X	100 mL

Sulfur in Biodiesel 20%

ppm (µg/g)	% Wt.	Cat. No.	Unit
0	0	BF-5453-B20-BL	100 mL
5	0.0005	BF-5453-B20-5X-SET	2 x 100 mL
10	0.001	BF-5453-B20-10X-SET	2 x 100 mL
15	0.0015	BF-5453-B20-15X-SET	2 x 100 mL
30	0.003	BF-5453-B20-30X	100 mL
50	0.005	BF-5453-B20-50X	100 mL
75	0.0075	BF-5453-B20-75X	100 mL
100	0.01	BF-5453-B20-100X	100 mL
200	0.02	BF-5453-B20-200X	100 mL
500	0.05	BF-5453-B20-500X	100 mL

Biofuel Blank

B100

BF-WM-B100-BL-1 100 grams BF-WM-B100-BL-5 500 grams

Technical Note

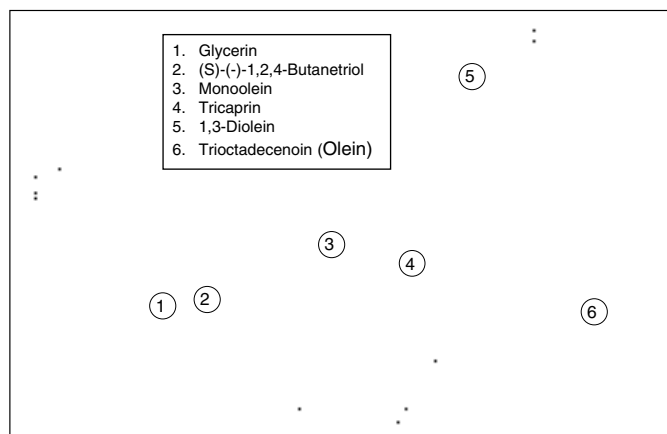
The 5, 10 and 15 ppm sulfurs are supplied as a set including a blank. We suggest using the blank for analysis to compensate for matrix interferences, such as low levels of native sulfur.

ASTM D6584 / EN14105

Free and Total Glycerin in Biodiesel by GC

Compound	Conc.	Matrix	Cat. No.	Unit
Glycerin	0.5 mg/mL	Pyridine	BF-D-6584-01	2 mL
Monoolein	5 mg/mL	Pyridine	BF-D-6584-02	2 mL
1,3-Diolein	5 mg/mL	Pyridine	BF-D-6584-03	2 mL
Triolein	5 mg/mL	Pyridine	BF-D-6584-04	2 mL
(S)-(-)-1,2,4-Butanetriol	1 mg/mL	Pyridine	BF-D-6584-05-IS	5 mL
Tricaprin	8 mg/mL	Pyridine	BF-D-6584-06	5 mL
MSTFA	5 mL	Neat	BF-D-6584-07N	5 mL
			BF-D-6584-SET	7 units

Mix of above compounds, on right (MSTFA separate)



ASTM D6584 Mix

BF-D-6584-MIX 1 x 5 mL
At stated conc. (mg/mL) in Pyridine 6 comps.

Glycerol	0.5
Monoolein	5
1,3-Diolein	5
Trioctadecenoin (Olein)	5
(S)-(-)-1,2,4-Butanetriol	1
Tricaprin	8

Note: MSTFA (BF-D-6584-07N) can be ordered separately.

ASTM Standard D6584 SET (without IS)

GLYC-FT-SET 5 x 1 mL
At stated conc. (µg/mL) in Pyridine 4 comps.

	Level 1	2	3	4	5
GLYC-FT	-01	-02	-03	-04	-05
1,3-Diolein	50	100	200	350	500
Triolein	50	100	200	350	500
Glycerol	5	15	25	35	50
Monoolein	100	250	500	750	1000

ASTM 6584 / EN14105
continued on next page

ASTM D6584 / EN14105

Free and Total Glycerin in Biodiesel by GC (continued)

Solution I

EN-14105-01

1 mL

At stated conc. (µg/mL) in Pyridine
6 comps.

(s)-(-)-1,2,4-Butanetriol	80
Monoolein	250
Dioline	50
Triolein	50
Glycerol	5
Tricaprin	800

Solution II

EN-14105-02

1 mL

At stated conc. (µg/mL) in Pyridine
6 comps.

(s)-(-)-1,2,4-Butanetriol	80
Monoolein	600
Dioline	200
Triolein	150
Glycerol	20
Tricaprin	800

Solution III

EN-14105-03

1 mL

At stated conc. (µg/mL) in Pyridine
6 comps.

(s)-(-)-1,2,4-Butanetriol	80
Monoolein	950
Dioline	350
Triolein	300
Glycerol	35
Tricaprin	800

Solution IV

EN-14105-04

1 mL

At stated conc. (µg/mL) in Pyridine
6 comps.

(s)-(-)-1,2,4-Butanetriol	80
Monoolein	1250
Dioline	500
Triolein	400
Glycerol	50
Tricaprin	800

EN12916

Hydrocarbons in Biofuel

EN-12916-SET

At stated conc. (mg/mL) in Heptane

4 x 1 mL

3 comps.

	EN-12916-01	EN-12916-02	EN-12916-03	EN-12916-04
o-Xylene (1,2-Dimethylbenzene)	40	10	2.5	0.5
Fluorene	20	10	2.5	0.2
Phenanthrene	4.0	2.0	0.5	0.1

EN14103

Fatty Acid Methyl Esters (FAMES)

The methyl esters in the mixture are those derived from typical glycerides present in biomass sources.

Soy and Corn

BF-SOY-ME

100 mg

At stated Wt. %
6 comps.

16:0 Methyl palmitate	6
18:0 Methyl stearate	3
20:0 Methyl arachidate	3
18:1 Methyl oleate	35
18:2 Methyl linoleate	50
18:3 Methyl linolenate	3

Palm Kernel

BF-PALM-ME

100 mg

At stated Wt. %
8 comps.

8:0 Methyl caprylate	7
10:0 Methyl caprate	5
12:0 Methyl laurate	48
14:0 Methyl myristate	15
16:0 Methyl palmitate	7
18:0 Methyl stearate	3
18:1 Methyl oleate	12
18:2 Methyl linoleate	3

Beef Tallow & Palm Oil

BF-BT-ME

100 mg

At stated Wt. %
7 comps.

14:0 Methyl myristate	2
16:0 Methyl palmitate	30
16:1 Methyl palmitoleate	3
18:0 Methyl stearate	14
18:1 Methyl oleate	41
18:2 Methyl linoleate	7
18:3 Methyl linolenate	3

Rapeseed Oil

BF-RAP-ME

100 mg

At stated Wt. %
11 comps.

14:0 Methyl myristate	1
16:0 Methyl palmitate	4
18:0 Methyl stearate	3
20:0 Methyl arachidate	3
22:0 Methyl behenate	3
24:0 Methyl lignocerate	3
18:1 Methyl oleate	60
22:1 Methyl erucate	5
18:2 Methyl linoleate	12
18:3 Methyl linolenate	5
20:1 Methyl eicosenoate	1

Percent Methanol Calibration Standard Set (EN14110)

BF-MEOH-SET

5 x 1 mL

At stated conc. (µg/g)

BF-MEOH-1X 100	BF-MEOH-10X 1000	BF-MEOH-50X 5000
BF-MEOH-5X 500	BF-MEOH-25X 2500	

Methanol in water

Technical Note

Individual mixes packaged under nitrogen for stability.

EN15721

Ethanol Impurities

Ethanol Impurities

Solution A

EN-15721-A

1 Wt. % each in Ethanol

Methanol
Acetaldehyde
3-Methyl-1-butanol
2-Methyl-1-butanol

2-Methyl-1-propanol
sec-Butanol
n-Butanol

n-Propanol
Ethyl acetate
Acetal

1 mL
10 comps.

Internal Standard

Solution A

EN-15721-A-IS

1 Wt. % in Ethanol

3-Pentanol

1 mL

EN15721 Solution A Set

EN-15721-A-SET

2 x 1 mL

EN-15721-A
EN-15721-A-IS

EN15779

Polyunsaturated Fatty Acid Methyl Esters (PUFAMES)

PUFAMES

EN-15779-R1

0.25% w/v in *n*-Heptane

1 mL

4 comps.

cis-4,7,10,13,16,19-Docosahexaenoic acid methyl ester
cis-7,10,13,16,19-Docosapentaenoic acid methyl ester
Arachidonic acid methyl ester
Eicosapentaenoic acid methyl ester

Internal Standard

EN-15779-IS

1.0 mg/mL in Heptane

1 mL

Methyl tricosanoate

IP585

Fatty Acid Methyl Esters (FAMES) in Aviation Turbine Fuel

FAME in Aviation Turbine Fuel

IP-585-BCS

1000 µg/g each in *n*-Dodecane

1 mL

6 comps.

Methyl palmitate
Methyl heptadecanoate
Methyl stearate

Methyl oleate
Methyl linoleate
Methyl linolenate

Internal Standard

IP-585-IS

1000 µg/g in *n*-Dodecane

1 mL

Methyl heptadecanoate-d₃₃

Fatty Acid Ethyl Esters (FAEEs)

Compound	Cat. No.	Unit	Compound	Cat. No.	Unit	Compound	Cat. No.	Unit
Ethyl palmitate (16:0)	FAEE-006N	100 mg	Ethyl myristate (14:0)	FAEE-005N	100 mg	Ethyl laurate (12:0)	FAEE-004N	100 mg
	FAEE-006S	1 mL		FAEE-005S	1 mL		FAEE-004S	1 mL
Ethyl stearate (18:0)	FAEE-007N	100 mg	Ethyl behenate (22:0)	FAEE-009N	100 mg	Ethyl palmitoleate (16:1)	FAEE-001N	100 mg
	FAEE-007S	1 mL		FAEE-009S	1 mL		FAEE-001S	1 mL
Ethyl arachidate (20:0)	FAEE-008N	100 mg	Ethyl lignocerate (24:0)	FAEE-010N	100 mg	Ethyl nervonate (24:1)	FAEE-013N	100 mg
	FAEE-008S	1 mL		FAEE-010S	1 mL		FAEE-013S	1 mL
Ethyl oleate (18:1)	FAEE-014N	100 mg	Ethyl erucate (22:1)	FAEE-011N	100 mg	Ethyl heptadecanoate (17:0)	FAEE-015N	100 mg
	FAEE-014S	1 mL		FAEE-011S	1 mL		FAEE-015S	1 mL
Ethyl linoleate (18:2)	FAEE-012N	100 mg	Ethyl caprylate (8:0)	FAEE-002N	100 mg	Ethyl linolenate (gamma) (18:3)	FAEE-020N	100 mg
	FAEE-012S	1 mL		FAEE-002S	1 mL		FAEE-020S	1 mL
Ethyl linolenate (18:3)	FAEE-016N	100 mg	Ethyl caprate (10:0)	FAEE-003N	100 mg			
	FAEE-016S	1 mL		FAEE-003S	1 mL			

Ethyl Esters in Soy & Corn

BF-SOY-EE

At stated Wt. %

100 mg
6 comps.

16:0 Ethyl palmitate 6
18:0 Ethyl stearate 3
20:0 Ethyl arachidate 3
18:1 Ethyl oleate 35
18:2 Ethyl linoleate 50
18:3 Ethyl linolenate 3

Ethyl Esters in Rapeseed Oil

BF-RAP-EE

At stated Wt. %

100 mg
10 comps.

14:0 Ethyl myristate 1
16:0 Ethyl palmitate 4
18:0 Ethyl stearate 3
20:0 Ethyl arachidate 3
22:0 Ethyl behenate 3
24:0 Ethyl lignocerate 3
18:1 Ethyl oleate 45
22:1 Ethyl erucate 20
18:2 Ethyl linoleate 15
18:3 Ethyl linolenate 3

Ethyl Esters in Palm Kernel Oil

BF-PALM-EE

At stated Wt. %

100 mg
8 comps.

8:0 Ethyl caprylate 7
10:0 Ethyl caprate 5
12:0 Ethyl laurate 48
14:0 Ethyl myristate 15
16:0 Ethyl palmitate 7
18:0 Ethyl stearate 3
18:1 Ethyl oleate 12
18:2 Ethyl linoleate 3

Ethyl Esters in Beef Tallow

BF-BT-EE

At stated Wt. %

100 mg
7 comps.

14:0 Ethyl myristate 2
16:0 Ethyl palmitate 30
16:1 Ethyl palmitoleate 3
18:0 Ethyl stearate 14
18:1 Ethyl oleate 41
18:2 Ethyl linoleate 7
18:3 Ethyl linolenate 3

IP391/07

Aromatic Hydrocarbon / FAME Test Method for Diesel and Petro / Biodiesel

Aromatic Hydrocarbon

IP-391-07-01

At stated conc. (µg/mL) in *n*-Heptane

5 mL

7 comps.

Cyclohexane 10,000
Dodecylbenzene 1,000
o-Xylene 5,000
Hexamethylbenzene 1,000
Naphthalene 1,000
Dibenzothiophene 500
9-Methylanthracene 500

FAME Test Method

IP-391-07-02

At stated conc. (µg/mL) in *n*-Heptane

5 mL

6 comps.

Methyl palmitate 800
Methyl stearate 800
Methyl *cis*-9-octadecenoate 800
Methyl linoleate 800
Chrysene 400
Methyl linolenate 800

IP391/07 Test Method Set

IP-391-07-SET

2 x 5 mL

IP-391-07-01
IP-391-07-02

Physical Standards

Compound	Conc.	Matrix	Cat. No.	Unit
ASTM D2500				
Cloud Point	-16 °C *	B5	BF-D-2500-B5-250ML ▲	250 mL
	-14 °C *	B20	BF-D-2500-B20-250ML	250 mL
	-1 °C *	B100	BF-D-2500-B100-250ML	250 mL
ASTM D93 / EN-ISO 3679				
Flash Point	60 °C *		BF-D-93-60C-250ML	250 mL
	65 °C *		BF-D-93-65C-250ML	250 mL
	140 °C *		BF-D-93-140C-250ML	250 mL
ASTM D4951 / EN 14107				
Phosphorus Content	0.001 µg/g *	B100	BF-D-4951-B100	100 g
ASTM D6304 / EN ISO 12937				
(KF) Water Content	60 µg/g *	Anisole	BF-KF-0.6X-5ML-VAP	10 x 5 mL
	100 µg/g *	Anisole	BF-KF-1X-5ML-VAP	10 x 5 mL
	1000 µg/g *	Anisole	BF-KF-10X-5ML-VAP	10 x 5 mL
	5000 µg/g *	Anisole	BF-KF-50X-5ML-VAP	10 x 5 mL
ASTM D6751 / UOP 391 / EN 14108 / EN 14109				
Sodium / Potassium	100 µg/g *	B100	BF-UOP-391-B100	100 g
EN 14538				
Calcium / Magnesium	100 µg/g *	B100	BF-14538-B100	100 g

* These are nominal values and the actual value will be recorded on the certificate.

EN14214

Wear Metals

Each is 100 grams at 500 µg/g concentration.

Compound	Matrix	Cat. No.	Unit
Aluminum (Al)	B100	BF-WM-B100-01-0.5X	100 grams
Calcium (Ca)	B100	BF-WM-B100-09-0.5X	100 grams
Chromium (Cr)	B100	BF-WM-B100-13-0.5X	100 grams
Copper (Cu)	B100	BF-WM-B100-15-0.5X	100 grams
Iron (Fe)	B100	BF-WM-B100-27-0.5X	100 grams
Lead (Pb)	B100	BF-WM-B100-29-0.5X	100 grams
Magnesium (Mg)	B100	BF-WM-B100-32-0.5X	100 grams
Phosphorus (P)	B100	BF-WM-B100-41-0.5X	100 grams
Potassium (K)	B100	BF-WM-B100-43-0.5X	100 grams
Sodium (Na)	B100	BF-WM-B100-54-0.5X	100 grams
Zinc (Zn)	B100	BF-WM-B100-70-0.5X	100 grams

Biofuel Blank

B100

BF-WM-B100-BL-1 100 grams BF-WM-B100-BL-5 500 grams

Biofuel Metals Mix

Multi-Element Biofuel Standard

BF-WM-B100-MIX

100 grams

200 µg/g each in B100

5 comps.

Calcium (Ca) Magnesium (Mg) Phosphorus (P)
Potassium (K) Sodium (Na)

Technical Note

Prepared by adding well characterized sulfur compounds gravimetrically to the matrix. The matrix may contain some native sulfur, a blank must be used for background correction and should be purchased with the standard.

Technical Note

All products are refinery grade stock, unless marked consumer grade.

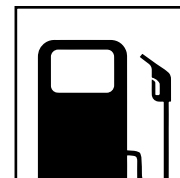


▲ Hazardous fee required for air shipments.

TPH, Fuel and Hydrocarbons

Petroleum is a broadly defined class of liquid hydrocarbon mixtures that are used in a large variety of products for many different uses. In general, they are oil-based products that can be obtained by distillation and are normally used outside the refining industry. Petroleum products include aviation gasoline, motor gasoline, jet fuels, kerosene, gas/diesel oil, heavy fuel oil, naphtha, and lubricants among others.

Most analytical methods for petroleum products focus on the level of benzene, toluene, ethyl benzene and xylene (BTEX), the total petroleum hydrocarbon number (TPH) and the finger print of the petroleum product.



