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Matériaux de Référence Certifiés & Equipements de Laboratoire

Petrochemical Standards



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Over 100 ASTM Methods

Cross references to ISO, DIN, IP, JIS and AFNOR methods.

Our selection of Biofuel reference standards include FAMEs, FAEEs (from popular biomasses), sulfurs, physical standards, wear metals and free and total glycerin.

Reference standards to meet the most common UOP LLC (a Honeywell company) methods.

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ASTM Methods

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ASTM Committee D02 has jurisdiction over 580 published methods pertaining to petroleum products and lubricants. As a member of this technical committee, as well as ASTM Committee D16 on Aromatic Hydrocarbons has given us the opportunity to formulate products to meet the requirements of many of these methods.

Use this Cross-reference Table to match other Methods for known Petrochemical analysis.

ANALYSIS	ASTM	IP	ISO	DIN	JIS	AFNOR
Tag Flash Point	D56			51411	K 2580	M07-003
Distillation	D86	123	3405	51751	K 2254	M07-002
COC Flash Point	D92	36	2592	51376	K 2265	T60-118
PMCC Flash Point	D93	34	2719	51758	K 2265	M07-019
Kinematic Viscosity	D445	71-1	3104	51562	K 2283	T60-100
Aniline Point	D611	2	2977	51775		M07-021
Hydrocarbon Types by FID	D1319	156	3837	51791	K 2536	M07-024
Water (Karl Fischer)	D1744		6296			T60-154
Freezing Point	D2386	16	3013	51421	K 2276	M07-048
Cloud Point	D2500	219	3015	51597	K 2269	T60-105
Sulfur by XRF	D2622			51400T6	K 2541	
Boiling Range By GC	D2887		3924			
Sulfur by Oxidative Microcoulometry	D3120		16591			
Lead by AAS	D3237	428				
Sulfur by Oxidative Microcoulometry	D3246	373				M07-052
Metals by AA	D3605	413	8691	51790T3		
Benzene by GC	D3606	425				
Sulfur by ED-XRF	D4294	336	8754			M07-053
Water (Karl Fischer)	D4377	356	10336			
Metals by AA	D4628	308		51391T1		
Nitrogen by Chemiluminescence Detection	D4629	379				M07-058
Metals by WD-XRF	D4927	407		51391T2		
Water (Karl Fischer)	D4928	386	10337			
Lead in Gas By X-Ray	D5059	228				
Vapor Pressure	D5191	394				M07-079
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Cloud Point	D5773	446				
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Hydrocarbons Automatic	D6591	391				
Metals			14597			

This is a partial list of Standards available for ASTM Methods.

Tables Generated from

- (a) R.A. Nadkarni, "Guide to ASTM Test Methods for the Analysis of Petroleum Products and Lubricants," Manual 44 (200), ASTM West Conshohocken, PA
- (b) Annual Book of ASTM Standards 2000, Volumes 05.01 to 05.05

ASTM

Physical Properties

ASTM D56, D92, D93 Flash Point Standards

The reference material is a stable, pure hydrocarbon with a method specific flash point determined by using the ASTM Method # referenced.

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

ASTM D86 Distillation Standards

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

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

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

▲ Hazardous fee required for air shipments.

ASTM D445 Viscosity Calibration Standards

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

ASTM D611 Aniline Point Standards

The accuracy of the automated aniline point apparatus can be verified using a range of standards whose aniline points are determined using ASTM D611 (Method A) and ASTM D611 (Method E). Standards are packaged in 20 mL ampules in an inert atmosphere.

Aniline Point Verification Method 611(A)

Set include 5 Standards listed below

Nominal Aniline Point	Cat. No.	Unit
	D-611-SET	5 x 20 mL
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

Aniline Point Verification Method 611(E)

Set include 3 Standards listed below

Nominal Aniline Point	Cat. No.	Unit
	D-611E-SET	3 x 20 mL
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 15 mL

ASTM

Physical Properties

ASTM D1015, D2386, D5972 Freezing Points of High Purity Hydrocarbons

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

ASTM D1319 Calibration Standards by Fluorescent Indicator Adsorption FIA

Olefin FIA Calibration Curve

FIA-CAL-SET

	7 x 1 mL						
	Std. 1 Target Vol.%	Std. 2 Vol.%	Std. 3 Vol.%	Std. 4 Vol.%	Std. 5 Vol.%	Std. 6 Vol.%	Std. 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

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

FIA Olefin Standard

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

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.

FIA Paraffin Standard

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

FIA Aromatic Standard

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

ASTM D1744, E1064, D4377, D4928, D6304 Water in Liquid Petroleum Products by Karl Fischer

Standards are available for coulometric Karl Fischer titrations and are packaged in 2 mL, 5 mL, and 20 mL ampoules in sets of 5 and 10. The following concentrations are available:

Description	Cat. No.	Unit
Water content 60 µg/g	KF-0.6X-5ML-VAP	10 x 5 mL
Water content 100 µg/g	KF-1X-2ML-VAP	10 x 2 mL
	KF-1X-5ML-VAP	10 x 5 mL
	KF-1X-20ML-PAK	5 x 20 mL
Water content 1000 µg/g	KF-10X-2ML-VAP	10 x 2 mL
	KF-10X-5ML-VAP	10 x 5 mL
	KF-10X-20ML-PAK	5 x 20 mL
Water content 5000 µg/g	KF-50X-2ML-VAP	10 x 2 mL
	KF-50X-5ML-VAP	10 x 5 mL
	KF-50X-20ML-PAK	5 x 20 mL

Value Added PAK
Packaged in ready to use quantities.

Value Added Paks (Cat. No.'s ending in -VAP) provide multiple single units packaged together for both greater stability and cost savings.

ASTM D2500, D5771, D5772, D5773 Cloud Point Calibration Standards

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

▲ Hazardous fee required for air shipments.

ASTM Sulfur

D2622, D3120, D3246, D4294, D5453, D6334, D6445 & Proposed ASTM Sulfur Methods

These calibration standards are designed for the analysis of sulfur in a wide variety of matrices such as #2 diesel fuel, white mineral oil, kerosene, gasoline, crude oil and residual oil. 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 on a weight/weight basis using balances that are calibrated 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.

Sulfur Standards for ASTM D2622, D3120, D3246, D4294, D5453, D6334, D6445 & Proposed ASTM Sulfur Methods

Sulfur in Heavy Weight Mineral Oil (75 cSt) Ready-to-Use

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

Individual bottles 100 mL 5 x 20 mL
 SWMO-CAL-100ML-SET 19 x 100 mL

Sulfur in Light Weight Mineral Oil (20 cSt) Ready-to-Use

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

Individual bottles 100 mL 5 x 20 mL
 SWMO-LT-CAL-100ML-SET 19 x 100 mL

Sulfur in #2 Diesel Fuel Ready-to-Use

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

Individual bottles 100 mL 5 x 20 mL
 Sets SDF-CAL-100ML-SET ▲ 19 x 100 mL
 SDF-CAL-20ML-SET 19 x (5 x 20 mL)

Sulfur in Light Distillate Kerosene Ready-to-Use

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

Individual bottles 100 mL 5 x 20 mL
 SK-CAL-100ML-SET ▲ 12 x 100 mL

Technical Note

Sulfur introduced using di-*n*-butyl sulfide

Sulfur in Heavy Distillate Kerosene

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

Individual bottles 100 mL
 SK-HD-CAL-100ML-SET ▲ 21 x 100 mL

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.

▲ Hazardous fee required for air shipments.

Sulfur Standards for ASTM D2622, D3120, D3246, D4294, D5453, D6334, D6445 & Proposed ASTM Sulfur Methods (continued)

ASTM D2622, D4294 Sulfur Calibration

Sulfur Calibration Stds. for Gasoline & Reformulated Gasoline Analysis

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

Individual bottles 100 mL
Each in Isooctane

STP-CAL-100ML-SET ▲ 13 x 100 mL

Technical Note

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

ASTM D3120, D3246 Sulfur Calibration

Sulfur Calibration Set

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

D-3120-92-CAL-SET 8 x 1 mL
Each in Isooctane

ASTM D2622, D4294 Sulfur Petroleum Products

Sulfur in Crude Oil Standards

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

SCO-CAL-100ML-SET ▲ 8 x 100 mL
Each at stated conc. in Crude oil

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)

ASTM D2622, D6334, D6445 Sulfur Calibration

Sulfur Calibration Stds. used on XRF Energy Dispersive or Wavelength Instruments

Low Level

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

Individual bottles 100 mL
Each in Isooctane:Toluene (75:25)

D-2622-LL-CAL-100ML-SET ▲ 10 x 100 mL

Mid Level Additions

200 µg/g	0.020	D-2622-LL-200X-100ML ▲
400 µg/g	0.040	D-2622-LL-400X-100ML ▲
600 µg/g	0.060	D-2622-LL-600X-100ML ▲
700 µg/g	0.070	D-2622-LL-700X-100ML ▲
800 µg/g	0.080	D-2622-LL-800X-100ML ▲
900 µg/g	0.090	D-2622-LL-900X-100ML ▲
1100 µg/g	0.110	D-2622-LL-1100X-100ML ▲
1200 µg/g	0.120	D-2622-LL-1200X-100ML ▲

Individual bottles 100 mL
Each in Isooctane:Toluene (75:25)

Technical Note

Thiophene and 2-Methylthiophene are used as starting material in these products.

Sulfur in Residual Oil Standards

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

SRO-CAL-100ML-SET 7 x 100 mL
Each at stated conc. in Residual oil

ASTM-SSTDA-B-SET 10 x 2 mL
At stated conc. in Isooctane

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

ASTM

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

ASTM D6729-04, D6730-01, D6733-01, D8071-17 PIANO

We offer a petroleum naphtha-based PIANO mix (acronym for Paraffins, Isoparaffins, Aromatics, Naphthenes and Olefins). 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 D6729-04, D6730-01, D6733-01 and D8071-17.

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 D 6729-04 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
2. Mass spectrum library search of an in-house generated library
3. Comparison of elution data from ASTM Methods 6729-04 and 6730-01
4. Analysis of individual standards
5. Interpretation of mass spectra target ions

PIANO Gasoline

PIANO 1 x 0.5 mL
PIANO-PAK 5 x 0.5 mL

PIANO Gasoline (with Ethanol)

PIANO-ETOH 1 x 0.5 mL
PIANO-ETOH-PAK 5 x 0.5 mL

PIANO Gasoline (with MtBE)

PIANO-MTBE 1 x 0.5 mL
PIANO-MTBE-PAK 5 x 0.5 mL

ASTM

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

ASTM D6729-04, D6730-01, D6733-01, D8071-17 PIANO (continued) - Contents of Information Packet

A complete data package of the PIANO Mix is provided with each order.

The data package includes:

- Detailed analytical conditions
- Mass Spectrum of each compound
- Chromatograms detailing separations

PIANO Mix Documentation Sample

PIANO mix

Analytical conditions

Instrument: Agilent GC-MS 7891A/5975C

Injection temp: 250°C

Injection: Splitless, 1.0 µl (10)

GC MS interface temp: 300°C

Detector: Mass selective detector, 50:50 Helium carrier gas

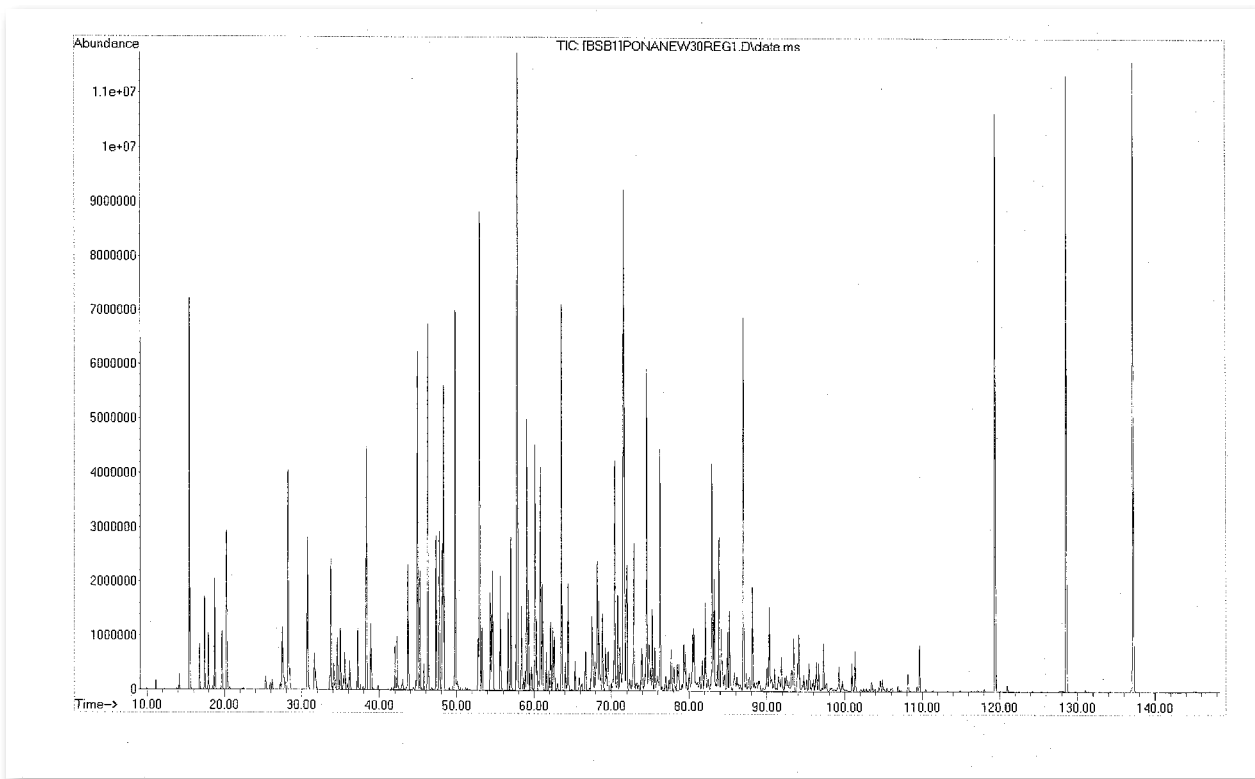
GC column: HP5MS-MS, 30m x 0.25mm ID, 0.25µm film

Carrier gas: Helium, 1.01 ml/min constant flow

PIANO MIX MASTER LIST OF COMPOUNDS

Peak #	RT	Pub. Name	Compound
1	8.927	0.001 P	n-Butane
2	13.223	0.004 P	2-Pentene
3	13.249	0.000 O	n-3-Pentene
4	14.029	0.005 O	2-Methyl-2-Butene
5	15.527	0.001 P	Isopentane
6	16.917	0.011 O	3-Pentene
7	19.481	0.111 O	3-Methyl-2-Butene
8	21.043	0.007 P	Hexane
9	26.976	0.001 O	2-Methyl-2-Pentene
10	28.798	0.040 O	Isopentane
11	33.543	0.200 O	2,3-Dimethyl-2-Butene
12	35.527	0.001 O	n-6-Hexene
13	35.532	0.001 O	2-Methyl-2-Pentene
14	37.229	0.005 O	2,3-Dimethyl-2-Butene
15	37.511	0.007 P	2,2-Dimethylbutane
16	41.237	0.001 O	2,2-Dimethylbutane
17	46.093	0.004 O	3-Methyl-2-pentene
18	46.266	0.001 O	3-Methyl-2-pentene
19	51.046	0.004 A	2,2-Dimethylbutane
20	57.719	0.041 P	2,3-Dimethyl-2-Butene
21	57.746	0.001 O	2,3-Dimethyl-2-Butene
22	58.005	0.001 P	2,3-Dimethyl-2-Butene
23	58.816	0.001 P	2-Methyl-2-pentene
24	58.827	0.001 O	2-Methyl-2-pentene
25	58.829	0.001 P	2-Methyl-2-pentene
26	51.087	0.001 O	2-Methyl-2-pentene
27	51.863	0.001 O	3-Methyl-2-pentene
28	53.448	0.001 O	2-Methyl-2-pentene
29	53.461	0.001 P	2-Methyl-2-pentene
30	53.461	0.001 O	2-Methyl-2-pentene
31	53.461	0.001 O	2-Methyl-2-pentene
32	53.461	0.001 O	2-Methyl-2-pentene

Total Ion Chromatogram of the PIANO mix



ASTM

Detailed Hydrocarbon Analysis

ASTM D2789 Hydrocarbon Types in Low Olefinic Gas by MS

Hydrocarbon Mixture

D-2789-CTM			1 x 1 mL
D-2789-CTM-PAK			5 x 1 mL
At stated Vol. %			9 comps.
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		

ASTM D2887 Boiling Range Distribution of Petroleum Fractions by GC

Calibration Mixture

DRH-002N		100 mg	
DRH-002N-10X		1 gm	
At stated Wt. %		17 comps.	
<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		

Column Test Mixture

D-2887		1 x 1 mL
10 mg/mL in <i>n</i> -Octane		2 comps.
<i>n</i> -Hexadecane	<i>n</i> -Octadecane	

Reference Gas Oil Sample Lot #2

D-2887-REFOIL 1 x 1 mL

Hydrocarbon Window Defining Standard

DRH-008S-R2		1 x 1 mL
DRH-008S-R2-PAK		5 x 1 mL
500 µg/mL each in Chloroform		35 comps.
<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> -Tritriacontane	
<i>n</i> -Octadecane	<i>n</i> -Tetracontane	
Pristane	<i>n</i> -Pentatriacontane	
<i>n</i> -Nonadecane	<i>n</i> -Hexatriacontane	
Phytane	<i>n</i> -Heptatriacontane	
<i>n</i> -Eicosane	<i>n</i> -Octatriacontane	
<i>n</i> -Heneicosane	<i>n</i> -Nonatriacontane	
<i>n</i> -Docosane	<i>n</i> -Tetracontane	
<i>n</i> -Tricosane		

Fuel Oil Degradation/Retention Time Mix for Quantification of

C₁₇/Pristane & C₁₈/Phytane ratios	
DRH-005S-10X	1 x 1 mL
2.0 mg/mL each in CH ₂ Cl ₂ :CS ₂ (1:1)	
	4 comps.
DRH-005S-R1-10X	1 x 1 mL
DRH-005S-R1-10X-PAK	5 x 1 mL
2.0 mg/mL each in Chloroform	
	4 comps.

