

Quality Control Standards

Real World
Gasoline
D-02.03
D-02.04

AccuPetroCheck and AccuPetroTest Real World Gasoline QC Standards

In cooperation with ASTM D-02 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 D-02.03 and D-02.04 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.

QC

AccuPetroCheck Consensus Value QC Standards

CARB Low Sulfur RFG QC Standard

ASTM-FUEL-QCS-01-PAK		5 x 15 mL	
Parameter	Method	Value	Conc.
Total Aromatics	D-1319	24.5	Vol.%
Total Olefins	D-1319	5.3	Vol.%
Total Saturates	D-1319	58.3	Vol.%
Sulfur	D-2622	0.0057	Wt.%
Sulfur	D-4294	0.0078	Wt.%
Sulfur	D-5453	55.76	µg/g
Sulfur	D-6344	59.31	µg/g
Benzene	D-5769	0.80	Vol.%
Toluene	D-5769	4.92	Vol.%
Total Aromatics	D-5769	23.42	Vol.%
Benzene	D-6277	0.78	Vol.%
Total Olefins	D-6550	5.3	Vol.%

Conventional Gasoline QC Standard

ASTM-FUEL-QCS-02-PAK		5 x 15 mL	
Parameter	Method	Value	Conc.
Total Aromatics	D-1319	34.6	Vol.%
Total Olefins	D-1319	12.4	Vol.%
Total Saturates	D-1319	62.8	Vol.%
Sulfur	D-2622	0.0338	Wt.%
Sulfur	D-4294	0.0368	Wt.%
Sulfur	D-5453	317.36	µg/g
Sulfur	D-6344	338.78	µg/g
Benzene	D-5769	0.55	Vol.%
Toluene	D-5769	5.53	Vol.%
Total Aromatics	D-5769	32.51	Vol.%
Benzene	D-6277	0.52	Vol.%
Total Olefins	D-6550	12.4	Vol.%

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		2 x 15 mL	
Parameter	Method	Approx. Range	
Sulfur		20 - 11000 µg/g	

See ASTM Methods D-2622, D-3120, D-3246-92, D-4294, D-5453 for Sulfur Calibration Standards

Sulfur in White Mineral Oil QC Standard

SBPT-SWMO		2 x 15 mL	
Parameter	Method	Approx. Range	
Sulfur		20 - 11000 µg/g	

See ASTM Methods D-2622, D-3120, D-3246-92, D-4294, D-5453 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		2 x 15 mL	
Parameter	Method	Approx. Range	
Sulfur	D-5453	0 - 50 µg/g	

Olefin QC Sample

SBPT-OLEFINSFC		2 x 15 mL	
Parameter	Method	Approx. Range	
Total Olefins	D-6550	1 - 40 Vol.%	

AccuPetroTest Gasoline

Comprehensive Single Blind Gasoline QC Sample

SBPT-COMP		2 x 15 mL	
Parameter	Method	Approx. Range	Conc.
Total Aromatics	D-1319	8 - 60	Vol.%
Total Olefins	D-1319	1 - 40	Vol.%
Total Saturates	D-1319	30 - 80	Vol.%
Sulfur	D-2622	0.0001 - 0.0930	Wt.%
Sulfur	D-4294	0.0016 - 0.0930	Wt.%
Sulfur	D-5453	0.5 - 500	µg/g
Sulfur	D-6344	1.0 - 1000	µg/g
Benzene	D-5769	0.1 - 2.0	Vol.%
Toluene	D-5769	1.0 - 15	Vol.%
Total Aromatics	D-5769	8 - 60	Vol.%
Benzene	D-6277	0.1 - 2.0	Vol.%
Total Olefins	D-6550	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 Standards