Individual Fuel and Hydrocarbons

Compound	Conc.	Matrix	Cat. No.	Unit	Compound	Conc.	Matrix	Cat. No.	Unit
5-alpha Androstane 438-22-2	1 mg/mL	CH ₂ Cl ₂	GRH-IS	1 mL	Gasoline Regular, unleaded	0.5 mg/mL	MeOH	GA-001	1 mL
	10 mg/mL	CH ₂ Cl ₂	GRH-IS-10X	1 mL		5 mg/mL	MeOH	GA-001-10X	1 mL
Aviation (gas) (grade 100-LL)	0.5 mg/mL	MeOH	GA-004	1 mL	20 mg/mL	MeOH	GA-001-40X	1 mL	
	20 mg/mL	MeOH	GA-004-40X	1 mL	20 mg/mL	CH ₂ Cl ₂	GA-001-D-40X	1 mL	
	20 mg/mL	CH ₂ Cl ₂	GA-004-D-40X	1 mL	Gasoline Premium	0.5 mg/mL	MeOH	GA-003	1 mL
Biodiesel 20	0.5 mg/mL	CH ₂ Cl ₂	FU-030-D	1 mL	20 mg/mL	MeOH	GA-003-40X	1 mL	
	20 mg/mL	CH ₂ Cl ₂	FU-030-D-40X	1 mL	20 mg/mL	CH ₂ Cl ₂	GA-003-D-40X	1 mL	
Biodiesel 100	0.5 mg/mL	CH ₂ Cl ₂	FU-029-D	1 mL	RFA Gasoline (oxygenate-free)	0.5 mg/mL	MeOH	GA-005	1 mL
	20 mg/mL	CH ₂ Cl ₂	FU-029-D-40X	1 mL	20 mg/mL	MeOH	GA-005-40X	1 mL	
Biodiesel 100 (refinery grade)	0.5 mg/mL	CH ₂ Cl ₂	FU-032-D	1 mL	20 mg/mL	CH ₂ Cl ₂	GA-005-D-40X	1 mL	
	20 mg/mL	CH ₂ Cl ₂	FU-032-D-40X	1 mL	Regular Leaded Gasoline	0.5 mg/mL	MeOH	GA-002	1 mL
p-Bromofluorobenzene 460-00-4	2.5 mg/mL	Acetone	GARH-SS	1 mL	20 mg/mL	MeOH	GA-002-40X	1 mL	
1-Chloro-4-fluorobenzene 352-33-0	2 mg/mL	MeOH	AK-101-IS-10X	1 mL	20 mg/mL	CH ₂ Cl ₂	GA-002-D-40X	1 mL	
	1 mg/mL	Hexane	DRH-007-SS	1 mL	Unleaded Gasoline 25% Weathered	5 mg/mL	MeOH	GA-W25-10X	1 mL
1-Chlorooctadecane 3386-33-2	1 mg/mL	Hexane	DRH-007-SS	1 mL	Unleaded Gasoline 50% Weathered	5 mg/mL	MeOH	GA-W50-10X	1 mL
1-Chloro-4-fluorobenzene 352-33-0	1 mg/mL	CH ₂ Cl ₂	GARH-IS	1 mL	Unleaded Gasoline 75% Weathered	5 mg/mL	MeOH	GA-W75-10X	1 mL
2,5-Dibromotoluene 615-59-8	50 µg/mL	MeOH	GRH-004-SS	1 mL	Hydraulic Fluid 64742-54-7	0.5 mg/mL	Hexane	FU-020-H	1 mL
	500 µg/mL	MeOH	GRH-004-SS-10X	1 mL	20 mg/mL	Hexane	FU-020-H-40X	1 mL	
	5 mg/mL	MeOH	GRH-004-SS-100X	1 mL	20 mg/mL	CH ₂ Cl ₂	FU-020-D-40X	1 mL	
Diesel	0.5 mg/mL	MeOH	FU-009	1 mL	Jet Reference Fuel Type I	0.5 mg/mL	MeOH	FU-011	1 mL
	5 mg/mL	CH ₂ Cl ₂	FU-009-D-10X	1 mL	20 mg/mL	MeOH	FU-011-40X	1 mL	
	20 mg/mL	MeOH	FU-009-40X	1 mL	20 mg/mL	CH ₂ Cl ₂	FU-011-D-40X	1 mL	
	20 mg/mL	CH ₂ Cl ₂	FU-009-D-40X	1 mL	JP-4 Jet Fuel 50815-00-4	0.5 mg/mL	MeOH	FU-010	1 mL
#1 Diesel (Low Sulfur)	0.5 mg/mL	MeOH	FU-013	1 mL	20 mg/mL	MeOH	FU-010-40X	1 mL	
	20 mg/mL	MeOH	FU-013-40X	1 mL	20 mg/mL	CH ₂ Cl ₂	FU-010-D-40X	1 mL	
	20 mg/mL	CH ₂ Cl ₂	FU-013-D-40X	1 mL	JP-5 Fuel	0.5 mg/mL	MeOH	FU-012	1 mL
	50 mg/mL	Acetone	DRO-AK-102-LCS-10X-R1	1 mL	20 mg/mL	MeOH	FU-012-40X	1 mL	
#2 Diesel 68334-30-5	0.5 mg/mL	MeOH	FU-017	1 mL	20 mg/mL	CH ₂ Cl ₂	FU-012-D-40X	1 mL	
#2 Diesel (Extra Low Sulfur) 68476-43-6	5 mg/mL	CH ₂ Cl ₂	FU-017-D-10X	1 mL	JP-7 Fuel	0.5 mg/mL	MeOH	FU-014	1 mL
	5 mg/mL	Acetone	DRO-AK-102-LCS	1 mL	20 mg/mL	MeOH	FU-014-40X	1 mL	
	50 mg/mL	Acetone	DRO-AK-102-LCS-10X	1 mL	20 mg/mL	CH ₂ Cl ₂	FU-014-D-40X	1 mL	
	20 mg/mL	MeOH	FU-017-40X	1 mL	JP-8 Fuel	0.5 mg/mL	MeOH	FU-015	1 mL
#2 Diesel (Low Sulfur) 25% Weathered	20 mg/mL	CH ₂ Cl ₂	FU-017-D-40X	1 mL	20 mg/mL	MeOH	FU-015-40X	1 mL	
	20 mg/mL	CH ₂ Cl ₂	FU-017-D-40X	1 mL	20 mg/mL	CH ₂ Cl ₂	FU-015-D-40X	1 mL	
#2 Diesel (Low Sulfur) 50% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W25-10X	1 mL	JP-TS Aviation Fuel 64742-47-8	0.5 mg/mL	MeOH	FU-016	1 mL
#2 Diesel (Low Sulfur) 75% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W50-10X	1 mL	20 mg/mL	MeOH	FU-016-40X	1 mL	
	5 mg/mL	CH ₂ Cl ₂	FD2-W75-10X	1 mL	20 mg/mL	CH ₂ Cl ₂	FU-016-D-40X	1 mL	
#2 Diesel 25% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W25-R1-10X	1 mL	JP-10 Aviation Fuel	0.5 mg/mL	MeOH	FU-022	1 mL
#2 Diesel 50% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W50-R1-10X	1 mL	20 mg/mL	MeOH	FU-022-40X	1 mL	
	5 mg/mL	CH ₂ Cl ₂	FD2-W75-R1-10X	1 mL	20 mg/mL	CH ₂ Cl ₂	FU-022-D-40X	1 mL	
#2 Diesel 75% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W75-R1-10X	1 mL	Kerosene 25% Weathered	5 mg/mL	CH ₂ Cl ₂	FK-W25-10X	1 mL
Renewable Diesel Fuel#2	20 mg/mL	CH ₂ Cl ₂	FU-033-D-40X	1 mL	Kerosene 50% Weathered	5 mg/mL	CH ₂ Cl ₂	FK-W50-10X	1 mL
Docosane 629-97-0	20 Wt. %	Toluene	D-5186-91-PM-0.4X	1 mL	Kerosene 75% Weathered	5 mg/mL	CH ₂ Cl ₂	FK-W75-10X	1 mL
n-Dodecane 112-40-3	5 mg/mL	MeOH	AS-E0238	1 mL	Kerosene 8008-20-6	0.5 mg/mL	MeOH	FU-005	1 mL
	1.5 Wt. %	Isooctane	M-GRA-SCS-AS	1 mL	20 mg/mL	MeOH	FU-005-40X	1 mL	
#1 Fuel oil 70892-10-3	0.5 mg/mL	MeOH	FU-001	1 mL	5 mg/mL	CH ₂ Cl ₂	FU-005-D-10X	1 mL	
	20 mg/mL	MeOH	FU-001-40X	1 mL	20 mg/mL	CH ₂ Cl ₂	FU-005-D-40X	1 mL	
	20 mg/mL	CH ₂ Cl ₂	FU-001-D-40X	1 mL	Lacquer Thinner	1 gram	Neat	HS-001N	1 mL
#2 Fuel oil 68476-30-2	0.5 mg/mL	MeOH	FU-002	1 mL	0.5 mg/mL	MeOH	HS-001S	1 mL	
	20 mg/mL	MeOH	FU-002-40X	1 mL	20 mg/mL	MeOH	HS-001S-40X	1 mL	
	20 mg/mL	CH ₂ Cl ₂	FU-002-D-40X	1 mL	20 mg/mL	CH ₂ Cl ₂	HS-001S-D-40X	1 mL	
#4 Fuel oil 68476-31-3	0.5 mg/mL	Hexane	FU-004	1 mL	Mineral Spirits 8030-30-6	1 gram	Neat	HS-002N	1 mL
	20 mg/mL	Hexane	FU-004-40X	1 mL	0.5 mg/mL	MeOH	HS-002S	1 mL	
	20 mg/mL	CH ₂ Cl ₂	FU-004-D-40X	1 mL	20 mg/mL	MeOH	HS-002S-40X	1 mL	
	20 mg/mL	CH ₂ Cl ₂	FU-004-D-40X	1 mL	20 mg/mL	CH ₂ Cl ₂	HS-002S-D-40X	1 mL	
#6 Fuel oil 68553-00-4	0.5 mg/mL	Hexane	FU-008	1 mL					
	20 mg/mL	Hexane	FU-008-40X	1 mL					
	20 mg/mL	CH ₂ Cl ₂	FU-008-D-40X	1 mL					

Individual Fuel and Hydrocarbons
continued on next page.

TPH, Fuel and Hydrocarbons

Individual Fuel and Hydrocarbons (continued)

Compound	Conc.	Matrix	Cat. No.	Unit	Compound	Conc.	Matrix	Cat. No.	Unit
Naphtha 64742-89-8	1 gram	Neat	HS-003N	1 mL	Stoddard solvent 8052-41-3	1 gram	Neat	HS-005N	1 mL
	0.5 mg/mL	MeOH	HS-003S	1 mL		0.5 mg/mL	MeOH	HS-005S	1 mL
	20 mg/mL	MeOH	HS-003S-40X	1 mL		5 mg/mL	MeOH	HS-005S-10X	1 mL
	20 mg/mL	CH ₂ Cl ₂	HS-003S-D-40X	1 mL		20 mg/mL	MeOH	HS-005S-40X	1 mL
n-Nonatriacontane 7194-86-7	750 µg/mL	Chloroform	DRH-FL-SS-R1	1 mL		20 mg/mL	CH ₂ Cl ₂	HS-005S-D-40X	1 mL
	1 mg/mL	CS ₂	DRH-FL-SS	1 mL		o-Terphenyl 84-15-1	200 µg/mL	Acetone	DRO-AK-102-SS
n-Pentadecane 629-62-9	3 mg/mL	CS ₂	DRH-FL-SS-3X	1 mL		1 mg/mL	CH ₂ Cl ₂	DRH-006-SS	1 mL
	5 mg/mL	MeOH	AS-E0241	1 mL		2 mg/mL	Acetone	DRO-AK-102-SS-10X	1 mL
SAE 5W30 Motor oil	0.5 mg/mL	Hexane	FU-025-H	1 mL		2 mg/mL	Acetone	GRH-SS	1 mL
	20 mg/mL	Hexane	FU-025-H-40X	1 mL		5 mg/mL	MeOH	AS-E0240	1 mL
	20 mg/mL	CH ₂ Cl ₂	FU-025-D-40X	1 mL	n-Tetradecane 629-59-4	500 µg/mL	CS ₂	D-5480-C40-5ML	5 mL
SAE 10W30 Motor oil	0.5 mg/mL	Hexane	FU-026-H	1 mL	Tetracosane 646-31-1	500 µg/mL	Chloroform	D-5480-C40-R1-5ML	5 mL
	20 mg/mL	Hexane	FU-026-H-40X	1 mL	n-Tridecane 629-50-5	5 mg/mL	MeOH	AS-E0239	1 mL
	20 mg/mL	CH ₂ Cl ₂	FU-026-D-40X	1 mL	1,2,3-Trimethylbenzene 526-73-8	1 mg/mL	CH ₂ Cl ₂	V-028S-D-10X	1 mL
SAE 10W40 Motor oil	0.5 mg/mL	Hexane	FU-027-H	1 mL	n-Triacontane-d₆₂ 93952-07-9	500 µg/mL	Acetone:THF	RRO-AK-103-SS	1 mL
	20 mg/mL	Hexane	FU-027-H-40X	1 mL		5 mg/mL	Acetone:THF	RRO-AK-103-SS2	1 mL
	20 mg/mL	CH ₂ Cl ₂	FU-027-D-40X	1 mL		5 mg/mL	THF	DRH-SS	1 mL
SAE 20W50 Motor oil	0.5 mg/mL	Hexane	FU-028-H	1 mL	Turbine (Jet) fuel	0.5 mg/mL	MeOH	FU-006	1 mL
	20 mg/mL	Hexane	FU-028-H-40X	1 mL		20 mg/mL	MeOH	FU-006-40X	1 mL
	20 mg/mL	CH ₂ Cl ₂	FU-028-D-40X	1 mL		20 mg/mL	CH ₂ Cl ₂	FU-006-D-40X	1 mL
SAE 30W Motor oil	0.5 mg/mL	Hexane	FU-018-H	1 mL		Turpentine 8006-64-2	NEAT		HS-004N
	20 mg/mL	Hexane	FU-018-H-40X	1 mL	0.5 mg/mL		MeOH	HS-004S	1 mL
	20 mg/mL	CH ₂ Cl ₂	FU-018-D-40X	1 mL	20 mg/mL		MeOH	HS-004S-40X	1 mL
SAE 40W Motor oil	0.5 mg/mL	Hexane	FU-019-H	1 mL	20 mg/mL		CH ₂ Cl ₂	HS-004S-D-40X	1 mL
	5 mg/mL	Acetone:CH ₂ Cl ₂	RRO-AK-103-LCS	1 mL					
	20 mg/mL	Hexane	FU-019-H-40X	1 mL					
	20 mg/mL	CH ₂ Cl ₂	FU-019-D-40X	1 mL					
SAE 50W Motor oil	20 mg/mL	Acetone:CH ₂ Cl ₂	RRO-AK-103-LCS-5X	1 mL					
	20 mg/mL	CH ₂ Cl ₂	FU-021-D-40X	1 mL					

Complete Set of Total Petroleum Hydrocarbon (TPH) Pattern Recognition Standards

Motor Fuels & Lubricating Oils Set

TPH-001-R2-SET

	mg/mL	Solv.	Cat. No.	Unit
Gasoline, regular unleaded	20	MeOH	GA-001-40X	1 mL
Gasoline, regular leaded	20	MeOH	GA-002-40X	1 mL
Gasoline, premium	20	MeOH	GA-003-40X	1 mL
RFA Gasoline (Oxygenate free)	20	MeOH	GA-005-40X	1 mL
#2 Diesel (Conventional)	20	CH ₂ Cl ₂	FU-009-D-40X	1 mL
#1 Diesel (Low sulfur)	20	CH ₂ Cl ₂	FU-013-D-40X	1 mL
#2 Diesel (Extra low sulfur)	20	CH ₂ Cl ₂	FU-017-D-40X	1 mL
SAE 30W Motor oil	20	CH ₂ Cl ₂	FU-018-D-40X	1 mL
SAE 40W Motor oil	20	CH ₂ Cl ₂	FU-019-D-40X	1 mL
SAE 50W Motor oil	20	CH ₂ Cl ₂	FU-021-D-40X	1 mL
Biodiesel 20	20	CH ₂ Cl ₂	FU-030-D-40X	1 mL
Biodiesel 100 (consumer grade)	20	CH ₂ Cl ₂	FU-029-D-40X	1 mL

Heating Fuel Oils Set

TPH-002-R2-SET

	mg/mL	Solv.	Cat. No.	Unit
#1 Fuel oil	20	CH ₂ Cl ₂	FU-001-D-40X	1 mL
#2 Fuel oil	20	CH ₂ Cl ₂	FU-002-D-40X	1 mL
#4 Fuel oil	20	CH ₂ Cl ₂	FU-004-D-40X	1 mL
#6 Fuel oil	20	CH ₂ Cl ₂	FU-008-D-40X	1 mL
Kerosene	20	CH ₂ Cl ₂	FU-005-D-40X	1 mL

Aviation Fuels & Oils Set

TPH-003-SET

	mg/mL	Solv.	Cat. No.	Unit
Aviation (Gas) Grade 100 LL	20	CH ₂ Cl ₂	GA-004-D-40X	1 mL
JP-4 Fuel	20	CH ₂ Cl ₂	FU-010-D-40X	1 mL
JP-5 Fuel	20	CH ₂ Cl ₂	FU-012-D-40X	1 mL
JP-7 Fuel	20	CH ₂ Cl ₂	FU-014-D-40X	1 mL
JP-8 Fuel	20	CH ₂ Cl ₂	FU-015-D-40X	1 mL
JP-10 Aviation Fuel	20	CH ₂ Cl ₂	FU-022-D-40X	1 mL
JP-TS Aviation	20	CH ₂ Cl ₂	FU-016-D-40X	1 mL
Jet Fuel (Type 1)	20	CH ₂ Cl ₂	FU-011-D-40X	1 mL
Turbine (Jet A) Fuel	20	CH ₂ Cl ₂	FU-006-D-40X	1 mL
Hydraulic fluid	20	CH ₂ Cl ₂	FU-020-D-40X	1 mL

Household & Industrial Solvent Set

TPH-004-SET

	mg/mL	Solv.	Cat. No.	Unit
Lacquer Thinner	20	CH ₂ Cl ₂	HS-001S-D-40X	1 mL
Mineral Spirits	20	CH ₂ Cl ₂	HS-002S-D-40X	1 mL
Naphtha	20	CH ₂ Cl ₂	HS-003S-D-40X	1 mL
Turpentine	20	CH ₂ Cl ₂	HS-004S-D-40X	1 mL
Stoddard solvent	20	CH ₂ Cl ₂	HS-005S-D-40X	1 mL

TPH-R4-SET

32 x 1 mL
(TPH-001-R2-SET, TPH-002-R2-SET, TPH-003-SET, TPH-004-SET)

Motor Oil Standards

Compound	mg/mL	Matrix	Cat. No.	Unit	Compound	mg/mL	Matrix	Cat. No.	Unit
SAE 5W30 Motor oil	0.5	Hexane	FU-025-H	1 mL	SAE 20W50 Motor oil	0.5	Hexane	FU-028-H	1 mL
	20.0	Hexane	FU-025-H-40X	1 mL		20.0	Hexane	FU-028-H-40X	1 mL
	20.0	CH ₂ Cl ₂	FU-025-D-40X	1 mL		20.0	CH ₂ Cl ₂	FU-028-D-40X	1 mL
SAE 10W30 Motor oil	0.5	Hexane	FU-026-H	1 mL	Motor Oil Composite Standard	5.0 each	CH ₂ Cl ₂	MO-COMP-D-40X	1 mL
	20.0	Hexane	FU-026-H-40X	1 mL		SAE 5W30			4 comps.
	20.0	CH ₂ Cl ₂	FU-026-D-40X	1 mL		SAE 10W30			
0.5	Hexane	FU-027-H	1 mL	SAE 10W40					
SAE 10W40 Motor oil	20.0	Hexane	FU-027-H-40X	1 mL	SAE 20W50				
	20.0	CH ₂ Cl ₂	FU-027-D-40X	1 mL					

TPH, Fuel and Hydrocarbons

Brownfield Regulation & ISO/DIS 9337

Petroleum Brownfield Regulation

Brownfield Regulation has been approved by the Canadian Ministry of the Environment as of October 1, 2004.

Light Petroleum Fraction

CCME-LPF-SET

At stated conc. ($\mu\text{g/mL}$) in MeOH

	CCME-LPF-0.05X	CCME-LPF-0.1X	CCME-LPF-0.2X	CCME-LPF-0.5X	CCME-LPF
<i>n</i> -Decane	12.5	25	50	125	250
<i>n</i> -Hexane	12.5	25	50	125	250
Toluene	12.5	25	50	125	250
Benzene	12.5	25	50	125	250
<i>o</i> -Xylene	12.5	25	50	125	250
<i>m</i> -Xylene	6.25	12.5	25	62.5	125
<i>p</i> -Xylene	6.25	12.5	25	62.5	125
Ethylbenzene	12.5	25	50	125	250

Medium & Heavy Petroleum Fraction

CCME-MHPF-SET

At stated conc. ($\mu\text{g/mL}$) in *n*-Hexane

3 x 1 mL

3 comps.

	CCME-MHPF-0.1X	CCME-MHPF-0.5X	CCME-MHPF
<i>n</i> -Decane	40	200	400
<i>n</i> -Hexadecane	40	200	400
<i>n</i> -Tetracontane	40	200	400

Performance Check Standard

CCME-QC

1 x 1 mL

CCME-QC-PAK

SAVE 5 x 1 mL

40 $\mu\text{g/mL}$ each in *n*-Hexane:Cyclohexane (50:50)

2 comps.

n-Pentacontane
n-Tetracontane

Hydrocarbon Standard

D-5442-R1

1 x 1 mL

100 $\mu\text{g/mL}$ each in Cyclohexane

18 comps.

n-Decane
n-Dodecane
n-Tetradecane
n-Hexadecane
n-Octadecane
n-Eicosane
n-Docosane
n-Tetracosane
n-Hexacosane

n-Octacosane
n-Triacontane
n-Dotriacontane
n-Tetracontane
n-Hexatriacontane
n-Octatriacontane
n-Tetracontane
n-Tetratetracontane
n-Pentacontane

Spike Standard

CCME-SPIKE

1 x 1 mL

2500 $\mu\text{g/mL}$ each in *n*-Hexane

2 comps.

SAE 30W Motor Oil - Non-Detergent Formula
#2 Diesel - 50% Weathered

Canadian Atlantic RBCA EPH Mix

CCME-EPH

1 x 1 mL

1000 $\mu\text{g/mL}$ each in Hexane: CH_2Cl_2 (85:15)

11 comps.

Acenaphthene
Anthracene
Benz[a]pyrene
Chrysene
n-Decane
n-Dodecane

n-Dotriacontane
n-Heneicosane
n-Hexadecane
n-Octacosane
Naphthalene

Surrogate Standard

CCME-EPH-SS

1 x 1 mL

1000 $\mu\text{g/mL}$ each in CH_2Cl_2

2 comps.

n-Dotriacontane
Isobutylbenzene

Canadian Atlantic RBCA VPH Mix

CCME-VPH

1 x 1 mL

1000 $\mu\text{g/mL}$ each in MeOH

12 comps.

Benzene
n-Decane
Ethylbenzene
n-Heptane
n-Hexane
1-Methyl-3-ethylbenzene

n-Octane
Toluene
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
o-Xylene
p-Xylene

Surrogate Standard

CCME-VPH-SS

1 x 1 mL

1000 $\mu\text{g/mL}$ in MeOH

Isobutylbenzene

ISO / DIS 9377

Hydrocarbon Oil Index

Diesel #2/Mineral Oil Standard

ENISO9377-2-1

1 x 1 mL

5000 $\mu\text{g/mL}$ each in Hexane

2 comps.

#2 Diesel
Heavy mineral oil

Quality Control Standard Mix

ISO-DIS9377-4-1

1 x 1 mL

500 $\mu\text{g/mL}$ each in Acetone

2 comps.

#2 Diesel
Mineral Oil

Extraction Solvent Stock Soln.

ENISO9377-2-3

1 x 5 mL

At stated conc. ($\mu\text{g/mL}$) in Hexane

2 comps.

n-Decane 14.5
n-Tetracontane 20

Stearyl Stearate Test Solution

ISO-DIS9377-4-2

1 x 10 mL

2000 $\mu\text{g/mL}$ in Cyclohexane

Stearyl stearate

Florisol Cartridge QC Std. Mix

ENISO9377-2-4

1 x 10 mL

1000 $\mu\text{g/mL}$ each in Hexane

2 comps.

#2 Diesel
Heavy mineral oil

System Performance Standard of *n*-alkanes

ENISO9377-2-2

1 x 1 mL

50 $\mu\text{g/mL}$ each in Hexane

16 comps.

n-Decane
n-Dodecane
n-Tetradecane
n-Hexadecane
n-Octadecane
n-Eicosane
n-Docosane
n-Tetracosane

n-Hexacosane
n-Octacosane
n-Triacontane
n-Dotriacontane
n-Tetracontane
n-Hexatriacontane
n-Octatriacontane
n-Tetracontane

ISO/DIS 9377-4 Standard Mixture Stock Solution

TPH-006-10X

1 x 1 mL

TPH-006-10X-PAK

SAVE 5 x 1 mL

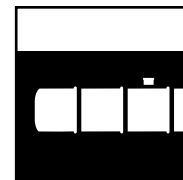
5000 $\mu\text{g/mL}$ each in Cyclohexane

2 comps.

#2 Diesel
Mineral oil

UST (LUFT/LUST)

According to the USEPA there are approximately 4,000 underground storage tanks nationwide that store petroleum or hazardous substances that can harm the environment and human health if their contents are released. Until the mid-1980s, most tanks were made of bare steel. Over time, these tanks would corrode and their contents would leak into the environment. Leaking could also occur due to faulty installation or inadequate maintenance procedures. The greatest potential hazard from a leaking underground storage tank is contaminated groundwater, the source of drinking water for nearly one third of all Americans. Other health and environmental risks, including the potential for fire and explosion also exist.



The standards listed in this section are designed to meet federal and state monitoring and testing regulations for underground storage tanks (UST).