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).

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		

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
5 x 1 gm
20 comps.

Reformulated to ship by Air

ASTM

Simulated Distillation (SIM DIS)

Simulated Distillation (SIM DIS) and Proposed Motor Oil Volatility Method

SIM DIS standards 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.

SIM DIS Simulated Distillation Standards

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		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		

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	



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

Standards of Interest

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

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

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.

ASTM D3230 Determination of Salts in Crude Oil

see page 363

ASTM D3237 Lead in Gasoline by AA Spectroscopy

see page 363

ASTM D3246 Sulfur in Petroleum Gas by Oxidative Microcoulometry

see pages 270-271

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	Std. 1 Target Wt. %	Std. 2 Target Wt. %	Std. 3 Target Wt. %	Std. 4 Target Wt. %	Std. 5 Target Wt. %	Std. 6 Target 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

5 x 10 mL

At stated Wt. % in *n*-Heptane

2 comps.

<i>n</i> -Decane	1.0
<i>n</i> -Octadecane	0.2

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

Column Resolution Mix

D-3524-CR

1 x 1 mL

D-3524-CR-PAK

5 x 1 mL

At stated Wt. % in *n*-Heptane

2 comps.

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

ASTM D3605 Trace Metals in Gas Turbine Fuels by AA & Flame Emission & Spectroscopy

see page 363

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.

ASTM D3606 Benzene & Toluene in Finished Motor & Aviation Gasoline by GC UPDATED

Aromatics Quantitative Calibration Standards

Without Internal Standards

D-3606-25ML-SET

7 x 25 mL

Analyte	Calibration Range	Std. 1 Target 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 and the actual analytical values will be reported on the certificate of analysis.

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 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 (Internal Std.)		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

Aromatics Quantitative Calibration Standard

With Internal Standard: sec-Butanol

D-3606-IS2-SET

7 x 1 mL

Analyte	Calibration Range	Std. 1 Target 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 (Internal Std.)		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

Technical Note

Due to the possible use of other oxygenates (i.e. ethanol) in gasoline, a calibration curve using sec-Butanol as an internal standard has been formulated. The use of this internal standard minimizes coelution caused by the oxygenate(s) and pre-column - standard column configuration in the GC system.

Aromatics Quantitative Calibration Curve

D-3606-IS2-R1-SET

7 x 1 mL

Analyte	Calibration Range	Std. 1 Target 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 (Internal Std.)		4	4	4	4	4	4	4

Aromatics Quantitative Calibration Curve

UPDATED

With Ethanol and Internal Standard

D-3606-IS2-R2-SET

7 x 1 mL

Analyte	Calibration Range	Std. 1 Target 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 (Internal Std.)		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

Daily Gasoline Refinery Quality Control Standards

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

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 (Internal Std.)	4.0
Isooctane	90.56

100

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

ASTM D3710 Boiling Range Distribution of Gasoline & Gasoline Fractions by GC

This **SIM DIS** (Simulated Distillation or GCD) Method is used to determine the boiling range distribution of gasoline and gasoline components. ASTM Method 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.

Qualitative Calibration Standard

D-3710-QUAL		1 x 1 mL	
D-3710-QUAL-PAK		5 x 1 mL	
At stated Wt. %			
<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		5 x 1 mL	
At stated Wt. %			
<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 D2887 Boiling Range Distribution of Petroleum Fractions by GC

Calibration Solution

DRH-002S-R1

DRH-002S-R1-PAK

At stated conc. (µg/mL) in Chloroform

1 x 1 mL

5 x 1 mL

17 comps.



Reformulated to ship by Air

<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						

ASTM D3798 Analysis of *p*-Xylene by GC

p-Xylene Impurity Standards

With Internal Standard

D-3798-IS		1 x 1 mL	
D-3798-IS-PAK		5 x 1 mL	
At stated Wt. %			
<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		1 x 10 mL	
D-3798-10ML-PAK		5 x 10 mL	
At stated Wt. %			
<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. If you prefer to eliminate making standards, contact our Technical Service Department with your unique formulation for a custom quotation. See back of catalog for details.

ASTM D3831 Manganese in Gasoline by AA Spectroscopy

see page 363

ASTM D4059 Polychlorinated Biphenyls in Insulating Liquids by GC

Solutions in PCB-Free Transformer Oil (Individuals, 2 Concentrations)

Aroclor #	Conc.	Individual	PAK	Aroclor #	Conc.	Individual	PAK				
CAS No.	ppm w/w	Cat. No.	1 mL	Cat. No.	5 x 1 mL	CAS No.	ppm w/w	Individual	PAK		
								Cat. No.	1 mL	Cat. No.	5 x 1 mL
Aroclor 1016	50	C-216-ST-1	C-216-ST-1-PAK	Aroclor 1262	50	C-262-ST-1	C-262-ST-1-PAK				
12674-11-2	500	C-216-ST-2	C-216-ST-2-PAK	37324-23-5	500	C-262-ST-2	C-262-ST-2-PAK				
Aroclor 1221	50	C-221-ST-1	C-221-ST-1-PAK	Aroclor 1268	50	C-268-ST-1	C-268-ST-1-PAK				
11104-28-2	500	C-221-ST-2	C-221-ST-2-PAK	11100-14-4	500	C-268-ST-2	C-268-ST-2-PAK				
Aroclor 1232	50	C-232-ST-1	C-232-ST-1-PAK								
11141-16-5	500	C-232-ST-2	C-232-ST-2-PAK								
Aroclor 1242	50	C-242-ST-1	C-242-ST-1-PAK								
53469-21-9	500	C-242-ST-2	C-242-ST-2-PAK								
Aroclor 1248	50	C-248-ST-1	C-248-ST-1-PAK								
12672-29-6	500	C-248-ST-2	C-248-ST-2-PAK								
Aroclor 1254	50	C-254-ST-1	C-254-ST-1-PAK								
11097-69-1	500	C-254-ST-2	C-254-ST-2-PAK								
Aroclor 1260	50	C-260-ST-1	C-260-ST-1-PAK								
11096-82-5	500	C-260-ST-2	C-260-ST-2-PAK								

Neats (Individuals)

Aroclor #	Cat. No.	Unit
Aroclor 1016	C-216N	100 mg
Aroclor 1221	C-221N-50MG	50 mg
Aroclor 1242	C-242N-50MG	50 mg
Aroclor 1248	C-248N-50MG	50 mg
Aroclor 1254	C-254N-50MG	50 mg
Aroclor 1260	C-260N-50MG	50 mg
Aroclor 1262	C-262N-50MG	50 mg

Aroclor-free Transformer Oil

T-W130 1 x 1 mL

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
5 x 1 mL

Ethylene glycol

ASTM D4294 Sulfur in Petroleum Products by ED-XRF Spectroscopy

see pages 270-271

ASTM D4377 Water in Crude oils by Potentiometric Karl Fischer Titration

see page 269

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	Std. 6	Std. 7	D-4420-94 D-4420-94-PAK At stated Vol. %	1 x 1 mL 5 x 1 mL 5 comps.
	Target Vol. %	Target Vol. %	Target Vol. %	Target Vol. %	Target Vol. %	Target Vol. %	Target Vol. %		
Benzene	0.05	0.10	0.25	0.75	1.25	2.50	5.00	Benzene	3.00
Toluene	0.5	1.00	2.50	5.00	10.00	15.00	25.00	Toluene	10.00
Total Xylenes (C ₈ aromatics)	5	10.00	15.00	20.00	25.00	1.00	3.00	Total Xylenes (C ₈ aromatics)	15.00
n-Butylbenzene (C ₉ + aromatics)	30.00	25.00	20.00	10.00	5.00	15.00	2.50	n-Butylbenzene (C ₉ + aromatics)	15.00
Isooctane	64.45	63.90	62.25	64.25	58.75	66.50	64.50	Isooctane	57.00

ASTM D4628 Barium, Calcium, Magnesium & Zinc in Unused Lubricating Oil

see page 370, 373

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

8 x 1 mL

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

Stock Nitrogen Solution

Low Boiling Solvents

D-4629-91-LB-CON 1 x 1 mL
D-4629-91-LB-CON-PAK 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

8 x 1 mL

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

Stock Nitrogen Solution

High Boiling Solvents

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

Nitrogen introduced using Carbazole

Nitrogen Calibration Set - Low Level

ASTM-P-0070-SET

Nitrogen introduced using Aniline

6 x 1 mL

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

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

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
<i>t</i> -Butanol	0.10	3.00	6.00	8.00	12.00
Methyl <i>t</i> -butyl ether (MtBE)	20.0	15.00	10.00	5.00	0.10
<i>t</i> -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

With Internal Standard

D-4815-IS-SET

D-4815-IS-SET-PAK

5 x 1 mL

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
<i>t</i> -Butanol	0.1 - 11.40	0.095	2.85	5.70	7.60	11.40
Methyl <i>t</i> -butyl ether (MtBE)	0.1 - 19.0	19.00	14.25	9.50	4.75	0.095
<i>t</i> -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

Oxygenate Internal Standard

M-GRO-IS-5ML

1 x 5 mL

M-GRO-IS-5ML-PAK

5 x 5 mL

1,2-Dimethoxyethane (neat)

Oxygenate Free Refinery Gasoline

Blank

RFA-BLNK-10ML

1 x 10 mL

RFA-BLNK-10ML-PAK

5 x 10 mL

RFA Gasoline (neat)

Quantitative Peak ID and Retention Time Mixture (Core Mix)

D-4815-RT

1 x 1 mL

D-4815-RT-PAK

5 x 1 mL

At stated Wt. %

16 comps.

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

Valve Timing Mixture

D-4815-VT

1 x 1 mL

D-4815-VT-PAK

5 x 1 mL

At stated Wt. %

5 comps.

Methylcyclopentane	10.00
Diisopropyl ether (DIPE)	10.00
Ethyl <i>tert</i> -butyl ether (EtBE)	10.00
Methyl <i>tert</i> -butyl ether (MtBE)	10.00
<i>n</i> -Hexane	60.00

ASTM D4927 Elemental Analysis of Lubricant and Additive Components - Ba, Ca, P, S, and Zn by WD-XRF Spectroscopy see page 370-374

ASTM D4928 Water in Crude Oils by Potentiometric Karl Fischer Titration see page 269

ASTM D4929 Organic Chloride Content in Crude Oil - Test Method B Combustion and Microcoulometry

Working Level Chlorine Standard

D-4929-94

1 x 5 mL

D-4929-94-PAK

5 x 5 mL

10 µg/mL in Isooctane

Chlorine

Stock Chlorine Standard

D-4929-94-100X

1 x 5 mL

D-4929-94-100X-PAK

5 x 5 mL

1000 µg/mL in Isooctane

Chlorine

Chlorine in Lube Oils

ASTM-P-0092-100ML-SET

7 x 100 mL

Each in 75 cSt Mineral oil

Cat. No.	Chlorine	Chlorine	Unit
	Wt. %	µg/g	
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 D4951 Additive Elements in Lubricating Oils by Inductively Coupled Plasma Atomic Emission Spectrometry see page 370-373

ASTM D5056 Trace Metals in Petroleum Coke by AA see pages 370

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

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

We have 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.

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			
g Pb/US gal	g Pb/ UK gal	µg Pb/mL	Cat. No.
0.0000	0.000	0.000	D-5059-C-01-100ML ▲ \$ 10
0.0010	0.001	0.264	D-5059-C-02-100ML ▲ 80
0.0050	0.006	1.321	D-5059-C-03-100ML ▲ 80
0.0100	0.012	2.642	D-5059-C-04-100ML ▲ 80
0.0500	0.060	13.209	D-5059-C-05-100ML ▲ 80
0.1000	0.120	26.417	D-5059-C-06-100ML ▲ 80
0.3000	0.360	79.252	D-5059-C-07-100ML ▲ 8

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.	1 mL
Alkylate Standard neat fraction approx. 30 comps. identified	D-5134-92-ALK	
Naphtha Standard neat fraction approx. 70 comps. identified	D-5134-92-NAP	
Reformate Standard neat fraction approx. 100 comps. identified	D-5134-92-REF	

Column Evaluation Mix

D-5134-92-CEM

1 x 1 mL

At stated Wt. %

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 D5185 Additive Elements, Wear Metals & Contaminants in Used Lubricating Oils by ICP-AES

see page 369

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

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% Wt. %

D-5186-96-DLC-25X

50% Wt. %

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 D5188 Vapor - Liquid Ratio Temperature Standards

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 Standards

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 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

Qualitative Paraffins Standard

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

<i>n</i> -Propane	3	<i>n</i> -Heptane	18
<i>n</i> -Butane	5	<i>n</i> -Octane	19
<i>n</i> -Pentane	18	<i>n</i> -Nonane	19
<i>n</i> -Hexane	18		

Internal Standard

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

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

Column Resolution Mix

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

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

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

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

MtBE Contaminant Standard

High Concentration

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

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

Qualitative Standard

D-5441-QUAL	1 x 1 mL
0.1 Wt.% each in <i>n</i> -Dodecane	33 comps.

Methanol	MtBE
Isobutylene	2,3-Dimethyl-1-butene
<i>n</i> -Butane	4-Methyl- <i>cis</i> -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 <i>n</i> -Dodecane	29 comps.

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

MtBE Resolution Test Mix

D-5441-RES	1 x 1 mL
D-5441-RES-PAK	5 x 1 mL
D-5441-RES-5ML	1 x 5 mL
D-5441-RES-5ML-PAK	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 D5442 Analysis of Petroleum Waxes by GC

Quantitative Wax Standard

D-5442			1 x 1 mL
D-5442-PAK			5 x 1 mL
<i>At stated Wt.% in Cyclohexane</i>			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			5 x 1 mL
<i>At stated Wt.% in Cyclohexane</i>			2 comps.
<i>n</i> -Eicosane			0.05
<i>n</i> -Tetracontane			0.05

Hydrocarbon Standard Brownfield Regulation

D-5442-R1			1 x 1 mL
<i>100 µg/mL each in Cyclohexane</i>			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			500 mg
<i>Equal Wt.%</i>			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			500 mg
<i>Equal Wt.%</i>			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 and Aromatic Hydrocarbon Type Analysis in Petroleum Distillates through 200°C by Multi-dimensional GC

Hydrocarbon Test Mixture

D-5443-93-HTM					1 x 1 mL
<i>At stated Wt.%</i>					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 D5453 Total Sulfur in Light Hydrocarbons, Motor Fuels and Oils by Ultraviolet Fluorescence

Low Level Sulfur Set

D-5453-LL-SET			5 x 2 mL
<i>At stated in Isooctane</i>			
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
<i>At stated in Isooctane</i>			
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
<i>At stated in Isooctane</i>			
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

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

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 1 mL	D-5501-12-02 1 mL	D-5501-12-03 1 mL	D-5501-12-04 1 mL	D-5501-12-05 1 mL
	LEVEL 1 Wt.%	LEVEL 2 Wt.%	LEVEL 3 Wt.%	LEVEL 4 Wt.%	LEVEL 5 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

ASTM D5580 Benzene, Toluene, Ethylbenzene, m/p-Xylene, o-Xylene, C9 & Heavier Aromatics & Total Aromatics in Finished Gasoline 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

5 x 1 mL

At stated Wt. %

6 comps.