QC

AccuPetroTest Gasoline QC

Olefins QC Sample SBPT-OLEFIN 2 x 15 mL <table border="1"> <thead> <tr> <th>Parameter</th> <th>Method</th> <th>Approx. Range</th> </tr> </thead> <tbody> <tr> <td>Total Aromatics</td> <td>D-1319</td> <td>8-60 Vol.%</td> </tr> <tr> <td>Total Olefins</td> <td>D-1319</td> <td>1 - 40 Vol.%</td> </tr> <tr> <td>Total Saturates</td> <td>D-1319</td> <td>30-80 Vol. %</td> </tr> </tbody> </table> See ASTM Method D-1319 for Sulfur Calibration Standards			Parameter	Method	Approx. Range	Total Aromatics	D-1319	8-60 Vol.%	Total Olefins	D-1319	1 - 40 Vol.%	Total Saturates	D-1319	30-80 Vol. %	Sulfur QC Sample SBPT-SGAS 2 x 15 mL <table border="1"> <thead> <tr> <th>Parameter</th> <th>Method</th> <th>Approx. Range</th> </tr> </thead> <tbody> <tr> <td>Sulfur</td> <td>D-2622</td> <td>0.0001 - 0.0930 Wt.%</td> </tr> <tr> <td>Sulfur</td> <td>D-4294</td> <td>0.0016 - 0.0930 Wt.%</td> </tr> <tr> <td>Sulfur</td> <td>D-5453</td> <td>4.0 - 500 µg/g</td> </tr> <tr> <td>Sulfur</td> <td>D-6344</td> <td>1.0 - 1000 µg/g</td> </tr> </tbody> </table> See ASTM Methods D-2622, D-3120, D-3246-92, D-4294, D-5453 for Sulfur Calibration Standards			Parameter	Method	Approx. Range	Sulfur	D-2622	0.0001 - 0.0930 Wt.%	Sulfur	D-4294	0.0016 - 0.0930 Wt.%	Sulfur	D-5453	4.0 - 500 µg/g	Sulfur	D-6344	1.0 - 1000 µg/g
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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 D-02 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 D-02 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 now 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 new Oxygenate PT samples and standards allow your Lab to:

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

WS-PT Oxygenates

OPE-OXY-001-AS *	2 mL
OPE-OXY-001-AT *	2 mL
OPE-OXY-001-AV *	2 mL

Sample conc. after prep 5.0-50 µg/L
Contains 4 analytes listed below

ETBE	MTBE
Diisopropylether	TAME

Suggested Calibration Standard

Oxygenate Gasoline Additive Standard

OGAD-001		1 x 1 mL
OGAD-001-PAK	SAVE 20%	5 x 1 mL
At stated conc. in MeOH		
MtBE (2000 µg/mL)	TAME (2000 µg/mL)	
ETBE (2000 µg/mL)	t-Butanol (10000 µg/mL)	
Isopropyl ether (2000 µg/mL)		

WP-PT Oil, Grease & TPH

IPE-OILG-001-AS *	5 mL
IPE-OILG-001-AT *	5 mL
IPE-OILG-001-AV *	5 mL

Sample conc. after prep

Contains 2 analytes listed below

* Designed for NELAC/CA

Analyte List	Sample range	† Indicates that these analytes are included in the NVLAP Scope of Accreditation, Lab Code 200389-0
Total Oil & Grease †	5-100 mg/L	
TPH	5-100 mg/L	

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.

Suggested Calibration Standard

Oil and Grease

WC-OILG-10X-1	100 mL
1000 µg/mL Total Oil and Grease in n-Propanol	
Contains 500 µg/mL vegetable oil and 500 µg/mL of petroleum oil. Shake well before use.	

SUFFIX KEY

- *AS = Formal PT Study
- *AT = Pre-Test
- *AV = Values Included



Physical Properties

Method 56, 92, 93



86
445

QC

ASTM

ASTM D-56, D-92, D-93 Flash Point Standards

Verified by consensus analysis using ASTM Method # referenced

Originally designed for
ASTM D-56-98a,
D-92-98a, D-93-99b

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

Certified Flash Point Standards

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

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

ASTM D-86 Synthetic Distillation Standard

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 D-86 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) and are verified by consensus analysis with twelve refinery laboratories. The group 4 standard covers the range from 410 - 670 °F (210 - 355 °C). Products are packaged in convenient sizes to meet your laboratory sample analysis demands.