UST (Underground Storage Tank)

Leaking Underground Fuel Tank (LUFT)

Leaking Underground Storage Tank (LUST)



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Multi-State Method Hydrocarbon Window Defining

DRH-008S-R2
DRH-008S-R2-PAK

500 µg/mL each in Chloroform

n-Octane
n-Nonane
n-Decane
n-Undecane
n-Dodecane
n-Tridecane
n-Tetradecane
n-Pentadecane
n-Hexadecane

n-Heptadecane
Pristane
n-Octadecane
Phytane
n-Nonadecane
n-Eicosane
n-Heneicosane
n-Docosane
n-Tricosane

n-Tetracosane
n-Pentacosane
n-Hexacosane
n-Heptacosane
n-Octacosane
n-Nonacosane
n-Triacosane
n-Hentriacontane
n-Dotriacontane

1 x 1 mL
SAVE 5 x 1 mL
35 comps.

n-Triacontane
n-Tetracontane
n-Pentatriacontane
n-Hexatriacontane
n-Heptatriacontane
n-Octatriacontane
n-Nonatriacontane
n-Tetracontane

Technical Note

This Hydrocarbon window defining standard with the C₈ to C₄₀ odd and even alkanes should meet the numerous state-to-state variations for hydrocarbon validation and reporting. Many LUFT/LUST programs require the use of the C₁₇ (Pristane) and C₁₈ (Phytane) ratio to estimate subsurface degradation of fuel oil spills. These compounds are included in the formulation.

UST (LUFT/LUST)

AZ / CA Methods

Arizona

Method 8015 Determination of Diesel Range and Oil Range Organic (DRO & ORO) Hydrocarbons

Diesel & Oil Range Standard

DRO-ORO-AZ-8015

1 x 1 mL

DRO-ORO-AZ-8015-PAK

SAVE 5 x 1 mL

2000 µg/mL each in CH₂Cl₂

12 comps.

n-Decane

n-Eicosane

n-Octadecane

n-Dodecane

n-Hexacosane

n-Tetracosane

n-Docosane

n-Hexadecane

n-Tetradecane

n-Dotriacontane

n-Octacosane

n-Triacontane

Surrogate Standards

DRO-AK-102-SS-10X

1 x 1 mL

DRO-AK-102-SS-10X-PAK

SAVE 5 x 1 mL

2.0 mg/mL in Acetone

o-Terphenyl

Retention Time Verification Standard

DRO-ORO-AZ-8015-RTV

1 x 1 mL

DRO-ORO-AZ-8015-RTV-PAK

SAVE 5 x 1 mL

1000 µg/mL each in CH₂Cl₂

3 comps.

n-Decane

n-Dotriacontane

n-Docosane

Stock Calibration Standard

DRO-ORO-AZ-8015-SCS

1 x 1 mL

DRO-ORO-AZ-8015-SCS-PAK

SAVE 5 x 1 mL

10,000 µg/mL each in CH₂Cl₂

2 comps.

#2 Diesel

SAE 10W30 Motor Oil

California

California Method (including LA County)

California - Gasoline Range Hydrocarbons

S-603A-10X

1 x 1 mL

S-603A-10X-PAK

SAVE 5 x 1 mL

2.0 mg/mL each in MeOH

7 comps.

Benzene

Toluene

m-Xylene

Ethylbenzene

o-Xylene

p-Xylene

MtBE

LA County Well Investigation & Monitoring Program

Purgeable Aromatics - Gasoline ID

M-602-GAS-10X

1 x 1 mL

M-602-GAS-10X-PAK

SAVE 5 x 1 mL

2.0 mg/mL each in MeOH

11 comps.

Benzene

1,4-Dichlorobenzene

p-Xylene

Chlorobenzene

Ethylbenzene

m-Xylene

1,2-Dichlorobenzene

Toluene

MtBE

1,3-Dichlorobenzene

o-Xylene

Oxygenate Gasoline Additive Standard

OGAD-001

1 x 1 mL

OGAD-001-PAK

SAVE 5 x 1 mL

At stated conc. (µg/mL) in MeOH

5 comps.

MtBE

2000

TAME

2000

EtBE

2000

t-Butanol

10000

Isopropyl ether

2000

Ethanol

M-8015B-5031-11

1 x 1 mL

10 mg/mL in Water

Methanol

M-8015B-5031-17

1 x 1 mL

10 mg/mL in Water

Method 1004 Carbonyl Compounds as DNPH Derivatives by HPLC

M-1004

1 x 1 mL

At stated conc. (µg/mL) in AcCN

13 comps.

M-1004-10X

1 x 1 mL

At 10 times the stated conc. in AcCN

13 comps.

Acetaldehyde-DNPH	15.3	Formaldehyde-DNPH	21.0
Acetone-DNPH	12.3	Hexanal-DNPH	8.4
Acrolein-DNPH	12.7	Methacrolein-DNPH	10.7
Benzaldehyde-DNPH	8.1	Propionaldehyde-DNPH	12.3
2-Butanone-DNPH (MEK)	10.5	<i>m</i> -Tolualdehyde-DNPH	7.5
<i>n</i> -Butyraldehyde-DNPH	10.5	Valeraldehyde-DNPH	9.3
Crotonaldehyde-DNPH	10.7		

CAR-DNPH

1 x 1 mL

At stated conc. (µg/mL) in AcCN

7 comps.

Acetaldehyde-DNPH	1000	Butyraldehyde-DNPH	500
Acetone-DNPH	500	Formaldehyde-DNPH	1500
Acrolein-DNPH	500	Propionaldehyde-DNPH	500
Benzaldehyde-DNPH	500		

Reference Gas Oil Sample

RGS-001

1 x 1 mL

Hydrocarbon Mixture (boiling point range 250-850°F)

Technical Note

Alcohol Oxidation Products in Automotive Engine Exhaust by HPLC of DNPH Derivatives The California Air Resources Board, in conjunction with some of the larger automobile manufacturers, has developed an HPLC method in which the 2,4-Dinitrophenylhydrazine derivatives of the by-products are quantitated.

UST (LUFT/LUST)

CT / MS / NJ / PA / TN / WI Methods

Connecticut

Extractable TPHs

CT ETPH Alkane Standard

DRH-009S

DRH-009S-PAK

1000 µg/mL each in CH₂Cl₂

<i>n</i> -Nonane	<i>n</i> -Octadecane	<i>n</i> -Octacosane
<i>n</i> -Decane	<i>n</i> -Eicosane	<i>n</i> -Triacontane
<i>n</i> -Dodecane	<i>n</i> -Docosane	<i>n</i> -Dotriacontane
<i>n</i> -Tetradecane	<i>n</i> -Tetracosane	<i>n</i> -Tetratriacontane
<i>n</i> -Hexadecane	<i>n</i> -Hexacosane	<i>n</i> -Hexatriacontane

1 x 1 mL
SAVE 5 x 1 mL
15 comps.

Internal Standard

GRH-IS

GRH-IS-PAK

1.0 mg/mL in CH₂Cl₂

5- α Androstane

1 x 1 mL
SAVE 5 x 1 mL

Surrogate Standard

GRH-SS

GRH-SS-PAK

2.0 mg/mL in Acetone

o-Terphenyl (OTP)

1 x 1 mL
SAVE 5 x 1 mL

Mississippi

Method

DRO Defining Mix

DRO-AK-102-NAS-10X

DRO-AK-102-NAS-10X-PAK

2.0 mg/mL each in CH₂Cl₂

<i>n</i> -Decane	<i>n</i> -Hexadecane	<i>n</i> -Heneicosane
<i>n</i> -Undecane	<i>n</i> -Heptadecane	<i>n</i> -Docosane
<i>n</i> -Dodecane	<i>n</i> -Octadecane	<i>n</i> -Tricosane
<i>n</i> -Tridecane	<i>n</i> -Nonadecane	<i>n</i> -Tetracosane
<i>n</i> -Tetradecane	<i>n</i> -Eicosane	<i>n</i> -Pentacosane
<i>n</i> -Pentadecane		

1 x 1 mL
SAVE 5 x 1 mL
16 comps.

New Jersey

Method

DEP (NJ) Aliphatic Hydrocarbon Standard

DRH-NJ-001S

1.0 mg/mL each in Hexane

<i>n</i> -Nonane	<i>n</i> -Heneicosane	<i>n</i> -Tetracontane
<i>n</i> -Decane	<i>n</i> -Docosane	<i>n</i> -Hexatriacontane
<i>n</i> -Dodecane	<i>n</i> -Tetracosane	<i>n</i> -Octatriacontane
<i>n</i> -Tetradecane	<i>n</i> -Hexacosane	<i>n</i> -Tetracontane
<i>n</i> -Hexadecane	<i>n</i> -Octacosane	Naphthalene
<i>n</i> -Octadecane	<i>n</i> -Triacontane	2-Methylnaphthalene
<i>n</i> -Eicosane	<i>n</i> -Dotriacontane	

1 x 1 mL
20 comps.

DEP (NJ) Aromatic Hydrocarbon Standard

DRH-NJ-002S

2.0 mg/mL each in CH₂Cl₂

Acenaphthene	Benzo[g,h,i]perylene	Indeno[1,2,3-cd]pyrene
Acenaphthylene	Benzo[k]fluoranthene	2-Methylnaphthalene
Anthracene	Chrysene	Naphthalene
Benz[a]anthracene	Dibenz[a,h]anthracene	Phenanthrene
Benz[a]pyrene	Fluoranthene	Pyrene
Benzo[b]fluoranthene	Fluorene	1,2,3-Trimethylbenzene

1 x 1 mL
18 comps.

Pennsylvania

Storage Tank Site Closure & Monitoring

PA Extractable PAH Standard

DRH-PA-001

DRH-PA-001-PAK

2000 µg/mL each in CH₂Cl₂

Benz[a]anthracene	Fluorene	Phenanthrene
Benz[a]pyrene	Naphthalene	

1 x 1 mL
SAVE 5 x 1 mL
5 comps.

PA Volatile Petroleum Standard

GRH-PA-001

GRH-PA-001-PAK

At stated conc. (µg/mL) in MeOH

Benzene	1000	<i>o</i> -Xylene	1000
Ethylbenzene	1000	<i>m</i> -Xylene	1000
MtBE	2000	<i>p</i> -Xylene	1000
Naphthalene	1000	Isopropylbenzene	1000
Toluene	1000		

1 x 1 mL
SAVE 5 x 1 mL
9 comps.

Tennessee

Method

DRO Defining Mix

DRO-AK-102-NAS-10X

DRO-AK-102-NAS-10X-PAK

2.0 mg/mL each in CH₂Cl₂

<i>n</i> -Decane	<i>n</i> -Hexadecane	<i>n</i> -Heneicosane
<i>n</i> -Undecane	<i>n</i> -Heptadecane	<i>n</i> -Docosane
<i>n</i> -Dodecane	<i>n</i> -Octadecane	<i>n</i> -Tricosane
<i>n</i> -Tridecane	<i>n</i> -Nonadecane	<i>n</i> -Tetracosane
<i>n</i> -Tetradecane	<i>n</i> -Eicosane	<i>n</i> -Pentacosane
<i>n</i> -Pentadecane		

1 x 1 mL
SAVE 5 x 1 mL
16 comps.

Wisconsin

Method

Wisconsin DNR - Gasoline Range Hydrocarbons

GRH-003S

GRH-003S-PAK

2.0 mg/mL each in MeOH

Benzene	Toluene	<i>o</i> -Xylene
Ethylbenzene	1,2,4-Trimethylbenzene	<i>m</i> -Xylene
MtBE	1,3,5-Trimethylbenzene	<i>p</i> -Xylene
Naphthalene		

1 x 1 mL
SAVE 5 x 1 mL
10 comps.

Save 20% on a pack of 5



UST (LUFT/LUST)

Alaska GRO/DRO Methods

Alaska

Method 101 Determination of Gasoline Range Organic (GRO) Hydrocarbons

Normal Alkane Standard - GRO Defining Mix

GRO-AK-101-NAS-10X 1 x 1 mL
 GRO-AK-101-NAS-10X-PAK SAVE 5 x 1 mL
 2.0 mg/mL each in MeOH 5 comps.

n-Hexane *n*-Octane *n*-Decane
n-Heptane *n*-Nonane

Laboratory Control Standard

GRO-AK-101-LCS 1 x 1 mL
 GRO-AK-101-LCS-PAK SAVE 5 x 1 mL
 5.0 mg/mL in MeOH

Gasoline-Regular, unleaded

Internal Standard

GRO-AK-101-IS-10X 1 x 1 mL
 GRO-AK-101-IS-10X-PAK SAVE 5 x 1 mL
 2.0 mg/mL in MeOH

1-Chloro-4-fluorobenzene

Surrogate Control Standard

GRO-AK-101-SS 1 x 1 mL
 GRO-AK-101-SS-PAK SAVE 5 x 1 mL
 50 µg/mL each in MeOH 2 comps.

GRO-AK-101-SS-10X 1 x 1 mL
 GRO-AK-101-SS-10X-PAK SAVE 5 x 1 mL
 500 µg/mL each in MeOH 2 comps.

GRO-AK-101-SS-100X 1 x 1 mL
 GRO-AK-101-SS-100X-PAK SAVE 5 x 1 mL
 5,000 µg/mL each in MeOH 2 comps.

p-Bromofluorobenzene a,a,a-Trifluorotoluene

Certified BTEX in Unleaded Gasoline

GA-001-20X-BTEX 1 x 1 mL
 10.0 mg/mL in MeOH

Gasoline-Regular, unleaded

includes certified concentration of:

Benzene Toluene *o*-Xylene
 Ethylbenzene *m,p*-Xylene

Certified BTEX in Gasoline Composite (Multi Source)

GRO-AK-101-GCS-BTEX 1 x 1 mL
 At stated conc. (mg/mL) in MeOH 3 comps.

Gasoline-Premium, unleaded 1.66
 Gasoline-Regular, leaded 1.67
 Gasoline-Regular, unleaded 1.67

Gasoline Calibration Composite Mix

GRO-AK-101-GCS 1 x 1 mL
 GRO-AK-101-GCS-PAK SAVE 5 x 1 mL
 At stated conc. (mg/mL) in MeOH 3 comps.

Gasoline-Premium, unleaded 1.66
 Gasoline-Regular, leaded 1.67
 Gasoline-Regular, unleaded 1.67

Gasoline Calibration Mix Version

GRO-AK-101-GSC-R1 1 x 1 mL
 GRO-AK-101-GSC-R1-PAK SAVE 5 x 1 mL
 Equal Wt.% 3 comps.

Gasoline-Regular, unleaded
 Gasoline-Plus, unleaded
 Gasoline-Premium, unleaded

Alaska

Method 101AA Determination of Aromatic & Aliphatic Hydrocarbons in GRO

AK101AA Aromatics Mix

GRO-AK-101AA-ARO 1 x 1 mL
 GRO-AK-101AA-ARO-PAK SAVE 5 x 1 mL
 2000 µg/mL each in MeOH 14 comps.

Benzene *o*-Xylene *m*-Ethyltoluene
 Toluene 1,2,3-Trimethylbenzene *p*-Ethyltoluene
 Ethylbenzene 1,2,4-Trimethylbenzene *o*-Ethyltoluene
m-Xylene 1,3,5-Trimethylbenzene *n*-Propylbenzene
p-Xylene Isopropylbenzene

Custom Formulations

Custom CRMs are a fast and economical way to meet your specific laboratory needs. We have decades of experience to formulate stable, reliable, and quality custom standards.

**Talk to one of our
 Quotation Specialists**

UST (LUFT/LUST)

Alaska DRO/RRO Methods

Alaska

Method 102 Determination of Diesel Range Organic (DRO) Hydrocarbons

Laboratory Control Standard

DRO-AK-102-LCS-10X-R1
DRO-AK-102-LCS-10X-R1-PAK
50.0 mg/mL in Acetone

1 x 1 mL
SAVE 5 x 1 mL

#2 Diesel (Conventional)

Normal Alkane Standard - DRO Defining Mix

DRO-AK-102-NAS-10X
DRO-AK-102-NAS-10X-PAK
2.0 mg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
16 comps.

<i>n</i> -Decane	<i>n</i> -Hexadecane	<i>n</i> -Heneicosane
<i>n</i> -Undecane	<i>n</i> -Heptadecane	<i>n</i> -Docosane
<i>n</i> -Dodecane	<i>n</i> -Octadecane	<i>n</i> -Tricosane
<i>n</i> -Tridecane	<i>n</i> -Nonadecane	<i>n</i> -Tetracosane
<i>n</i> -Tetradecane	<i>n</i> -Eicosane	<i>n</i> -Pentacosane
<i>n</i> -Pentadecane		

Surrogate Standards

DRO-AK-102-SS
DRO-AK-102-SS-PAK
200 µg/mL in Acetone

1 x 1 mL
SAVE 5 x 1 mL

DRO-AK-102-SS-10X
DRO-AK-102-SS-10X-PAK
2.0 mg/mL in Acetone

1 x 1 mL
SAVE 5 x 1 mL

o-Terphenyl

Internal Standard

DRO-AK-102-IS
DRO-AK-102-IS-PAK
1.0 mg/mL in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL

5- α Androstane

Alaska

Method 102/103AA Determination of Aromatic & Aliphatic Hydrocarbons in Diesel Range Organic (DRO)

Diesel Range Standard

DRO-AK-102AA
DRO-AK-102AA-PAK
2000 µg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
10 comps.

<i>n</i> -Undecane	<i>n</i> -Tetracosane	Fluorene
<i>n</i> -Pentadecane	Naphthalene	Pyrene
<i>n</i> -Heptadecane	Acenaphthene	Anthracene
<i>n</i> -Octadecane		

Surrogate Standard

DRO-AK-102-103AA-SS
DRO-AK-102-103AA-SS-PAK
1000 µg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
3 comps.

Squalane
o-Terphenyl
5,6,7,8-Tetrahydro-1-naphthol

Retention Time Marker Standard

DRO-AK-102-103AA-RT
DRO-AK-102-103AA-RT-PAK
50 µg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
3 comps.

n-Decane
n-Pentacosane
n-Hexatriacontane

Residual Composite Mixtures

RRO-AK-103-RCS
RRO-AK-103-RCS-PAK
At stated conc. (mg/mL) in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
3 comps.

SAE 30W Motor oil	1.66
SAE 40W Motor oil	1.67
SAE 50W Motor Oil	1.67

RRO-AK-103-RCS-10X
RRO-AK-103-RCS-10X-PAK
At stated conc. (mg/mL) in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
3 comps.

SAE 30W Motor oil	16.6
SAE 40W Motor oil	16.7
SAE 50W Motor Oil	16.7

Laboratory Control Standard

RRO-AK-103-LCS
RRO-AK-103-LCS-PAK
5.0 mg/mL in Acetone

1 x 1 mL
SAVE 5 x 1 mL

RRO-AK-103-LCS-5X
RRO-AK-103-LCS-5X-PAK
25.0 mg/mL in Acetone:CH₂Cl₂ (50:50)

1 x 1 mL
SAVE 5 x 1 mL

SAE 40W Motor oil

Surrogate Control Standard

RRO-AK-103-SS
RRO-AK-103-SS-PAK
500 µg/mL in Acetone:THF (90:10)

1 x 1 mL
SAVE 5 x 1 mL

RRO-AK-103-SS2
RRO-AK-103-SS2-PAK
5.0 mg/mL in THF:Acetone (75:25)

1 x 1 mL
SAVE 5 x 1 mL

n-Triacontane-d₆₂

Alaska

Method 103AA Determination of Aromatic & Aliphatic Hydrocarbons in Residual Range Organic

Residual Standard

RRO-AK-103AA
RRO-AK-103AA-PAK
2000 µg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
9 comps.

<i>n</i> -Hexacosane	Benzo[b]fluoranthene
<i>n</i> -Octacosane	Benz[a]pyrene
<i>n</i> -Triacontane	Benzo[g,h,i]perylene
<i>n</i> -Dotriacontane	Dibenz[a,h]anthracene
<i>n</i> -Tetracontane	

Surrogate Standard

DRO-AK-102-103AA-SS
DRO-AK-102-103AA-SS-PAK
1000 µg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
3 comps.

Squalane
o-Terphenyl
5,6,7,8-Tetrahydro-1-naphthol

Retention Time Marker Standard

DRO-AK-102-103AA-RT
DRO-AK-102-103AA-RT-PAK
50 µg/mL each in CH₂Cl₂

1 x 1 mL
SAVE 5 x 1 mL
3 comps.

n-Decane
n-Pentacosane
n-Hexatriacontane

UST (LUFT/LUST) Florida Method

Florida

Total Recoverable Petroleum Hydrocarbon (FTRPH) Standard and Surrogates

Calibration / Window Defining Hydrocarbon

DRH-004S-R1-5X **1 x 1 mL**
 DRH-004S-R1-5X-PAK **SAVE 5 x 1 mL**
 1.0 mg/mL each in Chloroform 17 comps.

<i>n</i> -Octane (C ₈)	<i>n</i> -Hexacosane (C ₂₆)
<i>n</i> -Decane (C ₁₀)	<i>n</i> -Octacosane (C ₂₈)
<i>n</i> -Dodecane (C ₁₂)	<i>n</i> -Triacosane (C ₃₀)
<i>n</i> -Tetradecane (C ₁₄)	<i>n</i> -Dotriacontane (C ₃₂)
<i>n</i> -Hexadecane (C ₁₆)	<i>n</i> -Tetraatriacontane (C ₃₄)
<i>n</i> -Octadecane (C ₁₈)	<i>n</i> -Hexatriacontane (C ₃₆)
<i>n</i> -Eicosane (C ₂₀)	<i>n</i> -Octatriacontane (C ₃₈)
<i>n</i> -Docosane (C ₂₂)	<i>n</i> -Tetracontane (C ₄₀)
<i>n</i> -Tetracosane (C ₂₄)	

FTRPH Calibration / Window Defining

DRH-FTRPH **1 x 1 mL**
 DRH-FTRPH-PAK **SAVE 5 x 1 mL**
 500 µg/mL each in Hexane 17 comps.

