PetroChemical Standards

- Widest selection of Biofuel reference standards. Includes FAMEs & FAEEs from most popular biomasses, sulfurs, physical standards, wear metals, and free & total glycerin.
- Reference standards to meet the most common UOP LLC (a Honeywell company) methods.
- Reference standards for over 100 ASTM methods plus cross references to ISO, DIN, IP, JIS & AFNOR methods.

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AccuPetroCheck and AccuPetroTest Real World Gasoline QC Standards

In cooperation with ASTM D02 subcommittee 3 and 4, AccuStandard ampulled 21 **Real World** gasoline reference fuels. Consensus Values have been determined for these reference fuels by various ASTM Round Robins to provide Petrochemical Laboratories with a source of well characterized gasoline standards for use in QA/QC applications and as Single Blind test samples over an extended period of time. As new ASTM D02.03 and D02.04 Test methods are promulgated they require **mandatory Quality Control** testing of real world samples. AccuStandard's PetroTest & PetroCheck standards are being successfully used to achieve these new Quality Control requirements.

AccuPetroCheck Consensus Value QC Standard

CARB Low Sulfur RFG QC Standard

ASTM-FUEL-QCS-01-PAK $ 60 / **5 x 15 mL**

Parameter	Method	Value	Conc.
Total Aromatics	D1319	24.5	Vol.%
Total Olefins	D1319	5.3	Vol.%
Total Saturates	D1319	58.3	Vol.%
Sulfur	D2622	0.0057	Wt.%
Sulfur	D4294	0.0078	Wt.%
Sulfur	D5453	55.76	µg/g
Sulfur	DXXXX *	59.31	µg/g
Benzene	D5769	0.80	Vol.%
Toluene	D5769	4.92	Vol.%
Total Aromatics	D5769	23.42	Vol.%
Total Olefins	D6550	5.3	Vol.%

Conventional Gasoline QC Standard

ASTM-FUEL-QCS-02-PAK $ 60 / **5 x 15 mL**

Parameter	Method	Value	Conc.
Total Aromatics	D1319	34.6	Vol.%
Total Olefins	D1319	12.4	Vol.%
Total Saturates	D1319	62.8	Vol.%
Sulfur	D2622	0.0338	Wt.%
Sulfur	D4294	0.0368	Wt.%
Sulfur	D5453	317.36	µg/g
Sulfur	DXXXX *	338.78	µg/g
Benzene	D5769	0.55	Vol.%
Toluene	D5769	5.53	Vol.%
Total Aromatics	D5769	32.51	Vol.%
Total Olefins	D6550	12.4	Vol.%

* non-specific

AccuPetroCheck QC Standards

Two of the fuels are available as **AccuPetroCheck** Consensus Value **QC Standards**. The **AccuPetroCheck** CARB and Conventional gasoline reference materials have all parameters listed on the certificate with the Consensus Values and the regression equations for reproducibility. Use of these Reference Materials improve the quality of laboratory results. The Consensus Values listed reflect initial statistical treatment of the data at the time the catalog was published. The actual certificate provided with the **AccuPetroCheck** QC standard will have the accepted Consensus Value based on statistical treatment of the data.

AccuPetroTest

Sulfur in Diesel Fuel QC Standard

SBPT-SDF-VAP $ 25 / **2 x 15 mL**

Parameter	Approx. Range
Sulfur	20 - 11000 µg/g

See ASTM Methods D2622, D3120, D3246, D4294, D5453 for Sulfur Calibration Standards

Sulfur in White Mineral Oil QC Standard

SBPT-SWMO-VAP $ 25 / **2 x 15 mL**

Parameter	Approx. Range
Sulfur	20 - 11000 µg/g

See ASTM Methods D2622, D3120, D3246, D4294, D5453 for Sulfur Calibration Standards

Sulfur Single Blind AccuPetroTest Alternative Matrices Standards

AccuStandard has manufactured a number of Diesel and White Mineral Oil QC products containing a gravimetrically prepared amount of Sulfur. Use of these alternative matrix materials can provide further evaluation of the QA/QC process in the laboratory. Two samples will be sent for the test parameter and a separate sealed envelope containing the gravimetrically prepared sulfur values is also provided. The second sample is for repeatability testing or for use as a future QA/QC reference.

AccuPetroTest Gasoline

Low Sulfur QC Sample

SBPT-LSGAS-VAP $ 25 / **2 x 15 mL**

Parameter	Method	Approx. Range
Sulfur	D5453	0 - 50 µg/g

Olefin QC Sample

SBPT-OLEFINSFC-VAP $ 25 / **2 x 15 mL**

Parameter	Method	Approx. Range
Total Olefins	D6550	1 - 40 Vol.%

AccuPetroTest Gasoline

Comprehensive Single Blind Gasoline QC Sample

SBPT-COMP-VAP $ 50 / **2 x 15 mL**

Parameter	Method	Approx. Range	Conc.
Total Aromatics	D1319	8 - 60	Vol.%
Total Olefins	D1319	1 - 40	Vol.%
Total Saturates	D1319	30 - 80	Vol.%
Sulfur	D2622	0.0001 - 0.0930	Wt.%
Sulfur	D4294	0.0016 - 0.0930	Wt.%
Sulfur	D5453	0.5 -500	µg/g
Sulfur	D6344	1.0 - 1000	µg/g
Benzene	D5769	0.1 - 2.0	Vol.%
Toluene	D5769	1.0 - 15	Vol.%
Total Aromatics	D5769	8 - 60	Vol.%
Benzene	D6277	0.1 - 2.0	Vol.%
Total Olefins	D6550	1 - 40	Vol.%

Technical Note

This comprehensive single blind gasoline QC sample tests for more parameters from a single sample. The actual gasoline sample will have consensus values listed on the datasheet that fall within the range listed for each parameter.

Quality Control Standards continue on next page

Quality Control

AccuPetroTest Gasoline QC

Olefins QC Sample

SBPT-OLEFIN-VAP $ 25 / **2 x 15 mL**

Parameter	Method	Approx. Range
Total Aromatics	D1319	8-60 Vol.%
Total Olefins	D1319	1 - 40 Vol.%
Total Saturates	D1319	30-80 Vol. %

See ASTM Method D1319 for Sulfur Calibration Standards

Sulfur QC Sample

SBPT-SGAS-VAP $ 25 / **2 x 15 mL**

Parameter	Method	Approx. Range
Sulfur	D2622	0.0001 - 0.0930 Wt.%
Sulfur	D4294	0.0016 - 0.0930 Wt.%
Sulfur	D5453	4.0 - 500 µg/g
Sulfur	D6344	1.0 - 1000 µg/g

See ASTM Methods D2622, D3120, D3246, D4294, D5453 for Sulfur Calibration Standards

Aromatics QC Sample

SBPT-AROM-VAP $ 25 / **2 x 15 mL**

Parameter	Method	Approx. Range
Total Aromatics	D5769	8 - 60 Vol.%

See ASTM Methods, D3606, D5580, D5769 for Benzene Calibration Standards

Benzene/Toluene QC Sample

SBPT-BENZ-VAP $ 25 / **2 x 15 mL**

Parameter	Method	Approx. Range
Benzene	D5769	0.1 - 2.0 Vol.%
Toluene	D5769	1.0 - 15 Vol.%

See ASTM Methods, D3606, D5580, D5769 for Benzene Calibration Standards

Technical Note

AccuPetroTest Single Blind Standards

Petrochemical laboratories looking to test the performance of the laboratory for a specific parameter can order the Single Blind **AccuPetroTest** sample for the parameter of interest. Two real world gasoline samples will be sent for the test parameter requested and a separate sealed envelope containing the determined Consensus Value is also provided. The second sample is for repeatability testing or as a future QA/QC reference.

Conducting a Petrochemical Round Robin for a new ASTM method?

Select AccuStandard to prepare the necessary samples for the Round Robin study

AccuStandard has packaged for ASTM committee D02 various select groups of gasoline fuels and hydrocarbon products for use in various Round Robin studies.

Large Sample Offering

AccuStandard was selected by ASTM committee D02 to fill, seal and package an initial set of 21 different types of Round Robin Gasolines. Each gasoline was selected due to its unique properties. These unique properties will be determined by various ASTM methods under evaluation through ASTM subcommittees. AccuStandard has expanded this offering with additional materials blended for other ASTM Round Robins.

Flexibility

Use the original 21 gasoline samples to conduct a Round Robin and we can label the samples appropriately to protect the integrity of the Round Robin. In addition, we can easily add additional samples to your specific Round Robin study to expand the scope of the method for different matrices, concentrations or instrument types.

Petro PT Samples

Oxygenate PT Sample

With MtBE contamination problems in drinking water, numerous states are requiring certification for Oxygenate monitoring. Join AccuStandard's next study for Oxygenate analysis. Our timely PT schedule easily allows your lab to be proactive in new regulatory requirements. The analytes in the standard and the PT sample have been drawn from the California list of known prevalent oxygenates in gasoline. These Oxygenate PT samples and standards allow your Lab to:

- Expand testing capabilities
- Generate new testing revenue
- Eliminate standard preparation
- Easily combine with other Volatile standards

SUFFIX KEY
"AT" = Pre-Test
"AV" = Values Included

WS-PT Oxygenates

OPE-OXY-001-AT $ 47 / **2 mL**
OPE-OXY-001-AV $ 47 / **2 mL**
Sample conc. after prep 5.0-50 µg/L 4 comps.

ETBE	MTBE
Diisopropylether	TAME

Technical Note

This PT sample can be used by gravimetric oil and grease methods. In addition, it can also be used for TPH analysis by gravimetric methods including the EPA method 1664. The sample contains real world material commonly found at petroleum containment sites.

WP-PT Oil, Grease & TPH

IPE-OILG-001-AT $ 32 / **5 mL**
IPE-OILG-001-AV $ 32 / **5 mL**
Sample conc. after prep 2 comps.

Analyte List	Sample range
Total Oil & Grease	5-100 mg/L
TPH	5-100 mg/L

Suggested Calibration Standards

Oxygenate Gasoline Additive Standards

OGAD-001 $ 30 / **1 x 1 mL**
OGAD-001-PAK *SAVE 20%* $ 120 / **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)		

OGAD-002 $ 30 / **1 x 1 mL**
At stated conc. in MeOH 5 comps

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

Suggested Calibration Standard

Oil and Grease

WC-OILG-10X-1 $ 45 / **100 mL**
1000 µg/mL Total Oil and Grease in n-Propanol 2 comps.

Contains 500 µg/mL vegetable oil and 500 µg/mL of petroleum oil.

Shake well before use.

ASTM

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

MEMBER

ASTM INTERNATIONAL
Standards Worldwide

On site Viscosity testing

Vacuum Distillation apparatus for Testing Biodiesels Standards

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.	Price / Unit
PMCC D93	60 °C	ASTM-P-132-01	$ 110 / 250 mL
PMCC D93	93 °C	ASTM-P-132-02	110 / 250 mL
COC D92	200 °C	ASTM-P-132-03	110 / 250 mL
COC D92	230 °C	ASTM-P-132-04	110 / 250 mL
PMCC D93	65 °C	ASTM-P-133-01	$ 175 / 250 mL
PMCC D93	134 °C	ASTM-P-133-02	130 / 250 mL
COC D92	138 °C	ASTM-P-133-03	130 / 250 mL
TCC D56	67 °C	ASTM-P-133-04	175 / 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.	Price / Unit
1, 2	Synthetic Distillation Standard	ASTM-P-126-01	$ 160 / 500 mL
1, 2	Synthetic Distillation Standard	ASTM-P-126-SET	290 / 2 x 500 mL
4	Distillation Standard	ASTM-P-127-250ML	160 / 250 mL
4	Distillation Standard	ASTM-P-127-500ML	290 / 500 mL

Note: nominal 500 mL fill, or 250 mL fill

ASTM D445 Viscosity Calibration Standards

Viscosity @ 40°C	Cat. No.	Price / Unit
4 Cst	ASTM-P-128-01	$ 60 / 500 mL
7 Cst	ASTM-P-128-02	60 / 500 mL
19 Cst	ASTM-P-128-03	60 / 500 mL
61 Cst	ASTM-P-128-04	60 / 500 mL
180 Cst	ASTM-P-128-05	60 / 500 mL
520 Cst	ASTM-P-128-06	60 / 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)

Nominal Aniline Point Set include 5 Standards listed below	Cat. No.	Price / Unit
	D-611-SET	**$ 90 / 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

Nominal Aniline Point Set include 3 Standards listed below	Cat. No.	Price / Unit
	D-611E-SET	**$ 90 / 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	$ 30 / 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 Freezing Points of High Purity Hydrocarbons

Nominal Freezing Point	Cat. No.	Price / Unit
- 50 °C	ASTM-P-129-01	$ 110 / 250 mL
- 45 °C	ASTM-P-129-02	110 / 250 mL

Note: nominal 250 mL fill

ASTM D1319 Calibration Standards by Fluorescent Indicator Adsorption FIA

Olefin FIA Calibration Curve

FIA-CAL-SET — $ 350 / **Set of 7 x 1 mL**

D1319 Meets EPA Guidelines for RFG Analysis

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

	Cat. No.	Price / 1 mL
Standard 1	FIA-CAL-01	$ 60
Standard 2	FIA-CAL-02	60
Standard 3	FIA-CAL-03	60
Standard 4	FIA-CAL-04	60
Standard 5	FIA-CAL-05	60
Standard 6	FIA-CAL-06	60
Standard 7	FIA-CAL-07	60

FIA Olefin Standard

FIA-OLE — $ 45 / **1 x 1 mL**
FIA-OLE-5ML — $ 135 / **1 x 5 mL**
3 comps.

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

Technical Note

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

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

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

FIA Paraffin Standard

FIA-PAR — $ 35 / **1 x 1 mL**
FIA-PAR-5ML — $ 115 / **1 x 5 mL**
8 comps.

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

FIA Aromatic Standard

FIA-ARO — $ 35 / **1 x 1 mL**
FIA-ARO-5ML — $ 115 / **1 x 5 mL**
10 comps.

	Vol. %		Vol. %
Benzene	4	*m*-Xylene	16
Toluene	32	1,2,4-Trimethylbenzene	8
Ethylbenzene	8	1,3,5-Trimethylbenzene	8
p-Xylene	8	1,2,4,5-Tetramethylbenzene	4
o-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 ampules in sets of 5 and 10. The following concentrations are available:

Description	Cat. No.	Price / Unit
Water content 60 µg/g	KF-0.6X-5ML-VAP	$ 65 / 10 x 5 mL
Water content 100 µg/g	KF-1X-2ML-VAP	40 / 10 x 2 mL
	KF-1X-5ML-VAP	45 / 10 x 5 mL
	KF-1X-20ML-PAK	50 / 5 x 20 mL
Water content 1000 µg/g	KF-10X-2ML-VAP	40 / 10 x 2 mL
	KF-10X-5ML-VAP	45 / 10 x 5 mL
	KF-10X-20ML-PAK	50 / 5 x 20 mL
Water content 5000 µg/g	KF-50X-2ML-VAP	40 / 10 x 2 mL
	KF-50X-5ML-VAP	45 / 10 x 5 mL
	KF-50X-20ML-PAK	50 / 5 x 20 mL

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

Value Added PAK
Packaged in ready to use quantities.

Karl Fischer titrator

ASTM D2386 Freezing Points Calibration Standards

Nominal Freezing Point	Cat. No.	Price / Unit
- 50 °C	ASTM-P-129-01	$ 110 / 250 mL
- 45 °C	ASTM-P-129-02	110 / 250 mL

ASTM D2500 Cloud Point Calibration Standards

Cloud Point, Approx. Value	Cat. No.	Price / Unit
+ 5 °C	ASTM-P-131-01	$ 110 / 250 mL
- 2 °C	ASTM-P-131-02	110 / 250 mL
- 10 °C	ASTM-P-131-03	110 / 250 mL
- 15 °C	ASTM-P-131-04	110 / 250 mL
- 20 °C	ASTM-P-131-05	110 / 250 mL

AccuStandard stands for accuracy in Cloud Points.

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

AccuStandard offers the Petroleum Industry the most complete line of calibration standards designed for today's test methods for sulfur analysis. These standards are designed specifically 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. All 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.

Packaging

Since applicable concentration ranges will vary based on the instrumentation used and the nature of the sample the standards can be ordered as complete sets or individual bottles.

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 µg/g	Concentration Wt. %	100 mL Cat. No.	PAK 5 x 20 mL Cat. No.
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 $ 850 — At stated concentration: 5 x 20 mL $ 60 / ea

Individual Sulfur Standards — 100 mL Bottle: 1 - 10 units $ 55 ea; 10+ units $ 50 ea

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

Concentration µg/g	Concentration Wt. %	100 mL Cat. No.	PAK 5 x 20 mL Cat. No.
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 $ 850 — At stated concentration: 5 x 20 mL $ 60

Individual Sulfur Standards — 100 mL Bottle: 1 - 10 units $ 55 ea; 10+ units $ 50 ea

Sulfur in #2 Diesel Fuel — Ready-to-Use

Concentration µg/g	Concentration Wt. %	100 mL Cat. No.	PAK 5 x 20 mL 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 $ 850 — **SDF-CAL-20ML-SET**: 19 x (5 x 20 mL) $ 950

Individual Sulfur Standards — 100 mL Bottle: 1 - 10 units $ 55 ea; 10+ units $ 50 ea — At stated concentration: 5 x 20 mL $ 60

Hazardous Shipping Fees apply to 100 mL Sulfur Standards in #2 Diesel Fuel.

Technical Note

A well-characterized di-*n*-butyl sulfide is used as the starting material in these products.

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

Sulfur in Light Distillate Kerosene

Ready-to-Use

Concentration µg/g	Concentration Wt. %	100 mL Cat. No.	PAK 5 x 20 mL Cat. No.
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** Δ
12 x 100 mL $ 500
At stated conc.
5 x 20 mL $ 60

Individual Sulfur Standards
100 mL Bottle
1 - 10 units $ 55 ea
10+ units $ 50 ea

Technical Note

A well-characterized di-*n*-butyl sulfide is used as the starting material in these products.

Sulfur in Heavy Distillate Kerosene

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

Set of above **SK-HD-CAL-100ML-SET** Δ
21 x 100 mL $ 950

Individual Sulfur Standards
100 mL Bottle
1 - 10 units $ 55 ea
10+ units $ 50 ea

Standards of Interest

For the mandatory real world QC samples stipulated in the Method, see beginning of this section.

Custom Concentrations

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

Δ Hazardous Shipping Fees apply to 100 mL Sulfur Standards in Kerosene.

Antek 900 Series Sulfur Analyzer

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

ASTM D2622, D4294 Sulfur Calibration

Sulfur Calibration Standards in Isooctane for Gasoline & Reformulated Gasoline Analysis

In Isooctane

Sulfur Conc.	Sulfur Wt.%	Cat. No. (100 mL)
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

STP-CAL-100ML-SET $ 650 / **13 x 100 mL**
In Isooctane Set of 13 individual bottles

Standards can be mixed for quantity discounts

1 to 4 units	$ 60 each
5 to 10 units	$ 55 each
more than 10 units	$ 50 each

Hazardous Shipping Fees apply to 100 mL Sulfur Standards in Isooctane.

Technical Note

A well characterized 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 $ 75 / **8 x 1 mL**
In Isooctane

Sulfur Conc.	Sulfur Wt. %	Cat. No (1 mL)
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. (100 mL)
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 $ 450 / **10 x 100 mL**
In Isooctane:Toluene (3:1) Set of 10 individual 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

Standards can be mixed for quantity discounts

1 to 4 units	$ 60 each
5 to 10 units	$ 55 each
more than 10 units	$ 50 each

Hazardous Shipping Fees apply to 100 mL Sulfur Standards in Isooctane:Toluene.

Technical Note

Well characterized Thiophene & 2-Methyl thiophene are used as starting material in these products.

Standards of Interest

For the mandatory real world QC samples stipulated in many ASTM Sulfur Methods, see beginning of this section.

ASTM Methods - Sulfur in Oil

Sulfur in Crude Oil Standards

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

SCO-CAL-100ML-SET $ 675 / 8 x 100 mL
In Crude oil Set of 8 individual bottles

Individual Sulfur	1 -10 units	10 +units
100 mL Bottle	$ 105 ea	$ 85 ea

Sulfur in Residual Oil Standards

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

SRO-CAL-100ML-SET $ 640 / 7 x 100 mL
In Residual oil Set of 7 individual bottles

Individual Sulfur	1 -10 units	10 +units
100 mL Bottle	$ 105 ea	$ 95 ea

Standards of Interest

We can provide **Ready-to-Inject** working level calibration standards to meet unique laboratory applications. Call or fax us your standard requirements.

ASTM Methods Sulfur in Aromatic Hydrocarbons

Total Sulfur in Aromatic Compounds by Hydrogenolysis & Rateometric Colorimetry

ASTM-P-0010-PAK $ 75 / **5 x 1 mL**
1000 µg/mL in Toluene

Sulfur (as Thiophene)

Trace Quantities of Sulfur in Liquid Aromatic Hydrocarbons by Oxidative Microcoulometry

ASTM-P-0020-PAK $ 75 / **5 x 1 mL**
1000 µg/mL in Xylenes

Sulfur (as Dibenzothiophene)

ASTM-SSTD-A/B-SET $ 100 / **10 x 2 mL**
Set contains the following 10 standards in isooctane

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

ASTM 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, please contact Technical Support for an updated product.

AccuStandard's Environmental Efforts

1. As part of a recent facility expansion, and in cooperation with the local utilities, AccuStandard invested almost $100,000 on energy conservation and controls. The estimated impact on the environment is similar to that of planting 19 acres of trees.

2. Many customers avoid the environmental impact and cost of disposing of unused standards. One of the only standards manufacturers to offer this, Accustandard's "On-Going Stability Program" allows us to extend the expiration date on a standard if our testing over time on a specific lot warrants it.

3. Many every day steps such as using recycled paper for the tens of thousands of catalogs every year, educating customers on the value of using standards as pre-made solutions rather than buying large quantities of neats.

The **PIANO** line of quantitative and qualitative petrochemical standards for analysis of naphthas, gasolines, reformates and other complex hydrocarbons mixtures. **PIANO** analysis involves the determination of the percentage of the following five fractions Paraffins, Isoparaffins, Aromatics, Naphthenes, and Olefins. **PONA** analysis involves analyzing the naphtha sample for Paraffins, Olefins, Naphthenes, and Aromatics. If the Isoparaffins and Olefins are not present, the analysis is just for **PNA**.

The **PIANO** line of standards is used to determine quantitative and qualitative retention times and indices as well as to monitor response factors within the hydrocarbon blend. 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 typical range for the analytes in each formulation has been provided for each catalog item. The exact composition on a weight % basis for each analyte has been provided on the certificate, and a disk deliverable spreadsheet is available on request.

Updated PIANO Full Analytical Data Package (FAP) includes:

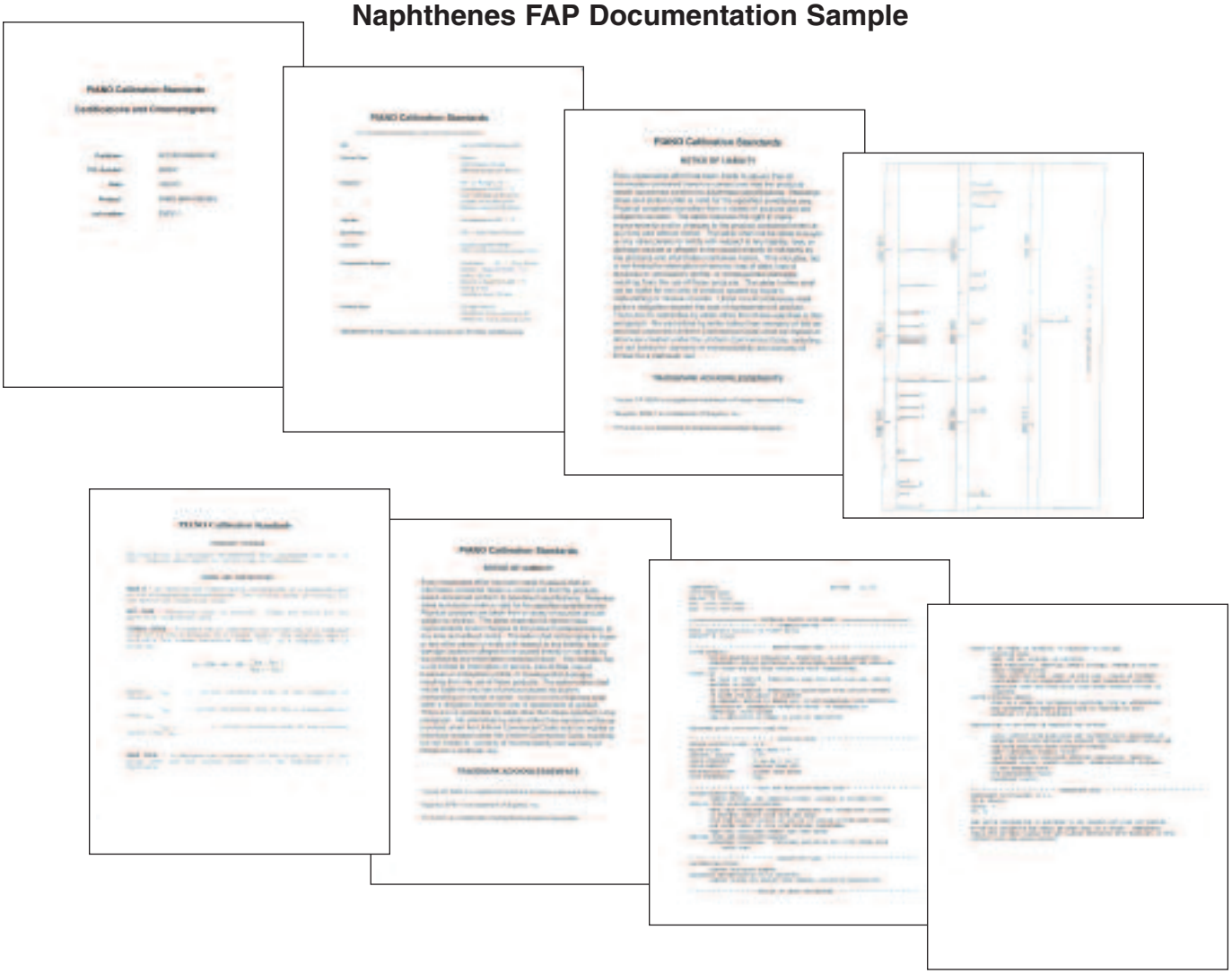
- **Detailed analytical contitions**
- **Certification of all components**
- **Chromatograms all products**

Products are prepared and certified gravimetrically.

1. All weights are traceable through National Institute of Standards & Technology.
2. Certified Analyte Concentration = Purity x Prepared Concentration.
3. The uncertainty value is ±2% and is determined in accordance with the CITAC guide to Quantifying Uncertainty in Analytical Measurement and is reported as an Expanded Uncertainty ($U(C_{cd})$). Assuming a normal distribution, a coverage factor of K=2 (95% confidence level) is used in the calculation.

Partnering with Air Liquide to provide these materials enables AccuStandard to provide a detailed certification package to meet your needs.

Naphthenes FAP Documentation Sample



PIANO, PONA, PNA Analysis

PIANO *n*-Paraffins Mix

ASTM-P-0031-FAP $ 220 / **100 µL**

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

PIANO Isoparaffins Mix

ASTM-P-0032-FAP $ 240 / **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-Ethyloctane	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-FAP $ 240 / **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
m-Xylene	2.2259
p-Xylene	4.4815
o-Xylene	2.2519
Isopropylbenzene	2.2248
n-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
tert-Butylbenzene	4.5310
Isobutylbenzene	4.4216
sec-Butylbenzene	2.2368
1-Methyl-3-isopropylbenzene	1.1066
1-Methyl-4-isopropylbenzene	1.0668
1-Methyl-2-isopropylbenzene	1.1241
1-Methyl-3-*n*-propylbenzene	2.1135
1-Methyl-4-*n*-propylbenzene	2.2336
n-Butylbenzene	2.2087
1,2-Diethylbenzene	1.0947
1-Methyl-2-*n*-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-tert-Butyl-2-methylbenzene	0.7641
n-Pentylbenzene	4.4828
1-tert-Butyl,3,5-dimethylbenzene	2.1641
1-tert-Butyl-4-ethylbenzene	2.2322
1,3,5-Triethylbenzene	4.5671
1,2,4-Triethylbenzene	1.1087
n-Hexylbenzene	4.5029

PIANO Naphthenes Mix

ASTM-P-0034-FAP $ 240 / **100 µL**

30 Napthenes 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
cis-1,3-Dimethylcyclopentane	0.5963
trans-1,2-Dimethylcyclopentane	1.4715
trans-1,3-Dimethylcyclopentane	2.7531
Methylcyclohexane	5.6091
Ethylcyclopentane	3.5534
ctc-1,2,3-Trimethylcyclopentane	1.5859
cct-1,2,4-Trimethylcyclopentane	3.7208
ctc-1,2,4-Trimethylcyclopentane	1.6467
trans-1,4-Dimethylcyclohexane	3.6499
1-Ethyl-1-methylcyclopentane	1.0554
trans-1,2-Dimethylcyclohexane	1.6537
ccc-1,2,3-Trimethylcyclopentane	0.7971
Isopropylcyclopentane	3.5042
cis-1,2-Dimethylcyclohexane	3.7159
n-Propylcyclopentane	3.6438
ccc-1,3,5-Trimethylcyclohexane	3.5263
1,1,4-Trimethylcyclohexane	3.6791
ctt-1,2,4-Trimethylcyclohexane	3.6107
ctc-1,2,4-Trimethylcyclohexane	3.5069
1,1,2-Trimethylcyclohexane	3.3354
Isobutylcyclopentane	3.7123
Isopropylcyclohexane	5.7233
n-Butylcyclopentane	3.6944
Isobutylcyclohexane	5.6729
t-1-Methyl-2-propylcyclohexane	3.8434
t-1-Methyl-2-(4MP)cyclopentane	3.7534

PIANO Olefins Mix

ASTM-P-0035-FAP $ 240 / **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
2-Methyl-1-butene	1.4440
2-Methyl-1,3-butadiene	2.3889
trans-2-Pentene	1.8034
cis-2-Pentene	1.9792
4-Methylpentene-1	3.4372
1-Hexene	7.0484
trans-2-Hexene	1.7302
2-Methylpentene-2	3.3901
cis-2-Hexene	3.8765
1-Heptene	7.6134
trans-3-Heptene	3.3469
cis-3-Heptene	5.8657
trans-2-Heptene	3.7217
cis-2-Heptene	5.7679
1-Octene	7.6901
trans-2-Octene	1.9432
cis-2-Octene	3.9502
1-Nonene	7.6425
trans-3-Nonene	1.9972
cis-3-Nonene	4.0042
trans-2-Nonene	1.9848
cis-2-Nonene	2.7952
1-Decene	8.2053

Technical Note

We may add and/or subtract PIANO Analytes and vary the weight % for each Analyte. The certificate will reflect the exact Analyte composition.

PIANO Mixture

ASTM-P-0030-FAP $ 660 / **100 µL** (139 comps.)

The PIANO formulation contains the *n*-Paraffins, Isoparaffins,Aromatics, Naphthenes, and Olefins: **ASTM-P-0031-FAP, ASTM-P-0032-FAP, ASTM-P-0033-FAP, ASTM-P-0034-FAP, ASTM-P-0035-FAP.** 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.

