

Petrochemical Standards

Table of Contents

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.

ASTM Listing and Cross References	264-268
Physical Properties	266-267
Sulfur Standards	268-270
PIANO	271
Detailed Hydrocarbon Analysis and SIM DIS	272
ASTM Reference Standards	273-301
Diisocyanates	296
UOP Standards	302
Miscellaneous - Skinner List, Fire Debris	303
Biofuels	304-306
TPH, Fuels and Hydrocarbons	307-310
Brownfield Regulation and ISO/DIS 9337	310
LUFT/LUST (UST) Methods - State Specific, GRH, DRH - TPH	311-324
Oil, Grease & TPH - EPA Methods 1664, 413.2/418.1 and 8440	324
Wear Metals (Organometallics) and Lubricating Oils See Inorganic Section	375-383





ASTM Table of Contents

ASTM Methods

ASTM #	Related Method Description	Page	ASTM #	Related Method Description	Page
	Cross Reference Tables (ASTM,IP,ISO,DIN,JIS,AFNOR)	265	D5307	Boiling Range Distribution of Crude Petroleum by GC	279
	PIANO, PONA, PNA by GC	271	D5441	MtBE Analysis by GC	280
D56	Flash Point by TAG Closed Cup	266	D5442	Petroleum Waxes by GC	281
D86	Synthetic Distillation Standard	266	D5443	PNA Analysis by Multidimensional GC	281
D92	Flash Point Standards (COC)	266	D5453	Sulfur by Ultra Violet Fluorescence	268-269, 281, 301
D93	Flash Point Standards (PMCC)	266	D5480	Engine Oil Volatility by GC	282
D445	Viscosity Calibration Standard	266	D5482	Vapor Pressure Standards	279, 282
D611	Aniline Point Standard	266	D5501	Ethanol Analysis by GC	282
D1015	Freezing Point Standards	266	D5580	Aromatics by GC	283
D1319	Olefin Analysis by FIA	267	D5599	Oxygenates by OFID	284-286
D1744	Water in Liquid Petroleum Products	267	D5600	Trace Metals by ICP	370
D2386	Freezing Point Calibration Standards	266	D5622	Oxygenates by Reductive Pyrolysis	287
D2500	Cloud Point Calibration Standards	267	D5623	Sulfur Compounds by Sulfur Selective Detection	287
D2622	Sulfur by XRF	268-269	D5708	Trace Metals by ICP	287, 379
D2789	Hydrocarbon Analysis in Gasoline by GC/MS	272	D5762	Nitrogen by Chemiluminescence	287
D2887	Boiling Range by GC	272, 275	D5769	Aromatics by GC/MS	288-295
	Simulated Distillation (SIM DIS) by GC		D5771	Cloud Point of Petro Products	267
D3120	Sulfur by Oxidative Microcoulometry	268-269, 273	D5772	Cloud Point of Petro Products (Linear Cooling Rate)	267
D3230	Salts in Crude Oil	273, 383	D5773	Cloud Point of Petro Products (Constant Cooling Rate)	267
D3231	Phosphorus in Gasoline	375	D5836	Diisocyanates	296
D3237	Lead in Gasoline by AA	273, 383	D5863	Ni, V, Fe & Na in Crude Oils and Residual Fuels by AA	296, 379
D3246	Sulfur in Petroleum Gas by Oxidative Microcoulometry	268-269, 273	D5972	Freezing Point Aviation Fuels	266
			D5986	Oxygenates and Aromatics by GC/FTIR	296
D3524	Diesel Fuel Diluent in Used Diesel Engine Oils by GC	273	D6042	Plastic Packaging Testing	91
D3605	Trace Metal in Gas Turbine Fuels by AA	383	D6160	PCBs by GC	297
D3606	Benzene & Toluene in Finished Motor & Aviation Gas by GC	274	D6258	Solvent Red 164 Dye Concentration in Diesel Fuels	297
D3710	Boiling Range by GC	275	D6293	Oxygenates (O-PONA) in Engine Fuels by GC	297
D3798	p-Xylene Analysis by GC	275	D6296	Total Olefins in Spark Ignition Engine Fuels by GC	298
D3831	Manganese in Gasoline by AA	275, 383	D6304	Water in Liquid Petro Products	267, 298
D4059	PCB Analysis by GC	275	D6334	Sulfur in Gasoline by Wavelength WD-XRF	268-268, 298
D4291	Ethylene Glycol by GC	276	D6352	Boiling Range Distribution of Petroleum	298
D4294	Sulfur by ED-XRF	268-269, 276	D6378	Vapor Pressure	299
D4377	Water in Liquid Petroleum Products	267, 276	D6379	Aromatic Hydrocarbon by HPLC	299
D4420	Aromatics in Gasoline by GC	276	D6417	Engine Oil by GC	299
D4628	Wear Metals in Lube Oil	276	D6428	Sulfur by ECD	299
D4629	Nitrogen by Chemiluminescence	276	D6443	Metals in Oil	299, 381-382
D4815	Oxygenates in Gasoline by GC	277	D6445	Sulfur in Gasoline by ED-XRF	268-269, 299
D4927	Wear Metals and Additives by WD-XRF	277, 380-382	D6481	Lube Oils by ED-XRF	299, 380-382
D4928	Water in Liquid Petroleum Products	267, 277	D6550	Olefin Content of Gasoline by SFC	299
D4951	Wear Metals and Additives by ICP	277, 381-382	D6584	(EN14105) Free and Total Glycerin	300
D5056	Trace Metals in Petroleum Coke by AA	277, 375	D6591	(IP 391) Aromatic Hydrocarbon by HPLC	300
D5059	Lead in Gasoline by X-Ray Spectroscopy	278	D6751	Sulfur in Biodiesel	301
D5134	Petroleum Naphthas through n-Nonane by GC	278	D7065	Nonylphenol and Octylphenol	261
D5184	Al and Si by ICP-AES & AA	278, 370	D7485	Nonylphenol and Octylphenol	261
D5185	Wear Metals and Additives by ICP	278, 375			
D5186	Aromatics by SFC	278	E1064	Water in Petroleum	267
D5188	Vapor - Liquid Ratio Temperature	279	E1387	Fire Debris Analysis	303
D5191	Vapor Pressure Standards	279, 282	E1618	Fire Debris Analysis	303

Sulfur Standards Group

D2622	Sulfur by XRF
D3120	Sulfur by Oxidative Microcoulometry
D3246	Sulfur in Petro Gas by Oxidative Microcoulometry
D4294	Sulfur by ED-XRF
D5453	Sulfur by Ultra Violet Fluorescence
D5623	Sulfur Compounds by Sulfur Selective Detection
D6334	Sulfur in Gasoline by Wavelength WD-XRF
D6445	Sulfur in Gasoline by ED-XRF



Wear Metals Group

D3605	Trace Metals in Gas Turbine Fuel by AA
D4628	Wear Metals in Lube Oil
D4927	Wear Metals and Additives by WDXRF
D4951	Wear Metals and Additives by ICP
D5185	Wear Metals and Additives by ICP
D5708	Trace Metals by ICP
D5863	Trace Metals by AA
D6443	Metals in Oil
D6481	Lube Oils by ED-XRF



Additional Methods

Motor Oil Standards	308
Chlorine in Lube Oil	277
Method 1664, Oil, Grease and TPH	324
Method 413.2, 418.1 and TPH Analysis	324
Method 8440 TPH Analysis	324
Method 1004 Alcohol Oxidation Products in Engine Exhaust	312



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

In addition, AccuStandard can prepare, package and ship products for both ASTM PTP's (proficiency testing programs) and round robin studies. Please contact our Technical Service Department for more information.

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

Shipping Symbols

- ▲ Hazardous fee required.
- ▼ Hazardous fee not required
- * A ColdPAK is required
- ✖ Can not be shipped by Air
- ✈ Reformulated to ship by Air



On site Viscosity testing



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

Note: nominal 250 mL fill

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
		ASTM-P-126-VAP ▲	2 x 500 mL
4	Distillation Standard	ASTM-P-127-01 ▲	250 mL
		ASTM-P-127-02 ▲	500 mL

Note: nominal 500 mL fill, or 250 mL fill



Distillation apparatus

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

Note: nominal 500 mL fill

ASTM D611 Aniline Point Standards

The accuracy of 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

Technical Note

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

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

Note: nominal 250 mL fill

▲ Hazardous fee required.



ASTM D1319 Calibration Standards by Fluorescent Indicator Adsorption FIA

Olefin FIA Calibration Curve

FIA-CAL-SET

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

Set of 7 x 1 mL

D1319
Meets
EPA Guidelines
for RFG
Analysis

	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

FIA-OLE-5ML

	Vol. %		Vol. %
1-Pentene	33.3	1-Heptene	33.3
2,3-Dimethyl-2-butene	33.3		

1 x 1 mL

1 x 5 mL

3 comps.

Vol. %

Vol. %

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

FIA-PAR-5ML

1 x 1 mL

1 x 5 mL

8 comps.

	Vol. %		Vol. %
<i>n</i> -Pentane	8	2,3-Dimethylpentane	14
<i>n</i> -Hexane	9	Isooctane	16
Cyclohexane	15	<i>n</i> -Octane	14
<i>n</i> -Heptane	14	<i>n</i> -Decane	7

FIA Aromatic Standard

FIA-ARO

FIA-ARO-5ML

1 x 1 mL

1 x 5 mL

10 comps.

	Vol. %		Vol. %
Benzene	4	<i>m</i> -Xylene	16
Toluene	32	1,2,4-Trimethylbenzene	8
Ethylbenzene	8	1,3,5-Trimethylbenzene	8
<i>p</i> -Xylene	8	1,2,4,5-Tetramethylbenzene	4
<i>o</i> -Xylene	8	Naphthalene	4

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

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.



Karl Fischer titrator

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.



Cloud Point



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.

Traceability, Quality and Certification

All sulfur standards are manufactured from the highest quality raw materials, including well characterized starting materials and the lowest sulfur matrices available. Most 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				PAK	
µg/g	Wt. %	Cat. No.	100 mL	Cat. No.	5 x 20 mL
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	

Set of above SWMO-CAL-100ML-SET
19 x 100 mL

At stated concentration
5 x 20 mL ea

Sulfur in Light Weight Mineral Oil (20 cSt)

Ready-to-Use

Concentration				PAK	
µg/g	Wt. %	Cat. No.	100 mL	Cat. No.	5 x 20 mL
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	

Set of above SWMO-LT-CAL-100ML-SET
19 x 100 mL

At stated concentration
5 x 20 mL

Sulfur in #2 Diesel Fuel

Ready-to-Use

Concentration		100 mL		PAK 5 x 20 mL	
µg/g	Wt. %	Cat. No.		Cat. No.	
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	

Set of above SDF-CAL-100ML-SET
19 x 100 mL

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

Individual Sulfur Standards 100 mL Bottle

At stated concentration
5 x 20 mL

▲ Hazardous fee required.

Sulfur in Light Distillate Kerosene

Ready-to-Use

Concentration				PAK	
µg/g	Wt. %	Cat. No.	100 mL	Cat. No.	5 x 20 mL
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	

Set of above SK-CAL-100ML-SET ▲
12 x 100 mL

At stated conc.
5 x 20 mL

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 correction and should be purchased with the standard.

Custom Concentrations

AccuStandard can custom design a sulfur set for your specific needs. Contact our Technical Service Department for assistance or additional information.



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

Sulfur in Heavy Distillate Kerosene

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

Technical Note

Sulfur introduced using di-*n*-butyl sulfide

Set of above 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 correction and should be purchased with the standard.

ASTM D2622, D4294 Sulfur Calibration

Sulfur Calibration Standards for Gasoline & Reformulated Gasoline Analysis

In Isooctane

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 ▲

100 mL

In Isooctane

STP-CAL-100ML-SET ▲

Individual Bottles

13 x 100 mL

Set of 13 bottles

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

D-3120-92-CAL-SET

8 x 1 mL

In Isooctane

Sulfur Conc.	Sulfur Wt. %	Cat. No.
Blank	—	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

Technical Note

Well characterized di-*n*-butyl sulfide is used in a low sulfur Isooctane matrix for this calibration set.

ASTM D2622, D6334, D6445 Sulfur Calibration

Sulfur Calibration Standards used on XRF Energy Dispersive or Wavelength Instruments

Low Level

In Isooctane:Toluene (3:1)

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 ▲

D-2622-LL-CAL-100ML-SET ▲

In Isooctane:Toluene (75:25)

10 x 100 mL

Set of 10 bottles

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 ▲

In Isooctane:Toluene (75:25)

100 mL

Individual Bottles

Technical Note

Thiophene & 2-methyl thiophene are used as starting material in these products.



ASTM Methods - Sulfur in Oil

Sulfur in Crude Oil Standards

$\mu\text{g/g}$	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 ▲
In Crude oil

8 x 100 mL
Set of 8 individual bottles

Sulfur in Residual Oil Standards

$\mu\text{g/g}$	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
In Residual oil

x 100 mL
Set of 7 individual bottles

ASTM Methods Sulfur in Aromatic Hydrocarbons

Total Sulfur in Aromatic Compounds by Hydrogenolysis & Rateometric Colorimetry

ASTM-P-0010-PAK

5 x 1 mL

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

Sulfur (as Dibenzothiophene)

ASTM-SSTDA/B-SET
in isooctane

10 x 2 mL
Set of 10 bottles

Sulfur	Cat. No. (2 mL)
Sulfur Blank	ASTM-SSTDA-BL
Sulfur @ 0.5 $\mu\text{g/g}$ in Isooctane	ASTM-SSTDA-01
Sulfur @ 1.0 $\mu\text{g/g}$ in Isooctane	ASTM-SSTDA-02
Sulfur @ 2.5 $\mu\text{g/g}$ in Isooctane	ASTM-SSTDA-03
Sulfur @ 5.0 $\mu\text{g/g}$ in Isooctane	ASTM-SSTDA-04
Sulfur Blank	ASTM-SSTDDB-BL
Sulfur @ 5.0 $\mu\text{g/g}$ in Isooctane	ASTM-SSTDDB-01
Sulfur @ 10.0 $\mu\text{g/g}$ in Isooctane	ASTM-SSTDDB-05
Sulfur @ 25.0 $\mu\text{g/g}$ in Isooctane	ASTM-SSTDDB-06
Sulfur @ 50.0 $\mu\text{g/g}$ in Isooctane	ASTM-SSTDDB-07

Standards of Interest

We can provide **Ready-to-Inject** working level calibration standards to meet unique laboratory applications.



AccuStandard is an active member in ASTM and strives to keep abreast of ASTM method revisions. If our listed formulation does not meet the most recent method revision, please contact Technical Support for an updated product.

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 correction and should be purchased with the standard.



Antek 900 Series Sulfur Analyzer



XOS Optical Systems, Sulfur Analyzer (Monochromatic Wavelength-Dispersive X-Ray Fluorescence Spectrometer)

▲ Hazardous fee required.



PIANO/PONA analysis is useful for fuel type differentiation as well as for estimating alteration by weathering and biodegradation. These complex mixes are prepared from materials of the highest available purity, accurate to four decimal places, and include a detailed data sheet on the formulation composition. The exact composition on a weight % basis for each analyte is provided on the certificate.

Products are prepared and certified gravimetrically.

- All weights are traceable through the National Institute of Standards and Technology.
- The uncertainty value is +/- 1% and is determined in accordance with the CITAC guide to quantifying Uncertainty in Analytical Measurement and is reported as an Expanded Uncertainty [U(Ccd)]. Assuming a normal distribution, a coverage factor K=2 (95% confidence level) is used in the calculation.

PIANO / PONA Analysis

PIANO Mix Set

ASTM-PIANO-R1-SET

6 x 100 µL

Set includes the following ASTM-P-0030, ASTM-P-0031, ASTM-P-0032, ASTM-P-0033, ASTM-P-0034, ASTM-P-0035

PIANO *n*-Paraffins Mix

ASTM-P-0031-R1

1 mL

11 paraffins listed below at varying Wt. % typically in the range from 7.0 to 11.0 Wt. %. The actual certificate will have the exact Wt. % for each analyte.

	Typ. Wt. %
<i>n</i> -Pentane	9.4375
<i>n</i> -Hexane	9.5661
<i>n</i> -Heptane	9.8048
<i>n</i> -Octane	9.5518
<i>n</i> -Nonane	9.0482
<i>n</i> -Decane	9.2517
<i>n</i> -Undecane	9.3172
<i>n</i> -Dodecane	9.1855
<i>n</i> -Tridecane	8.9332
<i>n</i> -Tetradecane	8.7989
<i>n</i> -Pentadecane	7.1057

PIANO Isoparaffins Mix

ASTM-P-0032-R1

100 µL

35 Isoparaffins listed below at varying Wt. % typically in the range from 0.5 to 6.0 Wt. %. The actual certificate will have the exact Wt. % for each analyte.

	Typ. Wt. %		Typ. Wt. %		Typ. Wt. %
Isopentane	2.1928	2,2-Dimethylhexane	1.3061	2,3-Dimethylheptane	1.4870
2,3-Dimethylbutane	0.4466	2,5-Dimethyl hexane	3.6975	3,4-Dimethylheptane	3.7450
2-Methylpentane	3.2815	2,2,3-Trimethylpentane	1.7371	2-Methyloctane	3.7576
3-Methylpentane	5.3865	2,4-Dimethylhexane	1.6252	3-Methyloctane	5.6020
2,2-Dimethylpentane	1.7747	2,3-Dimethylhexane	1.6212	3,3-Diethylpentane	1.5755
2,4-Dimethylpentane	3.6993	2-Methylheptane	4.4073	2,2-Dimethyloctane	3.4135
2,2,3-Trimethylbutane	3.9291	4-Methylheptane	3.2015	3,3-Dimethyloctane	3.2582
3,3-Dimethylpentane	1.1848	3-Methylheptane	5.5186	2,3-Dimethyloctane	3.8842
2-Methylhexane	2.2384	3-Ethylhexane	0.6999	3-Ethylheptane	3.7482
2,3-Dimethylpentane	1.7883	3,3-Dimethylheptane	1.7011	2-Methylnonane	3.7144
3-Methylhexane	1.6708	2,5-Dimethylheptane	5.6731	3-Methylnonane	5.7687
3-Ethylpentane	0.5080	3,5-Dimethylheptane	0.7565		

PIANO Aromatics Mix

ASTM-P-0033-R1

100 µL

38 Aromatics listed below at varying Wt. % typically in the range from 0.2 to 7.0 Wt. %. The actual certificate will have the exact Wt. % for each analyte.