DRH-FTRPH-0.1X
50 µg/mL each in Hexane

<i>n</i> -Octane	<i>n</i> -Eicosane	<i>n</i> -Dotriacontane
<i>n</i> -Decane	<i>n</i> -Docosane	<i>n</i> -Tetraatriacontane
<i>n</i> -Dodecane	<i>n</i> -Tetracosane	<i>n</i> -Hexatriacontane
<i>n</i> -Tetradecane	<i>n</i> -Hexacosane	<i>n</i> -Octatriacontane
<i>n</i> -Hexadecane	<i>n</i> -Octacosane	<i>n</i> -Tetracontane
<i>n</i> -Octadecane	<i>n</i> -Triacosane	

Technical Note

FTRPH Calibration/Window Defining Standard was formulated at a lower concentration to insure solubility of the analytes & eliminate the odor caused by the introduction of Carbon disulfide as a cosolvent.

Internal Standard

GRH-IS **1 x 1 mL**
 GRH-IS-PAK **SAVE 5 x 1 mL**
 1.0 mg/mL in CH₂Cl₂

GRH-IS-10X **1 x 1 mL**
 10 mg/mL in CH₂Cl₂
 5-alpha Androstane

Surrogate Standards

DRH-SS **1 x 1 mL**
 DRH-SS-PAK **SAVE 5 x 1 mL**
 5.0 mg/mL in THF
n-Triacosane-d₆₂

GRH-SS **1 x 1 mL**
 GRH-SS-PAK **SAVE 5 x 1 mL**
 2.0 mg/mL in Acetone
o-Terphenyl (OTP)

FTRPH Surrogate Standard

DRH-FL-SS-3X **1 x 1 mL**
 DRH-FL-SS-3X-PAK **SAVE 5 x 1 mL**
 3.0 mg/mL in Carbon disulfide

DRH-FL-SS **1 x 1 mL**
 DRH-FL-SS-PAK **SAVE 5 x 1 mL**
 1.0 mg/mL in Carbon disulfide

n-Nonatriacontane

FTRPH Combined Surrogate Standard

DRH-GRH-FL-SS **1 x 1 mL**
 DRH-GRH-FL-SS-PAK **SAVE 5 x 1 mL**
 5.0 mg/mL each in Carbon disulfide 2 comps.

n-Nonatriacontane *o*-Terphenyl (OTP)

DRH-GRH-FL-SS-R2 **1 x 1 mL**
 DRH-GRH-FL-SS-R2-PAK **SAVE 5 x 1 mL**
 At stated conc. (µg/mL) in Carbon disulfide 2 comps.

n-Nonatriacontane 6000 *o*-Terphenyl (OTP) 1500

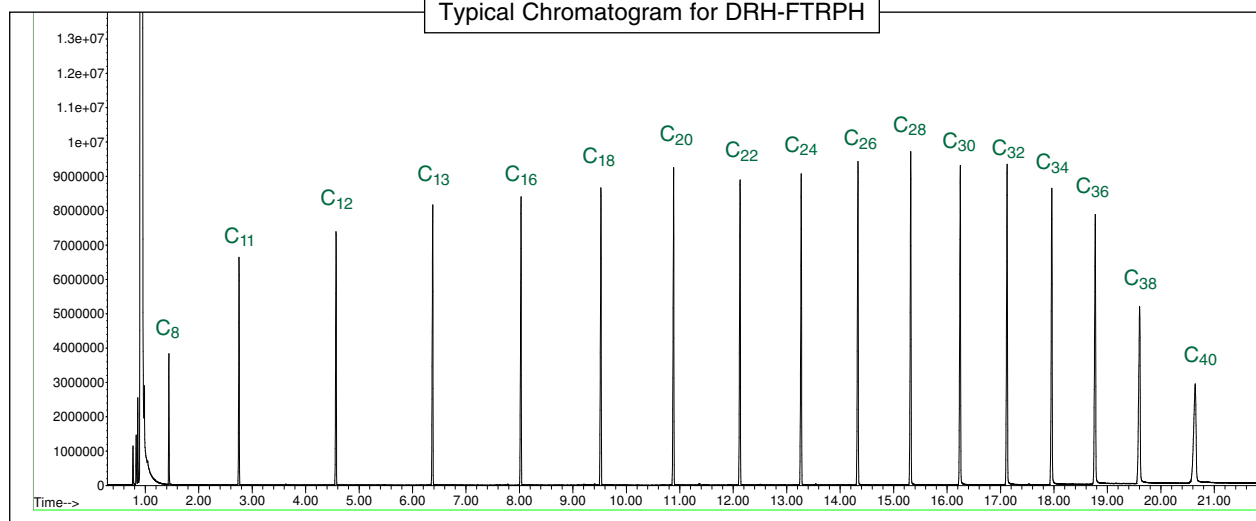
Technical Note

FTRPH Surrogate Standard was formulated at a higher concentration for combined DRH & GRH analysis. This standard has proven useful for those laboratories performing gasoline & diesel analysis simultaneously.



Carbon disulfide can not ship by air. When possible alternate solvents can be used. Please contact our Technical Service Department for other options.

Typical Chromatogram for DRH-FTRPH



UST (LUFT/LUST)

Massachusetts Method - Ready-to-Inject Working Level EPH Standards

Massachusetts

Determination of Extractable Petroleum Hydrocarbons (EPH)

Aromatic Hydrocarbons Calibration Set

DRH-006-CAL-SET

At stated conc. ($\mu\text{g/mL}$) in CH_2Cl_2

5 x 1 mL
18 comps.

Components	Level 1 (1X)	Level 2 (4X)	Level 3 (10X)	Level 4 (20X)	Level 5 (40X)
Acenaphthene	5	20	50	100	200
Acenaphthylene	5	20	50	100	200
Anthracene	5	20	50	100	200
Benz[a]anthracene	5	20	50	100	200
Benz[a]pyrene	5	20	50	100	200
Benzo[b]fluoranthene	5	20	50	100	200
Benzo[g,h,i]perylene	5	20	50	100	200
Benzo[k]fluoranthene	5	20	50	100	200
Chrysene	5	20	50	100	200
Dibenz[a,h]anthracene	5	20	50	100	200
Fluoranthene	5	20	50	100	200
Fluorene	5	20	50	100	200
Indeno[1,2,3-cd]pyrene	5	20	50	100	200
2-Methylnaphthalene	5	20	50	100	200
Naphthalene	5	20	50	100	200
Phenanthrene	5	20	50	100	200
Pyrene	5	20	50	100	200
o-Terphenyl (Surrogate)	5	20	50	100	200

Aliphatic Hydrocarbons Calibration Set

DRH-007-CAL-R1-SET

At stated conc. ($\mu\text{g/mL}$) in CH_2Cl_2 :n-Hexane (50:50)

5 x 1 mL
15 comps.

Components	Level 1 (1X)	Level 2 (4X)	Level 3 (10X)	Level 4 (20X)	Level 5 (40X)
n-Nonane	5	20	50	100	200
n-Decane	5	20	50	100	200
n-Dodecane	5	20	50	100	200
n-Tetradecane	5	20	50	100	200
n-Hexadecane	5	20	50	100	200
n-Octadecane	5	20	50	100	200
n-Nonadecane	5	20	50	100	200
n-Eicosane	5	20	50	100	200
n-Docosane	5	20	50	100	200
n-Tetracosane	5	20	50	100	200
n-Hexacosane	5	20	50	100	200
n-Octacosane	5	20	50	100	200
n-Triacontane	5	20	50	100	200
n-Hexatriacontane	5	20	50	100	200
1-Chlorooctadecane (Surrogate)	5	20	50	100	200

Combined Aromatic/Aliphatic Matrix Spike Standard

DRH-MS-ASL

DRH-MS-ASL-PAK

25 $\mu\text{g/mL}$ each in Hexane: CH_2Cl_2 (95:5)

1 x 1 mL
SAVE 5 x 1 mL
31 comps.

Acenaphthene	n-Docosane	Naphthalene
Acenaphthylene	n-Dodecane	n-Nonadecane
Anthracene	n-Eicosane	n-Nonane
Benz[a]anthracene	Fluoranthene	n-Octacosane
Benz[a]pyrene	Fluorene	n-Octadecane
Benzo[b]fluoranthene	n-Hexacosane	Phenanthrene
Benzo[g,h,i]perylene	n-Hexadecane	Pyrene
Benzo[k]fluoranthene	n-Hexatriacontane	n-Tetracosane
Chrysene	Indeno[1,2,3-cd]pyrene	n-Tetradecane
n-Decane	2-Methylnaphthalene	n-Triacontane
Dibenz[a,h]anthracene		

DEP (MA) - Fractionation Surrogate Spike

DRH-MA-FSS-10ML

DRH-MA-FSS-50X

DRH-MA-FSS-50X-PAK

40 $\mu\text{g/mL}$ each in Hexane

2.0 mg/mL each in Hexane

2.0 mg/mL each in Hexane

1 x 10 mL
1 x 1 mL
SAVE 5 x 1 mL
2 comps.

2-Fluorobiphenyl	2-Bromonaphthalene
------------------	--------------------

Aromatic Surrogate

DRH-006-SS

DRH-006-SS-PAK

1.0 mg/mL in CH_2Cl_2

1 x 1 mL
SAVE 5 x 1 mL

o-Terphenyl

DEP (MA) - Aromatic Hydrocarbons

DRH-006S

DRH-006S-PAK

1.0 mg/mL each in CH_2Cl_2

1 x 1 mL
SAVE 5 x 1 mL
17 comps.

Acenaphthene	Benzo[g,h,i]perylene	Indeno[1,2,3-cd]pyrene
Acenaphthylene	Benzo[k]fluoranthene	2-Methylnaphthalene
Anthracene	Chrysene	Naphthalene
Benz[a]anthracene	Dibenz[a,h]anthracene	Phenanthrene
Benz[a]pyrene	Fluoranthene	Pyrene
Benzo[b]fluoranthene	Fluorene	

Technical Note

Two high concentration EPH stocks for laboratories that prepare in-house working level solutions and Ready-to-Use working level aromatic and aliphatic calibration sets are available. Larger volumes of daily calibration solutions can be purchased by contacting our Technical Service Department.

DEP (MA) - Aliphatic Hydrocarbons

DRH-007S

DRH-007S-PAK

1.0 mg/mL each in CH_2Cl_2 : Hexane (50:50)

1 x 1 mL
SAVE 5 x 1 mL
14 comps.

n-Nonane	n-Octadecane	n-Hexacosane
n-Decane	n-Nonadecane	n-Octacosane
n-Dodecane	n-Eicosane	n-Triacontane
n-Tetradecane	n-Docosane	n-Hexatriacontane
n-Hexadecane	n-Tetracosane	

Aliphatic Surrogate

DRH-007-SS

DRH-007-SS-PAK

1.0 mg/mL in Hexane

1 x 1 mL
SAVE 5 x 1 mL

1-Chlorooctadecane

EPH Surrogate Spike

DRH-MA-SS

20 $\mu\text{g/mL}$ each in Acetone

1 x 1 mL
2 comps.

DRH-MA-SS-10X

200 $\mu\text{g/mL}$ each in Acetone

1 x 1 mL
2 comps.

DRH-MA-SS-100X

DRH-MA-SS-100X-PAK

2,000 $\mu\text{g/mL}$ each in Acetone

1 x 1 mL
SAVE 5 x 1 mL
2 comps.

1-Chlorooctadecane	o-Terphenyl
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EPH Matrix Spike

DRH-MA-MS

DRH-MA-MS-PAK

25 $\mu\text{g/mL}$ each in Acetone

1 x 1 mL
SAVE 5 x 1 mL
10 comps.

DRH-MA-MS-10X

DRH-MA-MS-10X-PAK

250 $\mu\text{g/mL}$ each in Acetone

1 x 1 mL
SAVE 5 x 1 mL
10 comps.

DRH-MA-MS-40X

DRH-MA-MS-40X-PAK

1,000 $\mu\text{g/mL}$ each in Acetone

1 x 1 mL
SAVE 5 x 1 mL
10 comps.

Acenaphthene	Naphthalene	n-Octacosane
Anthracene	n-Nonadecane	Pyrene
Chrysene	n-Nonane	n-Tetradecane
n-Eicosane		

Internal Standard

GRH-IS

GRH-IS-PAK

1,000 $\mu\text{g/mL}$ in CH_2Cl_2

1 x 1 mL
SAVE 5 x 1 mL

GRH-IS-10X

10.0 mg/mL in CH_2Cl_2

1 x 1 mL

5-alpha Androstane

UST (LUFT/LUST)

Massachusetts Method - Ready-to-Inject Working Level EPH Standards

Massachusetts

Determination of Volatile Petroleum Hydrocarbons (VPH)

Stock Concentrate

Volatile Petroleum Hydrocarbon Mix

GRH-004S-10X

GRH-004S-10X-PAK

At stated conc. (mg/mL) in MeOH

			1 x 1 mL
			SAVE 5 x 1 mL
			13 comps.
Benzene	5.0	<i>n</i> -Pentane	10.0
Ethylbenzene	5.0	Toluene	15.0
Isooctane	15.0	1,2,4-Trimethylbenzene	10.0
2-Methylpentane	15.0	<i>o</i> -Xylene	10.0
MtBE	15.0	<i>m</i> -Xylene	10.0
Naphthalene	10.0	<i>p</i> -Xylene	10.0
<i>n</i> -Nonane	10.0		

DEP (MA) - VPH Surrogate Standard

GRH-004-SS

GRH-004-SS-PAK

50 µg/mL in MeOH

GRH-004-SS-10X

GRH-004-SS-10X-PAK

500 µg/mL in MeOH

GRH-004-SS-100X

GRH-004-SS-100X-PAK

5,000 µg/mL in MeOH

2,5-Dibromotoluene

1 x 1 mL
SAVE 5 x 1 mL

1 x 1 mL
SAVE 5 x 1 mL

1 x 1 mL
SAVE 5 x 1 mL

MA VPH Matrix Spike Mix with Surrogate

GRH-004-MS-SS

50 µg/mL each in MeOH

			1 x 1 mL
			14 comps.
Benzene	2-Methylpentane	Toluene	
<i>n</i> -Butylcyclohexane	MtBE	1,2,4-Trimethylbenzene	
<i>n</i> -Decane	Naphthalene	Isooctane	
2,5-Dibromotoluene	<i>n</i> -Nonane	<i>m</i> -Xylene	
Ethylbenzene	<i>n</i> -Pentane		

VPH Matrix Spike

GRH-004-MS

GRH-004-MS-PAK

50 µg/mL each in MeOH

GRH-004-MS-10X

GRH-004-MS-10X-PAK

500 µg/mL each in MeOH

GRH-004-MS-100X

GRH-004-MS-100X-PAK

5,000 µg/mL each in MeOH

			1 x 1 mL
			SAVE 5 x 1 mL
			8 comps.
Benzene	Naphthalene	<i>m</i> -Xylene	
Ethylbenzene	Toluene	<i>p</i> -Xylene	
MtBE	<i>o</i> -Xylene		

Certified BTEX in Unleaded Gasoline

GA-001-20X-BTEX

10.0 mg/mL in MeOH

Gasoline-Regular, unleaded

includes certified concentration of:

			1 x 1 mL
Benzene	Toluene	<i>o</i> -Xylene	
Ethylbenzene	<i>m,p</i> -Xylene		

Volatile Petroleum Hydrocarbons without Surrogate

GRH-004S-R1-10X

At stated conc. (mg/mL) in MeOH

			1 x 1 mL
			15 comps.
Benzene	5.0	Toluene	15.0
Ethylbenzene	5.0	1,2,4-Trimethylbenzene	10.0
Isooctane	15.0	<i>o</i> -Xylene	10.0
2-Methylpentane	15.0	<i>m</i> -Xylene	10.0
MtBE	15.0	<i>p</i> -Xylene	10.0
Naphthalene	10.0	<i>n</i> -Butylcyclohexane	10.0
<i>n</i> -Nonane	10.0	<i>n</i> -Decane	10.0
<i>n</i> -Pentane	10.0		

GRH-004S-R2

10 mg/mL each in MeOH

			1 x 1 mL
			15 comps.
Benzene		Toluene	
Ethylbenzene		1,2,4-Trimethylbenzene	
Isooctane		<i>o</i> -Xylene	
2-Methylpentane		<i>m</i> -Xylene	
MtBE		<i>p</i> -Xylene	
Naphthalene		<i>n</i> -Butylcyclohexane	
<i>n</i> -Nonane		<i>n</i> -Decane	
<i>n</i> -Pentane			

Volatile Petroleum Hydrocarbons with Surrogate

GRH-004S-SS

GRH-004S-SS-PAK

At stated conc. (µg/mL) in MeOH

			1 x 1 mL
			SAVE 5 x 1 mL
			14 comps.
Benzene	500	<i>n</i> -Nonane	1,000
2,5-Dibromotoluene (Surrogate)	1,000	<i>n</i> -Pentane	1,000
Ethylbenzene	500	Toluene	1,500
Isooctane	1,500	1,2,4-Trimethylbenzene	1,000
2-Methylpentane	1,500	<i>o</i> -Xylene	1,000
MtBE	1,500	<i>m</i> -Xylene	1,000
Naphthalene	1,000	<i>p</i> -Xylene	1,000

GRH-004S-SS-R1

At stated conc. (µg/mL) in MeOH

			1 x 1 mL
			16 comps.
Benzene	500	<i>n</i> -Pentane	1,000
2,5-Dibromotoluene (Surrogate)	1,000	Toluene	1,500
Ethylbenzene	500	1,2,4-Trimethylbenzene	1,000
Isooctane	1,500	<i>o</i> -Xylene	1,000
2-Methylpentane	1,500	<i>m</i> -Xylene	1,000
MtBE	1,500	<i>p</i> -Xylene	1,000
Naphthalene	1,000	<i>n</i> -Butylcyclohexane	1,000
<i>n</i> -Nonane	1,000	<i>n</i> -Decane	1,000

GRH-004S-SS-R2

10.0 mg/mL each in MeOH

			1 x 1 mL
			16 comps.
Benzene		<i>n</i> -Pentane	
2,5-Dibromotoluene (Surrogate)		Toluene	
Ethylbenzene		1,2,4-Trimethylbenzene	
Isooctane		<i>o</i> -Xylene	
2-Methylpentane		<i>m</i> -Xylene	
MtBE		<i>p</i> -Xylene	
Naphthalene		<i>n</i> -Butylcyclohexane	
<i>n</i> -Nonane		<i>n</i> -Decane	

UST (LUFT/LUST)

Texas Methods - PST Standards

Texas

Method 1005 & 1006 Petroleum Storage Tanks (PST)

Stock Hydrocarbon Calibration Standard

DRH-TX-001-10X

1 x 1 mL

DRH-TX-001-10X-PAK

SAVE 5 x 1 mL

2000 µg/mL each in *n*-Pentane

12 comps.

n-Hexane

n-Tetradecane

n-Docosane

n-Octane

n-Hexadecane

n-Tetracosane

n-Decane

n-Octadecane

n-Hexacosane

n-Dodecane

n-Eicosane

n-Octacosane

Gasoline / Diesel Calibration Curve Set

DRH-TX-002-D-SET

8 x 1 mL

At stated conc. (µg/mL) in CH₂Cl₂

2 comps.

Components	.01X	.04X	.1X	.20X	.40X	1X	2X	10X
Gasoline-Regular (unleaded)	5	20	50	100	200	500	1000	5000
#2 Diesel Fuel	5	20	50	100	200	500	1000	5000

Each set contains 8 concentrations:

Gasoline/Diesel Continuing Calibration Standard

DRH-TX-002-D-0.4X-10ML

1 x 10 mL

200 µg/mL each in CH₂Cl₂

2 comps.

Gasoline-Regular, unleaded

#2 Diesel Fuel

Gasoline/Diesel Calibration/Matrix Spike Standard

DRH-TX-002-10X

1 x 1 mL

DRH-TX-002-10X-PAK

SAVE 5 x 1 mL

5000 µg/mL each in MeOH

2 comps.

Gasoline-Regular, unleaded

#2 Diesel Fuel

Stock Gasoline/Diesel Calibration Standard

DRH-TX-002-D-40X

1 x 1 mL

DRH-TX-002-D-40X-PAK

SAVE 5 x 1 mL

20,000 µg/mL each in CH₂Cl₂

2 comps.

Gasoline-Regular, unleaded

#2 Diesel Fuel

Technical Note

TCEQ Methods 1005 and 1006

Texas Commission on Environmental Quality (TCEQ) has developed these methods in response to notifications of leaking petroleum storage tanks that have contaminated ground water. These methods govern the testing of Total Petroleum Hydrocarbon (TPH) concentrations.

Gasoline / Diesel Calibration Curve Set

DRH-TX-003-SET

8 x 1 mL

Each at stated conc. in Pentane

2 comps.

Components	.04X	.2X	0.5X	1X	1.5X	2X	10X	20X
Gasoline-Regular (unleaded)	20	100	250	500	750	1000	5000	10,000
#2 Diesel Fuel	20	100	250	500	750	1000	5000	10,000

Each set contains 8 concentrations:

Gasoline and Diesel Standard

DRH-TX-003-20X

1 x 5 mL

DRH-TX-003-20X-PAK

SAVE 5 x 5 mL

10,000 µg/mL each in Pentane

2 comps.

Gasoline-Regular, unleaded

#2 Diesel Fuel

Surrogate Standard

DRH-TX-003-SS1

1 x 5 mL

DRH-TX-003-SS1-PAK

SAVE 5 x 5 mL

10 mg/mL each in Pentane

2 comps.

1-Chlorooctadecane

1-Chlorooctane

Carbon Number Distribution Maker

DRH-TX-003-CNM

1 x 1 mL

DRH-TX-003-CNM-PAK

SAVE 5 x 1 mL

2000 µg/mL each in Pentane

9 comps.

n-Decane

n-Heptane

n-Octacosane

n-Dodecane

n-Hexadecane

n-Octane

n-Heneicosane

n-Hexane

n-Pentatriacontane

Aromatic Fractionation Check Standard

DRH-TX-003-FCS

1 x 10 mL

DRH-TX-003-FCS-PAK

SAVE 5 x 10 mL

20 µg/mL each in Pentane

24 comps.