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

Internal Standard

M-GRA-IS-AS-5ML

1 x 5 mL

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

5 x 5 mL

2-Hexanone (neat)

Selectivity Check Standard

M-GRA-SCS-AS

1 x 1 mL

M-GRA-SCS-AS-PAK

5 x 1 mL

At stated Wt. %

2 comps.

n-Dodecane	1.5
Isooctane	98.5

Without Internal Standard

M-GRA-VT-AS-10ML

1 x 10 mL

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

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

Daily Quality Control Standard

Without Internal Standard

D-5580-QC-R1-10ML

1 x 10 mL

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

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

Daily Quality Control Standard

Without Internal Standard

D-5580-QC-10ML

1 x 10 mL

D-5580-QC-10ML-PAK

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

ASTM D5599 Oxygenates in Gas by GC & O-FID

Oxygenates Calibration Curves With Internal Standard

M-GRO-CAL-IS-SET

M-GRO-CAL-IS-SET-PAK

8 x 1 mL
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 formulates the product components and gasoline and then adds 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 D5599 (Continued) Oxygenates in Gas by GC & O-FID

Daily QC Standard Without Internal Standard

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

Methanol	1	Diisopropyl ether	3
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	79

Daily QC Standard With Internal Standard

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

Methanol	1	Diisopropyl ether	3
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	79

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

Revised Daily QC Standard Without Internal Standard

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

Revised Daily QC Standard With Internal Standard

M-GRO-QC-R-IS-5ML 1 x 5 mL
M-GRO-QC-R-IS-5ML-PAK 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

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.

Gasoline Refinery Blank With Internal Standard

M-GRO-BLNK-IS-10ML 1 x 10 mL
M-GRO-BLNK-IS-10ML-PAK 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 5 x 5 mL

1,2-Dimethoxyethane (neat)

O-FID Gasoline Refinery Blank

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

RFA Gasoline (neat)

ASTM D5599 Oxygenates in Gas by GC & O-FID

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
<i>t</i> -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
<i>t</i> -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

5 x 10 mL

At stated Wt. %

5 comps.

Methanol	4.0	MtBE	12.0
Ethanol	8.0	RFA gasoline	71.0
<i>t</i> -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

5 x 5 mL

At stated Wt. %

6 comps.

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

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.

EPA O-FID Spiking Solution

M-GRO-EPA-SP-5ML

1 x 5 mL

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

5 x 5 mL

At stated Wt. %

4 comps.

Methanol	14.3	<i>t</i> -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

5 x 10 mL

RFA Gasoline (neat)

Internal Standard

M-GRO-IS-5ML

1 x 10 mL

M-GRO-IS-5ML-PAK

5 x 10 mL

1,2-Dimethoxyethane (neat)

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 & t-Butanol in Oxygenate free RFA gasoline	10.0 & 5.0	ASTM-P-0069-SET	3 x 10 mL

Technical Note

All oxygenate blends come with a certificate to maintain traceability links to NIST SRMs (when available). The 10 mL size eliminates the need for special packaging and hazardous material fees.

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

22 x 1 mL

Approx. 2.0 mg/mL each in Toluene

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

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 D5708 Nickel, Vanadium, & Iron in Crude Oils & Residual Fuels by ICP-AES

see page 371

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.	1 mL
Xylene Blank	D-5762-95-BL	
Nitrogen @ 1.0 µg/mL in Xylene	D-5762-95-1X	
Nitrogen @ 5.0 µg/mL in Xylene	D-5762-95-5X	
Nitrogen @ 10 µg/mL in Xylene	D-5762-95-10X	
Nitrogen @ 50 µg/mL in Xylene	D-5762-95-50X	
Nitrogen @ 100 µg/mL in Xylene	D-5762-95-100X	

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. (1 mL)
Benzene Blank	ASTM-P-0071-BL
Nitrogen @ 0.25 µg/g & Sulfur @ 0.25 µg/g in Benzene	ASTM-P-0071-01
Nitrogen @ 0.50 µg/g & Sulfur @ 0.50 µg/g in Benzene	ASTM-P-0071-02
Nitrogen @ 1.00 µg/g & Sulfur @ 1.00 µg/g in Benzene	ASTM-P-0071-03

Nitrogen Calibration Set - Low Level

ASTM-P-0070-SET

6 x 1 mL

Nitrogen introduced using Aniline

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

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.

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

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

Calibration Curve with No Internal Standard

Six Level Calibration Curve without Internal Standard

D-5769-CAL6-5ML-SET 6 x 5 mL
D-5769-CAL6-10ML-SET 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

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 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 comp. Deuterated Internal Std. Mix

M-GRA-IS-R-10ML 1 x 10 mL
M-GRA-IS-R-10ML-PAK 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

3 comp. Deuterated Internal Std. Mix

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

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

Five Level Calibration Curve Without Internal Standard

D-5769-CAL-5ML-SET 5 x 5 mL
(Std. 1 to Std 5)
D-5769-CAL-10ML-SET 5 x 10 mL
(Std. 1 to Std 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.

CD Provided

CALAMTS
Contains Calibration Amounts

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

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

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

M-GRA-IS

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

5 x 15 mL

D-5769-QC-IS-5ML

1 x 5 mL

D-5769-QC-IS-5ML-PAK

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

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

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

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

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

5 x 1 mL

3.0 Wt. % in Isooctane

Toluene

Five Level Calibration Curve With Internal Standard

D-5769-CAL-IS-SET

5 x 1 mL

(Std. 1 to Std 5)

Additional Calibration Level With Internal Standard

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.

CD Provided

CALAMTS
Contains Calibration Amounts

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

Includes Internal Standard

M-GRA-IS (3 comp.) combined with the Core Calibration Curve Mixes (24 comps.) above in a 5 to 100 weight ratio to formulate these calibration solutions (27 comp).

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

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.	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

M-GRA-IS-R

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

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

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 Internal Standard

D-5769-CAL-IS-R-SET

5 x 1 mL

(Std. 1 to Std 5)

Additional Calibration Level With Internal Standard

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.

CD Provided

CALAMTS
Contains Calibration Amounts

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

M-GRA-IS-R Internal Standard (4 comp.) is combined with the Core Calibration Curve Mixes (24 comp.) above in a 12 to 100 weight ratio to formulate these Calibration Solutions (28 comps.)

Sensitivity Test Solution

M-GRA-ST

1 x 1 mL

M-GRA-ST-PAK

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

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

5 x 1 mL

3.0 Wt. % in Isooctane

1,2,3-Trimethylbenzene

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

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	

M-GRA-IS (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

1 x 1 mL

Core Calibr. Mix 24 Comps.	Optional Std. 6 Target Vol. %
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

M-GRA-IS (Internal Standard)

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

CD Provided

CALAMTS

Contains Calibration Amounts

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

Daily Quality Control Standard

Without Internal Standard

M-GRA-QC-10ML

1 x 10 mL

M-GRA-QC-10ML-PAK

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		

Daily Quality Control Standard

With Internal Standard

M-GRA-QC-IS-5ML

1 x 5 mL

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

5 x 5 mL

At stated Wt. %

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

Includes M-GRA-IS (3 comp. Internal Standards mix) combined with the above 13 comp. Core Mix in a 5 to 100 weight ratio.

ASTM/EPA Sensitivity Test Solution

M-GRA-ST

1 x 1 mL

M-GRA-ST-PAK

5 x 1 mL

100 µg/mL in Isooctane

1,4-Diethylbenzene

3 Comp. Deuterated Internal Std. Mix

M-GRA-IS-5ML

1 x 5 mL

M-GRA-IS-5ML-PAK

5 x 5 mL

At stated Wt. %

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

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

Calibration Curve with 4 Component Deuterated Internal Standard Added

Aromatics Calibration Standards Kit

With Internal Standard

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

5 x 1 mL

Core Calibration Mix 24 comps.	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
M-GRA-IS-R (Internal Standard)			At stated Wt. %		
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	2.48
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) At stated Wt. %	
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.

M-GRA-IS-R Internal Standard Mix (4 comps.) is combined with the Core Calibration Curve Mixes (25 comps.) in a 12 to 100 weight ratio to formulate a complete calibration solution containing 29 components.

Daily Quality Control Standard

Without Internal Standard

M-GRA-QC-10ML

1 x 10 mL

M-GRA-QC-10ML-PAK

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		

Daily Quality Control Standard

With Internal Standard

M-GRA-QC-IS-R-5ML

1 x 5 mL

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

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

Deuterated Internal Standard Mix

M-GRA-IS-R-10ML

1 x 10 mL

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

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

Includes Internal Standard

M-GRA-IS-R (4 comp.) combined with the above Core Mix (13 comps.) in a 12 to 100 weight ratio.

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-QC-R-IS-R-5ML	1 x 5 mL
M-GRA-IS-R-10ML	1 x 10 mL
M-GRA-ST	1 x 1 mL

ASTM/EPA Sensitivity Test Solution

M-GRA-ST

1 x 1 mL

M-GRA-ST-PAK

5 x 1 mL

100 µg/mL in Isooctane

1,4-Diethylbenzene

ASTM D5769 Benzene, Toluene & Total Aromatics in Finished Gasoline by GC/MS

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			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			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			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			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 Standards

Deuterated Internal Standard

ASTM-P-0140-IS			1 x 10 mL
ASTM-P-0140-IS-PAK			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			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			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			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

Use this Cross-reference Table to match other Methods for known Petrochemical analysis.

ANALYSIS	ASTM	IP	ISO	DIN	JIS	AFNOR
Tag Flash Point	D56			51411	K 2580	M07-003
Distillation	D86	123	3405	51751	K 2254	M07-002
COC Flash Point	D92	36	2592	51376	K 2265	T60-118
PMCC Flash Point	D93	34	2719	51758	K 2265	M07-019
Kinematic Viscosity	D445	71-1	3104	51562	K 2283	T60-100
Aniline Point	D611	2	2977	51775		M07-021
Hydrocarbon Types by FID	D1319	156	3837	51791	K 2536	M07-024
Water (Karl Fischer)	D1744		6296			T60-154
Freezing Point	D2386	16	3013	51421	K 2276	M07-048
Cloud Point	D2500	219	3015	51597	K 2269	T60-105
Sulfur by XRF	D2622			51400T6	K 2541	
Boiling Range By GC	D2887		3924			
Sulfur by Oxidative Microcoulometry	D3120		16591			
Lead by AAS	D3237	428				
Sulfur by Oxidative Microcoulometry	D3246	373				M07-052
Metals by AA	D3605	413	8691	51790T3		
Benzene by GC	D3606	425				
Sulfur by ED-XRF	D4294	336	8754			M07-053
Water (Karl Fischer)	D4377	356	10336			
Metals by AA	D4628	308		51391T1		
Nitrogen by Chemiluminescence Detection	D4629	379				M07-058
Metals by WD-XRF	D4927	407		51391T2		
Water (Karl Fischer)	D4928	386	10337			
Lead in Gas By X-Ray	D5059	228				
Vapor Pressure	D5191	394				M07-079
Oxygenates	D5599	408				
Cloud Point	D5771	444				
Cloud Point	D5772	445				
Cloud Point	D5773	446				
Freezing Point	D5901	434				
Auto-Freeze Point	D5972	435				
Hydrocarbons Automatic	D6379	436				
Hydrocarbons Automatic	D6591	391				
Metals			14597			

This is a partial list of Standards available for ASTM Methods.

Tables Generated from

- (a) R.A. Nadkarni, "Guide to ASTM Test Methods for the Analysis of Petroleum Products and Lubricants," Manual 44 (200), ASTM West Conshohocken, PA
 (b) Annual Book of ASTM Standards 2000, Volumes 05.01 to 05.05

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ASTM D5836 Determination of Diisocyanates (1,2-PP Method)

Underivatized Diisocyanates

Compound	Unit	Cat. No.
2,4-Toluene diisocyanate	100 mg	D-5836-01N
2,6-Toluene diisocyanate	100 mg	D-5836-02N
Hexamethylene diisocyanate	100 mg	D-5836-03N
4,4'-Methylenebis(phenyl isocyanate)	100 mg	D-5836-04N

Diisocyanate Storage - Refrig 0-5° C

Diisocyanate Set

D-5836-SET			9 x 1 mL
D-5836-01N	D-5836-04N	D-5836-03-DER	
D-5836-02N	D-5836-01-DER	D-5836-04-DER	
D-5836-03N	D-5836-02-DER	D-5836-03-ML-VAP	

Derivatized Diisocyanates (Weight Compensated to 1000 µg/mL of each Diisocyanate)

Compound	Cat. No.	1 mL
N,N'-(4-Methyl-1,3-phenylene)bis[4-(2-pyridinyl)-1-piperazinecarboxamide] 72375-21-4 (2,4-TDIP)	D-5836-01-DER	2840 µg/mL in DMSO
N,N'-(2-Methyl-1,3-phenylene)bis[4-(2-pyridinyl)-1-piperazinecarboxamide] (2,6-TDIP)	D-5836-02-DER	2840 µg/mL in DMSO
N,N'-1,6-Hexanediybis[4-(2-pyridinyl)-1-piperazinecarboxamide] 72375-27-0 (1,6-HDIP)	D-5836-03-DER	2900 µg/mL in DMSO
N,N'-(Methylenediphenylene)bis[4-(2-pyridinyl)-1-piperazinecarboxamide] 72375-24-7 (4,4'-MDIP)	D-5836-04-DER	2280 µg/mL in DMSO

Derivatizing Agents

1-(2-Pyridyl)piperazine 34803-66-2	D-5836-03-ML-VAP	2 mg/mL in CH ₂ Cl ₂	4 x 5 mL
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Individual Derivatized Diisocyanates

N,N'-(4-Methyl-1,3-phenylene)bis[4-(2-pyridinyl)-1-piperazinecarboxamide] 72375-21-4 (2,4-TDIP)	D-5836-01A-DER	1000 µg/mL in DMSO
N,N'-(2-Methyl-1,3-phenylene)bis[4-(2-pyridinyl)-1-piperazinecarboxamide] (2,6-TDIP)	D-5836-02A-DER	1000 µg/mL in DMSO
N,N'-1,6-Hexanediybis[4-(2-pyridinyl)-1-piperazinecarboxamide] 72375-27-0 (1,6-HDIP)	D-5836-03A-DER	1000 µg/mL in DMSO
N,N'-(Methylenediphenylene)bis[4-(2-pyridinyl)-1-piperazinecarboxamide] 72375-24-7 (4,4'-MDIP)	D-5836-04A-DER	1000 µg/mL in DMSO

ASTM D5837 Furanic Compounds in Electrical Insulating Liquids by High-Performance Liquid Chromatography (HPLC)

Furanic Compound Extraction Standard

D-5837-01 1 x 1 mL
1000 µg/mL each in Acetonitrile

2-Acetylfuran
2-Furaldehyde
Furfuryl alcohol
5-(Hydroxymethyl)-2-furaldehyde
5-Methylfurfural

Furanic Compound Calibration Standard

D-5837-02 1 x 1 mL
1000 µg/mL each in Toluene

2-Acetylfuran
2-Furaldehyde
Furfuryl alcohol
5-(Hydroxymethyl)-2-furaldehyde
5-Methylfurfural

ASTM D5863 Ni, V, Fe, & Na in Crude Oils & Residual Fuels by Flame AA Spectrometry

see page 371

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 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 D6160 Polychlorinated Biphenyls (PCBs in Waste Materials by GC)

Aroclor Standards

Aroclor #	35 µg/mL in Isooctane		35 µg/mL in MeOH		1000 µg/mL in Hexane	
	Cat. No.	1 mL	Cat. No.	1 mL	Cat. No.	1 mL
Aroclor 1016	C-216S		C-216S-M		C-216S-H-10X	
Aroclor 1221	C-221S		C-221S-M		C-221S-H-10X	
Aroclor 1232	C-232S		C-232S-M		C-232S-H-10X	
Aroclor 1242	C-242S		C-242S-M		C-242S-H-10X	
Aroclor 1248	C-248S		C-248S-M		C-248S-H-10X	
Aroclor 1254	C-254S		C-254S-M		C-254S-H-10X	
Aroclor 1260	C-260S		C-260S-M		C-260S-H-10X	
Aroclor 1262	C-262S		C-262S-M		C-262S-H-10X	
Aroclor 1268	C-268S		C-268S-M		C-268S-H-10X	

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 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

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
Isooctane	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

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

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

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

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	5 x 1 mL
At stated Wt. %	10 comps.