	Typ. Wt. %
Benzene	3.45
Toluene	4.5738
Ethylbenzene	6.7670
<i>m</i> -Xylene	2.2259
<i>p</i> -Xylene	4.4815
<i>o</i> -Xylene	2.2519
Isopropylbenzene	2.2248
<i>n</i> -Propylbenzene	4.4979
1-Methyl-3-ethylbenzene	2.2243
1-Methyl-4-ethylbenzene	2.2206
1,3,5-Trimethylbenzene	1.1076
1-Methyl-2-ethylbenzene	2.2611
1,2,4-Trimethylbenzene	2.2535
<i>tert</i> -Butylbenzene	4.5310
Isobutylbenzene	4.4216
<i>sec</i> -Butylbenzene	2.2368
1-Methyl-3-isopropylbenzene	1.1066
1-Methyl-4-isopropylbenzene	1.0668
1-Methyl-2-isopropylbenzene	1.1241
1-Methyl-3- <i>n</i> -propylbenzene	2.1135
1-Methyl-4- <i>n</i> -propylbenzene	2.2336
<i>n</i> -Butylbenzene	2.2087
1,2-Diethylbenzene	1.0947
1-Methyl-2- <i>n</i> -propylbenzene	2.2641
1,4-Dimethyl-2-ethylbenzene	2.2803
1,3-Dimethyl-5-ethylbenzene	2.2858
1,2-Dimethyl-4-ethylbenzene	2.2558
1,3-Dimethyl-2-ethylbenzene	1.1416
1,2-Dimethyl-3-ethylbenzene	2.1864
1,2,4,5-Tetramethylbenzene	0.2360
2-Methylbutylbenzene	1.1453
1- <i>tert</i> -Butyl-2-methylbenzene	0.7641
<i>n</i> -Pentylbenzene	4.4828
1- <i>tert</i> -Butyl-3,5-dimethylbenzene	2.1641
1- <i>tert</i> -Butyl-4-ethylbenzene	2.2322
1,3,5-Triethylbenzene	4.5671
1,2,4-Triethylbenzene	1.1087
<i>n</i> -Hexylbenzene	4.5029

PIANO Naphthenes Mix

ASTM-P-0034-R1

100 µL

30 Naphthenes listed below at varying Wt. % typically in the range from 0.5 to 8.0 Wt. %. The actual certificate will have the exact Wt. % for each analyte.

	Typ. Wt. %
Cyclopentane	4.9143
Methylcyclopentane	3.2829
Cyclohexane	5.3268
1,1-Dimethylcyclopentane	3.4612
<i>cis</i> -1,3-Dimethylcyclopentane	0.5963
<i>trans</i> -1,2-Dimethylcyclopentane	1.4715
<i>trans</i> -1,3-Dimethylcyclopentane	2.7531
Methylcyclohexane	5.6091
Ethylcyclopentane	3.5534
<i>ctc</i> -1,2,3-Trimethylcyclopentane	1.5859
<i>cct</i> -1,2,4-Trimethylcyclopentane	3.7208
<i>ctc</i> -1,2,4-Trimethylcyclopentane	1.6467
<i>trans</i> -1,4-Dimethylcyclohexane	3.6499
1-Ethyl-1-methylcyclopentane	1.0554
<i>trans</i> -1,2-Dimethylcyclohexane	1.6537
<i>ccc</i> -1,2,3-Trimethylcyclopentane	0.7971
Isopropylcyclopentane	3.5042
<i>cis</i> -1,2-Dimethylcyclohexane	3.7159
<i>n</i> -Propylcyclopentane	3.6438
<i>ccc</i> -1,3,5-Trimethylcyclohexane	3.5263
1,1,4-Trimethylcyclohexane	3.6791
<i>ctt</i> -1,2,4-Trimethylcyclohexane	3.6107
<i>ctc</i> -1,2,4-Trimethylcyclohexane	3.5069
1,1,2-Trimethylcyclohexane	3.3354
Isobutylcyclopentane	3.7123
Isopropylcyclohexane	5.7233
<i>n</i> -Butylcyclopentane	3.6944
Isobutylcyclohexane	5.6729
<i>t</i> -1-Methyl-2-propylcyclohexane	3.8434
<i>t</i> -1-Methyl-2-(4MP)cyclopentane	3.7534

PIANO Olefins Mix

ASTM-P-0035-R1

100 µL

25 Olefins listed below at varying Wt. % typically in the range from 1.2 to 9.0 Wt. %. The actual certificate will have the exact Wt. % for each analyte.

	Typ. Wt. %
3-Methyl-1-butene	1.9396
1-Pentene	4.1355
Cyclohexyl-1-butene	1.4440
2-Methyl-1,3-butadiene	2.3889
<i>trans</i> -2-Pentene	1.8034
<i>cis</i> -2-Pentene	1.9792
4-Methylpentene-1	3.4372
1-Hexene	7.0484
<i>trans</i> -2-Hexene	1.7302
2-Methylpentene-2	3.3901
<i>cis</i> -2-Hexene	3.8765
1-Heptene	7.6134
<i>trans</i> -3-Heptene	3.3469
<i>cis</i> -3-Heptene	5.8657
<i>trans</i> -2-Heptene	3.7217
<i>cis</i> -2-Heptene	5.7679
1-Octene	7.6901
<i>trans</i> -2-Octene	1.9432
<i>cis</i> -2-Octene	3.9502
1-Nonene	7.6425
<i>trans</i> -3-Nonene	1.9972
<i>cis</i> -3-Nonene	4.0042
<i>trans</i> -2-Nonene	1.9848
<i>cis</i> -2-Nonene	2.7952
1-Decene	8.2053

Technical Note

PIANO analytes may be added and/or subtracted and may vary by weight percentage. The certificate will reflect the exact analyte composition.

PIANO Mixture

ASTM-P-0030-R1

100 µL

139 comps.

The PIANO formulation contains the *n*-Paraffins, Isoparaffins, Aromatics, Naphthenes, and Olefins:

ASTM-P-0031-R1, ASTM-P-0032-R1, ASTM-P-0033-R1, ASTM-P-0034-R1, ASTM-P-0035-R1. Approximate weight %s for the total: *n*-Paraffins 18.5%, Isoparaffins 17.9%, Aromatics 23.6%, Naphthenes 20.9%, Olefins 19.0%. The certificate lists the weight % for all analytes in the formulation.



ASTM

Detailed Hydrocarbon Analysis

ASTM D2789 Hydrocarbon Types in Low Olefinic Gas by MS

Hydrocarbon Mixture

D-2789-CTM

D-2789-CTM-PAK

SAVE

1 x 1 mL

5 x 1 mL

9 comps.

Technical Note

Actual volume percent ratio and the final weight fractions for each analyte will be listed on the certificate.

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

ASTM D2887 Boiling Range Distribution of Petroleum Fractions by GC

Calibration Mixture

DRH-002N

DRH-002N-10X

100 mg

1 gm

17 comps.

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

Hydrocarbon Window Defining Standard

DRH-008S-R2

DRH-008S-R2-PAK

SAVE

500 µg/mL each in Chloroform

1 x 1 mL

5 x 1 mL

35 comps.

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

Fuel Oil Degradation/Retention Time Mix for Quantification of C₁₇/Pristane & C₁₈/Phytane ratios

DRH-005S-10X

2.0 mg/mL each in CH₂Cl₂:CS₂ (1:1)

DRH-005S-R1-10X

DRH-005S-R1-10X-PAK

2.0 mg/mL each in Chloroform

1 x 1 mL

4 comps.

1 x 1 mL

5 x 1 mL

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 C₃₀ odd and even alkanes. Measuring the C₁₇/pristane and C₁₈/phytane ratios can be used to estimate fuel oil degradation.

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

Column Test Mixture

D-2887

1% w/v in *n*-Octane

1 x 1 mL

2 comps.

n-Hexadecane *n*-Octadecane

Reference Gas Oil Sample Lot #2

D-2887-REFOIL

1 x 1 mL

Calibration Solutions

DRH-002S-R1

DRH-002S-R1-PAK

At stated conc. in Chloroform



SAVE

1 x 1 mL

5 x 1 mL

17 comps.

	µg/mL		µg/mL
<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./Wt. each in Chloroform



SAVE

1 x 1 gm

5 x 1 gm

20 comps.

<i>n</i> -Tetratetracontane	<i>n</i> -Octadecane	<i>n</i> -Octane
<i>n</i> -Tetracontane	<i>n</i> -Hexadecane	<i>n</i> -Heptane
<i>n</i> -Hexatriacontane	<i>n</i> -Tetradecane	<i>n</i> -Hexane
<i>n</i> -Dotriacontane	<i>n</i> -Dodecane	<i>n</i> -Pentane
<i>n</i> -Octacosane	<i>n</i> -Undecane	<i>n</i> -Pentadecane
<i>n</i> -Tetracosane	<i>n</i> -Decane	<i>n</i> -Heptadecane
<i>n</i> -Eicosane	<i>n</i> -Nonane	



Reformulated to ship by Air

ASTM

Simulated Distillation (SIM DIS)



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

AccuStandard has developed an extensive line of 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
14 comps.

	Wt. %		Wt. %
<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

ASTM-P-0052-PAK **SAVE**

At stated conc. in Carbon disulfide

1 x 1 mL
5 x 1 mL
15 comps.

	Wt. %		Wt. %
<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		



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

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

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

set of 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 correction and should be purchased with the standard.

ASTM D3230 Determination of Salts in Crude Oil

see page 405

ASTM D3237 Lead in Gasoline by AA Spectroscopy

see page 405

ASTM D3246 Sulfur in Petroleum Gas by Oxidative Microcoulometry

see pages 276-279

ASTM D3524 Diesel Fuel Diluent in Used Diesel Engine Oils by GC

Calibration Curve

D-3524-CAL-5ML-SET

D-3524-CAL-10ML-SET

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

Internal Standard

D-3524-IS-10ML

D-3524-IS-10ML-PAK **SAVE**

At stated conc. in *n*-Heptane

	Wt./Wt. %
<i>n</i> -Decane	1.0
<i>n</i> -Octadecane	0.2

Mid Level Daily QC Solution

D-3524-QC-10ML

At stated conc.

	Wt. / Wt. %
# 2 Diesel	5.0
30 W Motor oil	95.0

Column Resolution Mix

D-3524-CR

D-3524-CR-PAK **SAVE**

At stated conc. in *n*-Heptane

	Wt. / Wt. %
<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 405

ASTM D3120-D3605 SIM DIS



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

Aromatics Quantitative Calibration Standards

Without Internal Standards

D-3606-25ML-SET

7 x 25 mL

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



With Internal Standard: MEK

D-3606/IS-SET

7 x 1 mL

D-3606/IS-2ML-SET

7 x 2 mL

D-3606/IS-2ML-SET-PAK

5 x (7 x 2) mL

Analyte	Std. 1	Std. 2	Std. 3	Std. 4	Std. 5	Std. 6	Std. 7
Calibr. range	Target Vol. %	Vol. %	Vol. %	Vol. %	Vol. %	Vol. %	Vol. %
Benzene	0.06 - 5.0	4.8	2.4	1.2	0.6432	0.3168	0.1152
Toluene	0.5 - 20	19.2	14.4	9.6	4.8000	2.4000	0.9600
Isooctane		72.0	79.2	85.2	90.5568	93.2832	94.9248
Methyl ethyl ketone (Internal Std.)	4.0	4.0	4.0	4.0	4.0	4.0	4.0

Aromatics Quantitative Calibration Standard

With Internal Standard: sec Butanol

D-3606/IS2-SET

7 x 1 mL

D-3606/IS2-SET-PAK

5 x (7 x 1) mL

Analyte	Std. 1	Std. 2	Std. 3	Std. 4	Std. 5	Std. 6	Std. 7
Calibr. range	Target Vol. %	Vol. %	Vol. %	Vol. %	Vol. %	Vol. %	Vol. %
Benzene	0.06 - 5.0	4.8	2.4	1.2	0.6432	0.3168	0.1152
Toluene	0.5 - 20	19.2	14.4	9.6	4.8000	2.4000	0.9600
Isooctane		72.0	79.2	85.2	90.5568	93.2832	94.9248
sec Butanol (Internal Std.)	4.0	4.0	4.0	4.0	4.0	4.0	4.0

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

set of 7 x 1 mL

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

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 quantities

4 comps.

Compound	Target Vol. %
Benzene	0.6432
Toluene	4.8000
Isooctane	90.5568
sec-Butanol (Internal Std.)	4.0
	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 quantities

4 comps.

Compound	Target Vol. %
Benzene	0.6432
Toluene	4.8000
Isooctane	90.5568
Methyl ethyl ketone (Internal Std.)	4.0
	100

Without Internal Standard

D-3606-QC-25ML

1 x 25 mL

D-3606-QC-25ML-PAK

5 x 25 mL

Each at stated quantities

3 comps.

Compound	Target Vol. %
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
D-3710-QUAL-PAK **SAVE** 1 x 1 mL
5 x 1 mL
19 comps.

Approx. Wt./ Wt. %	Approx. Wt./ 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
D-3710-PAK **SAVE** 1 x 1 mL
5 x 1 mL
16 comps.

Vol./Vol. %	Vol./Vol. %
<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. in Chloroform

SAVE

1 x 1 mL
5 x 1 mL
17 comps.

Reformulated to ship by Air

µg/mL	µg/mL	µg/mL	µg/mL
<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
D-3798-IS-PAK **SAVE** 1 x 1 mL
5 x 1 mL
At stated conc. by weight 11 comps.

Wt./Wt. %	Wt./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	grams

Without Internal Standard

D-3798-10ML
D-3798-10ML-PAK **SAVE** 1 x 10 mL
5 x 10 mL
At stated conc. by weight 10 comps.

Wt./Wt. %	Wt./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. A custom quotation request form is located in the back of this catalog.

ASTM D3831 Manganese in Gasoline by AA Spectroscopy

see page 383

ASTM D4059 Polychlorinated Biphenyls in Insulating Liquids by GC

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

Aroclor # CAS No.	Conc. ppm w/w	Individual Cat. No. 1 mL	PAK SAVE Cat. No. 5 x 1 mL	Aroclor # CAS No.	Conc. ppm w/w	Individual Cat. No. 1 mL	PAK SAVE 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		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		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
Ethylene glycol

SAVE

5 x 1 mL
5 x 1 mL

ASTM D4294 Sulfur in Petroleum Products by ED-XRF Spectroscopy

see pages 276-279

ASTM D4377 Water in Crude oils by Potentiometric Karl Fischer Titration

see page 267

ASTM D4420 Aromatics in Finished Gasoline by GC

see page 402

Aromatics in Gasoline by GC/TC

D-4420-CAL-SET

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

D-4420-94 D-4420-94-PAK	SAVE	1 x 1 mL 5 x 1 mL 5 comps. Vol. % 3.00 10.00 15.00 15.00 57.00
Benzene		3.00
Toluene		10.00
Total Xylenes (C ₈ aromatics)		15.00
n-Butylbenzene (C ₉ + aromatics)		15.00
Isooctane		57.00

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

see page 380-382

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
Set includes the following Cat. No.s

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

set of 8 x 1 mL
Set includes the following Cat. No.s

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
Set includes the following Cat. No.s

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
Set includes the following Cat. No.s

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 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

set of 5 x 10 mL of 5 component mix

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 (<i>MtBE</i>)	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 of 6 component mix

D-4815/IS-SET-PAK

set of 5 x 1 mL
set of 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 (<i>MtBE</i>)	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 (<i>DME</i>) (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 **SAVE**

5 x 5 mL

1,2-Dimethoxyethane (neat)

**Oxygenate Free Refinery Gasoline
Blank**

RFA-BLNK-10ML

1 x 10 mL

RFA-BLNK-10ML-PAK **SAVE**

5 x 10 mL

RFA Gasoline (neat)

**Quantitative Peak ID and
Retention Time Mixture**

D-4815-RT

1 x 1 mL

D-4815-RT-PAK

SAVE

5 x 1 mL

16 comp. core mix

	Wt. %
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 (<i>MtBE</i>)	4.00
<i>sec</i> -Butanol	7.30
Diisopropyl ether (<i>DIPE</i>)	4.00
Isobutanol	7.30
Ethyl <i>tert</i> -butyl ether (<i>EtBE</i>)	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	7.30
	100

Valve Timing Mixture

D-4815-VT

1 x 1 mL

D-4815-VT-PAK

SAVE

5 x 1 mL

5 comps.

	Wt. %
Methylcyclopentane	10.00
Diisopropyl ether (<i>DIPE</i>)	10.00
Ethyl <i>tert</i> -butyl ether (<i>EtBE</i>)	10.00
Methyl <i>tert</i> -butyl ether (<i>MtBE</i>)	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 380-382

ASTM D4928 Water in Crude Oils by Potentiometric Karl Fischer Titration

see page 267

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

SAVE

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 **SAVE**

5 x 5 mL

1000 µg/mL in Isooctane

Chlorine

Chlorine in Lube Oils

ASTM-P-0092-100ML-SET

Each in 75 cSt mineral oil

ASTM-P-0092-BL-100ML

set of 7 x 100 mL

100 mL

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

ASTM D4951 Additive Elements in Lubricating Oils by Inductively Coupled Plasma Atomic Emission Spectrometry

see page 381-382

ASTM D5056 Trace Metals in Petroleum Coke by AA

see pages 375



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 solutions in Isooctane

7 x 100 mL

Lead Concentration			Cat. No.	100 mL
g Pb/US gal	g Pb/ UK gal	mg Pb/mL		
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

D-5059-IS-10ML-PAK

0.793 mg/mL in Mineral Oil

Bismuth

1 x 100 mL
5 x 10 mL ampules



Technical Note

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

Technical Note

Certificates for D5059 standards have the lead content listed in 3 concentration units.

Part C - Lead in Gasoline Standards

D-5059-C-CAL-100ML-SET ▲

set of 7 x 100 mL

The set contains the following 7 solutions in Isooctane

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

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
7 comps.

	Wt. / Wt. %	Wt. / 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

10% w/w each component

5 x 50 mg
10 comps.

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

ASTM D5184 Al and Si in Fuel Oils by Ashing, Fusion, ICP-AES & AA Spectrometry

see page 370

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

see page 375

ASTM D5186 Aromatic Content & Polynuclear Aromatic Content of Diesel Fuels & Aviation Turbine Fuels by SFC

Performance Solution

D-5186-96-PM

D-5186-96-PM-PAK SAVE

At stated approx. Wt. %

1 x 1 mL

5 x 1 mL

4 comps.

Wt./Wt. %	Wt./Wt. %
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

Set includes the below two Cat. No.'s

#2 Diesel Fuel in n-Hexadecane

25% w/w	D-5186-96-DLC-25X
50% w/w	D-5186-96-DLC-50X

Docosane

D-5186-91-PM-0.4X

20% w/w in Toluene

1 x 1 mL

▲ Hazardous fee required.



ASTM D5188 Vapor - Liquid Ratio Temperature Standards

Performance Check Samples for 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
68.0kPa (9.86 psi)	ASTM-P-124-02-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

Technical Note

Consists of pure solvents with known vapor pressures.

Value Added PAK

Packaged in ready to use quantities.

ASTM D5307 Boiling Range Distribution of Crude Petroleum by GC

Quantitative Paraffins Standard

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

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

Qualitative Paraffins Standard

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

	Wt./Wt. %		Wt./Wt. %
Propane	10	<i>n</i> -Heptane	15
Butane	15	<i>n</i> -Octane	15
<i>n</i> -Pentane	15	<i>n</i> -Nonane	15
<i>n</i> -Hexane	15		

Internal Standard

D-5307-IS-10ML 1 x 10 mL
D-5307-IS-10ML-PAK **SAVE** 5 x 10 mL
4 comps.

	Wt./Wt. %		Wt./Wt. %
<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 **SAVE** 5 x 1 mL
At stated approx. Wt. % 3 comps.