PIANO Mix Set

ASTM-PIANO-FAP-SET $ 1320 / **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**

ASTM D2789 Hydrocarbon Types in Low Olefinic Gas by MS

Hydrocarbon Mixture

D-2789-CTM $ 40 / **1 x 1 mL**
D-2789-CTM-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
9 comps.

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

Technical Note

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

ASTM D2887 Boiling Range Distribution of Petroleum Fractions by GC

Calibration Mixture

DRH-002N $ 30 / **100 mg**
DRH-002N-10X $ 40 / **1 gm**
17 comps.

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

Hydrocarbon Window Defining Standard

DRH-008S-R2 $ 65 / **1 x 1 mL**
DRH-008S-R2-PAK *SAVE 20%* $ 260 / **5 x 1 mL**
500 µg/mL each in Chloroform 35 comps.

Octane	Nonadecane	Triacontane
Nonane	Phytane	*n*-Hentriacontane
Decane	Eicosane	Dotriacontane
Undecane	Heneicosane	Tritriacontane
Dodecane	Docosane	Tetratriacontane
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 C_{17}/Pristane & C_{18}/Phytane ratios

DRH-005S-10X $ 20 / **1 x 1 mL**
2.0 mg/mL each in CH_2Cl_2:CS_2 (1:1) 4 comps.
DRH-005S-R1-10X $ 25 / **1 x 1 mL**
DRH-005S-R1-10X-PAK *SAVE 20%* $ 100 / **5 x 1 mL**
2.0 mg/mL each in Chloroform 4 comps.

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

Technical Note

AccuStandard offers a hydrocarbon window defining standard with the C_8 to C_{40} odd and even alkanes. As an added benefit, pristane and phytane are included in the formulation. Use of this one standard measuring the C_{17}/ pristane and C_{18}/ phytane ratio can be used to estimate degradation of fuel oil.

Also available is a fuel oil degradation mixture containing just the four required analytes to determine the C_{17}/pristane and C_8/ phytane ratio (DRH-005S-10X).

Column Test Mixture

D-2887 $ 10 / **1 x 1 mL**
1% v/v in n-Octane 2 comps.

n-Hexadecane *n*-Octadecane

Reference Gas Oil Sample Lot #2

D-2887-REFOIL $ 35 / **1 x 1 mL**

Calibration Solutions

DRH-002S-R1 $ 50 / **1 x 1 mL**
DRH-002S-R1-PAK *SAVE 20%* $ 200 / **5 x 1 mL**
At stated conc. in Chloroform 17 comps.

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

DRH-002S-R2 $ 50 / **1 x 1 gm**
DRH-002S-R2-PAK *SAVE 20%* $ 200 / **5 x 1 gm**
0.1 % Wt./Wt. each in Chloroform 20 comps.

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

Can be shipped by Air and Sea

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 $ 85 / **1 x 5 mL**

14 comps.

	Wt. %		Wt. %
n-Pentane	6.66	*n*-Dodecane	13.33
n-Hexane	6.66	*n*-Tetradecane	6.66
n-Heptane	6.66	*n*-Pentadecane	6.66
n-Octane	6.66	*n*-Hexadecane	6.66
n-Nonane	6.66	*n*-Heptadecane	6.66
n-Decane	6.66	*n*-Octadecane	6.66
n-Undecane	6.66	*n*-Eicosane	6.66

Working Level SIM DIS Paraffin Solution with Polywax 500

ASTM-P-0052 $ 40 / **1 x 1 mL**

ASTM-P-0052-PAK *SAVE 20%* $ 160 / **5 x 1 mL**

At stated conc. in Carbon disulfide 15 comps.

	Wt. %		Wt. %
n-Pentane	0.0333	*n*-Tetradecane	0.0333
n-Hexane	0.0333	*n*-Pentadecane	0.0333
n-Heptane	0.0333	*n*-Hexadecane	0.0333
n-Octane	0.0333	*n*-Heptadecane	0.0333
n-Nonane	0.0333	*n*-Octadecane	0.0333
n-Decane	0.0333	*n*-Eicosane	0.0333
n-Undecane	0.0333	Polywax 500	0.5
n-Dodecane	0.0666		

Standards of Interest

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

Polywax 850®

ASTM-P-0137N-2G $ 20 / **2 grams**

Polywax 850

Polywax 1000®

ASTM-P-0138N-2G $ 20 / **2 grams**

Polywax 1000

Polywax 500®

ASTM-P-0051N-2G $ 20 / **2 grams**

Polywax 500

Polywax 655®

ASTM-P-0053N-2G $ 20 / **2 grams**

Polywax 655

ASTM D3120 & D3246 Trace Quantities of Sulfur in Light Liquid Petroleum Hydrocarbons by Oxidative Microcoulometry

Sulfur Calibration Set

D-3120-92-CAL-SET $ 75 / **set of 8 x 1 mL**

In Isooctane

Sulfur Conc.	Sulfur Wt. %	Cat. No (1 mL)	Sulfur Conc.	Sulfur Wt. %	Cat. No (1 mL)
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

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

ASTM D3230 Determination of Salts in Crude Oil

see ASTM methods in Inorganic Table of Contents

ASTM D3231 Determination of Phosphorus in Gasoline

see Single Element ICP standards in Inorganic Table of Contents

ASTM D3237 Lead in Gasoline by AA Spectroscopy

see ASTM methods in Inorganic Table of Contents

ASTM D3246 Sulfur in Petroleum Gas by Oxidative Microcoulometry

see Table of Contents for Sulfur Standards

ASTM D3340 Li & Na in Lubricating Greases by Flame Photometer

see Single Element AA standards in Inorganic Table of Contents

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

Calibration Curve

D-3524-CAL-5ML-SET $ 150 / **6 x 5 mL**

D-3524-CAL-10ML-SET $ 250 / **6 x 10 mL**

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

Internal Standard

D-3524-IS-10ML $ 20 / **1 x 10 mL**

D-3524-IS-10ML-PAK *SAVE 20%* $ 100 / **5 x 10 mL**

At stated conc. in n-Heptane 2 comps.

	Wt./Wt. %
n-Decane	1.0
n-Octadecane	0.2

Mid Level Daily QC Solution

D-3524-QC-10ML $ 30 / **1 x 10 mL**

At stated conc. 2 comps.

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

Column Resolution Mix

D-3524-CR $ 10 / **1 x 1 mL**

D-3524-CR-PAK *SAVE 20%* $ 40 / **5 x 1 mL**

At stated conc. in n-Heptane 2 comps.

	Wt. / Wt. %
n-Hexadecane	1.0
n-Octadecane	1.0

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

see ASTM methods in Inorganic T of C

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

Aromatics Quantitative Calibration Standards

Without Internal Standards

D-3606-25ML-SET — $ 800 / **7 x 25 mL**

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

D3606 Meets EPA Guidelines for RFG Analysis

With Internal Standard: MEK

D-3606/IS-SET — $ 115 / **7 x 1 mL**
D-3606/IS-2ML-SET — $ 190 / **7 x 2 mL**
D-3606/IS-2ML-SET-PAK — $ 760 / **5 x (7 x 2) mL**

	Analyte Calibr. range	Std. 1 Target Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %	Std. 6 Vol. %	Std. 7 Vol. %
Benzene	0.06 - 5.0	4.8	2.4	1.2	0.6432	0.3168	0.1152	0.0576
Toluene	0.5 - 20	19.2	14.4	9.6	4.8000	2.4000	0.9600	0.4800
Isooctane		72.0	79.2	85.2	90.5568	93.2832	94.9248	95.4624
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 — $ 115 / **7 x 1 mL**
D-3606/IS2-SET-PAK — $ 460 / **5 x (7 x 1) mL**

	Analyte Calibr. range	Std. 1 Target Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %	Std. 6 Vol. %	Std. 7 Vol. %
Benzene	0.06 - 5.0	4.8	2.4	1.2	0.6432	0.3168	0.1152	0.0576
Toluene	0.5 - 20	19.2	14.4	9.6	4.8000	2.4000	0.9600	0.4800
Isooctane		72.0	79.2	85.2	90.5568	93.2832	94.9248	95.4624
sec Butanol (Internal Std.)		4.0	4.0	4.0	4.0	4.0	4.0	4.0

Aromatics Quantitative Calibration Curve

D-3606/IS2-R1-SET — NEW — $ 115 / **set of 7 x 1 mL**

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

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.

Daily Gasoline Refinery Quality Control Standards

With Internal Standard: sec Butanol

D-3606-QC-IS2-25ML — $ 125 / **1 x 25 mL**
D-3606-QC-IS2-25ML-PAK — $ 600 / **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 — $ 75 / **1 x 10 mL**
D-3606-QC/IS-10ML-PAK — $ 300 / **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 — $ 125 / **1 x 25 mL**
D-3606-QC-25ML-PAK — $ 500 / **5 x 25 mL**
Each at stated quantities — 3 comps.

Compound	Target Vol. %
Benzene	0.67
Toluene	5.00
Isooctane	94.33
	100

ASTM D3610 Total Cobalt in Alumina-Base Cobalt-Molybdenum Catalyst by Potentiometric Titration

Cobalt Oxide Standard

D-3610-93-1 — $ 50 / **1 x 100 mL**

Cobalt oxide @ 1500 µg/mL in Water

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 $ 50 / **1 x 1 mL**
D-3710-QUAL-PAK *SAVE 20%* $ 200 / **5 x 1 mL**
19 comps.

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

Quanitative Calibration Standard

D-3710 $ 40 / **1 x 1 mL**
D-3710-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
16 comps.

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

ASTM D2887 Boiling Range Distribution of Petroleum Fractions by GC

Calibration Solution

DRH-002S-R1 $ 50 / **1 x 1 mL**
DRH-002S-R1-PAK *SAVE 20%* $ 200 / **5 x 1 mL**
At stated conc. in Chloroform 17 comps.

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

Can be shipped by Air and Sea

ASTM D3798 Analysis of p-Xylene by GC

p-Xylene Impurity Standards

With Internal Standard

D-3798-IS $ 30 / **1 x 1 mL**
D-3798-IS-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
At stated conc. by weight 11 comps.

	Wt./Wt. %		Wt./Wt. %
n-Pentane	0.15	*o*-Xylene	0.15
n-Octane	0.15	Cumene	0.15
Benzene	0.15	Propylbenzene	0.15
Toluene	0.15		
Ethylbenzene	0.15	Total Analytes	100
p-Xylene	98.65	plus *n*-Undecane* (ISTD)	0.500
m-Xylene	0.15	grams	

Without Internal Standard

D-3798-10ML $ 65 / **1 x 10 mL**
D-3798-10ML-PAK *SAVE 20%* $ 260 / **5 x 10 mL**
At stated conc. by weight 10 comps.

	Wt./Wt. %		Wt./Wt. %
n-Pentane	0.15	*p*-Xylene	98.65
n-Octane	0.15	*m*-Xylene	0.15
Benzene	0.15	*o*-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 specfic 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 ASTM methods in Inorganic Table of Contents

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.	Price 1 mL	PAK *SAVE 20%* Cat. No.	Price 5 x 1 mL
Aroclor 1016	50	C-216-ST-1	$ 30	C-216-ST-1-PAK	$ 120
12674-11-2	500	C-216-ST-2	50	C-216-ST-2-PAK	200
Aroclor 1221	50	C-221-ST-1	30	C-221-ST-1-PAK	120
11104-28-2	500	C-221-ST-2	50	C-221-ST-2-PAK	200
Aroclor 1232	50	C-232-ST-1	50	C-232-ST-1-PAK	200
11141-16-5	500	C-232-ST-2	75	C-232-ST-2-PAK	300
Aroclor 1242	50	C-242-ST-1	30	C-242-ST-1-PAK	120
53469-21-9	500	C-242-ST-2	50	C-242-ST-2-PAK	200
Aroclor 1248	50	C-248-ST-1	30	C-248-ST-1-PAK	120
12672-29-6	500	C-248-ST-2	50	C-248-ST-2-PAK	200
Aroclor 1254	50	C-254-ST-1	30	C-254-ST-1-PAK	120
11097-69-1	500	C-254-ST-2	50	C-254-ST-2-PAK	200
Aroclor 1260	50	C-260-ST-1	30	C-260-ST-1-PAK	120
11096-82-5	500	C-260-ST-2	50	C-260-ST-2-PAK	200
Aroclor 1262	50	C-262-ST-1	$ 30	C-262-ST-1-PAK	$ 120
37324-23-5	500	C-262-ST-2	50	C-262-ST-2-PAK	200
Aroclor 1268	50	C-268-ST-1	30	C-268-ST-1-PAK	120
11100-14-4	500	C-268-ST-2	75	C-268-ST-2-PAK	300

Neats (Individuals)

Aroclor #	Cat. No.	Price / Unit
Aroclor 1016	C-216N	$ 40 / 50 mg
Aroclor 1221	C-221N-50MG	50 / 50 mg
Aroclor 1242	C-242N-50MG	25 / 50 mg
Aroclor 1248	C-248N-50MG	40 / 50 mg
Aroclor 1254	C-254N-50MG	55 / 50 mg
Aroclor 1260	C-260N-50MG	40 / 50 mg
Aroclor 1262	C-262N-50MG	40 / 50 mg

Aroclor-free Transformer Oil

T-W130 $ 10 / **1 x 1 mL**

ASTM D4291 Trace Ethylene Glycol in Used Engine Oil

D-4291-93 $ 20 / **5 x 1 mL**
D-4291-93-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
2000 µg/mL in water

Ethylene glycol

ASTM D4294 Sulfur in Petroleum Products by ED-XRF Spectroscopy

See Table of Contents for Sulfur Standards

ASTM D4377 Water in Crude oils by Potentiometric Karl Fischer Titration

See Table of Contents for Karl Fischer Water Standards

ASTM D4420 Aromatics in Finished Gasoline by GC

Aromatics in Gasoline by GC/TC

D-4420-CAL-SET $ 105 / **set of 7 x 1 mL**

Analyte	Std. 1 Target Vol. %	Std. 2 Target Vol. %	Std. 3 Target Vol. %	Std. 4 Target Vol. %	Std. 5 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 $ 20 / **1 x 1 mL**
D-4420-94-PAK *SAVE 20%* $ 80 / **5 x 1 mL**

5 comps.	**Vol. %**
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 ASTM methods in Inorganic Table of Contents

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 between 0.2 and 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 $ 85 / **8 x 1 mL**
Nitrogen introduced using Pyridine Set includes the following Cat. No.s

Each in Isooctane	Cat. No.	Price / 1 mL	Each in Isooctane	Cat. No.	Price / 1 mL
Blank	D-4629-91-LB-BL	$ 20	Nitrogen @ 25 µg/mL	D-4629-91-LB-25X	$ 20
Nitrogen @ 0.3 µg/mL	D-4629-91-LB-0.3X	20	Nitrogen @ 50 µg/mL	D-4629-91-LB-50X	20
Nitrogen @ 1 µg/mL	D-4629-91-LB-1X	20	Nitrogen @ 75 µg/mL	D-4629-91-LB-75X	20
Nitrogen @ 10 µg/mL	D-4629-91-LB-10X	20	Nitrogen @ 100 µg/mL	D-4629-91-LB-100X	20

Stock Nitrogen Solution Low Boiling Solvents

D-4629-91-LB-CON $ 20 / **1 x 1 mL**
D-4629-91-LB-CON-PAK $ 80 / **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 $ 85 / **set of 8 x 1 mL**
Nitrogen introduced using Carbazole Set includes the following Cat. No.s

Each in Toluene	Cat. No.	Price / 1 mL	Each in Toluene	Cat. No.	Price / 1 mL
Blank	D-4629-91-HB-BL	$ 20	Nitrogen @ 25 µg/mL	D-4629-91-HB-25X	$ 20
Nitrogen @ 0.3 µg/mL	D-4629-91-HB-0.3X	20	Nitrogen @ 50 µg/mL	D-4629-91-HB-50X	20
Nitrogen @ 1 µg/mL	D-4629-91-HB-1X	20	Nitrogen @ 75 µg/mL	D-4629-91-HB-75X	20
Nitrogen @ 10 µg/mL	D-4629-91-HB-10X	20	Nitrogen @ 100 µg/mL	D-4629-91-HB-100X	20

Stock Nitrogen Solution High Boiling Solvents

D-4629-91-HB-CON $ 20 / **1 x 1 mL**
D-4629-91-HB-CON-PAK $ 80 / **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 $ 75 / **6 x 1 mL**
Nitrogen introduced using Aniline 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 $ 50 / **4 x 1 mL**
The Nitrogen is introduced using Aniline and the Sulfur is introduced using di-n-butyl sulfide 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

ASTM D4815 MtBE, EtBE, TAME, DIPE, Tertiary-amyl & C_1 to C_4 Alcohols in Gasoline by GC

Oxygenate Quantitative Calibration Mixtures

Without Internal Standard

D4815 Meets EPA Guidelines for RFG Analysis

D-4815-10ML-SET $ 300 / **set of 5 x 10 mL** of 5 component mix

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

With Internal Standard

D-4815/IS-SET of 6 component mix $ 125 / **set of 5 x 1 mL**

D-4815/IS-SET-PAK $ 500 / **set of 5 x (5 x 1 mL)**

Analyte	Calibration Range	Std. 1 Wt. %	Std. 2 Wt. %	Std. 3 Wt. %	Std. 4 Wt. %	Std. 5 Wt. %
		Target Concentrations				
Ethanol	0.1 - 11.40	2.85	0.10	5.70	8.55	11.40
t-Butanol	0.1 - 11.40	0.10	2.85	5.70	7.60	11.40
Methyl *t*-butyl ether *(MtBE)*	0.1 - 19.0	19.00	14.25	9.50	4.75	0.10
t-Pentanol	0.1 - 4.79	1.19	4.75	2.38	3.56	0.10
1,2-Dimethoxyethane *(DME)* (Internal Std.)		5.00	5.00	5.00	5.00	5.00
Isooctane/xylene (65:35)		71.86	73.05	71.72	70.54	72.0
Total Oxgenates & Internal Standard		**28.14**	**26.95**	**28.28**	**29.46**	**28.00**

Oxygenate Internal Standard

M-GRO-IS-5ML $ 10 / **1 x 5 mL**

M-GRO-IS-5ML-PAK *SAVE 20%* $ 40 / **5 x 5 mL**

1,2-Dimethoxyethane (neat)

Oxygenate Free Refinery Gasoline Blank

RFA-BLNK-10ML $ 10 / **1 x 10 mL**

RFA-BLNK-10ML-PAK *SAVE 20%* $ 40 / **5 x 10 mL**

RFA Gasoline (neat)

Quantitative Peak ID and Retention Time Mixture

D-4815-RT $ 25 / **1 x 1 mL**

D-4815-RT-PAK *SAVE 20%* $ 100 / **5 x 1 mL**

16 comp. core mix

Compound	Wt. %
Methylcyclopentane	4.00
Methanol	7.30
Ethanol	7.30
Isopropanol	7.30
tert-Butanol	7.30
n-Propanol	7.30
Methyl *tert*-butyl ether *(MtBE)*	4.00
sec-Butanol	7.30
Diisopropyl ether *(DIPE)*	4.00
Isobutanol	7.30
Ethyl *tert*-butyl ether *(EtBE)*	4.00
tert-Pentanol	7.30
1,2-Dimethoxyethane (ISTD)	6.00
n-Butanol	7.30
Benzene	5.00
tert-Amyl methyl ether	7.30
	100

Valve Timing Mixture

D-4815-VT $ 25 / **1 x 1 mL**

D-4815-VT-PAK *SAVE 20%* $ 100 / **5 x 1 mL**

5 comps.

Compound	Wt. %
Methylcyclopentane	10.00
Diisopropyl ether *(DIPE)*	10.00
Ethyl *tert*-butyl ether *(EtBE)*	10.00
Methyl *tert*-butyl ether *(MtBE)*	10.00
n-Hexane	60.00

ASTM D4927 Elemental Analysis of Lubricant and Additive Components - Barium, Calcium, Phosphorus, Sulfur, and Zinc by WD-XRF Spectroscopy

see ASTM methods in Inorganic Table of Contents

ASTM D4928 Water in Crude oils by Potentiometric Karl Fischer Titration

See Table of Contents for Karl Fischer Water Standards

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

Working Level Chlorine Standard

D-4929-94 $ 10 / **1 x 5 mL**

D-4929-94-PAK *SAVE 20%* $ 40 / **5 x 5 mL**

10 µg/mL in Isooctane

Chlorine

Stock Chlorine Standard

D-4929-94-100X $ 15 / **1 x 5 mL**

D-4929-94-100X-PAK *SAVE 20%* $ 60 / **5 x 5 mL**

1000 µg/mL in Isooctane

Chlorine

Standards of Interest

See catalog number index for ASTM-P-0092 - Chlorine in Lube Oil standard.

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

see ASTM methods in Inorganic Table of Contents

ASTM D5056 Trace Metals in Petroleum Coke by AA

see Single Element AA standards in Inorganic Table of Contents

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 $ 450 / **7 x 100 mL**
7 solutions in Isooctane

Lead Concentration				Price
g Pb/US gal	g Pb/ UK gal	mg Pb/mL	Cat. No.	100 mL
0.0000	0.000	0.000	D-5059-A-01-100ML	$ 10
0.1000	0.120	0.026	D-5059-A-02-100ML	80
1.0000	1.200	0.264	D-5059-A-03-100ML	80
2.0000	2.400	0.528	D-5059-A-04-100ML	80
3.0000	3.600	0.793	D-5059-A-05-100ML	80
4.0000	4.800	1.057	D-5059-A-06-100ML	80
5.0000	6.000	1.321	D-5059-A-07-100ML	80

Part C - Lead in Gasoline Standards

D-5059-C-CAL-100ML-SET $ 450 / **set of 7 x 100 mL**
The set contains the following 7 solutions in Isooctane

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

Internal Standard

D-5059-IS-100ML $ 80 / **1 x 100 mL**
D-5059-IS-10ML-PAK $ 60 / **5 x 10 mL ampules**
0.793 mg/mL in Mineral Oil

Bismuth

D5059 Meets EPA Guidelines for RFG Analysis

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.

ASTM D5134 Petroleum Naphthas through n-Nonane by Capillary GC

Qualitative Reference Petroleum Set

D-5134-92-SET $ 75 / **3 x 1 mL**

Qualitative Reference Standards	Cat. No.	Price / 1 mL
Alkylate Standard neat fraction approx. 30 comps. identified	D-5134-92-ALK	$ 30
Naphtha Standard neat fraction approx. 70 comps. identified	D-5134-92-NAP	30
Reformate Standard neat fraction approx. 100 comps. identified	D-5134-92-REF	20

Column Evaluation Mix

D-5134-92-CEM $ 35 / **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 $ 55 / **5 x 50 mg**
10% w/w each component 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 ICP misc. standards in Inorganic T of C

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

see ASTM methods in Inorganic Table of Contents

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

Performance Solution

D-5186-96-PM $ 40 / **1 x 1 mL**
D-5186-96-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
At stated approx. Wt. % 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 $ 30 / **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 / **1 x 1 mL**
20% w/w in Toluene

ASTM D5188 Vapor - Liquid Ratio Temperature Standards

Performance Check Samples for daily monitoring of instrument performance

Volume/Liquid Temp	Cat. No.	Price / Set
36.1˚C (96.9˚F)	ASTM-P-125-01-VAP	$ 45 / 5 x 20 mL
68.0˚C (155.7˚F)	ASTM-P-125-02-VAP	45 / 5 x 20 mL

ASTM D5191 & D-5482 Vapor Pressure Standards

Vapor Pressure Quality Control Samples

Vapor Pressure	Cat. No.	Price / Set
68.3kPa (9.91 psi)	ASTM-P-124-01-VAP	$ 65 / 10 x 10 mL
68.0kPa (9.86 psi)	ASTM-P-124-02-VAP	75 / 10 x 10 mL
51.1kPa (7.41 psi)	ASTM-P-124-03-VAP	70 / 10 x 10 mL
46.7kPa (6.77 psi)	ASTM-P-124-04-VAP	129 / 10 x 10 mL
22.5kPa (3.26 psi)	ASTM-P-124-05-VAP	50 / 10 x 10 mL
7.1kPa (1.03 psi)	ASTM-P-124-06-VAP	50 / 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 $ 60 / **1 x 2 mL**
D-5307-QUANT-PAK *SAVE 20%* $ 240 / **5 x 2 mL**
Equal Wt. % 16 comps.

- *n*-Decane
- *n*-Undecane
- *n*-Dodecane
- *n*-Tridecane
- *n*-Tetradecane
- *n*-Pentadecane
- *n*-Hexadecane
- *n*-Heptadecane
- *n*-Octadecane
- *n*-Eicosane
- *n*-Tetracosane
- *n*-Octacosane
- *n*-Dotriacontane
- *n*-Hexatriacontane
- *n*-Tetracontane
- *n*-Tetratetracontane

Qualitative Paraffins Standard

D-5307-QUAL $ 40 / **1 x 1 mL**
D-5307-QUAL-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
At stated approx. Wt. % 7 comps.

	Wt./Wt. %		Wt./Wt. %
Propane	10	*n*-Heptane	15
Butane	15	*n*-Octane	15
n-Pentane	15	*n*-Nonane	15
n-Hexane	15		

Internal Standard

D-5307-IS-10ML $ 30 / **1 x 10 mL**
D-5307-IS-10ML-PAK *SAVE 20%* $ 120 / **5 x 10 mL**
4 comps.

	Wt./Wt. %		Wt./Wt. %
n-Tetradecane	25	*n*-Hexadecane	25
n-Pentadecane	25	*n*-Heptadecane	25

Column Resolution Mix

D-5307-CR $ 15 / **1 x 1 mL**
D-5307-CR-PAK *SAVE 20%* $ 60 / **5 x 1 mL**
At stated approx. Wt. % 3 comps.

	Wt./Wt. %
n-Hexadecane	1.0
n-Octadecane	1.0
n-Octane	98.0

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

ASTM Committee D02 on Petroleum Products and Lubricants has issued the Standard Method D5441 for the determination of the purity of methyl tert-butyl ether (MtBE) by Gas Chromatography. This method provides a procedure to measure impurities in MtBE such as C_4 to C_{12} olefins, methyl, isopropyl and tert-butyl alcohols, methyl sec-butyl & 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		$ 30 / **1 x 1 mL**
D-5441-PAK	*SAVE 20%*	$ 120 / **5 x 1 mL**
D-5441-5ML		$ 100 / **1 x 5 mL**
D-5441-5ML-PAK	*SAVE 20%*	$ 400 / **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		$ 30 / **1 x 1 mL**
D-5441-10X-PAK	*SAVE 20%*	$ 120 / **5 x 1 mL**
D-5441-10X-5ML		$ 100 / **1 x 5 mL**
D-5441-10X-5ML-PAK	*SAVE 20%*	$ 400 / **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	$ 145 / **1 x 1 mL**
0.1% Wt./Wt. each in n-Dodecane	33 comps.

Methanol
Isobutylene
n-Butane
trans-2-butene
cis-2-butene
3-Methyl-1-butene
Acetone
Isopentane
2-Propanol
1-Pentene
2-Methyl-1-butene
n-Pentane
trans-2-Pentene
t-Butanol
cis-2-Pentene
2-Methyl-2-butene
Cyclopentene
MtBE
2,3-Dimethyl-1-butene
4-Methyl-cis-2-pentene
2-Methylpentane
Methylethyl ketone
3-Methylpentane
sec-Butyl methyl ether
ETBE
TAME
3,5-Dimethyl-1-hexene
2,4,4-Trimethyl-1-pentene
2,4,4-Trimethyl-2-pentene
3,4,4-Trimethyl-trans-2-pentene
2,3,4-Trimethyl-2-pentene
4,4-Dimethyl-2-neopentyl-1-pentene
2,2',4,6,6'-Pentamethyl-3-heptene

Quantitative Standard

D-5441-QUANT-R1	$ 130 / **1 x 1 mL**
0.1% Wt./Wt. each in n-Dodecane	29 comps.

Methanol (0.04 Wt/Wt)
3-Methyl-1-butene
Acetone
Isopentane
2-Propanol
1-Pentene
2-Methyl-1-butene
n-Pentane
trans-2-Pentene
t-Butanol
cis-2-Pentene
2-Methyl-2-butene
Cyclopentene
MtBE
2,3-Dimethyl-1-butene
4-Methyl-*cis*-2-pentene
2-Methylpentane
Methyl ethyl ketone
3-Methylpentane
sec-Butyl methyl ether
Ethyl tert-butyl ether
TAME
3,5-Dimethyl-1-hexene
2,4,4-Trimethyl-1-pentene
2,4,4-Trimethyl-2-pentene
3,4,4-Trimethyl-trans-2-pentene
2,3,4-Trimethyl-2-pentene
4,4-Dimethyl-2-neopentyl-1-pentene
2,2',4,6,6'-Pentamethyl-3-heptene

MtBE Resolution Test Mix

D-5441-RES		$ 20 / **1 x 1 mL**
D-5441-RES-PAK	*SAVE 20%*	$ 80 / **5 x 1 mL**
D-5441-RES-5ML		$ 60 / **1 x 5 mL**
D-5441-RES-5ML-PAK	*SAVE 20%*	$ 240 / **5 x 5 mL**
1% Wt./Wt. each in MtBE		3 comps.

trans-2-Pentene
tert-Butanol
cis-Pentene

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.

ASTM D5442 Analysis of Petroleum Waxes by GC

Quantitative Wax Standard

D-5442 $ 25 / **1 x 1 mL**
D-5442-PAK *SAVE 20%* $ 100 / **5 x 1 mL**
At stated Wt. % in Cyclohexane 16 comps.

	Wt./Wt. %		Wt./Wt.
n-Dodecane	0.02	*n*-Octacosane	0.12
n-Tetradecane	0.03	*n*-Triacontane	0.10
n-Hexadecane	0.04	*n*-Dotriacontane	0.08
n-Octadecane	0.05	*n*-Hexatriacontane	0.06
n-Eicosane	0.06	*n*-Tetracontane	0.05
n-Docosane	0.08	*n*-Tetratetracontane	0.04
n-Tetracosane	0.10	*n*-Pentacontane	0.03
n-Hexacosane	0.12	*n*-Hexacontane	0.02

Column Resolution Standard

D-5442-CR-PAK $ 40 / **5 x 1 mL**
At stated Wt. % in Cyclohexane 2 comps.

	Wt./Wt. %
n-Eicosane	0.05
n-Tetracontane	0.05

Hydrocarbon Standard Brownfield Regulation

D-5442-R1 $ 60 / **1 x 1 mL**
100 µg/mL each in Cyclohexane 18 comps.

n-Decane	n-Octacosane
n-Dodecane	n-Triacontane
n-Tetradecane	n-Dotriacontane
n-Hexadecane	n-Tetratriacontane
n-Octadecane	n-Hexatriacontane
n-Eicosane	n-Octatriacontane
n-Docosane	n-Tetracontane
n-Tetracosane	n-Tetratetracontane
n-Hexacosane	n-Pentacontane

Retention Time Standard Mix 1

D-5442-RT1 $ 50 / **500 mg**
Equal parts by weight 12 comps.

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

Retention Time Standard Mix 2

D-5442-RT2 $ 55 / **500 mg**
Equal parts by weight 16 comps.

n-Dodecane (c12)	*n*-Octacosane (c28)
n-Tetradecane (c14)	*n*-Triacontane (c30)
n-Hexadecane (c16)	*n*-Dotriacontane (c32)
n-Octadecane (c18)	*n*-Hexatriacontane (c36)
n-Eicosane (c20)	*n*-Tetracontane (c40)
n-Docosane (c22)	*n*-Tetratetracontane (c44)
n-Tetracosane (c24)	*n*-Pentacontane (c50)
n-Hexacosane (c26)	*n*-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 $ 100 / **1 x 1 mL**
At stated Wt. % 28 comps.