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

Originally designed for
ASTM D-86-99a

ASTM D-92 & ASTM D-93 Flash & Fire Points by Cleveland Open Cup (COC) & Flash Point by Pensky Martin Closed Cup (PMCC)

See Method D-56 on this page for the comprehensive line of flash point standards

ASTM D-445 Viscosity Calibration Standards

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

Originally designed for
ASTM D-445-97

Technical Note

Oils are tested in accordance with ASTM D-445

Standards of Interest

Also see Cloud Point Standards used for ASTM Method D-2500 on page 5



Physical Properties

ASTM

ASTM D-611 (Reapproved 1998) 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 D-611 (Method A) and ASTM D-611 (Method E). Standards are packaged in 20 mL ampules in an inert atmosphere.

Cat. No.	Nominal Aniline Point	Unit
D-611-SET	Set include 5 Standards listed below Aniline Point Verification Set Method 611(A)	5 x 20 mL
D-611-01	0°C	20 mL
D-611-02	30°C	20 mL
D-611-03	55°C	20 mL
D-611-04	68°C	20 mL
D-611-05	94°C	20 mL
D-611E-SET	Set include 3 Standards listed below Aniline Point Verification Set Method 611(E)	3 x 20 mL
D-611E-01	43°C	20 mL
D-611E-02	62°C	20 mL
D-611E-03	77°C	20 mL
ASTM-P-134-PAK	Pure Aniline	5 x 15 mL

Originally designed for D-611-82

Technical Note

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

ASTM D-1015 Freezing Points of High Purity Hydrocarbons

See Method D-2386 page 5 for AccuStandard's new line of Freezing Point Standards

ASTM D-1319 Calibration Standards by Fluorescent Indicator Adsorption FIA

Olefin FIA Calibration Curve

FIA-CAL-SET

Set of 7 x 1 mL

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

Originally designed for D-1319-99

FIA Paraffin Standard

FIA-PAR

FIA-PAR-5ML

1 x 1 mL

1 x 5 mL

8 comps.

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

FIA Olefin Standard

FIA-OLE

FIA-OLE-5ML

1 x 1 mL

1 x 5 mL

3 comps.

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

FIA Aromatic Standard

FIA-ARO

FIA-ARO-5ML

1 x 1 mL

1 x 5 mL

10 comps.

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

Standards of Interest

For the mandatory real world QC samples stipulated in the Method, see page 1-2

Technical Note

The following set of 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 final certificate for the FIA calibration curve lists not only the volume percents for the hydrocarbon types, but also the individual volume percents for each analyte in the functional group.

To further assist the Petrochemist, the weight fraction for each hydrocarbon type and individual analyte is listed on the final certificate. By providing the individual weights the Petrochemical chemist can use the FIA standards for other types of instrumentation measuring these Petroleum fractions.

Physical Properties

Method



1744-
6304
2386
2500

ASTM

ASTM D-1744, E-1064, D-4377 D-4928, D-6304

Water in Liquid Petroleum Products by Karl Fischer

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

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

Technical Note

Many ASTM Petrochemical methods and specifications reference using QA/QC standards for water content measurements. AccuStandard has formulated a comprehensive range of water standards packaged in convenient sizes to meet the various referenced methods.

ASTM D-2386

Freezing Point Calibration Standards

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

Originally designed for D-2386-97

Technical Note

Verified by consensus analysis by ASTM Method D-2386

ASTM D-2500

Cloud Point Calibration Standards

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

Originally designed for D-2500-00

Technical Note

Verified by consensus analysis by ASTM Method D-2500



Sulfur Standards

D-2622-98, D-3120-96, D-3246-96, D-4294-98, D-5453-00, D-6334-98, D-6445-99 & Proposed ASTM Sulfur Methods
AccuStandard offers the Petroleum Industry the most complete line of calibration standards designed for today's Proposed & Promulgated test methods for Sulfur analysis. These calibration 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 & residual oil.