	Wt./Wt. %		Wt./Wt. %
<i>n</i> -Hexadecane	1.0	<i>n</i> -Octane	98.0
<i>n</i> -Octadecane	1.0		

ASTM D5188-D5307





ASTM D5441 Analysis of Methyl tert-butyl ether (MtBE) by GC

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

MtBE Contaminant Standard

Low Concentration

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

tert-Amyl methyl ether
tert-Butanol
tert-Butyl ethyl ether
4,4-Dimethyl-2-neopentyl-1-pentene
Methanol
2-Methylbutane
2-Methyl-2-butene
2,2',4,6,6'-Pentamethyl-3-heptene
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	SAVE	5 x 1 mL
D-5441-10X-5ML		1 x 5 mL
D-5441-10X-5ML-PAK	SAVE	5 x 5 mL
1% Wt./Wt. each in MtBE		12 comps.

tert-Amyl methyl ether
tert-Butanol
tert-Butyl ethyl ether
4,4-Dimethyl-2-neopentyl-1-pentene
Methanol
2-Methylbutane
2-Methyl-2-butene
2,2',4,6,6'-Pentamethyl-3-heptene
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./Wt. each in <i>n</i> -Dodecane	33 comps.

Methanol	MtBE
Isobutylene	2,3-Dimethyl-1-butene
n-Butane	4-Methyl-cis-2-pentene
trans-2-butene	2-Methylpentane
cis-2-butene	Methylethyl ketone
3-Methyl-1-butene	3-Methylpentane
Acetone	sec-Butyl methyl ether
Isopentane	ETBE
2-Propanol	TAME
1-Pentene	3,5-Dimethyl-1-hexene
2-Methyl-1-butene	2,4,4-Trimethyl-1-pentene
n-Pentane	2,4,4-Trimethyl-2-pentene
trans-2-Pentene	3,4,4-Trimethyl-trans-2-pentene
t-Butanol	2,3,4-Trimethyl-2-pentene
cis-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./Wt. each in <i>n</i> -Dodecane	29 comps.

Methanol (0.04 Wt/Wt)	2-Methylpentane
3-Methyl-1-butene	Methyl ethyl ketone
Acetone	3-Methylpentane
Isopentane	sec-Butyl methyl ether
2-Propanol	Ethyl tert-butyl ether
1-Pentene	TAME
2-Methyl-1-butene	3,5-Dimethyl-1-hexene
n-Pentane	2,4,4-Trimethyl-1-pentene
trans-2-Pentene	2,4,4-Trimethyl-2-pentene
t-Butanol	3,4,4-Trimethyl-trans-2-pentene
cis-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-cis-2-pentene	

MtBE Resolution Test Mix

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

trans-2-Pentene cis-Pentene
tert-Butanol



Member

AccuStandard is an active member in ASTM and strives to keep abreast of ASTM method revisions. If our listed formulation does not meet the most recent method revision, contact Technical Service for an updated product.



ASTM D5442 Analysis of Petroleum Waxes by GC

Quantitative Wax Standard

D-5442 1 x 1 mL
D-5442-PAK 5 x 1 mL
At stated Wt. % in Cyclohexane 16 comps.

SAVE

Wt./Wt. %	Wt./Wt.
<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
At stated Wt. % in Cyclohexane 2 comps.

Wt./Wt. %
<i>n</i> -Eicosane 0.05
<i>n</i> -Tetracontane 0.05

Hydrocarbon Standard Brownfield Regulation

D-5442-R1 1 x 1 mL
100 µg/mL each in Cyclohexane 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> -Tetratriacontane
<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
Equal parts by weight 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
Equal parts by weight 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
At stated Wt. % 28 comps.

Wt./Wt. %	Wt./Wt. %	Wt./Wt. %
Cyclopentane 1.00	1cis,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	1cis,2 cis,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
 Contains the following 5 standards in Isooctane

Description	Unit
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
 Contains the following 5 standards in Isooctane

Description	Unit
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
 Contains the following 5 standards in Isooctane

Description	Unit
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

Standards of Interest

ASTM Method D5453 Sulfur as Di-*n*-butyl sulfide in Biodiesel see ASTM D6751.

Real World Sulfur in Various Gasoline & Fuels QC Samples

SBPT-LSGAS-VAP 2 x 15 mL

Parameter	Method	Approx. Range
Sulfur	D-5453-00	0 - 50 µg/g

As the matrix may contain some native sulfur, AccuStandard encourages purchasing sulfur blanks for calibration analysis



ASTM D5480 Engine Oil Volatility by GC

Stock Column Resolution Standard

D-5480-CR-PAK

5 x 1 mL

10 µg/mL each in Carbon disulfide

5 comps.

D-5480-CR-100X-PAK

5 x 1 mL

1000 µg/mL each in Carbon disulfide

5 comps.

n-Decane

n-Octadecane

n-Dodecane

n-Tetracosane

n-Hexadecane

Tetracosane (Solution A)

D-5480-C40-5ML

1 x 5 mL

D-5480-C40-5ML-PAK SAVE

5 x 5 mL

500 µg/mL in Carbon disulfide

D-5480-C40-R1-5ML

1 x 5 mL

D-5480-C40-R1-5ML-PAK SAVE

5 x 5 mL

500 µg/mL in Chloroform

n-Tetracosane

Internal Standard Solution

D-5480-IS-5ML

1 x 5 mL

D-5480-IS-5ML-PAK SAVE

5 x 5 mL

Each comp. at equal weights

3 comps.

n-Decane

n-Dodecane

n-Undecane



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

ASTM D5482 & D5191 Vapor Pressure Standards

Vapor Pressure Quality Control Samples

Vapor Pressure	Cat. No	Set of 10
68.3kPa (9.91 psi)	ASTM-P-124-01	10 x 10 mL
68.0kPa (9.86 psi)	ASTM-P-124-02	10 x 10 mL
51.1kPa (7.41 psi)	ASTM-P-124-03	10 x 10 mL
46.7kPa (6.77 psi)	ASTM-P-124-04	10 x 10 mL
22.5kPa (3.26 psi)	ASTM-P-124-05	10 x 10 mL
7.1kPa (1.03 psi)	ASTM-P-124-06	10 x 10 mL

ASTM D5501 Ethanol Content of Denatured Fuel Ethanol by GC

Denatured Fuel Ethanol Calibration Set

D-5501-94-SET

7 x 1 mL

Comp.1	Wt./ Wt. %	Comp.2	Wt./ Wt. %	Comp.3	Wt./ Wt. %	Unit
Ethanol	92	Methanol	0.6	Heptane	7.4	1 mL
Ethanol	93	Methanol	0.5	Heptane	6.5	1 mL
Ethanol	94	Methanol	0.4	Heptane	5.6	1 mL
Ethanol	95	Methanol	0.3	Heptane	4.7	1 mL
Ethanol	96	Methanol	0.2	Heptane	3.8	1 mL
Ethanol	97	Methanol	0.1	Heptane	2.9	1 mL
Ethanol	98	Methanol	0.05	Heptane	1.95	1 mL

Technical Note

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

ASTM Method D5501-12 Update

D-5501-12-SET

5 x 1 mL

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





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 (of 6 component mix)

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 (of 7 component mix)

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

Valve Timing Calibration Mixes

With Internal Standard

M-GRA-VT/IS-AS

1 x 1 mL

M-GRA-VT/IS-AS-PAK **SAVE**

5 x 1 mL

Each at stated conc.

6 comps.

Wt./Wt. %

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

Without Internal Standard

M-GRA-VT-AS-10ML

1 x 10 mL

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

5 x 10 mL

Each at stated conc.

5 comps.

Wt./Wt. %

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

Internal Standard

M-GRA-IS-AS-5ML

1 x 5 mL

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

5 x 5 mL

2-Hexanone (Neat)

Selectivity Check Standard

M-GRA-SCS-AS

1 x 1 mL

M-GRA-SCS-AS-PAK **SAVE**

5 x 1 mL

Each at stated conc.

2 comps.

Wt./Wt. %

n-Dodecane	1.5
Isooctane	98.5

Daily Quality Control Standard

Without Internal Standard

D-5580-QC-R1-10ML

1 x 10 mL

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

5 x 10 mL

14 comps.

Wt./Wt. %		Wt./Wt. %	
<i>n</i> -Hexane	12	Toluene	9
<i>n</i> -Heptane	20	Ethylbenzene	2
<i>n</i> -Octane	15	<i>p</i> -Xylene	3
<i>n</i> -Decane	10	<i>o</i> -Xylene	2
<i>n</i> -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 **SAVE**

5 x 10 mL

14 comps.

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

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 gasoline 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.



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

of 15 Comp. Mix

SAVE

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

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	---	---
iso-Butanol 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

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.

With Internal Standard

M-GRO-CAL/IS-R1-SET

8 x 1 mL

M-GRO-CAL/IS	Analyte	01-R1 Wt. %	02-R1 Wt. %	03-R1 Wt. %	04-R1 Wt. %	05-R1 Wt. %	06-R1 Wt. %	07-R1 Wt. %	08-R1 Wt. %
Calibration range									
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	--	--
tert-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	0

Technical Note

The revised set formulates the product components and gasoline to 100 mL volume and then adds the Internal Standard for a total volume of 104 mL.



Without Internal Standard

M-GRO-CAL-SET

8 x 10 mL
of 14 Comp. Mix

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	---	---
iso-Butanol 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



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 **SAVE** 5 x 10 mL
 14 comps.

Oxygenate	Target Wt. %	Compound Oxygenate	Target Wt. %
Methanol	1	<i>Di</i> -isopropyl ether	3
Ethanol	1	iso-Butanol	1
Isopropanol	1	EtBE	3
<i>t</i> -Butanol	1	<i>t</i> -Pentanol	1
Propanol	1	Butanol	1
MtBE	3	TAME	3
sec-Butanol	1	RFA Gasoline	79

Revised Daily QC Standard

Without Internal Standard

M-GRO-QC-R-10ML 1 x 10 mL
 M-GRO-QC-R-10ML-PAK **SAVE** 5 x 10 mL
 14 comps.

Oxygenate	Target Wt. %	Oxygenate	Target Wt. %
Methanol	1	<i>Di</i> -isopropyl ether	1
Ethanol	1	iso-Butanol	1
Isopropanol	1	EtBE	3
<i>t</i> -Butanol	1	<i>t</i> -Pentanol	1
Propanol	1	Butanol	1
MtBE	3	TAME	3
sec-Butanol	1	RFA Gasoline	81

D5599
 Meets
 EPA Guidelines
 for RFG
 Analysis

Technical Note

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

Daily QC Standard

With Internal Standard

M-GRO-QC/IS-5ML 1 x 5 mL
 M-GRO-QC/IS-5ML-PAK **SAVE** 5 x 5 mL
 Internal Standard 1,2-Dimethoxyethane is combined in a 4 to 100 weight ratio. 15 comps.

Oxygenate	Target Wt. %	Oxygenate	Target Wt. %
Methanol	1	<i>Di</i> -isopropyl ether	3
Ethanol	1	iso-Butanol	1
Isopropanol	1	EtBE	3
<i>t</i> -Butanol	1	<i>t</i> -Pentanol	1
Propanol	1	Butanol	1
MtBE	3	TAME	3
sec-Butanol	1	RFA Gasoline	79

Revised Daily QC Standard

With Internal Standard

M-GRO-QC-R/IS-5ML 1 x 5 mL
 M-GRO-QC-R/IS-5ML-PAK **SAVE** 5 x 5 mL
 Internal Standard 1,2-Dimethoxyethane is combined in a 4 to 100 weight ratio. 15 comps.

Oxygenate	Target Wt. %	Oxygenate	Target Wt. %
Methanol	1	<i>Di</i> -isopropyl ether	1
Ethanol	1	iso-Butanol	1
Isopropanol	1	EtBE	3
<i>t</i> -Butanol	1	<i>t</i> -Pentanol	1
Propanol	1	Butanol	1
MtBE	3	TAME	3
sec-Butanol	1	RFA Gasoline	81

Gasoline Refinery Blank

With Internal Standard

M-GRO-BLNK/IS-10ML 1 x 10 mL
 M-GRO-BLNK/IS-10ML-PAK **SAVE** 5 x 10 mL
 2 comps.

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

O-FID/EPA Gasoline Refinery

Internal Standard

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

1,2-Dimethoxyethane (Internal Standard)

O-FID Gasoline Refinery Blank

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

RFA Gasoline (neat)

Cross Reference Table

ASTM IP ISO DIN JIS AFNOR

see page 265



ASTM D5599 EPA Gasoline Refinery Oxygenates Calibration Curves

EPA O-FID Quantitative Calibration Mixes

Without Internal Standard

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

5 comps.

5 x 10 mL

	Calibr. 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

6 comps.

5 x 1 mL

	Calibr. 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

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

1 x 10 mL

5 x 10 mL

5 comps.

	Wt./Wt. %		Wt./Wt. %
Methanol	4.0	Methyl <i>tert</i> -butyl ether	12.0
Ethanol	8.0	RFA gasoline	71.0
<i>tert</i> -Butanol	5.0		

EPA O-FID Quantitative Calibration
Check Standard

With Internal Standard

M-GRO-EPACC/IS-5ML

M-GRO-EPACC/IS-5ML-PAK **SAVE**

1 x 5 mL

5 x 5 mL

6 comps.

	Wt./Wt. %		Wt./Wt. %
Methanol	3.80	Methyl <i>tert</i> -butyl ether	11.40
Ethanol	7.60	RFA gasoline	67.45
<i>tert</i> -Butanol	4.75	DME (Internal Standard)	5.0

Technical Note

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

EPA O-FID Spiking Solution

M-GRO-EPA-SP-5ML

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

1 x 5 mL

5 x 5 mL

4 comps.

	Wt./Wt. %		Wt./Wt. %
Methanol	14.3	<i>tert</i> -Butanol	14.3
Ethanol	28.6	Methyl <i>tert</i> -butyl ether	42.8

Oxygenate Free Gasoline Refinery
Blank

RFA-BLNK-10ML

RFA-BLNK-10ML-PAK **SAVE**

1 x 10 mL

5 x 10 mL

RFA Gasoline (neat)

Internal Standard

M-GRO-IS-5ML

M-GRO-IS-5ML-PAK **SAVE**

1 x 10 mL

5 x 10 mL

1,2-Dimethoxyethane (Internal Standard)

ASTM D5600 Trace Metals in Petroleum Coke by ICP-AES

see page 370



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
t-Amyl methyl ether in Oxygenate free RFA gasoline	10.0	ASTM-P-0063-SET	3 x 10 mL
t-Amyl methyl ether in Oxygenate free RFA gasoline	15.0	ASTM-P-0064-SET	3 x 10 mL
Ethyl t-butyl ether in Oxygenate free RFA gasoline	10.0	ASTM-P-0065-SET	3 x 10 mL
Ethyl t-butyl ether in Oxygenate free RFA gasoline	15.0	ASTM-P-0066-SET	3 x 10 mL
Methyl t-butyl ether in Oxygenate free RFA gasoline	10.0	ASTM-P-0067-SET	3 x 10 mL
Methyl t-butyl ether 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

set of 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 379

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	

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

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

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 correction and should be purchased with the standard.



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. Standards for Method D5769 are listed on pages 299-306.

Calibration Curve with 3 Component Deuterated Internal Standard Added

Aromatics Calibration Standards Kit

Internal Standard Version

M-GRA-CAL/IS-SET

set of 5 x 1 mL

Core Calibration Mix 24 Comps.	Std. 1 Target 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
1-Methyl-3-ethylbenzene	3	1.50	0.75	0.375	0.1875
1-Methyl-4-ethylbenzene	3	1.50	0.75	0.375	0.1875
1,3,5-Trimethylbenzene	3	1.50	0.75	0.375	0.1875
1-Methyl-2-ethylbenzene	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	--	Bal	Bal	Bal	Bal

Internal Standard (M-GRA-IS)

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. %
Benzene	2.25
Toluene	15
Ethylbenzene	3.75
<i>m</i> -Xylene	4.50
<i>p</i> -Xylene	4.50
<i>o</i> -Xylene	4.50
Isopropylbenzene	2.25
<i>n</i> -Propylbenzene	2.25
3-Ethyltoluene	2.25
4-Ethyltoluene	2.25
1,3,5-Trimethylbenzene	2.25
2-Ethyltoluene	2.25
1,2,4-Trimethylbenzene	3.75
1,2,3-Trimethylbenzene	2.25
Indan	2.25
1,4-Diethylbenzene	2.25
<i>n</i> -Butylbenzene	2.25
1,2-Diethylbenzene	2.25
1,2,4,5-Tetramethylbenzene	4.0
1,2,3,5-Tetramethylbenzene	1.5
Naphthalene	1.5
Pentamethylbenzene	1.5
1-Methylnaphthalene	1.5
2-Methylnaphthalene	1.5
Isooctane	Bal

Internal Standard (M-GRA-IS)

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

M-GRA-QC-10ML-PAK **SAVE**

1 x 10 mL

5 x 10 mL

13 comps.

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

Daily Quality Control Standard

With Internal Standard

M-GRA-QC/IS-5ML

M-GRA-QC/IS-5ML-PAK **SAVE**

1 x 5 mL

5 x 5 mL

16 comps.

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

Technical Note

Use with any M-GRA Calibration Curve.

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

M-GRA-ST-PAK **SAVE**

100 µg/mL in Isooctane

1 x 1 mL

5 x 1 mL

1,4-Diethylbenzene

3 Comp. Deuterated Internal Std. Mix

M-GRA-IS-5ML

M-GRA-IS-5ML-PAK **SAVE**

1 x 5 mL

5 x 5 mL

3 comps.

Mix Ratio		Mix Ratio
Benzene-d ₆	2 mL	Naphthalene-d ₈
Ethylbenzene-d ₁₀	2 mL	1 gm

ASTM D5769 continued on Next Pages



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

Core Calibr. Mix 24 comps.	set of 5 x 1 mL				
	Std. 1 Target Wt. %	Std. 2 Wt. %	Std. 3 Wt. %	Std. 4 Wt. %	Std. 5 Wt. %
Benzene	3.13	1.78	0.95	0.490	0.2490
Toluene	19.65	11.11	5.90	3.058	1.5547
Ethylbenzene	5.12	2.92	1.55	0.805	0.4090
<i>m</i> -Xylene	6.27	3.50	1.86	0.962	0.4891
<i>p</i> -Xylene	6.33	3.50	1.86	0.962	0.4891
<i>o</i> -Xylene	6.51	3.56	1.89	0.980	0.4981
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	2.32	1.34	0.71	0.369	0.1877
2-Methylnaphthalene	2.41	1.37	0.73	0.378	0.1922
Isooctane	-----	43.47	69.96	84.441	92.0905

Internal Standard

(M-GRA-IS-R) Mix Ratio					
Benzene-d ₆ (2 mL)	16.57	16.57	16.57	16.57	16.57
Ethylbenzene-d ₁₀ (2 mL)	16.76	16.76	16.76	16.76	16.76
Naphthalene-d ₈ (1 gm)	8.78	8.78	8.78	8.78	8.78
Toluene-d ₈ (7 mL)	57.88	57.88	57.88	57.88	57.88

The 4 component internal standard mix (M-GRA-IS-R) is combined with the 25 component core calibration curve mixtures in a 12 to 100 weight ratio to formulate a complete calibration solution containing 29 components.

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

Internal Standard

(M-GRA-IS-R) Mix Ratio		
Benzene-d ₆ (2 mL)	16.57	
Ethylbenzene-d ₁₀ (2 mL)	16.76	
Naphthalene-d ₈ (1 mL)	8.78	
Toluene-d ₈ (7 mL)	57.88	

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.