	Wt./Wt. %		Wt./Wt. %		Wt./Wt. %
Cyclopentane	1.00	1cis,2-Dimethylcyclohexane	5.00	*trans*-Decahydronaphthelene	4.25
n-Pentane	1.00	Isooctane	5.00	*n*-Tetradecane	4.50
Cyclohexane	2.00	*n*-Octane	5.00	Ethylbenzene	4.50
2,3-Dimethylbutane	2.00	1cis,2 cis,4-Trimethylcyclohexane	4.25	*o*-Xylene	4.25
n-Hexane	2.00	*n*-Nonane	4.50	*n*-Propylbenzene	5.00
n-Hexene	1.50	*n*-Decane	4.25	1,2,4-Trimethylbenzene	4.50
Methylcyclohexane	4.25	*n*-Undecane	3.50	1,2,3-Trimethylbenzene	5.00
4-Methyl-1-hexene	1.50	*n*-Dodecane	3.25	1,2,4,5-Tetramethylbenzene	5.00
n-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 $ 90 / **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 $ 90 / **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 $ 90 / **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 $ 25 / **2 x 15 mL**

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

ASTM D5480 Engine Oil Volatility by GC

Stock Column Resolution Standard

D-5480-CR-PAK $ 40 / **5 x 1 mL**
10 µg/mL each in Carbon disufide 5 comps.
D-5480-CR-100X-PAK $ 50 / **5 x 1 mL**
1000 µg/mL each in Carbon disufide 5 comps.

n-Decane
n-Dodecane
n-Hexadecane
n-Octadecane
n-Tetracosane

Tetracosane (Solution A)

D-5480-C40-5ML $ 15 / **1 x 5 mL**
D-5480-C40-5ML-PAK *SAVE 20%* $ 60 / **5 x 5 mL**
500 µg/mL in Carbon disufide
D-5480-C40-R1-5ML *NEW* $ 15 / **1 x 5 mL**
D-5480-C40-R1-5ML-PAK *SAVE 20%* $ 60 / **5 x 5 mL**
500 µg/mL in Chloroform

n-Tetracosane

Internal Standard Solution

D-5480-IS-5ML $ 30 / **1 x 5 mL**
D-5480-IS-5ML-PAK *SAVE 20%* $ 120 / **5 x 5 mL**
Each comp. at equal weights 3 comps.

n-Decane
n-Dodecane
n-Undecane

ASTM D5482 & D5191 Vapor Pressure Standards

Vapor Pressure Quality Control Samples

Vapor Pressure.	Cat. No	Price / Set of 10
68.3kPa (9.91 psi)	ASTM-P-124-01	$ 65 / 10 x 10 mL
68.0kPa (9.86 psi)	ASTM-P-124-02	75 / 10 x 10 mL
51.1kPa (7.41 psi)	ASTM-P-124-03	70 / 10 x 10 mL
46.7kPa (6.77 psi)	ASTM-P-124-04	125 / 10 x 10 mL
22.5kPa (3.26 psi)	ASTM-P-124-05	50 / 10 x 10 mL
7.1kPa (1.03 psi)	ASTM-P-124-06	50 / 10 x 10 mL

ASTM D5501 Ethanol Content of Denatured Fuel Ethanol by GC

Denatured Fuel Ethanol Calibration Set

D-5501-94-SET $ 75 / **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 D5580 Benzene, Toluene, Ethylbenzene, m/p-Xylene, o-Xylene, C_9 & Heavier Aromatics & Total Aromatics in Finished Gasoline by GC

Aromatics Quantitative Calibration Mixes

Without Internal Standard

D-5580-95-CAL-10ML-SET $ 300 / **5 x 10 mL** (of 6 component mix)

Analyte	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 $ 100 / **5 x 1 mL** (of 7 component mix)

Analyte	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 $ 25 / 1 mL

Technical Note

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

Valve Timing Calibration Mixes

With Internal Standard

M-GRA-VT/IS-AS $ 25 / **1 x 1 mL**
M-GRA-VT/IS-AS-PAK *SAVE 20%* $ 100 / **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 $ 100 / **1 x 10 mL**
M-GRA-VT-AS-10ML-PAK *SAVE 20%* $ 400 / **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 $ 20 / **1 x 5 mL**
M-GRA-IS-AS-5ML-PAK *SAVE 20%* $ 80 / **5 x 5 mL**

2-Hexanone (Neat)

Selectivity Check Standard

M-GRA-SCS-AS $ 10 / **1 x 1 mL**
M-GRA-SCS-AS-PAK *SAVE 20%* $ 40 / **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 $ 125 / **1 x 10 mL**
D-5580-QC-R1-10ML-PAK *SAVE 20%* $ 500 / **5 x 10 mL**
14 comps.

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

Daily Quality Control Standard

Without Internal Standard

D-5580-QC-10ML $ 125 / **1 x 10 mL**
D-5580-QC-10ML-PAK *SAVE 20%* $ 500 / **5 x 10 mL**
14 comps.

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

ASTM D5599 Oxygenates in Gas by GC & O-FID

Oxygenates Calibration Curves

With Internal Standard

M-GRO-CAL/IS-SET $ 250 / **8 x 1 mL**
M-GRO-CAL/IS-SET-PAK *SAVE 20%* $ 1,000 / **5 x (8 x 1) mL**
of 15 Comp. Mix

Analyte / Calibration range	Std. 1 Wt. %	Std. 2 Wt. %	Std. 3 Wt. %	Std. 4 Wt. %	Std. 5 Wt. %	Std. 6 Wt. %	Std. 7 Wt. %	Std. 8 Wt. %
Methanol 0.1 - 5.0	---	0.1	2.5	---	5	0.5	1	---
Ethanol 1.0 - 12.0	12	---	3	---	8	5	1	---
Isopropanol 0.1 - 2.0	2	1	---	0.1	0.3	---	0.5	---
t-Butanol 0.1 - 2.0	0.5	0.1	1	---	2	0.3	---	---
Propanol 0.2 - 2.0	2	---	0.7	0.2	1	---	0.4	---
MtBE 1.0 - 17.0	5	17	---	---	1	2.5	10	---
sec-Butanol 0.1 - 2.5	1	---	0.5	0.1	---	2.5	0.7	---
Diisopropyl ether 0.1 - 2.0	---	0.5	0.3	0.1	2	1	---	---
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 & 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 $ 250 / **8 x 1 mL**

NEW

M-GRO-CAL/IS Analyte / Calibration range	01-R1 Wt. %	02-R1 Wt. %	03-R1 Wt. %	04-R1 Wt. %	05-R1 Wt. %	06-R1 Wt. %	07-R1 Wt. %	08-R1 Wt. %
Methanol 0.1 - 5.0	--	0.1	2.5	--	5	0.5	1	--
Ethanol 1.0 - 12.0	12	--	3	--	8	5	1	--
Isopropanol 0.1 - 2.0	2	1	--	0.1	0.3	--	0.5	--
t-Butanol 0.1 - 2.0	0.5	0.1	1	--	2	0.3	--	--
Propanol 0.2 - 2.0	2	--	0.7	0.2	1	--	0.4	--
MtBE 1.0 - 17.0	5	17	--	--	1	2.5	10	--
sec-Butanol 0.1 - 2.5	1	--	0.5	0.1	--	2.5	0.7	--
Diisopropyl ether 0.1 - 2.0	--	0.5	0.3	0.1	2	1	--	--
Isobutanol 0.1 - 2.0	2	0.5	--	1	0.1	0.3	--	--
EtBE 1.0 - 18.0	--	3.5	18	7.5	--	1	12	--
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 & ISTD	**28.6**	**30.0**	**30.1**	**30.3**	**30.3**	**30.0**	**30.4**	**0**

Technical Note

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

D5599 Meets EPA Guidelines for RFG Analysis

Without Internal Standard

M-GRO-CAL-SET $ 850 / **8 x 10 mL**
of 14 Comp. Mix

Analyte / Calibration range	Std. 1 Wt. %	Std. 2 Wt. %	Std. 3 Wt. %	Std. 4 Wt. %	Std. 5 Wt. %	Std. 6 Wt. %	Std. 7 Wt. %	Std. 8 Wt. %
Methanol 0.1 - 5.0	---	0.1	2.5	---	5	0.5	1	---
Ethanol 1.0 - 12.0	12	---	3	---	8	5	1	---
Isopropanol 0.1 - 2.0	2	1	---	0.1	0.3	---	0.5	---
t-Butanol 0.1 - 2.0	0.5	0.1	1	---	2	0.3	---	---
Propanol 0.2 - 2.0	2	---	0.7	0.2	1	---	0.4	---
MtBE 1.0 - 17.0	5	17	---	---	1	2.5	10	---
sec-Butanol 0.1 - 2.5	1	---	0.5	0.1	---	2.5	0.7	---
Diisopropyl ether 0.1 - 2.0	---	0.5	0.3	0.1	2	1	---	---
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 $ 100 / **1 x 10 mL**
M-GRO-QC-10ML-PAK *SAVE 20%* $ 400 / **5 x 10 mL**
14 comps.

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

Daily QC Standard
With Internal Standard

M-GRO-QC/IS-5ML $ 75 / **1 x 5 mL**
M-GRO-QC/IS-5ML-PAK *SAVE 20%* $ 300 / **5 x 5 mL**
15 comps.

Internal Standard 1,2-Dimethoxyethane is combined in a 4 to 100 weight ratio.

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

Gasoline Refinery Blank
With Internal Standard

M-GRO-BLNK/IS-10ML $ 15 / **1 x 10 mL**
M-GRO-BLNK/IS-10ML-PAK *SAVE 20%* $ 60 / **5 x 10 mL**
2 comps.

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

O-FID Gasoline Refinery Blank

RFA-BLNK-10ML $ 10 / **1 x 10 mL**
RFA-BLNK-10ML-PAK *SAVE 20%* $ 40 / **5 x 10 mL**

RFA Gasoline (neat)

Revised Daily QC Standard
Without Internal Standard

M-GRO-QC-R-10ML $ 100 / **1 x 10 mL**
M-GRO-QC-R-10ML-PAK *SAVE 20%* $ 400 / **5 x 10 mL**
14 comps.

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

Revised Daily QC Standard
With Internal Standard

M-GRO-QC-R/IS-5ML $ 75 / **1 x 5 mL**
M-GRO-QC-R/IS-5ML-PAK *SAVE 20%* $ 300 / **5 x 5 mL**
15 comps.

Internal Standard 1,2-Dimethoxyethane is combined in a 4 to 100 weight ratio.

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

O-FID/EPA Gasoline Refinery
Internal Standard

M-GRO-IS-5ML $ 10 / **1 x 5 mL**
M-GRO-IS-5ML-PAK *SAVE 20%* $ 40 / **5 x 5 mL**

1,2-Dimethoxyethane (Internal Standard)

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.

ASTM D5599 EPA Gasoline Refinery Oxygenates Calibration Curves

EPA O-FID Quantitative Calibration Mixes

Without Internal Standard

M-GRO-CAL-EPA-10ML-SET — $ 350 / **5 x 10 mL**

5 comps.

	Analyte 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
t-Butanol	0.30 - 12.00	0.30	6.00	9.00	12.00	3.00
MtBE	0.30 - 15.00	15.00	7.50	11.25	3.75	0.30
RFA Gasoline		78.40	71.50	70.75	74.95	75.70

With Internal Standard

M-GRO-CAL-IS/EPA-SET — $ 175 / **5 x 1 mL**

6 comps.

	Analyte 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
t-Butanol	0.29 - 11.40	0.29	5.70	8.55	11.40	2.85
MtBE	0.29 - 14.29	14.25	7.13	10.69	3.56	0.29
1,2-Dimethoxyethane (ISTD)		5.00	5.00	5.00	5.00	5.00
RFA Gasoline		74.48	67.93	67.31	71.20	71.92

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.

EPA O-FID Quantitative Calibration Check Standard

Without Internal Standard

M-GRO-EPA-CC-10ML — $ 50 / **1 x 10 mL**

M-GRO-EPA-CC-10ML-PAK — *SAVE 20%* $ 200 / **5 x 10 mL**

5 comps.

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

EPA O-FID Quantitative Calibration Check Standard

With Internal Standard

M-GRO-EPACC/IS-5ML — $ 35 / **1 x 5 mL**

M-GRO-EPACC/IS-5ML-PAK — *SAVE 20%* $ 150 / **5 x 5 mL**

6 comps.

	Wt./Wt. %		Wt./Wt. %
Methanol	3.80	Methyl tert-butyl ether	11.40
Ethanol	7.60	RFA gasoline	67.45
tert-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 — $ 50 / **1 x 5 mL**

M-GRO-EPA-SP-5ML-PAK — *SAVE 20%* $ 200 / **5 x 5 mL**

4 comps.

	Wt./Wt. %		Wt./Wt. %
Methanol	14.3	*tert*-Butanol	14.3
Ethanol	28.6	Methyl tert-butyl ether	42.8

Oxygenate Free Gasoline Refinery Blank

RFA-BLNK-10ML — $ 10 / **1 x 10 mL**

RFA-BLNK-10ML-PAK — *SAVE 20%* $ 40 / **5 x 10 mL**

RFA Gasoline (neat)

Internal Standard

M-GRO-IS-5ML — $ 10 / **1 x 10 mL**

M-GRO-IS-5ML-PAK — *SAVE 20%* $ 40 / **5 x 10 mL**

1,2-Dimethoxyethane (Internal Standard)

ASTM D5600 Trace Metals in Petroleum Coke by ICP-AES

See ICP misc. standards in Inorganic Table of Contents

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.	Price / Unit
Ethanol in Oxygenate free RFA gasoline	5.0	ASTM-P-0061-SET	$ 50 / 3 x 10 mL
Ethanol in Oxygenate free RFA gasoline	10.0	ASTM-P-0062-SET	50 / 3 x 10 mL
t-Amyl methyl ether in Oxygenate free RFA gasoline	10.0	ASTM-P-0063-SET	50 / 3 x 10 mL
t-Amyl methyl ether in Oxygenate free RFA gasoline	15.0	ASTM-P-0064-SET	50 / 3 x 10 mL
Ethyl t-butyl ether in Oxygenate free RFA gasoline	10.0	ASTM-P-0065-SET	50 / 3 x 10 mL
Ethyl t-butyl ether in Oxygenate free RFA gasoline	15.0	ASTM-P-0066-SET	50 / 3 x 10 mL
Methyl t-butyl ether in Oxygenate free RFA gasoline	10.0	ASTM-P-0067-SET	50 / 3 x 10 mL
Methyl t-butyl ether in Oxygenate free RFA gasoline	15.0	ASTM-P-0068-SET	50 / 3 x 10 mL
Methanol & t-Butanol in Oxygenate free RFA gasoline	10.0 & 5.0	ASTM-P-0069-SET	50 / 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 $ 10 / **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 $ 625 / **set of 22 x 1 mL**

Approx. 2.0 mg/mL each in Toluene

Compound	Cat. No.	Price / 1 mL
Hydrogen sulfide	ASTM-P-0091-01-10X	$ 35
Carbonyl sulfide (Carbon oxysulfide)	ASTM-P-0091-02-10X	35
Methyl mercaptan (Methanethiol)	ASTM-P-0091-03-10X	35
Ethyl mercaptan (Ethanethiol)	ASTM-P-0091-04-10X	35
Methyl sulfide (Dimethyl sulfide)	ASTM-P-0091-05-10X	35
Carbon disulfide	ASTM-P-0091-06-10X	35
2-Propanethiol (Isopropyl mercaptan)	ASTM-P-0091-07-10X	35
2-Methyl-2-propanethiol (t-butyl mercaptan)	ASTM-P-0091-08-10X	35
1-Propanethiol (Propyl mercaptan)	ASTM-P-0091-09-10X	35
Ethyl methyl sulfide	ASTM-P-0091-10-10X	35
1-Methyl-1-propanethiol (2-butanethiol)	ASTM-P-0091-11-10X	35
Thiophene	ASTM-P-0091-12-10X	35
2-Methyl-1-propanethiol (Isobutyl mercaptan)	ASTM-P-0091-13-10X	35
Diethyl sulfide	ASTM-P-0091-14-10X	35
1-Butanethiol (Butyl mercaptan)	ASTM-P-0091-15-10X	35
Methyl disulfide (Dimethyl disulfide)	ASTM-P-0091-16-10X	35
2-Methylthiophene	ASTM-P-0091-17-10X	35
3-Methylthiophene	ASTM-P-0091-18-10X	35
Diethyl disulfide (Ethyl disulfide)	ASTM-P-0091-19-10X	35
3-Methylbenzo(b)thiophene	ASTM-P-0091-20-10X	35
5-Methylbenzo(b)thiophene	ASTM-P-0091-21-10X	75
Diphenyl sulfide	ASTM-P-0091-22-10X	35

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 ASTM methods in Inorganic Table of Content

ASTM D5762 Nitrogen in Petroleum & Petroleum Products by Boat-Inlet Chemiluminescence

Nitrogen Calibration Set

D-5762-95-CAL-SET $ 75 / **6 x 1 mL**

Nitrogen introduced using Acridine

Description	Cat. No.	Price / 1 mL
Xylene Blank	D-5762-95-BL	$ 10
Nitrogen @ 1.0 µg/mL in Xylene	D-5762-95-1X	15
Nitrogen @ 5.0 µg/mL in Xylene	D-5762-95-5X	15
Nitrogen @ 10 µg/mL in Xylene	D-5762-95-10X	15
Nitrogen @ 50 µg/mL in Xylene	D-5762-95-50X	15
Nitrogen @ 100 µg/mL in Xylene	D-5762-95-100X	15

Nitrogen Calibration Set - Low Level

ASTM-P-0070-SET $ 75 / **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 $ 50 / **4 x 1 mL**

The Nitrogen is introduced using Aniline and 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 $ 60 / **5 x 1 mL**

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

Custom Services

Custom Synthesis

The AccuStandard Synthesis Department employs PhD Organic Chemists with many years of academic and industrial experience. This experienced team has developed hundreds of pure chemical compounds for companies and governmental agencies around the world. AccuStandard specializes in synthesizing chemicals of high purity to be used as reference standards, for milligram to kilogram batches. AccuStandard is the only company to synthesize all 209 individual PCB congeners as well as over 180 individual PBDE congeners.

Synthesis Experience

- PCBs (all 209 congeners), PBBs, PCB Metabolites
- Explosives - TNT, RDX, HMX, TATP, HND, HMTD
- PBDEs (over 180 congeners)
- PBDE Metabolites
- FBDEs
- Halo-Dibenzodioxins
- Halo-Dibenzofurans
- PAHs, Nitro-PAHs
- Substituted Diphenylethers
- Pesticides and Metabolites
- Forensics
- Wear Metals
- Pharmaceuticals and Other Rare Chemicals

Lab Resources

- Milligram to Kilogram Scale Glassware
- Equipment to work under N_2/Ar
- Liquid Solid Phase Chrom. (mg to 2 kg)
- Flash Chrom. (mg to 2 kg) including Horizon High Performance Flash Chrom. System
- Microwave Synthesis System
- Preparative TLC
- Buchi Rotary Evaporators
- Vacuum Drying Oven
- Parr Pressure Reactor (high pressure reaction, hydrogenation)
- Distillation Equipment - High Vacuum Distillation, Molecular Distillation (Kugelrohr), and Spinning Band Columns

Analytical Resources

- ^{1}H-NMR spectrometer - 400 MHZ
- GC/MS, GC/FID, GC/ECD, GC/NPD
- HPLC
- ICP
- ICP/MS
- Low Sulfur Analyzers (Antek, X-Ray Optical)
- LC/MS/MS
- Hg Analyzer

Custom Formulations

With over 40,000 custom and catalog standards, there is a good chance that AccuStandard will have a catalog item 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 +/-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 & 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.

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 listed on the following pages**.

Calibration Curve with 3 Component Deuterated Internal Standard Added

Aromatics Calibration Standards Kit
Internal Standard Version

M-GRA-CAL/IS-SET $ 375 / **set of 5 x 1 mL**

Core Calibration Mix 24 Comps.	Target Vol. %	Std. 1 Vol. %	Std. 2 Vol. %	Std. 3 Vol. %	Std. 4 Vol. %	Std. 5 Vol. %
Benzene	3	1.50	0.75	0.375	0.1875	
Toluene	19	9.50	4.75	2.375	1.1875	
Ethylbenzene	5	2.50	1.25	0.625	0.3125	
m-Xylene	6	3.00	1.50	0.750	0.3750	
p-Xylene	6	3.00	1.50	0.750	0.3750	
o-Xylene	6	3.00	1.50	0.750	0.3750	
Isopropylbenzene	3	1.50	0.75	0.375	0.1875	
n-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	
n-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 $ 100 / **1 x 1 mL**

Core Calibr. Mix 24 Comps.	Optional Std. 6 Target Vol. %
Benzene	2.25
Toluene	15
Ethylbenzene	3.75
m-Xylene	4.50
p-Xylene	4.50
o-Xylene	4.50
Isopropylbenzene	2.25
n-Proplylbenzene	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
n-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

Disk Deliverable
(At no additional charge)

CALAMTS®
(Disk containing "Calibration Amounts")
Eliminates hand keyed-in data.

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

Daily Quality Control Standard
Without Internal Standard

M-GRA-QC-10ML $ 125 / **1 x 10 mL**
M-GRA-QC-10ML-PAK *SAVE 20%* $ 500 / **5 x 10 mL**
13 comps.

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

Daily Quality Control Standard
With Internal Standard

M-GRA-QC/IS-5ML $ 100 / **1 x 5 mL**
M-GRA-QC/IS-5ML-PAK *SAVE 20%* $ 400 / **5 x 5 mL**
16 comps.

	Wt. Ratio	Compound	Wt. Ratio
n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-Dodecane	5	1,2,4-Trimethylbenzene	3
Isooctane	12	1,2,4,5-Tetramethylbenzene	3
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 $ 10 / **1 x 1 mL**
M-GRA-ST-PAK *SAVE 20%* $ 40 / **5 x 1 mL**
100 µg/mL in Isooctane

1,4-Diethylbenzene

3 Comp. Deuterated Internal Std. Mix

M-GRA-IS-5ML $ 158 / **1 x 5 mL**
M-GRA-IS-5ML-PAK *SAVE 20%* $ 632 / **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 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 $ 425 / **set of 5 x 1 mL**

Core Calibr. Mix 24 comps.	Std. 1 Target Wt. %	Std. 2 Wt. %	Std. 3 Wt. %	Std. 4 Wt. %	Std. 5 Wt. %
Benzene	3.13	1.78	0.95	0.490	0.2490
Toluene	19.65	11.11	5.90	3.058	1.5547
Ethylbenzene	5.12	2.92	1.55	0.805	0.4090
m-Xylene	6.27	3.50	1.86	0.962	0.4891
p-Xylene	6.33	3.50	1.86	0.962	0.4891
o-Xylene	6.51	3.56	1.89	0.980	0.4981
Isopropylbenzene	3.06	1.74	0.93	0.480	0.2439
n-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
n-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

Optional Sixth Standard
With Internal Standard

M-GRA-ADD/IS-R $ 100 / **1 x 1 mL**

Core Calibr. Mix 24 comps.	Optional Std. 6 Target Wt. %
Benzene	2.48
Toluene	16.29
Ethylbenzene	4.07
m-Xylene	4.87
p-Xylene	4.87
o-Xylene	4.96
Isopropylbenzene	2.43
n-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
n-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 especially helpful in the quantification of gasoline containing high levels of toluene.

Technical Note

This set of calibration solutions was formulated to improve quantification for Toluene by using Toluene-d_8 as an additional Internal Standard.

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.

Daily Quality Control Standard
Without Internal Standard

M-GRA-QC-10ML $ 125 / **1 x 10 mL**
M-GRA-QC-10ML-PAK *SAVE 20%* $ 500 / **5 x 10 mL**
13 comps.

	Wt. Ratio		Wt. Ratio
n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-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 $ 125 / **1 x 5 mL**
M-GRA-QC/IS-R-5ML-PAK *SAVE 20%* $ 500 / **5 x 5 mL**
17 comps.

	Wt. Ratio		Wt. Ratio
n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-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 $ 225 / **1 x 10 mL**
M-GRA-IS-R-10ML-PAK *SAVE 20%* $ 900 / **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 $ 10 / **1 x 1 mL**
M-GRA-ST-PAK *SAVE 20%* $ 40 / **5 x 1 mL**
100 µg/mL in Isooctane

1,4-Diethylbenzene

ASTM D5769

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 $ 1500 / **set of 5 x 5 mL**
D-5769-CAL-10ML-SET $ 2750 / **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
m-Xylene	6.19	3.48	1.856	0.9598	0.4883
p-Xylene	6.19	3.48	1.856	0.9598	0.4883
o-Xylene	6.30	3.54	1.890	0.9776	0.4973
Isopropylbenzene	3.09	1.74	0.925	0.4786	0.2435
n-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
n-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 $ 150 / **1 x 5 mL**
D-5769-ADD-10ML $ 300 / **1 x 10 mL**

Core Calibration Mix 23 Comps.	Target Wt. %
Benzene	4.16
Toluene	16.41
Ethylbenzene	4.10
m-Xylene	4.91
p-Xylene	4.91
o-Xylene	5.00
Isopropylbenzene	2.45
n-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
n-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

Disk Deliverable
(At no additional charge)

CALAMTS®
(Disk containing "Calibration Amounts")
Eliminates hand keyed-in data.

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

Daily Quality Control Standard
Without Internal Standard

D-5769-QC-10ML $ 125 / **1 x 10 mL**
D-5769-QC-10ML-PAK ***SAVE 20%*** $ 500 / **5 x 10 mL**
14 comps.

	Wt. Ratio		Wt. Ratio
n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-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 $ 225 / **1 x 10 mL**
M-GRA-IS-R-10ML-PAK ***SAVE 20%*** $ 900 / **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 $ 158 / **1 x 5 mL**
M-GRA-IS-5ML-PAK ***SAVE 20%*** $ 632 / **5 x 5 mL**
3 comps.

	Mix Ratio
Benzene-d_6	2 mL
Ethylbenzene-d_{10}	2 mL
Naphthalene-d_8	1 gm

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 $ 375 / **5 x 1 mL**

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
m-Xylene	6.19	3.48	1.856	0.9598	0.4883
p-Xylene	6.19	3.48	1.856	0.9598	0.4883
o-Xylene	6.30	3.54	1.890	0.9776	0.4973
Isopropylbenzene	3.09	1.74	0.925	0.4786	0.2435
n-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
n-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 $ 100 / **1 x 1 mL**

Core Calibration Mix 24 Comps.	Target Wt. %
Benzene	4.16
Toluene	16.41
Ethylbenzene	4.10
m-Xylene	4.91
p-Xylene	4.91
o-Xylene	5.00
Isopropylbenzene	2.45
n-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
n-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.

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 $ 100 / **1 x 5 mL**
D-5769-QC/IS-5ML-PAK *SAVE 20%* $ 400 / **5 x 5 mL**
17 comps.

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

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

Resolution Standard

M-GRA-RES $ 30 / **1 x 1 mL**
M-GRA-RES-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
3 comps.

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

3 comp. Deuterated Internal Std. Mix

M-GRA-IS-5ML $ 158 / **1 x 5 mL**
M-GRA-IS-5ML-PAK *SAVE 20%* $ 632 / **5 x 5 mL**
3 comps.

Compound	Mix Ratio
Benzene-d_6	2 mL
Ethylbenzene-d_{10}	2 mL
Naphthalene-d_8	1 gm

Sensitivity Test Solution

M-GRA-ST $ 10 / **1 x 1 mL**
M-GRA-ST-PAK *SAVE 20%* $ 40 / **5 x 1 mL**
100 µg/mL in Isooctane

1,4-Diethyl benzene

Fragmentation Pattern Standard

M-GRA-FP $ 20 / **1 x 1 mL**
M-GRA-FP-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
3.0% w/w in Isooctane

1,2,3-Trimethylbenzene

Mass Scan Range Standard

M-GRA-MSR $ 20 / **1 x 1 mL**
M-GRA-MSR-PAK *SAVE 20%* $ 80 / **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-d_4)

Calibration Curve with Deuterated Toluene
With Internal Standard

D-5769-CAL/IS-R-SET $ 425 / **5 x 1 mL**

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
m-Xylene	6.19	3.48	1.856	0.9598	0.4883
p-Xylene	6.19	3.48	1.856	0.9598	0.4883
o-Xylene	6.30	3.54	1.890	0.9776	0.4973
Isopropylbenzene	3.09	1.74	0.925	0.4786	0.2435
n-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
n-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 $ 100 / **1 x 1 mL**

Core Calibration Mix 24 Comp.	Target Wt. %
Benzene	4.16
Toluene	16.41
Ethylbenzene	4.10
m-Xylene	4.91
p-Xylene	4.91
o-Xylene	5.00
Isopropylbenzene	2.45
n-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
n-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 $ 100 / **1 x 5 mL**
D-5769-QC/IS-R-5ML-PAK *SAVE 20%* $ 400 / **5 x 5 mL**
18 comps.

Compound	Wt. Ratio	Compound	Wt. Ratio
n-Hexane	12	Toluene	9
n-Heptane	17	Ethylbenzene	3
n-Octane	17	*m*-Xylene	3
n-Decane	12	*o*-Xylene	3
n-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

4 comp. Deuterated Internal Std. Mix

M-GRA-IS-R-10ML $ 225 / **1 x 10 mL**
M-GRA-IS-R-10ML-PAK *SAVE 20%* $ 900 / **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

Sensitivity Test Solution

M-GRA-ST $ 10 / **1 x 1 mL**
M-GRA-ST-PAK *SAVE 20%* $ 40 / **5 x 1 mL**
100 µg/mL in Isooctane

1,4-Diethyl benzene

Resolution Standard

M-GRA-RES $ 30 / **1 x 1 mL**
M-GRA-RES-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
3 comps.

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

Fragmentation Pattern Standard

M-GRA-FP $ 20 / **1 x 1 mL**
M-GRA-FP-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
3.0 w/w in Isooctane

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 $ 375 / **5 x 1 mL**

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
m-Xylene	6.19	3.48	1.856	0.9598	0.4883
p-Xylene	6.19	3.48	1.856	0.9598	0.4883
o-Xylene	6.30	3.54	1.890	0.9776	0.4973
Isopropylbenzene	3.09	1.74	0.925	0.4786	0.2435
n-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
n-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-R2 $ 100 / **1 x 1 mL**

Core Calibration Mix 24 Components	Target Wt.%
Benzene	4.16
Toluene	16.41
Ethylbenzene	4.10
m-Xylene	4.91
p-Xylene	4.91
o-Xylene	5.00
Isopropylbenzene	2.45
n-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
n-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

Disk Deliverable
(At no additional charge)

CALAMTS®

(Disk containing "Calibration Amounts")

Eliminates hand keyed-in data.

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

Internal Standard
M-GRA-IS-R2

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

The 3 comp. Internal Standard Mix (M-GRA-IS-R2) is combined with the 24 Comp. Core Calibration Curve mixtures above in a 5 to 100 weight ratio to formulate these 27 Comp. calibration solutions.

Daily QC Standard
With Internal Standard

D-5769-QC/IS-R2-5ML $ 100 / **1 x 5 mL**

D-5769-QC/IS-R2-5ML-PAK ***SAVE 20%*** $ 400 / **5 x 5 mL**

17 comps.