Acenaphthene

Benz[e]pyrene

Naphthalene

Acenaphthylene

Benzo[g,h,i]perylene

Phenanthrene

Anthracene

Chrysene

Pyrene

Benzene

Dibenz[a,h]anthracene

Toluene

Benz[a]anthracene

Ethylbenzene

1,2,3-Trimethylbenzene

Benzo[b]fluoranthene

Fluoranthene

m-Xylene

Benzo[k]fluoranthene

Fluorene

p-Xylene

Benz[a]pyrene

Indeno[1,2,3-cd]pyrene

o-Xylene

UST (LUFT/LUST)

Washington Methods

Washington

Determination of Volatile Petroleum Hydrocarbons (VPH)

VPH Standard

VPH-WA

VPH-WA-PAK

200 µg/mL each in MeOH

Benzene	<i>p</i> -Xylene	<i>n</i> -Decane
Ethylbenzene	MtBE	<i>n</i> -Dodecane
Toluene	<i>n</i> -Pentane	1-Methylnaphthalene
<i>o</i> -Xylene	<i>n</i> -Hexane	Naphthalene
<i>m</i> -Xylene	<i>n</i> -Octane	1,2,3-Trimethylbenzene

1 x 1 mL

SAVE 5 x 1 mL

15 comps.

VPH Matrix Spike

VPH-WA-MS

VPH-WA-MS-PAK

At stated conc. (µg/mL) in MeOH

Benzene	60	Toluene	60
Ethylbenzene	60	1,2,3-Trimethylbenzene	60
MtBE	180	<i>m</i> -Xylene	60
Naphthalene	360	<i>p</i> -Xylene	60
<i>n</i> -Nonane	200	<i>o</i> -Xylene	60
<i>n</i> -Pentane	600		

1 x 1 mL

SAVE 5 x 1 mL

11 comps.

VPH Primary Dilution Standard with Surrogate

VPH-WA-SS-10X

VPH-WA-SS-10X-PAK

2,000 µg/mL each in MeOH

Benzene	MtBE	<i>n</i> -Dodecane
Ethylbenzene	<i>n</i> -Pentane	1-Methylnaphthalene
Toluene	<i>n</i> -Hexane	Naphthalene
<i>o</i> -Xylene	<i>n</i> -Octane	1,2,3-Trimethylbenzene
<i>m</i> -Xylene	<i>n</i> -Decane	2,5-Dibromotoluene (surrogate)
<i>p</i> -Xylene		

1 x 1 mL

SAVE 5 x 1 mL

16 comps.

VPH Surrogate Standard

GRH-004-SS

GRH-004-SS-PAK

50 µg/mL in MeOH

GRH-004-SS-10X
GRH-004-SS-10X-PAK
500 µg/mL in MeOH

GRH-004-SS-100X
GRH-004-SS-100X-PAK
5,000 µg/mL in MeOH

2,5-Dibromotoluene

1 x 1 mL

SAVE 5 x 1 mL

1 x 1 mL

SAVE 5 x 1 mL

1 x 1 mL

SAVE 5 x 1 mL

Stock Concentrate VPH Standards

VPH-WA-10X

VPH-WA-10X-PAK

2,000 µg/mL each in MeOH

Benzene	<i>p</i> -Xylene	<i>n</i> -Decane
Ethylbenzene	MtBE	<i>n</i> -Dodecane
Toluene	<i>n</i> -Pentane	1-Methylnaphthalene
<i>o</i> -Xylene	<i>n</i> -Hexane	Naphthalene
<i>m</i> -Xylene	<i>n</i> -Octane	1,2,3-Trimethylbenzene

1 x 1 mL

SAVE 5 x 1 mL

15 comps.

VPH-WA-100X

VPH-WA-100X-PAK

20.0 mg/mL each in MeOH

1 x 1 mL

SAVE 5 x 1 mL

15 comps.

VPH Retention Time Marker

VPH-WA-RT

VPH-WA-RT-PAK

2,000 µg/mL each in MeOH

<i>n</i> -Pentane	<i>n</i> -Octane	<i>n</i> -Dodecane
<i>n</i> -Hexane	<i>n</i> -Decane	<i>n</i> -Tridecane

1 x 1 mL

SAVE 5 x 1 mL

6 comps.

Certified BTEX in Unleaded Gasoline

GA-001-20X-BTEX

10.0 mg/mL in MeOH

Gasoline-Regular, unleaded

includes certified concentration of:

Benzene	Toluene	<i>o</i> -Xylene
Ethylbenzene	<i>m,p</i> -Xylene	

1 x 1 mL

1,2,3-Trimethylbenzene Standard

V-028S-D-10X

V-028S-D-10X-PAK

1000 µg/mL each in CH₂Cl₂

1,2,3-Trimethylbenzene

1 x 1 mL

SAVE 5 x 1 mL

Certified BTEX in Gasoline Composite (Multi Source)

GRO-AK-101-GCS-BTEX

At stated conc. (mg/mL) in MeOH

Gasoline-Premium, unleaded	1.66
Gasoline-Regular, leaded	1.67
Gasoline-Regular, unleaded	1.67

1 x 1 mL

3 comps.

UST (LUFT/LUST)

Washington Methods

Washington

Determination of Extractable Petroleum Hydrocarbons (EPH)

EPH Aromatic/PAH Standard

EPH-WA-10X

1 x 1 mL

EPH-WA-10X-PAK

SAVE 5 x 1 mL

1.0 mg/mL each in CH₂Cl₂

18 comps.

Acenaphthene	Benzo[g,h,i]perylene	Indeno[1,2,3-cd]pyrene
Acenaphthylene	Benzo[k]fluoranthene	2-Methylnaphthalene
Anthracene	Chrysene	Naphthalene
Benz[a]anthracene	Dibenz[a,h]anthracene	Phenanthrene
Benz[a]pyrene	Fluoranthene	Pyrene
Benzo[b]fluoranthene	Fluorene	1,2,3-Trimethylbenzene

Internal Standard

GRH-IS

1 x 1 mL

GRH-IS-PAK

SAVE 5 x 1 mL

1000 µg/mL in CH₂Cl₂

GRH-IS-10X

1 x 1 mL

10.0 mg/mL in CH₂Cl₂

5-alpha Androstane

EPH Surrogate Spike

DRH-MA-SS

1 x 1 mL

20 µg/mL each in Acetone

2 comps.

DRH-MA-SS-10X

1 x 1 mL

200 µg/mL each in Acetone

2 comps.

DRH-MA-SS-100X

1 x 1 mL

DRH-MA-SS-100X-PAK

SAVE 5 x 1 mL

2,000 µg/mL each in Acetone

2 comps.

1-Chlorooctadecane

o-Terphenyl

EPH Matrix Spike

EPH-WA-MS2-20ML

1 x 20 mL

EPH-WA-MS2-20ML-PAK

SAVE 5 x 20 mL

25 µg/mL each in Acetone

10 comps.

Acenaphthene	<i>n</i> -Decane	<i>n</i> -Heneicosane
Anthracene	<i>n</i> -Dodecane	Naphthalene
Benzo[g,h,i]perylene	<i>n</i> -Hexadecane	Pyrene
Benz[a]pyrene		

EPH Aliphatic Check Mix

EPH-WA-ALI

1 x 1 mL

EPH-WA-ALI-PAK

SAVE 5 x 1 mL

1.0 mg/mL each in CH₂Cl₂

5 comps.

<i>n</i> -Octane	<i>n</i> -Dodecane	<i>n</i> -Heneicosane
<i>n</i> -Decane	<i>n</i> -Hexadecane	

EPH Aromatic Check Mix

EPH-WA-ARO

1 x 1 mL

EPH-WA-ARO-PAK

SAVE 5 x 1 mL

1.0 mg/mL each in CH₂Cl₂

5 comps.

Acenaphthene	Naphthalene	1,2,3-Trimethylbenzene
Benzo[g,h,i]perylene	Pyrene	

Revised EPH Aliphatic Check Mix

EPH-WA-ALI-R1

1 x 1 mL

EPH-WA-ALI-R1-PAK

SAVE 5 x 1 mL

1.0 mg/mL each in CH₂Cl₂

6 comps.

<i>n</i> -Octane	<i>n</i> -Dodecane	<i>n</i> -Heneicosane
<i>n</i> -Decane	<i>n</i> -Hexadecane	<i>n</i> -Tetracontane

EPH Fractionation Check Standard

EPH-WA-FCS

1 x 1 mL

EPH-WA-FCS-PAK

SAVE 5 x 1 mL

25 µg/mL each in Hexane

24 comps.

Acenaphthene	Chrysene	Pyrene
Acenaphthylene	Dibenz[a,h]anthracene	<i>n</i> -Decane
Anthracene	Fluoranthene	<i>n</i> -Dodecane
Benz[a]anthracene	Fluorene	<i>n</i> -Tetradecane
Benz[a]pyrene	Indeno[1,2,3-cd]pyrene	<i>n</i> -Hexadecane
Benzo[b]fluoranthene	2-Methylnaphthalene	<i>n</i> -Octadecane
Benzo[g,h,i]perylene	Naphthalene	<i>n</i> -Eicosane
Benzo[k]fluoranthene	Phenanthrene	<i>n</i> -Heneicosane

Revised EPH Fractionation Check Standard

EPH-WA-FCS-R1

1 x 1 mL

EPH-WA-FCS-R1-PAK

SAVE 5 x 1 mL

25 µg/mL each in Hexane

23 comps.

Acenaphthene	Chrysene	Pyrene
Acenaphthylene	Dibenz[a,h]anthracene	<i>n</i> -Octane
Anthracene	Fluoranthene	<i>n</i> -Decane
Benz[a]anthracene	Fluorene	<i>n</i> -Dodecane
Benz[a]pyrene	Indeno[1,2,3-cd]pyrene	<i>n</i> -Hexadecane
Benzo[b]fluoranthene	2-Methylnaphthalene	<i>n</i> -Heneicosane
Benzo[g,h,i]perylene	Naphthalene	<i>n</i> -Tetracontane
Benzo[k]fluoranthene	Phenanthrene	

1,2,3-Trimethylbenzene Standard

V-028S-D-10X

1 x 1 mL

V-028S-D-10X-PAK

SAVE 5 x 1 mL

1000 µg/mL each in CH₂Cl₂

1,2,3-Trimethylbenzene

Revised EPH Aromatic Check Mix

EPH-WA-ARO-R1

1 x 1 mL

EPH-WA-ARO-R1-PAK

SAVE 5 x 1 mL

1.0 mg/mL each in CH₂Cl₂

6 comps.

Acenaphthene	Naphthalene	1,2,3-Trimethylbenzene
Benzo[g,h,i]perylene	Pyrene	Toluene

Aliphatic Surrogate

DRH-007-SS

1 x 1 mL

DRH-007-SS-PAK

SAVE 5 x 1 mL

1.0 mg/mL in Hexane

1-Chlorooctadecane

Aromatic Surrogate

DRH-006-SS

1 x 1 mL

DRH-006-SS-PAK

SAVE 5 x 1 mL

1.0 mg/mL in CH₂Cl₂

o-Terphenyl

UST (LUFT/LUST)

Gasoline Range Hydrocarbon (GRH)

Gasoline Range Hydrocarbon Analysis

EPA Method - Gasoline Range Hydrocarbons

Gasoline Standard

GRH-002S 1 x 1 mL
 GRH-002S-10X 1 x 1 mL
 At stated conc. (mg/mL) in MeOH 10 comps.

	GRH-002S	GRH-002-10X
2-Methylpentane	1.5	15
2,2,4-Trimethylpentane	1.5	15
n-Heptane	0.5	5
Benzene	0.5	5
Toluene	1.5	15
Ethylbenzene	0.5	5
m-Xylene	1.0	10
p-Xylene	1.0	10
o-Xylene	1.0	10
1,2,4-Trimethylbenzene	1.0	10

Internal Standard

GARH-IS 1 x 1 mL

1.0 mg/mL in CH₂Cl₂

1-Chloro-4-fluorobenzene

Surrogate Standard

GARH-SS 1 x 1 mL

2.5 mg/mL in Acetone

4-Bromofluorobenzene

Gasoline Additives

GAD-001 1 x 1 mL

GAD-001-PAK SAVE 5 x 1 mL

0.2 mg/mL each in MeOH 4 comps.

Dibromomethane	1,2-Dichloroethane
1,2-Dibromoethane	MtBE

Certified BTEX in Unleaded Gasoline

GA-001-20X-BTEX 1 x 1 mL

10.0 mg/mL in MeOH

Gasoline-Regular, unleaded

includes certified concentration of:

Benzene	Toluene	o-Xylene
Ethylbenzene	m,p-Xylene	

Hexadecane Extraction Volatiles

CLP-BTEX 1 x 1 mL

CLP-BTEX-PAK SAVE 5 x 1 mL

0.2 mg/mL each in MeOH 6 comps.

CLP-BTEX-10X 1 x 1 mL

CLP-BTEX-10X-PAK SAVE 5 x 1 mL

2.0 mg/mL each in MeOH 6 comps.

Benzene	o-Xylene
Ethyl benzene	m-Xylene
Toluene	p-Xylene

California - Gasoline Range Hydrocarbons

S-603A-10X 1 x 1 mL

S-603A-10X-PAK SAVE 5 x 1 mL

2.0 mg/mL each in MeOH 7 comps.

Benzene	Toluene	m-Xylene
Ethylbenzene	o-Xylene	p-Xylene
MtBE		

LA County Well Investigation & Monitoring Program

Purgeable Aromatics - Gasoline ID

M-602-GAS-10X 1 x 1 mL

M-602-GAS-10X-PAK SAVE 5 x 1 mL

2.0 mg/mL each in MeOH 11 comps.

Benzene	Toluene
Chlorobenzene	o-Xylene
1,2-Dichlorobenzene	p-Xylene
1,3-Dichlorobenzene	m-Xylene
1,4-Dichlorobenzene	MtBE
Ethylbenzene	

Oxygenate Gasoline Additive Standard

OGAD-001 1 x 1 mL

OGAD-001-PAK SAVE 5 x 1 mL

At stated conc. (µg/mL) in MeOH 5 comps.

MtBE	2000	TAME	2000
EtBE	2000	t-Butanol	10000
Isopropyl ether	2000		

Ethanol

M-8015B-5031-11 1 x 1 mL

10 mg/mL in Water

Methanol

M-8015B-5031-17 1 x 1 mL

10 mg/mL in Water

Pennsylvania DER - Gasoline Range Hydrocarbons

GRH-001S 1 x 1 mL

GRH-001S-PAK SAVE 5 x 1 mL

1.0 mg/mL each in MeOH 10 comps.

Benzene	1,2,4-Trimethylbenzene
Ethylbenzene	2,2,4-Trimethylpentane
n-Heptane	o-Xylene
2-Methyl pentane	m-Xylene
Toluene	p-Xylene

Wisconsin DNR - Gasoline Range Hydrocarbons

GRH-003S 1 x 1 mL

GRH-003S-PAK SAVE 5 x 1 mL

2.0 mg/mL each in MeOH 10 comps.

Benzene	1,2,4-Trimethylbenzene
Ethylbenzene	1,3,5-Trimethylbenzene
MtBE	o-Xylene
Naphthalene	m-Xylene
Toluene	p-Xylene

UST (LUFT/LUST)

Diesel Range Hydrocarbons (DRH)

Diesel Range Hydrocarbon Analysis

EPA Method - Diesel Range Hydrocarbons

DRH-001S 1 x 1 mL
0.2 mg/mL each in CH₂Cl₂: Hexane (50:50) 10 comps.

DRH-001S-10X 1 x 1 mL
2.0 mg/mL each in CH₂Cl₂: Hexane (50:50) 10 comps.

<i>n</i> -Decane (C ₁₀)	<i>n</i> -Octadecane (C ₁₈)	<i>n</i> -Tetracosane (C ₂₄)
<i>n</i> -Dodecane (C ₁₂)	<i>n</i> -Eicosane (C ₂₀)	<i>n</i> -Hexacosane (C ₂₆)
<i>n</i> -Tetradecane (C ₁₄)	<i>n</i> -Docosane (C ₂₂)	<i>n</i> -Octacosane (C ₂₈)
<i>n</i> -Hexadecane (C ₁₆)		

Surrogate Standard

GRH-SS 1 x 1 mL
GRH-SS-PAK SAVE 5 x 1 mL
2.0 mg/mL in Acetone

o-Terphenyl (OTP)

Internal Standard

GRH-IS 1 x 1 mL
GRH-IS-PAK SAVE 5 x 1 mL
1.0 mg/mL in CH₂Cl₂

5-alpha Androstane

Calibration/Window Defining Hydrocarbon Standard

DRH-004S-R1-5X 1 x 1 mL
DRH-004S-R1-5X-PAK SAVE 5 x 1 mL
1.0 mg/mL each in Chloroform 17 comps.

<i>n</i> -Octane (C ₈)	<i>n</i> -Eicosane (C ₂₀)	<i>n</i> -Dotriacontane (C ₃₂)
<i>n</i> -Decane (C ₁₀)	<i>n</i> -Docosane (C ₂₂)	<i>n</i> -Tetracontane (C ₃₄)
<i>n</i> -Dodecane (C ₁₂)	<i>n</i> -Tetracosane (C ₂₄)	<i>n</i> -Hexatriacontane (C ₃₆)
<i>n</i> -Tetradecane (C ₁₄)	<i>n</i> -Hexacosane (C ₂₆)	<i>n</i> -Octatriacontane (C ₃₈)
<i>n</i> -Hexadecane (C ₁₆)	<i>n</i> -Octacosane (C ₂₈)	<i>n</i> -Tetracontane (C ₄₀)
<i>n</i> -Octadecane (C ₁₈)	<i>n</i> -Triacontane (C ₃₀)	

Surrogate Standard

DRH-SS 1 x 1 mL
DRH-SS-PAK SAVE 5 x 1 mL
5.0 mg/mL in THF

n-Triacontane-d₆₂

D2887 Calibration Solution

Calibration Solution

DRH-002S 1 x 1 mL
At stated conc. (µg/mL) in Carbon disulfide 17 comps.

<i>n</i> -Hexane	600	<i>n</i> -Dodecane	1,200	<i>n</i> -Octacosane	100
<i>n</i> -Heptane	600	<i>n</i> -Tetradecane	1,200	<i>n</i> -Dotriacontane	100
<i>n</i> -Octane	800	<i>n</i> -Hexadecane	1,000	<i>n</i> -Hexatriacontane	100
<i>n</i> -Nonane	800	<i>n</i> -Octadecane	500	<i>n</i> -Tetracontane	100
<i>n</i> -Decane	1,200	<i>n</i> -Eicosane	200	<i>n</i> -Tetracontane	100
<i>n</i> -Undecane	1,200	<i>n</i> -Tetracosane	200		

Column Test Mixture

D-2887 1 x 1 mL
10 mg/mL each in *n*-Octane 2 comps.

n-Hexadecane *n*-Octadecane

Wisconsin Diesel Range Hydrocarbons

DRH-003S 1 x 1 mL
0.2 mg/mL each in Hexane 11 comps.

<i>n</i> -Decane (C ₁₀)	<i>n</i> -Tetradecane (C ₁₄)	<i>n</i> -Octadecane (C ₁₈)
<i>n</i> -Undecane (C ₁₁)	<i>n</i> -Pentadecane (C ₁₅)	<i>n</i> -Nonadecane (C ₁₉)
<i>n</i> -Dodecane (C ₁₂)	<i>n</i> -Hexadecane (C ₁₆)	<i>n</i> -Eicosane (C ₂₀)
<i>n</i> -Tridecane (C ₁₃)	<i>n</i> -Heptadecane (C ₁₇)	

Complete Hydrocarbon Analysis

Multi-State Hydrocarbon Window Defining Standard

DRH-008S-R2 1 x 1 mL
DRH-008S-R2-PAK SAVE 5 x 1 mL
500 µg/mL each in Chloroform 35 comps.

<i>n</i> -Octane	Phytane	<i>n</i> -Triacontane
<i>n</i> -Nonane	<i>n</i> -Nonadecane	<i>n</i> -Hentriacontane
<i>n</i> -Decane	<i>n</i> -Eicosane	<i>n</i> -Dotriacontane
<i>n</i> -Undecane	<i>n</i> -Heneicosane	<i>n</i> -Triacontane
<i>n</i> -Dodecane	<i>n</i> -Docosane	<i>n</i> -Tetracontane
<i>n</i> -Tridecane	<i>n</i> -Tricosane	<i>n</i> -Pentatriacontane
<i>n</i> -Tetradecane	<i>n</i> -Tetracosane	<i>n</i> -Hexatriacontane
<i>n</i> -Pentadecane	<i>n</i> -Pentacosane	<i>n</i> -Heptatriacontane
<i>n</i> -Hexadecane	<i>n</i> -Hexacosane	<i>n</i> -Octatriacontane
<i>n</i> -Heptadecane	<i>n</i> -Heptacosane	<i>n</i> -Nonatriacontane
Pristane	<i>n</i> -Octacosane	<i>n</i> -Tetracontane
<i>n</i> -Octadecane	<i>n</i> -Nonacosane	

Technical Note

We offer a hydrocarbon window defining standard with the C₈ - C₄₀ odd and even Alkanes. Use of this one standard should meet the numerous state to state variations for hydrocarbon validation and reporting. As an added benefit pristane and phytane are included in the formulation. This one standard can meet numerous LUFT/LUST programs requiring that the C₁₇ / Pristane and C₁₈ / Phytane ratio be used to estimate subsurface degradation of fuel oil spills.

Also available, a fuel oil degradation mix containing just 4 required analytes to determine the C₁₇ / Pristane and C₁₈ / Phytane ratio (DRH-005S-10X)

Fuel Oil Degradation/Retention Time Mixture for Quantification of C₁₇/Pristane & C₁₈/Phytane Ratios

DRH-005S-10X 1 x 1 mL
2.0 mg/mL each in CH₂Cl₂: CS₂ (50:50) 4 comps.