Technical Note

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

Daily Quality Control Standard

Without Internal Standard

M-GRA-QC-10ML

M-GRA-QC-10ML-PAK **SAVE**

1 x 10 mL

5 x 10 mL

13 comps.

Wt. Ratio		Wt. Ratio	
<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

M-GRA-QC/IS-R-5ML-PAK **SAVE**

1 x 5 mL

5 x 5 mL

17 comps.

Wt. Ratio		Wt. Ratio	
<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-R (4 comp. Internal Standard Mix) combined with the above 13 comp. Core Mix in a 12 to 100 weight ratio.

4 comp. Deuterated Internal Std. Mix

M-GRA-IS-R-10ML

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

1 x 10 mL

5 x 10 mL

4 comps.

Mix Ratio		Mix Ratio	
Benzene-d ₆	2 mL	Naphthalene-d ₈	1 gm
Ethylbenzene-d ₁₀	2 mL	Toluene-d ₈	7 mL

ASTM/EPA Sensitivity Test Solution

M-GRA-ST

M-GRA-ST-PAK

SAVE

1 x 1 mL

5 x 1 mL

100 µg/mL in Isooctane

1,4-Diethylbenzene



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

Calibration Curve with No Internal Standard

Calibration Curve

Without Internal Standard

D-5769-CAL-5ML-SET

D-5769-CAL-10ML-SET

set of 5 x 5 mL

set of 5 x 10 mL

Core Calibr. Mix 23 Comps.	Std. 1 Target Wt. %	Std. 2 Wt. %	Std. 3 Wt. %	Std. 4 Wt. %	Std. 5 Wt. %
Benzene	5.25	2.95	1.575	0.8144	0.4143
Toluene	19.67	11.06	5.898	3.0505	1.5519
Ethylbenzene	5.18	2.91	1.552	0.8026	0.4083
<i>m</i> -Xylene	6.19	3.48	1.856	0.9598	0.4883
<i>p</i> -Xylene	6.19	3.48	1.856	0.9598	0.4883
<i>o</i> -Xylene	6.30	3.54	1.890	0.9776	0.4973
Isopropylbenzene	3.09	1.74	0.925	0.4786	0.2435
<i>n</i> -Propylbenzene	3.09	1.74	0.926	0.4787	0.2435
3-Ethyltoluene	3.10	1.74	0.928	0.4801	0.2442
4-Ethyltoluene	3.08	1.73	0.925	0.4782	0.2433
1,3,5-Trimethylbenzene	3.10	1.74	0.929	0.4804	0.2444
2-Ethyltoluene	3.15	1.77	0.945	0.4890	0.2488
1,2,4-Trimethylbenzene	5.23	2.94	1.567	0.8104	0.4123
1,2,3-Trimethylbenzene	3.20	1.80	0.960	0.4965	0.2526
Indan	3.45	1.94	1.034	0.5350	0.2722
1,4-Diethylbenzene	3.09	1.74	0.925	0.4786	0.2435
<i>n</i> -Butylbenzene	3.08	1.73	0.923	0.4776	0.2430
1,2-Diethylbenzene	3.15	1.77	0.945	0.4885	0.2485
1,2,4,5-Tetramethylbenzene	2.12	1.19	0.635	0.3284	0.1671
1,2,3,5-Tetramethylbenzene	2.12	1.19	0.637	0.3295	0.1676
Naphthalene	2.37	1.34	0.712	0.3683	0.1874
1-Methylnaphthalene	2.37	1.34	0.712	0.3683	0.1874
2-Methylnaphthalene	2.43	1.37	0.730	0.3773	0.1919
Isooctane	-----	43.77	70.015	84.4922	92.1105

Optional Sixth Standard

Without Internal Standard

D-5769-ADD-5ML

1 x 5 mL

D-5769-ADD-10ML

1 x 10 mL

Core Calibration Mix 23 Comps.	Target Wt. %
Benzene	4.16
Toluene	16.41
Ethylbenzene	4.10
<i>m</i> -Xylene	4.91
<i>p</i> -Xylene	4.91
<i>o</i> -Xylene	5.00
Isopropylbenzene	2.45
<i>n</i> -Propylbenzene	2.45
3-Ethyltoluene	2.45
4-Ethyltoluene	2.44
1,3,5-Trimethylbenzene	2.46
2-Ethyltoluene	2.50
1,2,4-Trimethylbenzene	4.14
1,2,3-Trimethylbenzene	2.54
Indan	2.73
1,4-Diethylbenzene	2.45
<i>n</i> -Butylbenzene	2.44
1,2-Diethylbenzene	2.50
1,2,4,5-Tetramethylbenzene	1.68
1,2,3,5-Tetramethylbenzene	1.68
Naphthalene	1.88
1-Methylnaphthalene	1.88
2-Methylnaphthalene	1.93
Isooctane	19.92

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

D-5769-QC-10ML

1 x 10 mL

D-5769-QC-10ML-PAK

SAVE

5 x 10 mL

14 comps.

Wt. Ratio	Wt. Ratio
<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

SAVE

5 x 10 mL

4 comps.

Mix Ratio	Mix Ratio
Benzene-d ₆ 2 mL	Naphthalene-d ₈ 1 gm
Ethylbenzene-d ₁₀ 2 mL	Toluene-d ₈ 7 mL

3 comp. Deuterated Internal Std. Mix

M-GRA-IS-5ML

1 x 5 mL

M-GRA-IS-5ML-PAK

SAVE

5 x 5 mL

3 comps.

Mix Ratio	Mix Ratio
Benzene-d ₆ 2 mL	Naphthalene-d ₈ 1 gm
Ethylbenzene-d ₁₀ 2 mL	



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

With 3 Component Internal Standard

Calibration Curve

With Internal Standard

D-5769-CAL/IS-SET

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

Internal Standard

M-GRA-IS

	Mix ratio
Benzene-d ₆	2 mL
Ethylbenzene-d ₁₀	2 mL
Naphthalene-d ₈	1 gm

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

Daily Quality Control Standard

With Internal Standard

D-5769-QC/IS-5ML

D-5769-QC/IS-5ML-PAK **SAVE**

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

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

Resolution Standard

M-GRA-RES

M-GRA-RES-PAK **SAVE**

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

Optional Sixth Standard

With Internal Standard

D-5769-ADD/IS

1 x 1 mL

Core Calibration Mix 24 Comps.	Target Wt. %
Benzene	4.16
Toluene	16.41
Ethylbenzene	4.10
<i>m</i> -Xylene	4.91
<i>p</i> -Xylene	4.91
<i>o</i> -Xylene	5.00
Isopropylbenzene	2.45
<i>n</i> -Propylbenzene	2.45
3-Ethyltoluene	2.45
4-Ethyltoluene	2.44
1,3,5-Trimethylbenzene	2.46
2-Ethyltoluene	2.50
1,2,4-Trimethylbenzene	4.14
1,2,3-Trimethylbenzene	2.54
Indan	2.73
1,4-Diethylbenzene	2.45
<i>n</i> -Butylbenzene	2.44
1,2-Diethylbenzene	2.50
1,2,4,5-Tetramethylbenzene	1.68
1,2,3,5-Tetramethylbenzene	1.68
Naphthalene	1.88
1-Methylnaphthalene	1.88
2-Methylnaphthalene	1.93
Isooctane	19.92

Technical Note

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

3 comp. Deuterated Internal Std. Mix

M-GRA-IS-5ML

M-GRA-IS-5ML-PAK

SAVE

1 x 5 mL

5 x 5 mL

3 comps.

Mix Ratio	
Benzene-d ₆	2 mL
Ethylbenzene-d ₁₀	2 mL
Naphthalene-d ₈	1 gm

Sensitivity Test Solution

M-GRA-ST

M-GRA-ST-PAK

SAVE

1 x 1 mL

5 x 1 mL

100 µg/mL in Isooctane

1,4-Diethyl benzene

Fragmentation Pattern Standard

M-GRA-FP

M-GRA-FP-PAK

SAVE

1 x 1 mL

5 x 1 mL

3.0% w/w in Isooctane

1,2,3-Trimethylbenzene

Mass Scan Range Standard

M-GRA-MSR

M-GRA-MSR-PAK

SAVE

1 x 1 mL

5 x 1 mL

3.0% w/w in Isooctane

Toluene



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

With 4 Component Internal Standard (includes Toluene-d₈)

Calibration Curve with Deuterated Toluene

With Internal Standard

D-5769-CAL/IS-R-SET

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

Optional Sixth Standard

With Internal Standard

D-5769-ADD/IS-R

Core Calibration Mix 24 Comp.	1 x 1 mL Target Wt. %
Benzene	4.16
Toluene	16.41
Ethylbenzene	4.10
<i>m</i> -Xylene	4.91
<i>p</i> -Xylene	4.91
<i>o</i> -Xylene	5.00
Isopropylbenzene	2.45
<i>n</i> -Propylbenzene	2.45
3-Ethyltoluene	2.45
4-Ethyltoluene	2.44
1,3,5-Trimethylbenzene	2.46
2-Ethyltoluene	2.50
1,2,4-Trimethylbenzene	4.14
1,2,3-Trimethylbenzene	2.54
Indan	2.73
1,4-Diethylbenzene	2.45
<i>n</i> -Butylbenzene	2.44
1,2-Diethylbenzene	2.50
1,2,4,5-Tetramethylbenzene	1.68
1,2,3,5-Tetramethylbenzene	1.68
Naphthalene	1.88
1-Methylnaphthalene	1.88
2-Methylnaphthalene	1.93
Isooctane	19.92

Internal Standard

M-GRA-IS-R

	Mix ratio
Benzene-d ₆	2 mL
Ethylbenzene-d ₁₀	2 mL
Naphthalene-d ₈	1 gm
Toluene-d ₈	7 mL

The 4 comp. Internal Standard Mix (M-GRA-IS-R) is combined with the 24 component core calibration curve mixtures above in a 12 to 100 weight ratio to formulate these 28 component calibration solutions.

Daily Quality Control Standard

With Internal Standard

D-5769-QC/IS-R-5ML

D-5769-QC/IS-R-5ML-PAK **SAVE**

1 x 5 mL

5 x 5 mL

18 comps.

Wt. Ratio		Wt. Ratio	
<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. mix) added in 12 to 100 weight ratio

Sensitivity Test Solution

M-GRA-ST

M-GRA-ST-PAK

SAVE

100 µg/mL in Isooctane

1 x 1 mL

5 x 1 mL

1,4-Diethyl benzene

Resolution Standard

M-GRA-RES

M-GRA-RES-PAK

SAVE

1 x 1 mL

5 x 1 mL

3 comps.

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

4 comp. Deuterated Internal Std. Mix

M-GRA-IS-R-10ML

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

1 x 10 mL

5 x 10 mL

Mix Ratio		Mix Ratio	
Benzene-d ₆	2 mL	Naphthalene-d ₈	1 gm
Ethylbenzene-d ₁₀	2 mL	Toluene-d ₈	7 mL

Fragmentation Pattern Standard

M-GRA-FP

M-GRA-FP-PAK

SAVE

3.0 w/w in Isooctane

1 x 1 mL

5 x 1 mL

1,2,3-Trimethylbenzene



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

Proposed / Promulgated Method Modifications

Calibration Curve

With Chlorinated Internal Standard

D-5769-CAL/IS-R2-SET

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

Internal Standard

M-GRA-IS-R2

Mix ratio	
Chlorobenzene	2 mL
1,2-Dichlorobenzene	2 mL
1,2,4-Trichlorobenzene	1 mL

Optional Sixth Standard

With Internal Standard

D-5769-ADD/IS-R2

1 x 1 mL

Core Calibration Mix 24 Components	Target Wt. %
Benzene	4.16
Toluene	16.41
Ethylbenzene	4.10
<i>m</i> -Xylene	4.91
<i>p</i> -Xylene	4.91
<i>o</i> -Xylene	5.00
Isopropylbenzene	2.45
<i>n</i> -Propylbenzene	2.45
3-Ethyltoluene	2.45
4-Ethyltoluene	2.44
1,3,5-Trimethylbenzene	2.46
2-Ethyltoluene	2.50
1,2,4-Trimethylbenzene	4.14
1,2,3-Trimethylbenzene	2.54
Indan	2.73
1,4-Diethylbenzene	2.45
<i>n</i> -Butylbenzene	2.44
1,2-Diethylbenzene	2.50
1,2,4,5-Tetramethylbenzene	1.68
1,2,3,5-Tetramethylbenzene	1.68
Naphthalene	1.88
1-Methylnaphthalene	1.88
2-Methylnaphthalene	1.93
Isooctane	19.92

CD Provided

CALAMTS™

Contains Calibration Amounts

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

Daily QC Standard

With Internal Standard

D-5769-QC/IS-R2-5ML

D-5769-QC/IS-R2-5ML-PAK **SAVE**

1 x 5 mL

5 x 5 mL

17 comps.

Wt. Ratio		Wt. Ratio	
<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

Sensitivity Test Solution

M-GRA-ST

M-GRA-ST-PAK

SAVE

100 µg/mL in Isooctane

1 x 1 mL

5 x 1 mL

1,4-Diethyl benzene

Fragmentation Pattern Standard

M-GRA-FP

M-GRA-FP-PAK

SAVE

3.0 w/w in Isooctane

1 x 1 mL

5 x 1 mL

1,2,3-Trimethylbenzene

Includes M-GRA-IS-R2 added in 5 to 100 weight ratio.

3 comp. Chlorinated Internal Std. Mix

M-GRA-IS-R2-VAP

set of 25 x 1 mL

M-GRA-IS-R2-25ML

1 x 25 mL

3 comps.

Mix Ratio	
Chlorobenzene	2 mL
1,2-Dichlorobenzene	2 mL
1,2,4-Trichlorobenzene	1 mL

Resolution Standard

M-GRA-RES

M-GRA-RES-PAK

SAVE

1 x 1 mL

5 x 1 mL

3 comps.

Wt. %	
1,3,5-Trimethylbenzene	3.0
1-Methyl-2-ethylbenzene	3.0
Isooctane	94



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 SAVE	5 x 10 mL 15 comps.

Wt. Ratio		Wt. Ratio	
<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

M-GRA-QC-R/IS-5ML	1 x 5 mL
M-GRA-QC-R/IS-5ML-PAK SAVE	5 x 5 mL 18 comps.

Wt. Ratio		Wt. Ratio	
<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 combined with the above 15 comp. Core Mix in a 5 to 100 weight ratio.

3 comp. Deuterated Internal Std. Mix

M-GRA-IS-5ML	1 x 5 mL
M-GRA-IS-5ML-PAK SAVE	5 x 5 mL 3 comps.

Mix Ratio	
Benzene-d ₆	2 mL
Ethylbenzene-d ₁₀	2 mL
Naphthalene-d ₈	1 gm

4 comp. Deuterated Internal Std. Mix

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

Mix Ratio	
Benzene-d ₆	2 mL
Ethylbenzene-d ₁₀	2 mL
Naphthalene-d ₈	1 gm
Toluene-d ₈	7 mL

Daily QC Standard

With Internal Standard M-GRA-IS-R

M-GRA-QCR/IS-R-5ML	1 x 5 mL
M-GRA-QCR/IS-R-5ML-PAK SAVE	5 x 5 mL 19 comps.

Wt. Ratio		Wt. Ratio	
<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 combined with the above 15 comp. Core Mix in a 12 to 100 weight ratio.

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

Original Formulations

M-GRA-K1-SET Set

Set includes:	Units	Function
M-GRA-CAL/IS-SET	5 x 1 mL	5 Point Curve with 3 Internal Standards
M-GRA-QC/IS-5ML	1 x 5 mL	Daily QC with 3 Internal Standards
M-GRA-IS-5ML	1 x 5 mL	3 Component Internal Standard
M-GRA-ST	1 x 1 mL	Sensitivity Test Solution

4 Component Internal Standard Formulations

M-GRA-K4-SET Set

Set includes:	Units	Function
M-GRA-CAL-R/IS-R-SET	5 x 1 mL	5 Point Curve with 4 Internal Standards
M-GRA-ADD/IS-R	1 x 1 mL	6th Standard for Revision 5 F
M-GRA-QC-R/IS-R-5ML	1 x 5 mL	Daily QC with 4 Internal Standards
M-GRA-IS-R-10ML	1 x 10 mL	4 Component Internal Standard
M-GRA-ST	1 x 1 mL	Sensitivity Test Solution

Revision 5 F

M-GRA-K2-SET Set

Set includes:	Units	Function
M-GRA-CAL/IS-SET	5 x 1 mL	5 Point Curve with 3 Internal Standards
M-GRA-ADD/IS	1 x 1 mL	6th Standard for Revision 5 F
M-GRA-QC/IS-5ML	1 x 5 mL	Daily QC with 3 Internal Standards
M-GRA-IS-5ML	1 x 5 mL	3 Component Internal Standard
M-GRA-ST	1 x 1 mL	Sensitivity Test Solution

Technical Note

Used to meet the toluene-d₈ internal standard version recommended by a network of major petroleum refineries.



ASTM D5769 Additional Internal, Deuterated and Quality Control Standards

4 comp. Deuterated Internal Std. Mix

ASTM-P-0140-IS 1 x 10 mL
 ASTM-P-0140-IS-PAK **SAVE** 5 x 10 mL
 4 comps.

	Vol. %	Compound	Vol. %
Benzene-d ₆	2	Naphthalene-d ₈	1
Ethylbenzene-d ₁₀	2	Isooctane *	balance

4 comp. Deuterated Internal Std. Mix

ASTM-P-0140-IS2 1 x 10 mL
 ASTM-P-0140-IS2-PAK **SAVE** 5 x 10 mL
 5 comps.

	Vol. %		Vol. %
Benzene-d ₆	2	Toluene-d ₈	7
Ethylbenzene-d ₁₀	2	Isooctane *	balance
Naphthalene-d ₈	1		

Performance Evaluation Standard

ASTM-P-0140-PES 1 x 1 mL
 ASTM-P-0140-PES-PAK **SAVE** 5 x 1 mL
 11 comps.

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

Composition of Daily QC Standard

ASTM-P-0140-QC 1 x 10 mL
 ASTM-P-0140-QC-PAK **SAVE** 5 x 10 mL
 9 comps.

	Target Vol. %
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 (solvent) *	balance

* The isooctane balance is the amount of material to make up a 100 mL calibration standard. Certificate will reflect actual weight of each component in the 100 mL batch including the isooctane.





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

Diisocyanate Sets

D-5836-SET

9 x 1 mL

D-5836-01N, D-5836-02N, D-5836-03N, D-5836-04N,

D-5836-01-DER, D-5836-02-DER, D-5836-03-DER, D-5836-04-DER, D-5836-DER-5ML-VAP

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

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
34803-66-2D-5836-DER-5ML-VAP
2 mg/mL in CH₂Cl₂

4 x 5 mL

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

see page 379

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

M-GRA-QC-10ML-PAK

SAVE

1 x 10 mL

5 x 10 mL

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".