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

Isooctane Blank Compensation Std.

D-6296-BL	1 x 5 mL
Isooctane (neat)	

Calibration Standard with EtBE

D-6296-CAL2	1 x 1 mL
D-6296-CAL2-PAK	5 x 1 mL
At stated Wt. %	11 comps.

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

ASTM D6304 Determination of Water in Petroleum Products Lubricating oil and additives by Coulometric Karl Fischer Titration

see page 269

ASTM D6334 Sulfur in Gasoline by Wavelength Dispersive X-Ray Fluorescence

see pages 270-271

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 850®

ASTM-P-0137N-2G	2 grams
Polywax 850	

Polywax 655®

ASTM-P-0053N-2G	2 grams
Polywax 655	

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	5 x 1 mL
500 µg/mL each in Chloroform	35 comps.

<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> -Tritriacontane
<i>n</i> -Octadecane	<i>n</i> -Tetracontane
Pristane	<i>n</i> -Pentatriacontane
<i>n</i> -Nonadecane	<i>n</i> -Hexatriacontane
Phytane	<i>n</i> -Heptatriacontane
<i>n</i> -Eicosane	<i>n</i> -Octatriacontane
<i>n</i> -Heneicosane	<i>n</i> -Nonatriacontane
<i>n</i> -Docosane	<i>n</i> -Tetracontane
<i>n</i> -Tricosane	

Calibration Mix

DRH-002N	100 mg
DRH-002N-10X	1 gm
At stated Wt. %	17 comps.

<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> -Tetracontane	1
<i>n</i> -Hexadecane	10		

Column Test Mixture

D-2887	1 x 1 mL
10 mg/mL in <i>n</i> -Octane	2 comps.
<i>n</i> -Hexadecane	<i>n</i> -Octadecane

ASTM D6378 Vapor Pressure (VPx) of Petroleum Products, Hydrocarbons and Hydrocarbon-Oxygenate Mixtures (Triple Expansion Method)

see page 281

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 5 x 1 mL
 At stated conc. (mg/mL) in *n*-Heptane 3 comps.

Cyclohexane	10
<i>o</i> -Xylene	0.5
1-Methyl naphthalene	0.05

D-6379-SRS-R1 1 x 1 mL
 D-6379-SRS-R1-PAK 5 x 1 mL
 At stated conc. (mg/mL) in *n*-Heptane 3 comps.

Cyclohexane	10
<i>o</i> -Xylene	5
1-Methyl naphthalene	0.5

Calibration Curves (Alternative Conc.)

D-6379-SET 4 x 1 mL
 D-6379-SET-PAK 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-Methyl naphthalene	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)
 At stated conc. (mg/mL) in *n*-Heptane

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

ASTM D6417 Estimation of Engine Oil Volatility by Capillary GC

see page 300

ASTM D6428 Sulfur by Combustion and Electrochemical Detection

D-6428-R1-100ML-SET 7 x 100 mL

D-6428-R1-SET 7 x 1 mL

Each in Isooctane

	D-6428-R1-100ML-SET 100 mL	D-6428-R1-SET 1 mL
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 6 x 100 mL

D-6428-R2-SET 6 x 1 mL

Each in Isooctane

	D-6428-R2-100ML-SET 100 mL	D-6428-R2-SET 1 mL
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

Sulfur introduced using di-*n*-butyl sulfide

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.

ASTM D6443 Ca, Cl, Cu, Mg, P, S, Zn in Unused Lubricating Oils & Additives by Wave-length Dispersive X-ray Fluorescence & Spectrometry

see pages 370-374

ASTM D6445 Sulfur in Gasoline by ED - XRF

see pages 270-271

ASTM D6481 P, S, Ca and Zn in Lube Oils by ED-XRF

see pages 370-374

ASTM D6550 Olefin Content of Gasolines by SFC

Stock Olefin Calibration Standard

D-6550-CONC 1 x 1 mL
 D-6550-CONC-5ML 1 x 5 mL
 At stated Wt. % 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 D6584 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

ASTM D6584 Mixture

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.

Mix of above compounds, on right (MSTFA separate)

Biofuel 20	0.5 mg/mL	CH ₂ Cl ₂	BF-FU-030-D	2 mL
	20 mg/mL	CH ₂ Cl ₂	BF-FU-030-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
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-032-D-40X	2 mL

EN 14105 Free and Total Glycerin in Biodiesel by GC

EN 14105 Biofuel Glyceride Solution I

EN-14105-01 1 x 1 mL
At stated conc. (µg/mL) in Pyridine
6 comps.

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

EN 14105 Biofuel Glyceride Solution II

EN-14105-02 1 x 1 mL
At stated conc. (µg/mL) in Pyridine
6 comps.

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

EN 14105 Biofuel Glyceride Solution III

EN-14105-03 1 x 1 mL
At stated conc. (µg/mL) in Pyridine
6 comps.

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

EN 14105 Biofuel Glyceride Solution IV

EN-14105-04 1 x 1 mL
At stated conc. (µg/mL) in Pyridine
6 comps.

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

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 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 D6751 & ASTM D5453 Sulfur as Di-n-butyl sulfide in Biodiesel

Sulfur in Biodiesel 5%

ppm (µg/g)	% Wt.	Cat. No.	100 mL
0	0	BF-5453-B5-BL	
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	
50	0.005	BF-5453-B5-50X	
75	0.0075	BF-5453-B5-75X	
100	0.01	BF-5453-B5-100X	
200	0.02	BF-5453-B5-200X	
500	0.05	BF-5453-B5-500X	

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 should be purchased with the standard.

Technical Note

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

ASTM D6751 & ASTM D5453 Sulfur as Di-n-butyl sulfide in Biodiesel (continued)

Sulfur in Biodiesel 20%

ppm (µg/g)	% Wt.	Cat. No.	100 mL
0	0	BF-5453-B20-BL	
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	
50	0.005	BF-5453-B20-50X	
75	0.0075	BF-5453-B20-75X	
100	0.01	BF-5453-B20-100X	
200	0.02	BF-5453-B20-200X	
500	0.05	BF-5453-B20-500X	

Sulfur in Biodiesel 100%

ppm (µg/g)	% Wt.	Cat. No.	100 mL
0	0	BF-5453-B100-BL	
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	
50	0.005	BF-5453-B100-50X	
75	0.0075	BF-5453-B100-75X	
100	0.01	BF-5453-B100-100X	
200	0.02	BF-5453-B100-200X	
500	0.05	BF-5453-B100-500X	

Note: 10,000 ppm = 1% Wt.

ASTM D7096 Gasoline Boiling Range Distribution by GC

D-7096-SET

D-7096-01

At stated conc. Wt. %

		1 x 1 mL 17 comps.
2-Methylbutane	2.5	n-Propylbenzene 6.5
n-Pentane	3	n-Decane 4.5
2-Methylpentane	4	n-Butylbenzene 6
n-Hexane	3	n-Dodecane 3.5
2,4-Dimethylpentane	5.5	n-Tridecane 4.5
n-Heptane	7.5	n-Tetradecane 3
Toluene	15.5	n-Pentadecane 5
n-Octane	7	n-Hexadecane 3
p-Xylene	16	

D-7096-02

100 µg/mL in Isooctane:Ethanol (97:3)

n-Propane	n-Butane
2-Methylpropane	

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

1 x 1 mL
3 comps.

ASTM D7576 Total Aromatics in Denatured Ethanol

D-7576-SET

5 x 1 mL

At stated Wt. %

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.

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 % Wt.	B100	BF-D-4951-B100	100 g
ASTM D6304 / EN ISO 12937 (KF) Water Content				
	60 µg/g *		BF-KF-0.6X-5ML-VAP	10 x 5 mL
	100 µg/g *		BF-KF-1X-5ML-VAP	10 x 5 mL
	1000 µg/g *		BF-KF-10X-5ML-VAP	10 x 5 mL
	5000 µg/g *		BF-KF-50X-5ML-VAP	10 x 5 mL
ASTM D6751 / UOP 391 / EN 14108 / EN 14109				
Sodium / Potassium	100 ppm *	B100	BF-UOP-391-B100	100 g
EN 14538				
Calcium / Magnesium	100 ppm *	B100	BF-14538-B100	100 g

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

ASTM D7751 Additive Elements in Lubricating Oil by ED-XRF

see pages 373

UOP Standards

UOP (Universal Oil Products) methods were developed to facilitate the refining industry in analyzing refinery feeds, products and process streams for composition, purity and physical and chemical properties.

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.

<i>n</i> -Dodecane	70	Toluene	30
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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.

<i>n</i> -Hexane	<i>o</i> -Xylene
Benzene	<i>m</i> -Xylene
Toluene	<i>p</i> -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
1000 ppm 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.

<i>o</i> -Xylene	0.1	<i>n</i> -Undecane	1.0
<i>m</i> -Xylene	0.1	<i>p</i> -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.

<i>n</i> -Heptane	25	<i>o</i> -Xylene	6.6
Benzene	15	<i>p</i> -Xylene	6.7
Toluene	20	<i>o</i> -Ethyltoluene	10
<i>m</i> -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	<i>n</i> -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.

<i>n</i> -Butylcyclohexane	500
<i>n</i> -Propylcyclohexane	400
<i>n</i> -Decane	500
<i>n</i> -Nonane	500
<i>n</i> -Octane	300
<i>n</i> -Hexane	100
Ethylcyclohexane	300
Cyclohexane	100
<i>n</i> -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	<i>n</i> -Undecane	2.0
Toluene	2.0	<i>n</i> -Heptane	92.0
<i>o</i> -Ethyltoluene	2.0		

Miscellaneous Petroleum

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
4,4-Dimethyloxazolidine	51200-87-4	FRACK-008N-10MG	10 mg
2-Bromo-2-nitropropane-1,3-diol	52-51-7	FRACK-009N-25MG	25 mg
Peracetic acid	79-21-0	FRACK-010N	100 mg
N-Bromosuccinimide	128-08-5	FRACK-011N	100 mg
		FRACK-SET	11 units

Skinner List for Refinery Waste

Semi-Volatiles

Base/Neutral Extractables

M-005B	1 x 1 mL
M-005B-PAK	5 x 1 mL
0.2 mg/mL each in CH ₂ Cl ₂	
M-005B-10X	1 x 1 mL
M-005B-10X-PAK	5 x 1 mL
2.0 mg/mL each in CH ₂ Cl ₂	
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	1 x 1 mL
M-005A-PAK	5 x 1 mL
0.2 mg/mL each in CH ₂ Cl ₂	
M-005A-10X	1 x 1 mL
M-005A-10X-PAK	5 x 1 mL
2.0 mg/mL each in CH ₂ Cl ₂	
<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	1 x 1 mL
M-005V-PAK	5 x 1 mL
0.2 mg/mL each in MeOH	
M-005V-10X	1 x 1 mL
M-005V-10X-PAK	5 x 1 mL
2.0 mg/mL each in MeOH	
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

Resolution Check for Fire Debris Analysis

ASTM E1387 Resolution Check Mix

ASTM-E1387	1 x 1 mL
ASTM-E1387-PAK	5 x 1 mL
2.0 mg/mL each in CH ₂ Cl ₂	
Decane	Hexadecane
Dodecane	Hexane
Eicosane	Octadecane
2-Ethyltoluene	Octane
3-Ethyltoluene	
	Tetradecane
	Toluene
	1,2,4-Trimethylbenzene
	<i>p</i> -Xylene

ASTM E1618 Test Mix for Fire Debris Analysis

ASTM-E1618	1 x 1 mL
ASTM-E1618-PAK	5 x 1 mL
0.05 Vol.% each in CH ₂ Cl ₂	
<i>n</i> -Decane	<i>n</i> -Hexadecane
<i>n</i> -Dodecane	<i>n</i> -Hexane
<i>n</i> -Eicosane	<i>n</i> -Octadecane
<i>o</i> -Ethyltoluene	<i>n</i> -Octane
<i>m</i> -Ethyltoluene	
	<i>n</i> -Tetradecane
	Toluene
	1,2,4-Trimethylbenzene
	<i>p</i> -Xylene

Biofuel Standards

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 that are used to produce these fuels include plant oils, ethyl alcohol (usually from corn) and vegetable waste products.

Product Highlights:

- Physical properties such as viscosity and flash point
- Chemical classes such as Glycerins, FAMES and the Hydrocarbon fraction
- All products are derived from ASTM, EN and IP Standard Methods
- New standard methods include, EN15779, EN12916, IP391/07 and IP585

Refinery and Consumer Grade Biofuels

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

ASTM D6584 / EN14105 Free and Total Glycerin in Biodiesel by GC

Compound	Qty. / 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

ASTM D6584 Mixture

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

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

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

Mix of above compounds, on right (MSTFA separate)

Solution I

EN-14105-01 1 mL
At stated conc. (µg/mL) in Pyridine
6 comps.

(s)-(-)-1,2,4-Butanetriol	80
Monoolein	250
Diolein	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
Diolein	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
Diolein	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
Diolein	500
Triolein	400
Glycerol	50
Tricaprin	800

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

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

Beef Tallow and 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

Percent Methanol Calibration Standard Set (EN14110)

BF-MEOH-SET		5 x 1 mL	
At stated conc. (µg/g)			
BF-MEOH-1X	100	BF-MEOH-25X	2500
BF-MEOH-5X	500	BF-MEOH-50X	5000
BF-MEOH-10X	1000		
Methanol in water			

Technical Note

Individual mixes packaged under nitrogen for stability.

IP585 Fatty Acid Methyl Esters (FAMES) in Aviation Turbine Fuel

FAME in Aviation Turbine Fuel

IP-585-BCS	1 mL
1000 µg/g each in <i>n</i> -Dodecane	6 comps.
Methyl palmitate	
Methyl heptadecanoate	
Methyl stearate	
Methyl oleate	
Methyl linoleate	
Methyl linolenate	

Internal Standard

IP-585-BCS-IS	1 mL
1000 µg/g in <i>n</i> -Dodecane	
Methyl heptadecanoate-d ₃₃	

EN15779 Polyunsaturated Fatty Acid Methyl Esters (PUFAMES)

PUFAMES

EN-15779	1 mL
250 mg/mL in Heptane	4 comps.
Methyl docosahexaenoate	
Methyl <i>cis</i> -7,10,13,16,19-docosapentaenoate	
Methyl arachidonate	
Eicosapentaenoic acid	

Internal Standard

EN-15779-IS	1 mL
1.0 mg/mL in Heptane	4 comps.
Methyl tricosanoate	

Biofuel Standards

Fatty Acid Ethyl Esters (FAEEs)

Ethyl Esters in Soy & Corn

BF-SOY-EE	100 mg
At stated Wt. %	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	100 mg
At stated Wt. %	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	100 mg
At stated Wt. %	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	100 mg
At stated Wt. %	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

FAEEs Compounds

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

EN15721 Ethanol Impurities

Ethanol Impurities

Solution A

EN-15721-A 1 mL
At stated conc. (1 Wt.% each in Ethanol) 10 comps.

Methanol	sec-Butanol
Acetaldehyde	n-Butanol
3-Methyl-1-butanol	n-Propanol
2-Methyl-1-butanol	Ethyl acetate
2-Methyl-1-propanol	Acetal

Internal Standard

Solution A

EN-15721-A-IS 1 mL
At stated conc. (1 Wt.% in Ethanol)

3-Propanol

EN15721 Solution A Set

EN-15721-A-SET 2 x 1 mL

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

IP391/07 Aromatic Hydrocarbon / FAME Test Method for Diesel and Petro / Biodiesel

IP-391-07-01 5 mL
At stated conc. (µg/mL) in n-Heptane 7 comps.