<i>n</i> -Heptadecane	Phytane	Pristane
<i>n</i> -Octadecane		

Hydrocarbon Window Defining Standard Sets

DRH-FTRPH-SET 2 x 1 mL
500 µg/mL each in Hexane

DRH-FTRPH-SET-PAK SAVE 5 x (2 x 1 mL)
DRH-FTRPH, DRH-FTRPH2

FTRPH Calibration/Window Defining Standard

DRH-FTRPH 1 x 1 mL
DRH-FTRPH-PAK SAVE 5 x 1 mL
500 µg/mL each in Hexane 17 comps.

<i>n</i> -Octane	<i>n</i> -Eicosane	<i>n</i> -Dotriacontane
<i>n</i> -Decane	<i>n</i> -Docosane	<i>n</i> -Tetracontane
<i>n</i> -Dodecane	<i>n</i> -Tetracosane	<i>n</i> -Hexatriacontane
<i>n</i> -Tetradecane	<i>n</i> -Hexacosane	<i>n</i> -Octatriacontane
<i>n</i> -Hexadecane	<i>n</i> -Octacosane	<i>n</i> -Tetracontane
<i>n</i> -Octadecane	<i>n</i> -Triacontane	

Hydrocarbon Window Defining Standard

DRH-FTRPH2 1 x 1 mL
DRH-FTRPH2-PAK SAVE 5 x 1 mL
500 µg/mL each in Hexane 18 comps.

<i>n</i> -Nonane	Phytane	<i>n</i> -Nonacosane
<i>n</i> -Undecane	<i>n</i> -Nonadecane	<i>n</i> -Hentriacontane
<i>n</i> -Tridecane	<i>n</i> -Heneicosane	<i>n</i> -Triacontane
<i>n</i> -Pentadecane	<i>n</i> -Tricosane	<i>n</i> -Pentatriacontane
<i>n</i> -Heptadecane	<i>n</i> -Pentacosane	<i>n</i> -Heptatriacontane
Pristane	<i>n</i> -Heptacosane	<i>n</i> -Nonatriacontane

UST (LUFT/LUST)

Weathered Fuel

Weathered LUFT/LUST Fuel Sets

The weathered fuel mimics the weathering, evaporation, and migration process. These standards can assist in the identification of the fuel type if it has been present in the ground for some time, in a sandy type soil with possible evaporation loss, or has migrated from the plume point of origin.

Weathered Gasoline Set

WGA-SET	Each in 5.0 mg/mL in MeOH	Cat. No.	4 x 1 mL
Gasoline, regular unleaded		GA-001-10X	1 mL
Gasoline, regular unleaded (25% Weathered)		GA-W25-10X	1 mL
Gasoline, regular unleaded (50% Weathered)		GA-W50-10X	1 mL
Gasoline, regular unleaded (75% Weathered)		GA-W75-10X	1 mL

Weathered Kerosene Set

WFK-SET	Each in 5.0 mg/mL in CH ₂ Cl ₂		4 x 1 mL
Kerosene		FU-005-D-10X	1 mL
Kerosene (25% Weathered)		FK-W25-10X	1 mL
Kerosene (50% Weathered)		FK-W50-10X	1 mL
Kerosene (75% Weathered)		FK-W75-10X	1 mL

Weathered #2 Diesel (extra Low Sulfur Content) Set

WFD2-SET	Each in 5.0 mg/mL in CH ₂ Cl ₂		4 x 1 mL
#2 Diesel (Extra Low Sulfur)		FU-017-D-10X	1 mL
#2 Diesel (Extra Low Sulfur) (25% Weathered)		FD2-W25-10X	1 mL
#2 Diesel (Extra Low Sulfur) (50% Weathered)		FD2-W50-10X	1 mL
#2 Diesel (Extra Low Sulfur) (75% Weathered)		FD2-W75-10X	1 mL

Weathered #2 Diesel (Conventional) Set

WFD2-R1-SET	Each in 5.0 mg/mL in CH ₂ Cl ₂		4 x 1 mL
#2 Diesel (Conventional)		FU-009-D-10X	1 mL
#2 Diesel (Conventional) (25% Weathered)		FD2-W25-R1-10X	1 mL
#2 Diesel (Conventional) (50% Weathered)		FD2-W50-R1-10X	1 mL
#2 Diesel (Conventional) (75% Weathered)		FD2-W75-R1-10X	1 mL

Technical Note

Petroleum Products contain many different chemicals, plus synthetic product additives. Typically, these petroleum products are subdivided into two groups based on their volatility: [a] gasoline related products (more volatile) and [b] fuel related products (less volatile such as kerosene, aviation fuels, diesel fuels and heating oils).

Most analytical methods for petroleum products focus on several items: the level of BTEX, the total petroleum hydrocarbon number (TPH), and the fingerprint of the petroleum product. Depending on the volatility of the petroleum product, the nature of the contaminated soil, and the age of the spill, analysis can be more difficult. Weathering, evaporation, and the migration of the lighter volatiles at the contamination site can affect the fingerprint identification portion of the fuel products analysis.

Custom Formulations

Custom CRMs are a fast and economical way to meet your specific laboratory needs. We have decades of experience to formulate stable, reliable, and quality custom standards.

**Talk to one of our
Quotation Specialists**



Oil, Grease, TPH, Fracking Fluids

Method 413.2 / 418.1, 1664, & 8440 and EU 528/2012

Method 413.2 & 418.1

TPH Analysis by IR

Oil, Grease & Petroleum Hydrocarbon

Concentrates Mix

M-418-CON

1 x 1 mL

At stated Vol. %

3 comps.

Chlorobenzene	25.0	<i>n</i> -Hexadecane	37.5
Isooctane	37.5		

Oil, Grease and Petroleum

Hydrocarbon Total Recoverable (IR Method)

M-418

1 x 1 mL

M-418-PAK

SAVE 5 x 1 mL

At stated conc. (mg/mL) in Freon 113

3 comps.

Chlorobenzene	1.05	Isooctane	1.55
<i>n</i> -Hexadecane	1.55		

Method 1664

Oil, Grease & TPH Determination

Precision and Recovery (PAR) Spiking Solution

M-1664-5ML

1 x 5 mL

M-1664-5ML-PAK

SAVE 5 x 5 mL

4.0 mg/mL each in Acetone

M-1664-20ML

1 x 20 mL

M-1664-20ML-PAK

SAVE 5 x 20 mL

4.0 mg/mL each in Acetone

2 comps.

<i>n</i> -Hexadecane	Stearic acid
----------------------	--------------

Silica Gel Hexane Extraction Material

SGT-HEM

1 x 1 mL

20 µg/mL each in Acetone

2 comps.

Stearic acid	<i>n</i> -Hexadecane
--------------	----------------------

Technical Note

Precision and Recovery (PAR) Spiking Solution was developed for Method 1664. This performance based method was developed to replace previous gravimetric procedures which incorporated Freon-113 as the extraction solvent for the determination of Oil and Grease and Total Petroleum Hydrocarbons. Each standard is packaged in a flame sealed ampule conveniently sized for quality control of the analytical batch.

Method 8440

Total Petroleum Hydrocarbon Analysis

Total Recoverable Petroleum Hydrocarbon Mix

M-8440

1 x 1 mL

M-8440-PAK

SAVE 5 x 1 mL

At stated Wt. % in Tetrachloroethene

3 comps.

Chlorobenzene	0.10	Isooctane	0.15
<i>n</i> -Hexadecane	0.15		

Silica Gel Cleanup Calibration Solution

M-8440-SGC

1 x 1 mL

M-8440-SGC-PAK

SAVE 5 x 1 mL

10.0 mg/mL in Tetrachloroethene

Corn Oil

Total Petroleum Hydrocarbon Concentrate Mix

M-8440-CON

1 x 1 mL

M-8440-CON-PAK

SAVE 5 x 1 mL

At stated Vol. %

3 comps.

Chlorobenzene	25.0	Isooctane	37.5
<i>n</i> -Hexadecane	37.5		

Retention Time Standard

DRH-010S

1 x 1 mL

DRH-010S-PAK

SAVE 5 x 1 mL

25 µg/mL each in CH₂Cl₂

7 comps.

<i>n</i> -Hexane	<i>n</i> -Tetracosane	<i>n</i> -Triacontane
<i>n</i> -Decane	<i>n</i> -Octacosane	<i>n</i> -Tetracontane
<i>n</i> -Dodecane		

Technical Note

A sample showing peaks in the C₆-C₁₀ range generally indicates a gasoline spill. Samples with the peaks in the C₁₂-C₂₄ range are indicative of a diesel spill while samples with the higher carbon numbers above C₂₄ are typically oils or lubricants. Once the initial screen is complete, more detailed work can be done to further identify the contaminant.

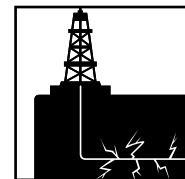
EU 528/2012

Biocides in Fracking Fluids

The underground gas and petroleum production enhancement process of fracking has generated much attention. There is concern about potential short and long-term adverse health effects and environmental contamination associated with the process. Biocides are important fracking fluid additives used to kill microbes that might produce corrosive acids or form well-clogging biofilms. Since biocides are inherently toxic, there is a growing concern over the environmental fate and impact on groundwater contamination.

These biocides are part of our 217 biocide product line that was developed for the EU Biocides Regulation 528/2012. This legislation classifies biocides into 22 product types grouped into four main areas.

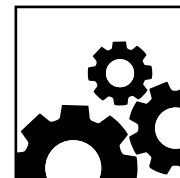
Compound	CAS	Cat. No.	Unit
Glutaraldehyde Solution (~50% Water)	111-30-8	FRACK-001N	1 mL
2,2-Dibromo-2-cyanoacetamide	10222-01-2	FRACK-002N	100 mg
Tetrakis(hydroxymethyl)phosphonium sulfate	55566-30-8	FRACK-003N	100 mg
Didecyltrimethylammonium chloride	7173-51-5	FRACK-004N-10MG	10 mg
Tributyltetradecylphosphonium chloride	81741-28-8	FRACK-005N	100 mg
2-Methyl-2H-isothiazol-3-one	2682-20-4	FRACK-006N-10MG	10 mg
Dazomet	533-74-4	FRACK-007N-10MG	10 mg
2-Bromo-2-nitropropane-1,3-diol	52-51-7	FRACK-009N-25MG	25 mg
N-Bromosuccinimide	128-08-5	FRACK-011N	100 mg



Wear Metals

AA, ICP, DCP & XRF Analysis

These Standards were formulated for the analysis of metals in oils and other organic matrices. These Standards and curves provide a convenient way to analyze for metals (wear metals, additives and contaminants) in lubricating oils, gasolines, residual oils, crude oils, turbine fuels and environmental samples. Organometallic Standards listed on this page may contain sulfur which can be introduced by possible sulfonate starting materials used to formulate the actual organometallic standard.



- Single & Multi Element Standards
- Prepared Calibration Curves
- Formulated from Ultra High Purity Organometallic starting materials & matrices
- Certificate of Analysis

Wear Metal Products are NOT on our ISO scope of accreditation.

WEAR METALS CONTENTS

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Single Element Wear Metals

Element	1,000 µg/g in 75 cSt base oil		5,000 µg/g in 75 cSt base oil	
	Cat. No.	Unit	Cat. No.	Unit
Aluminum (Al)	WM-75CST-01	50 grams	WM-75CST-01-5X	50 grams
Antimony (Sb)	WM-75CST-02	50 grams	WM-75CST-02-5X	50 grams
Arsenic (As)	WM-75CST-03	50 grams	-----	----
Barium (Ba)	WM-75CST-04	50 grams	WM-75CST-04-5X	50 grams
Beryllium (Be)	WM-75CST-05	50 grams	-----	----
Bismuth (Bi)	WM-75CST-06	50 grams	-----	----
Boron (B)	WM-75CST-07	50 grams	WM-75CST-07-5X	50 grams
Cadmium (Cd)	WM-75CST-08	50 grams	WM-75CST-08-5X	50 grams
Calcium (Ca)	WM-75CST-09	50 grams	WM-75CST-09-5X	50 grams
Cerium (Ce)	WM-75CST-11	50 grams	WM-75CST-11-5X	50 grams
Chromium (Cr)	WM-75CST-13	50 grams	WM-75CST-13-5X	50 grams
Cobalt (Co)	WM-75CST-14	50 grams	WM-75CST-14-5X	50 grams
Copper (Cu)	WM-75CST-15	50 grams	WM-75CST-15-5X	50 grams
Indium (In)	WM-75CST-25	50 grams	WM-75CST-25-5X	50 grams
Iron (Fe)	WM-75CST-27	50 grams	WM-75CST-27-5X	50 grams
Lanthanum (La)	-----	----	WM-75CST-28-5X	50 grams
Lead (Pb)	WM-75CST-29	50 grams	WM-75CST-29-5X	50 grams
Lithium (Li)	WM-75CST-30	50 grams	WM-75CST-30-5X	50 grams
Magnesium (Mg)	WM-75CST-32	50 grams	WM-75CST-32-5X	50 grams
Manganese (Mn)	WM-75CST-33	50 grams	WM-75CST-33-5X	50 grams
Mercury (Hg)	WM-75CST-34	50 grams	-----	----
Molybdenum (Mo)	WM-75CST-35	50 grams	WM-75CST-35-5X	50 grams
Nickel (Ni)	WM-75CST-37	50 grams	WM-75CST-37-5X	50 grams
Phosphorus (P)	WM-75CST-41	50 grams	WM-75CST-41-5X	50 grams
Potassium (K)	WM-75CST-43	50 grams	WM-75CST-43-5X	50 grams
Scandium (Sc)	WM-75CST-50	50 grams	-----	----
Selenium (Se)	WM-75CST-51	50 grams	-----	----
Silicon (Si)	WM-75CST-52	50 grams	WM-75CST-52-5X	50 grams
Silver (Ag)	WM-75CST-53	50 grams	WM-75CST-53-5X	50 grams
Sodium (Na)	WM-75CST-54	50 grams	WM-75CST-54-5X	50 grams
Strontium (Sr)	WM-75CST-55	50 grams	WM-75CST-55-5X	50 grams
Sulfur (S)	WM-75CST-56	50 grams	WM-75CST-56-5X	50 grams
Thallium (Tl)	WM-75CST-60	50 grams	-----	----
Tin (Sn)	WM-75CST-63	50 grams	WM-75CST-63-5X	50 grams
Titanium (Ti)	WM-75CST-64	50 grams	WM-75CST-64-5X	50 grams
Tungsten (W)	WM-75CST-65	50 grams	WM-75CST-65-5X	50 grams
Vanadium (V)	WM-75CST-67	50 grams	WM-75CST-67-5X	50 grams
Yttrium (Y)	WM-75CST-69	50 grams	WM-75CST-69-5X	50 grams
Zinc (Zn)	WM-75CST-70	50 grams	WM-75CST-70-5X	50 grams
Zirconium (Zr)	WM-75CST-71	50 grams	WM-75CST-71-5X	50 grams

Matrix Oil and Stabilizer

75 cSt Oil

MOSOL-75 500 mL

Stabilizer

WM-STAB 1 x 50 grams

Technical Note

Used to improve the stability of Organo-metallic Standards when diluting into solvents such as Kerosene. Add 0.6% by weight.

Metals Additives

MA-900-100G	100 grams
MA-900-200G	200 grams
900 µg/g in 75 cSt in Base oil	5 comps.
MA-1000-100G	100 grams
MA-1000-200G	200 grams
1000 µg/g in 75 cSt in Base oil	5 comps.
MA-3000-100G	100 grams
MA-3000-200G	200 grams
3000 µg/g in 75 cSt in Base oil	5 comps.
MA-5000-100G	100 grams
MA-5000-200G	200 grams
5000 µg/g in 75 cSt in Base oil	5 comps.

Barium (Ba)
Calcium (Ca)
Magnesium (Mg)

Phosphorus (P)
Zinc (Zn)

See our Table of Contents for complete list of Organometallic standards containing < 1 ppm sulfur or phosphorus.

Wear Metals

AA, ICP, DCP & XRF Analysis

21 Wear Metal Multi-Element

100 gram Set [WM-21-100G-SET](#) 7 x 100 grams
 200 gram Set [WM-21-200G-SET](#) 7 x 200 grams

21 Wear Metals in 75 cSt base oil at the stated concentration

Conc.	Cat. No.	Unit
10 µg/g	WM-21-1X-100G	100 grams
	WM-21-1X-200G	200 grams
30 µg/g	WM-21-3X-100G	100 grams
	WM-21-3X-200G	200 grams
50 µg/g	WM-21-5X-100G	100 grams
	WM-21-5X-200G	200 grams
100 µg/g	WM-21-10X-100G	100 grams
	WM-21-10X-200G	200 grams
300 µg/g	WM-21-30X-100G	100 grams
	WM-21-30X-200G	200 grams
500 µg/g	WM-21-50X-100G	100 grams
	WM-21-50X-200G	200 grams
900 µg/g	WM-21-90X-100G	100 grams
	WM-21-90X-200G	200 grams

Silver (Ag)	Copper (Cu)	Phosphorus (P)
Aluminum (Al)	Iron (Fe)	Lead (Pb)
Boron (B)	Magnesium (Mg)	Silicon (Si)
Barium (Ba)	Manganese (Mn)	Tin (Sn)
Calcium (Ca)	Molybdenum (Mo)	Titanium (Ti)
Cadmium (Cd)	Sodium (Na)	Vanadium (V)
Chromium (Cr)	Nickel (Ni)	Zinc (Zn)

23 Wear Metal Multi-Element

100 gram Set [WM-23-100G-SET](#) 7 x 100 grams
 200 gram Set [WM-23-200G-SET](#) 7 x 200 grams

21 Wear Metals plus Potassium (K) and Antimony (Sb) in 75 cSt base oil at the stated concentration

Conc.	Cat. No.	Unit
10 µg/g	WM-23-1X-100G	100 grams
	WM-23-1X-200G	200 grams
30 µg/g	WM-23-3X-100G	100 grams
	WM-23-3X-200G	200 grams
50 µg/g	WM-23-5X-100G	100 grams
	WM-23-5X-200G	200 grams
100 µg/g	WM-23-10X-100G	100 grams
	WM-23-10X-200G	200 grams
300 µg/g	WM-23-30X-100G	100 grams
	WM-23-30X-200G	200 grams
500 µg/g	WM-23-50X-100G	100 grams
	WM-23-50X-200G	200 grams
900 µg/g	WM-23-90X-100G	100 grams
	WM-23-90X-200G	200 grams

Silver (Ag)	Iron (Fe)	Lead (Pb)
Aluminum (Al)	Potassium (K)	Antimony (Sb)
Boron (B)	Magnesium (Mg)	Silicon (Si)
Barium (Ba)	Manganese (Mn)	Tin (Sn)
Calcium (Ca)	Molybdenum (Mo)	Titanium (Ti)
Cadmium (Cd)	Sodium (Na)	Vanadium (V)
Chromium (Cr)	Nickel (Ni)	Zinc (Zn)
Copper (Cu)	Phosphorus (P)	

22 Wear Metal Multi-Element

100 gram Set [WM-22-100G-SET](#) 7 x 100 grams
 200 gram Set [WM-22-200G-SET](#) 7 x 200 grams

21 Wear Metals plus Potassium (K) in 75 cSt base oil at the stated concentration

Conc.	Cat. No.	Unit
10 µg/g	WM-22-1X-100G	100 grams
	WM-22-1X-200G	200 grams
30 µg/g	WM-22-3X-100G	100 grams
	WM-22-3X-200G	200 grams
50 µg/g	WM-22-5X-100G	100 grams
	WM-22-5X-200G	200 grams
100 µg/g	WM-22-10X-100G	100 grams
	WM-22-10X-200G	200 grams
300 µg/g	WM-22-30X-100G	100 grams
	WM-22-30X-200G	200 grams
500 µg/g	WM-22-50X-100G	100 grams
	WM-22-50X-200G	200 grams
900 µg/g	WM-22-90X-100G	100 grams
	WM-22-90X-200G	200 grams

Silver (Ag)	Iron (Fe)	Phosphorus (P)
Aluminum (Al)	Potassium (K)	Lead (Pb)
Boron (B)	Magnesium (Mg)	Silicon (Si)
Barium (Ba)	Manganese (Mn)	Tin (Sn)
Calcium (Ca)	Molybdenum (Mo)	Titanium (Ti)
Cadmium (Cd)	Sodium (Na)	Vanadium (V)
Chromium (Cr)	Nickel (Ni)	Zinc (Zn)
Copper (Cu)		



Wear Metals

AA, ICP, DCP & XRF Analysis

Organometallic Single Element Stock (Premium Sulfur-Free)

Element	1,000 µg/g		5,000 µg/g	
	Cat. No.	Unit	Cat. No.	Unit
Aluminum (Al)	WM-NMS-01	50 mL	WM-NMS-01-5X	50 mL
Antimony (Sb)	WM-NMS-02	50 mL	WM-NMS-02-5X	50 mL
Arsenic (As)	WM-NMS-03	50 mL	WM-NMS-03-5X	50 mL
Barium (Ba)	WM-NMS-04	50 mL	WM-NMS-04-5X	50 mL
Beryllium (Be)	WM-NMS-05	50 mL	WM-NMS-05-5X	50 mL
Cadmium (Cd)	WM-NMS-08	50 mL	WM-NMS-08-5X	50 mL
Calcium (Ca)	WM-NMS-09	50 mL	WM-NMS-09-5X	50 mL
Cerium (Ce)	WM-NMS-11	50 mL	WM-NMS-11-5X	50 mL
Chromium (Cr)	WM-NMS-13	50 mL	WM-NMS-13-5X	50 mL
Cobalt (Co)	WM-NMS-14	50 mL	WM-NMS-14-5X	50 mL
Copper (Cu)	WM-NMS-15	50 mL	WM-NMS-15-5X	50 mL
Gold (Au)	WM-NMS-22	50 mL	-----	----
Iron (Fe)	WM-NMS-27	50 mL	WM-NMS-27-5X	50 mL
Lead (Pb)	WM-NMS-29	50 mL	WM-NMS-29-5X	50 mL
Lithium (Li)	WM-NMS-30	50 mL	WM-NMS-30-5X	50 mL
Magnesium (Mg)	WM-NMS-32	50 mL	WM-NMS-32-5X	50 mL
Manganese (Mn)	WM-NMS-33	50 mL	WM-NMS-33-5X	50 mL
Mercury (Hg)	WM-NMS-34	50 mL	WM-NMS-34-5X	50 mL
Molybdenum (Mo)	WM-NMS-35	50 mL	WM-NMS-35-5X	50 mL
Palladium (Pd)	WM-NMS-40	50 mL	WM-NMS-40-5X	50 mL
Phosphorus (P)	WM-NMS-41	50 mL	WM-NMS-41-5X	50 mL
Platinum (Pt)	WM-NMS-42	50 mL	WM-NMS-42-5X	50 mL
Potassium (K)	WM-NMS-43	50 mL	WM-NMS-43-5X	50 mL
Selenium (Se)	WM-NMS-51	50 mL	WM-NMS-51-5X	50 mL
Silicon (Si)	WM-NMS-52	50 mL	WM-NMS-52-5X	50 mL
Silver (Ag)	WM-NMS-53	50 mL	WM-NMS-53-5X	50 mL
Sodium (Na)	WM-NMS-54	50 mL	WM-NMS-54-5X	50 mL
Strontium (Sr)	WM-NMS-55	50 mL	WM-NMS-55-5X	50 mL
Thallium (Tl)	WM-NMS-60	50 mL	WM-NMS-60-5X	50 mL
Tin (Sn)	WM-NMS-63	50 mL	WM-NMS-63-5X	50 mL
Titanium (Ti)	WM-NMS-64	50 mL	WM-NMS-64-5X	50 mL
Vanadium (V)	WM-NMS-67	50 mL	WM-NMS-67-5X	50 mL
Yttrium (Y)	WM-NMS-69	50 mL	WM-NMS-69-5X	50 mL
Zinc (Zn)	WM-NMS-70	50 mL	WM-NMS-70-5X	50 mL
Zirconium (Zr)	WM-NMS-71	50 mL	WM-NMS-71-5X	50 mL

Premium Sulfur-Free

Sulfur below detection limits for most element

No Metallic Sulfonates

Stabilized

Ready-to-Use

All elements are provided in mineral oil except for Mercury, Palladium and Platinum which are provided in xylene.