	Wt. Ratio		Wt. Ratio
<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

Cross Reference Table

ASTM IP ISO DIN JIS AFNOR

see page 265



ASTM D6160 Polychlorinated Biphenyls (PCBs in Waste Materials by GC)

Aroclor Standards

Aroclor #	35 µg/mL in Isooctane Cat. No.	1 mL	35 µg/mL in MeOH Cat. No.	1 mL	1000 µg/mL in Hexane 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

D-6258 Calibration Curve

D-6258-5ML-SET

6 x 5 mL

Set includes the following Cat. No.'s

Description	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

Technical Note

Solvent Red 26 is the azo dye standard against which the concentration of Solvent Red 164 is measured. The visible spectrum of Solvent Red 164 is virtually identical to the spectrum of Solvent Red 26.

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

ASTM-P-0080-PAK

SAVE

1 x 1 mL

5 x 1 mL

33 comps.

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

O-PONA Olefin Mix

ASTM-P-0081

ASTM-P-0081-PAK

At stated conc. in Hexane:Heptane (50:50)

1 x 1 mL

5 x 1 mL

5 comps.

	Wt./Wt. %
1-Pentene	5.0
1-Hexene	2.0
1-Heptene	2.0
1-Octene	2.0
1-Nonene	3.0

O-PONA Paraffin Mixes

ASTM-P-0082

ASTM-P-0082-PAK

At stated conc. in Hexane:Heptane (50:50)

1 x 1 mL

5 x 1 mL

2 comps.

	Wt./Wt. %
n-Nonane	5.0
n-Decane	2.0

ASTM-P-0082-R1

ASTM-P-0082-R1-PAK

At stated conc. in Hexane:Heptane (50:50)

1 x 1 mL

5 x 1 mL

2 comps.

	Wt./Wt. %
n-Nonane	3.0
n-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-VER1, D-6296-VER2)

D-6296-VER-SET-PAK

SAVE

5 x (2 x 1 mL)

Set of 5 each (D-6296-VER1, D-6296-VER2)

System Setup & Verification 1

D-6296-VER1

1 x 1 mL

2 comps.

	Wt. %		Wt. %
MTBE	5%	Isooctane	95%

System Setup & Verification 2

D-6296-VER2

1 x 1 mL

2 comps.

	Wt. %		Wt. %
ETBE	5%	Isooctane	95%

Calibration Standard with MTBE

D-6296-CAL1

1 x 1 mL

D-6296-CAL1-PAK

SAVE

5 x 1 mL

10 comps.

	Wt. %		Wt. %
Pentene	1.0	Decene	1.0
Hexene	1.0	Undecane	1.0
Heptene	1.0	Dodecane	1.0
Octene	1.0	Isooctane	87.0
Nonene	1.0	MTBE	5.0

Calibration Standard with ETBE

D-6296-CAL2

1 x 1 mL

D-6296-CAL2-PAK

SAVE

5 x 1 mL

11 comps.

	Wt. %		Wt. %
Pentene	1.0	Decane	1.0
Hexene	1.0	Undecane	1.0
Heptene	1.0	Dodecane	1.0
Octene	1.0	Isooctane	86.0
Nonene	1.0	ETBE	5.0
Decene	1.0		

Isooctane Blank Compensation Standard

D-6296-BL

1 x 5 mL

Isooctane (Neat)

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

see page 267

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

see pages 269-268

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 Standard

DRH-008S-R2

1 x 1 mL

DRH-008S-R2-PAK

SAVE

5 x 1 mL

500 µg/mL each in Chloroform

35 comps.

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

Calibration Mix

DRH-002N

100 mg

DRH-002N-10X

1 gm

17 comps.

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

Column Test Mixture

D-2887

1 x 1 mL

1% w/v in *n*-Octane

2 comps.

n-Hexadecane*n*-Octadecane


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

see page 279

ASTM D6379 Aromatic Hydrocarbon Types in Aviation Fuels & Petroleum Distillates - HPLC method with Refractive Index
System Resolution Standards

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

Cyclohexane	10
o-Xylene	0.5
1-Methyl naphthalene	0.05

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

Cyclohexane	10
o-Xylene	5
1-Methyl naphthalene	0.5

Calibration Curves

D-6379-SET 4 x 1 mL
D-6379-SET-PAK **SAVE** 5 x (4 x 1 mL)
 At stated conc. (mg/mL) in n-Heptane

Analyte	Std. 1	Std. 2	Std. 3	Std. 4
Cyclohexane	5	2	0.5	0.1
o-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 **SAVE** 5 x (4 x 1 mL)
 At stated conc. (mg/mL) in n-Heptane

Analyte	Std. 1	Std. 2	Std. 3	Std. 4
Cyclohexane	50	20	5	1
o-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 298

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
 In Isooctane

Description	D-6428-R1-100ML-SET 7 x 100 mL	D-6428-R1-SET 7 x 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
 In Isooctane

Description	D-6428-R2-100ML-SET 6 x 100 mL	D-6428-R2-SET 6 x 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 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 381-382

ASTM D6445 Sulfur in Gasoline by ED - XRF

see pages 268-269

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

see pages 380-382

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 Conc. by Wt. % 15 comps.

Wt. %	Wt. %	Wt. %
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
Set of 7 above compounds			BF-D-6584-SET *	7 units
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	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

ASTM D6584 Mixture

BF-D-6584-MIX *	1 x 5 mL
<i>At stated conc. in Pyridine</i>	
Glycerol	0.5 mg/mL
Monoolein	5 mg/mL
1,3-Diolein	5 mg/mL
Triolein	5 mg/mL
(S)-(-)-1,2,4-Butanetriol	1 mg/mL
Tricaprin	8 mg/mL

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

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 µg/mL
Monoolein	600 µg/mL
Diolein	200 µg/mL
Triolein	150 µg/mL
Glycerol	20 µg/mL
Tricaprin	800 µg/mL

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 µg/mL
Monoolein	950 µg/mL
Diolein	350 µg/mL
Triolein	300 µg/mL
Glycerol	35 µg/mL
Tricaprin	800 µg/mL

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 µg/mL
Monoolein	1250 µg/mL
Diolein	500 µg/mL
Triolein	400 µg/mL
Glycerol	50 µg/mL
Tricaprin	800 µg/mL

ASTM D6591-11 (IP 391) Aromatic Hydrocarbon Types in Middle Distillates - HPLC method with Refractive Index Detection

System Performance Standard

ASTM-P-0135 **1 x 5 mL**
ASTM-P-0135-PAK SAVE **5 x 5 mL**
At stated conc. (mg/mL) in *n*-Heptane 4 comps.

Cyclohexane	10
<i>o</i> -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
<i>o</i> -Xylene	40	10	2.5	0.5
1-Methyl naphthalene	40	10	2.5	0.2
Phenanthrene	4	2	0.5	0.1

* ColdPAK required to maintain integrity of product.



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	

Sulfur in Biodiesel 20%

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	

Technical Note

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

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	

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.

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 correction and should be purchased with the standard.

Note: 10,000 ppm = 1% Wt.

Physical Standards

Compound	Conc.	Matrix	Cat. No.	Unit
ASTM D2500				
Cloud Point	-16 °C *	B5	BF-D-2500-B5	200 mL
	-14 °C *	B20	BF-D-2500-B20	200 mL
	-1 °C *	B100	BF-D-2500-B100	200 mL
ASTM D93 / EN-ISO 3679				
Flash Point	60 °C *		BF-D-93-60C	200 mL
	65 °C *		BF-D-93-65C	200 mL
	140 °C *		BF-D-93-140C	200 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.



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. In addition to the products listed below, AccuStandard can custom formulate products to fit your exact needs. Please contact our Technical Service Department for additional information.

UOP Method 543 Standard

Non-Aromatic Hydrocarbons in High-Purity Aromatics by GC.

UOP-M-543-PAK 5 x 1 mL
At stated Wt./Wt.% 2 comps.

	Wt./Wt. %
n-Dodecane	70
Toluene	30

UOP 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 Mass % 7 comps.

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

UOP 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

UOP Method 720 Standard

Impurities in High Purity p-Xylene by GC.

UOP-M-720-PAK 5 x 1 mL
At stated Mass % 5 comps.

	Mass %
o-Xylene	0.1
m-Xylene	0.1
Ethylbenzene	0.1
n-Undecane	1.0
p-Xylene	98.7

UOP Method 744 Standard

Aromatics in Hydrocarbons by GC.

UOP-M-744-PAK 5 x 1 mL
At stated Wt./Wt.% 8 comps.

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

UOP Method 831 Standard

UOP-M-831-PAK
10 µg/g each in Sulfolane

5 x 1 mL
5 comps.

Benzene	Isopropylbenzene
Toluene	n-Nonane
Ethylbenzene	

UOP Method 868 Standard

Trace Saturates in High Purity Aromatics by GC.

UOP-M-868-PAK 5 x 1 mL
Stated conc. in Toluene 10 comps.

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

UOP Method 931 Standard

Trace Impurities in Mixed Xylenes by GC.

UOP-M-931-PAK 5 x 1 mL
At stated Wt./Wt.% 5 comps.

	Wt./Wt. %
Benzene	2.0
Toluene	2.0
o-Ethyltoluene	2.0
n-Undecane	2.0
n-Heptane	92.0



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Skinner List for Refinery Waste

Semi-Volatiles

Base/Neutral Extractables

M-005B		1 x 1 mL
M-005B-PAK	SAVE	5 x 1 mL
<i>0.2 mg/mL each in CH₂Cl₂</i>		
M-005B-10X		1 x 1 mL
M-005B-10X-PAK	SAVE	5 x 1 mL
<i>2.0 mg/mL each in CH₂Cl₂</i>		
Anthracene	7,12-Dimethylbenz[a]anthracene	
Benzo[a]anthracene	Dimethyl phthalate	
Benzo[b]fluoranthene	Di- <i>n</i> -butyl phthalate	
Benzo[k]fluoranthene	Di- <i>n</i> -octyl phthalate	
Benzo[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	SAVE	5 x 1 mL
<i>0.2 mg/mL each in CH₂Cl₂</i>		
M-005A-10X		1 x 1 mL
M-005A-10X-PAK	SAVE	5 x 1 mL
<i>2.0 mg/mL each in CH₂Cl₂</i>		
<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	SAVE	5 x 1 mL
<i>0.2 mg/mL each in MeOH</i>		
M-005V-10X		1 x 1 mL
M-005V-10X-PAK	SAVE	5 x 1 mL
<i>2.0 mg/mL each in MeOH</i>		
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	SAVE	5 x 1 mL
<i>2.0 mg/mL each in CH₂Cl₂</i>		
Decane	Hexadecane	Tetradecane
Dodecane	Hexane	Toluene
Eicosane	Octadecane	1,2,4-Trimethylbenzene
2-Ethyltoluene	Octane	<i>p</i> -Xylene
3-Ethyltoluene		

ASTM E1618 Test Mix for Fire Debris Analysis

ASTM-E1618		1 x 1 mL
ASTM-E1618-PAK	SAVE	5 x 1 mL
<i>0.05% v/v (0.50 µL/mL) each in CH₂Cl₂</i>		
<i>n</i> -Decane	<i>n</i> -Hexadecane	<i>n</i> -Tetradecane
<i>n</i> -Dodecane	<i>n</i> -Hexane	Toluene
<i>n</i> -Eicosane	<i>n</i> -Octadecane	1,2,4-Trimethylbenzene
<i>o</i> -Ethyltoluene	<i>n</i> -Octane	<i>p</i> -Xylene
<i>m</i> -Ethyltoluene		

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Save 20-40% 5 x 1 mL





BioFuel Standards

ASTM, EN and other test methods have been developed to monitor the properties (physical and chemical), constituent distribution, impurities and suitability of use.

The source materials that are used to produce these fuels vary from plant oils, ethyl alcohol (usually from corn) and even waste products.

Biodiesel refineries have opened all over the world.

- The Minister for the Environment and Heritage of Australia signed the Fuel Standard (Biodiesel) which sets out the physical and chemical parameters with the associated test methods to determine compliance.
- In Germany the sale of biodiesel in gas stations is over 2 million cubic meters.
- In the USA, some state legislatures have mandated 2% biodiesel content in all diesels sold in those states.

ASTM D6584 / EN 14105 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
Set of 7 above compounds				BF-D-6584-SET *	7 units
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	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

ASTM D6584 Mixture

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

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

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

EN 14105 BioFuel Glyceride Solutions



Solution I

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

(s)-(-)-1,2,4-Butanetriol	80
Monoolein	250
Diolein	50
Triolein	50
Glycerol	5
Tricaprin	8

Solution II

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

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

EN 14103 Fatty Acid Methyl Esters (FAMES)

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

Soy & Corn

BF-SOY-ME *	100 mg
16:0 Palmitate	6% Wt.
18:0 Stearate	3% Wt.
20:0 Arachidate	3% Wt.
18:1 Oleate	35% Wt.
18:2 Linoleate	50% Wt.
18:3 Linolenate	3% Wt.

Palm Kernel

BF-PALM-ME *	100 mg
8:0 Caprylate	7% Wt.
10:0 Caprate	5% Wt.
12:0 Laurate	48% Wt.
14:0 Myristate	15% Wt.
16:0 Palmitate	7% Wt.
18:0 Stearate	3% Wt.
18:1 Oleate	12% Wt.
18:2 Linoleate	3% Wt.

Percent Methanol Calibration Standard Set (EN 14110)

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

Rapeseed Oil

BF-RAP-ME *	100 mg
14:0 Myristate	1% Wt.
16:0 Palmitate	4% Wt.
18:0 Stearate	3% Wt.
20:0 Arachidate	3% Wt.
22:0 Behenate	3% Wt.
24:0 Lignocerate	3% Wt.
18:1 Oleate	60% Wt.
22:1 Erucate	5% Wt.
18:2 Linoleate	12% Wt.
18:3 Linolenate	5% Wt.
20:1 Eicosenoate	1% Wt.

Beef Tallow & Palm Oil

BF-BT-ME *	100 mg
14:0 Myristate	2% Wt.
16:0 Palmitate	30% Wt.
16:1 Palmitoleate	3% Wt.
18:0 Stearate	14% Wt.
18:1 Oleate	41% Wt.
18:2 Linoleate	7% Wt.
18:3 Linolenate	3% Wt.

Technical Note

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

Technical Note

Individual mixes packaged under Nitrogen for stability.

* ColdPAK required to maintain integrity of product.



Fatty Acid Ethyl Esters (FAEEs)

Ethyl Esters in Soy & Corn

BF-SOY-EE	100 mg
16:0 Ethyl palmitate	6% Wt.
18:0 Ethyl stearate	3% Wt.
20:0 Ethyl arachidate	3% Wt.
18:1 Ethyl oleate	35% Wt.
18:2 Ethyl linoleate	50% Wt.
18:3 Ethyl linolenate	3% Wt.

Ethyl Esters in Palm Kernel Oil

BF-PALM-EE	100 mg
8:0 Ethyl caprylate	7% Wt.
10:0 Ethyl caprate	5% Wt.
12:0 Ethyl laurate	48% Wt.
14:0 Ethyl myristate	15% Wt.
16:0 Ethyl palmitate	7% Wt.
18:0 Ethyl stearate	3% Wt.
18:1 Ethyl oleate	12% Wt.
18:2 Ethyl linoleate	3% Wt.

Ethyl Esters in Rapeseed Oil

BF-RAP-EE	100 mg
14:0 Ethyl myristate	1% Wt.
16:0 Ethyl palmitate	4% Wt.
18:0 Ethyl stearate	3% Wt.
20:0 Ethyl arachidate	3% Wt.
22:0 Ethyl behenate	3% Wt.
24:0 Ethyl lignocerate	3% Wt.
18:1 Ethyl oleate	60% Wt.
22:1 Ethyl erucate	5% Wt.
18:2 Ethyl linoleate	12% Wt.
18:3 Ethyl linolenate	5% Wt.
20:1 Ethyl eicosenoate	1% Wt.

Ethyl Esters in Beef Tallow

BF-BT-EE	100 mg
14:0 Ethyl myristate	2% Wt.
16:0 Ethyl palmitate	30% Wt.
16:1 Ethyl palmitoleate	3% Wt.
18:0 Ethyl stearate	14% Wt.
18:1 Ethyl oleate	41% Wt.
18:2 Ethyl linoleate	7% Wt.
18:3 Ethyl linolenate	3% Wt.

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

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	

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	

Sulfur in Biodiesel 20%

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	

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 correction and should be purchased with the standard.

Note: 10,000 ppm = 1% Wt.



BioFuel Standards

Physical Standards

Compound	Conc.	Matrix	Cat. No.	Unit
ASTM D2500				
Cloud Point	-16 °C *	B5	BF-D-2500-B5	200 mL
	-14 °C *	B20	BF-D-2500-B20	200 mL
	-1 °C *	B100	BF-D-2500-B100	200 mL
ASTM D93 / EN-ISO 3679				
Flash Point	60 °C *		BF-D-93-60C	200 mL
	65 °C *		BF-D-93-65C	200 mL
	140 °C *		BF-D-93-140C	200 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.



EN 14214 Wear Metals

Each is 100 grams at 500 µg/g concentration.

Compound	Matrix	Cat. No.	100 grams
Aluminum	B100	BF-WM-B100-01-0.5X	
Calcium	B100	BF-WM-B100-09-0.5X	
Chromium	B100	BF-WM-B100-13-0.5X	
Copper	B100	BF-WM-B100-15-0.5X	
Iron	B100	BF-WM-B100-27-0.5X	
Lead	B100	BF-WM-B100-29-0.5X	
Magnesium	B100	BF-WM-B100-32-0.5X	
Phosphorus	B100	BF-WM-B100-41-0.5X	
Potassium	B100	BF-WM-B100-43-0.5X	
Sodium	B100	BF-WM-B100-54-0.5X	
Zinc	B100	BF-WM-B100-70-0.5X	

Biofuel Metals Mix

Multi-Element Biofuel Standard

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

Biofuel Blank

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

Technical Note

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

EN 15721 Ethanol Impurities



Ethanol Impurities Solution A

EN-15721-A 1 mL
1% w/w each in Ethanol 10 comps.