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

IP-391-07-02 5 mL
At stated conc. (µg/mL) in n-Heptane 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

EN12916 Hydrocarbons in Biofuel

EN-12916-SET 4 x 1 mL
At stated conc. (mg/mL) in Heptane 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

Biofuel Standards

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	10 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 / EN14108 / EN14109				
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.

ASTM D6751 & ASTM D5453 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

Note: 10,000 ppm = 1% Wt.

Biofuel Blank

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

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.

EN14214 Wear Metals

Each is 100 grams at 500 µg/g concentration.

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

Biofuel Metals Mix

Multi-Element Biofuel Standard		100 g
BF-WM-B100-MIX		5 comps.
200 µg/g each in B100		
Calcium (Ca)	Sodium (Na)	
Potassium (K)	Phosphorus (P)	
Magnesium (Mg)		

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.	1 mL	Compound	Conc.	Matrix	Cat. No.	1 mL
5-alpha Androstane 438-22-2	1 mg/mL	CH ₂ Cl ₂	GRH-IS		Gasoline Regular, unleaded	0.5 mg/mL	MeOH	GA-001	
	10 mg/mL	CH ₂ Cl ₂	GRH-IS-10X			5 mg/mL	MeOH	GA-001-10X	
Aviation (gas) (grade 100-LL)	0.5 mg/mL	MeOH	GA-004		20 mg/mL	MeOH	GA-001-40X		
	20 mg/mL	MeOH	GA-004-40X		20 mg/mL	CH ₂ Cl ₂	GA-001-D-40X		
	20 mg/mL	CH ₂ Cl ₂	GA-004-D-40X		Gasoline Premium	0.5 mg/mL	MeOH	GA-003	
Biodiesel 20	0.5 mg/mL	CH ₂ Cl ₂	FU-030-D		20 mg/mL	MeOH	GA-003-40X		
	20 mg/mL	CH ₂ Cl ₂	FU-030-D-40X		20 mg/mL	CH ₂ Cl ₂	GA-003-D-40X		
Biodiesel 100	0.5 mg/mL	CH ₂ Cl ₂	FU-029-D		Hydraulic Fluid 64742-54-7	0.5 mg/mL	Hexane	FU-020-H	
	20 mg/mL	CH ₂ Cl ₂	FU-029-D-40X			20 mg/mL	Hexane	FU-020-H-40X	
Biodiesel 100 (refinery grade)	0.5 mg/mL	CH ₂ Cl ₂	FU-032-D		20 mg/mL	CH ₂ Cl ₂	FU-020-D-40X		
	20 mg/mL	CH ₂ Cl ₂	FU-032-D-40X		Jet Reference Fuel Type I	0.5 mg/mL	MeOH	FU-011	
p-Bromofluorobenzene 460-00-4	2.5 mg/mL	Acetone	GARH-SS		20 mg/mL	MeOH	FU-011-40X		
1-Chloro-4-fluorobenzene 352-33-0	2 mg/mL	MeOH	AK-101-IS-10X		20 mg/mL	CH ₂ Cl ₂	FU-011-D-40X		
1-Chlorooctadecane 3386-33-2	1 mg/mL	Hexane	DRH-007-SS		JP-4 Jet Fuel 50815-00-4	0.5 mg/mL	MeOH	FU-010	
1-Chloro-4-fluorobenzene 352-33-0	1 mg/mL	CH ₂ Cl ₂	GARH-IS		20 mg/mL	MeOH	FU-010-40X		
					20 mg/mL	CH ₂ Cl ₂	FU-010-D-40X		
2,5-Dibromotoluene 615-59-8	50 µg/mL	MeOH	GRH-004-SS		JP-5 Fuel	0.5 mg/mL	MeOH	FU-012	
	500 µg/mL	MeOH	GRH-004-SS-10X			20 mg/mL	MeOH	FU-012-40X	
	5 mg/mL	MeOH	GRH-004-SS-100X			20 mg/mL	CH ₂ Cl ₂	FU-012-D-40X	
Diesel	0.5 mg/mL	MeOH	FU-009		JP-7 Fuel	0.5 mg/mL	MeOH	FU-014	
	5 mg/mL	CH ₂ Cl ₂	FU-009-D-10X		20 mg/mL	MeOH	FU-014-40X		
	20 mg/mL	MeOH	FU-009-40X		20 mg/mL	CH ₂ Cl ₂	FU-014-D-40X		
	20 mg/mL	CH ₂ Cl ₂	FU-009-D-40X		JP-8 Fuel	0.5 mg/mL	MeOH	FU-015	
#1 Diesel - Low Sulfur	0.5 mg/mL	MeOH	FU-013		20 mg/mL	MeOH	FU-015-40X		
	20 mg/mL	MeOH	FU-013-40X		20 mg/mL	CH ₂ Cl ₂	FU-015-D-40X		
	20 mg/mL	CH ₂ Cl ₂	FU-013-D-40X		JP-TS Aviation Fuel 64742-47-8	0.5 mg/mL	MeOH	FU-016	
#2 Diesel 68334-30-5	50 mg/mL	Acetone	DRO-AK-102-LCS-10X-R1		20 mg/mL	MeOH	FU-016-40X		
#2 Diesel (Extra Low Sulfur) 68476-43-6	0.5 mg/mL	MeOH	FU-017		20 mg/mL	CH ₂ Cl ₂	FU-016-D-40X		
	5 mg/mL	CH ₂ Cl ₂	FU-017-D-10X		JP-10 Aviation Fuel	0.5 mg/mL	MeOH	FU-022	
	5 mg/mL	Acetone	DRO-AK-102-LCS		20 mg/mL	MeOH	FU-022-40X		
	50 mg/mL	Acetone	DRO-AK-102-LCS-10X		20 mg/mL	CH ₂ Cl ₂	FU-022-D-40X		
	20 mg/mL	MeOH	FU-017-40X		Kerosene 25% Weathered	5 mg/mL	CH ₂ Cl ₂	FK-W25-10X	
#2 Diesel (Low Sulfur) 25% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W25-10X		Kerosene 50% Weathered	5 mg/mL	CH ₂ Cl ₂	FK-W50-10X	
#2 Diesel (Low Sulfur) 50% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W50-10X		Kerosene 75% Weathered	5 mg/mL	CH ₂ Cl ₂	FK-W75-10X	
#2 Diesel (Low Sulfur) 75% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W75-10X		Kerosene 8008-20-6	0.5 mg/mL	MeOH	FU-005	
#2 Diesel 25% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W25-R1-10X		20 mg/mL	MeOH	FU-005-40X		
#2 Diesel 50% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W50-R1-10X		5 mg/mL	CH ₂ Cl ₂	FU-005-D-10X		
#2 Diesel 75% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W75-R1-10X		20 mg/mL	CH ₂ Cl ₂	FU-005-D-40X		
Docosane 629-97-0	20 Wt. %	Toluene	D-5186-91-PM-0.4X		Lacquer Thinner	1 gram	Neat	HS-001N	
n-Dodecane 112-40-3	5 mg/mL	MeOH	AS-E0238			0.5 mg/mL	MeOH	HS-001S	
	1.5 Wt. %	Isocetane	M-GRA-SCS-AS			20 mg/mL	MeOH	HS-001S-40X	
#1 Fuel oil 70892-10-3	0.5 mg/mL	MeOH	FU-001			20 mg/mL	CH ₂ Cl ₂	HS-001S-D-40X	
	20 mg/mL	MeOH	FU-001-40X		Mineral Spirits 8030-30-6	1 gram	Neat	HS-002N	
	20 mg/mL	CH ₂ Cl ₂	FU-001-D-40X		0.5 mg/mL	MeOH	HS-002S		
#2 Fuel oil 68476-30-2	0.5 mg/mL	MeOH	FU-002		20 mg/mL	MeOH	HS-002S-40X		
	20 mg/mL	MeOH	FU-002-40X		20 mg/mL	CH ₂ Cl ₂	HS-002S-D-40X		
	20 mg/mL	CH ₂ Cl ₂	FU-002-D-40X		Naphtha 64742-89-8	1 gram	Neat	HS-003N	
#3 Fuel oil	0.5 mg/mL	Hexane	FU-003		0.5 mg/mL	MeOH	HS-003S		
	20 mg/mL	Hexane	FU-003-40X		20 mg/mL	MeOH	HS-003S-40X		
	20 mg/mL	CH ₂ Cl ₂	FU-003-D-40X		20 mg/mL	CH ₂ Cl ₂	HS-003S-D-40X		
#4 Fuel oil 68476-31-3	0.5 mg/mL	Hexane	FU-004		Nonatriacontane 7194-86-7	750 µg/mL	Chloroform	DRH-FL-SS-R1	
	20 mg/mL	Hexane	FU-004-40X		1 mg/mL	CS ₂	DRH-FL-SS		
	20 mg/mL	CH ₂ Cl ₂	FU-004-D-40X		3 mg/mL	CS ₂	DRH-FL-SS-3X		
#6 Fuel oil 68553-00-4	0.5 mg/mL	Hexane	FU-008		n-Pentadecane 629-62-9	5 mg/mL	MeOH	AS-E0241	
	20 mg/mL	Hexane	FU-008-40X		RFA Gasoline (oxygenate-free)	0.5 mg/mL	MeOH	GA-005	
	20 mg/mL	CH ₂ Cl ₂	FU-008-D-40X		20 mg/mL	MeOH	GA-005-40X		
					20 mg/mL	CH ₂ Cl ₂	GA-005-D-40X		
					Regular Leaded Gasoline	0.5 mg/mL	MeOH	GA-002	
					20 mg/mL	MeOH	GA-002-40X		
					20 mg/mL	CH ₂ Cl ₂	GA-002-D-40X		

Individual Fuels and Hydrocarbons continued on next page

TPH, Fuel and Hydrocarbons

Individual Fuel and Hydrocarbons

Compound	Conc.	Matrix	Cat. No.	1 mL	Compound	Conc.	Matrix	Cat. No.	1 mL		
SAE 5W30 Motor oil	0.5 mg/mL	Hexane	FU-025-H		o-Terphenyl 84-15-1	200 µg/mL	Acetone	DRO-AK-102-SS			
	20 mg/mL	Hexane	FU-025-H-40X			1 mg/mL	CH ₂ Cl ₂	DRH-006-SS			
	20 mg/mL	CH ₂ Cl ₂	FU-025-D-40X			2 mg/mL	Acetone	DRO-AK-102-SS-10X			
SAE 10W30 Motor oil	0.5 mg/mL	Hexane	FU-026-H		n-Tetradecane 629-59-4	2 mg/mL	Acetone	GRH-SS			
	20 mg/mL	Hexane	FU-026-H-40X			5 mg/mL	MeOH	AS-E0240			
	20 mg/mL	CH ₂ Cl ₂	FU-026-D-40X								
SAE 10W40 Motor oil	0.5 mg/mL	Hexane	FU-027-H		Tetracosane (5 mL) 646-31-1	500 µg/mL	CS ₂	D-5480-C40-5ML			
	20 mg/mL	Hexane	FU-027-H-40X			500 µg/mL	Chloroform	D-5480-C40-R1-5ML			
	20 mg/mL	CH ₂ Cl ₂	FU-027-D-40X			5 mg/mL	MeOH	AS-E0239			
SAE 20W50 Motor oil	0.5 mg/mL	Hexane	FU-028-H		n-Tridecane 629-50-5						
	20 mg/mL	Hexane	FU-028-H-40X			1,2,3-Trimethylbenzene 526-73-8	1 mg/mL	CH ₂ Cl ₂	V-028S-D-10X		
	20 mg/mL	CH ₂ Cl ₂	FU-028-D-40X								
SAE 30W Motor oil	0.5 mg/mL	Hexane	FU-018-H		n-Triacontane-d ₆₂ 93952-07-9	500 µg/mL	Acetone:THFRRO-AK-103-SS				
	20 mg/mL	Hexane	FU-018-H-40X			5 mg/mL	Acetone:THFRRO-AK-103-SS2				
	20 mg/mL	CH ₂ Cl ₂	FU-018-D-40X			5 mg/mL	THF	DRH-SS			
SAE 40W Motor oil	0.5 mg/mL	Hexane	FU-019-H		Turbine (Jet) fuel	0.5 mg/mL	MeOH	FU-006			
	5 mg/mL	Acetone:CH ₂ Cl ₂	RRO-AK-103-LCS			20 mg/mL	MeOH	FU-006-40X			
	20 mg/mL	Hexane	FU-019-H-40X			20 mg/mL	CH ₂ Cl ₂	FU-006-D-40X			
	20 mg/mL	CH ₂ Cl ₂	FU-019-D-40X			1 gram	Neat	HS-004N			
	25 mg/mL	Acetone:CH ₂ Cl ₂	RRO-AK-103-LCS-5X			0.5 mg/mL	MeOH	HS-004S			
SAE 50W Motor oil	20 mg/mL	CH ₂ Cl ₂	FU-021-D-40X		Turpentine 8006-64-2	20 mg/mL	MeOH	HS-004S-40X			
						20 mg/mL	CH ₂ Cl ₂	HS-004S-D-40X			
Stoddard solvent 8052-41-3	1 gram	Neat	HS-005N		Unleaded Gasoline 25% Weathered	5 mg/mL	MeOH	GA-W25-10X			
	0.5 mg/mL	MeOH	HS-005S			Unleaded Gasoline 50% Weathered	5 mg/mL	MeOH	GA-W50-10X		
	5 mg/mL	MeOH	HS-005S-10X				Unleaded Gasoline 75% Weathered	5 mg/mL	MeOH	GA-W75-10X	
	20 mg/mL	MeOH	HS-005S-40X								
	20 mg/mL	CH ₂ Cl ₂	HS-005S-D-40X								

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

The following sets to identify specific petroleum product types found during LUFT/LUST investigations. The sets can be purchased using one convenient Cat. No. or as individuals.

TPH-R3-SET

33 x 1 mL (TPH-001-R2-SET, TPH-002-R1-SET, TPH-003-SET, TPH-004-SET)

Motor Fuels & Lubricating Oils Set

TPH-001-R2-SET

12 x 1 mL

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

Heating Fuel Oils Set

TPH-002-R1-SET

6 x 1 mL

	mg/mL	Solv.	Cat. No.
#1 Fuel oil	20	CH ₂ Cl ₂	FU-001-D-40X
#2 Fuel oil	20	CH ₂ Cl ₂	FU-002-D-40X
#3 Fuel oil	20	CH ₂ Cl ₂	FU-003-D-40X
#4 Fuel oil	20	CH ₂ Cl ₂	FU-004-D-40X
#6 Fuel oil	20	CH ₂ Cl ₂	FU-008-D-40X
Kerosene	20	CH ₂ Cl ₂	FU-005-D-40X

Aviation Fuels & Oils Set

TPH-003-SET

10 x 1 mL

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

Household & Industrial Solvent Set

TPH-004-SET

5 x 1 mL

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

Motor Oil Standards

	mg/mL	Solv.	Cat. No.
SAE 5W30 Motor oil	0.5	Hexane	FU-025-H
	20.0	Hexane	FU-025-H-40X
	20.0	CH ₂ Cl ₂	FU-025-D-40X
SAE 10W30 Motor oil	0.5	Hexane	FU-026-H
	20.0	Hexane	FU-026-H-40X
	20.0	CH ₂ Cl ₂	FU-026-D-40X
SAE 10W40 Motor oil	0.5	Hexane	FU-027-H
	20.0	Hexane	FU-027-H-40X
	20.0	CH ₂ Cl ₂	FU-027-D-40X

	mg/mL	Solv.	Cat. No.
SAE 20W50 Motor oil	0.5	Hexane	FU-028-H
	20.0	Hexane	FU-028-H-40X
	20.0	CH ₂ Cl ₂	FU-028-D-40X
Composite Standard	20.0	CH ₂ Cl ₂	MO-COMP-D-40X

TPH, Fuel and Hydrocarbons

The weathered fuel line to mimic the weathering, evaporation, and migration process. Use of these standards can help 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 LUFT/LUST Fuel Sets

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 spilled, the nature of the contaminated soil, and the age of the spill, analysis becomes even 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.

Total Petroleum Hydrocarbon Pattern Recognition Standards

This book contains chromatography for the various petroleum products typically found during LUFT/LUST site investigations. The chromatography shows each fuel pattern in a 25 minute analytical run for early eluting petroleum products like gasoline to late eluting products like motor oil. In addition, an n-alkane standard (DRH-008S) analyzed under identical conditions has been overlaid on each petroleum product chromatogram. Use of the book will assist the chemist's identification of the fuel for pattern recognition.