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

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

Sensitivity Test Solution
M-GRA-ST $ 10 / **1 x 1 mL**

M-GRA-ST-PAK ***SAVE 20%*** $ 40 / **5 x 1 mL**

100 µg/mL in Isooctane

1,4-Diethyl benzene

Fragmentation Pattern Standard
M-GRA-FP $ 20 / **1 x 1 mL**

M-GRA-FP-PAK ***SAVE 20%*** $ 80 / **5 x 1 mL**

3.0 w/w in Isooctane

1,2,3-Trimethylbenzene

3 comp. Chlorinated Internal Std. Mix
M-GRA-IS-R2-VAP $ 125 / **set of 25 x 1 mL**

M-GRA-IS-R2-25ML $ 100 / **1 x 25 mL**

3 comps.

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

Resolution Standard
M-GRA-RES $ 30 / **1 x 1 mL**

M-GRA-RES-PAK ***SAVE 20%*** $ 120 / **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 $ 125 / **1 x 10 mL**
M-GRA-QC-R-10ML-PAK *SAVE 20%* $ 500 / **5 x 10 mL**
15 comps.

	Wt. Ratio		Wt. Ratio
n-Hexane	12	Ethylbenzene	3
n-Heptane	17	*m*-Xylene	3
n-Octane	17	*o*-Xylene	3
n-Decane	12	1,2,4-Trimethylbenzene	3
n-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 $ 100 / **1 x 5 mL**
M-GRA-QC-R/IS-5ML-PAK *SAVE 20%* $ 400 / **5 x 5 mL**
18 comps.

	Wt. Ratio		Wt. Ratio
n-Hexane	12	Ethylbenzene	3
n-Heptane	17	*m*-Xylene	3
n-Octane	17	*o*-Xylene	3
n-Decane	12	1,2,4-Trimethylbenzene	3
n-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 $ 158 / **1 x 5 mL**
M-GRA-IS-5ML-PAK *SAVE 20%* $ 632 / **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 $ 225 / **1 x 10 mL**
M-GRA-IS-R-10ML-PAK *SAVE 20%* $ 900 / **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 $ 125 / **1 x 5 mL**
M-GRA-QCR/IS-R-5ML-PAK *SAVE 20%* $ 500 / **5 x 5 mL**
19 comps.

	Wt. Ratio		Wt. Ratio
n-Hexane	12	Ethylbenzene	3
n-Heptane	17	*m*-Xylene	3
n-Octane	17	*o*-Xylene	3
n-Decane	12	1,2,4-Trimethylbenzene	3
n-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 $ 600 / **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

Revision 5 F

M-GRA-K2-SET $ 700 / **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 Revison 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

4 Component Internal Standard Formulations

M-GRA-K4-SET $ 850 / **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 Revison 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

Technical Note

Used to meet the Toluene-d_8 internal standard version recommended by a network of major petroleum refineries.

Modifications to D5769

- Calibration standards when combined with internal standards are diluted into significantly more isooctane.
- The analytes in the Performance Standard have been expanded to better tune the GC/MS system for optimum performance.
- The number of components in the QA/QC mix has been reduced with new QA/QC tolerances.
- The number of analytes in the calibration mix has been reduced.
- Samples that exceed the linear range are to be diluted, reducing the number of extra calibration points required.

ASTM D5769-XX Calibration Curve with No Internal Standard Added

ASTM-P-0140-SET $ 1500 / **5 x 5 mL**
Level 1, 2, 3, 4, 5

Core Calibr. Mix Compound	Target	Level 1 Mass %	Level 2 Mass %	Level 3 Mass %	Level 4 Mass %	Level 5 Mass %
Benzene	5	3	1	0.5	0.1	
Toluene	12	9	6	3	0.5	
Ethylbenzene	5	3.75	2.5	1.25	0.2	
1,3-Dimethylbenzene	10	7.5	5	2.5	0.2	
1,4-Dimethylbenezene	5	3.75	2.5	1.25	0.2	
1,2-Dimethylbenezene	5	3.75	2.5	1.25	0.2	
(1-Methylethyl)-benzene	3	2.25	1.5	0.75	0.2	
1-Methyl-3-ethylbenzene	3	2.25	1.5	0.75	0.2	
1-Methyl-4-ethylbenzene	3	2.25	1.5	0.75	0.2	
1,3,5-Trimethylbenzene	3	2.25	1.5	0.75	0.2	
1-Methyl-2-ethylbenzene	3	2.25	1.5	0.75	0.2	
1,2,4-Trimethylbenzene	6	4.5	3	1.5	0.2	
1,2,3-Trimethylbenzene	3	2.25	1.5	0.75	0.2	
Indan	3	2.25	1.5	0.75	0.2	
1,2-Diethylbenzene	2	1.5	1	0.5	0.2	
Naphthalene[A]	2	1.5	1	0.5	0.1	
2-Methylnaphthalene [A]	2	1.5	1	0.5	0.1	
1-Methylnaphthalene [A]	2	1.5	1	0.5	0.1	
Isooctane (solvent) *	balance	balance	balance	balance	balance	

4 comp. Deuterated Internal Std. Mix

ASTM-P-0140-IS $ 75 / **1 x 10 mL**
ASTM-P-0140-IS-PAK *SAVE 20%* $ 300 / **5 x 10 mL**
4 comps.

Compound	Mass %	Compound	Mass %
Benzene-d_6	2	Naphthalene-d_8	1
Ethylbenzene-d_{10}	2	Isooctane *	balance

4 comp. Deuterated Internal Std. Mix

ASTM-P-0140-IS2 $ 75 / **1 x 10 mL**
ASTM-P-0140-IS2-PAK *SAVE 20%* $ 300 / **5 x 10 mL**
5 comps.

Compound	Mass %	Compound	Mass %
Benzene-d_6	2	Naphthalene-d_8	1
Ethylbenzene-d_{10}	2	Toluene-d_8	7
		Isooctane *	balance

Performance Evalutation Standard

ASTM-P-0140-PES $ 55 / **1 x 1 mL**
ASTM-P-0140-PES-PAK *SAVE 20%* $ 220 / **5 x 1 mL**
11 comps.

	Target Mass %
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(1:1) *	balance

Composition of Daily QC Standard

ASTM-P-0140-QC $ 125 / **1 x 10 mL**
ASTM-P-0140-QC-PAK *SAVE 20%* $ 500 / **5 x 10 mL**
9 comps.

	Target Mass %
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

[A] This component is a solid at room temperature

* 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 D5771 Cloud Point of Petroleum Products

See Table of Contents for Cloud Point Standards

ASTM D5772 Cloud Point of Petroleum Products (Linear Cooling Rate Method)

See Table of Contents for Cloud Point Standards

ASTM D5773 Cloud Point of Petroleum Products (Constant Cooling Rate Method)

See Table of Contents for Cloud Point Standards

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

Diisocyanate Sets

D-5836-SET $ 175 / 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

NEW

Diisocyanate Storage - Refrig 0-5° C

Underivatized Diisocyanates

Compound	Unit	Cat. No.	Price
2,4-Toluene diisocyanate	100 mg	D-5836-01N	$ 25
2,6-Toluene diisocyanate	100 mg	D-5836-02N	25
Hexamethylene diisocyanate	100 mg	D-5836-03N	25
4,4'-Methylenebis(phenyl isocyanate)	100 mg	D-5836-04N	25

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

Compound	Cat. No.	Price / 1 mL
N,N'-(4-Methyl-1,3-phenylene)bis[4-2-pyridinyl)-1-piperazinecarboxyamide 72375-21-4 **(2,4-TDIP)**	D-5836-01-DER 2840 µg/mL in DMSO	$ 25
N,N'-(2-Methyl-1,3-phenylene)bis[4-2-pyridinyl)-1-piperazinecarboxyamide **(2,6-TDIP)**	D-5836-02-DER 2840 µg/mL in DMSO	25
N,N'-(1,6-Hexanediylbis[4-(2-pyridinyl)-1-piperazinecarboxyamide 72375-27-0 **(1,6-HDIP)**	D-5836-03-DER 2900 µg/mL in DMSO	25
N,N'-(Methylenediphenylene)bis[4-(2-pyridinyl)-1-piperazinecarboxyamide 72375-24-7 **(4,4'-MDIP)**	D-5836-04-DER 2280 µg/mL in DMSO	25

Derivatizing Agents

1-(2-Pyridyl)piperazine 34803-66-2	D-5836-DER-5ML-VAP 2 mg/mL in CH_2Cl_2	$ 25 / 4 x 5 mL

Individual Derivatized Diisocyanates

N,N'-(4-Methyl-1,3-phenylene)bis[4-2-pyridinyl)-1-piperazinecarboxyamide 72375-21-4 **(2,4-TDIP)**	D-5836-01A-DER 1000 µg/mL in DMSO	$ 25
N,N'-(2-Methyl-1,3-phenylene)bis[4-2-pyridinyl)-1-piperazinecarboxyamide **(2,6-TDIP)**	D-5836-02A-DER 1000 µg/mL in DMSO	$ 25
N,N'-(1,6-Hexanediylbis[4-(2-pyridinyl)-1-piperazinecarboxyamide 72375-27-0 **(1,6-HDIP)**	D-5836-03A-DER 1000 µg/mL in DMSO	$ 25
N,N'-(Methylenediphenylene)bis[4-(2-pyridinyl)-1-piperazinecarboxyamide 72375-24-7 **(4,4'-MDIP)**	D-5836-04A-DER 1000 µg/mL in DMSO	$ 25

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

see ASTM methods in Inorganic T of C

ASTM D5901 Freezing Point Aviation Fuels (Automated Optical Method)

See Table of Contents for Cloud Freezing Point Standards

ASTM D5972 Freezing Point Aviation Fuels (Automated Phase Transition Method)

See Table of Contents for Cloud Freezing Pt. Standards

ASTM D5986 Oxygenates, Benzene, Toluene, C_8-C_{12}, Aromatics & Total Aromatics in Finished Gasolines by GC/FTIR

Daily QC Standard

Without Internal Standard

M-GRA-QC-10ML $ 125 / **1 x 10 mL**
M-GRA-QC-10ML-PAK *SAVE 20%* $ 500 / **5 x 10 mL**

Compound	Wt. Ratio
n-Hexane	12
n-Heptane	17
n-Octane	17
n-Decane	12
n-Dodecane	5
Isooctane	12
Benzene	1

Compound	Wt. Ratio
Toluene	9
Ethylbenzene	3
m-Xylene	3
o-Xylene	3
1,2,4-Trimethylbenzene	3
1,2,4,5-Tetramethylbenzene	3
13 Comp. Core Mix	100

Technical Note

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

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

Aroclor Standards

Aroclor #	35 µg/mL in Isooctane Cat. No.	1 mL Price	35 µg/mL in MeOH Cat. No.	1 mL Price	1000 µg/mL in Hexane Cat. No.	1 mL Price
Aroclor 1016	C-216S	$ 15	C-216S-M	$ 15	C-216S-H-10X	$ 20
Aroclor 1221	C-221S	15	C-221S-M	15	C-221S-H-10X	20
Aroclor 1232	C-232S	15	C-232S-M	15	C-232S-H-10X	20
Aroclor 1242	C-242S	15	C-242S-M	15	C-242S-H-10X	20
Aroclor 1248	C-248S	15	C-248S-M	15	C-248S-H-10X	20
Aroclor 1254	C-254S	15	C-254S-M	15	C-254S-H-10X	20
Aroclor 1260	C-260S	15	C-260S-M	15	C-260S-H-10X	20
Aroclor 1262	C-262S	15	C-262S-M	15	C-262S-H-10X	20
Aroclor 1268	C-268S	15	C-268S-M	15	C-268S-H-10X	20

ASTM D6258 Solvent Red 164 Dye Concentration in Diesel Fuels

Stock Solvent Red 26 Standard

D-6258-CONC-5ML $ 45 / **1 x 5 mL**

Solvent Red 26 @ 300 µg/mL in Xylene

D-6258 Calibration Curve

D-6258-5ML-SET $ 125 / **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 D6277 Benzene in Spark - Ignition Engine Fuels using Mid Infrared Spectroscopy See Table of Contents for Petro QC Standards

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 $ 135 / **1 x 1 mL**

ASTM-P-0080-PAK *SAVE 20%* $ 540 / **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 $ 45 / **1 x 1 mL**

ASTM-P-0081-PAK $ 180 / **5 x 1 mL**

At stated conc. in Hexane:Heptane (1:1)

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 $ 25 / **1 x 1 mL**

ASTM-P-0082-PAK $ 100 / **5 x 1 mL**

At stated conc. in Hexane:Heptane (1:1)

2 comps.

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

ASTM-P-0082-R1 $ 25 / **1 x 1 mL**

ASTM-P-0082-R1-PAK $ 100 / **5 x 1 mL**

At stated conc. in Hexane:Heptane (1:1)

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 — $ 40 / **2 x 1 mL** (D-6296-VER1, D-6296-VER2)

D-6296-VER-SET-PAK — *SAVE 20%* $ 160 / **5 x (2 x 1 mL)** Set of 5 each (D-6296-VER1, D-6296-VER2)

D-6296-VER1 — **1 x 1 mL**, 2 comps.

	Wt. %
MTBE	5%
Isooctane	95%

D-6296-VER2 — **1 x 1 mL**, 2 comps.

	Wt. %
ETBE	5%
Isooctane	95%

Calibration Standard with MTBE

D-6296-CAL1 — $ 65 / **1 x 1 mL**

D-6296-CAL1-PAK — *SAVE 20%* $ 260 / **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 — $ 65 / **1 x 1 mL**

D-6296-CAL2-PAK — *SAVE 20%* $ 260 / **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 — $ 15 / **1 x 5 mL**

Isooctane (Neat)

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

See Table of Contents for Karl Fischer Standards

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

See Table of Contents for Sulfur Calibration Standards

ASTM D6352 Boiling Range Distribution of Petroleum Distillates from 174 to 700ºC by GC

Polywax 500®

ASTM-P-0051N-2G — $ 20 / **2 grams**

Polywax 500

Polywax 655®

ASTM-P-0053N-2G — $ 20 / **2 grams**

Polywax 655

Hydrocarbon Window Defining Standard

DRH-008S-R2 — $ 65 / **1 x 1 mL**

DRH-008S-R2-PAK — *SAVE 20%* $ 260 / **5 x 1 mL**

500 µg/mL each in Chloroform — 35 comps.

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

Polywax 850®

ASTM-P-0137N-2G — $ 20 / **2 grams**

Polywax 850

Polywax 1000®

ASTM-P-0138N-2G — $ 20 / **2 grams**

Polywax 1000

Calibration Mix

DRH-002N — $ 30 / **100 mg**

DRH-002N-10X — $ 40 / **1 gm**

17 comps.

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

Column Test Mixture

D-2887 — $ 10 / **1 x 1 mL**

1% wt./v in n-Octane — 2 comps.

n-Hexadecane *n*-Octadecane

Can be shipped by Air and Sea

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

See Table of Contents for Vapor Pressure Standards

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

System Resolution Standards

D-6379-SRS $ 40 / **1 x 1 mL**
D-6379-SRS-PAK *SAVE 20%* $ 160 / **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 $ 40 / **1 x 1 mL**
D-6379-SRS-R1-PAK *SAVE 20%* $ 160 / **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 $ 100 / **4 x 1 mL**
D-6379-SET-PAK *SAVE 20%* $ 400 / **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 $ 100 / **4 x 1 mL**
D-6379-10X-SET-PAK *SAVE 20%* $ 400 / **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 Table of Contents for Alkane and Polywax Standards

ASTM D6428 Sulfur by Combustion and Electrochemical Detection

D-6428-R1-100ML-SET $ 300 / **7 x 100 mL**
D-6428-R1-SET $ 65 / **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 $ 275 / **6 x 100 mL**
D-6428-R2-SET $ 65 / **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

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

see ASTM methods in Inorganic Table of Contents

ASTM D6445 Sulfur in Gasoline by ED - XRF

See Table of Contents for Sulfur Standards

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

see ASTM methods in Inorganic Table of Contents

ASTM D6550 Olefin Content of Gasolines by SFC

Stock Olefin Calibration Standard

D-6550-CONC $ 80 / **1 x 1 mL**
D-6550-CONC-5ML $ 350 / **1 x 5 mL**
At stated Conc. by Wt. % 15 comps.

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

ASTM D6584 / EN 14105 Free and Total Glycerin in Biodiesel by GC

Compound	Conc.	Matrix	Cat. No.	Price / Unit
Glycerin	0.5 mg/mL	Pyridine	BF-D-6584-01	$ 25 / 2 mL
Monoolein	5 mg/mL	Pyridine	BF-D-6584-02	25 / 2 mL
1,3-Diolein	5 mg/mL	Pyridine	BF-D-6584-03	25 / 2 mL
Triolein	5 mg/mL	Pyridine	BF-D-6584-04	25 / 2 mL
(S)-(-)-1,2,4-Butanetriol	1 mg/mL	Pyridine	BF-D-6584-05-IS	145 / 5 mL
Tricaprin	8 mg/mL	Pyridine	BF-D-6584-06	145 / 5 mL
MSTFA	5 mL	Neat	BF-D-6584-07N	145 / 5 mL
Set of 7 above compounds			**BF-D-6584-SET**	450 / **7 units**
Mix of above compounds, on right (MSTFA separate)				
Biofuel 20	0.5 mg/mL	CH_2Cl_2	BF-FU-030-D	10 / 2 mL
	20 mg/mL	CH_2Cl_2	BF-FU-030-D-40X	20 / 2 mL
Biofuel 100 Consumer grade	0.5 mg/mL	CH_2Cl_2	BF-FU-029-D	20 / 2 mL
	20 mg/mL	CH_2Cl_2	BF-FU-029-40X	45 / 2 mL
Biofuel 100	0.5 mg/mL	CH_2Cl_2	BF-FU-032-D	20 / 2 mL
	20 mg/mL	CH_2Cl_2	BF-FU-032-D-40X	45 / 2 mL

ASTM D6584 Mixture

BF-D-6584-MIX $ 225 / **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
Trioctadecenoin (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.

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

System Performance Standard

ASTM-P-0135 $ 75 / **1 x 5 mL**
ASTM-P-0135-PAK *SAVE 20%* $ 300 / **5 x 5 mL**
At stated conc. (mg/mL) in n-Heptane 4 comps.

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

IP 391-95 Calibration Curve

ASTM-P-0136-SET $ 145 / **4 x 1 mL**
At stated conc.(mg/mL) in n-Heptane

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

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

Sulfur in Biodiesel 5%

ppm (µg/g)	% Wt.	Cat. No.	Price / 100 mL
0	0	BF-5453-B5-BL	$ 65
5	0.0005	BF-5453-B5-5X-SET	80 / 2 x 100 mL
10	0.001	BF-5453-B5-10X-SET	80 / 2 x 100 mL
15	0.0015	BF-5453-B5-15X-SET	80 / 2 x 100 mL
30	0.003	BF-5453-B5-30X	65
50	0.005	BF-5453-B5-50X	65
75	0.0075	BF-5453-B5-75X	65
100	0.01	BF-5453-B5-100X	65
200	0.02	BF-5453-B5-200X	65
500	0.05	BF-5453-B5-500X	65

Sulfur in Biodiesel 100%

NEW

ppm (µg/g)	% Wt.	Cat. No.	Price / 100 mL
0	0	BF-5453-B100-BL	$ 65
5	0.0005	BF-5453-B100-5X-SET	80 / 2 x 100 mL
10	0.001	BF-5453-B100-10X-SET	80 / 2 x 100 mL
15	0.0015	BF-5453-B100-15X-SET	80 / 2 x 100 mL
30	0.003	BF-5453-B100-30X	65
50	0.005	BF-5453-B100-50X	65
75	0.0075	BF-5453-B100-75X	65
100	0.01	BF-5453-B100-100X	65
200	0.02	BF-5453-B100-200X	65
500	0.05	BF-5453-B100-500X	65

Sulfur in Biodiesel 20%

0	0	BF-5453-B20-BL	$ 65
5	0.0005	BF-5453-B20-5X-SET	80 / 2 x 100 mL
10	0.001	BF-5453-B20-10X-SET	80 / 2 x 100 mL
15	0.0015	BF-5453-B20-15X-SET	80 / 2 x 100 mL
30	0.003	BF-5453-B20-30X	65
50	0.005	BF-5453-B20-50X	65
75	0.0075	BF-5453-B20-75X	65
100	0.01	BF-5453-B20-100X	65
200	0.02	BF-5453-B20-200X	65
500	0.05	BF-5453-B20-500X	65

Note: 10,000 ppm = 1% Wt.

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

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

Physical Standards

Compound	Conc.		Matrix	Cat. No.	Unit	Price
ASTM D2500						
Cloud Point	TBD *	ºC	B5	BF-D-2500-B5	200 mL	$ 120
	TBD *	ºC	B20	BF-D-2500-B20	200 mL	120
	TBD *	ºC	B100	BF-D-2500-B100	200 mL	120
ASTM D93 / EN-ISO 3679						
Flash Point	60	ºC		BF-D-93-60C	200 mL	140
	65	ºC		BF-D-93-65C	200 mL	140
	140	ºC		BF-D-93-140C	200 mL	140
ASTM D4951 / EN 14107						
Phosphorus Content	0.001	% Wt.	B5	BF-D-4951-B5	50 g	75
	0.001	% Wt.	B20	BF-D-4951-B20	50 g	75
	0.001	% Wt.	B100	BF-D-4951-B100	50 g	75
ASTM D6304 / EN ISO 12937						
(KF) Water Content	60	µg/g		BF-KF-0.6X-5ML-VAP	10 x 5 mL	70
	100	µg/g		BF-KF-1X-5ML-VAP	10 x 5 mL	50
	1000	µg/g		BF-KF-10X-5ML-VAP	10 x 5 mL	50
	5000	µg/g		BF-KF-50X-5ML-VAP	10 x 5 mL	50
ASTM D6751 / UOP 391 / EN 14108 / EN 14109						
Sodium / Potassium	100	ppm	B5	BF-UOP-391-B5	50 g	75
	100	ppm	B20	BF-UOP-391-B20	50 g	75
	100	ppm	B100	BF-UOP-391-B100	50 g	75
EN 14538						
Calcium / Magnesium	100	ppm	B5	BF-14538-B5	50 g	75
	100	ppm	B20	BF-14538-B20	50 g	75
	100	ppm	B100	BF-14538-B100	50 g	75

* TBD - These values will be certified on the individual lots and may vary between lots.

AccuStandard stands for accuracy in Cloud Points.

UOP Standards

UOP (Universal Oil Products) methods were developed to facilitate the refining industry in analyzing refinery feeds, products and process streams for compostion, purity and physical and chemical properties. In additional to the products lised 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 — $ 50 / **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 — $ 50 / **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 — $ 50 / **5 x 1 mL**

1% in Water

UOP-M-660-10X-PAK — $ 50 / **5 x 1 mL**

10% in Water

UOP-M-660-0.1X-PAK — $ 50 / **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 — $ 50 / **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 — $ 50 / **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 — $ 50 / **5 x 1 mL**

10 µg/g each in Sulfolane — 5 comps.

Benzene	Isopropylbenzene
Toluene	n-Nonane
Ethylbenzene	

NEW

UOP Method 868 Standard

Trace Saturates in High Purity Aromatics by GC.

UOP-M-868-PAK — $ 50 / **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 — $ 50 / **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

Skinner List for Refinery Waste

Semi-Volatiles

Base/Neutral Extractables

M-005B $ 150 / **1 x 1 mL**
M-005B-PAK *SAVE 20%* $ 600 / **5 x 1 mL**
0.2 mg/mL each in CH_2Cl_2
M-005B-10X $ 200 / **1 x 1 mL**
M-005B-10X-PAK *SAVE 20%* $ 800 / **5 x 1 mL**
2.0 mg/mL each in CH_2Cl_2 27 comps.

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

Acid Extractables

M-005A $ 35 / **1 x 1 mL**
M-005A-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
0.2 mg/mL each in CH_2Cl_2
M-005A-10X $ 40 / **1 x 1 mL**
M-005A-10X-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
2.0 mg/mL each in CH_2Cl_2 8 comps.

- *o*-Cresol
- *m*-Cresol
- *p*-Cresol
- 2,4-Dimethylphenol
- 2,4-Dinitrophenol
- 4-Nitrophenol
- Phenol
- Thiophenol

Volatiles

M-005V $ 35 / **1 x 1 mL**
M-005V-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
0.2 mg/mL each in MeOH
M-005V-10X $ 40 / **1 x 1 mL**
M-005V-10X-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
2.0 mg/mL each in MeOH 14 comps.

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

Resolution Check for Fire Debris Analysis

ASTM E1387 Resolution Check Mix

ASTM-E1387 $ 30 / **1 x 1 mL**
ASTM-E1387-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
2.0 mg/mL each in CH_2Cl_2 13 comps.

- Decane
- Dodecane
- Eicosane
- 2-Ethyltoluene
- 3-Ethyltoluene
- Hexadecane
- Hexane
- Octadecane
- Octane
- Tetradecane
- Toluene
- 1,2,4-Trimethylbenzene
- *p*-Xylene

ASTM E1618 Test Mix for Fire Debris Analysis

ASTM-E1618 $ 35 / **1 x 1 mL**
ASTM-E1618-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
0.05% v/v (0.50 µL/mL) each in CH_2Cl_2 13 comps.

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

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 has signed the Fuel Standard (Biodiesel) in 2006 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.	Price / Unit
Glycerin	0.5	mg/mL	Pyridine	BF-D-6584-01	$ 25 / 2 mL
Monoolein	5	mg/mL	Pyridine	BF-D-6584-02	25 / 2 mL
1,3-Diolein	5	mg/mL	Pyridine	BF-D-6584-03	25 / 2 mL
Triolein	5	mg/mL	Pyridine	BF-D-6584-04	25 / 2 mL
(S)-(-)-1,2,4-Butanetriol	1	mg/mL	Pyridine	BF-D-6584-05-IS	145 / 5 mL
Tricaprin	8	mg/mL	Pyridine	BF-D-6584-06	145 / 5 mL
MSTFA	5	mL	Neat	BF-D-6584-07N	145 / 5 mL
Set of 7 above compounds				**BF-D-6584-SET**	**450 / 7 units**
Mix of above compounds, on right (MSTFA separate)					
Biofuel 20	0.5	mg/mL	CH_2Cl_2	BF-FU-030-D	10 / 2 mL
	20	mg/mL	CH_2Cl_2	BF-FU-030-D-40X	20 / 2 mL
Biofuel 100 Consumer grade	0.5	mg/mL	CH_2Cl_2	BF-FU-029-D	20 / 2 mL
	20	mg/mL	CH_2Cl_2	BF-FU-029-40X	45 / 2 mL
Biofuel 100	0.5	mg/mL	CH_2Cl_2	BF-FU-032-D	20 / 2 mL
	20	mg/mL	CH_2Cl_2	BF-FU-032-D-40X	45 / 2 mL

ASTM D6584 Mixture

BF-D-6584-MIX $ 225 / **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
Trioctadecenoin (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 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 $ 145 / **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.

Rapeseed Oil

BF-RAP-ME $ 200 / **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.

Palm Kernel

BF-PALM-ME $ 200 / **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.

Beef Tallow & Palm Oil

BF-BT-ME $ 175 / **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.

Percent Methanol Calibration Standard Set (EN 14110)

BF-MEOH-SET $ 65 / **5 x 1 mL**

BF-MEOH-1X (100 µg/g)
BF-MEOH-5X (500 µg/g)
BF-MEOH-10X (1000 µg/g)
BF-MEOH-25X (2500 µg/g)
BF-MEOH-50X (5000 µg/g)

Methanol *in Water*

Technical Note

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

Technical Note

Individual Mixes packaged under Nitrogen for stability.

Fatty Acid Ethyl Esters (FAEEs)

Ethyl Esters in Soy & Corn

BF-SOY-EE	$ 185 / 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 Rapeseed Oil

BF-RAP-EE	$ 250 / 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 Palm Kernel Oil

BF-PALM-EE	$ 250 / 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 Beef Tallow

BF-BT-EE	$ 225 / 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.

	Neat (100 mg)		Solution (10 mg/mL in Hexane)	
Compound	Cat. No.	Price	Cat. No.	Price / 1 mL
Ethyl palmitate (16:0)	FAEE-006N	$ 15	FAEE-006S	$ 15
Ethyl stearate (18:0)	FAEE-007N	15	FAEE-007S	15
Ethyl arachidate (20:0)	FAEE-008N	15	FAEE-008S	15
Ethyl oleate (18:1)	FAEE-014N	15	FAEE-014S	15
Ethyl linoleate (18:2)	FAEE-012N	15	FAEE-012S	15
Ethyl linolenate (18:3)	FAEE-016N	15	FAEE-016S	15
Ethyl myristate (14:0)	FAEE-005N	15	FAEE-005S	15
Ethyl behenate (22:0)	FAEE-009N	15	FAEE-009S	15
Ethyl lignocerate (24:0)	FAEE-010N	25	FAEE-010S	25
Ethyl erucate (22:1)	FAEE-011N	15	FAEE-011S	15
Ethyl caprylate (8:0)	FAEE-002N	15	FAEE-002S	15
Ethyl caprate (10:0)	FAEE-003N	15	FAEE-003S	15
Ethyl laurate (12:0)	FAEE-004N	15	FAEE-004S	15
Ethyl palmitoleate (16:1)	FAEE-001N	15	FAEE-001S	15
Ethyl nervonate (24:1)	FAEE-013N	25	FAEE-013S	25
Ethyl heptadecanoate (17:0)	FAEE-015N	15	FAEE-015S	15
Ethyl linolenate (gamma) (18:3)	FAEE-020N	35	FAEE-020S	35

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

Sulfur in Biodiesel 5%

ppm (µg/g)	% Wt.	Cat. No.	Price / 100 mL
0	0	BF-5453-B5-BL	$ 65
5	0.0005	BF-5453-B5-5X-SET	80 / 2 x 100 mL
10	0.001	BF-5453-B5-10X-SET	80 / 2 x 100 mL
15	0.0015	BF-5453-B5-15X-SET	80 / 2 x 100 mL
30	0.003	BF-5453-B5-30X	65
50	0.005	BF-5453-B5-50X	65
75	0.0075	BF-5453-B5-75X	65
100	0.01	BF-5453-B5-100X	65
200	0.02	BF-5453-B5-200X	65
500	0.05	BF-5453-B5-500X	65

Sulfur in Biodiesel 20%

0	0	BF-5453-B20-BL	$ 65
5	0.0005	BF-5453-B20-5X-SET	80 / 2 x 100 mL
10	0.001	BF-5453-B20-10X-SET	80 / 2 x 100 mL
15	0.0015	BF-5453-B20-15X-SET	80 / 2 x 100 mL
30	0.003	BF-5453-B20-30X	65
50	0.005	BF-5453-B20-50X	65
75	0.0075	BF-5453-B20-75X	65
100	0.01	BF-5453-B20-100X	65
200	0.02	BF-5453-B20-200X	65
500	0.05	BF-5453-B20-500X	65

Note: 10,000 ppm = 1% Wt.