Technical Note

Sulfur below detection limits for most elements. Sulfur content otherwise noted on certificate. For use with X-ray fluorescence (XRF), plasma emission (ICP or DCP), rotating disk (RDE), or atomic absorption (AA) spectroscopy. May be blended together to prepare multi-element standards. Solutions are stabilized with proprietary chelation and stabilization solution and are ready for use.

21 Wear Metal Multi-Element (Premium Sulfur-Free)

Conc.	Cat. No.	Unit
10 µg/g	WM-21-NMS-1X-1	100 mL
30 µg/g	WM-21-NMS-3X-1	100 mL
50 µg/g	WM-21-NMS-5X-1	100 mL
100 µg/g	WM-21-NMS-10X-1	100 mL
300 µg/g	WM-21-NMS-30X-1	100 mL
500 µg/g	WM-21-NMS-50X-1	100 mL
900 µg/g	WM-21-NMS-90X-1	100 mL

**Suitable for ASTM
D4628, D4927, D4951,
D5056, D5185, D6443,
D6481**

100 mL Set **WM-21-NMS-1-SET** **7 x 100 mL**

21 Wear Metal in Mineral oil at the stated concentration

Silver (Ag)	Copper (Cu)	Phosphorus (P)
Aluminum (Al)	Iron (Fe)	Lead (Pb)
Boron (B)	Magnesium (Mg)	Silicon (Si)
Barium (Ba)	Manganese (Mn)	Tin (Sn)
Calcium (Ca)	Molybdenum (Mo)	Titanium (Ti)
Cadmium (Cd)	Sodium (Na)	Vanadium (V)
Chromium (Cr)	Nickel (Ni)	Zinc (Zn)

Technical Note

For analysis by XRF, AA, ICP or AE for applications for which sulfur interference is undesirable. Prepared with sulfur-free organometallics that do not contain metallic sulfonates. Solutions are stabilized with proprietary chelation and stabilization solution and are ready for use. Additional stabilizers may be required in some cases. For additional information contact Technical Service.

Recommended Internal Standard

Organometallic (Internal Standard)

WM-NMS-14	1000 µg/g	50 mL
WM-NMS-14-5X	5000 µg/g	50 mL

Cobalt (Sulfur-free)

Wear Metals

AA, ICP, DCP & XRF Analysis

ASTM D3605

Trace Metals in Gas Turbine Fuels by AA & Flame Emission & Spectroscopy

Trace Metals Standard

D-3605-91-R1-1

250 µg/mL each in 75 cSt Hydrocarbon oil

1 x 100 mL

4 comps.

Sodium (Na)
Lead (Pb)

Calcium (Ca)
Vanadium (V)

ASTM D5708 & D5863

Sulfur and Metals in Oil

Test Method A - ICP with an Organic Solvent Specimen Solution

Sulfur and Metals in Mineral Oil

ASTM-P-0102-SET

12 x 100 mL

Cat. No.	S (Wt. %)	12 x 100 mL			Unit
		Fe (µg/g)	Ni (µg/g)	V (µg/g)	
ASTM-P-0102-01	0.00	0.00	0.00	0.00	100 mL
ASTM-P-0102-02	0.50	300	10.0	500	100 mL
ASTM-P-0102-03	1.00	500	100	25.0	100 mL
ASTM-P-0102-04	0.00	100	80.0	250	100 mL
ASTM-P-0102-05	2.00	200	40.0	100	100 mL
ASTM-P-0102-06	2.50	400	5.00	400	100 mL
ASTM-P-0102-07	3.00	0.00	60.0	300	100 mL
ASTM-P-0102-08	3.50	500	0.00	200	100 mL
ASTM-P-0102-09	0.00	100	100	0.00	100 mL
ASTM-P-0102-10	4.50	300	50.0	250	100 mL
ASTM-P-0102-11	5.00	200	20.0	500	100 mL
ASTM-P-0102-12	5.50	50.0	100	50.0	100 mL

Sulfur and Metals in Residual Fuel Oil

ASTM-P-0103-SET

12 x 100 mL

Cat. No.	S (Wt. %)	12 x 100 mL			Unit
		Fe (µg/g)	Ni (µg/g)	V (µg/g)	
ASTM-P-0103-01	0.00	0.00	0.00	0.00	100 mL
ASTM-P-0103-02	0.50	300	10.0	500	100 mL
ASTM-P-0103-03	1.00	500	100	25.0	100 mL
ASTM-P-0103-04	0.00	100	80.0	250	100 mL
ASTM-P-0103-05	2.00	200	40.0	100	100 mL
ASTM-P-0103-06	2.50	400	5.00	400	100 mL
ASTM-P-0103-07	3.00	0.00	60.0	300	100 mL
ASTM-P-0103-08	3.50	500	0.00	200	100 mL
ASTM-P-0103-09	0.00	100	100	0.00	100 mL
ASTM-P-0103-10	4.50	300	50.0	250	100 mL
ASTM-P-0103-11	5.00	200	20.0	500	100 mL
ASTM-P-0103-12	5.50	50	100	50.0	100 mL

Stock Multi-Element Standard in Mineral Oil

D-5863-95B-10X-1

100 mL

At stated conc. (µg/g) in 20 cst Mineral Oil

3 comps.

Sodium (Na) 50 Vanadium (V) 150
Nickel (Ni) 200

Stock Multi-Element Standard in Mineral Oil

D-5863-00A-10X-1

100 mL

At stated conc. (µg/g) in 20 cst Mineral Oil

3 comps.

Nickel (Na) 100 Iron (Fe) 10
Vanadium (V) 500 Sodium (Na) 20

ISO/CD 14597

Vanadium and Nickel Standards with Manganese (Internal Standard)

Vanadium Standards - Low Range for ISO/CD 14597 with 0.05% Manganese Internal Standard in Xylene-Mineral Oil

ASTM-P-0104-SET

9 x 100 mL

Cat. No.	Vanadium	
	Conc. (Wt.%)	Unit
ASTM-P-0104-01	0.0005	100 mL
ASTM-P-0104-02	0.0025	100 mL
ASTM-P-0104-03	0.0050	100 mL
ASTM-P-0104-04	0.0075	100 mL
ASTM-P-0104-05	0.0100	100 mL
ASTM-P-0104-06	0.0125	100 mL
ASTM-P-0104-07	0.0150	100 mL
ASTM-P-0104-08	0.0175	100 mL
ASTM-P-0104-09	0.0200	100 mL

Vanadium Standards - High Range for ISO/CD 14597 with 0.05% Manganese Internal Standard in Xylene-Mineral Oil

ASTM-P-0105-SET

7 x 100 mL

Cat. No.	Vanadium	
	Conc. (Wt.%)	Unit
ASTM-P-0105-01	0.0000	100 mL
ASTM-P-0105-02	0.0300	100 mL
ASTM-P-0105-03	0.0400	100 mL
ASTM-P-0105-04	0.0500	100 mL
ASTM-P-0105-05	0.0600	100 mL
ASTM-P-0105-06	0.0800	100 mL
ASTM-P-0105-07	0.1000	100 mL

Nickel Standards for ISO/CD 14597 with 0.05% Manganese Internal Standard in Xylene-Mineral Oil

ASTM-P-0106-SET

7 x 100 mL

Cat. No.	Nickel	
	Conc. (Wt.%)	Unit
ASTM-P-0106-01	0.0000	100 mL
ASTM-P-0106-02	0.0005	100 mL
ASTM-P-0106-03	0.0010	100 mL
ASTM-P-0106-04	0.0025	100 mL
ASTM-P-0106-05	0.0050	100 mL
ASTM-P-0106-06	0.0075	100 mL
ASTM-P-0106-07	0.0100	100 mL

Internal Standard

ASTM-P-0107-5

500 mL

Manganese @ 0.05 Wt. % in Xylene-Mineral Oil

Technical Note

Concentrations for the sets on pages 61-64 are targets. Actual production lots may vary.

Wear Metals

AA, ICP, DCP & XRF Analysis

ASTM D4628, D4927, D4951, D6443

Lubricating Oil Calibration Curve

ASTM-P-0118-SET

Cat. No.	10 x 100 mL							
	Ba (Wt.%)	Ca (Wt.%)	Cl (Wt.%)	Cu (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0118-01	0.020	0.020	0.030	0.010	0.200	0.250	1.000	0.020
ASTM-P-0118-02	0.250	0.020	0.020	0.050	0.200	0.020	0.020	0.250
ASTM-P-0118-03	0.020	0.020	0.200	0.010	0.040	0.250	0.150	0.250
ASTM-P-0118-04	0.250	0.020	0.200	0.050	0.040	0.020	1.000	0.020
ASTM-P-0118-05	0.020	0.400	0.020	0.010	0.040	0.020	1.000	0.250
ASTM-P-0118-06	0.250	0.400	0.020	0.050	0.040	0.250	0.020	0.020
ASTM-P-0118-07	0.020	0.400	0.200	0.010	0.200	0.020	0.020	0.050
ASTM-P-0118-08	0.250	0.400	0.200	0.050	0.200	0.250	1.000	0.250
ASTM-P-0118-09	0.130	0.200	0.100	0.025	0.080	0.150	0.500	0.100
ASTM-P-0118-10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

ASTM D4927, D6443, D6481

Lubricating Oil Calibration Curve

ASTM-P-0108-SET

Cat. No.	17 x 100 mL			
	Ca (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0108-01	0.600	0.005	0.175	0.060
ASTM-P-0108-02	0.500	0.200	0.050	0.080
ASTM-P-0108-03	0.400	0.150	0.300	0.180
ASTM-P-0108-04	0.260	0.250	0.150	0.120
ASTM-P-0108-05	0.005	0.005	0.450	0.070
ASTM-P-0108-06	0.400	0.025	0.350	0.100
ASTM-P-0108-07	0.300	0.060	0.250	0.120
ASTM-P-0108-08	0.200	0.100	0.450	0.100
ASTM-P-0108-09	0.060	0.080	0.300	0.130
ASTM-P-0108-10	0.060	0.050	0.200	0.050
ASTM-P-0108-11	0.050	0.120	0.100	0.075
ASTM-P-0108-12	0.025	0.150	0.200	0.130
ASTM-P-0108-13	0.005	0.200	0.400	0.150
ASTM-P-0108-14	0.170	0.250	0.550	0.110
ASTM-P-0108-15	0.100	0.100	0.200	0.200
ASTM-P-0108-16	0.010	0.010	0.600	0.250
ASTM-P-0108-17	0.000	0.000	0.000	0.000

ASTM-P-0109-SET

Cat. No.	17 x 100 mL				
	Ca (Wt.%)	Cl (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0109-01	0.600	0.100	0.005	0.175	0.060
ASTM-P-0109-02	0.500	0.000	0.200	0.050	0.080
ASTM-P-0109-03	0.400	0.010	0.150	0.300	0.180
ASTM-P-0109-04	0.260	0.500	0.250	0.150	0.120
ASTM-P-0109-05	0.005	1.000	0.005	0.450	0.070
ASTM-P-0109-06	0.400	0.400	0.025	0.350	0.100
ASTM-P-0109-07	0.300	0.100	0.060	0.250	0.120
ASTM-P-0109-08	0.200	0.010	0.100	0.450	0.100
ASTM-P-0109-09	0.060	0.050	0.080	0.300	0.130
ASTM-P-0109-10	0.060	0.200	0.050	0.200	0.050
ASTM-P-0109-11	0.050	0.500	0.120	0.100	0.075
ASTM-P-0109-12	0.025	0.800	0.150	0.200	0.130
ASTM-P-0109-13	0.005	1.000	0.200	0.400	0.150
ASTM-P-0109-14	0.170	0.600	0.250	0.550	0.110
ASTM-P-0109-15	0.100	0.200	0.100	0.200	0.200
ASTM-P-0109-16	0.010	0.400	0.010	0.600	0.250
ASTM-P-0109-17	0.000	0.000	0.000	0.000	0.000

ASTM-P-0110-SET

Cat. No.	17 x 100 mL				
	Ba (Wt.%)	Ca (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0110-01	0.100	0.600	0.005	0.175	0.060
ASTM-P-0110-02	0.175	0.500	0.200	0.050	0.080
ASTM-P-0110-03	0.000	0.400	0.150	0.300	0.180
ASTM-P-0110-04	0.025	0.260	0.250	0.150	0.120
ASTM-P-0110-05	0.150	0.005	0.005	0.450	0.070
ASTM-P-0110-06	0.000	0.400	0.025	0.350	0.100
ASTM-P-0110-07	0.200	0.300	0.060	0.250	0.120
ASTM-P-0110-08	0.000	0.200	0.100	0.450	0.100
ASTM-P-0110-09	0.100	0.060	0.080	0.300	0.130
ASTM-P-0110-10	0.050	0.060	0.050	0.200	0.050
ASTM-P-0110-11	0.075	0.050	0.120	0.100	0.075
ASTM-P-0110-12	0.010	0.025	0.150	0.200	0.130
ASTM-P-0110-13	0.005	0.005	0.200	0.400	0.150
ASTM-P-0110-14	0.000	0.170	0.250	0.550	0.110
ASTM-P-0110-15	0.000	0.100	0.100	0.200	0.200
ASTM-P-0110-16	0.005	0.010	0.010	0.600	0.250
ASTM-P-0110-17	0.000	0.000	0.000	0.000	0.000

ASTM-P-0111-SET

Cat. No.	17 x 100 mL					
	Ba (Wt.%)	Ca (Wt.%)	Cl (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0111-01	0.100	0.600	0.100	0.005	0.175	0.060
ASTM-P-0111-02	0.175	0.500	0.000	0.200	0.050	0.080
ASTM-P-0111-03	0.000	0.400	0.010	0.150	0.300	0.180
ASTM-P-0111-04	0.025	0.260	0.500	0.250	0.150	0.120
ASTM-P-0111-05	0.150	0.005	1.000	0.005	0.450	0.070
ASTM-P-0111-06	0.000	0.400	0.400	0.025	0.350	0.100
ASTM-P-0111-07	0.200	0.300	0.100	0.060	0.250	0.120
ASTM-P-0111-08	0.000	0.200	0.010	0.100	0.450	0.100
ASTM-P-0111-09	0.100	0.060	0.050	0.080	0.300	0.130
ASTM-P-0111-10	0.050	0.060	0.200	0.050	0.200	0.050
ASTM-P-0111-11	0.075	0.050	0.500	0.120	0.100	0.075
ASTM-P-0111-12	0.010	0.025	0.800	0.150	0.200	0.130
ASTM-P-0111-13	0.005	0.005	1.000	0.200	0.400	0.150
ASTM-P-0111-14	0.000	0.170	0.600	0.250	0.550	0.110
ASTM-P-0111-15	0.000	0.100	0.200	0.100	0.200	0.200
ASTM-P-0111-16	0.005	0.010	0.400	0.010	0.600	0.250
ASTM-P-0111-17	0.000	0.000	0.000	0.000	0.000	0.000

ASTM-P-0112-SET

Cat. No.	17 x 100 mL				
	Ca (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0112-01	0.000	0.000	0.000	0.000	0.000
ASTM-P-0112-02	0.500	0.150	0.200	0.050	0.080
ASTM-P-0112-03	0.400	0.350	0.150	0.300	0.180
ASTM-P-0112-04	0.260	0.225	0.250	0.150	0.120
ASTM-P-0112-05	0.005	0.450	0.005	0.450	0.070
ASTM-P-0112-06	0.400	0.500	0.025	0.350	0.100
ASTM-P-0112-07	0.300	0.325	0.060	0.250	0.120
ASTM-P-0112-08	0.200	0.250	0.100	0.450	0.100
ASTM-P-0112-09	0.060	0.100	0.080	0.300	0.130
ASTM-P-0112-10	0.060	0.400	0.050	0.200	0.050
ASTM-P-0112-11	0.050	0.300	0.120	0.100	0.075
ASTM-P-0112-12	0.025	0.200	0.150	0.200	0.130
ASTM-P-0112-13	0.005	0.375	0.200	0.400	0.150
ASTM-P-0112-14	0.170	0.175	0.250	0.550	0.110
ASTM-P-0112-15	0.100	0.425	0.100	0.200	0.200
ASTM-P-0112-16	0.010	0.275	0.010	0.600	0.250
ASTM-P-0112-17	0.600	0.100	0.005	0.175	0.060

ASTM-P-0113-SET

Cat. No.	17 x 100 mL					
	Ba (Wt.%)	Ca (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0113-01	0.025	0.600	0.100	0.005	0.175	0.060
ASTM-P-0113-02	0.000	0.500	0.150	0.200	0.050	0.080
ASTM-P-0113-03	0.100	0.400	0.350	0.150	0.300	0.180
ASTM-P-0113-04	0.175	0.260	0.225	0.250	0.150	0.120
ASTM-P-0113-05	0.150	0.005	0.000	0.005	0.450	0.070
ASTM-P-0113-06	0.000	0.400	0.500	0.025	0.350	0.100
ASTM-P-0113-07	0.100	0.300	0.325	0.060	0.250	0.120
ASTM-P-0113-08	0.200	0.200	0.250	0.100	0.450	0.100
ASTM-P-0113-09	0.050	0.060	0.100	0.080	0.300	0.130
ASTM-P-0113-10	0.075	0.060	0.400	0.050	0.200	0.050
ASTM-P-0113-11	0.010	0.050	0.300	0.120	0.100	0.075
ASTM-P-0113-12	0.000	0.025	0.200	0.150	0.200	0.130
ASTM-P-0113-13	0.175	0.005	0.375	0.200	0.400	0.150
ASTM-P-0113-14	0.005	0.170	0.175	0.250	0.550	0.110
ASTM-P-0113-15	0.000	0.100	0.425	0.100	0.200	0.200
ASTM-P-0113-16	0.005	0.010	0.275	0.010	0.600	0.250
ASTM-P-0113-17	0.000	0.000	0.000	0.000	0.000	0.000

Wear Metals

AA, ICP, DCP & XRF Analysis

ASTM D4927, D6443, D6481
Lubricating Oil Calibration Curve (continued)
ASTM-P-0114-SET
17 x 100 mL

Cat. No.	Ca	P	S	Zn
Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)
ASTM-P-0114-01	0.005	0.005	0.050	0.050
ASTM-P-0114-02	0.600	0.000	0.000	0.000
ASTM-P-0114-03	0.000	0.300	0.000	0.000
ASTM-P-0114-04	1.000	0.000	1.000	0.000
ASTM-P-0114-05	0.000	0.000	0.000	0.300
ASTM-P-0114-06	0.005	0.250	0.800	0.300
ASTM-P-0114-07	0.500	0.150	0.500	0.150
ASTM-P-0114-08	0.010	0.200	0.100	0.250
ASTM-P-0114-09	0.050	0.010	0.400	0.075
ASTM-P-0114-10	0.100	0.150	0.200	0.200
ASTM-P-0114-11	0.200	0.200	0.800	0.100
ASTM-P-0114-12	0.400	0.005	0.800	0.300
ASTM-P-0114-13	0.600	0.100	0.500	0.050
ASTM-P-0114-14	0.800	0.010	0.050	0.100
ASTM-P-0114-15	1.000	0.300	1.000	0.150
ASTM-P-0114-16	0.400	0.050	0.600	0.250
ASTM-P-0114-17	0.000	0.000	0.000	0.000