The n-alkane standard (DRH-008S) overlay provides n-alkane reference points between the standard and the unknown sample. These beginning and ending n-alkane reference points can be used to establish gross hydrocarbon concentrations. By comparing the specific n-alkane range of the closest identified petroleum standard to that of the unknown sample, a reproducible gross hydrocarbon number can be achieved.

To Order,

BOOK-TPH-001

TPH, Fuel and Hydrocarbons

Brownfield Regulation & ISO/DIS 9337

Petroleum Brownfield Regulation

Brownfield Regulation that 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

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

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

1 x 1 mL

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-Tetracontane
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
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

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

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

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
Mineral Oil

ISO/DIS 9377-4 Standard Mixture Stock Solution

TPH-006-10X

1 x 1 mL

TPH-006-10X-PAK

5 x 1 mL

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

2 comps.

#2 Diesel
Mineral oil

LUFT/LUST (UST) Standards

Multi-State

There are approximately 571,000 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 half of all Americans. Other health and environmental risks, including the potential for fire and explosion, also exist.

From 1988 through March of 2008 there have been 478,457 confirmed releases reported, 453,065 cleanups have been initiated, and 371,880 cleanups have been completed.

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

LUFT/LUST (UST) Standards

Leaking
Underground
Fuel
Tank

/

Leaking
Underground
Storage
Tank

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Additional LUFT/LUST

GRH

DRH, Oil, Grease and TPH
(Method 1664, 413.2/418.1 & 8440)

Automotive Engine Exhaust, Refinery Waste
(Method 1004, ASTM E1387, E1618, Skinner List)

Multi-State Method Hydrocarbon Window Defining

DRH-008S-R2
DRH-008S-R2-PAK
500 µg/mL each in Chloroform

1 x 1 mL
5 x 1 mL
35 comps.

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

<i>n</i> -Triacontane
<i>n</i> -Hentriacontane
<i>n</i> -Dotriacontane
<i>n</i> -Tritriacontane
<i>n</i> -Tetraatriacontane
<i>n</i> -Pentatriacontane
<i>n</i> -Hexatriacontane
<i>n</i> -Heptatriacontane
<i>n</i> -Octatriacontane
<i>n</i> -Nonatriacontane
<i>n</i> -Tetracontane

Technical Note

We offer a hydrocarbon window defining standard with the C₈ to C₄₀ odd and even alkanes. Use of this one standard should meet the numerous state-to-state variations for hydrocarbon validation and reporting. Since many LUFT/LUST programs require the use of the C₁₇ (Pristane) and C₁₈ (Phytane) ratio to estimate subsurface degradation of fuel oil spills, the compounds are also included in the formulation.

LUFT/LUST Standards

Arizona / California 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 5 x 1 mL
 2000 µg/mL each in CH₂Cl₂ 12 comps.

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

Surrogate Standards

DRO-AK-102-SS-10X 1 x 1 mL
 DRO-AK-102-SS-10X-PAK 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 5 x 1 mL
 1000 µg/mL each in CH₂Cl₂ 3 comps.

<i>n</i> -Decane	<i>n</i> -Dotriacontane
<i>n</i> -Docosane	

Stock Calibration Standard

DRO-ORO-AZ-8015-SCS 1 x 1 mL
 DRO-ORO-AZ-8015-SCS-PAK 5 x 1 mL
 10,000 µg/mL each in CH₂Cl₂ 2 comps.

#2 Diesel	SAE 10W30 Motor Oil
-----------	---------------------

California Method (including LA County)

California - Gasoline Range Hydrocarbons

S-603A-10X 1 x 1 mL
 S-603A-10X-PAK 5 x 1 mL
 2.0 mg/mL each in MeOH 7 comps.

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

LA County Well Investigation & Monitoring Program

Purgeable Aromatics - Gasoline ID

M-602-GAS-10X 1 x 1 mL
 2.0 mg/mL each in MeOH 11 comps.

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

Oxygenate Gasoline Additive Standard

OGAD-001 1 x 1 mL
 OGAD-001-PAK 5 x 1 mL
 At stated conc. (µg/mL) in MeOH 5 comps.

MtBE	2000	TAME	2000
EtBE	2000	<i>t</i> -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

At stated conc. (µg/mL) in AcCN 1 x 1 mL
 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.

LUFT/LUST Standards

Connecticut / Mississippi / New Jersey / Pennsylvania / Tennessee / Wisconsin Methods

Connecticut Method Extractable Total Petroleum Hydrocarbons

CT ETPH Alkane Standard

DRH-009S 1 x 1 mL
 DRH-009S-PAK 5 x 1 mL
 1000 µg/mL in CH₂Cl₂ 15 comps.

<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> -Tetracontane
<i>n</i> -Hexadecane	<i>n</i> -Hexacosane	<i>n</i> -Hexatriacontane

Internal Standard

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

5- α Androstane

Surrogate Standard

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

o-Terphenyl (OTP)

Mississippi Method

DRO Defining Mix

DRO-AK-102-NAS-10X 1 x 1 mL
 DRO-AK-102-NAS-10X-PAK 5 x 1 mL
 2.0 mg/mL each in CH₂Cl₂ 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		

New Jersey Method

DEP (NJ) Aliphatic Hydrocarbon Standard

DRH-NJ-001S 1 x 1 mL
 1.0 mg/mL each in Hexane 20 comps.

<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	

DEP (NJ) Aromatic Hydrocarbon Standard

DRH-NJ-002S 1 x 1 mL
 2.0 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

Pennsylvania Method Storage Tank Site Closure & Monitoring Petroleum Standards

PA Extractable PAH Standard

DRH-PA-001 1 x 1 mL
 DRH-PA-001-PAK 5 x 1 mL
 2000 µg/mL each in CH₂Cl₂ 5 comps.

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

PA Volatile Petroleum Standard

GRH-PA-001 1 x 1 mL
 GRH-PA-001-PAK 5 x 1 mL
 At stated conc. (µg/mL) in MeOH 9 comps.

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		

Tennessee Method

DRO Defining Mix

DRO-AK-102-NAS-10X 1 x 1 mL
 DRO-AK-102-NAS-10X-PAK 5 x 1 mL
 2.0 mg/mL each in CH₂Cl₂ 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		

Wisconsin Method

Wisconsin DNR - Gasoline Range Hydrocarbons

GRH-003S 1 x 1 mL
 GRH-003S-PAK 5 x 1 mL
 2.0 mg/mL each in MeOH 10 comps.

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		

LUFT/LUST Standards

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	5 x 1 mL	
2.0 mg/mL each in MeOH	5 comps.	
<i>n</i> -Hexane	<i>n</i> -Octane	<i>n</i> -Decane
<i>n</i> -Heptane	<i>n</i> -Nonane	

Laboratory Control Standard

GRO-AK-101-LCS	1 x 1 mL
GRO-AK-101-LCS-PAK	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	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	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	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	5 x 1 mL
5,000 µg/mL each in MeOH	2 comps.
<i>p</i> -Bromofluorobenzene	a,a,a-Trifluorotoluene

Alaska Method Determination of Aromatic & Aliphatic Hydrocarbons in GRO

AK101AA Aromatics Mix

GRO-AK-101AA-ARO	1 x 1 mL	
GRO-AK-101AA-ARO-PAK	5 x 1 mL	
2000 µg/mL each in MeOH	14 comps.	
Benzene	<i>o</i> -Xylene	<i>m</i> -Ethyltoluene
Toluene	1,2,3-Trimethylbenzene	<i>p</i> -Ethyltoluene
Ethylbenzene	1,2,4-Trimethylbenzene	<i>o</i> -Ethyltoluene
<i>m</i> -Xylene	1,3,5-Trimethylbenzene	<i>n</i> -Propylbenzene
<i>p</i> -Xylene	Isopropylbenzene	

Certified BTEX in Gasoline (Single Source)

GA-001-20X-BTEX	1 x 1 mL
10.0 mg/mL in MeOH	6 comps.
Benzene	<i>m,p</i> -Xylene
Ethylbenzene	<i>o</i> -Xylene
Toluene	Gasoline-Regular, unleaded

Technical Note

Laboratory Control Standard

The gasoline laboratory control standard was taken from an ASTM selected fuel set and a source independent of what is being used in the Gasoline Composite Mix.

Simultaneous BTEX / Gasoline QA/QC

Our QC Department has certified the benzene, toluene, ethyl benzene and xylene concentrations in the unleaded gasoline standard and (GRO-AK-101-GCS-BTEX).

This allows the use of a single injection to verify that the QA/QC requirements are being met for the BTEX analytes as well as for the gasoline.

We have added a multi source certified BTEX in gasoline composite mix (GRO-AK-101-GCS-BTEX). The BTEX values for this multi-source calibration standard have been determined through in-house analysis against a BTEX multi-level calibration curve listed on the certificate.

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	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	5 x 1 mL
Equal Wt. %	3 comps.
Gasoline-Regular, unleaded	
Gasoline-Plus, unleaded	
Gasoline-Premium, unleaded	

Technical Note

Laboratory Control Standards are prepared from an independent source.

LUFT/LUST Standards

Alaska DRO/RRO Methods

Alaska Method 102 Determination of Diesel Range Organic (DRO) Hydrocarbons (continued)

Laboratory Control Standard

DRO-AK-102-LCS-10X-R1 1 x 1 mL
 DRO-AK-102-LCS-10X-R1-PAK 5 x 1 mL
 50.0 mg/mL in Acetone

#2 Diesel (Conventional)

Normal Alkane Standard - DRO Defining Mix

DRO-AK-102-NAS-10X 1 x 1 mL
 DRO-AK-102-NAS-10X-PAK 5 x 1 mL
 2.0 mg/mL each in CH₂Cl₂ 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 1 x 1 mL
 DRO-AK-102-SS-PAK 5 x 1 mL
 200 µg/mL in Acetone

DRO-AK-102-SS-10X 1 x 1 mL
 DRO-AK-102-SS-10X-PAK 5 x 1 mL
 2.0 mg/mL in Acetone

o-Terphenyl

Internal Standard

DRO-AK-102-IS 1 x 1 mL
 DRO-AK-102-IS-PAK 5 x 1 mL
 1.0 mg/mL in CH₂Cl₂

5- α Androstane

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

Diesel Range Standard

DRO-AK-102AA 1 x 1 mL
 DRO-AK-102AA-PAK 5 x 1 mL
 2000 µg/mL each in CH₂Cl₂ 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 1 x 1 mL
 DRO-AK-102-103AA-SS-PAK 5 x 1 mL
 1000 µg/mL each in CH₂Cl₂ 3 comps.

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

Retention Time Marker Standard

DRO-AK-102-103AA-RT 1 x 1 mL
 DRO-AK-102-103AA-RT-PAK 5 x 1 mL
 50 µg/mL each in CH₂Cl₂ 3 comps.

n-Decane *n*-Hexatriacontane
n-Pentacosane

Alaska Method 103 Determination of Residual Range Organic (RRO) Hydrocarbons

Residual Composite Mixtures

RRO-AK-103-RCS 1 x 1 mL
 RRO-AK-103-RCS-PAK 5 x 1 mL
 At stated conc. (mg/mL) in CH₂Cl₂ 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 1 x 1 mL
 RRO-AK-103-RCS-10X-PAK 5 x 1 mL
 At stated conc. (mg/mL) in CH₂Cl₂ 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 1 x 1 mL
 RRO-AK-103-LCS-PAK 5 x 1 mL
 5.0 mg/mL in Acetone

RRO-AK-103-LCS-5X 1 x 1 mL
 RRO-AK-103-LCS-5X-PAK 5 x 1 mL
 25.0 mg/mL in Acetone:CH₂Cl₂ (50:50)

SAE 40W Motor oil

Surrogate Control Standard

RRO-AK-103-SS 1 x 1 mL
 RRO-AK-103-SS-PAK 5 x 1 mL
 500 µg/mL in Acetone:THF (90:10)

RRO-AK-103-SS2 1 x 1 mL
 RRO-AK-103-SS2-PAK 5 x 1 mL
 5.0 mg/mL in THF:Acetone (75:25)

n-Triacontane-d₆₂

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

Residual Standard

RRO-AK-103AA 1 x 1 mL
 RRO-AK-103AA-PAK 5 x 1 mL
 2000 µg/mL each in CH₂Cl₂ 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 1 x 1 mL
 DRO-AK-102/103AA-SS-PAK 5 x 1 mL
 1000 µg/mL each in CH₂Cl₂ 3 comps.

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

Retention Time Marker Standard

DRO-AK-102/103AA-RT 1 x 1 mL
 DRO-AK-102/103AA-RT-PAK 5 x 1 mL
 50 µg/mL each in CH₂Cl₂ 3 comps.

n-Decane *n*-Hexatriacontane
n-Pentacosane

LUFT/LUST Standards

Florida Methods

Florida Method Total Recoverable Petroleum Hydrocarbon (FTRPH) Standard & Surrogates

Calibration/Window Defining Hydrocarbon Standard

DRH-004S-R1-5X 1 x 1 mL
 DRH-004S-R1-5X-PAK 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 Standard

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

DRH-FTRPH-0.1X 1 x 1 mL
 50 µg/mL each in Hexane 17 comps.

<i>n</i> -Octane	<i>n</i> -Hexacosane
<i>n</i> -Decane	<i>n</i> -Octacosane
<i>n</i> -Dodecane	<i>n</i> -Triacosane
<i>n</i> -Tetradecane	<i>n</i> -Dotriacontane
<i>n</i> -Hexadecane	<i>n</i> -Tetraatriacontane
<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	

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 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 5 x 1 mL
 5.0 mg/mL in THF
n-Triacosane-d₆₂

GRH-SS 1 x 1 mL
 GRH-SS-PAK 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 5 x 1 mL
 3.0 mg/mL in Carbon disulfide

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

n-Nonatriacontane o-Terphenyl (OTP)

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.

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

n-Nonatriacontane 6000 o-Terphenyl (OTP) 1500



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

LUFT/LUST Standards

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

Massachusetts Method 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

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

2.0 mg/mL in Hexane

2.0 mg/mL in Hexane

1 x 10 mL

1 x 1 mL

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

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

5 x 1 mL

17 comps.

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

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

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

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

5 x 1 mL

2 comps.

1-Chlorooctadecane

o-Terphenyl

EPH Matrix Spike

DRH-MA-MS

DRH-MA-MS-PAK

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

1 x 1 mL

5 x 1 mL

10 comps.

DRH-MA-MS-10X

DRH-MA-MS-10X-PAK

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

1 x 1 mL

5 x 1 mL

10 comps.

DRH-MA-MS-40X

DRH-MA-MS-40X-PAK

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

1 x 1 mL

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

5 x 1 mL

GRH-IS-10X

10.0 mg/mL in CH_2Cl_2

1 x 1 mL

5-alpha Androstane

LUFT/LUST Standards

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

Massachusetts Method Determination of Volatile Petroleum Hydrocarbons (VPH)

Stock Concentrate

Volatile Petroleum Hydrocarbon Mix

GRH-004S-10X			1 x 1 mL
GRH-004S-10X-PAK			5 x 1 mL
<i>At stated conc. (mg/mL) in MeOH</i>			
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		1 x 1 mL
GRH-004-SS-PAK		5 x 1 mL
<i>50 µg/mL in MeOH</i>		
GRH-004-SS-10X		1 x 1 mL
GRH-004-SS-10X-PAK		5 x 1 mL
<i>500 µg/mL in MeOH</i>		
GRH-004-SS-100X		1 x 1 mL
GRH-004-SS-100X-PAK		5 x 1 mL
<i>5,000 µg/mL in MeOH</i>		
2,5-Dibromotoluene		

MA VPH Matrix Spike Mix with Surrogate

GRH-004-MS/SS		1 x 1 mL
<i>50 µg/mL each in MeOH</i>		
Benzene	Naphthalene	
<i>n</i> -Butylcyclohexane	<i>n</i> -Nonane	
<i>n</i> -Decane	<i>n</i> -Pentane	
2,5-Dibromotoluene	Toluene	
Ethylbenzene	1,2,4-Trimethylbenzene	
2-Methylpentane	Isooctane	
MtBE	<i>m</i> -Xylene	

VPH Matrix Spike

GRH-004-MS		1 x 1 mL
GRH-004-MS-PAK		5 x 1 mL
<i>50 µg/mL each in MeOH</i>		
GRH-004-MS-10X		1 x 1 mL
GRH-004-MS-10X-PAK		5 x 1 mL
<i>500 µg/mL each in MeOH</i>		
GRH-004-MS-100X		1 x 1 mL
GRH-004-MS-100X-PAK		5 x 1 mL
<i>5,000 µg/mL each in MeOH</i>		

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		1 x 1 mL
<i>10.0 mg/mL each in MeOH</i>		
Benzene	<i>m,p</i> -Xylene	
Ethylbenzene	<i>o</i> -Xylene	
Toluene	Gasoline-Regular, unleaded	

Volatile Petroleum Hydrocarbons without Surrogate

GRH-004S-R1-10X			1 x 1 mL
<i>At stated conc. (mg/mL) in MeOH</i>			
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

GRH-004S-R2			1 x 1 mL
<i>10 mg/mL each in MeOH</i>			
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			1 x 1 mL
GRH-004S-SS-PAK			5 x 1 mL
<i>At stated conc. (µg/mL) in MeOH</i>			
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

GRH-004S-SS-R1			1 x 1 mL
<i>At stated conc. (µg/mL) in MeOH</i>			
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

GRH-004S-SS-R2			1 x 1 mL
<i>10.0 mg/mL each in MeOH</i>			
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	

Technical Note

Calibration Curve

Analytical chemists can develop the VPH Calibration Curve using one primary dilution standard that includes the surrogate.