Sulfur in Biodiesel 100%

ppm (µg/g)	% Wt.	Cat. No.	Price / 100 mL
0	0	BF-5453-B100-BL	$ 65
5	0.0005	BF-5453-B100-5X-SET	80 / 2 x 100 mL
10	0.001	BF-5453-B100-10X-SET	80 / 2 x 100 mL
15	0.0015	BF-5453-B100-15X-SET	80 / 2 x 100 mL
30	0.003	BF-5453-B100-30X	65
50	0.005	BF-5453-B100-50X	65
75	0.0075	BF-5453-B100-75X	65
100	0.01	BF-5453-B100-100X	65
200	0.02	BF-5453-B100-200X	65
500	0.05	BF-5453-B100-500X	65

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

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

BioFuel Standards

Physical Standards

Compound	Conc.		Matrix	Cat. No.	Unit	Price
ASTM D2500						
Cloud Point	TBD *	ºC	B5	BF-D-2500-B5	200 mL	$ 120
	TBD *	ºC	B20	BF-D-2500-B20	200 mL	120
	TBD *	ºC	B100	BF-D-2500-B100	200 mL	120
ASTM D93 / EN-ISO 3679						
Flash Point	60	ºC		BF-D-93-60C	200 mL	140
	65	ºC		BF-D-93-65C	200 mL	140
	140	ºC		BF-D-93-140C	200 mL	140
ASTM D4951 / EN 14107						
Phosphorus Content	0.001	% Wt.	B5	BF-D-4951-B5	50 g	75
	0.001	% Wt.	B20	BF-D-4951-B20	50 g	75
	0.001	% Wt.	B100	BF-D-4951-B100	50 g	75
ASTM D6304 / EN ISO 12937						
(KF) Water Content	60	µg/g		BF-KF-0.6X-5ML-VAP	10 x 5 mL	70
	100	µg/g		BF-KF-1X-5ML-VAP	10 x 5 mL	50
	1000	µg/g		BF-KF-10X-5ML-VAP	10 x 5 mL	50
	5000	µg/g		BF-KF-50X-5ML-VAP	10 x 5 mL	50
ASTM D6751 / UOP 391 / EN 14108 / EN 14109						
Sodium / Potassium	100	ppm	B5	BF-UOP-391-B5	50 g	75
	100	ppm	B20	BF-UOP-391-B20	50 g	75
	100	ppm	B100	BF-UOP-391-B100	50 g	75
EN 14538						
Calcium / Magnesium	100	ppm	B5	BF-14538-B5	50 g	75
	100	ppm	B20	BF-14538-B20	50 g	75
	100	ppm	B100	BF-14538-B100	50 g	75

* TBD - These values will be certified on the individual lots and may vary between lots.

AccuStandard stands for accuracy in Cloud Points.

EN 14214 Wear Metals

Each is 50 grams at 1000 µg/g concentration.

Compound	Matrix	Cat. No.	Price / 50 grams
Aluminum	B5	BF-WM-B5-01	$ 55
	B20	BF-WM-B20-01	55
	B100	BF-WM-B100-01	55
Chromium	B5	BF-WM-B5-13	55
	B20	BF-WM-B20-13	55
	B100	BF-WM-B100-13	55
Copper	B5	BF-WM-B5-15	55
	B20	BF-WM-B20-15	55
	B100	BF-WM-B100-15	55
Iron	B5	BF-WM-B5-27	55
	B20	BF-WM-B20-27	55
	B100	BF-WM-B100-27	55
Lead	B5	BF-WM-B5-29	55
	B20	BF-WM-B20-29	55
	B100	BF-WM-B100-29	55
Silicon	B5	BF-WM-B5-52	55
	B20	BF-WM-B20-52	55
	B100	BF-WM-B100-52	55

Technical Note

Formulations for EN 12916, other methods and custom formulations are available.

Technical Note

Algae, as a biofuel feedstock, yields energy balances higher than even soybeans. (source: "Widescale Biodiesel Production from Algae", Briggs, Michael, University of New Hampshire Biodiesel Group, UNH (revised August 2004) page 8.

Technical Note

"Liquid biofuels have been used since the early days of the car industry. Nikolaus August Otto, the German inventor of the combustion engine, conceived his invention to run on ethanol. Rudolf Diesel, the German inventor of the Diesel engine, designed it to run on peanut oil. Henry Ford originally designed the Ford Model T, a car produced from 1903 to 1926, to run completely on ethanol." (source: http://en.wikipedia.org/wiki/Biofuel Retrieved 8/31/2007).

TPH & Fuel & 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.	Price / 1 mL
5-alpha Androstane 438-22-2	1 mg/mL	CH_2Cl_2	GRH-IS	$ 15
	10 mg/mL	CH_2Cl_2	GRH-IS-10X	30
Arctic Diesel	0.5 mg/mL	MeOH	FU-023	10
	20 mg/mL	MeOH	FU-023-40X	20
	20 mg/mL	CH_2Cl_2	FU-023-D-40X	20
Aviation (gas) (grade 100-LL)	0.5 mg/mL	MeOH	GA-004	10
	20 mg/mL	MeOH	GA-004-40X	20
	20 mg/mL	CH_2Cl_2	GA-004-D-40X	20
Biodiesel 20 NEW	0.5 mg/mL	CH_2Cl_2	FU-030-D	10
	20 mg/mL	CH_2Cl_2	FU-030-D-40X	25
Biodiesel 100 NEW	0.5 mg/mL	CH_2Cl_2	FU-029-D	20
	20 mg/mL	CH_2Cl_2	FU-029-D-40X	45
Biodiesel 100 NEW (refinery grade)	0.5 mg/mL	CH_2Cl_2	FU-032-D	20
	20 mg/mL	CH_2Cl_2	FU-032-D-40X	45
p-Bromofluorobenzene 460-00-4	2.5 mg/mL	Acetone	GARH-SS	20
1-Chloro-4-fluorobenzene 352-33-0	2 mg/mL	MeOH	AK-101.0-IS-10X	20
1-Chlorooctadecane 3386-33-2	1 mg/mL	Hexane	DRH-007-SS	15
1-Chloro-4-fluorobenzene 352-33-0	1 mg/mL	CH_2Cl_2	GARH-IS	15
2,5-Dibromotoluene 615-59-8	50 µg/mL	MeOH	GRH-004-SS	10
	500 µg/mL	MeOH	GRH-004-SS-10X	20
	5 mg/mL	MeOH	GRH-004-SS-100X	20
Diesel	0.5 mg/mL	MeOH	FU-009	10
	5 mg/mL	CH_2Cl_2	FU-009-D-10X	20
	20 mg/mL	MeOH	FU-009-40X	20
	20 mg/mL	CH_2Cl_2	FU-009-D-40X	20
#1 Diesel - Low Sulfur	0.5 mg/mL	MeOH	FU-013	10
	20 mg/mL	MeOH	FU-013-40X	20
	20 mg/mL	CH_2Cl_2	FU-013-D-40X	20
#2 Diesel 68334-30-5	50 mg/mL	Acetone	AK-102-LCS-R1-10X	20
#2 Diesel (Extra Low Sulfur) 68476-43-6	0.5 mg/mL	MeOH	FU-017	10
	5 mg/mL	CH_2Cl_2	FU-017-D-10X	20
	5 mg/mL	Acetone	AK-102.0-LCS	10
	50 mg/mL	Acetone	AK-102.0-LCS-10X	20
	20 mg/mL	MeOH	FU-017-40X	20
	20 mg/mL	CH_2Cl_2	FU-017-D-40X	20
#2 Diesel (Low Sulfur) 25% Weathered	5 mg/mL	CH_2Cl_2	FD2-W25-10X	25
#2 Diesel (Low Sulfur) 50% Weathered	5 mg/mL	CH_2Cl_2	FD2-W50-10X	25
#2 Diesel (Low Sulfur) 75% Weathered	5 mg/mL	CH_2Cl_2	FD2-W75-10X	25
#2 Diesel 25% Weathered	5 mg/mL	CH_2Cl_2	FD2-W25-R1-10X	25
#2 Diesel 50% Weathered	5 mg/mL	CH_2Cl_2	FD2-W50-R1-10X	25
#2 Diesel 75% Weathered	5 mg/mL	CH_2Cl_2	FD2-W75-R1-10X	25
Docosane 629-97-0	50 % w/w	Toluene	D-5186-91-PM	20
n-Dodecane 112-40-3	5 mg/mL	MeOH	AS-E0238	32
	1.5 % w/w	Isooctane	M-GRA-SCS-AS	10
#1 Fuel oil 70892-10-3	0.5 mg/mL	MeOH	FU-001	10
	20 mg/mL	MeOH	FU-001-40X	20
	20 mg/mL	CH_2Cl_2	FU-001-D-40X	20
#2 Fuel oil 68476-30-2	0.5 mg/mL	MeOH	FU-002	10
	20 mg/mL	MeOH	FU-002-40X	20
	20 mg/mL	CH_2Cl_2	FU-002-D-40X	20
#3 Fuel oil	0.5 mg/mL	Hexane	FU-003	10
	20 mg/mL	Hexane	FU-003-40X	20
	20 mg/mL	CH_2Cl_2	FU-003-D-40X	20
#4 Fuel oil 68476-31-3	0.5 mg/mL	Hexane	FU-004	10
	20 mg/mL	Hexane	FU-004-40X	20
	20 mg/mL	CH_2Cl_2	FU-004-D-40X	20
#6 Fuel Oil 68553-00-4	0.5 mg/mL	Hexane	FU-008	$ 10
	20 mg/mL	Hexane	FU-008-40X	20
	20 mg/mL	CH_2Cl_2	FU-008-D-40X	20
Gasoline Regular, unleaded	0.5 mg/mL	MeOH	GA-001	10
	5 mg/mL	MeOH	GA-001-10X	20
	20 mg/mL	MeOH	GA-001-40X	22
	20 mg/mL	CH_2Cl_2	GA-001-D-40X	20
Gasoline Premium	0.5 mg/mL	MeOH	GA-003	10
	20 mg/mL	MeOH	GA-003-40X	20
	20 mg/mL	CH_2Cl_2	GA-003-D-40X	20
Hydraulic Fluid 64742-54-7	0.5 mg/mL	Hexane	FU-020-H	10
	20 mg/mL	Hexane	FU-020-H-40X	20
	20 mg/mL	CH_2Cl_2	FU-020-D-40X	20
Jet Reference Fuel Type I	0.5 mg/mL	MeOH	FU-011	10
	20 mg/mL	MeOH	FU-011-40X	20
	20 mg/mL	CH_2Cl_2	FU-011-D-40X	20
JP-4 Jet Fuel	0.5 mg/mL	MeOH	FU-010	10
	20 mg/mL	MeOH	FU-010-40X	20
	20 mg/mL	CH_2Cl_2	FU-010-D-40X	20
JP-5 Fuel	0.5 mg/mL	MeOH	FU-012	10
	20 mg/mL	MeOH	FU-012-40X	20
	20 mg/mL	CH_2Cl_2	FU-012-D-40X	20
JP-7 Fuel	0.5 mg/mL	MeOH	FU-014	10
	20 mg/mL	MeOH	FU-014-40X	20
	20 mg/mL	CH_2Cl_2	FU-014-D-40X	20
JP-8 Fuel	0.5 mg/mL	MeOH	FU-015	10
	20 mg/mL	MeOH	FU-015-40X	20
	20 mg/mL	CH_2Cl_2	FU-015-D-40X	20
JP-TS Aviation Fuel 64742-47-8	0.5 mg/mL	MeOH	FU-016	10
	20 mg/mL	MeOH	FU-016-40X	20
	20 mg/mL	CH_2Cl_2	FU-016-D-40X	20
JP-10 Aviation Fuel 2825-82-3	0.5 mg/mL	MeOH	FU-022	10
	20 mg/mL	MeOH	FU-022-40X	20
	20 mg/mL	CH_2Cl_2	FU-022-D-40X	20
Kerosene 25% Weathered	5 mg/mL	CH_2Cl_2	FK-W25-10X	25
Kerosene 50% Weathered	5 mg/mL	CH_2Cl_2	FK-W50-10X	25
Kerosene 75% Weathered	5 mg/mL	CH_2Cl_2	FK-W75-10X	25
Kerosene 8008-20-6	0.5 mg/mL	MeOH	FU-005	10
	20 mg/mL	MeOH	FU-005-40X	20
	5 mg/mL	CH_2Cl_2	FU-005-D-10X	20
	20 mg/mL	CH_2Cl_2	FU-005-D-40X	20
Lacquer Thinner	1 gram	Neat	HS-001N	20
	0.5 mg/mL	MeOH	HS-001S	10
	20 mg/mL	MeOH	HS-001S-40X	20
	20 mg/mL	CH_2Cl_2	HS-001S-D-40X	20
Mineral Spirits 8030-30-6	1 gram	Neat	HS-002N	20
	0.5 mg/mL	MeOH	HS-002S	10
	20 mg/mL	MeOH	HS-002S-40X	20
	20 mg/mL	CH_2Cl_2	HS-002S-D-40X	20
Naphtha 64742-89-8	1 gram	Neat	HS-003N	20
	0.5 mg/mL	MeOH	HS-003S	10
	20 mg/mL	MeOH	HS-003S-40X	20
	20 mg/mL	CH_2Cl_2	HS-003S-D-40X	20
Nonatriacontane 7194-86-7	750 µg/mL	Chloroform	DRH-FL-SS-R1	60
	1 mg/mL	CS_2	DRH-FL-SS	20
	3 mg/mL	CS_2	DRH-FL-SS-3X	27
n-Pentadecane 629-62-9	5 mg/mL	MeOH	AS-E0241	32
RFA Gasoline (oxygenate-free)	0.5 mg/mL	MeOH	GA-005	10
	20 mg/mL	MeOH	GA-005-40X	20
	20 mg/mL	CH_2Cl_2	GA-005-D-40X	20
Regular Leaded Gasoline	0.5 mg/mL	MeOH	GA-002	10
	20 mg/mL	MeOH	GA-002-40X	20
	20 mg/mL	CH_2Cl_2	GA-002-D-40X	20

Individual Fuel and Hydrocarbons

Compound	Conc.	Matrix	Cat. No.	Price / 1 mL
SAE 5W30 Motor Oil	0.5 mg/mL	Hexane	FU-025-H	$ 10
	20 mg/mL	Hexane	FU-025-H-40X	20
	20 mg/mL	CH_2Cl_2	FU-025-D-40X	20
SAE 10W30 Motor Oil	0.5 mg/mL	Hexane	FU-026-H	10
	20 mg/mL	Hexane	FU-026-H-40X	20
	20 mg/mL	CH_2Cl_2	FU-026-D-40X	20
SAE 10W40 Motor Oil	0.5 mg/mL	Hexane	FU-027-H	10
	20 mg/mL	Hexane	FU-027-H-40X	20
	20 mg/mL	CH_2Cl_2	FU-027-D-40X	20
SAE 20W50 Motor Oil	0.5 mg/mL	Hexane	FU-028-H	10
	20 mg/mL	Hexane	FU-028-H-40X	20
	20 mg/mL	CH_2Cl_2	FU-028-D-40X	20
SAE 30W Motor Oil	0.5 mg/mL	Hexane	FU-018-H	10
	20 mg/mL	Hexane	FU-018-H-40X	20
	20 mg/mL	CH_2Cl_2	FU-018-D-40X	20
SAE 40W Motor Oil	0.5 mg/mL	Hexane	FU-019-H	10
	5 mg/mL	Acetone	AK-103.0-LCS	10
	20 mg/mL	Hexane	FU-019-H-40X	20
	20 mg/mL	CH_2Cl_2	FU-019-D-40X	20
	25 mg/mL	Acetone:CH_2Cl_2	AK-103.0-LCS-5X	20
SAE 50W Motor Oil	20 mg/mL	CH_2Cl_2	FU-021-D-40X	20
Stoddard solvent 8052-41-3	1 gram	Neat	HS-005N	20
	0.5 mg/mL	MeOH	HS-005S	10
	5 mg/mL	MeOH	HS-005S-10X	20
	20 mg/mL	MeOH	HS-005S-40X	20
	20 mg/mL	CH_2Cl_2	HS-005S-D-40X	20
o-Terphenyl 84-15-1	200 µg/mL	Acetone	AK-102.0-SS	$ 10
	1 mg/mL	CH_2Cl_2	DRH-006-SS	15
	2 mg/mL	Acetone	AK-102.0-SS-10X	15
	2 mg/mL	Acetone	GRH-SS	17
n-Tetradecane 629-59-4	5 mg/mL	MeOH	AS-E0240	32
Tetracosane (5 mL) 646-31-1	500 µg/mL	CS_2	D-5480-C40-5ML	15
	500 µg/mL	Chloroform	D-5480-C40-R1-5ML	20
n-Tridecane 629-50-5	5 mg/mL	MeOH	AS-E0239	32
1,2,3-Trimethylbenzene 526-73-8	1 mg/mL	CH_2Cl_2	V-028S-D-10X	20
n-Triacontane-d_{62} 93952-07-9	500 µg/mL	Acetone	AK-103.0-SS	20
	5 mg/mL	Acetone:THF	AK-103.0-SS-10X	30
	5 mg/mL	THF	DRH-SS	30
Turbine (Jet) fuel	0.5 mg/mL	MeOH	FU-006	10
	20 mg/mL	MeOH	FU-006-40X	20
	20 mg/mL	CH_2Cl_2	FU-006-D-40X	20
Turpentine 8006-64-2	1 gram	Neat	HS-004N	20
	0.5 mg/mL	MeOH	HS-004S	10
	20 mg/mL	MeOH	HS-004S-40X	20
	20 mg/mL	CH_2Cl_2	HS-004S-D-40X	20
Unleaded Gasoline 25% Weathered	5 mg/mL	MeOH	GA-W25-10X	25
Unleaded Gasoline 50% Weathered	5 mg/mL	MeOH	GA-W50-10X	25
Unleaded Gasoline 75% Weathered	5 mg/mL	MeOH	GA-W75-10X	25

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 $ 585 / **34 x 1 mL** (includes **TPH-001-R1-SET**, **TPH-002-R1-SET**, **TPH-003-SET**, **TPH-004-SET**)

Motor Fuels & Lubricating Oils Set

TPH-001-R1-SET $ 235 / **13 x 1 mL**

	mg/mL	Solv.	Cat. No.	Price
Gasoline, regular unleaded	20	MeOH	GA-001-40X	$ 20
Gasoline, regular leaded	20	MeOH	GA-002-40X	20
Gasoline, Premium	20	MeOH	GA-003-40X	20
RFA Gasoline (oxygenate free)	20	MeOH	GA-005-40X	20
#2 Diesel (conventional)	20	CH_2Cl_2	FU-009-D-40X	20
#1 Diesel (low sulfur)	20	CH_2Cl_2	FU-013-D-40X	20
#2 Diesel (extra low sulfur)	20	CH_2Cl_2	FU-017-D-40X	20
Arctic Diesel	20	CH_2Cl_2	FU-023-D-40X	20
SAE 30 W motor oil	20	CH_2Cl_2	FU-018-D-40X	20
SAE 40 W motor oil	20	CH_2Cl_2	FU-019-D-40X	20
SAE 50 W motor oil	20	CH_2Cl_2	FU-021-D-40X	20
Biodiesel 20 ***NEW***	20	CH_2Cl_2	FU-030-D-40X	20
Biodiesel 100 (consumer grade) ***NEW***	20	CH_2Cl_2	FU-029-D-40X	45

Heating Fuel Oils Set

TPH-002-R1-SET $ 100 / **6 x 1 mL**

	mg/mL	Solv.	Cat. No.	Price
#1 Fuel oil	20	CH_2Cl_2	FU-001-D-40X	$ 20
#2 Fuel oil	20	CH_2Cl_2	FU-002-D-40X	20
#3 Fuel oil	20	CH_2Cl_2	FU-003-D-40X	20
#4 Fuel oil	20	CH_2Cl_2	FU-004-D-40X	20
#6 Fuel oil	20	CH_2Cl_2	FU-008-D-40X	20
Kerosene	20	CH_2Cl_2	FU-005-D-40X	20

Aviation Fuels & Oils Set

TPH-003-SET $ 160 / **10 x 1 mL**

	mg/mL	Solv.	Cat. No.	Price
Aviation gasoline Grade 100 LL	20	CH_2Cl_2	GA-004-D-40X	$ 20
JP-4 Fuel	20	CH_2Cl_2	FU-010-D-40X	20
JP-5 Fuel	20	CH_2Cl_2	FU-012-D-40X	20
JP-7 Fuel	20	CH_2Cl_2	FU-014-D-40X	20
JP-8 Fuel	20	CH_2Cl_2	FU-015-D-40X	20
JP-10 Fuel (Cruise Missile)	20	CH_2Cl_2	FU-022-D-40X	20
JP-TS	20	CH_2Cl_2	FU-016-D-40X	20
Jet Fuel (type 1)	20	CH_2Cl_2	FU-011-D-40X	20
Turbine (Jet A) Fuel	20	CH_2Cl_2	FU-006-D-40X	20
Hydraulic oil	20	CH_2Cl_2	FU-020-D-40X	20

Household & Industrial Solvent Set

TPH-004-SET $ 80 / **5 x 1 mL**

	mg/mL	Solv.	Cat. No.	Price
Lacquer thinner	20	CH_2Cl_2	HS-001S-D-40X	$ 20
Mineral spirits	20	CH_2Cl_2	HS-002S-D-40X	20
Naphtha	20	CH_2Cl_2	HS-003S-D-40X	20
Turpentine	20	CH_2Cl_2	HS-004S-D-40X	20
Stoddard	20	CH_2Cl_2	HS-005S-D-40X	20

Motor Oil Standards

	mg/mL	Solv.	Cat. No.	Price
SAE 5W 30 Motor Oil	0.5	Hexane	FU-025-H	$ 10
	20.0	Hexane	FU-025-H-40X	20
	20.0	CH_2Cl_2	FU-025-D-40X	20
SAE 10W 30 Motor Oil	0.5	Hexane	FU-026-H	10
	20.0	Hexane	FU-026-H-40X	20
	20.0	CH_2Cl_2	FU-026-D-40X	20
SAE 10W 40 Motor Oil	0.5	Hexane	FU-027-H	10
	20.0	Hexane	FU-027-H-40X	20
	20.0	CH_2Cl_2	FU-027-D-40X	20

	mg/mL	Solv.	Cat. No.	Price
SAE 20W 50 Motor Oil	0.5	Hexane	FU-028-H	$ 10
	20.0	Hexane	FU-028-H-40X	20
	20.0	CH_2Cl_2	FU-028-D-40X	20
Composite Standard	20.0	CH_2Cl_2	MO-COMP-D-40X	30

Individual Fuels and Hydrocarbons continued on next page

TPH & Fuel & Hydrocarbons

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.	$ 85 / 4 x 1 mL
Gasoline - Regular, unleaded		GA-001-10X	20 / 1 mL
Gasoline - Regular, unleaded (25% Weathered)		GA-W25-10X	25 / 1 mL
Gasoline - Regular, unleaded (50% Weathered)		GA-W5-10X	25 / 1 mL
Gasoline - Regular, unleaded (75% Weathered)		GA-W75-10X	25 / 1 mL

Weathered Kerosene Set

WFK-SET	Each in 5.0 mg/mL in CH_2Cl_2		$ 85 / 4 x 1 mL
Kerosene		FU-005-D-10X	20 / 1 mL
Kerosene (25% Weathered)		FK-W25-10X	25 / 1 mL
Kerosene (50% Weathered)		FK-W50-10X	25 / 1 mL
Kerosene (75% Weathered)		FK-W75-10X	25 / 1 mL

Weathered #2 Diesel (extra Low Sulfur Content) Set

WFD2-SET	Each in 5.0 mg/mL in CH_2Cl_2		$ 85 / 4 x 1 mL
#2 Diesel (extra Low Sulfur)		FU-017-D-10X	20 / 1 mL
#2 Diesel (extra Low Sulfur) (25% Weathered)		FD2-W25-10X	25 / 1 mL
#2 Diesel (extra Low Sulfur) (50% Weathered)		FD2-W50-10X	25 / 1 mL
#2 Diesel (extra Low Sulfur) (75% Weathered)		FD2-W75-10X	25 / 1 mL

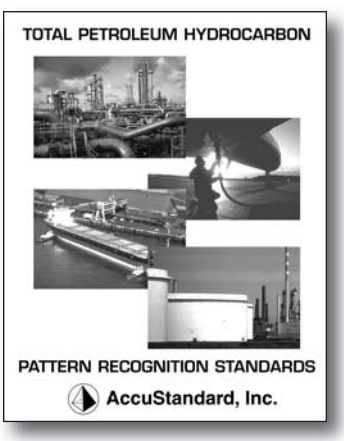
Weathered #2 Diesel (Conventional) Set

WFD2-R1-SET	Each in 5.0 mg/mL in CH_2Cl_2		$ 85 / 4 x 1 mL
#2 Diesel (Conventional)		FU-009-D-10X	20 / 1 mL
#2 Diesel (Conventional) (25% Weathered)		FD2-W25-R1-10X	25 / 1 mL
#2 Diesel (Conventional) (50% Weathered)		FD2-W50-R1-10X	25 / 1 mL
#2 Diesel (Conventional) (75% Weathered)		FD2-W75-R1-10X	25 / 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 $ 35

TPH & Fuel & 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 $ 95 / **5 x 1 mL**
At stated conc. (µg/mL) in MeOH 8 comps.

	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

Hydrocarbon Standard

D-5442-R1 $ 60 / **1 x 1 mL**
100 µg/mL each in Cyclohexane 18 comps.

- n-Decane
- n-Dodecane
- n-Tetradecane
- n-Hexadecane
- n-Octadecane
- n-Eicosane
- n-Docosane
- n-Tetracosane
- n-Hexacosane
- n-Octacosane
- n-Triacontane
- n-Dotriacontane
- n-Tetratriacontane
- n-Hexatriacontane
- n-Octatriacontane
- n-Tetracontane
- n-Tetratetracontane
- n-Pentacontane

Medium & Heavy Petroleum Fraction

CCME-MHPF-SET $ 75 / **3 x 1 mL**
At stated conc. (µg/mL) in n-Hexane 3 comps.

	CCME-MHPF-0.1X	CCME-MHPF-0.5X	CCME-MHPF
n-Decane	40	200	400
n-Hexadecan	40	200	400
n-Tetratriacontane	40	200	400

Performance Check Standard

CCME-QC $ 45 / **1 x 1 mL**
CCME-QC-PAK *SAVE 20%* $ 180 / **5 x 1 mL**
At 40 µg/mL each in n-Hexane:Cyclohexane 2 comps.

- n-Pentacontane
- n-Tetracontane

Spike Standard

CCME-SPIKE $ 30 / **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

ISO/DIS 9377 Hydrocarbon Oil Index

Diesel #2/Mineral Oil Standard

ENISO9377-2-1 $ 25 / **1 x 1 mL**
10000 µg/mL total hydrocarbons in Hexane 2 comps.

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

Florisil Cartridge QC Standard Mix

ENISO9377-2-4 $ 40 / **1 x 10 mL**
2000 µg/mL total hydrocarbons in Hexane 2 comps.

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

Quality Control Standard Mix

ISO/DIS9377-4-1 $ 25 / **1 x 1 mL**
1000 µg/mL total hydrocarbons in Acetone 2 comps.

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

System Performance Standard of n-alkanes

ENISO9377-2-2 $ 45 / **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-Tetratriacontane
- n-Hexatriacontane
- n-Octatriacontane
- n-Tetracontane

Extraction Solvent Stock Solution

ENISO9377-2-3 $ 25 / **1 x 5 mL**
At stated conc. in Hexane 2 comps.

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

ISO/DIS 9377-4 Standard Mixture Stock Solution

TPH-006-10X $ 35 / **1 x 1 mL**
TPH-006-10X-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
5000 µg/mL each in Cyclohexane 2 comps.

#2 Diesel
Mineral oil

Stearyl Stearate Test Solution

ISO/DIS9377-4-2 $ 45 / **1 x 10 mL**
2000 µg/mL in Cyclohexane

Stearyl stearate

LUFT/LUST Standards

Multi-State

There are approximately 625,000 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.

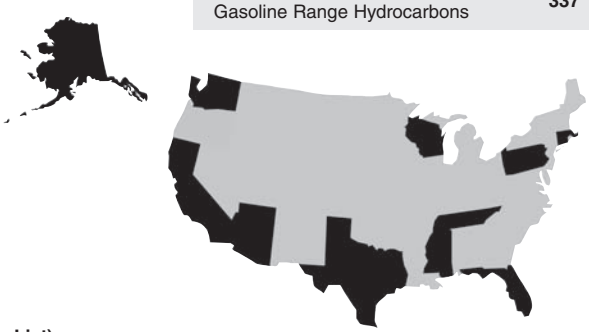
The standards listed in this section are designed to meet federal and state monitoring and testing regulations for underground storage tanks.

Multi-State Hydrocarbon Window Defining	**326**
Alaska GRO, DRO Hydrocarbons, RRO, DRO Hydrocarbons (Fuel) DRO Hydrocarbons (Standards)	**327-329**
Arizona Diesel Range	**330**
California Gasoline	**330**
Connecticut Extractable TPH	**331**
Florida FTRPH	**331**
Massachusetts EPH, VPH	**332-333**
Mississippi DRO	**334**
Pennsylvania Storage Tank Monitoring Standards	**334**
Tennessee DRO	**334**
Texas Method 1005 (PST)	**335**
Washington VPH, EPH	**336-337**
Wisconsin Gasoline Range Hydrocarbons	**337**

LUFT/LUST (UST) Standards

Leaking
Underground
Fuel
Tank

Leaking
Underground
Storage
Tank



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 $ 65 / **1 x 1 mL**
DRH-008S-R2-PAK ***SAVE 20%*** $ 260 / **5 x 1 mL**
500 µg/mL each in Chloroform 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	*n*-Hentriacontane	Tetracontane
Hexadecane	Tricosane	Dotriacontane	

Technical Note

We offer a hydrocarbon window defining standard with the C_8 to C_{40} 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 C_{17} (Pristane) and C_{18} (Phytane) ratio be used to estimate subsurface degradation of fuel oil spills.

LUFT/LUST Standards

Alaska GRO Methods

Alaska Method 101 Determination of Gasoline Range Organic (GRO) Hydrocarbons

Normal Alkane Standard - GRO Defining Mix

GRO-AK-101-NAS-10X $ 20 / **1 x 1 mL**
GRO-AK-101-NAS-10X-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
2.0 mg/mL each in MeOH 5 comps.

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

Laboratory Control Standard

GRO-AK-101-LCS $ 20 / **1 x 1 mL**
GRO-AK-101-LCS-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
5.0 mg/mL in MeOH

Gasoline (Regular Unleaded)

Internal Standard

GRO-AK-101-IS-10X $ 20 / **1 x 1 mL**
GRO-AK-101-IS-10X-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
2.0 mg/mL in MeOH

1-Chloro-4-fluorobenzene

Surrogate Control Standard

GRO-AK-101-SS $ 10 / **1 x 1 mL**
GRO-AK-101-SS-PAK *SAVE 20%* $ 40 / **5 x 1 mL**
50 µg/mL each in MeOH
GRO-AK-101-SS-10X $ 20 / **1 x 1 mL**
GRO-AK-101-SS-10X-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
500 µg/mL each in MeOH
GRO-AK-101-SS-100X $ 20 / **1 x 1 mL**
GRO-AK-101-SS-100X-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
5,000 µg/mL each in MeOH 2 comps.

p-Bromofluorobenzene
a,a,a-Trifluorotoluene

Alaska Method Determination of Aromatic & Aliphatic Hydrocarbons in GRO

AK101AA Aromatics Mix

GRO-AK-101AA-ARO $ 30 / **1 x 1 mL**
GRO-AK-101AA-ARO-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
2000 µg/mL each in MeOH 14 comps.

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

Certified BTEX in Gasoline (Single Source)

GA-001-20X-BTEX $ 55 / **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 (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.