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

Internal Standard Solution A

EN-15721-A-IS 1 mL
1% w/w in Ethanol

3-Propanol

EN 15721 Solution A Set

EN-15721-A-SET 2 x 1 mL
EN-15721-A and EN-15721-A-IS



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	
Aviation (gas) (grade 100-LL)	10 mg/mL	CH ₂ Cl ₂	GRH-IS-10X			5 mg/mL	MeOH	GA-001-10X	
	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-101.0-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 (weathered)	0.5 mg/mL	MeOH	FU-010	
						20 mg/mL	MeOH	FU-010-40X	
1-Chloro-4-fluorobenzene 352-33-0	1 mg/mL	CH ₂ Cl ₂	GARH-IS			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	
					JP-7 Fuel	0.5 mg/mL	MeOH	FU-014	
Diesel	0.5 mg/mL	MeOH	FU-009			20 mg/mL	MeOH	FU-014-40X	
	5 mg/mL	CH ₂ Cl ₂	FU-009-D-10X			20 mg/mL	CH ₂ Cl ₂	FU-014-D-40X	
	20 mg/mL	MeOH	FU-009-40X		JP-8 Fuel	0.5 mg/mL	MeOH	FU-015	
	20 mg/mL	CH ₂ Cl ₂	FU-009-D-40X			20 mg/mL	MeOH	FU-015-40X	
#1 Diesel - Low Sulfur	0.5 mg/mL	MeOH	FU-013			20 mg/mL	CH ₂ Cl ₂	FU-015-D-40X	
	20 mg/mL	MeOH	FU-013-40X		JP-TS Aviation Fuel 64742-47-8	0.5 mg/mL	MeOH	FU-016	
	20 mg/mL	CH ₂ Cl ₂	FU-013-D-40X			20 mg/mL	MeOH	FU-016-40X	
	50 mg/mL	Acetone	AK-102-LCS-R1-10X			20 mg/mL	CH ₂ Cl ₂	FU-016-D-40X	
#2 Diesel 68334-30-5					JP-10 Aviation Fuel 2825-82-3	0.5 mg/mL	MeOH	FU-022	
#2 Diesel (Extra Low Sulfur) 68476-43-6	0.5 mg/mL	MeOH	FU-017			20 mg/mL	MeOH	FU-022-40X	
	5 mg/mL	CH ₂ Cl ₂	FU-017-D-10X			20 mg/mL	CH ₂ Cl ₂	FU-022-D-40X	
	5 mg/mL	Acetone	AK-102.0-LCS		Kerosene 25% Weathered	5 mg/mL	CH ₂ Cl ₂	FK-W25-10X	
	50 mg/mL	Acetone	AK-102.0-LCS-10X		Kerosene 50% Weathered				
	20 mg/mL	MeOH	FU-017-40X		Kerosene 75% Weathered	5 mg/mL	CH ₂ Cl ₂	FK-W75-10X	
#2 Diesel (Low Sulfur) 25% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W25-10X		Kerosene 8008-20-6	0.5 mg/mL	MeOH	FU-005	
#2 Diesel (Low Sulfur) 50% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W50-10X			20 mg/mL	MeOH	FU-005-40X	
#2 Diesel (Low Sulfur) 75% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W75-10X			5 mg/mL	CH ₂ Cl ₂	FU-005-D-10X	
#2 Diesel 25% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W25-R1-10X			20 mg/mL	CH ₂ Cl ₂	FU-005-D-40X	
#2 Diesel 50% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W50-R1-10X		Lacquer Thinner	1 gram	Neat	HS-001N	
#2 Diesel 75% Weathered	5 mg/mL	CH ₂ Cl ₂	FD2-W75-R1-10X			0.5 mg/mL	MeOH	HS-001S	
Docosane 629-97-0	50 % w/w	Toluene	D-5186-91-PM			20 mg/mL	MeOH	HS-001S-40X	
n-Dodecane 112-40-3	5 mg/mL	MeOH	AS-E0238			20 mg/mL	CH ₂ Cl ₂	HS-001S-D-40X	
	1.5 % w/w	Isocetane	M-GRA-SCS-AS		Mineral Spirits 8030-30-6	1 gram	Neat	HS-002N	
#1 Fuel oil 70892-10-3	0.5 mg/mL	MeOH	FU-001			0.5 mg/mL	MeOH	HS-002S	
	20 mg/mL	MeOH	FU-001-40X			20 mg/mL	MeOH	HS-002S-40X	
	20 mg/mL	CH ₂ Cl ₂	FU-001-D-40X			20 mg/mL	CH ₂ Cl ₂	HS-002S-D-40X	
	0.5 mg/mL	MeOH	FU-002		Naphtha 64742-89-8	1 gram	Neat	HS-003N	
#2 Fuel oil 68476-30-2	20 mg/mL	MeOH	FU-002-40X			0.5 mg/mL	MeOH	HS-003S	
	20 mg/mL	CH ₂ Cl ₂	FU-002-D-40X			20 mg/mL	MeOH	HS-003S-40X	
	0.5 mg/mL	Hexane	FU-003			20 mg/mL	CH ₂ Cl ₂	HS-003S-D-40X	
#3 Fuel oil	20 mg/mL	Hexane	FU-003-40X		Nonatriacontane 7194-86-7	750 µg/mL	Chloroform	DRH-FL-SS-R1	
	20 mg/mL	CH ₂ Cl ₂	FU-003-D-40X			1 mg/mL	CS ₂	DRH-FL-SS	
	0.5 mg/mL	Hexane	FU-004			3 mg/mL	CS ₂	DRH-FL-SS-3X	
	20 mg/mL	Hexane	FU-004-40X		n-Pentadecane 629-62-9	5 mg/mL	MeOH	AS-E0241	
#4 Fuel oil 68476-31-3	20 mg/mL	CH ₂ Cl ₂	FU-004-D-40X		RFA Gasoline (oxygenate-free)	0.5 mg/mL	MeOH	GA-005	
	0.5 mg/mL	Hexane	FU-008			20 mg/mL	MeOH	GA-005-40X	
	20 mg/mL	Hexane	FU-008-40X			20 mg/mL	CH ₂ Cl ₂	GA-005-D-40X	
	20 mg/mL	CH ₂ Cl ₂	FU-008-D-40X		Regular Leaded Gasoline	0.5 mg/mL	MeOH	GA-002	
#6 Fuel Oil 68553-00-4	0.5 mg/mL	Hexane	FU-008-40X			20 mg/mL	MeOH	GA-002-40X	
	20 mg/mL	Hexane	FU-008-40X			20 mg/mL	CH ₂ Cl ₂	GA-002-D-40X	
	20 mg/mL	CH ₂ Cl ₂	FU-008-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	AK-102.0-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	AK-102.0-SS-10X	
SAE 10W30 Motor oil	0.5 mg/mL	Hexane	FU-026-H			2 mg/mL	Acetone	GRH-SS	
	20 mg/mL	Hexane	FU-026-H-40X		n-Tetradecane 629-59-4	5 mg/mL	MeOH	AS-E0240	
	20 mg/mL	CH ₂ Cl ₂	FU-026-D-40X		Tetracosane (5 mL) 646-31-1	500 µg/mL	CS ₂	D-5480-C40-5ML	
SAE 10W40 Motor oil	0.5 mg/mL	Hexane	FU-027-H			500 µg/mL	Chloroform	D-5480-C40-R1-5ML	
	20 mg/mL	Hexane	FU-027-H-40X		n-Tridecane 629-50-5	5 mg/mL	MeOH	AS-E0239	
	20 mg/mL	CH ₂ Cl ₂	FU-027-D-40X		1,2,3-Trimethylbenzene 526-73-8	1 mg/mL	CH ₂ Cl ₂	V-028S-D-10X	
SAE 20W50 Motor oil	0.5 mg/mL	Hexane	FU-028-H			500 µg/mL	Acetone	AK-103.0-SS	
	20 mg/mL	Hexane	FU-028-H-40X		n-Triacontane-d ₃₂ 93952-07-9	5 mg/mL	Acetone:THF	AK-103.0-SS-10X	
	20 mg/mL	CH ₂ Cl ₂	FU-028-D-40X			5 mg/mL	THF	DRH-SS	
SAE 30W Motor oil	0.5 mg/mL	Hexane	FU-018-H		Turbine (Jet) fuel	0.5 mg/mL	MeOH	FU-006	
	20 mg/mL	Hexane	FU-018-H-40X			20 mg/mL	MeOH	FU-006-40X	
	20 mg/mL	CH ₂ Cl ₂	FU-018-D-40X			20 mg/mL	CH ₂ Cl ₂	FU-006-D-40X	
	5 mg/mL	Acetone	AK-103.0-LCS			1 gram	Neat	HS-004N	
SAE 40W Motor oil	20 mg/mL	Hexane	FU-019-H-40X			0.5 mg/mL	MeOH	HS-004S	
	20 mg/mL	CH ₂ Cl ₂	FU-019-D-40X		Turpentine 8006-64-2	20 mg/mL	MeOH	HS-004S-40X	
	25 mg/mL	Acetone:CH ₂ Cl ₂	AK-103.0-LCS-5X			20 mg/mL	CH ₂ Cl ₂	HS-004S-D-40X	
	20 mg/mL	CH ₂ Cl ₂	FU-021-D-40X			5 mg/mL	MeOH	GA-W25-10X	
SAE 50W Motor oil	1 gram	Neat	HS-005N		Unleaded Gasoline 25% Weathered	5 mg/mL	MeOH	GA-W50-10X	
	0.5 mg/mL	MeOH	HS-005S			5 mg/mL	MeOH	GA-W75-10X	
	5 mg/mL	MeOH	HS-005S-10X		Unleaded Gasoline 50% Weathered	5 mg/mL	MeOH	GA-W50-10X	
	20 mg/mL	MeOH	HS-005S-40X			5 mg/mL	MeOH	GA-W75-10X	
	20 mg/mL	CH ₂ Cl ₂	HS-005S-D-40X		Unleaded Gasoline 75% Weathered	5 mg/mL	MeOH	GA-W75-10X	
Stoddard solvent 8052-41-3	1 gram	Neat	HS-005N			5 mg/mL	MeOH	GA-W75-10X	
	0.5 mg/mL	MeOH	HS-005S						
	5 mg/mL	MeOH	HS-005S-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

AccuStandard has assembled 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. **Other concentrations are listed on the next page.**

TPH-R2-SET

33 x 1 mL (includes 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 (weathered)	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 (Cruise Missile)	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



AccuStandard designed 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. (µg/mL) in MeOH

	CCME-LPF-0.05X	CCME-LPF-0.1X	CCME-LPF-0.2X	CCME-LPF-0.5X	CCME-LPF
n-Decane	12.5	25	50	125	250
n-Hexane	12.5	25	50	125	250
Toluene	12.5	25	50	125	250
Benzene	12.5	25	50	125	250
o-Xylene	12.5	25	50	125	250
m-Xylene	6.25	12.5	25	62.5	125
p-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. (µg/mL) in n-Hexane

	CCME-MHPF-0.1X	CCME-MHPF-0.5X	CCME-MHPF
n-Decane	40	200	400
n-Hexadecane	40	200	400
n-Tetatriacontane	40	200	400

Performance Check Standard

CCME-QC

1 x 1 mL

CCME-QC-PAK **SAVE**

5 x 1 mL

At 40 µg/mL each in n-Hexane:Cyclohexane

2 comps.

n-Pentacontane
n-Tetracontane

Spike Standard

CCME-SPIKE

1 x 1 mL

At 2500 µg/mL each in n-Hexane

2 comps.

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

Hydrocarbon Standard

D-5442-R1

100 µg/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-Tetatriacontane
n-Hexatriacontane
n-Octatriacontane
n-Tetracontane
n-Tetratetracontane
n-Pentacontane

Canadian Atlantic RBCA EPH Mix

CCME-EPH

1 x 1 mL

1000 µg/mL each in Hexane:CH₂Cl₂ 85:15

11 comps.

Acenaphthene
Anthracene
Benzo[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 µg/mL each in CH₂Cl₂

2 comps.

n-Dotriacontane
Isobutylbenzene

Canadian Atlantic RBCA VPH Mix

CCME-VPH

1 x 1 mL

1000 µg/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 µg/mL in MeOH

Isobutylbenzene

ISO/DIS 9377 Hydrocarbon Oil Index

Diesel #2/Mineral Oil Standard

ENISO9377-2-1

1 x 1 mL

10000 µg/mL total hydrocarbons in Hexane

2 comps.

#2 Diesel (5000 µg/mL)
Mineral Oil (5000 µg/mL)

Quality Control Standard Mix

ISO/DIS9377-4-1

1 x 1 mL

1000 µg/mL total hydrocarbons in Acetone

2 comps.

#2 Diesel (500 µg/mL)
Mineral Oil (500 µg/mL)

Extraction Solvent Stock Soln.

ENISO9377-2-3

1 x 5 mL

At stated conc. in Hexane

2 comps.

n-Decane (20 µg/L)
n-Tetracontane (20 mg/L)

Stearyl Stearate Test Solution

ISO/DIS9377-4-2

1 x 10 mL

2000 µg/mL in Cyclohexane

Stearyl stearate

Florasil Cartridge QC Std. Mix

ENISO9377-2-4

1 x 10 mL

2000 µg/mL total hydrocarbons in Hexane

2 comps.

#2 Diesel (1000 µg/mL)
Mineral Oil (1000 µg/mL)

System Performance Standard of n-alkanes

ENISO9377-2-2

1 x 1 mL

50 µg/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-Tetatriacontane
n-Hexatriacontane
n-Octatriacontane
n-Tetracontane

ISO/DIS 9377-4 Standard Mixture Stock Solution

TPH-006-10X

1 x 1 mL

TPH-006-10X-PAK **SAVE**

5 x 1 mL

5000 µg/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



Multi-State Hydrocarbon Window Defining Arizona Diesel Range California Gasoline Connecticut Extractable TPH Mississippi DRO New Jersey Pennsylvania Storage Tank Monitoring Standards Tennessee DRO Wisconsin Gasoline Range Hydrocarbons	311-313
Alaska GRO, DRO Hydrocarbons, RRO, DRO Hydrocarbons (Fuel) DRO Hydrocarbons (Standards)	314-315
Florida FTRPH	316
Massachusetts EPH, VPH	317-318
Texas Method 1005 (PST)	319
Washington VPH, EPH	320-321
Gasoline Range Hydrocarbons (GRH)	322
Diesel Range Hydrocarbons (DRH)	323
Oil, Grease & TPH (Method 1664, 413.2/418.1 and 8440) Weathered Fuel Sets	324

Multi-State LUFT/LUST (UST)

Additional LUFT/LUST

GRH

DRH, Oil, Grease & 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

SAVE

1 x 1 mL
5 x 1 mL
35 comps.

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. As an added benefit, AccuStandard has included Pristane and Phytane in the formulation. Again, use of 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.

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



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

DRO/ORO-AZ-8015-PAK

2000 µg/mL each in CH₂Cl₂

SAVE

1 x 1 mL

5 x 1 mL

12 comps.

n-Decane
n-Dodecane
n-Docosane
n-Dotriacontane
n-Eicosane
n-Hexacosane

n-Hexadecane
n-Octacosane
n-Octadecane
n-Tetracosane
n-Tetradecane
n-Triacotane

Retention Time Verification Standard

DRO/ORO-AZ-8015-RTV

DRO/ORO-AZ-8015-RTV-PAK

1000 µg/mL each in CH₂Cl₂

SAVE

1 x 1 mL

1 x 1 mL

3 comps.

n-Decane
n-Docosane
n-Dotriacontane

Stock Calibration Standard

DRO/ORO-AZ-8015-SCS

DRO/ORO-AZ-8015-SCS-PAK

10,000 µg/mL each in CH₂Cl₂

SAVE

1 x 1 mL

1 x 1 mL

2 comps.

#2 Diesel
10W 30 Motor Oil

Surrogate Standards

DRO-AK-102-SS-10X

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

2.0 mg/mL in Acetone

SAVE

1 x 1 mL

5 x 1 mL

o-Terphenyl

California Method (including LA County)

California - Gasoline Range Hydrocarbons

S-603A-10X

S-603A-10X-PAK

2.0 mg/mL each in MeOH

SAVE

1 x 1 mL

5 x 1 mL

7 comps.

Benzene
Ethylbenzene
Methyl *t*-butyl ether
Toluene

o-Xylene
m-Xylene
p-Xylene

LA County Well Investigation & Monitoring Program

Purgeable Aromatics - Gasoline ID

M-602-GAS-10X

2.0 mg/mL each in MeOH

1 x 1 mL

11 comps.

Benzene
Chlorobenzene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Ethylbenzene

Toluene
o-Xylene
p-Xylene
m-Xylene
MtBE

Oxygenate Gasoline Additive Standard

OGAD-001

OGAD-001-PAK

At stated conc. in MeOH

SAVE

1 x 1 mL

5 x 1 mL

5 comps.

MtBE (2000 µg/mL)
ETBE (2000 µg/mL)
Isopropyl ether (2000 µg/mL)

TAME (2000 µg/mL)
t-Butanol (10000 µg/mL)

Ethanol

M-8015B/5031-11

10 mg/mL in Water

1 x 1 mL

Methanol

M-8015B/5031-17

10 mg/mL in Water

1 x 1 mL

Method 1004 Carbonyl Compounds as DNPH Derivatives by HPLC

M-1004

At stated conc. in AcCN

M-1004-10X

At 10 times the stated conc. in AcCN

1 x 1 mL

13 comps.

1 x 1 mL

13 comps.

Carbonyl Compound	DNPH Derivative
Acetaldehyde	(3.0 µg/mL) (15.3 µg/mL)
Acetone	(3.0 µg/mL) (12.3 µg/mL)
Acrolein	(3.0 µg/mL) (12.7 µg/mL)
Benzaldehyde	(3.0 µg/mL) (8.1 µg/mL)
2-Butanone (MEK)	(3.0 µg/mL) (10.5 µg/mL)
<i>n</i> -Butyraldehyde	(3.0 µg/mL) (10.5 µg/mL)
Crotonaldehyde	(3.0 µg/mL) (10.7 µg/mL)
Formaldehyde	(3.0 µg/mL) (21.0 µg/mL)
Hexanal	(3.0 µg/mL) (8.4 µg/mL)
Methacrolein	(3.0 µg/mL) (10.7 µg/mL)
Propionaldehyde	(3.0 µg/mL) (12.3 µg/mL)
<i>m</i> -Tolualdehyde	(3.0 µg/mL) (7.5 µg/mL)
Valeraldehyde	(3.0 µg/mL) (9.3 µg/mL)

CAR-DNPH

At stated conc. in AcCN as DNPH derivatives

1 x 1 mL

7 comps.

Acetaldehyde	(1000 µg/mL)	Butyraldehyde	(500 µg/mL)
Acetone	(500 µg/mL)	Formaldehyde	(1500 µg/mL)
Acrolein	(500 µg/mL)	Propionaldehyde	(500 µg/mL)
Benzaldehyde	(500 µg/mL)		

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 / Tennessee / Pennsylvania / 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.

SAVE

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

Internal Standard

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

SAVE

5- α Androstane

Surrogate Standard

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

SAVE

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.

SAVE

<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> -Tetratriacontane
<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
Benzo(a)anthracene	Dibenz(a,h)anthracene	Phenanthrene
Benzo(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.

SAVE

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

PA Volatile Petroleum Standard

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

SAVE

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

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.

SAVE

<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.

SAVE

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		

CT, MS, NJ, PA, TN, WI LUFT/LUST



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	SAVE	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	SAVE	5 x 1 mL
5.0 mg/mL in MeOH		
Gasoline, regular unleaded		

Internal Standard

GRO-AK-101-IS-10X		1 x 1 mL
GRO-AK-101-IS-10X-PAK	SAVE	5 x 1 mL
2.0 mg/mL in MeOH		
1-Chloro-4-fluorobenzene		

Surrogate Control Standard

GRO-AK-101-SS		1 x 1 mL
GRO-AK-101-SS-PAK	SAVE	5 x 1 mL
50 µg/mL each in MeOH		
GRO-AK-101-SS-10X		1 x 1 mL
GRO-AK-101-SS-10X-PAK	SAVE	5 x 1 mL
500 µg/mL each in MeOH		
GRO-AK-101-SS-100X		1 x 1 mL
GRO-AK-101-SS-100X-PAK	SAVE	5 x 1 mL
5,000 µg/mL each in MeOH		2 comps.
<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	SAVE	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	

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

Diesel Calibration Composite Mixture (low sulfur)

DRO-AK-102-DCS		1 x 1 mL
DRO-AK-102-DCS-PAK	SAVE	5 x 1 mL
Total 5.0 mg/mL in CH ₂ Cl ₂		
DRO-AK-102-DCS-10X		1 x 1 mL
DRO-AK-102-DCS-10X-PAK	SAVE	5 x 1 mL
Total 50.0 mg/mL in CH ₂ Cl ₂		3 comps.