Traceability, Quality and Certification

All Sulfur standards are manufactured from the highest quality raw materials, including well characterized starting materials & the lowest sulfur matrices available from the Petrochemical market. 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 under test No. 822/254480. The concentration of these working level Sulfur standards have established traceability links to NIST SRM's where available.

Convenient Packaging

Since applicable concentration ranges will vary based on the instrumentation used & the nature of the sample the standards can be ordered as complete sets, individual bottles, or Ready-to-Aspirate AccuShots.

AccuShots... Packaged to improve analytical standard integrity

AccuStandard is the first standard manufacturer to provide sulfur standards in convenient and Ready-to-Aspirate AccuShot 20 mL sealed ampules. Each 20 mL AccuShot provides the necessary material for calibration curve development or daily QA/QC. By purchasing AccuShots the analytical chemist can open a fresh shot for each analysis which eliminates opening and pipetting repeatedly from a stock bottle. This minimizes contamination and evaporation. These ship with no haz fee for additional savings.

ASTM D-5453

Test to Low ppb Sulfur

Contact us for a copy of the
Southwest Research Institute
D-5453 Fitness for Use Report

Low Sulfur Standards on following pages

Analytical Capabilities

MWD XRF Sulfur Analyzer

in Diesel and Gasoline Fuels



X-Ray Optical Systems, Inc.
15 Tech Valley Drive
East Greenbush, NY 12061
Tel. 518-880-1500
website: www.xos.com

XOS SINDIE Analyzer

X-Ray optics enable detection capability well beyond traditional XRF techniques. The same Monochromatic WD XRF technology of the SINDIE bench-top sulfur analyzer is available in an on-line sulfur analyzer.

- Limits of Detection < 1 ppm
- Fast and easy sample preparation.
- Typical measurement time: 300 sec.
- Dynamic range: 0-1000 ppm in one calibration.
- No sample conversion or reagents required.
- Exceptional signal-to-background provides high sensitivity for low-level sulfur fuels

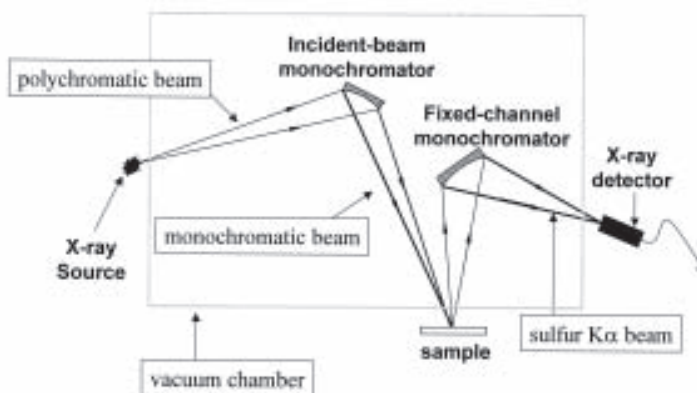
SULFUR

SULFUR ANALYSIS IN ULTRA LOW SULFUR FUELS

Repeatability:

1 ppm	0.5 ppm
10 ppm	1.7 ppm
100 ppm	5.3 ppm
500 ppm	11.7 ppm

Monochromatic WDXRF Technology





Sulfur Standards

ASTM Methods

Sulfur Standards for ASTM D-2622, D-3120, D-3246, D-4294, D-5453, D-6334, D-6445 & Proposed ASTM Sulfur Methods