Certified BTEX in Gasoline Composite (Multi Source)

GRO-AK-101-GCS-BTEX $ 55 / **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 $ 25 / **1 x 1 mL**
GRO-AK-101-GCS-PAK *SAVE 20%* $ 100 / **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 $ 25 / **1 x 1 mL**
GRO-AK-101-GSC-R1-PAK *SAVE 20%* $ 100 / **5 x 1 mL**
Equal parts by weight of each

Gasoline (Regular Unleaded)
Gasoline (Plus Unleaded)
Gasoline (Premium Unleaded)

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

Diesel Calibration Composite Mixture (low sulfur)

DRO-AK-102-DCS $ 25 / **1 x 1 mL**
DRO-AK-102-DCS-PAK *SAVE 20%* $ 100 / **5 x 1 mL**
Total 5.0 mg/mL in CH_2Cl_2
DRO-AK-102-DCS-10X $ 40 / **1 x 1 mL**
DRO-AK-102-DCS-10X-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
Total 50.0 mg/mL in CH_2Cl_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 $ 40 / **1 x 1 mL**
DRO-AK-102-DCS-10X-R1-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
Total 50.0 mg/mL in CH_2Cl_2 3 comps.

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

Laboratory Control Standard (low sulfur)

DRO-AK-102-LCS $ 10 / **1 x 1 mL**
DRO-AK-102-LCS-PAK *SAVE 20%* $ 40 / **5 x 1 mL**
5.0 mg/mL in Acetone
DRO-AK-102-LCS-10X $ 20 / **1 x 1 mL**
DRO-AK-102-LCS-10X-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
50.0 mg/mL in Acetone

#2 Diesel (extra Low Sulfur)

Laboratory Control Standard

DRO-AK-102-LCS-10X-R1 $ 20 / **1 x 1 mL**
DRO-AK-102-LCS-10X-R1-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
50.0 mg/mL in Acetone

#2 Diesel (Conventional)

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 insure 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.

Normal Alkane Standard - DRO Defining Mix

DRO-AK-102-NAS-10X $ 40 / **1 x 1 mL**
DRO-AK-102-NAS-10X-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
2.0 mg/mL each in CH_2Cl_2 16 comps.

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

Surrogate Standards

DRO-AK-102-SS $ 10 / **1 x 1 mL**
DRO-AK-102-SS-PAK *SAVE 20%* $ 40 / **5 x 1 mL**
200 µg/mL in Acetone
DRO-AK-102-SS-10X $ 15 / **1 x 1 mL**
DRO-AK-102-SS-10X-PAK *SAVE 20%* $ 60 / **5 x 1 mL**
2.0 mg/mL in Acetone

o-Terphenyl

Internal Standard

DRO-AK-102-IS $ 15 / **1 x 1 mL**
DRO-AK-102-IS-PAK *SAVE 20%* $ 60 / **5 x 1 mL**
1.0 mg/mL in CH_2Cl_2

5-alpha Androstane

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

Diesel Range Standard

DRO-AK-102AA $ 40 / **1 x 1 mL**
DRO-AK-102AA-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
2000 µg/mL each in CH_2Cl_2 10 comps.

n-Undecane
n-Pentadecane
n-Heptadecane
n-Octadecane
n-Tetracosane
Naphthalene
Acenaphthene
Fluorene
Pyrene
Anthracene

Retention Time Marker Standard

DRO-AK-102/103AA-RT $ 25 / **1 x 1 mL**
DRO-AK-102/103AA-RT-PAK *SAVE 20%* $ 100 / **5 x 1 mL**
50 µg/mL each in CH_2Cl_2 3 comps.

n-Decane
n-Pentacosane
n-Hexatriacontane

Surrogate Standard

DRO-AK-102/103AA-SS $ 35 / **1 x 1 mL**
DRO-AK-102/103AA-SS-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
1000 µg/mL each in CH_2Cl_2 3 comps.

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

AccuStandard is accredited to ISO/IEC 17025 and certified to ISO 9001

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

Residual Composite Mixtures

RRO-AK-103-RCS $ 40 / **1 x 1 mL**
RRO-AK-103-RCS-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
Total 5.0 mg/mL in CH_2Cl_2 3 comps.

SAE 30W Motor Oil (1.66 mg)
SAE 40W Motor Oil (1.67 mg)
SAE 50W Motor Oil (1.67 mg)

RRO-AK-103-RCS-10X $ 40 / **1 x 1 mL**
RRO-AK-103-RCS-10X-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
Total 50.0 mg/mL in CH_2Cl_2 3 comps.

SAE 30W Motor Oil (16.6 mg)
SAE 40W Motor Oil (16.7 mg)
SAE 50W Motor Oil (16.7 mg)

Laboratory Control Standard

RRO-AK-103-LCS $ 10 / **1 x 1 mL**
RRO-AK-103-LCS-PAK *SAVE 20%* $ 40 / **5 x 1 mL**
5.0 mg/mL in Acetone
RRO-AK-103-LCS-5X $ 20 / **1 x 1 mL**
RRO-AK-103-LCS-5X-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
25.0 mg/mL in Acetone: CH_2Cl_2 (1:1)

SAE 40W Motor Oil

Surrogate Control Standard

RRO-AK-103-SS $ 20 / **1 x 1 mL**
RRO-AK-103-SS-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
500 µg/mL in Acetone:THF (9:1)
RRO-AK-103-SS2 $ 30 / **1 x 1 mL**
RRO-AK-103-SS2-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
5.0 mg/mL in THF:Acetone (3:1)

n-Triacontane-d_{62}

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

Residual Standard

RRO-AK-103AA $ 35 / **1 x 1 mL**
RRO-AK-103AA-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
2000 µg/mL each in CH_2Cl_2 9 comps.

n-Hexacosane
n-Octacosane
n-Triacontane
n-Dotriacontane
n-Tetratriacontane
Benzo[b]fluoranthene
Benzo[a]pyrene
Benzo[g,h,i]perylene
Dibenz[a,h]anthracene

Retention Time Marker Standard

DRO-AK-102/103AA-RT $ 25 / **1 x 1 mL**
DRO-AK-102/103AA-RT-PAK *SAVE 20%* $ 100 / **5 x 1 mL**
50 µg/mL each in CH_2Cl_2 3 comps.

n-Decane
n-Pentacosane
n-Hexatriacontane

Surrogate Standard

DRO-AK-102/103AA-SS $ 35 / **1 x 1 mL**
DRO-AK-102/103AA-SS-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
1000 µg/mL each in CH_2Cl_2 3 comps.

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

LUFT/LUST Standards

Arizona, California & Connecticut Methods

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

Diesel & Oil Range Standard

DRO/ORO-AZ-8015 $ 40 / **1 x 1 mL**
DRO/ORO-AZ-8015-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
2000 µg/mL each in CH_2Cl_2 12 comps.

n-Decane	*n*-Hexadecane
n-Dodecane	*n*-Octacosane
n-Docosane	*n*-Octadecane
n-Dotriacontane	*n*-Tetracosane
n-Eicosane	*n*-Tetradecane
n-Hexacosane	*n*-Triacontane

Surrogate Standards

DRO-AK-102-SS-10X $ 15 / **1 x 1 mL**
DRO-AK-102-SS-10X-PAK *SAVE 20%* $ 60 / **5 x 1 mL**
2.0 mg/mL in Acetone

o-Terphenyl

Retention Time Verification Standard

DRO/ORO-AZ-8015-RTV $ 25 / **1 x 1 mL**
DRO/ORO-AZ-8015-RTV-PAK *SAVE 20%* $ 100 / **1 x 1 mL**
1000 µg/mL each in CH_2Cl_2 3 comps.

n-Decane	*n*-Dotriacontane
n-Docosane	

Stock Calibration Standard

DRO/ORO-AZ-8015-SCS $ 40 / **1 x 1 mL**
DRO/ORO-AZ-8015-SCS-PAK *SAVE 20%* $ 160 / **1 x 1 mL**
10,000 µg/mL each in CH_2Cl_2 2 comps.

#2 Diesel	10W 30 Motor Oil

California Method (including LA County)

California - Gasoline Range Hydrocarbons

S-603A-10X $ 25 / **1 x 1 mL**
S-603A-10X-PAK *SAVE 20%* $ 100 / **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	

LA County Well Investigation & Monitoring Program

Purgeable Aromatics - Gasoline ID

M-602-GAS-10X $ 30 / **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 $ 30 / **1 x 1 mL**
OGAD-001-PAK *SAVE 20%* $ 120 / **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 $ 25 / **1 x 1 mL**
10 mg/mL in Water

Methanol

M-8015B/5031-17 $ 20 / **1 x 1 mL**
10 mg/mL in Water

Method 1004 Carbonyl Compounds as DNPH Derivatives by HPLC

M-1004 $ 25 / **1 x 1 mL**
At stated conc. in AcCN 13 comps.
M-1004-10X $ 35 / **1 x 1 mL**
At 10 times the stated conc. in AcCN 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)
n-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)
m-Tolualdehyde	(3.0 µg/mL)	(7.5 µg/mL)
Valeraldehyde	(3.0 µg/mL)	(9.3 µg/mL)

CAR-DNPH $ 20 / **1 x 1 mL**
At stated conc. in AcCN as DNPH derivatives 7 comps.

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

Reference Gas Oil Sample

RGS-001 $ 20 / **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

Florida Methods

Connecticut Method Extractable Total Petroleum Hydrocarbons

CT ETPH Alkane Standard

DRH-009S $ 35 / **1 x 1 mL**
DRH-009S-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
1000 µg/mL in CH_2Cl_2 15 comps.

n-Nonane
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-Tetratriacontane
n-Hexatriacontane

Internal Standard

GRH-IS $ 15 / **1 x 1 mL**
GRH-IS-PAK *SAVE 20%* $ 60 / **5 x 1 mL**
1.0 mg/mL in CH_2Cl_2

5-alpha Androstane

Surrogate Standard

GRH-SS $ 17 / **1 x 1 mL**
GRH-SS-PAK *SAVE 20%* $ 68 / **5 x 1 mL**
2.0 mg/mL in Acetone

o-Terphenyl *(OTP)*

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

Calibration/Window Defining Hydrocarbon Standard

DRH-004S-R1-5X $ 50 / **1 x 1 mL**
DRH-004S-5X-PAK *SAVE 20%* $ 200 / **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}	Hexatricontane	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 $ 35 / **1 x 1 mL**
DRH-FTRPH-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
500 µg/mL each in Hexane 17 comps.
DRH-FTRPH-0.1X ***NEW*** $ 30 / **1 x 1 mL**
50 µg/mL each in Hexane 17 comps.

n-Octane
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-Tetratriacontane
n-Hexatriacontane
n-Octatriacontane
n-Tetracontane

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 $ 15 / **1 x 1 mL**
GRH-IS-PAK *SAVE 20%* $ 60 / **5 x 1 mL**
1.0 mg/mL in CH_2Cl_2

5-alpha Androstane

Surrogate Standards

DRH-SS $ 30 / **1 x 1 mL**
DRH-SS-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
5.0 mg/mL in THF

n-Triacontane-d_{62}

GRH-SS $ 17 / **1 x 1 mL**
GRH-SS-PAK *SAVE 20%* $ 68 / **5 x 1 mL**
2.0 mg/mL in Acetone

o-Terphenyl *(OTP)*

FTRPH Surrogate Standard

DRH-FL-SS-3X $ 27 / **1 x 1 mL**
DRH-FL-SS-3X-PAK *SAVE 20%* $ 108 / **5 x 1 mL**
3.0 mg/mL in Carbon disulfide
DRH-FL-SS $ 20 / **1 x 1 mL**
DRH-FL-SS-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
1.0 mg/mL in Carbon disulfide

Nonatriacontane

FTRPH Combined Surrogate Standard

DRH/GRH-FL-SS $ 50 / **1 x 1 mL**
DRH/GRH-FL-SS-PAK *SAVE 20%* $ 200 / **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 $ 50 / **1 x 1 mL**
DRH/GRH-FL-SS-R2-PAK *SAVE 20%* $ 200 / **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.

Massachusetts Method Determination of Extractable Petroleum Hydrocarbons (EPH)

Aromatic Hydrocarbons Calibration Set

DRH-006-CAL-SET $ 125 / **5 x 1 mL**
At stated conc. in CH_2Cl_2 18 comps.

Components (units in µg/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 $ 125 / **5 x 1 mL**
At stated conc. in CH_2Cl_2 : n-Hexane (1:1) 15 comps.

Components (units in µg/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 $ 45 / **1 x 1 mL**
DRH-MS-ASL-PAK *SAVE 20%* $ 180 / **5 x 1 mL**
25 µg/mL each in Hexane 31 comps.

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

DEP (MA) - Fractionation Surrogate Spike

DRH-MA-FSS-10ML	40 µg/mL in Hexane	$ 25 / **1 x 10 mL**
DRH-MA-FSS-50X	2.0 mg/mL in Hexane	$ 25 / **1 x 1 mL**
DRH-MA-FSS-50X-PAK	2.0 mg/mL in Hexane	*SAVE 20%* $ 100 / **5 x 1 mL**

2 comps.

2-Fluorobiphenyl
2-Bromonaphthalene

Aromatic Surrogate

DRH-006-SS $ 15 / **1 x 1 mL**
DRH-006-SS-PAK *SAVE 20%* $ 60 / **5 x 1 mL**
1.0 mg/mL in CH_2Cl_2

o-Terphenyl

DEP (MA) - Aromatic Hydrocarbons

DRH-006S $ 65 / **1 x 1 mL**
DRH-006S-PAK *SAVE 20%* $ 260 / **5 x 1 mL**
1.0 mg/mL each in CH_2Cl_2 17 comps.

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

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 $ 40 / **1 x 1 mL**
DRH-007S-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
1.0 mg/mL each in CH_2Cl_2 : Hexane (1:1) 14 comps.

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

Aliphatic Surrogate

DRH-007-SS $ 15 / **1 x 1 mL**
DRH-007-SS-PAK *SAVE 20%* $ 60 / **5 x 1 mL**
1.0 mg/mL in Hexane

1-Chlorooctadecane

EPH Surrogate Spike

DRH-MA-SS	20 µg/mL each in Acetone	$ 10 / **1 x 1 mL**
DRH-MA-SS-10X	200 µg/mL each in Acetone	$ 20 / **1 x 1 mL**
DRH-MA-SS-100X	2,000 µg/mL each in Acetone	$ 22 / **1 x 1 mL**
DRH-MA-SS-100X-PAK	2,000 µg/mL each in Acetone	$ 88 / **5 x 1 mL**

2 comps.

1-Chlorooctadecane
o-Terphenyl

EPH Matrix Spike

DRH-MA-MS	25 µg/mL in Acetone	$ 20 / **1 x 1 mL**
DRH-MA-MS-PAK	25 µg/mL in Acetone	*SAVE 20%* $ 80 / **5 x 1 mL**
DRH-MA-MS-10X	250 µg/mL in Acetone	$ 30 / **1 x 1 mL**
DRH-MA-MS-10X-PAK	250 µg/mL in Acetone	*SAVE 20%* $ 120 / **5 x 1 mL**
DRH-MA-MS-40X	1,000 µg/mL in Acetone	$ 30 / **1 x 1 mL**
DRH-MA-MS-40X-PAK	1,000 µg/mL in Acetone	*SAVE 20%* $ 120 / **5 x 1 mL**

10 comps.

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

Internal Standard

GRH-IS	1,000 µg/mL in CH_2Cl_2	$ 15 / **1 x 1 mL**
GRH-IS-PAK	1,000 µg/mL in CH_2Cl_2	*SAVE 20%* $ 60 / **5 x 1 mL**
GRH-IS-10X	10.0 mg/mL in CH_2Cl_2	$ 30 / **1 x 1 mL**

5-alpha Androstane

Massachusetts Method Determination of Volatile Petroleum Hydrocarbons (VPH)

Stock Concentrate

Volatile Petroleum Hydrocarbon Mix

GRH-004S-10X — $ 40 / **1 x 1 mL**
GRH-004S-10X-PAK — *SAVE 20%* $ 160 / **5 x 1 mL**
At stated conc. (mg/mL) in MeOH — 13 comps.

Benzene	(5.0)	*n*-Pentane	(10.0)
Ethylbenzene	(5.0)	Toluene	(15.0)
Isooctane	(15.0)	1,2,4-Trimethylbenzene	(10.0)
2-Methylpentane	(15.0)	*o*-Xylene	(10.0)
MtBE	(15.0)	*m*-Xylene	(10.0)
Naphthalene	(10.0)	*p*-Xylene	(10.0)
n-Nonane	(10.0)		

DEP (MA)-VPH Surrogate Standard

GRH-004-SS — $ 10 / **1 x 1 mL**
GRH-004-SS-PAK — *SAVE 20%* $ 40 / **5 x 1 mL**
50 µg/mL in MeOH

GRH-004-SS-10X — $ 20 / **1 x 1 mL**
GRH-004-SS-10X-PAK — *SAVE 20%* $ 80 / **5 x 1 mL**
500 µg/mL in MeOH

GRH-004-SS-100X — $ 20 / **1 x 1 mL**
GRH-004-SS-100X-PAK — *SAVE 20%* $ 80 / **5 x 1 mL**
5,000 µg/mL in MeOH

2,5-Dibromotoluene

MA VPH Matrix Spike Mix with Surrogate

GRH-004-MS/SS — $ 30 / **1 x 1 mL**
50 µg/mL each in MeOH — 14 comps.

Benzene	Naphthalene
n-Butylcyclohexane	n-Nonane
n-Decane	n-Pentane
2,5-dibromotoluene	Toluene
Ethylbenzene	1,2,4-Trimethylbenzene
2-Methylpentane	Isooctane
MtBE	m-Xylene

VPH Matrix Spike

GRH-004-MS — $ 15 / **1 x 1 mL**
GRH-004-MS-PAK — *SAVE 20%* $ 60 / **5 x 1 mL**
50 µg/mL each in MeOH

GRH-004-MS-10X — $ 25 / **1 x 1 mL**
GRH-004-MS-10X-PAK — *SAVE 20%* $ 100 / **5 x 1 mL**
500 µg/mL each in MeOH

GRH-004-MS-100X — $ 25 / **1 x 1 mL**
GRH-004-MS-100X-PAK — *SAVE 20%* $ 100 / **5 x 1 mL**
5,000 µg/mL each in MeOH — 8 comps.

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

Certified BTEX in Unleaded Gasoline

GA-001-20X-BTEX — $ 55 / **1 x 1 mL**
10.0 mg/mL in MeOH

Gasoline - Regular, unleaded

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.

Volatile Petroleum Hydrocarbon without Surrogate

GRH-004S-R1-10X — $ 55 / **1 x 1 mL**
At stated conc. (mg/mL) in MeOH — 15 comps.

Benzene	(5.0)	Toluene	(15.0)
Ethylbenzene	(5.0)	1,2,4-Trimethylbenzene	(10.0)
Isooctane	(15.0)	*o*-Xylene	(10.0)
2-Methylpentane	(15.0)	*m*-Xylene	(10.0)
MtBE	(15.0)	*p*-Xylene	(10.0)
Naphthalene	(10.0)	*n*-Butylcyclohexane	(10.0)
n-Nonane	(10.0)	*n*-Decane	(10.0)
n-Pentane	(10.0)		

GRH-004S-R2 — $ 50 / **1 x 1 mL**
10 mg/mL each in MeOH — 15 comps.

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

Volatile Petroleum Hydrocarbons with Surrogate

GRH-004S/SS — $ 30 / **1 x 1 mL**
GRH-004S/SS-PAK — *SAVE 20%* $ 120 / **5 x 1 mL**
At stated conc. (µg/mL) in MeOH — 14 comps.

Benzene	(500)	*n*-Nonane	(1,000)
2,5-Dibromotoluene (Surrogate)	(1,000)	*n*-Pentane	(1,000)
Ethylbenzene	(500)	Toluene	(1,500)
Isooctane	(1,500)	1,2,4-Trimethylbenzene	(1,000)
2-Methylpentane	(1,500)	*o*-Xylene	(1,000)
MtBE	(1,500)	*m*-Xylene	(1,000)
Naphthalene	(1,000)	*p*-Xylene	(1,000)

GRH-004S/SS-R1 — $ 45 / **1 x 1 mL**
At stated conc. (µg/mL) in MeOH — 16 comps.

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

GRH-004S/SS-R2 — $ 50 / **1 x 1 mL**
10.0 mg/mL each in MeOH — 16 comps.

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

Mississippi / Tennessee Method

DRO Defining Mix

DRO-AK-102-NAS-10X $ 40 / **1 x 1 mL**
DRO-AK-102-NAS-10X-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
2.0 mg/mL each in CH_2Cl_2 16 comps.

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

Pennsylvania Method Storage Tank Site Closure & Monitoring Petroleum Standards

PA Extractable PAH Standard

DRH-PA-001 $ 25 / **1 x 1 mL**
DRH-PA-001-PAK *SAVE 20%* $ 100 / **5 x 1 mL**
2000 µg/mL each in CH_2Cl_2 5 comps.

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

PA Volatile Petroleum Standard

GRH-PA-001 $ 25 / **1 x 1 mL**
GRH-PA-001-PAK *SAVE 20%* $ 100 / **5 x 1 mL**
At stated conc. in MeOH 9 comps.

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

Texas Method 1005 & 1006 Petroleum Storage Tanks (PST)

Stock Hydrocarbon Calibration Standard

DRH-TX-001-10X — $ 25 / **1 x 1 mL**
DRH-TX-001-10X-PAK — *SAVE 20%* $ 100 / **5 x 1 mL**
2000 µg/mL each in n-Pentane — 12 comps.

n-Hexane	*n*-Tetradecane	*n*-Docosane
n-Octane	*n*-Hexadecane	*n*-Tetracosane
n-Decane	*n*-Octadecane	*n*-Hexacosane
n-Dodecane	*n*-Eicosane	*n*-Octacosane

Gasoline & Diesel Calibration Curve Set

DRH-TX-002-D-SET — $ 75 / **8 x 1 mL**
Each at stated conc. in CH_2Cl_2 — 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 — $ 50 / **1 x 10 mL**
200 µg/mL each in CH_2Cl_2 — 2 comps.

Regular Unleaded Gasoline — #2 Diesel Fuel

Gasoline/Diesel Calibration/Matrix Spike Standard

DRH-TX-002-10X — $ 25 / **1 x 1 mL**
DRH-TX-002-10X-PAK — *SAVE 20%* $ 100 / **5 x 1 mL**
5000 µg/mL each in MeOH — 2 comps.

Regular Unleaded Gasoline — #2 Diesel Fuel

Stock Gasoline/Diesel Calibration Standard

DRH-TX-002-D-40X — $ 25 / **1 x 1 mL**
DRH-TX-002-D-40X-PAK — *SAVE 20%* $ 100 / **5 x 1 mL**
20,000 µg/mL each in CH_2Cl_2 — 2 comps.

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 method govern the testing of Total Petroleum Hydrocarbon (TPH) concentrations.

Gasoline & Diesel Calibration Curve Set

DRH-TX-003-SET — $ 125 / **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

NEW

DRH-TX-003-20X — $ 25 / **1 x 5 mL**
DRH-TX-003-20X-PAK — *SAVE 20%* $ 100 / **5 x 5 mL**
10,000 µg/mL each in Pentane — 2 comps.

Regular Unleaded Gasoline — #2 Diesel Fuel

Surrogate Standard

DRH-TX-003-SS1 — $ 35 / **1 x 5 mL**
DRH-TX-003-SS1-PAK — *SAVE 20%* $ 140 / **5 x 5 mL**
10 mg/mL each in Pentane — 2 comps.

1-Chlorooctadecane — 1-Chlorooctane

Carbon Number Distribution Maker

DRH-TX-003-CNM — $ 30 / **1 x 1 mL**
DRH-TX-003-CNM-PAK — *SAVE 20%* $ 120 / **5 x 1 mL**
2000 µg/mL each in Pentane — 9 comps.

n-Decane	*n*-Heptane	*n*-Octacosane
n-Dodecane	*n*-Hexadecane	*n*-Octane
n-Heneicosane	*n*-Hexane	*n*-Pentatriacontane

Aromatic Fractionation Check Standard

DRH-TX-003-FCS — $ 55 / **1 x 10 mL**
DRH-TX-003-FCS-PAK — *SAVE 20%* $ 220 / **5 x 10 mL**
20 µg/mL each in Pentane — 24 comps.

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	*m*-Xylene
Benzo[k]fluoranthene	Fluorene	*p*-Xylene
Benzo[a]pyrene	Indeno[1,2,3-cd]pyrene	*o*-Xylene

Washington Method Determination of Volatile Petroleum Hydrocarbons (VPH)

VPH Standard

VPH-WA $ 20 / **1 x 1 mL**
VPH-WA-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
200 µg/mL each in MeOH 15 comps.

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

VPH Primary Dilution Standard with Surrogate

VPH-WA-SS-10X $ 35 / **1 x 1 mL**
VPH-WA-SS-10X-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
2,000 µg/mL each in MeOH 16 comps.

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

Stock Concentrate VPH Standards

VPH-WA-10X $ 30 / **1 x 1 mL**
VPH-WA-10X-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
2,000 µg/mL each in MeOH 15 comps.
VPH-WA-100X $ 40 / **1 x 1 mL**
VPH-WA-100X-PAK *SAVE 20%* $ 160 / **5 x 1 mL**
20.0 mg/mL each in MeOH 15 comps.

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

Certified BTEX in Unleaded Gasoline (Single Source)

GA-001-20X-BTEX $ 55 / **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 $ 55 / **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 $ 25 / **1 x 1 mL**
VPH-WA-MS-PAK *SAVE 20%* $ 100 / **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)	*m*-Xylene	(60 µg/mL)
Naphthalene	(360 µg/mL)	*p*-Xylene	(60 µg/mL)
n-Nonane	(200 µg/mL)	*o*-Xylene	(60 µg/mL)
n-Pentane	(600 µg/mL)		

VPH Surrogate Standard

GRH-004-SS $ 10 / **1 x 1 mL**
GRH-004-SS-PAK *SAVE 20%* $ 40 / **5 x 1 mL**
50 µg/mL in MeOH
GRH-004-SS-10X $ 20 / **1 x 1 mL**
GRH-004-SS-10X-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
500 µg/mL in MeOH
GRH-004-SS-100X $ 20 / **1 x 1 mL**
GRH-004-SS-100X-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
5,000 µg/mL in MeOH

2,5-Dibromotoluene

VPH Retention Time Marker

VPH-WA-RT $ 20 / **1 x 1 mL**
VPH-WA-RT-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
2,000 µg/mL each in MeOH 6 comps.

n-Pentane	*n*-Decane
n-Hexane	*n*-Dodecane
n-Octane	*n*-Tridecane

1,2,3-Trimethylbenzene Standard

V-028S-D-10X $ 20 / **1 x 1 mL**
V-028S-D-10X-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
1000 µg/mL each in CH_2Cl_2

1,2,3-Trimethylbenzene

Technical Note

Simultaneous BTEX / Gasoline QA/QC
Our QC Department has 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, Wisconsin Methods

Washington Method Determination of Extractable Petroleum Hydrocarbons (EPH)

EPH Aromatic/PAH Standard

EPH-WA-10X — $ 75 / **1 x 1 mL**
EPH-WA-10X-PAK — *SAVE 20%* $ 300 / **5 x 1 mL**
1.0 mg/mL each in CH_2Cl_2 — 18 comps.

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

Internal Standard

GRH-IS — $ 15 / **1 x 1 mL**
GRH-IS-PAK — *SAVE 20%* $ 60 / **5 x 1 mL**
1000 µg/mL in CH_2Cl_2
GRH-IS-10X — $ 30 / **1 x 1 mL**
10.0 mg/mL in CH_2Cl_2

- 5-alpha Androstane

EPH Surrogate Spike

DRH-MA-SS — $ 10 / **1 x 1 mL**
20 µg/mL each in Acetone — 2 comps.
DRH-MA-SS-10X — $ 20 / **1 x 1 mL**
200 µg/mL each in Acetone — 2 comps.
DRH-MA-SS-100X — $ 22 / **1 x 1 mL**
DRH-MA-SS-100X-PAK — *SAVE 20%* $ 88 / **5 x 1 mL**
2,000 µg/mL each in Acetone — 2 comps.

- 1-Chlorooctadecane
- *o*-Terphenyl

EPH Matrix Spike

EPH-WA-MS2-20ML — $ 30 / **1 x 20 mL**
EPH-WA-MS2-20ML-PAK — *SAVE 20%* $ 120 / **5 x 20 mL**
25 µg/mL each in Acetone — 10 comps.

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

EPH Aliphatic Check Mix

EPH-WA-ALI — $ 20 / **1 x 1 mL**
EPH-WA-ALI-PAK — *SAVE 20%* $ 80 / **5 x 1 mL**
1.0 mg/mL each in CH_2Cl_2 — 5 comps.

- *n*-Octane
- *n*-Decane
- *n*-Dodecane
- *n*-Hexadecane
- *n*-Heneicosane

EPH Aromatic Check Mix

EPH-WA-ARO — $ 30 / **1 x 1 mL**
EPH-WA-ARO-PAK — *SAVE 20%* $ 120 / **5 x 1 mL**
1.0 mg/mL each in CH_2Cl_2 — 5 comps.

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

Revised EPH Aliphatic Check Mix

EPH-WA-ALI-R1 — $ 20 / **1 x 1 mL**
EPH-WA-ALI-R1-PAK — *SAVE 20%* $ 80 / **5 x 1 mL**
1.0 mg/mL each in CH_2Cl_2 — 6 comps.

- *n*-Octane
- *n*-Decane
- *n*-Dodecane
- *n*-Hexadecane
- *n*-Heneicosane
- *n*-Tetratriacontane

EPH Fractionation Check Standard

EPH-WA-FCS — $ 45 / **1 x 1 mL**
EPH-WA-FCS-PAK — *SAVE 20%* $ 180 / **5 x 1 mL**
25 µg/mL each in Hexane — 24 comps.

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

Revised EPH Fractionation Check Standard

EPH-WA-FCS-R1 — $ 45 / **1 x 1 mL**
EPH-WA-FCS-R1-PAK — *SAVE 20%* $ 180 / **5 x 1 mL**
25 µg/mL each in Hexane — 23 comps

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

1,2,3-Trimethylbenzene Standard

V-028S-D-10X — $ 20 / **1 x 1 mL**
V-028S-D-10X-PAK — *SAVE 20%* $ 80 / **5 x 1 mL**
1000 µg/mL each in CH_2Cl_2

- 1,2,3-Trimethylbenzene

Revised EPH Aromatic Check Mix

EPH-WA-ARO-R1 — $ 30 / **1 x 1 mL**
EPH-WA-ARO-R1-PAK — *SAVE 20%* $ 120 / **5 x 1 mL**
1.0 mg/mL each in CH_2Cl_2 — 6 comps.

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

Aliphatic Surrogate

DRH-007-SS — $ 15 / **1 x 1 mL**
DRH-007-SS-PAK — *SAVE 20%* $ 60 / **5 x 1 mL**
1.0 mg/mL in Hexane

- 1-Chlorooctadecane

Aromatic Surrogate

DRH-006-SS — $ 15 / **1 x 1 mL**
DRH-006-SS-PAK — *SAVE 20%* $ 60 / **5 x 1 mL**
1.0 mg/mL in CH_2Cl_2

- *o*-Terphenyl

Wisconsin Method

Wisconsin DNR - Gasoline Range Hydrocarbons

GRH-003S — $ 35 / **1 x 1 mL**
GRH-003S-PAK — *SAVE 20%* $ 140 / **5 x 1 mL**
2.0 mg/mL each in MeOH — 10 comps.