	DRO-AK-102-DCS	DRO-AK-102-DCS-10X
Diesel Fuel (Arctic)	1.66 mg/mL	16.6 mg/mL
#1 Diesel (Low Sulfur)	1.67 mg/mL	16.6 mg/mL
#2 Diesel (extra Low Sulfur)	1.67 mg/mL	16.6 mg/mL

Stock Concentrate Diesel Calibration Composite Mix

DRO-AK-102-DCS-10X-R1		1 x 1 mL
DRO-AK-102-DCS-10X-R1-PAK	SAVE	5 x 1 mL
Total 50.0 mg/mL in CH ₂ Cl ₂		3 comps.

	Wt. Vol.		Wt. Vol.
Diesel Fuel (Arctic)	16.6 mg/mL	#2 Diesel	16.7 mg/mL
#1 Diesel (Low Sulfur)	16.7 mg/mL	(Conventional)	

Alaska Method 102 DRO Hydrocarbons
continued on next page

Certified BTEX in Gasoline (Single Source)

GA-001-20X-BTEX	1 x 1 mL
10.0 mg/mL in MeOH	
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
5 mg/mL total in MeOH	
3 comps.	

	Wt. Vol.
Gasoline, premium	1.66 mg/mL
Gasoline, regular leaded	1.67 mg/mL
Gasoline, regular unleaded	1.67 mg/mL

Gasoline Calibration Composite Mix

GRO-AK-101-GCS		1 x 1 mL
GRO-AK-101-GCS-PAK	SAVE	5 x 1 mL
Total 5.0 mg/mL in MeOH		3 comps.

	Wt. Vol.
Gasoline, premium	1.66 mg/mL
Gasoline, regular leaded	1.67 mg/mL
Gasoline, regular unleaded	1.67 mg/mL

Gasoline Calibration Mix Version

GRO-AK-101-GSC-R1		1 x 1 mL
GRO-AK-101-GSC-R1-PAK	SAVE	5 x 1 mL
Equal parts by weight of each		

Gasoline, regular unleaded	Gasoline, premium unleaded
Gasoline, plus unleaded	

Technical Note

Laboratory Control Standards are prepared from an independent source.

Technical Note

AccuStandard formulated the Diesel Calibration Composite Mix and Laboratory Control Standard using two independent sources of #2 Diesel as required by the Alaskan method. Unfortunately, the chromatographic patterns for the #2 diesel sources (conventional & extra low sulfur) are different. We have obtained independent sources of each type of #2 diesel to assure similar chromatographic patterns and recommend that when a customer is analyzing the Diesel Calibration Composite and Laboratory Control standard that the client orders DRO-AK-102-DCS and DRO-AK-102-LCS products together to obtain similar chromatographic patterns for #2 diesel extra low sulfur patterns and DRO-AK-102-DCS-10X-R1 and DRO-AK-102-LCS-10X-R1 products to obtain similar chromatographic patterns for #2 Diesel conventional patterns. Laboratories performing the Alaskan DRO analysis will find the #2 Diesel conventional chromatographic pattern more closely resembles typical Diesel samples drawn from environmental sites.

Laboratory Control Standard (low sulfur)

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

#2 Diesel (extra Low Sulfur)

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	SAVE	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	SAVE	5 x 1 mL
2.0 mg/mL each in CH ₂ Cl ₂		
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	SAVE	5 x 1 mL
200 µg/mL in Acetone		
DRO-AK-102-SS-10X		1 x 1 mL
DRO-AK-102-SS-10X-PAK	SAVE	5 x 1 mL
2.0 mg/mL in Acetone		
<i>o</i> -Terphenyl		

Internal Standard

DRO-AK-102-IS		1 x 1 mL
DRO-AK-102-IS-PAK	SAVE	5 x 1 mL
1.0 mg/mL in CH ₂ Cl ₂		
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	SAVE	5 x 1 mL
2000 µg/mL each in CH ₂ Cl ₂		
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	SAVE	5 x 1 mL
1000 µg/mL each in CH ₂ Cl ₂		
3 comps.		
Squalane	5,6,7,8-Tetrahydro-1-naphthol	
<i>o</i> -Terphenyl		

Retention Time Marker Standard

DRO-AK-102/103AA-RT		1 x 1 mL
DRO-AK-102/103AA-RT-PAK	SAVE	5 x 1 mL
50 µg/mL each in CH ₂ Cl ₂		
3 comps.		
<i>n</i> -Decane	<i>n</i> -Hexatriacontane	
<i>n</i> -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	SAVE	5 x 1 mL
Total 5.0 mg/mL in CH ₂ Cl ₂		
3 comps.		
SAE 30W Motor oil (1.66 mg)	SAE 50W Motor Oil (1.67 mg)	
SAE 40W Motor oil (1.67 mg)		

RRO-AK-103-RCS-10X		1 x 1 mL
RRO-AK-103-RCS-10X-PAK	SAVE	5 x 1 mL
Total 50.0 mg/mL in CH ₂ Cl ₂		
3 comps.		
SAE 30W Motor oil (16.6 mg)	SAE 50W Motor Oil (16.7 mg)	
SAE 40W Motor oil (16.7 mg)		

Laboratory Control Standard

RRO-AK-103-LCS		1 x 1 mL
RRO-AK-103-LCS-PAK	SAVE	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	SAVE	5 x 1 mL
25.0 mg/mL in Acetone: CH ₂ Cl ₂ (1:1)		
SAE 40W Motor oil		

Surrogate Control Standard

RRO-AK-103-SS		1 x 1 mL
RRO-AK-103-SS-PAK	SAVE	5 x 1 mL
500 µg/mL in Acetone:THF (9:1)		
RRO-AK-103-SS2		1 x 1 mL
RRO-AK-103-SS2-PAK	SAVE	5 x 1 mL
5.0 mg/mL in THF:Acetone (3:1)		
<i>n</i> -Triacotane-d ₆₂		

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	SAVE	5 x 1 mL
2000 µg/mL each in CH ₂ Cl ₂		
9 comps.		
<i>n</i> -Hexacosane	Benzo[b]fluoranthene	
<i>n</i> -Octacosane	Benzo[a]pyrene	
<i>n</i> -Triacotane	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	SAVE	5 x 1 mL
1000 µg/mL each in CH ₂ Cl ₂		
3 comps.		
Squalane	5,6,7,8-Tetrahydro-1-naphthol	
<i>o</i> -Terphenyl		

Retention Time Marker Standard

DRO-AK-102/103AA-RT		1 x 1 mL
DRO-AK-102/103AA-RT-PAK	SAVE	5 x 1 mL
50 µg/mL each in CH ₂ Cl ₂		
3 comps.		
<i>n</i> -Decane	<i>n</i> -Hexatriacontane	
<i>n</i> -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.

Octane	C ₈	Eicosane	C ₂₀	Dotriacontane	C ₃₂
Decane	C ₁₀	Docosane	C ₂₂	Tetratriacontane	C ₃₄
Dodecane	C ₁₂	Tetracosane	C ₂₄	Hexatriacontane	C ₃₆
Tetradecane	C ₁₄	Hexacosane	C ₂₆	Octatriacontane	C ₃₈
Hexadecane	C ₁₆	Octacosane	C ₂₈	Tetracontane	C ₄₀
Octadecane	C ₁₈	Triacontane	C ₃₀		

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

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
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-Triacontane-d₃₂

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
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.
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. in Carbon disulfide 2 comps.
Nonatriacontane (6000 µg/mL) *o*-Terphenyl (OTP) (1500 µg/mL)



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. in CH_2Cl_2

5 x 1 mL
18 comps.

Components (units in $\mu g/mL$)	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
Benzo[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. in CH_2Cl_2 : n-Hexane (1:1)

5 x 1 mL
15 comps.

Components (units in $\mu g/mL$)	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 $\mu g/mL$ each in Hexane

SAVE

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
Benzo[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

40 $\mu g/mL$ in Hexane

DRH-MA-FSS-50X

2.0 mg/mL in Hexane

DRH-MA-FSS-50X-PAK

2.0 mg/mL in Hexane

SAVE

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

SAVE

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

SAVE

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
Benzo[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 are available. In addition, Ready-to-Use working level aromatic and aliphatic calibration sets are also 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 (1:1)

SAVE

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

SAVE

1 x 1 mL
5 x 1 mL

1-Chlorooctadecane

EPH Surrogate Spike

DRH-MA-SS

20 $\mu g/mL$ each in Acetone

DRH-MA-SS-10X 200 $\mu g/mL$ each in Acetone

DRH-MA-SS-100X 2,000 $\mu g/mL$ each in Acetone

DRH-MA-SS-100X-PAK 2,000 $\mu g/mL$ each in Acetone

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

1-Chlorooctadecane

o-Terphenyl

EPH Matrix Spike

DRH-MA-MS

25 $\mu g/mL$ in Acetone

DRH-MA-MS-PAK

25 $\mu g/mL$ in Acetone

DRH-MA-MS-10X 250 $\mu g/mL$ in Acetone

DRH-MA-MS-10X-PAK 250 $\mu g/mL$ in Acetone

DRH-MA-MS-40X 1,000 $\mu g/mL$ in Acetone

DRH-MA-MS-40X-PAK 1,000 $\mu g/mL$ in Acetone

SAVE

SAVE

SAVE

SAVE

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

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

Internal Standard

GRH-IS

1,000 $\mu g/mL$ in CH_2Cl_2

GRH-IS-PAK

1,000 $\mu g/mL$ in CH_2Cl_2

GRH-IS-10X

10.0 mg/mL in CH_2Cl_2

SAVE

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

DEP (MA)-VPH Surrogate Standard

GRH-004-SS			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>			14 comps.
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>			8 comps.
Benzene	Toluene		
Ethylbenzene	<i>o</i> -Xylene		
MtBE	<i>m</i> -Xylene		
Naphthalene	<i>p</i> -Xylene		

Certified BTEX in Unleaded Gasoline

GA-001-20X-BTEX		1 x 1 mL
<i>10.0 mg/mL in MeOH</i>		
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>			15 comps.
Benzene	(5.0)	Toluene	(15.0)
Ethylbenzene	(5.0)	1,2,4-Trimethylbenzene	(10.0)
Isooctane	(15.0)	<i>o</i> -Xylene	(10.0)
2-Methylpentane	(15.0)	<i>m</i> -Xylene	(10.0)
MtBE	(15.0)	<i>p</i> -Xylene	(10.0)
Naphthalene	(10.0)	<i>n</i> -Butylcyclohexane	(10.0)
<i>n</i> -Nonane	(10.0)	<i>n</i> -Decane	(10.0)
<i>n</i> -Pentane	(10.0)		

GRH-004S-R2		1 x 1 mL
<i>10 mg/mL each in MeOH</i>		15 comps.

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

Volatile Petroleum Hydrocarbons with Surrogate

GRH-004S/SS			1 x 1 mL
GRH-004S/SS-PAK			5 x 1 mL
<i>At stated conc. (µg/mL) in MeOH</i>			14 comps.
Benzene	(500)	<i>n</i> -Nonane	(1,000)
2,5-Dibromotoluene (Surrogate)	(1,000)	<i>n</i> -Pentane	(1,000)
Ethylbenzene	(500)	Toluene	(1,500)
Isooctane	(1,500)	1,2,4-Trimethylbenzene	(1,000)
2-Methylpentane	(1,500)	<i>o</i> -Xylene	(1,000)
MtBE	(1,500)	<i>m</i> -Xylene	(1,000)
Naphthalene	(1,000)	<i>p</i> -Xylene	(1,000)

GRH-004S/SS-R1		1 x 1 mL
<i>At stated conc. (µg/mL) in MeOH</i>		16 comps.

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

GRH-004S/SS-R2		1 x 1 mL
<i>10.0 mg/mL each in MeOH</i>		16 comps.

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

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.



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.

SAVE

<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.

Regular Unleaded Gasoline #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.

Regular Unleaded Gasoline #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.

SAVE

Regular Unleaded Gasoline #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.

SAVE

Regular Unleaded Gasoline #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.

Regular Unleaded Gasoline #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.

SAVE

Regular Unleaded Gasoline #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.

SAVE

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.

SAVE

<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.

SAVE

Acenaphthene	Benzo[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
Benzo[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	SAVE		5 x 1 mL
200 µg/mL each in MeOH			15 comps.
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	SAVE		5 x 1 mL
2,000 µg/mL each in MeOH			16 comps.
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	SAVE		5 x 1 mL
2,000 µg/mL each in MeOH			15 comps.
VPH-WA-100X			1 x 1 mL
VPH-WA-100X-PAK	SAVE		5 x 1 mL
20.0 mg/mL each in MeOH			15 comps.
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 (Single Source)

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

Certified BTEX in Gasoline Composite (Multi Source)

GRO-AK-101-GCS-BTEX	1 x 1 mL
5 mg/mL in MeOH	3 comps.
	Wt. Vol.
Gasoline (Premium)	1.66 mg/mL
Gasoline (Regular Leaded)	1.67 mg/mL
Gasoline (Regular Unleaded)	1.67 mg/mL

VPH Matrix Spike

VPH-WA-MS			1 x 1 mL
VPH-WA-MS-PAK	SAVE		5 x 1 mL
Varied conc. in MeOH			11 comps.
Benzene	(60 µg/mL)	Toluene	(60 µg/mL)
Ethylbenzene	(60 µg/mL)	1,2,3-Trimethylbenzene	(60 µg/mL)
MtBE	(180 µg/mL)	<i>m</i> -Xylene	(60 µg/mL)
Naphthalene	(360 µg/mL)	<i>p</i> -Xylene	(60 µg/mL)
<i>n</i> -Nonane	(200 µg/mL)	<i>o</i> -Xylene	(60 µg/mL)
<i>n</i> -Pentane	(600 µg/mL)		

VPH Surrogate Standard

GRH-004-SS			1 x 1 mL
GRH-004-SS-PAK	SAVE		5 x 1 mL
50 µg/mL in MeOH			
GRH-004-SS-10X			1 x 1 mL
GRH-004-SS-10X-PAK	SAVE		5 x 1 mL
500 µg/mL in MeOH			
GRH-004-SS-100X			1 x 1 mL
GRH-004-SS-100X-PAK	SAVE		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	SAVE		5 x 1 mL
2,000 µg/mL each in MeOH			6 comps.
<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	SAVE		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	
Benzo[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	
Benzo[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-Tetatriacontane	

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	
Benzo[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	
Benzo[a]pyrene	Indeno[1,2,3-cd]pyrene	n-Hexadecane	
Benzo[b]fluoranthene	2-Methylnaphthalene	n-Heneicosane	
Benzo[g,h,i]perylene	Naphthalene	n-Tetatriacontane	
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. in MeOH 10 comps.

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

Internal Standard

GARR-IS 1 x 1 mL
1.0 mg/mL in CH₂Cl₂
Chloro-4-fluorobenzene

Surrogate Standard

GARR-SS 1 x 1 mL
2.5 mg/mL in Acetone
4-Bromofluorobenzene

Gasoline Additives

GAD-001 1 x 1 mL
GAD-001-PAK **SAVE** 5 x 1 mL
0.2 mg/mL each in MeOH 4 comps.
Dibromomethane 1,2-Dichloroethane
1,2-Dibromoethane Methyl t-butyl ethers

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 in MeOH
Regular unleaded gasoline

Hexadecane Extraction Volatiles

CLP-BTEX 1 x 1 mL
CLP-BTEX-PAK **SAVE** 5 x 1 mL
0.2 mg/mL each in MeOH 6 comps.
CLP-BTEX-10X 1 x 1 mL
CLP-BTEX-10X-PAK **SAVE** 5 x 1 mL
2.0 mg/mL each in MeOH 6 comps.
Benzene o-Xylene
Ethyl benzene m-Xylene
Toluene p-Xylene

California - Gasoline Range Hydrocarbons

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

Benzene	o-Xylene
Ethylbenzene	m-Xylene
Methyl t-butyl ether	p-Xylene
Toluene	

Los Angeles County Well Investigation and 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	o-Xylene
1,2-Dichlorobenzene	p-Xylene
1,3-Dichlorobenzene	m-Xylene
1,4-Dichlorobenzene	MtBE
Ethylbenzene	

Oxygenate Gasoline Additive Standard

OGAD-001 1 x 1 mL
OGAD-001-PAK **SAVE** 5 x 1 mL
At stated conc. in MeOH 5 comps.

MtBE	(2000 µg/mL)	TAME	(2000 µg/mL)
ETBE	(2000 µg/mL)	t-Butanol	(10000 µg/mL)
Isopropyl ether	(2000 µg/mL)		

Ethanol

M-8015B/5031-11 1 x 1 mL
10 mg/mL in Water

Methanol

M-8015B/5031-17 1 x 1 mL
10 mg/mL in Water

Pennsylvania DER - Gasoline Range Hydrocarbons

GRH-001S 1 x 1 mL
GRH-001S-PAK **SAVE** 5 x 1 mL
1.0 mg/mL each in MeOH 10 comps.

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

Wisconsin DNR - Gasoline Range Hydrocarbons

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

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

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

n-Decane C₁₀ *n*-Hexadecane C₁₆ *n*-Docosane C₂₂ *n*-Hexacosane C₂₆
n-Dodecane C₁₂ *n*-Octadecane C₁₈ *n*-Tetracosane C₂₄ *n*-Octacosane C₂₈
n-Tetradecane C₁₄ *n*-Eicosane C₂₀

Surrogate Standard

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

Internal Standard

GRH-IS 1 x 1 mL
GRH-IS-PAK 5 x 1 mL
1.0 mg/mL in CH₂Cl₂ **SAVE**
5- α 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 **SAVE** 17 comps.

Octane C₈ Octadecane C₁₈ Hexacosane C₂₆ Tetratriacontane C₃₄
Decane C₁₀ Eicosane C₂₀ Octacosane C₂₈ Hexatriacontane C₃₆
Dodecane C₁₂ Docosane C₂₂ Triacontane C₃₀ Octatriacontane C₃₈
Tetradecane C₁₄ Tetracosane C₂₄ Dotriacontane C₃₂ Tetracontane C₄₀
Hexadecane C₁₆

Surrogate Standard

DRH-SS 1 x 1 mL
DRH-SS-PAK 5 x 1 mL
5.0 mg/mL in THF **SAVE**
n-Triacontane-d₃₂

D-2887 Calibration Solution

Calibration Solution

DRH-002S 1 x 1 mL
At stated conc. in CS₂ 17 comps.

Hexane (600 μ g/mL) Dodecane (1,200 μ g/mL) Octacosane (100 μ g/mL)
Heptane (600 μ g/mL) Tetradecane (1,200 μ g/mL) Dotriacontane (100 μ g/mL)
Octane (800 μ g/mL) Hexadecane (1,000 μ g/mL) Hexatriacontane (100 μ g/mL)
Nonane (800 μ g/mL) Octadecane (500 μ g/mL) Tetracontane (100 μ g/mL)
Decane (1,200 μ g/mL) Eicosane (200 μ g/mL) Tetraoctacontane (100 μ g/mL)
Undecane (1,200 μ g/mL) Tetracosane (200 μ g/mL)

Column Test Mixture

ASTM-D2887 1 x 1 mL
1% v/v 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.

n-Decane C₁₀ *n*-Tetradecane C₁₄ *n*-Octadecane C₁₈
n-Undecane C₁₁ *n*-Pentadecane C₁₅ *n*-Nonadecane C₁₉
n-Dodecane C₁₂ *n*-Hexadecane C₁₆ *n*-Eicosane C₂₀
n-Tridecane C₁₃ *n*-Heptadecane C₁₇

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 μ g/mL each in Chloroform **SAVE** 35 comps.