ASTM
SULFUR

ASTM Methods Sulfur in Mineral Oil

Sulfur in Heavy Weight Mineral Oil (75 cSt)				Sulfur in Light Weight Mineral Oil (20 cSt)			
Concentration		Sulfur in White Mineral Oil	Ready-to-Use Sulfur AccuShots	Concentration		Sulfur in White Mineral Oil	Ready-to-Use Sulfur AccuShots
µg/g	Wt. %	Cat. No.	Cat. No.	µg/g	Wt. %	Cat. No.	Cat. No.
Blank	0.000	SWMO-BL-4	SWMO-BL-SHOT	Blank	0.000	SWMO-LT-BL-4	SWMO-LT-BL-SHOT
100	0.010	SWMO-1X-4	SWMO-1X-SHOT	100	0.010	SWMO-LT-1X-4	SWMO-LT-1X-SHOT
200	0.020	SWMO-2X-4	SWMO-2X-SHOT	200	0.020	SWMO-LT-2X-4	SWMO-LT-2X-SHOT
300	0.030	SWMO-3X-4	SWMO-3X-SHOT	300	0.030	SWMO-LT-3X-4	SWMO-LT-3X-SHOT
400	0.040	SWMO-4X-4	SWMO-4X-SHOT	400	0.040	SWMO-LT-4X-4	SWMO-LT-4X-SHOT
500	0.050	SWMO-5X-4	SWMO-5X-SHOT	500	0.050	SWMO-LT-5X-4	SWMO-LT-5X-SHOT
750	0.075	SWMO-7.5X-4	SWMO-7.5X-SHOT	750	0.075	SWMO-LT-7.5X-4	SWMO-LT-7.5X-SHOT
1,000	0.10	SWMO-10X-4	SWMO-10X-SHOT	1,000	0.10	SWMO-LT-10X-4	SWMO-LT-10X-SHOT
1,500	0.15	SWMO-15X-4	SWMO-15X-SHOT	1,500	0.15	SWMO-LT-15X-4	SWMO-LT-15X-SHOT
2,000	0.20	-----	-----	2,000	0.20	-----	-----
3,000	0.30	SWMO-30X-4	SWMO-30X-SHOT	3,000	0.30	SWMO-LT-30X-4	SWMO-LT-30X-SHOT
4,000	0.40	-----	-----	4,000	0.40	-----	-----
5,000	0.50	SWMO-50X-4	SWMO-50X-SHOT	5,000	0.50	SWMO-LT-50X-4	SWMO-LT-50X-SHOT
7,000	0.70	SWMO-70X-4	SWMO-70X-SHOT	7,000	0.70	SWMO-LT-70X-4	SWMO-LT-70X-SHOT
10,000	1.00	SWMO-100X-4	SWMO-100X-SHOT	10,000	1.00	SWMO-LT-100X-4	SWMO-LT-100X-SHOT
15,000	1.50	SWMO-150X-4	SWMO-150X-SHOT	15,000	1.50	SWMO-LT-150X-4	SWMO-LT-150X-SHOT
20,000	2.00	SWMO-200X-4	SWMO-200X-SHOT	20,000	2.00	SWMO-LT-200X-4	SWMO-LT-200X-SHOT
30,000	3.00	SWMO-300X-4	SWMO-300X-SHOT	30,000	3.00	SWMO-LT-300X-4	SWMO-LT-300X-SHOT
40,000	4.00	SWMO-400X-4	SWMO-400X-SHOT	40,000	4.00	SWMO-LT-400X-4	SWMO-LT-400X-SHOT
50,000	5.00	SWMO-500X-4	SWMO-500X-SHOT	50,000	5.00	SWMO-LT-500X-4	SWMO-LT-500X-SHOT
60,000	6.00	SWMO-600X-4	SWMO-600X-SHOT	60,000	6.00	SWMO-LT-600X-4	SWMO-LT-600X-SHOT
Set of above		SWMO-CAL-SET-4	Each AccuShot product contains 5 x 20 mL ampules at the stated conc.	Set of above		SWMO-LT-CAL-SET-4	Each AccuShot product contains 5 x 20 mL ampules at the stated conc.
Cat. No.'s		19 x 4 oz.		Cat. No.'s		19 x 4 oz.	
Individual Sulfur		1 -10 units	Standards 4 oz Bottle	Individual Sulfur		1 -10 units	Standards 4 oz Bottle
		10 +units				10 +units	