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

LUFT/LUST Standards

Gasoline Range Hydrocarbon (GRH)

Gasoline Range Hydrocarbon Analysis

EPA Method - Gasoline Range Hydrocarbons

Gasoline Standard

GRH-002S $ 25 / **1 x 1 mL**
GRH-002S-10X $ 30 / **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

GARH-IS $15 / **1 x 1 mL**
1.0 mg/mL in CH_2Cl_2

Chloro-4-fluorobenzene

Surrogate Standard

GARH-SS $ 20 / **1 x 1 mL**
2.5 mg/mL in Acetone

4-Bromofluorobenzene

Gasoline Additives

GAD-001 $ 20 / **1 x 1 mL**
GAD-001-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
0.2 mg/mL each in MeOH 4 comps.

Dibromomethane
1,2-Dibromoethane
1,2-Dichloroethane
Methyl t-butyl ether

Technical Note

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.

Certified BTEX in Unleaded Gasoline

GA-001-20X-BTEX $ 55 / **1 x 1 mL**
10.0 mg/mL in MeOH

Regular unleaded gasoline

Hexadecane Extraction Volatiles

CLP-BTEX $ 30 / **1 x 1 mL**
CLP-BTEX-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
0.2 mg/mL each in MeOH 6 comps.
CLP-BTEX-10X $ 30 / **1 x 1 mL**
CLP-BTEX-10X-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
2.0 mg/mL each in MeOH 6 comps.

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

California - Gasoline Range Hydrocarbons

S-603A-10X $ 25 / **1 x 1 mL**
S-603A-10X-PAK *SAVE 20%* $ 100 / **5 x 1 mL**
2.0 mg/mL each in MeOH 7 comps.

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

Los Angeles County Well Investigation and Monitoring Program

Purgeable Aromatics - Gasoline ID

M-602-GAS-10X $ 30 / **1 x 1 mL**
2.0 mg/mL each in MeOH 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 $ 30 / **1 x 1 mL**
OGAD-001-PAK *SAVE 20%* $ 120 / **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 $ 25 / **1 x 1 mL**
10 mg/mL in Water

Methanol

M-8015B/5031-17 $ 20 / **1 x 1 mL**
10 mg/mL in Water

Pennsylvania DER - Gasoline Range Hydrocarbons

GRH-001S $ 25 / **1 x 1 mL**
GRH-001S-PAK *SAVE 20%* $ 100 / **5 x 1 mL**
1.0 mg/mL each in MeOH 10 comps.

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

Wisconsin DNR - Gasoline Range Hydrocarbons

GRH-003S $ 35 / **1 x 1 mL**
GRH-003S-PAK *SAVE 20%* $ 140 / **5 x 1 mL**
2.0 mg/mL each in MeOH 10 comps.

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

LUFT/LUST Standards

Diesel Range Hydrocarbons (DRH)

Diesel Range Hydrocarbon Analysis

EPA Method - Diesel Range Hydrocarbons

DRH-001S — $ 20 / **1 x 1 mL**
0.2 mg/mL each in CH_2Cl_2: Hexane (1:1) — 10 comps.
DRH-001S-10X — $ 30 / **1 x 1 mL**
2.0 mg/mL each in CH_2Cl_2: Hexane (1:1) — 10 comps.

n-Decane	C_{10}	*n*-Hexadecane	C_{16}	*n*-Docosane	C_{22}	*n*-Hexacosane	C_{26}
n-Dodecane	C_{12}	*n*-Octadecane	C_{18}	*n*-Tetracosane	C_{24}	*n*-Octacosane	C_{28}
n-Tetradecane	C_{14}	*n*-Eicosane	C_{20}				

Surrogate Standard

GRH-SS — $ 17 / **1 x 1 mL**
GRH-SS-PAK — *SAVE 20%* $ 68 / **5 x 1 mL**
2.0 mg/mL in Acetone

o-Terphenyl *(OTP)*

Internal Standard

GRH-IS — $ 15 / **1 x 1 mL**
GRH-IS-PAK — *SAVE 20%* $ 60 / **5 x 1 mL**
1.0 mg/mL in CH_2Cl_2

5-alpha Androstane

Calibration/Window Defining Hydrocarbon Standard

DRH-004S-R1-5X — $ 50 / **1 x 1 mL**
DRH-004S-R1-5X-PAK — *SAVE 20%* $ 200 / **5 x 1 mL**
1.0 mg/mL each in Chloroform — 17 comps.

Octane	C_8	Octadecane	C_{18}	Hexacosane	C_{26}	Tetratriacontane	C_{34}
Decane	C_{10}	Eicosane	C_{20}	Octacosane	C_{28}	Hexatriacontane	C_{36}
Dodecane	C_{12}	Docosane	C_{22}	Triacontane	C_{30}	Octatriacontane	C_{38}
Tetradecane	C_{14}	Tetracosane	C_{24}	Dotriacontane	C_{32}	Tetracontane	C_{40}
Hexadecane	C_{16}						

Surrogate Standard

DRH-SS — $ 30 / **1 x 1 mL**
DRH-SS-PAK — *SAVE 20%* $ 120 / **5 x 1 mL**
5.0 mg/mL in THF

n-Triacontane-d_{62}

D-2887 Calibration Solution

Calibration Solution

DRH-002S — $ 45 / **1 x 1 mL**
At stated conc. in CS_2 — 17 comps.

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

Column Test Mixture

ASTM-D2887 — $ 10 / **1 x 1 mL**
1% v/v in n-Octane — 2 comps.

n-Hexadecane — *n*-Octadecane

Wisconsin Diesel Range Hydrocarbons

DRH-003S — $ 20 / **1 x 1 mL**
0.2 mg/mL each in Hexane — 11 comps.

n-Decane	C_{10}	*n*-Tetradecane	C_{14}	*n*-Octadecane	C_{18}
n-Undecane	C_{11}	*n*-Pentadecane	C_{15}	*n*-Nonadecane	C_{19}
n-Dodecane	C_{12}	*n*-Hexadecane	C_{16}	*n*-Eicosane	C_{20}
n-Tridecane	C_{13}	*n*-Heptadecane	C_{17}		

Complete Hydrocarbon Analysis

Multi-State Hydrocarbon Window Defining Standard

DRH-008S-R2 — $ 65 / **1 x 1 mL**
DRH-008S-R2-PAK — *SAVE 20%* $ 260 / **5 x 1 mL**
500 µg/mL each in Chloroform — 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	*n*-Hentriacontane	Tetracontane
Hexadecane	Tricosane	Dotriacontane	

Technical Note

We offer a hydrocarbon window defining standard with the C_8 to C_{40} 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 C_{17}/ pristane and C_{18}/ 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 C_{17}/pristane and C_{18}/ phytane ratio (DRH-005S-10X) is also available.

Fuel Oil Degradation/Retention Time Mixture for Quantification of C_{17}/Pristane and C_{18}/Phytane Ratios

DRH-005S-10X — $ 20 / **1 x 1 mL**
2.0 mg/mL each in CH_2Cl_2 : CS_2 (1:1) — 4 comps.

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

Hydrocarbon Window Defining Standard Set

DRH-FTRPH-SET — $ 80 / **2 x 1 mL** **(DRH-FTRPH, DRH-FTRPH2)**
DRH-FTRPH-SET-PAK — *SAVE 20%* $ 320 / **5 (2 x 1 mL)**
500 µg/mL each in Hexane

FTRPH Calibration/Window Defining Standard

DRH-FTRPH — $ 35 / **1 x 1 mL**
DRH-FTRPH-PAK — *SAVE 20%* $ 140 / **5 x 1 mL**
500 µg/mL each in Hexane — 17 comps.

n-Octane	*n*-Octadecane	*n*-Hexacosane	*n*-Tetratriacontane
n-Decane	*n*-Eicosane	*n*-Octacosane	*n*-Hexatriacontane
n-Dodecane	*n*-Docosane	*n*-Triacontane	*n*-Octatriacontane
n-Tetradecane	*n*-Tetracosane	*n*-Dotriacontane	*n*-Tetracontane
n-Hexadecane			

Hydrocarbon Window Defining Standard

DRH-FTRPH2 — $ 60 / **1 x 1 mL**
DRH-FTRPH2-PAK — *SAVE 20%* $ 240 / **5 x 1 mL**
500 µg/mL each in Hexane — 18 comps.

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

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 $ 15 / **1 x 5 mL**
M-1664-5ML-PAK *SAVE 20%* $ 60 / **5 x 5 mL**
4.0 mg/mL each in Acetone

M-1664-20ML $ 25 / **1 x 20 mL**
M-1664-20ML-PAK *SAVE 20%* $ 100 / **5 x 20 mL**
4.0 mg/mL each in Acetone 2 comps.

Hexadecane
Stearic acid

Silica Gel Hexane Extraction Material

NEW

SGT-HEM $ 15 / **1 x 1 mL**
20 µg/mL each in Acetone 2 comps.

Stearic acid
Hexadecane

Technical Note

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

Method 413.2 & 418.1 Total Petroleum Hydrocarbon Analysis by IR

Oil, Grease & Petroleum Hydrocarbon Concentrates Mix

M-418-CON $ 35 / **1 x 1 mL**
% by volume 3 comps.

Chlorobenzene	(25.0)	Hexadecane	(37.5)
Isooctane	(37.5)		

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

M-418 $ 30 / **1 x 1 mL**
M-418-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
Total 4.15 mg/mL in Freon 113, (Parts by volume) 3 comps.

Chlorobenzene	(10.0)	Isooctane	(15.0)
n-Hexadecane	(15.0)		

Method 8440 Total Petroleum Hydrocarbon Analysis

Total Recoverable Petroleum Hydrocarbon Mix

M-8440 $ 20 / **1 x 1 mL**
M-8440-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
At stated conc. in Tetrachloroethene 3 comps.

Chlorobenzene	(0.10 w/w %)	Isooctane	(0.15 w/w %)
n-Hexadecane	(0.15 w/w %)		

Silica Gel Cleanup Calibration Solution

M-8440-SGC $ 10 / **1 x 1 mL**
M-8440-SGC-PAK *SAVE 20%* $ 40 / **5 x 1 mL**
10.0 mg/mL in Tetrachloroethene

Corn Oil

Total Petroleum Hydrocarbon Concentrate Mix

M-8440-CON $ 30 / **1 x 1 mL**
M-8440-CON-PAK *SAVE 20%* $ 120 / **5 x 1 mL**
3 comps.

Chlorobenzene	(25.0 vol %)	Isooctane	(37.5 vol %)
n-Hexadecane	(37.5 vol %)		

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 $ 20 / **1 x 1 mL**
DRH-010S-PAK *SAVE 20%* $ 80 / **5 x 1 mL**
25 µg/mL each in CH_2Cl_2 7 comps.

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

Technical Note

A sample showing peaks in the C_6-C_{10} range generally indicates a gasoline spill. Samples with the peaks in the C_{24}-C_{12} range are indicative of a diesel spill while samples with the higher carbon numbers above C_{24} are typically oils or lubricants. Once the initial screen is complete, more detailed work can be done to further identify the contaminant.

Standards of Interest

See our Weathered LUFT/LUST Fuel Set in the Fuel and Hydrocarbon Section.

Wear Metals

AA, ICP, DCP & XRF Analysis

These Standards were formulated for the analysis of metals in oils and other organic matrices. These Standards and curves provide a convenient way to analyze for metals (wear metals, additives and contaminants) in lubricating oils, gasolines, residual oils, crude oils, turbine fuels and environmental samples. All standards undergo rigorous quality assurance checks. Major constituents in the final Standard are typically analyzed by both plasma emission and rotrode techniques. Organometallic Standards listed on this page may contain sulfur which can be introduced by possible sulfonate starting materials used to formulate the actual organometallic standard. We developed a Premium Organometallic line for preferring to have organometallic standards with <1 ppm sulfur or phosphorous (see Table of Contents).

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

Single Element Wear Metals

Organometallic ICP/XRF

Element	1000 µg/g in 75 cSt base oil Cat. No. (50 g)	Price	5000 µg/g in 75 cSt base oil Cat. No. (50 g)	Price
Al (Aluminum)	WM-75CST-01	$ 38	WM-75CST-01-5X	$ 48
Sb (Antimony)	WM-75CST-02	38	WM-75CST-02-5X	48
As (Arsenic)	WM-75CST-03	44	----------	----
Ba (Barium)	WM-75CST-04	38	WM-75CST-04-5X	48
Be (Beryllium) ***NEW***	WM-75CST-05	41	----------	----
Bi (Bismuth)	WM-75CST-06	38	WM-75CST-06-5X	48
B (Boron)	WM-75CST-07	38	WM-75CST-07-5X	48
Cd (Cadmium)	WM-75CST-08	38	WM-75CST-08-5X	48
Ca (Calcium)	WM-75CST-09	38	WM-75CST-09-5X	48
Cr (Chromium)	WM-75CST-13	38	WM-75CST-13-5X	48
Co (Cobalt) ***NEW***	WM-75CST-14	38	WM-75CST-14-5X	48
Cu (Copper)	WM-75CST-15	38	WM-75CST-15-5X	48
Fe (Iron)	WM-75CST-27	38	WM-75CST-27-5X	48
La (Lanthanum) ***NEW***	WM-75CST-28	44	----------	----
Pb (Lead)	WM-75CST-29	38	WM-75CST-29-5X	48
Li (Lithium)	WM-75CST-30	38	WM-75CST-30-5X	48
Mg (Magnesium)	WM-75CST-32	38	WM-75CST-32-5X	48
Mn (Manganese)	WM-75CST-33	38	WM-75CST-33-5X	48
Hg (Mercury)	WM-75CST-34	44	----------	----
Mo (Molybdenum)	WM-75CST-35	38	WM-75CST-35-5X	48
Ni (Nickel)	WM-75CST-37	38	WM-75CST-37-5X	48
P (Phosphorous)	WM-75CST-41	38	WM-75CST-41-5X	48
K (Potassium)	WM-75CST-43	38	WM-75CST-43-5X	48
Sc (Scandium)	WM-75CST-50	65	----------	----
Se (Selenium) ***NEW***	WM-75CST-51	44	WM-75CST-51-5X	55
Si (Silicon)	WM-75CST-52	38	WM-75CST-52-5X	48
Ag (Silver)	WM-75CST-53	38	WM-75CST-53-5X	48
Na (Sodium)	WM-75CST-54	38	WM-75CST-54-5X	48
Sr (Strontium)	WM-75CST-55	38	----------	----
S (Sulfur) ***NEW***	WM-75CST-56	38	WM-75CST-56-5X	48
Tl (Thallium)	WM-75CST-60	44	----------	----
Sn (Tin)	WM-75CST-63	38	WM-75CST-63-5X	48
Ti (Titanium)	WM-75CST-64	38	WM-75CST-64-5X	48
V (Vanadium)	WM-75CST-67	38	WM-75CST-67-5X	48
Y (Yttrium) ***NEW***	WM-75CST-69	44	WM-75CST-69-5X	106
Zn (Zinc)	WM-75CST-70	38	WM-75CST-70-5X	48
Zn (Zirconium)	WM-75CST-71	38	WM-75CST-71-5X	48

Matrix Oil and Stabilizer

75 cSt Oil

MOSOL-75 $ 15 / **400 g**

Stabilizer

WM-STAB $ 95 / **1 x 50 g**

Technical Note

Used to improve the stability or Organometallic Standards when diluting into solvents such as Kerosene.

Metals Additives

Metals Additives Standard

MA-900-100G $ 114 / **100 g**
MA-900-200G $ 165 / **200 g**
900 µg/g each in Hydrocarbon oil
MA-1000-100G $ 149 / **100 g**
MA-1000-200G $ 251 / **200 g**
1000 µg/g each in Hydrocarbon oil
MA-3000-100G $ 295 / **100 g**
MA-3000-200G $ 471 / **200 g**
3000 µg/g each in Hydrocarbon oil
MA-5000-100G $ 424 / **100 g**
MA-5000-200G $ 685 / **200 g**
5000 µg/g each in Hydrocarbon oil

Ba (Barium)
Ca (Calcium)
Mg (Magnesium)
P (Phosphorous)
Zn (Zinc)

These products do not require Hazardous Shipping Fee at this time.

Wear Metals

AA, ICP, DCP & XRF Analysis

12 Wear Metal Multi-Element

Conc.	Unit	Cat. No.	Price
10 µg/g	100 g	WM-12-1X-100G	$ 90
	200 g	WM-12-1X-200G	95
30 µg/g	100 g	WM-12-3X-100G	90
	200 g	WM-12-3X-200G	95
50 µg/g	100 g	WM-12-5X-100G	95
	200 g	WM-12-5X-200G	100
100 µg/g	100 g	WM-12-10X-100G	100
	200 g	WM-12-10X-200G	150
300 µg/g	100 g	WM-12-30X-100G	120
	200 g	WM-12-30X-200G	215
500 µg/g	100 g	WM-12-50X-100G	180
	200 g	WM-12-50X-200G	310
900 µg/g	100 g	WM-12-90X-100G	250
	200 g	WM-12-90X-200G	445
100 gram Set		WM-12-100G-SET set of above 7 x 100 g	$ 825
200 gram Set		WM-12-200G-SET set of above 7 x 200 g	$ 1250

Each Wear Metal Standard contains 12 elements listed below of hydrocarbon oil at the stated concentration.

Ag (Silver)
Al (Aluminum)
Cr (Chromium)
Cu (Copper)
Fe (Iron)
Mg (Magnesium)
Na (Sodium)
Ni (Nickel)
Pb (Lead)
Si (Silicon)
Sn (Tin)
Ti (Titanium)

21 Wear Metal Multi-Element

Conc.	Unit	Cat. No.	Price
10 µg/g	100 g	WM-21-1X-100G	$ 95
	200 g	WM-21-1X-200G	100
30 µg/g	100 g	WM-21-3X-100G	95
	200 g	WM-21-3X-200G	100
50 µg/g	100 g	WM-21-5X-100G	100
	200 g	WM-21-5X-200G	105
100 µg/g	100 g	WM-21-10X-100G	105
	200 g	WM-21-10X-200G	160
300 µg/g	100 g	WM-21-30X-100G	170
	200 g	WM-21-30X-200G	310
500 µg/g	100 g	WM-21-50X-100G	245
	200 g	WM-21-50X-200G	445
900 µg/g	100 g	WM-21-90X-100G	380
	200 g	WM-21-90X-200G	675
100 gram Set		WM-21-100G-SET set of above 7 x 100 g	$ 1050
200 gram Set		WM-21-200G-SET set of above 7 x 200 g	$ 1700

Each Wear Metal Standard contains 21 elements listed below of hydrocarbon oil at the stated concentration.

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

22 Wear Metal Multi-Element

NEW

Conc.	Unit	Cat. No.	Price
10 µg/g	100 g	WM-22-1X-100G	$ 115
	200 g	WM-22-1X-200G	120
30 µg/g	100 g	WM-22-3X-100G	115
	200 g	WM-22-3X-200G	120
50 µg/g	100 g	WM-22-5X-100G	120
	200 g	WM-22-5X-200G	125
100 µg/g	100 g	WM-22-10X-100G	125
	200 g	WM-22-10X-200G	145
300 µg/g	100 g	WM-22-30X-100G	190
	200 g	WM-22-30X-200G	340
500 µg/g	100 g	WM-22-50X-100G	275
	200 g	WM-22-50X-200G	485
900 µg/g	100 g	WM-22-90X-100G	420
	200 g	WM-22-90X-200G	725
100 gram Set		WM-22-100G-SET set of above 7 x 100 g	$ 1225
200 gram Set		WM-22-200G-SET set of above 7 x 200 g	$ 1850

Each Wear Metal Standard contains 22 elements listed below of hydrocarbon oil at the stated concentration.

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

23 Wear Metal Multi-Element

NEW

Conc.	Unit	Cat. No.	Price
10 µg/g	100 g	WM-23-1X-100G	$ 135
	200 g	WM-23-1X-200G	140
30 µg/g	100 g	WM-23-3X-100G	135
	200 g	WM-23-3X-200G	140
50 µg/g	100 g	WM-23-5X-100G	140
	200 g	WM-23-5X-200G	145
100 µg/g	100 g	WM-23-10X-100G	145
	200 g	WM-23-10X-200G	165
300 µg/g	100 g	WM-23-30X-100G	210
	200 g	WM-23-30X-200G	395
500 µg/g	100 g	WM-23-50X-100G	305
	200 g	WM-23-50X-200G	525
900 µg/g	100 g	WM-23-90X-100G	495
	200 g	WM-23-90X-200G	765
100 gram Set		WM-23-100G-SET set of above 7 x 100 g	$ 1400
200 gram Set		WM-23-200G-SET set of above 7 x 200 g	$ 2025

Each Wear Metal Standard contains 23 elements listed below of hydrocarbon oil at the stated concentration.

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

See our BioFuel Standards in the Petrochemical Section of this Catalog for Wear Metals in BioFuels.

These products do not require Hazardous Shipping fee at this time.

Wear Metals

Premium Sulfur-Free

- Highly Concentrated Liquid Organometallic Standards
- Stabilized
- Sulfur/Phosphorous free (< 1 ppm)
- Ready for Use

Organometallic Single Element Stock Standards

Sulfur free Element	@ 1000 µg/g Cat. No.	Price 50 mL	@ 5000 µg/g Cat. No.	Price 50 mL
Al (Aluminum)	WM-NMS-01	$ 55	WM-NMS-01-5X	$ 72
Sb (Antimony)	WM-NMS-02	55	WM-NMS-02-5X	72
As (Arsenic) ***NEW***	WM-NMS-03	55	WM-NMS-03-5X	72
Ba (Barium)	WM-NMS-04	55	WM-NMS-04-5X	72
Be (Beryllium) ***NEW***	WM-NMS-05	69	WM-NMS-05-5X	118
Cd (Cadmium)	WM-NMS-08	55	WM-NMS-08-5X	72
Ca (Calcium)	WM-NMS-09	55	WM-NMS-09-5X	72
Ce (Cerium) ***NEW***	WM-NMS-11	55	WM-NMS-11-5X	72
Cr (Chromium)	WM-NMS-13	44	WM-NMS-13-5X	58
Co (Cobalt)	WM-NMS-14	44	WM-NMS-14-5X	58
Cu (Copper)	WM-NMS-15	44	WM-NMS-15-5X	58
Ga (Gallium) ***NEW***	WM-NMS-20	72	WM-NMS-20-5X	142
Au (Gold) ***NEW***	WM-NMS-22	111	----------	----
Fe (Iron)	WM-NMS-27	55	WM-NMS-27-5X	72
Pb (Lead)	WM-NMS-29	55	WM-NMS-29-5X	72
Li (Lithium) ***NEW***	WM-NMS-30	72	WM-NMS-30-5X	124
Mg (Magnesium)	WM-NMS-32	55	WM-NMS-32-5X	72
Mn (Manganese)	WM-NMS-33	55	WM-NMS-33-5X	72
Hg (Mercury) ***NEW***	WM-NMS-34	62	WM-NMS-34-5X	110
Mo (Molybdenum)	WM-NMS-35	62	WM-NMS-35-5X	110
Ni (Nickel)	WM-NMS-37	55	WM-NMS-37-5X	72
P (Phosphorous)	WM-NMS-41	55	WM-NMS-41-5X	72
K (Potassium)	WM-NMS-43	55	WM-NMS-43-5X	72
Se (Selenium)	WM-NMS-51	55	WM-NMS-51-5X	72
Si (Silicon)	WM-NMS-52	72	WM-NMS-52-5X	124
Ag (Silver) ***NEW***	WM-NMS-53	72	WM-NMS-53-5X	124
Na (Sodium)	WM-NMS-54	55	WM-NMS-54-5X	72
Sr (Strontium)	WM-NMS-55	55	WM-NMS-55-5X	72
Tl (Thallium)	WM-NMS-60	55	WM-NMS-60-5X	72
Sn (Tin) ***NEW***	WM-NMS-63	55	WM-NMS-63-5X	72
Ti (Titanium)	WM-NMS-64	55	WM-NMS-64-5X	72
V (Vanadium)	WM-NMS-67	55	WM-NMS-67-5X	72
Y (Yttrium)	WM-NMS-69	60	WM-NMS-69-5X	105
Zn (Zinc)	WM-NMS-70	55	WM-NMS-70-5X	72
Zr (Zirconium)	WM-NMS-71	55	WM-NMS-71-5X	72

Stabilization Solutions

The solutions were specifically designed for chelating & solubilizing our line of Sulfur-Free Organometallic Standards. Contact Tech Service for additional information.

Premium Sulfur-Free
Sulfur below detection limits

Stabilizer Solution A

ASTM-P-0122-0.5 $ 80 / **50 mL**
ASTM-P-0122-1 $ 120 / **100 mL**

Stabilizer Solution B

ASTM-P-0123-0.5 $ 80 / **50 mL**
ASTM-P-0123-1 $ 120 / **100 mL**

Stabilizer Solution C

ASTM-P-0124-0.5 $ 80 / **50 mL**
ASTM-P-0124-1 $ 120 / **100 mL**

Stabilizer Solution D

ASTM-P-0125-0.5 $ 80 / **50 mL**
ASTM-P-0125-1 $ 120 / **100 mL**

Contains No Metallic Sulfonates

These highly concentrated stabilized solutions can be used for customer specific formulations of additive elements in lubricating oils, iron, nickel and vanadium in residual oil, and wear metals in oils. These organometallic solutions can also be used to prepare single element or multi-element standards for plasma emission (ICP or DCP), rotating disk (rotrode), or atomic absorption spectroscopy (AA). The starting materials are PURE REAGENTS and have been certified against NIST SRM's whenever available. **THEY DO NOT CONTAIN PHOSPHORUS OR SULFUR.**

Organometallic Single Element Concentrates

Element	Conc. (Wt. %)	Cat. No.	Price / 25 grams	Cat. No.	Price / 50 grams
Al (Aluminum)	3	WM-NMS-01-30X-25G	$ 178	WM-NMS-01-30X-50G	$ 261
Sb (Antimony) ***NEW***	2	WM-NMS-02-20X-25G	122	WM-NMS-02-20X-50G	183
Ba (Barium)	12.5	WM-NMS-04-125X-25G	540	WM-NMS-04-125X-50G	780
Cd (Cadmium)	10	WM-NMS-08-100X-25G	510	WM-NMS-08-100X-50G	710
Ca (Calcium)	5	WM-NMS-09-50X-25G	272	WM-NMS-09-50X-50G	422
Ce (Cerium) ***NEW***	5	WM-NMS-11-50X-25G	272	WM-NMS-11-50X-50G	422
Cr (Chromium)	3.5	WM-NMS-13-35X-25G	194	WM-NMS-13-35X-50G	299
Co (Cobalt)	7.5	WM-NMS-14-75X-25G	422	WM-NMS-14-75X-50G	577
Cu (Copper)	6	WM-NMS-15-60X-25G	344	WM-NMS-15-60X-50G	516
Fe (Iron)	4	WM-NMS-27-40X-25G	239	WM-NMS-27-40X-50G	361
Pb (Lead)	20	WM-NMS-29-200X-25G	900	WM-NMS-29-200X-50G	1260
Li (Lithium) ***NEW***	1.5	WM-NMS-30-15X-25G	155	WM-NMS-30-15X-50G	239
Mg (Magnesium422)	3	WM-NMS-32-30X-25G	180	WM-NMS-32-30X-50G	278
Mn (Manganese)	6	WM-NMS-33-60X-25G	333	WM-NMS-33-60X-50G	505
Mo (Molybdenum)	5	WM-NMS-35-50X-25G	272	WM-NMS-35-50X-50G	422
Ni (Nickel)	5	WM-NMS-37-50X-25G	272	WM-NMS-37-50X-50G	422
P (Phosphorus)	5	WM-NMS-41-50X-25G	272	WM-NMS-41-50X-50G	422
K (Potassium) ***NEW***	7.5	WM-NMS-43-75X-25G	422	WM-NMS-43-75X-50G	577
Pr (Praseodymium)	3	WM-NMS-44-30X-25G	175	WM-NMS-44-30X-50G	240
Se (Selenium)	3.5	WM-NMS-51-35X-25G	200	WM-NMS-51-35X-50G	270
Si (Silicon) ***NEW***	7.5	WM-NMS-52-75X-25G	383	WM-NMS-52-75X-50G	528
Na (Sodium) ***NEW***	2.5	WM-NMS-54-25X-25G	180	WM-NMS-54-25X-50G	278
Sr (Strontium)	10	WM-NMS-55-100X-25G	510	WM-NMS-55-100X-50G	710
Tl (Thallium)	5	WM-NMS-60-50X-25G	272	WM-NMS-60-50X-50G	422
Sn (Tin) ***NEW***	7.5	WM-NMS-63-75X-25G	422	WM-NMS-63-75X-50G	577
Ti (Titanium)	5	WM-NMS-64-50X-25G	272	WM-NMS-64-50X-50G	422
V (Vanadium)	4	WM-NMS-67-40X-25G	239	WM-NMS-67-40X-50G	361
Y (Yttrium) ***NEW***	2.5	WM-NMS-69-25X-25G	180	WM-NMS-69-25X-50G	278
Zn (Zinc)	6	WM-NMS-70-60X-25G	306	WM-NMS-70-60X-50G	461
Zr (Zirconium)	5	WM-NMS-71-50X-25G	272	WM-NMS-71-50X-50G	422

Technical Note

These standards are **sulfur free** (below detection limits) **organometallic standards** for X-ray Fluorescence (XRF), plasma emission (ICP or DCP), rotating disk (rotrode), or atomic absorption (AA). They are stabilized for blending together with other Analytes to prepare multi-element standards.

Wear Metals

Premium Sulfur-Free

11 Wear Metal Multi-Element

Conc.	Unit	Cat. No.	Price
10 µg/g	100 mL	WM-11-NMS-1X-1	$ 130
30 µg/g	100 mL	WM-11-NMS-3X-1	130
50 µg/g	100 mL	WM-11-NMS-5X-1	130
100 µg/g	100 mL	WM-11-NMS-10X-1	140
300 µg/g	100 mL	WM-11-NMS-30X-1	165
500 µg/g	100 mL	WM-11-NMS-50X-1	245
900 µg/g	100 mL	WM-11-NMS-90X-1	325
	100 mL Set	**WM-11-NMS-1-SET** set of above 7 x 100 mL	$ 1100

Each Wear Metal Standard contains 11 elements listed below of hydrocarbon oil at the stated concentration.

Al (Aluminum)
Cr (Chromium)
Cu (Copper)
Fe (Iron)
Mg (Magnesium)
Na (Sodium)
Ni (Nickel)
Pb (Lead)
Si (Silicon)
Sn (Tin)
Ti (Titanium)

12 Wear Metal Multi-Element

Conc.	Unit	Cat. No.	Price
10 µg/g	100 mL	WM-12-NMS-1X-1	$ 135
30 µg/g	100 mL	WM-12-NMS-3X-1	135
50 µg/g	100 mL	WM-12-NMS-5X-1	135
100 µg/g	100 mL	WM-12-NMS-10X-1	145
300 µg/g	100 mL	WM-12-NMS-30X-1	170
500 µg/g	100 mL	WM-12-NMS-50X-1	250
900 µg/g	100 mL	WM-12-NMS-90X-1	375
	100 mL Set	**WM-12-NMS-1-SET** set of above 7 x 100 mL	$ 1175

Each Wear Metal Standard contains 12 elements listed below of hydrocarbon oil at the stated concentration.