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

Technical Note

We offer a hydrocarbon window defining standard with the C₉ to C₃₅ 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.

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

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

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

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

FTRPH Calibration/Window Defining Standard

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

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

Hydrocarbon Window Defining Standard

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

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

Hydrocarbon Window Defining Standard Set

DRH-FTRPH-SET 2 x 1 mL
DRH-FTRPH-SET-PAK 5 (2 x 1 mL)
500 μ g/mL each in Hexane **SAVE** (DRH-FTRPH, DRH-FTRPH2)

DRH LUFT/LUST



LUFT/LUST Standards

Oil, Grease & TPH (Method 1664, 413.2/418.1 & 8440) Weathered Fuel Sets

Method 1664 Oil, Grease & Total Petroleum Hydrocarbon Determination

Precision and Recovery (PAR) Spiking Solution

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

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.

Silica Gel Hexane Extraction Material

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

Method 413.2 & 418.1 Total Petroleum Hydrocarbon Analysis by IR

Oil, Grease & Petroleum Hydrocarbon Concentrates Mix

M-418-CON		1 x 1 mL
% by volume		
Chlorobenzene (25.0)	Hexadecane (37.5)	3 comps.
Isooctane (37.5)		

Oil, Grease and Petroleum Hydrocarbon Total Recoverable (IR Method)

M-418		1 x 1 mL
M-418-PAK	SAVE	5 x 1 mL
Total 4.15 mg/mL in Freon 113, (Parts by volume)		
Chlorobenzene (10.0)	Isooctane (15.0)	3 comps.
n-Hexadecane (15.0)		

Method 8440 Total Petroleum Hydrocarbon Analysis

Total Recoverable Petroleum Hydrocarbon Mix

M-8440		1 x 1 mL
M-8440-PAK	SAVE	5 x 1 mL
At stated conc. in Tetrachloroethene		
Chlorobenzene (0.10 w/w %)	Isooctane (0.15 w/w %)	3 comps.
n-Hexadecane (0.15 w/w %)		

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	SAVE	5 x 1 mL
25 µg/mL each in CH ₂ Cl ₂		
n-Hexane	n-Tetracosane	n-Triacontane
n-Decane	n-Octacosane	n-Tetracontane
n-Dodecane		

Silica Gel Cleanup Calibration Solution

M-8440-SGC		1 x 1 mL
M-8440-SGC-PAK	SAVE	5 x 1 mL
10.0 mg/mL in Tetrachloroethene		
Corn Oil		

Total Petroleum Hydrocarbon Concentrate Mix

M-8440-CON		1 x 1 mL
M-8440-CON-PAK	SAVE	5 x 1 mL
Chlorobenzene (25.0 vol %)	Isooctane (37.5 vol %)	3 comps.
n-Hexadecane (37.5 vol %)		

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.

Organic Technical Reference

Solvent Miscibility Table, Density and Boiling Point

Acetic acid (1.049 g/mL) (117-118°C)
Acetone (0.791 g/mL) (56°C)
Acetonitrile (AcCN) (0.786 g/mL) (81-82°C)
Benzene (0.874 g/mL) (80°C)
2-Butanol (0.808 g/mL) (98°C)
Butyl alcohol (0.81 g/mL) (116-118°C)
tert-Butylmethyl ether (MtBE) (0.74 g/mL) (55-56°C)
Carbon tetrachloride (1.594 g/mL) (76-77°C)
Chloroform (1.492 g/mL) (60.5-61.5°C)
Cyclohexane (0.779 g/mL) (80.7°C)
Cyclopentane (0.751 g/mL) (50°C)
Dichloroethane (1.256 g/mL) (83°C)
N,N-Dimethylformamide (DMF) (0.944 g/mL) (153°C)
1,4-Dioxane (1.034 g/mL) (100-102°C)
Dipropyl ether (0.736 g/mL) (88-90°C)
Ethyl acetate (EtOAc) (0.902 g/mL) (76.5-77.5°C)
Ethyl alcohol (EtOH) (0.789 g/mL) (78°C)
Ethyl ether (0.706 g/mL) (34.6°C)
n-Heptane (0.684 g/mL) (98°C)
n-Hexane (0.659 g/mL) (69°C)
Isooctane (0.692 g/mL) (98-99°C)
Isopropyl alcohol (0.785 g/mL) (82°C)
Methanol (MeOH) (0.791 g/mL) (64.7°C)
Methylene chloride (CH ₂ Cl ₂) (1.325 g/mL) (39.8-40°C)
Methyl sulfoxide (DMSO) (1.10 g/mL) (189°C)
n-Pentane (0.626 g/mL) (35-36°C)
1,1,2,2-Tetrachloroethane (1.586 g/mL) (147°C)
Tetrahydrofuran (THF) (0.889 g/mL) (65-67°C)
Toluene (0.865 g/mL) (110-111°C)
Trichloroethane (1.336 g/mL) (74-76°C)
Water (1 g/mL) (100°C)
Xylene (0.868 g/mL) (138-139°C)

☐ Miscible
☒ Immiscible

Read down column
and across for solvent
miscibility

Density@25°C
Boiling Point

Abbreviations

AA	Atomic Absorption	ICP	Inductively Coupled Plasma
ACS	American Chemical Society	IR	Infrared
ANSI	American National Standards Institute	KF	Karl Fischer
AOAC	Association of Official Analytical Chemists	meq	Milliequivalent
APHA	American Public Health Association	NF	National Formulary
ASTM	American Society for Testing Materials	NIST	National Institute of Standards and Technology
BSI	British Standards Institute	OSHA	Occupational Safety and Health Administration
CAS	Chemical Abstracts Service	RFA	Renewable Fuel Association
CI	Color Index	SPE	Solid Phase Extraction
EPA	U.S. Environmental Protection Agency	TLC	Thin Layer Chromatography
GLC	Gas Liquid Chromatography	USDA	U.S. Department of Agriculture
GR	Guaranteed Reagent	USP	U.S. Pharmacopoeia

Instrumentation for Analysis

GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectroscopy
GC/FID	Gas Chromatography/Flame Ionization Detector
GC/PID	Gas Chromatography/Photoionization Detector
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/ELCD	Gas Chromatography/Electrolytic Conductivity Detector
GC/NPD	Gas Chromatography/Nitrogen Phosphorus Detector
HPLC	High Performance Liquid Chromatography
NPD/TEA	Nitrogen-Phosphorus Detector/Thermal Energy Analyzer with the reductive Hall detector
TCD/FID	Thermal Conductivity Detector/Flame Ionization Detector
NPD/AFD/TSD	Nitrogen-Phosphorus Detector/Alkali-Flame Detector/Thermionic Specific Detector
NPA/ELCD/FPD	Nitrogen-Phosphorus Detector/Electrolytic Conductivity Detector/Flame Photometric Detector
HRGC/LRMS	High Resolution Gas Chromatography/Low Resolution Mass Spectrometry
FTIR	Fourier Transform Infrared

General Constants

Universal Gas Constant	R = 0.0821 (Atm)(L)/(K)(mole)
Acceleration Due to Gravity	g = 32.17 ft/sec ² , 9.8 m/sec ²
Avogadro's Constant	N = 6.023 x 10 ²³ molecules/mole
Speed of Light	c = 186,282 miles/sec, 3 x 10 ¹⁰ cm/sec
Heat of Fusion (water 1 atm, 0°C)	ΔH _{fus} = 79.7 cal/g
Heat of Vaporization (water 1 atm, 100°C)	ΔH _{vap} = 540 cal/g
Volume of Perfect Gas	22.4L/mol at 0°C, 760 torr
Faraday's Constant	F = 96485.31 C/mol
Planck's Constant	h = 6.626 x 10 ⁻²⁷ erg/sec
Bragg's Law	2d nλ = 2d sin(θ)
Absolute Zero	-273.15 °C
Temp. of Liquid Nitrogen	-195.8 °C

Unit Conversions

Temperature

°Fahrenheit	°Celsius	(°F - 32) x 5/9
°Celsius	°Fahrenheit	(°C x 9/5) + 32
°Celsius	°Kelvin	°C + 273

Mass

1 ounce	= 28.4 grams
0.03527 ounces	= 1 gram

Liquid Volume

	Multiply by
Ounces (US)	Milliliters 29.57
Pints (US)	Liters 0.47
Quarts (US)	Liters 0.95
Gallons (US)	Liters 3.8
Milliliters	Ounces (US) 0.034
Liters	Pints (US) 2.1
Liters	Quarts (US) 1.06
Liters	Gallons (US) 0.26
Cubic Feet	Cubic meters 0.03
Cubic Yards	Cubic meters 0.76

1 ppm = 1 µg/mL (wt. /vol.) and
 1 ppm = 1 µg/g (wt./wt.)
 1% = 10,000 ppm (parts per million)
 1 ppm = 1,000 ppb (parts per billion)
 1 ppb = 1,000 ppt (parts per trillion)

1 g = 1,000 mg (milligram)
 1 mg = 1,000 µg (microgram)
 1 µg = 1,000 ng (nanogram)

1 L = 1,000 mL (milliLiter)
 1 mL = 1,000 µL (microLiter)
 1 µL = 1,000 nL (nanoLiter)

Labels, Safety, Storage and Packaging

All organic solutions are in 2 mL Ampules, filled to approximately 1.2 mL to ensure 1 mL can be transferred.

2-Part Label System

Smudgeproof, tear and solvent resistant * (Organic products in ampules)

Part One can be placed into a laboratory journal to document the standard used for the analysis. This label section includes the catalog number, description, lot number, expiration date, safety information, proper storage conditions and documents AccuStandard as the manufacturer.

Part Two duplicates required information for labeling transfer vial(s) with correct information.

* Includes the most common solvents:

Methylene chloride, Methanol and Acetone



Usage, Handling and Storage

Amber ampules are used to ensure the integrity of the contents. The ampule contains at least 120% of the stated volume of a solution, allowing easy transfer. Transfer the required amount using a pipet or clean gastight syringe. Excess solution can be stored in a tightly capped vial.

Expiration dates are determined by short-term and long-term stability studies, experience and knowledge of chemical interactions. As part of our long-term studies, standards are analyzed at the end of their assigned period and sometimes can be recertified for an additional length of time.

All products come with storage conditions listed on the label of the ampule or bottle. Some chemical formulations require refrigeration or freezer storage to inhibit adverse reactions among the components. It is imperative that these conditions are followed to preserve the integrity of the material.

GHS Symbols



- Acute Toxicity (fatal or toxic)

GHS-06



GHS-02

- Flammables
- Self Reactives
- Pyrophorics
- Self-Heating
- Emits Flammable Gas
- Organic Peroxides



GHS-05

- Corrosives
- Skin corrosion/burns
- Eye Damage
- Corrosive to Metals



GHS-07

- Irritant
- Skin Sensitizer
- Acute toxicity (harmful)
- Narcotic Effects
- Respiratory Tract Irritant



GHS-03

- Oxidizers



GHS-08

- Carcinogen
- Respiratory Sensitizer
- Reproductive Toxicity
- Mutagenicity
- Aspiration Toxicity

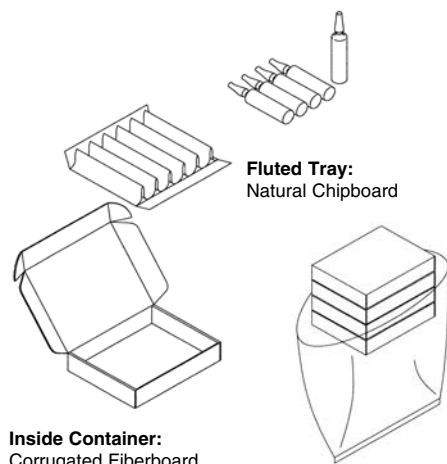


GHS-09

- Aquatic Toxicity

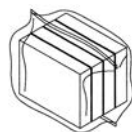
AccuStandard uses recyclable and biogradable material

Package compliant with DOT and International regulations.

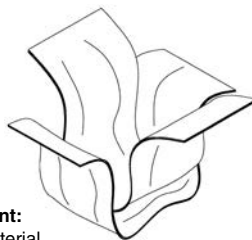


Fluted Tray:
Natural Chipboard

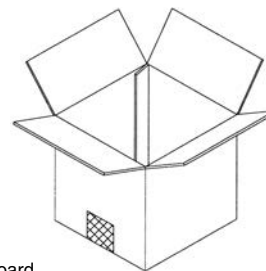
Inside Container:
Corrugated Fiberboard



Cushioning/Absorbent:
Natural Kraft Fiber Material



Shipping Container:
Natural Kraft Corrugated Fiberboard



Custom Services

Custom Synthesis

The AccuStandard Synthesis Department employs several PhD. Organic Chemists with many years of pertinent academic and industrial experience. The experienced staff has developed hundreds of pure chemical compounds for companies and governmental agencies around the world. The very well-equipped synthetic laboratory, with significant analytical support has made many notable synthesis projects possible. We specialize in synthesizing chemicals of high purity to be used as reference standards, and also offer custom synthesis capability on milligram to kilogram scales.



Analytical Capabilities

- GC-MS, GC-FID, GC-ECD, GC-NPD
- HPLC, LC-MS
- ICP, ICP-MS
- access to more analytical instrumentation if necessary

Synthesis and Purification

- Milligram to Kilogram Glassware
- Inert Conditions Equipment
- High Performance Flash Chromatography
- Distillation Equipment - High Vacuum, Molecular (Kugelrohr), and Spinning Band Columns
- Preparative TLC
- Parr Pressure and Hydrogenation Reactor

Custom Synthesized Products

- PCBs (all 209 congeners), & hydroxy, methoxy, and methylsulfonyl metabolites
- Halo-Dibenzodioxins and Furans
- PBDEs (all 209 congeners) & hydroxy, methoxy, chloro metabolites
- Fluorinated PBDEs
- Other Brominated Flame Retardants
- PBBs
- PAHs, Nitro-PAHs, Methyl-PAHs
- Pesticides and metabolites
- Explosives and metabolites
- Nonyl- and Octylphenol Ethoxylates
- Mono- and Diester Phthalates
- Organophosphates
- Other Rare Chemicals

AccuStandard is renowned for its quick response to the needs for new compounds. The company's especially strong Synthesis Department allows the synthesis of important and unique products. Featured in its history of firsts are all of the 209 congeners of polychlorinated biphenyls (PCBs), 209 congeners of polybrominated diphenyl ethers (PBDEs) as well as many halogenated dioxins and dibenzofurans, PAHs, pesticides and fluorinated surrogates substituting the expensive isotopically labelled compounds.

Among the more recent introductions are the hydroxy and methoxy PBDE congeners, mixed bromo/chloro hydroxy and methoxy diphenyl ethers, organophosphate flame retardants, biofuels, plastic additives (AccuStandard authored the Handbook for the Chemical Analysis of Plastic and Polymer Additives published by CRC Press), EPA Method 535 pesticide derivatives and previously unavailable explosive standards.

Custom Formulations

With over 30,000+ custom and 10,000+ listed standards, there is a good chance that AccuStandard will have a standard to meet your needs. However, if your laboratory requires something specific, our Chemists will manufacture a Custom Standard to meet your unique requirements. Custom Standards are an economical and time saving way to have a Standard prepared for your individual needs.

Custom QC options

1. Gravimetric/Volumetric Certification: Each purity is measured gravimetrically and QC verified instrumentally (where available). Every component in the Standard is guaranteed to be within $\pm 0.5\%$ of the requested value unless otherwise stated on the Certificate of Analysis. The solutions are diluted to volume using Class A glassware. A Certificate of Analysis accompanies each Standard and documents the gravimetric values used.
2. Full Quantitative Certification: This QA/QC method includes extended GC analysis using both internal calibration standards plus statistical analysis. A data package containing analytical and gravimetric data can be provided if requested during the quotation phase (Organic Customs only).



Custom Packaging and Bulk Quantity Requirements

AccuStandard has the resources and equipment to meet your custom packaging requirements.

- Automated ampule filling & sealing 0.2 mL up to 20 mL and ampule sizes from 1 mL to 20 mL
- Quantities from 500 to over 500,000 ampules
- Homogeneity testing
- Amber ampules for added product stability
- Private labeling and packaging (OEM)

We can reduce your costs using the Cozzoli Auto Filling/Sealing Machine to package just the right size product for your application. OEM Standards - Privately labeled standards manufactured and tested to your specifications. Cold and under Nitrogen sealing available.



Custom Quotation Request Form

From: Company Contact _____
Company Name _____
Phone: () _____ Ext. _____
FAX: () _____
Email: _____

Send to:

Page ____ of ____

For Internal Use Only

AS Tech. Rep. _____ Product Ordering # _____
Quote Creation Date _____ Quoted price \$ _____

Requested Quantity

No. of Comps. ____
Product Description _____
Concentration _____
Solvent / Matrix _____

Organic

☐ 5 x 1 mL

☐ 10 x 1 mL

☐ 20 x 1 mL

☐ other ____ x ____

Inorganic

☐ 1 x 500 mL

☐ ____ x 500 mL

Component (s)	CAS No. (optional)	Concentration (if varied)	Concentration Units
1 _____	_____	_____	☐ ng/mL
2 _____	_____	_____	☐ µg/mL
3 _____	_____	_____	☐ mg/mL
4 _____	_____	_____	☐ wt. %
5 _____	_____	_____	☐ vol. %
6 _____	_____	_____	
7 _____	_____	_____	
8 _____	_____	_____	
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20 _____	_____	_____	

Photocopy
this form for
future use

Quotation Notes _____

Requested Delivery Date _____

Contact / Order Information

For ordering information contact your AccuStandard Distributor
Visit our website www.accustandard.com

Liability:

- Products listed in this catalog are for research use only.
- No warranty for any particular application is expressed or implied.
- Due to the products hazardous nature, they should be handled by trained personnel.
- AccuStandard's liability will be limited to, replacement of product or refund of purchase price.
- Notice of claims must be made within thirty (30) days from the date of delivery.

AccuStandard.com



- ✓ Thousands of Standards
- ✓ Online SDSs, COAs and EPA Methods
- ✓ New Products and Technical Information

AccuStandard Trademarks and Registered Trademarks

The following trademarks and registered trademarks are accurate to the best of our knowledge at the time of printing. Please consult individual manufacturers and other resources for specific information.

AccuPAK

AccuStandard

AccuTrace

AllergenCheck

eStandards

PolyStandards

PolyAddCheck

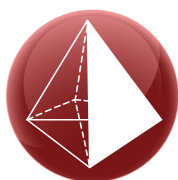


New Products in this Catalog

- Phthalates **17 NEW**
- Phosphate Flame Retardants (PFRs)
- PBDE Congeners (209)
- PBDE Metabolites **25 NEW**

- PBCDE Metabolites
- Biocides (EU Directive)
- Pesticides **Over 125 NEW**
- Plastic Additives **20 NEW**

- Bisphenol Analogs
- EN14105, EN15721 Biofuels
- Halobenzoquinones
- Imidazoles



AccuStandard®

ISO Guide 34 • 17025 • 9001