Simultaneous BTEX / Gasoline QA/QC

Our QC Dept. has certified the benzene, toluene, ethyl benzene and xylene concentrations in the unleaded gasoline standard (GA-001-20X-BTEX). This allows the use of a single injection to verify that the QA/QC requirements are being met for the BTEX analytes as well as for the gasoline.

LUFT/LUST Standards

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 5 x 1 mL
 2000 µg/mL each in *n*-Pentane 12 comps.

<i>n</i> -Hexane	<i>n</i> -Tetradecane	<i>n</i> -Docosane
<i>n</i> -Octane	<i>n</i> -Hexadecane	<i>n</i> -Tetracosane
<i>n</i> -Decane	<i>n</i> -Octadecane	<i>n</i> -Hexacosane
<i>n</i> -Dodecane	<i>n</i> -Eicosane	<i>n</i> -Octacosane

Gasoline & Diesel Calibration Curve Set

DRH-TX-002-D-SET 8 x 1 mL
 Each at stated conc. in CH₂Cl₂ 2 comps.

Gasoline-Regular, unleaded #2 Diesel Fuel

Each set contains 8 concentrations:

5 µg/mL	50 µg/mL	200 µg/mL	1000 µg/mL
20 µg/mL	100 µg/mL	500 µg/mL	5000 µg/mL

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 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 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.

Gasoline-Regular, unleaded #2 Diesel Fuel

Each set contains 8 concentrations:

20 µg/mL	250 µg/mL	750 µg/mL	5000 µg/mL
100 µg/mL	500 µg/mL	1000 µg/mL	10,000 µg/mL

Gasoline and Diesel Standard

DRH-TX-003-20X 1 x 5 mL
 DRH-TX-003-20X-PAK 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 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 5 x 1 mL
 2000 µg/mL each in Pentane 9 comps.

<i>n</i> -Decane	<i>n</i> -Heptane	<i>n</i> -Octacosane
<i>n</i> -Dodecane	<i>n</i> -Hexadecane	<i>n</i> -Octane
<i>n</i> -Heneicosane	<i>n</i> -Hexane	<i>n</i> -Pentatriacontane

Aromatic Fractionation Check Standard

DRH-TX-003-FCS 1 x 10 mL
 DRH-TX-003-FCS-PAK 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	<i>m</i> -Xylene
Benzo[k]fluoranthene	Fluorene	<i>p</i> -Xylene
Benz[a]pyrene	Indeno[1,2,3-cd]pyrene	<i>o</i> -Xylene

LUFT/LUST Standards

Washington Method

Washington Method Determination of Volatile Petroleum Hydrocarbons (VPH)

VPH Standard

VPH-WA			1 x 1 mL
VPH-WA-PAK			5 x 1 mL
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	

VPH Primary Dilution Standard with Surrogate

VPH-WA-SS-10X			1 x 1 mL
VPH-WA-SS-10X-PAK			5 x 1 mL
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			

Stock Concentrate VPH Standards

VPH-WA-10X			1 x 1 mL
VPH-WA-10X-PAK			5 x 1 mL
2,000 µg/mL each in MeOH			
VPH-WA-100X			1 x 1 mL
VPH-WA-100X-PAK			5 x 1 mL
20.0 mg/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	

Certified BTEX in Unleaded Gasoline

GA-001-20X-BTEX			1 x 1 mL
10.0 mg/mL each in MeOH			
Benzene	<i>m,p</i> -Xylene		
Ethylbenzene	<i>o</i> -Xylene		
Toluene	Gasoline-Regular, unleaded		

Certified BTEX in Gasoline Composite (Multi Source)

GRO-AK-101-GCS-BTEX			1 x 1 mL
At stated conc. (mg/mL) in MeOH			
Gasoline-Premium, unleaded	1.66		
Gasoline-Regular, leaded	1.67		
Gasoline-Regular, unleaded	1.67		

VPH Matrix Spike

VPH-WA-MS			1 x 1 mL
VPH-WA-MS-PAK			5 x 1 mL
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		

VPH Surrogate Standard

GRH-004-SS			1 x 1 mL
GRH-004-SS-PAK			5 x 1 mL
50 µg/mL in MeOH			
GRH-004-SS-10X			1 x 1 mL
GRH-004-SS-10X-PAK			5 x 1 mL
500 µg/mL in MeOH			
GRH-004-SS-100X			1 x 1 mL
GRH-004-SS-100X-PAK			5 x 1 mL
5,000 µg/mL in MeOH			
2,5-Dibromotoluene			

VPH Retention Time Marker

VPH-WA-RT			1 x 1 mL
VPH-WA-RT-PAK			5 x 1 mL
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	

1,2,3-Trimethylbenzene Standard

V-028S-D-10X			1 x 1 mL
V-028S-D-10X-PAK			5 x 1 mL
1000 µg/mL each in CH ₂ Cl ₂			
1,2,3-Trimethylbenzene			

Technical Note

Simultaneous BTEX / Gasoline QA/QC

We have certified the benzene, toluene, ethyl benzene and xylene concentrations in the unleaded gasoline standard GA-001-20X-BTEX and GRO-AK-101-GCS-BTEX. This allows the use of a single injection to verify that the QA/QC requirements are being met for the BTEX analytes as well as for the gasoline.

We have added a multi source certified BTEX in gasoline composite mix GRO-AK-101-GCS-BTEX. The BTEX values for this multi-source calibration standard have been determined through in-house analysis against a BTEX multi-level calibration curve listed on the certificate.

LUFT/LUST Standards

Washington Method

Washington Method Determination of Extractable Petroleum Hydrocarbons (EPH)

EPH Aromatic/PAH Standard

EPH-WA-10X	1 x 1 mL	
EPH-WA-10X-PAK	5 x 1 mL	
1.0 mg/mL each in CH ₂ Cl ₂	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	5 x 1 mL
1000 µg/mL in CH ₂ Cl ₂	
GRH-IS-10X	1 x 1 mL
10.0 mg/mL in CH ₂ Cl ₂	
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	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	5 x 20 mL	
25 µg/mL each in Acetone	10 comps.	
Acenaphthene	n-Decane	n-Heneicosane
Anthracene	n-Dodecane	Naphthalene
Benzo[g,h,i]perylene	n-Hexadecane	Pyrene
Benz[a]pyrene		

EPH Aliphatic Check Mix

EPH-WA-ALI	1 x 1 mL	
EPH-WA-ALI-PAK	5 x 1 mL	
1.0 mg/mL each in CH ₂ Cl ₂	5 comps.	
n-Octane	n-Dodecane	n-Heneicosane
n-Decane	n-Hexadecane	

EPH Aromatic Check Mix

EPH-WA-ARO	1 x 1 mL	
EPH-WA-ARO-PAK	5 x 1 mL	
1.0 mg/mL each in CH ₂ Cl ₂	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	5 x 1 mL	
1.0 mg/mL each in CH ₂ Cl ₂	6 comps.	
n-Octane	n-Dodecane	n-Heneicosane
n-Decane	n-Hexadecane	n-Tetracontane

EPH Fractionation Check Standard

EPH-WA-FCS	1 x 1 mL	
EPH-WA-FCS-PAK	5 x 1 mL	
25 µg/mL each in Hexane	24 comps.	
Acenaphthene	Chrysene	Pyrene
Acenaphthylene	Dibenz[a,h]anthracene	n-Decane
Anthracene	Fluoranthene	n-Dodecane
Benz[a]anthracene	Fluorene	n-Tetradecane
Benz[a]pyrene	Indeno[1,2,3-cd]pyrene	n-Hexadecane
Benzo[b]fluoranthene	2-Methylnaphthalene	n-Octadecane
Benzo[g,h,i]perylene	Naphthalene	n-Eicosane
Benzo[k]fluoranthene	Phenanthrene	n-Heneicosane

Revised EPH Fractionation Check Standard

EPH-WA-FCS-R1	1 x 1 mL	
EPH-WA-FCS-R1-PAK	5 x 1 mL	
25 µg/mL each in Hexane	23 comps.	
Acenaphthene	Chrysene	Pyrene
Acenaphthylene	Dibenz[a,h]anthracene	n-Octane
Anthracene	Fluoranthene	n-Decane
Benz[a]anthracene	Fluorene	n-Dodecane
Benz[a]pyrene	Indeno[1,2,3-cd]pyrene	n-Hexadecane
Benzo[b]fluoranthene	2-Methylnaphthalene	n-Heneicosane
Benzo[g,h,i]perylene	Naphthalene	n-Tetracontane
Benzo[k]fluoranthene	Phenanthrene	

1,2,3-Trimethylbenzene Standard

V-028S-D-10X	1 x 1 mL
V-028S-D-10X-PAK	5 x 1 mL
1000 µg/mL each in CH ₂ Cl ₂	
1,2,3-Trimethylbenzene	

Revised EPH Aromatic Check Mix

EPH-WA-ARO-R1	1 x 1 mL	
EPH-WA-ARO-R1-PAK	5 x 1 mL	
1.0 mg/mL each in CH ₂ Cl ₂	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	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	5 x 1 mL
1.0 mg/mL in CH ₂ Cl ₂	
o-Terphenyl	

LUFT/LUST Standards

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
<i>n</i> -Heptane	0.5	5
Benzene	0.5	5
Toluene	1.5	15
Ethylbenzene	0.5	5
<i>m</i> -Xylene	1.0	10
<i>p</i> -Xylene	1.0	10
<i>o</i> -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
 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 5 x 1 mL
 0.2 mg/mL each in MeOH 4 comps.

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

Technical Note

Simultaneous BTEX / Gasoline QA/QC

We have certified the benzene, toluene, ethyl benzene and xylene concentrations in the unleaded gasoline standard (GA-001-20X-BTEX). This allows the use of a single injection to verify that the QA/QC requirements are being met for the BTEX analytes as well as for the gasoline.

Certified BTEX in Unleaded Gasoline

GA-001-20X-BTEX 1 x 1 mL
 10.0 mg/mL each in MeOH 6 comps.

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

Hexadecane Extraction Volatiles

CLP-BTEX 1 x 1 mL
 CLP-BTEX-PAK 5 x 1 mL
 0.2 mg/mL each in MeOH 6 comps.
 CLP-BTEX-10X 1 x 1 mL
 CLP-BTEX-10X-PAK 5 x 1 mL
 2.0 mg/mL each in MeOH 6 comps.

Benzene	<i>o</i> -Xylene
Ethyl benzene	<i>m</i> -Xylene
Toluene	<i>p</i> -Xylene

California - Gasoline Range Hydrocarbons

S-603A-10X 1 x 1 mL
 S-603A-10X-PAK 5 x 1 mL
 2.0 mg/mL each in MeOH 7 comps.

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

LA County Well Investigation & Monitoring Program

Purgeable Aromatics - Gasoline ID

M-602-GAS-10X 1 x 1 mL
 2.0 mg/mL each in MeOH 11 comps.

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

Oxygenate Gasoline Additive Standard

OGAD-001 1 x 1 mL
 OGAD-001-PAK 5 x 1 mL
 At stated conc. (µg/mL) in MeOH 5 comps.

MtBE	2000	TAME	2000
EtBE	2000	<i>t</i> -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 5 x 1 mL
 1.0 mg/mL each in MeOH 10 comps.

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

Wisconsin DNR - Gasoline Range Hydrocarbons

GRH-003S 1 x 1 mL
 GRH-003S-PAK 5 x 1 mL
 2.0 mg/mL each in MeOH 10 comps.

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

LUFT/LUST Standards

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 5 x 1 mL

2.0 mg/mL in Acetone

o-Terphenyl (OTP)

Internal Standard

GRH-IS 1 x 1 mL

GRH-IS-PAK 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 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> -Tetraatriacontane (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 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> -Tetraatriacontane	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 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> -Tetraatriacontane
<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 \$ 5 x (2 x 1 mL)

DRH-FTRPH, DRH-FTRPH2

FTRPH Calibration/Window Defining Standard

DRH-FTRPH 1 x 1 mL

DRH-FTRPH-PAK 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> -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> -Triacontane	

Hydrocarbon Window Defining Standard

DRH-FTRPH2 1 x 1 mL

DRH-FTRPH2-PAK 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

LUFT/LUST Standards

Oil, Grease & TPH (Method 1664, 413.2/418.1 & 8440) & Biocides in Fracking Fluids

Method 1664 Oil, Grease & TPH Determination

Precision and Recovery (PAR) Spiking Solution

M-1664-5ML 1 x 5 mL
M-1664-5ML-PAK 5 x 5 mL
4.0 mg/mL each in Acetone

M-1664-20ML 1 x 20 mL
M-1664-20ML-PAK 5 x 20 mL
4.0 mg/mL each in Acetone 2 comps.

n-Hexadecane Stearic acid

Silica Gel Hexane Extraction Material

SGT-HEM 1 x 1 mL
20 µg/mL each in Acetone 2 comps.

Stearic acid *n*-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 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 *n*-Hexadecane 37.5
Isooctane 37.5

Oil, Grease and Petroleum

Hydrocarbon Total Recoverable (IR Method)

M-418 1 x 1 mL
M-418-PAK 5 x 1 mL
At stated conc. (mg/mL) in Freon 113 3 comps.

Chlorobenzene 1.05 Isooctane 1.55
n-Hexadecane 1.55

Method 8440 Total Petroleum Hydrocarbon Analysis

Total Recoverable Petroleum Hydrocarbon Mix

M-8440 1 x 1 mL
M-8440-PAK 5 x 1 mL
At stated Wt.% in Tetrachloroethene 3 comps.

Chlorobenzene 0.10 Isooctane 0.15
n-Hexadecane 0.15

Silica Gel Cleanup Calibration Solution

M-8440-SGC 1 x 1 mL
M-8440-SGC-PAK 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 5 x 1 mL
At stated Vol.% 3 comps.

Chlorobenzene 25.0 Isooctane 37.5
n-Hexadecane 37.5

Technical Note

Leaking Underground Storage Tank Retention Time Standard

This product can be used to screen a sample to determine what type of petroleum spill that may have caused the contamination.

Retention Time Standard

DRH-010S 1 x 1 mL
DRH-010S-PAK 5 x 1 mL
25 µg/mL each in CH₂Cl₂ 7 comps.

n-Hexane *n*-Tetracosane *n*-Triacontane
n-Decane *n*-Octacosane *n*-Tetracontane
n-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.

Organometallic Standards

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. All standards undergo rigorous quality assurance checks. Major constituents in the final Standard are typically analyzed by both plasma emission and rotrode techniques. 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. We developed a Premium Organometallic line for chemists preferring to have organometallic standards with <1 ppm sulfur or phosphorus (see Table of Contents).