ASTM-P-0115-SET
17 x 100 mL

Cat. No.	Ca	Mg	P	S	Zn
Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)
ASTM-P-0115-01	0.005	0.100	0.005	0.050	0.050
ASTM-P-0115-02	0.600	0.150	0.000	0.000	0.000
ASTM-P-0115-03	0.000	0.350	0.300	0.000	0.000
ASTM-P-0115-04	1.000	0.225	0.000	1.000	0.000
ASTM-P-0115-05	0.000	0.450	0.000	0.000	0.300
ASTM-P-0115-06	0.005	0.500	0.250	0.800	0.300
ASTM-P-0115-07	0.500	0.325	0.150	0.500	0.150
ASTM-P-0115-08	0.010	0.250	0.200	0.100	0.250
ASTM-P-0115-09	0.050	0.050	0.010	0.400	0.075
ASTM-P-0115-10	0.100	0.400	0.150	0.200	0.200
ASTM-P-0115-11	0.200	0.300	0.200	0.800	0.100
ASTM-P-0115-12	0.400	0.200	0.005	0.800	0.300
ASTM-P-0115-13	0.600	0.375	0.100	0.500	0.050
ASTM-P-0115-14	0.800	0.175	0.010	0.050	0.100
ASTM-P-0115-15	1.000	0.425	0.300	1.000	0.150
ASTM-P-0115-16	0.400	0.275	0.050	0.600	0.250
ASTM-P-0115-17	0.000	0.000	0.000	0.000	0.000

ASTM-P-0120-SET
23 x 100 mL

Cat. No.	Ba	Ca	Cl	Cu	Mg	P	S	Zn
Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)
ASTM-P-0120-01	0.100	0.300	0.080	0.030	0.060	0.060	0.275	0.060
ASTM-P-0120-02	0.175	0.250	0.100	0.000	0.010	0.150	0.000	0.150
ASTM-P-0120-03	0.040	0.500	0.000	0.035	0.160	0.150	0.000	0.020
ASTM-P-0120-04	0.020	0.350	0.010	0.000	0.120	0.080	0.200	0.000
ASTM-P-0120-05	0.150	0.110	0.000	0.015	0.100	0.100	0.300	0.050
ASTM-P-0120-06	0.000	0.200	0.100	0.000	0.200	0.050	0.250	0.150
ASTM-P-0120-07	0.200	0.000	0.050	0.025	0.000	0.000	0.450	0.020
ASTM-P-0120-08	0.000	0.150	0.030	0.000	0.100	0.030	0.400	0.040
ASTM-P-0120-09	0.000	0.250	0.150	0.010	0.160	0.000	0.350	0.080
ASTM-P-0120-10	0.000	0.110	0.150	0.040	0.005	0.030	0.750	0.150
ASTM-P-0120-11	0.100	0.260	0.050	0.000	0.000	0.000	0.750	0.000
ASTM-P-0120-12	0.050	0.200	0.000	0.005	0.140	0.080	0.500	0.080
ASTM-P-0120-13	0.000	0.000	0.000	0.005	0.020	0.020	0.200	0.020
ASTM-P-0120-14	0.080	0.070	0.150	0.020	0.080	0.140	0.650	0.150
ASTM-P-0120-15	0.010	0.050	0.000	0.000	0.000	0.150	0.000	0.000
ASTM-P-0120-16	0.000	0.400	0.000	0.001	0.080	0.000	0.500	0.020
ASTM-P-0120-17	0.000	0.180	0.020	0.020	0.000	0.020	0.600	0.060
ASTM-P-0120-18	0.000	0.400	0.010	0.001	0.010	0.020	0.000	0.000
ASTM-P-0120-19	0.150	0.010	0.020	0.040	0.010	0.020	0.200	0.100
ASTM-P-0120-20	0.005	0.050	0.005	0.050	0.000	0.008	0.000	0.120
ASTM-P-0120-21	0.100	0.200	0.050	0.020	0.080	0.050	0.275	0.050
ASTM-P-0120-22	0.120	0.200	0.000	0.000	0.000	0.000	0.750	0.000
ASTM-P-0120-23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

ASTM D4927, D6443, D6481, D7751
Lubricating Oil Calibration Curve
ASTM-P-0119-SET
22 x 100 mL

Cat. No.	Ca	Cl	Cu	Mg	P	S	Zn
Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)
ASTM-P-0119-01	0.300	0.080	0.030	0.060	0.060	0.275	0.060
ASTM-P-0119-02	0.250	0.100	0.000	0.010	0.150	0.000	0.150
ASTM-P-0119-03	0.500	0.000	0.035	0.160	0.150	0.000	0.020
ASTM-P-0119-04	0.350	0.010	0.000	0.120	0.080	0.200	0.000
ASTM-P-0119-05	0.110	0.000	0.015	0.100	0.100	0.300	0.050
ASTM-P-0119-06	0.200	0.100	0.000	0.200	0.050	0.250	0.150
ASTM-P-0119-07	0.000	0.050	0.025	0.000	0.000	0.450	0.020
ASTM-P-0119-08	0.150	0.030	0.000	0.100	0.030	0.400	0.040
ASTM-P-0119-09	0.250	0.150	0.010	0.160	0.000	0.350	0.080
ASTM-P-0119-10	0.110	0.150	0.040	0.005	0.030	0.750	0.150
ASTM-P-0119-11	0.260	0.050	0.000	0.000	0.000	0.750	0.000
ASTM-P-0119-12	0.200	0.000	0.005	0.140	0.080	0.500	0.080
ASTM-P-0119-13	0.000	0.000	0.005	0.020	0.020	0.200	0.020
ASTM-P-0119-14	0.070	0.150	0.020	0.080	0.140	0.650	0.150
ASTM-P-0119-15	0.050	0.000	0.000	0.000	0.150	0.000	0.000
ASTM-P-0119-16	0.400	0.000	0.001	0.080	0.000	0.500	0.020
ASTM-P-0119-17	0.180	0.020	0.020	0.000	0.020	0.600	0.060
ASTM-P-0119-18	0.400	0.010	0.001	0.010	0.020	0.000	0.000
ASTM-P-0119-19	0.010	0.020	0.040	0.010	0.020	0.200	0.100
ASTM-P-0119-20	0.050	0.005	0.050	0.000	0.008	0.000	0.120
ASTM-P-0119-21	0.200	0.050	0.020	0.080	0.050	0.275	0.050
ASTM-P-0119-22	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Wear Metals

AA, ICP, DCP & XRF Analysis

ASTM D6443

Lubricating Oil Calibration Curve

ASTM-P-0117-SET

10 x 100 mL

Cat. No.	Ca (Wt.%)	Cl (Wt.%)	Cu (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
Nominal Value							
ASTM-P-0117-01	0.020	0.030	0.010	0.200	0.250	1.000	0.020
ASTM-P-0117-02	0.020	0.020	0.050	0.200	0.020	0.020	0.250
ASTM-P-0117-03	0.020	0.200	0.010	0.040	0.250	0.150	0.250
ASTM-P-0117-04	0.020	0.200	0.050	0.040	0.020	1.000	0.020
ASTM-P-0117-05	0.400	0.020	0.010	0.040	0.020	1.000	0.250
ASTM-P-0117-06	0.400	0.020	0.050	0.040	0.250	0.020	0.020
ASTM-P-0117-07	0.400	0.200	0.010	0.200	0.020	0.020	0.050
ASTM-P-0117-08	0.400	0.200	0.050	0.200	0.250	1.000	0.250
ASTM-P-0117-09	0.200	0.100	0.025	0.080	0.150	0.500	0.100
ASTM-P-0117-10	0.000	0.000	0.000	0.000	0.000	0.000	0.000

ASTM D6481

Lubricating Oil Calibration Curve

ASTM-P-0116-SET

11 x 100 mL

Cat. No.	Ca (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
Nominal Value				
ASTM-P-0116-01	0.500	1.000	0.500	0.500
ASTM-P-0116-02	2.000	1.000	2.500	2.000
ASTM-P-0116-03	2.000	1.250	1.000	1.500
ASTM-P-0116-04	5.000	0.000	0.000	0.000
ASTM-P-0116-05	4.000	0.500	1.250	0.500
ASTM-P-0116-06	2.500	0.750	4.000	1.000
ASTM-P-0116-07	3.500	0.000	1.500	1.000
ASTM-P-0116-08	0.500	2.000	5.000	1.000
ASTM-P-0116-09	1.000	0.750	2.000	1.500
ASTM-P-0116-10	2.500	1.200	3.000	0.500
ASTM-P-0116-11	0.000	0.000	0.000	0.000

Metal Working Fluids

ASTM-P-0121-SET

13 x 100 mL

Cat. No.	Cl (Wt.%)	P (Wt.%)	S (Wt.%)
Nominal Value			
ASTM-P-0121-01	0.000	0.000	0.000
ASTM-P-0121-02	0.750	0.025	0.500
ASTM-P-0121-03	0.050	0.100	3.000
ASTM-P-0121-04	1.000	0.500	2.500
ASTM-P-0121-05	0.100	0.005	2.000
ASTM-P-0121-06	1.500	0.200	1.000
ASTM-P-0121-07	2.000	0.005	3.000
ASTM-P-0121-08	1.000	0.050	0.100
ASTM-P-0121-09	0.500	0.400	0.000
ASTM-P-0121-10	2.000	0.200	1.500
ASTM-P-0121-11	0.000	0.500	1.500
ASTM-P-0121-12	1.250	0.010	0.050
ASTM-P-0121-13	0.050	0.300	0.050

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AK-103.0-SS-10X	40	ASTM-P-0102-03	61	ASTM-P-128-02	1	BF-D-6584-01	35
AS-E0238	39	ASTM-P-0102-04	61	ASTM-P-128-03	1	BF-D-6584-02	35
AS-E0239	40	ASTM-P-0102-05	61	ASTM-P-128-04	1	BF-D-6584-03	35
AS-E0240	40	ASTM-P-0102-06	61	ASTM-P-128-05	1	BF-D-6584-04	35
AS-E0241	40	ASTM-P-0102-07	61	ASTM-P-128-06	1	BF-D-6584-05-IS	35
ASTM-E1387	33	ASTM-P-0102-08	61	ASTM-P-128-07	1	BF-D-6584-06	35
ASTM-E1387-PAK	33	ASTM-P-0102-09	61	ASTM-P-129-01	1	BF-D-6584-07N	35
ASTM-E1618	33	ASTM-P-0102-10	61	ASTM-P-129-02	1	BF-D-6584-MIX	35
ASTM-E1618-PAK	33	ASTM-P-0102-11	61	ASTM-P-131-01	2	BF-D-6584-SET	35
ASTM-P-0010-PAK	5	ASTM-P-0102-12	61	ASTM-P-131-02	2	BF-FU-029-40X	35
ASTM-P-0020-PAK	5	ASTM-P-0102-SET	61	ASTM-P-131-03	2	BF-FU-029-D	35
ASTM-P-0050	31	ASTM-P-0103-01	61	ASTM-P-131-04	2	BF-FU-030-D	35
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ASTM-P-0052	31	ASTM-P-0103-03	61	ASTM-P-132-01	1	BF-FU-032-D	35
ASTM-P-0052-PAK	31	ASTM-P-0103-04	61	ASTM-P-132-02	1	BF-FU-032-D-40X	35
ASTM-P-0053N-2G	25, 31	ASTM-P-0103-05	61	ASTM-P-132-03	1	BF-KF-0.6X-5ML-VAP	38
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ASTM-P-0062-SET	18	ASTM-P-0103-07	61	ASTM-P-133-01	1	BF-KF-10X-5ML-VAP	38
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ASTM-P-0071-03	9, 18	ASTM-P-0105-01	61	ASTM-P-0140-PES	24	BF-WM-B100-41-0.5X	38
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ASTM-P-0091-12-10X	18	ASTM-P-0112-SET	62	BF-5453-B20-15X-SET	35	CLP-BTEX-10X	54
ASTM-P-0091-13-10X	18	ASTM-P-0113-SET	62	BF-5453-B20-30X	35	CLP-BTEX-10X-PAK	54
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ASTM-P-0091-17-10X	18	ASTM-P-0117-SET	64	BF-5453-B20-200X	35	D-611E-SET	2
ASTM-P-0091-18-10X	18	ASTM-P-0118-SET	62	BF-5453-B20-500X	35	D-611-SET	2
ASTM-P-0091-19-10X	18	ASTM-P-0119-SET	63	BF-5453-B20-BL	35	D-2622-LL-5X-100ML	4
ASTM-P-0091-20-10X	18	ASTM-P-0120-SET	63	BF-5453-B100-5X-SET	35	D-2622-LL-10X-100ML	4
ASTM-P-0091-21-10X	18	ASTM-P-0121-SET	64	BF-5453-B100-10X-SET	35	D-2622-LL-30X-100ML	4
ASTM-P-0091-22-10X	18	ASTM-P-124-01-VAP	11	BF-5453-B100-15X-SET	35	D-2622-LL-50X-100ML	4
ASTM-P-0092-0.1X-100ML	9	ASTM-P-124-03-VAP	11	BF-5453-B100-30X	35	D-2622-LL-75X-100ML	4
ASTM-P-0092-1X-100ML	9	ASTM-P-124-04-VAP	11	BF-5453-B100-50X	35	D-2622-LL-100X-100ML	4
ASTM-P-0092-5X-100ML	9	ASTM-P-124-05-VAP	11	BF-5453-B100-75X	35	D-2622-LL-200X-100ML	4
ASTM-P-0092-10X-100ML	9	ASTM-P-124-06-VAP	11	BF-5453-B100-100X	35	D-2622-LL-300X-100ML	4
ASTM-P-0092-100ML-SET	9	ASTM-P-125-01-VAP	11	BF-5453-B100-200X	35	D-2622-LL-400X-100ML	4
ASTM-P-0092-100X-100ML	9	ASTM-P-125-02-VAP	11	BF-5453-B100-500X	35	D-2622-LL-500X-100ML	4
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TPH-002-R2-SET	40	WM-22-90X-100G	59	WM-75CST-63-5X	58	WM-NMS-69	60
TPH-004-SET	40	WM-22-90X-200G	59	WM-75CST-64	58	WM-NMS-69-5X	60
TPH-006-10X	42	WM-22-100G-SET	59	WM-75CST-64-5X	58	WM-NMS-70	60
TPH-006-10X-PAK	42	WM-22-200G-SET	59	WM-75CST-65	58	WM-NMS-70-5X	60
		WM-23-1X-100G	59	WM-75CST-65-5X	58	WM-NMS-71	60
U		WM-23-1X-200G	59	WM-75CST-67	58	WM-NMS-71-5X	60
UOP-M-543-PAK	34	WM-23-3X-100G	59	WM-75CST-67-5X	58	WM-STAB	58
UOP-M-551-PAK	34	WM-23-3X-200G	59	WM-75CST-69	58		
UOP-M-660-0.1X-PAK	34	WM-23-5X-100G	59	WM-75CST-69-5X	58		
UOP-M-660-10X-PAK	34	WM-23-5X-200G	59	WM-75CST-70	58		
UOP-M-660-PAK	34	WM-23-10X-100G	59	WM-75CST-70-5X	58		
UOP-M-720-PAK	34	WM-23-10X-200G	59	WM-75CST-71	58		
UOP-M-744-PAK	34	WM-23-30X-100G	59	WM-75CST-71-5X	58		
UOP-M-831-PAK	34	WM-23-30X-200G	59	WM-NMS-01	60		
UOP-M-868-PAK	34	WM-23-50X-100G	59	WM-NMS-01-5X	60		
UOP-M-931-PAK	34	WM-23-50X-200G	59	WM-NMS-02	60		
		WM-23-90X-100G	59	WM-NMS-02-5X	60		
V		WM-23-90X-200G	59	WM-NMS-03	60		
V-028S-D-10X	40, 52, 53	WM-23-100G-SET	59	WM-NMS-03-5X	60		
V-028S-D-10X-PAK	52, 53	WM-23-200G-SET	59	WM-NMS-04	60		
VPH-WA	52	WM-23-200G-SET	59	WM-NMS-04-5X	60		
VPH-WA-10X	52	WM-75CST-01	58	WM-NMS-05	60		
VPH-WA-10X-PAK	52	WM-75CST-01-5X	58	WM-NMS-05-5X	60		
VPH-WA-100X	52	WM-75CST-02	58	WM-NMS-08	60		
VPH-WA-100X-PAK	52	WM-75CST-02-5X	58	WM-NMS-08-5X	60		
VPH-WA-MS	52	WM-75CST-03	58	WM-NMS-09	60		
VPH-WA-MS-PAK	52	WM-75CST-04	58	WM-NMS-09-5X	60		
VPH-WA-PAK	52	WM-75CST-04-5X	58	WM-NMS-11	60		
VPH-WA-RT	52	WM-75CST-05	58	WM-NMS-11-5X	60		
VPH-WA-RT-PAK	52	WM-75CST-06	58	WM-NMS-13	60		
VPH-WA-SS-10X	52	WM-75CST-07	58	WM-NMS-13-5X	60		
		WM-75CST-07-5X	58	WM-NMS-14	60		
		WM-75CST-08	58				
		WM-75CST-08-5X	58				

Certification of Analysis

125 Market Street
New Haven, CT 06513
USA

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

Catalog No: BF-D-6584-MIX
Description: ASTM D 6584 Mix
Lot: 222081127
Solvent: Pyridine
Hazards: Refer to SDS for complete safety information

Date Certified: Aug 19, 2022
Expiration: Sep 19, 2024
Sample Size: 5 mL
Components: 6
Storage Condition: Refrig (0-5 °C)

GHS safety information

Signal Word: Danger

Component	CAS #	Purity %	Prepared Concentration*	Certified Analyte Concentration*
		(GC/MS)	(µg/mL)	(µg/mL)
Glycerol	56-81-5	98.7	501.2	494.7
Monoclein	111-03-5	99.4	5008	4975
1,3-Diolein	2465-32-9	96.4	5189*	5002
Trioctadecenol (Olein)	122-32-7	99.9	5001	4996
(S)-(-)-1,2,4-Butanetriol	42890-78-6	98.2	1002	964
Tricaprin	621-71-8	99.9	8012	8004

This Certified Reference Material was verified in accordance with ISO/IEC 17025

* Weight compensated to 100% purity.

A product with a suffix (-1A, -2B, etc. or -01, -02, etc.) on its lot number has had its expiration date extended and is identical to the same lot number without the suffix.

* All weights are traceable through NIST, Test No. 684Q89671-17

* Certified Analyte Concentration = Purity x Prepared Concentration

The Uncertainty associated with the certified concentration reported on this certificate is ±2.4%. This value is the combined expanded uncertainty and represents an estimated standard deviation equal to the positive square root of the total variation of the uncertainty of components. A normal distribution is assumed and a coverage factor of K=2 is chosen using approximately a 95% confidence level.

Labels and certificates follow U.S. Conventions in reporting numerical values: A comma (,) is used to separate units of one-thousand or greater. A period (.) is used as a decimal place marker.

The information on this certificate may not be reproduced without the express permission of the manufacturer. See reverse side for additional information

Hazard Information: Please refer to the SDS for information regarding the hazards associated with using this material.

This product was prepared according to in-house procedures and is guaranteed to be homogeneous.

Uncertainty reported for statistical confidence.

Certified By:
Larry Decker, Origin QC Manager

QC management approval

Page 1 of 1 For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015 DR-06020-001 Rev. 1/20



AccuStandard 125 Market St. New Haven, CT 06513
www.AccuStandard.com

BF-D-6584-MIX
ASTM D 6584 Mix
Varied Conc. in Pyridine
Lot: 222081127
Exp: Sep 19, 2024
PRODUCT OF THE USA

5 mL

6 comp(s)
Storage: Refrig (0-5 °C)
FOR LABORATORY USE ONLY

Signal Word: Danger

Custom Formulations

Custom Standards offer an efficient and economical option when our listed catalog products do not match your exact testing requirements. With decades of experience in manufacturing Certified Reference Material (CRMs), AccuStandard can formulate quality custom standards that are uniquely made to meet your specific specifications. Our Custom (CRMs) follow our ISO17034 quality guidelines offering convenience but most importantly reliability and confidence. Our commitment to quality goes above and beyond by offering shelf life extension test to all our custom CRMs included in our custom standard service.

Why buy AccuStandard's Custom Standards?

- Fast and knowledgeable quotations
- Experienced technical support to answer your questions
- Formulation is carefully evaluated for stability and compatibility
- Concentrations are certified gravimetrically and verified analytically
- Balances used are calibrated daily against NIST traceable weights
- Certificate of Analysis (COA) provided as well as chromatograms (when requested)

To request a custom formulation visit our website at:

<https://www.accustandard.com/custom-quote-request> or
call to talk with a quotation specialist.



Usage and Handling

Organic Products (Usage, Handling)

- Check label for proper storage and if it needs to be sonicated prior to use.
- Always tap ampule before opening to ensure no product is in the head.

Inorganic Products (Usage, Handling)

- Shake bottle prior to use and do not pipette directly out of the bottle.
- Use only clean Class A volumetric glassware.
- Keep bottles tightly capped when not being used and store under normal laboratory conditions.

Storage

Expiration dates are determined by short-term and long-term stability studies, experience and knowledge of chemical interactions. As part of our long-term studies, standards are analyzed at the end of their assigned expiration period and sometimes can be recertified for an additional length of time.

All products come with storage conditions listed on the label of the ampule or bottle. Some chemical formulations require refrigeration or freezer storage to inhibit adverse reactions among the components. It is imperative that these conditions are followed to preserve the integrity of the material.

Note: ColdPacks may be recommended or required with certain temperature sensitive products. Some standards are susceptible to change at room temperature or higher. In some of these cases, we may recommend or require that these products ship in a ColdPack (a styrofoam container that has an ice pack). The purpose is to delay the exposure of the product to higher temperatures, and NOT to keep the product frozen. The product will not immediately go out of specification when the ColdPack melts or when the product reaches room temperature. It simply delays exposure to higher temperatures.

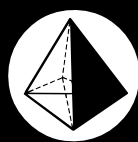
Safety Information

Products are designed to be used by trained laboratory personnel.

All products come with a Safety Data Sheet (SDS), which also can be downloaded on our website.

Check out our instructional videos at
<https://www.accustandard.com/video-library>





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Rev. 4/23