Ag (Silver)
Al (Aluminum)
Cr (Chromium)
Cu (Copper)
Fe (Iron)
Mg (Magnesium)
Na (Sodium)
Ni (Nickel)
Pb (Lead)
Si (Silicon)
Sn (Tin)
Ti (Titanium)

Contains No Metallic Sulfonates

Premium Sulfur-Free

Sulfur below detection limits

20 Wear Metal Multi-Element

Conc.	Unit	Cat. No.	Price
10 µg/g	100 mL	WM-20-NMS-1X-1	$ 150
30 µg/g	100 mL	WM-20-NMS-3X-1	150
50 µg/g	100 mL	WM-20-NMS-5X-1	150
100 µg/g	100 mL	WM-20-NMS-10X-1	170
300 µg/g	100 mL	WM-20-NMS-30X-1	230
500 µg/g	100 mL	WM-20-NMS-50X-1	350
900 µg/g	100 mL	WM-20-NMS-90X-1	500
	100 mL Set	**WM-20-NMS-1-SET** set of above 7 x 100 mL	$ 1450

Each Wear Metal Standard contains 20 elements listed below of hydrocarbon oil at the stated concentration.

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

21 Wear Metal Multi-Element

Conc.	Unit	Cat. No.	Price
10 µg/g	100 mL	WM-21-NMS-1X-1	$ 160
30 µg/g	100 mL	WM-21-NMS-3X-1	160
50 µg/g	100 mL	WM-21-NMS-5X-1	160
100 µg/g	100 mL	WM-21-NMS-10X-1	180
300 µg/g	100 mL	WM-21-NMS-30X-1	240
500 µg/g	100 mL	WM-21-NMS-50X-1	350
900 µg/g	100 mL	WM-21-NMS-50X-1	550
	100 mL Set	**WM-21-NMS-1-SET** set of above 7 x 100 mL	$ 1550

Each Wear Metal Standard contains 21 elements listed below of hydrocarbon oil at the stated concentration.

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

Recommended Internal Standard

Organometallic (Internal Standard) Sulfur free

	Conc.	Cat. No.	Price / 50 mL
Cobalt	1000 µg/g	WM-NMS-14	$ 44
	5000 µg/g	WM-NMS-14-5X	$ 58

These products do not require Hazardous Shipping fee at this time.

Wear Metals

AA, ICP, DCP & XRF Analysis

Sulfur and Metals in Oil

Sulfur and Metals in Mineral Oil

ASTM-P-0100-SET — $ 1650 / **12 x 100 mL**

Cat. No.	Sulfur (Wt. %)	Nickel (µg/g)	Vanadium (µg/g)	100 mL Price
ASTM-P-0100-01	0.00	0	0	$ 200
ASTM-P-0100-02	0.50	10	500	200
ASTM-P-0100-03	1.00	100	25	200
ASTM-P-0100-04	1.50	80	250	200
ASTM-P-0100-05	2.00	40	100	200
ASTM-P-0100-06	2.50	5	400	200
ASTM-P-0100-07	3.00	60	300	200
ASTM-P-0100-08	3.50	0	200	200
ASTM-P-0100-09	4.00	100	0	200
ASTM-P-0100-10	4.50	50	250	200
ASTM-P-0100-11	5.00	20	500	200
ASTM-P-0100-12	5.50	100	50	200

Sulfur and Metals in Residual Fuel Oil

ASTM-P-0101-SET — $ 1800 / **12 x 100 mL**

Cat. No.	Sulfur (Wt. %)	Nickel (µg/g)	Vanadium (µg/g)	100 mL Price
ASTM-P-0101-01	0.00	0	0	$ 200
ASTM-P-0101-02	0.50	10	500	200
ASTM-P-0101-03	1.00	100	25	200
ASTM-P-0101-04	1.50	80	250	200
ASTM-P-0101-05	2.00	40	100	200
ASTM-P-0101-06	2.50	5	400	200
ASTM-P-0101-07	3.00	60	300	200
ASTM-P-0101-08	3.50	0	200	200
ASTM-P-0101-09	4.00	100	0	200
ASTM-P-0101-10	4.50	50	250	200
ASTM-P-0101-11	5.00	20	500	200
ASTM-P-0101-12	5.50	100	50	200

Test Method A - ICP with an Organic Solvent Specimen Solution

Sulfur and Metals in Mineral Oil

Designed for ASTM D5708

ASTM-P-0102-SET — $ 1850 / **12 x 100 mL**

Cat. No.	Sulfur (Wt. %)	Iron (µg/g)	Nickel (µg/g)	Vanadium (µg/g)	100 mL Price
ASTM-P-0102-01	0.00	0	0	0	$ 200
ASTM-P-0102-02	0.50	300	10	500	200
ASTM-P-0102-03	1.00	500	100	25	200
ASTM-P-0102-04	-----	100	80	250	200
ASTM-P-0102-05	2.00	200	40	100	200
ASTM-P-0102-06	2.50	400	5	400	200
ASTM-P-0102-07	3.00	0	60	300	200
ASTM-P-0102-08	3.50	500	0	200	200
ASTM-P-0102-09	-----	100	100	0	200
ASTM-P-0102-10	4.50	300	50	250	200
ASTM-P-0102-11	5.00	200	20	500	200
ASTM-P-0102-12	5.50	50	100	50	200

Sulfur and Metals in Residual Fuel Oil

Designed for ASTM D5708

ASTM-P-0103-SET — $ 2100 / **12 x 100 mL**

Cat. No.	Sulfur (Wt. %)	Iron (µg/g)	Nickel (µg/g)	Vanadium (µg/g)	100 mL Price
ASTM-P-0103-01	0.00	0	0	0	$ 200
ASTM-P-0103-02	0.50	300	10	500	200
ASTM-P-0103-03	1.00	500	100	25	200
ASTM-P-0103-04	-----	100	80	250	200
ASTM-P-0103-05	2.00	200	40	100	200
ASTM-P-0103-06	2.50	400	5	400	200
ASTM-P-0103-07	3.00	0	60	300	200
ASTM-P-0103-08	3.50	500	0	200	200
ASTM-P-0103-09	-----	100	100	0	200
ASTM-P-0103-10	4.50	300	50	250	200
ASTM-P-0103-11	5.00	200	20	500	200
ASTM-P-0103-12	5.50	50	100	50	200

After Acid Decomposition of Sample

Stock Multi-Element in Mineral Oil

D-5708-A-10X — $ 150 / **100 mL**

100 µg/g in 20 cSt mineral oil — 3 comps.

Iron
Nickel
Vanadium

Nitric Acid Blank

CLP-BLN-5 Δ — $ 30 / **500 mL**

CLP-BLN-L-VAP Δ — $ 45 / **1 L** (2 x 500 mL)

5% HNO_3 in ASTM Type I Water

Working Level Multi-Element Aqueous Standard

D-5708-B-5 Δ — $ 105 / **500 mL**

10 µg/mL each in 2-5% HNO_3 — 3 comps.

Iron
Nickel
Vanadium

Stock Multi-Element Aqueous Standard

D-5708-B-10X-1 Δ — $ 60 / **100 mL**

D-5708-B-10X-5 Δ — $ 115 / **500 mL**

100 µg/mL each in 2-5% HNO_3 — 3 comps.

Iron
Nickel
Vanadium

Stock Multi-Element Aqueous Standard

D-5863-95A-10X-1 Δ — $ 75 / **1 x 100 mL**

2-5% HNO_3 — 3 comps.

Iron	100	Vanadium	200
Nickel	200		

Stock Multi-Element Standard in Mineral Oil

D-5863-95B-10X — $ 160 / **1 x 100 g**

At stated conc. (µg/g) in 20 cst Mineral Oil — 3 comps.

Sodium	50	Vanadium	150
Nickel	200		

ISO/CD 14597 Vanadium and Nickel Standards with Manganese (Internal Standard)

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

ASTM-P-0104-SET — $ 1050 / **9 x 100 mL**

Cat. No.	Vanadium Conc. (Wt.%)	Price 100 mL
ASTM-P-0104-01	0.0005	$ 150
ASTM-P-0104-02	0.0025	150
ASTM-P-0104-03	0.0050	150
ASTM-P-0104-04	0.0075	150
ASTM-P-0104-05	0.0100	150
ASTM-P-0104-06	0.0125	150
ASTM-P-0104-07	0.0150	150
ASTM-P-0104-08	0.0175	150
ASTM-P-0104-09	0.0200	150

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

ASTM-P-0105-SET — $ 780 / **7 x 100 mL**

Cat. No.	Vanadium Conc. (Wt.%)	Price 100 mL
ASTM-P-0105-01	0.0000	$ 135
ASTM-P-0105-02	0.0300	135
ASTM-P-0105-03	0.0400	135
ASTM-P-0105-04	0.0500	135
ASTM-P-0105-05	0.0600	135
ASTM-P-0105-06	0.0800	135
ASTM-P-0105-07	0.1000	135

Internal Standard

ASTM-P-0107-5 — $ 235 / **500 mL**

Manganese @ 0.05 Wt. % in Xylene-Mineral Oil

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

ASTM-P-0106-SET — $ 780 / **7 x 100 mL**

Cat. No.	Nickel Conc. (Wt.%)	Price 100 mL
ASTM-P-0106-01	0.0000	$ 135
ASTM-P-0106-02	0.0005	135
ASTM-P-0106-03	0.0010	135
ASTM-P-0106-04	0.0025	135
ASTM-P-0106-05	0.0050	135
ASTM-P-0106-06	0.0075	135
ASTM-P-0106-07	0.0100	135

Δ Requires a Hazardous Shipping Fee

Lubricating Oil Standards

ASTM-P-0108-SET $ 1900 / 17 x 100 mL

Designed for ASTM D6481

Cat. No. Nominal Value	Ca (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0108-01	0.600	0.005	0.175	0.060
ASTM-P-0108-02	0.500	0.200	0.050	0.080
ASTM-P-0108-03	0.400	0.150	0.300	0.180
ASTM-P-0108-04	0.260	0.250	0.150	0.120
ASTM-P-0108-05	0.005	0.005	0.450	0.070
ASTM-P-0108-06	0.400	0.025	0.350	0.100
ASTM-P-0108-07	0.300	0.060	0.250	0.120
ASTM-P-0108-08	0.200	0.100	0.450	0.100
ASTM-P-0108-09	0.060	0.080	0.300	0.130
ASTM-P-0108-10	0.060	0.050	0.200	0.050
ASTM-P-0108-11	0.050	0.120	0.100	0.075
ASTM-P-0108-12	0.025	0.150	0.200	0.130
ASTM-P-0108-13	0.005	0.200	0.400	0.150
ASTM-P-0108-14	0.170	0.250	0.550	0.110
ASTM-P-0108-15	0.100	0.100	0.200	0.200
ASTM-P-0108-16	0.010	0.010	0.600	0.250
ASTM-P-0108-17	0.000	0.000	0.000	0.000

ASTM-P-0109-SET $ 1600 / 17 x 100 mL

Cat. No. Nominal Value	Ca (Wt.%)	Cl (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0109-01	0.600	0.100	0.005	0.175	0.060
ASTM-P-0109-02	0.500	0.000	0.200	0.050	0.080
ASTM-P-0109-03	0.400	0.010	0.150	0.300	0.180
ASTM-P-0109-04	0.260	0.500	0.250	0.150	0.120
ASTM-P-0109-05	0.005	1.000	0.005	0.450	0.070
ASTM-P-0109-06	0.400	0.400	0.025	0.350	0.100
ASTM-P-0109-07	0.300	0.100	0.060	0.250	0.120
ASTM-P-0109-08	0.200	0.010	0.100	0.450	0.100
ASTM-P-0109-09	0.060	0.050	0.080	0.300	0.130
ASTM-P-0109-10	0.060	0.200	0.050	0.200	0.050
ASTM-P-0109-11	0.050	0.500	0.120	0.100	0.075
ASTM-P-0109-12	0.025	0.800	0.150	0.200	0.130
ASTM-P-0109-13	0.005	1.000	0.200	0.400	0.150
ASTM-P-0109-14	0.170	0.600	0.250	0.550	0.110
ASTM-P-0109-15	0.100	0.200	0.100	0.200	0.200
ASTM-P-0109-16	0.010	0.400	0.010	0.600	0.250
ASTM-P-0109-17	0.000	0.000	0.000	0.000	0.000

ASTM-P-0110-SET $ 2300 / 17 x 100 mL

Designed for ASTM D4927

Cat. No. Nominal Value	Ba (Wt.%)	Ca (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0110-01	0.100	0.600	0.005	0.175	0.060
ASTM-P-0110-02	0.175	0.500	0.200	0.050	0.080
ASTM-P-0110-03	0.000	0.400	0.150	0.300	0.180
ASTM-P-0110-04	0.025	0.260	0.250	0.150	0.120
ASTM-P-0110-05	0.150	0.005	0.005	0.450	0.070
ASTM-P-0110-06	0.000	0.400	0.025	0.350	0.100
ASTM-P-0110-07	0.200	0.300	0.060	0.250	0.120
ASTM-P-0110-08	0.000	0.200	0.100	0.450	0.100
ASTM-P-0110-09	0.100	0.060	0.080	0.300	0.130
ASTM-P-0110-10	0.050	0.060	0.050	0.200	0.050
ASTM-P-0110-11	0.075	0.050	0.120	0.100	0.075
ASTM-P-0110-12	0.010	0.025	0.150	0.200	0.130
ASTM-P-0110-13	0.005	0.005	0.200	0.400	0.150
ASTM-P-0110-14	0.000	0.170	0.250	0.550	0.110
ASTM-P-0110-15	0.000	0.100	0.100	0.200	0.200
ASTM-P-0110-16	0.005	0.010	0.010	0.600	0.250
ASTM-P-0110-17	0.000	0.000	0.000	0.000	0.000

ASTM-P-0111-SET $ 2800 / 17 x 100 mL

Designed for ASTM D4927

Cat. No. Nominal Value	Ba (Wt.%)	Ca (Wt.%)	Cl (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0111-01	0.100	0.600	0.100	0.005	0.175	0.060
ASTM-P-0111-02	0.175	0.500	0.000	0.200	0.050	0.080
ASTM-P-0111-03	0.000	0.400	0.010	0.150	0.300	0.180
ASTM-P-0111-04	0.025	0.260	0.500	0.250	0.150	0.120
ASTM-P-0111-05	0.150	0.005	1.000	0.005	0.450	0.070
ASTM-P-0111-06	0.000	0.400	0.400	0.025	0.350	0.100
ASTM-P-0111-07	0.200	0.300	0.100	0.060	0.250	0.120
ASTM-P-0111-08	0.000	0.200	0.010	0.100	0.450	0.100
ASTM-P-0111-09	0.100	0.060	0.050	0.080	0.300	0.130
ASTM-P-0111-10	0.050	0.060	0.200	0.050	0.200	0.050
ASTM-P-0111-11	0.075	0.050	0.500	0.120	0.100	0.075
ASTM-P-0111-12	0.010	0.025	0.800	0.150	0.200	0.130
ASTM-P-0111-13	0.005	0.005	1.000	0.200	0.400	0.150
ASTM-P-0111-14	0.000	0.170	0.600	0.250	0.550	0.110
ASTM-P-0111-15	0.000	0.100	0.200	0.100	0.200	0.200
ASTM-P-0111-16	0.005	0.010	0.400	0.010	0.600	0.250
ASTM-P-0111-17	0.000	0.000	0.000	0.000	0.000	0.000

ASTM-P-0112-SET $ 2300 / 17 x 100 mL

Cat. No. Nominal Value	Ca (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0112-01	0.600	0.100	0.005	0.175	0.060
ASTM-P-0112-02	0.500	0.150	0.200	0.050	0.080
ASTM-P-0112-03	0.400	0.350	0.150	0.300	0.180
ASTM-P-0112-04	0.260	0.225	0.250	0.150	0.120
ASTM-P-0112-05	0.005	0.450	0.005	0.450	0.070
ASTM-P-0112-06	0.400	0.500	0.025	0.350	0.100
ASTM-P-0112-07	0.300	0.325	0.060	0.250	0.120
ASTM-P-0112-08	0.200	0.250	0.100	0.450	0.100
ASTM-P-0112-09	0.060	0.100	0.080	0.300	0.130
ASTM-P-0112-10	0.060	0.400	0.050	0.200	0.050
ASTM-P-0112-11	0.050	0.300	0.120	0.100	0.075
ASTM-P-0112-12	0.025	0.200	0.150	0.200	0.130
ASTM-P-0112-13	0.005	0.375	0.200	0.400	0.150
ASTM-P-0112-14	0.170	0.175	0.250	0.550	0.110
ASTM-P-0112-15	0.100	0.425	0.100	0.200	0.200
ASTM-P-0112-16	0.010	0.275	0.010	0.600	0.250
ASTM-P-0112-17	0.000	0.000	0.000	0.000	0.000

ASTM-P-0113-SET $ 2850 / 17 x 100 mL

Designed for ASTM D4628 & D4927

Cat. No. Nominal Value	Ba (Wt.%)	Ca (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0113-01	0.025	0.600	0.100	0.005	0.175	0.060
ASTM-P-0113-02	0.000	0.500	0.150	0.200	0.050	0.080
ASTM-P-0113-03	0.100	0.400	0.350	0.150	0.300	0.180
ASTM-P-0113-04	0.175	0.260	0.225	0.250	0.150	0.120
ASTM-P-0113-05	0.150	0.005	0.450	0.005	0.450	0.070
ASTM-P-0113-06	0.000	0.400	0.500	0.025	0.350	0.100
ASTM-P-0113-07	0.100	0.300	0.325	0.060	0.250	0.120
ASTM-P-0113-08	0.200	0.200	0.250	0.100	0.450	0.100
ASTM-P-0113-09	0.050	0.060	0.100	0.080	0.300	0.130
ASTM-P-0113-10	0.075	0.060	0.400	0.050	0.200	0.050
ASTM-P-0113-11	0.010	0.050	0.300	0.120	0.100	0.075
ASTM-P-0113-12	0.000	0.025	0.200	0.150	0.200	0.130
ASTM-P-0113-13	0.175	0.005	0.375	0.200	0.400	0.150
ASTM-P-0113-14	0.005	0.170	0.175	0.250	0.550	0.110
ASTM-P-0113-15	0.000	0.100	0.425	0.100	0.200	0.200
ASTM-P-0113-16	0.005	0.010	0.275	0.010	0.600	0.250
ASTM-P-0113-17	0.000	0.000	0.000	0.000	0.000	0.000

These products do not require Hazardous Shipping Fees at this time.

Lubricating Oil Standards (Continued)

ASTM-P-0114-SET $ 1900 / **17 x 100 mL**

EDXRF ASTM Method — Designed for ASTM D6481

Cat. No. Nominal Value	Ca (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0114-01	0.005	0.005	0.050	0.050
ASTM-P-0114-02	0.600	0.000	0.000	0.000
ASTM-P-0114-03	0.000	0.300	0.000	0.000
ASTM-P-0114-04	1.000	0.000	1.000	0.000
ASTM-P-0114-05	0.000	0.000	0.000	0.300
ASTM-P-0114-06	0.005	0.250	0.800	0.300
ASTM-P-0114-07	0.500	0.150	0.500	0.150
ASTM-P-0114-08	0.010	0.200	0.100	0.250
ASTM-P-0114-09	0.050	0.010	0.400	0.075
ASTM-P-0114-10	0.100	0.150	0.200	0.200
ASTM-P-0114-11	0.200	0.200	0.800	0.100
ASTM-P-0114-12	0.400	0.005	0.800	0.300
ASTM-P-0114-13	0.600	0.100	0.500	0.050
ASTM-P-0114-14	0.800	0.010	0.050	0.100
ASTM-P-0114-15	1.000	0.300	1.000	0.150
ASTM-P-0114-16	0.400	0.050	0.600	0.250
ASTM-P-0114-17	0.000	0.000	0.000	0.000

ASTM-P-0115-SET $ 2300 / **17 x 100 mL**

Cat. No. Nominal Value	Ca (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)	Mg (Wt.%)
ASTM-P-0115-01	0.005	0.005	0.050	0.050	0.100
ASTM-P-0115-02	0.600	0.000	0.000	0.000	0.150
ASTM-P-0115-03	0.000	0.300	0.000	0.000	0.350
ASTM-P-0115-04	1.000	0.000	1.000	0.000	0.225
ASTM-P-0115-05	0.000	0.000	0.000	0.300	0.450
ASTM-P-0115-06	0.005	0.250	0.800	0.300	0.500
ASTM-P-0115-07	0.500	0.150	0.500	0.150	0.325
ASTM-P-0115-08	0.010	0.200	0.100	0.250	0.250
ASTM-P-0115-09	0.050	0.010	0.400	0.075	0.050
ASTM-P-0115-10	0.100	0.150	0.200	0.200	0.400
ASTM-P-0115-11	0.200	0.200	0.800	0.100	0.300
ASTM-P-0115-12	0.400	0.005	0.800	0.300	0.200
ASTM-P-0115-13	0.600	0.100	0.500	0.050	0.375
ASTM-P-0115-14	0.800	0.010	0.050	0.100	0.175
ASTM-P-0115-15	1.000	0.300	1.000	0.150	0.425
ASTM-P-0115-16	0.400	0.050	0.600	0.250	0.275
ASTM-P-0115-17	0.000	0.000	0.000	0.000	0.000

ASTM-P-0116-SET $ 2450 / **11 x 100 mL**

Additives — Designed for ASTM D6481

Cat. No. Nominal Value	Ca (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0116-01	0.500	1.000	0.500	0.500
ASTM-P-0116-02	3.000	1.000	3.000	2.000
ASTM-P-0116-03	2.000	1.250	1.000	1.500
ASTM-P-0116-04	5.000	1.500	0.500	1.200
ASTM-P-0116-05	4.000	0.500	1.500	0.750
ASTM-P-0116-06	2.500	0.750	4.000	1.000
ASTM-P-0116-07	4.000	0.500	2.000	1.250
ASTM-P-0116-08	0.500	2.000	5.000	1.000
ASTM-P-0116-09	1.000	0.750	2.000	1.500
ASTM-P-0116-10	2.500	1.200	3.000	0.500
ASTM-P-0116-11	0.000	0.000	0.000	0.000

ASTM-P-0117-SET $ 2100 / **10 x 100 mL**

WLXRF ASTM Method — Designed for ASTM D6443

Cat. No. Nominal Value	Ca (Wt.%)	Cl (Wt.%)	Cu (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0117-01	0.020	0.030	0.010	0.200	0.250	1.000	0.020
ASTM-P-0117-02	0.020	0.020	0.050	0.200	0.020	0.020	0.250
ASTM-P-0117-03	0.020	0.200	0.010	0.040	0.250	0.150	0.250
ASTM-P-0117-04	0.020	0.200	0.050	0.040	0.020	1.000	0.020
ASTM-P-0117-05	0.400	0.020	0.010	0.040	0.020	1.000	0.250
ASTM-P-0117-06	0.400	0.020	0.050	0.040	0.250	0.020	0.020
ASTM-P-0117-07	0.400	0.200	0.010	0.200	0.020	0.020	0.050
ASTM-P-0117-08	0.400	0.200	0.050	0.200	0.250	1.000	0.250
ASTM-P-0117-09	0.200	0.100	0.025	0.080	0.150	0.500	0.100
ASTM-P-0117-10	0.000	0.000	0.000	0.000	0.000	0.000	0.000

ASTM-P-0118-SET $ 2400 / **10 x 100 mL**

WLXRF ASTM Method — Designed for ASTM D4628, D4927, D4951, D6443

Cat. No. Nominal Value	Ba (Wt.%)	Ca (Wt.%)	Cl (Wt.%)	Cu (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0118-01	0.020	0.020	0.030	0.010	0.200	0.250	1.000	0.020
ASTM-P-0118-02	0.250	0.020	0.020	0.050	0.200	0.020	0.020	0.250
ASTM-P-0118-03	0.020	0.020	0.200	0.010	0.040	0.250	0.150	0.250
ASTM-P-0118-04	0.250	0.020	0.200	0.050	0.040	0.020	1.000	0.020
ASTM-P-0118-05	0.020	0.400	0.020	0.010	0.040	0.020	1.000	0.250
ASTM-P-0118-06	0.250	0.400	0.020	0.050	0.040	0.250	0.020	0.020
ASTM-P-0118-07	0.020	0.400	0.200	0.010	0.200	0.020	0.020	0.050
ASTM-P-0118-08	0.250	0.400	0.200	0.050	0.200	0.250	1.000	0.250
ASTM-P-0118-09	0.130	0.200	0.100	0.025	0.080	0.150	0.500	0.100
ASTM-P-0118-10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Lubricating Oil Standards continued on next page

Lubricating Oil Standards (Continued)

ASTM-P-0119-SET $ 2900 / **22 x 100 mL**

Designed for ASTM D4628, D4927, D4951, D6443

Cat. No. Nominal Value	Ca (Wt.%)	Cl (Wt.%)	Cu (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0119-01	0.300	0.080	0.030	0.060	0.060	0.275	0.060
ASTM-P-0119-02	0.250	0.100	0.000	0.010	0.150	0.000	0.150
ASTM-P-0119-03	0.500	0.000	0.035	0.160	0.150	0.000	0.020
ASTM-P-0119-04	0.350	0.010	0.000	0.120	0.080	0.200	0.000
ASTM-P-0119-05	0.110	0.000	0.015	0.100	0.100	0.300	0.050
ASTM-P-0119-06	0.200	0.100	0.000	0.200	0.050	0.250	0.150
ASTM-P-0119-07	0.000	0.050	0.025	0.000	0.000	0.450	0.020
ASTM-P-0119-08	0.150	0.030	0.000	0.100	0.030	0.400	0.040
ASTM-P-0119-09	0.250	0.150	0.010	0.160	0.000	0.350	0.080
ASTM-P-0119-10	0.110	0.150	0.040	0.005	0.030	0.750	0.150
ASTM-P-0119-11	0.260	0.050	0.000	0.000	0.000	0.750	0.000
ASTM-P-0119-12	0.200	0.000	0.005	0.140	0.080	0.500	0.080
ASTM-P-0119-13	0.000	0.000	0.005	0.020	0.020	0.200	0.020
ASTM-P-0119-14	0.070	0.150	0.020	0.080	0.140	0.650	0.150
ASTM-P-0119-15	0.050	0.000	0.000	0.000	0.150	0.000	0.000
ASTM-P-0119-16	0.400	0.000	0.001	0.080	0.000	0.500	0.020
ASTM-P-0119-17	0.180	0.020	0.020	0.000	0.020	0.600	0.060
ASTM-P-0119-18	0.400	0.010	0.001	0.010	0.020	0.000	0.000
ASTM-P-0119-19	0.010	0.020	0.040	0.010	0.020	0.200	0.100
ASTM-P-0119-20	0.050	0.005	0.050	0.000	0.008	0.000	0.120
ASTM-P-0119-21	0.200	0.050	0.020	0.080	0.050	0.275	0.050
ASTM-P-0119-22	0.000	0.000	0.000	0.000	0.000	0.000	0.000

ASTM-P-0120-SET $ 3100 / **23 x 100 mL**

Cat. No. Nominal Value	Ba (Wt.%)	Ca (Wt.%)	Cl (Wt.%)	Cu (Wt.%)	Mg (Wt.%)	P (Wt.%)	S (Wt.%)	Zn (Wt.%)
ASTM-P-0120-01	0.100	0.300	0.080	0.030	0.060	0.060	0.275	0.060
ASTM-P-0120-02	0.175	0.250	0.100	0.000	0.010	0.150	0.000	0.150
ASTM-P-0120-03	0.040	0.500	0.000	0.035	0.160	0.150	0.000	0.020
ASTM-P-0120-04	0.020	0.350	0.010	0.000	0.120	0.080	0.200	0.000
ASTM-P-0120-05	0.150	0.110	0.000	0.015	0.100	0.100	0.300	0.050
ASTM-P-0120-06	0.000	0.200	0.100	0.000	0.200	0.050	0.250	0.150
ASTM-P-0120-07	0.200	0.000	0.050	0.025	0.000	0.000	0.450	0.020
ASTM-P-0120-08	0.000	0.150	0.030	0.000	0.100	0.030	0.400	0.040
ASTM-P-0120-09	0.000	0.250	0.150	0.010	0.160	0.000	0.350	0.080
ASTM-P-0120-10	0.000	0.110	0.150	0.040	0.005	0.030	0.750	0.150
ASTM-P-0120-11	0.100	0.260	0.050	0.000	0.000	0.000	0.750	0.000
ASTM-P-0120-12	0.050	0.200	0.000	0.005	0.140	0.080	0.500	0.080
ASTM-P-0120-13	0.000	0.000	0.000	0.005	0.020	0.020	0.200	0.020
ASTM-P-0120-14	0.080	0.070	0.150	0.020	0.080	0.140	0.650	0.150
ASTM-P-0120-15	0.010	0.050	0.000	0.000	0.000	0.150	0.000	0.000
ASTM-P-0120-16	0.000	0.400	0.000	0.001	0.080	0.000	0.500	0.020
ASTM-P-0120-17	0.000	0.180	0.020	0.020	0.000	0.020	0.600	0.060
ASTM-P-0120-18	0.000	0.400	0.010	0.001	0.010	0.020	0.000	0.000
ASTM-P-0120-19	0.150	0.010	0.020	0.040	0.010	0.020	0.200	0.100
ASTM-P-0120-20	0.005	0.050	0.005	0.050	0.000	0.008	0.000	0.120
ASTM-P-0120-21	0.100	0.200	0.050	0.020	0.080	0.050	0.275	0.050
ASTM-P-0120-22	0.120	0.200	0.000	0.000	0.000	0.000	0.750	0.000
ASTM-P-0120-23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Standards of Interest

Concentration for the sets on pages 346-348 are targets. Actual production lots may vary.

These products do not require Hazardous Shipping charges at this time.

Metal Working Fluids

ASTM-P-0121-SET $ 1300 / **13 x 100 mL**

Cat. No. Nominal Value	Cl (Wt.%)	P (Wt.%)	S (Wt.%)
ASTM-P-0121-01	0.000	0.000	0.000
ASTM-P-0121-02	0.750	0.025	0.500
ASTM-P-0121-03	0.050	0.100	3.000
ASTM-P-0121-04	1.000	0.500	2.500
ASTM-P-0121-05	0.100	0.005	2.000
ASTM-P-0121-06	1.500	0.200	1.000
ASTM-P-0121-07	2.000	0.005	3.000
ASTM-P-0121-08	1.000	0.050	0.100
ASTM-P-0121-09	0.500	0.400	0.000
ASTM-P-0121-10	2.000	0.200	1.500
ASTM-P-0121-11	0.000	0.500	1.500
ASTM-P-0121-12	1.250	0.010	0.050
ASTM-P-0121-13	0.050	0.300	0.050

Stabilization Solutions

The solutions were specifically designed for chelating & solubilizing our line of Sulfur-Free Organometallic Standards. Contact Tech Service for additional information.

Stabilizer Solution A

ASTM-P-0122-0.5 $ 80 / **50 mL**
ASTM-P-0122-1 $ 120 / **100 mL**

Stabilizer Solution B

ASTM-P-0123-0.5 $ 80 / **50 mL**
ASTM-P-0123-1 $ 120 / **100 mL**

Stabilizer Solution C

ASTM-P-0124-0.5 $ 80 / **50 mL**
ASTM-P-0124-1 $ 120 / **100 mL**

Stabilizer Solution D

ASTM-P-0125-0.5 $ 80 / **50 mL**
ASTM-P-0125-1 $ 120 / **100 mL**