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

Single Element Organometallic

Element	1000 µg/g in 75 cSt base oil		5000 µg/g in 75 cSt base oil	
	Cat. No. (50 g)		Cat. No. (50 g)	
Aluminum (Al)	WM-75CST-01		WM-75CST-01-5X	
Antimony (Sb)	WM-75CST-02		WM-75CST-02-5X	
Arsenic (As)	WM-75CST-03			
Barium (Ba)	WM-75CST-04		WM-75CST-04-5X	
Beryllium (Be)	WM-75CST-05			
Bismuth (Bi)	WM-75CST-06		WM-75CST-06-5X	
Boron (B)	WM-75CST-07		WM-75CST-07-5X	
Cadmium (Cd)	WM-75CST-08		WM-75CST-08-5X	
Calcium (Ca)	WM-75CST-09		WM-75CST-09-5X	
Chromium (Cr)	WM-75CST-13		WM-75CST-13-5X	
Cobalt (Co)	WM-75CST-14		WM-75CST-14-5X	
Copper (Cu)	WM-75CST-15		WM-75CST-15-5X	
Iron (Fe)	WM-75CST-27		WM-75CST-27-5X	
Lanthanum (La)	WM-75CST-28			
Lead (Pb)	WM-75CST-29		WM-75CST-29-5X	
Lithium (Li)	WM-75CST-30		WM-75CST-30-5X	
Magnesium (Mg)	WM-75CST-32		WM-75CST-32-5X	
Manganese (Mn)	WM-75CST-33		WM-75CST-33-5X	
Mercury (Hg)	WM-75CST-34			
Molybdenum (Mo)	WM-75CST-35		WM-75CST-35-5X	
Nickel (Ni)	WM-75CST-37		WM-75CST-37-5X	
Phosphorus (P)	WM-75CST-41		WM-75CST-41-5X	
Potassium (K)	WM-75CST-43		WM-75CST-43-5X	
Scandium (Sc)	WM-75CST-50			
Selenium (Se)	WM-75CST-51			
Silicon (Si)	WM-75CST-52		WM-75CST-52-5X	
Silver (Ag)	WM-75CST-53		WM-75CST-53-5X	
Sodium (Na)	WM-75CST-54		WM-75CST-54-5X	
Strontium (Sr)	WM-75CST-55			
Sulfur (S)	WM-75CST-56		WM-75CST-56-5X	
Thallium (Tl)	WM-75CST-60			
Tin (Sn)	WM-75CST-63		WM-75CST-63-5X	
Titanium (Ti)	WM-75CST-64		WM-75CST-64-5X	
Vanadium (V)	WM-75CST-67		WM-75CST-67-5X	
Yttrium (Y)	WM-75CST-69		WM-75CST-69-5X	
Zinc (Zn)	WM-75CST-70		WM-75CST-70-5X	
Zirconium (Zn)	WM-75CST-71		WM-75CST-71-5X	

Matrix Oil and Stabilizer

75 cSt Oil

MOSOL-75 500 mL

Stabilizer

WM-STAB 1 x 50 g

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 g

MA-900-200G 200 g

900 µg/g each in Base oil

MA-1000-100G 100 g

MA-1000-200G 200 g

1000 µg/g each in Base oil

MA-3000-100G 100 g

MA-3000-200G 200 g

3000 µg/g each in Base oil

MA-5000-100G 100 g

MA-5000-200G 200 g

5000 µg/g each in Base oil 5 comps.

Barium (Ba)

Calcium (Ca)

Magnesium (Mg)

Phosphorus (P)

Zinc (Zn)

Organometallic Standards

AA, ICP, DCP & XRF Analysis

21 Wear Metal Multi-Element

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

WM-21-100G-SET

7 x 100 g

WM-21-200G-SET

7 x 200 g

21 Wear Metals in base oil at the stated conc.

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)

22 Wear Metal Multi-Element

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

100 gram Set WM-22-100G-SET

7 x 100 g

200 gram Set WM-22-200G-SET

7 x 200 g

21 Wear Metals plus K in base oil at the stated conc.

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

23 Wear Metal Multi-Element

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

100 gram Set WM-23-100G-SET

7 x 100 g

200 gram Set WM-23-200G-SET

7 x 200 g

21 Wear Metals plus K and Sb in base oil at the stated conc.

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)	

Organometallic Standards

Premium Sulfur-Free

Organometallic Single Element Stock Standards

Evtnt	1000 µg/g		5000 µg/g		Element	1000 µg/g		5000 µg/g	
	Cat. No.	50 mL	Cat. No.	50 mL		Cat. No.	50 mL	Cat. No.	50 mL
Aluminum (Al)	WM-NMS-01		WM-NMS-01-5X		Mercury (Hg)	WM-NMS-34		WM-NMS-34-5X	
Antimony (Sb)	WM-NMS-02		WM-NMS-02-5X		Molybdenum (Mo)	WM-NMS-35		WM-NMS-35-5X	
Arsenic (As)	WM-NMS-03		WM-NMS-03-5X		Nickel (Ni)	WM-NMS-37		WM-NMS-37-5X	
Barium (Ba)	WM-NMS-04		WM-NMS-04-5X		Phosphorus (P)	WM-NMS-41		WM-NMS-41-5X	
Beryllium (Be)	WM-NMS-05		WM-NMS-05-5X		Potassium (K)	WM-NMS-43		WM-NMS-43-5X	
Cadmium (Cd)	WM-NMS-08		WM-NMS-08-5X		Selenium (Se)	WM-NMS-51		WM-NMS-51-5X	
Calcium (Ca)	WM-NMS-09		WM-NMS-09-5X		Silicon (Si)	WM-NMS-52		WM-NMS-52-5X	
Cerium (Ce)	WM-NMS-11		WM-NMS-11-5X		Silver (Ag)	WM-NMS-53		WM-NMS-53-5X	
Chromium (Cr)	WM-NMS-13		WM-NMS-13-5X		Sodium (Na)	WM-NMS-54		WM-NMS-54-5X	
Cobalt (Co)	WM-NMS-14		WM-NMS-14-5X		Strontium (Sr)	WM-NMS-55		WM-NMS-55-5X	
Copper (Cu)	WM-NMS-15		WM-NMS-15-5X		Thallium (Tl)	WM-NMS-60		WM-NMS-60-5X	
Gallium (Ga)	WM-NMS-20		WM-NMS-20-5X		Tin (Sn)	WM-NMS-63		WM-NMS-63-5X	
Gold (Au)	WM-NMS-22		-----	----	Titanium (Ti)	WM-NMS-64		WM-NMS-64-5X	
Iron (Fe)	WM-NMS-27		WM-NMS-27-5X		Vanadium (V)	WM-NMS-67		WM-NMS-67-5X	
Lead (Pb)	WM-NMS-29		WM-NMS-29-5X		Yttrium (Y)	WM-NMS-69		WM-NMS-69-5X	
Lithium (Li)	WM-NMS-30		WM-NMS-30-5X		Zinc (Zn)	WM-NMS-70		WM-NMS-70-5X	
Magnesium (Mg)	WM-NMS-32		WM-NMS-32-5X		Zirconium (Zr)	WM-NMS-71		WM-NMS-71-5X	
Manganese (Mn)	WM-NMS-33		WM-NMS-33-5X						

- Stabilized
- Ready for Use

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

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

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)

Recommended Internal Standard

Organometallic (Internal Standard) Sulfur free

	Conc.	Cat. No.	50 mL
Cobalt	1000 µg/g	WM-NMS-14	
	5000 µg/g	WM-NMS-14-5X	

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

Organometallic standards do not
require a hazardous shipping fee
except where noted.

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. Contact Technical Service for additional information.

Organometallic Standards

AA, ICP, DCP & XRF Analysis

Sulfur and Metals in Oil

Test Method A - ICP with an Organic Solvent Specimen Solution

Sulfur and Metals in Mineral Oil

Designed for ASTM D5708					
ASTM-P-0102-SET 12 x 100 mL					
Cat. No.	Sulfur (Wt. %)	Iron (µg/g)	Nickel (µg/g)	Vanadium (µg/g)	100 mL
ASTM-P-0102-01	0.00	0.00	0.00	0.00	
ASTM-P-0102-02	0.50	300	10.0	500	
ASTM-P-0102-03	1.00	500	100	25.0	
ASTM-P-0102-04	0.00	100	80.0	250	
ASTM-P-0102-05	2.00	200	40.0	100	
ASTM-P-0102-06	2.50	400	5.00	400	
ASTM-P-0102-07	3.00	0.00	60.0	300	
ASTM-P-0102-08	3.50	500	0.00	200	
ASTM-P-0102-09	0.00	100	100	0.00	
ASTM-P-0102-10	4.50	300	50.0	250	
ASTM-P-0102-11	5.00	200	20.0	500	
ASTM-P-0102-12	5.50	50.0	100	50.0	

Sulfur and Metals in Residual Fuel Oil

Designed for ASTM D5708					
ASTM-P-0103-SET 12 x 100 mL					
Cat. No.	Sulfur (Wt. %)	Iron (µg/g)	Nickel (µg/g)	Vanadium (µg/g)	100 mL
ASTM-P-0103-01	0.00	0.00	0.00	0.00	
ASTM-P-0103-02	0.50	300	10.0	500	
ASTM-P-0103-03	1.00	500	100	25.0	
ASTM-P-0103-04	0.00	100	80.0	250	
ASTM-P-0103-05	2.00	200	40.0	100	
ASTM-P-0103-06	2.50	400	5.00	400	
ASTM-P-0103-07	3.00	0.00	60.0	300	
ASTM-P-0103-08	3.50	500	0.00	200	
ASTM-P-0103-09	0.00	100	100	0.00	
ASTM-P-0103-10	4.50	300	50.0	250	
ASTM-P-0103-11	5.00	200	20.0	500	
ASTM-P-0103-12	5.50	50	100	50.0	

Stock Multi-Element Standard in Mineral Oil

D-5863-95B-10X-1 1 x 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 1 x 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.%)	100 mL
ASTM-P-0104-01	0.0005	
ASTM-P-0104-02	0.0025	
ASTM-P-0104-03	0.0050	
ASTM-P-0104-04	0.0075	
ASTM-P-0104-05	0.0100	
ASTM-P-0104-06	0.0125	
ASTM-P-0104-07	0.0150	
ASTM-P-0104-08	0.0175	
ASTM-P-0104-09	0.0200	

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.%)	100 mL
ASTM-P-0105-01	0.0000	
ASTM-P-0105-02	0.0300	
ASTM-P-0105-03	0.0400	
ASTM-P-0105-04	0.0500	
ASTM-P-0105-05	0.0600	
ASTM-P-0105-06	0.0800	
ASTM-P-0105-07	0.1000	

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.%)	100 mL
ASTM-P-0106-01	0.0000	
ASTM-P-0106-02	0.0005	
ASTM-P-0106-03	0.0010	
ASTM-P-0106-04	0.0025	
ASTM-P-0106-05	0.0050	
ASTM-P-0106-06	0.0075	
ASTM-P-0106-07	0.0100	

Internal Standard

ASTM-P-0107-5 500 mL
Manganese @ 0.05 Wt. % in Xylene-Mineral Oil

Organometallic Standards

AA, ICP, DCP & XRF Analysis

Lubricating Oil Standards

Elements in Lubricating Oil

ASTM-P-0108-SET

17 x 100 mL

Designed for ASTM D4927, D6443 & D6481

Cat. No.	Ca		P		S		Zn	
	Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(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				

Elements in Lubricating Oil

ASTM-P-0109-SET

17 x 100 mL

Designed for ASTM D4927, D6443 & D6481

Cat. No.	Ca		Cl		P		S		Zn	
	Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(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					

Elements in Lubricating Oil

ASTM-P-0110-SET

17 x 100 mL

Designed for ASTM D4927, D6443 & D6481

Cat. No.	Ba		Ca		P		S		Zn	
	Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(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					

Elements in Lubricating Oil

ASTM-P-0111-SET

17 x 100 mL

Designed for ASTM D4927, D6443 & D6481

Cat. No.	Ba		Ca		Cl		P		S		Zn	
	Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(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						

Elements in Lubricating Oil

ASTM-P-0112-SET

17 x 100 mL

Designed for ASTM D4927, D6443 & D6481

Cat. No.	Ca		Mg		P		S		Zn			
	Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(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							

Elements in Lubricating Oil

ASTM-P-0113-SET

17 x 100 mL

Designed for ASTM D4927, D6443 & D6481

Cat. No.	Ba		Ca		Mg		P		S		Zn	
	Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(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						

Organometallic Standards

AA, ICP, DCP & XRF Analysis

Lubricating Oil Standards (Continued)

Elements in Lubricating Oil

ASTM-P-0114-SET

17 x 100 mL

Designed for ASTM D4927, D6443 & D6481

Cat. No.	Ca (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (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

Elements in Lubricating Oil

ASTM-P-0115-SET

17 x 100 mL

Designed for ASTM D4927, D6443 & D6481

Cat. No.	Ca (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (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

Elements in Lubricating Oil

ASTM-P-0116-SET

11 x 100 mL

Designed for ASTM D6481

Cat. No.	Ca (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
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

Elements in Lubricating Oil

ASTM-P-0117-SET

10 x 100 mL

Designed for ASTM D6443

Cat. No.	Ca (Wt.%)	Cl (Wt.%)	Cu (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
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

Elements in Lubricating Oil

ASTM-P-0118-SET

10 x 100 mL

Designed for ASTM D4628, D4927, D4951, D6443

Cat. No.	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

Organometallic Standards

AA, ICP, DCP & XRF Analysis

Lubricating Oil Standards (Continued)

Elements in Lubricating Oil

ASTM-P-0119-SET

22 x 100 mL

Designed for ASTM D4927, D6443, D6481 & D7751

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

Standards of Interest

Concentrations for the sets on pages 371-374 are targets. Actual production lots may vary.

Metal Working Fluids

ASTM-P-0121-SET

13 x 100 mL

Cat. No.	Cl	P	S
Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)
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

Elements in Lubricating Oil

ASTM-P-0120-SET

23 x 100 mL

Designed for ASTM D4927, D6443 & D6481

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

Elements in Lubricating Oil

ASTM-P-0127-SET

11 x 100 mL

Designed for Test Method IP 501

Cat #	Al	Ca	Fe	Na	Ni	P	S	Si	V	Zn
Nominal Value	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)	(Wt.%)
ASTM-P-0127-01	0.0005	0.0010	0.0250	0.0010	0.0050	0.0020	5.0000	0.0050	0.0075	0.0010
ASTM-P-0127-02	0.0100	0.0075	0.0100	0.0000	0.0005	0.0005	2.0000	0.0100	0.0300	0.0002
ASTM-P-0127-03	0.0010	0.0100	0.0000	0.0020	0.0000	0.0010	0.5000	0.0000	0.0350	0.0050
ASTM-P-0127-04	0.0025	0.0030	0.0050	0.0200	0.0075	0.0050	4.0000	0.0250	0.0050	0.0040
ASTM-P-0127-05	0.0075	0.0040	0.0150	0.0005	0.0100	0.0075	0.3000	0.0200	0.0000	0.0015
ASTM-P-0127-06	0.0050	0.0000	0.0075	0.0015	0.0040	0.0100	1.0000	0.0030	0.0100	0.0075
ASTM-P-0127-07	0.0150	0.0050	0.0200	0.0100	0.0020	0.0040	0.7250	0.0150	0.0010	0.0000
ASTM-P-0127-08	0.0000	0.0005	0.0010	0.0000	0.0010	0.0000	0.1000	0.0010	0.0200	0.0020
ASTM-P-0127-09	0.0025	0.0020	0.0005	0.0050	0.0150	0.0025	2.5000	0.0050	0.0005	0.0005
ASTM-P-0127-10	0.0050	0.0150	0.0025	0.0150	0.0025	0.0015	3.0000	0.0025	0.0025	0.0010
ASTM-P-0127-11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Custom Quotation Request Form

Company :

Contact : Job Function:

Address :

Postal Code: Town: Country:

Telephone : FAX :

Email : URL :

Area of Interest :

Product Description :

Concentration :

Matrix :

Concentration Units :

- ng/ml
- µg/ml
- mg/ml
- wt. %
- vol. %

Requested Quantity :

Organic	Inorganic
<input type="checkbox"/> 5 x 1 ml	<input type="checkbox"/> ___ x 500 ml
<input type="checkbox"/> Others ___ x ___	

Component(s)

Concentration (if various)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

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The logo for TECHLAB is presented in a white rectangular box. The word "TECHLAB" is written in a bold, sans-serif font. The letters "T", "E", "C", "H", and "A" are blue, while the letters "L" and "B" are grey. The logo is centered in the lower half of the page, which has a background split diagonally from the top-left to the bottom-right, with blue on the upper-left and grey on the lower-right.

TECHLAB

Matériaux de Référence certifiés et Equipements de Laboratoire

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