ASTM Methods Sulfur in #2 Diesel Fuel

Concentration		Sulfur in #2 Diesel Fuel	Ready-to-Use Sulfur AccuShots
µg/g	Wt. %	Cat. No.	Cat. No.
Blank	0.000	SDF-BL-4	SDF-BL-SHOT
100	0.010	SDF-1X-4	SDF-1X-SHOT
200	0.020	SDF-2X-4	SDF-2X-SHOT
300	0.030	SDF-3X-4	SDF-3X-SHOT
400	0.040	SDF-4X-4	SDF-4X-SHOT
500	0.050	SDF-5X-4	SDF-5X-SHOT
750	0.075	SDF-7.5X-4	SDF-7.5X-SHOT
1,000	0.10	SDF-10X-4	SDF-10X-SHOT
1,500	0.15	SDF-15X-4	SDF-15X-SHOT
2,000	0.20	-----	-----
3,000	0.30	SDF-30X-4	SDF-30X-SHOT
4,000	0.40	-----	-----
5,000	0.50	SDF-50X-4	SDF-50X-SHOT
7,000	0.70	SDF-70X-4	SDF-70X-SHOT
10,000	1.00	SDF-100X-4	SDF-100X-SHOT
15,000	1.50	SDF-150X-4	SDF-150X-SHOT
20,000	2.00	SDF-200X-4	SDF-200X-SHOT
30,000	3.00	SDF-300X-4	SDF-300X-SHOT
40,000	4.00	SDF-400X-4	SDF-400X-SHOT
50,000	5.00	SDF-500X-4	SDF-500X-SHOT
60,000	6.00	SDF-600X-4	SDF-600X-SHOT
Set of above		SDF-CAL-SET-4	Each AccuShot product contains 5 x 20 mL ampules at the stated conc.
Cat. No.'s		19 x 4 oz.	
Individual Sulfur		1 -10 units	Standards 4 oz Bottle
		10 +units	

Ready-to-Use

AccuShots... Packaged to improve analytical standard integrity

AccuStandard is the first standard manufacturer to provide sulfur standards in convenient and Ready-to-Aspirate AccuShot 20 mL sealed ampules. Each 20 mL AccuShot provides the necessary material for calibration curve development or daily QA/QC. By purchasing AccuShots the analytical chemist can open a fresh shot for each analysis which eliminates opening and pipetting repeatedly from a stock bottle. This minimizes contamination and evaporation. These ship with no haz fee for additional savings.

Technical Note

Sulfur conc. calculated from % sulfur in di-n-butyl sulfide

Cross Reference Table

ASTM IP ISO DIN JIS AFNOR sorted by
ASTM Method see beginning of Catalog

Sulfur Standards

ASTM Methods



Sulfur Standards for ASTM D-2622, D-3120, D-3246, D-4294, D-5453, D-6334, D-6445 & Proposed ASTM Sulfur Methods

ASTM Methods Sulfur in Kerosene

Sulfur in Light Distillate Kerosene				Sulfur in Heavy Distillate Kerosene			
Concentration		Sulfur in Light Distillate Kerosene	Ready-to-Use Sulfur AccuShots	Concentration		Sulfur in Heavy Distillate Kerosene	
µg/g	Wt. %	Cat. No.	Cat. No.	µg/g	Wt. %	Cat. No.	
Blank	0.000	SK-BL-4	SK-BL-SHOT	Blank	0.000	SK-HD-BL-4	
100	0.010	SK-1X-4	SK-1X-SHOT	100	0.010	SK-HD-1X-4	
200	0.020	-----		200	0.020	SK-HD-2X-4	
300	0.030	SK-3X-4	SK-3X-SHOT	300	0.030	SK-HD-3X-4	
400	0.040	-----		400	0.040	SK-HD-4X-4	
500	0.050	SK-5X-4	SK-5X-SHOT	500	0.050	SK-HD-5X-4	
750	0.075	SK-7.5X-4	SK-7.5X-SHOT	750	0.075	SK-HD-7.5X-4	
1,000	0.10	SK-10X-4	SK-10X-SHOT	1,000	0.10	SK-HD-10X-4	
1,500	0.15	-----		1,500	0.15	SK-HD-15X-4	
2,000	0.20	SK-20X-4	SK-20X-SHOT	2,000	0.20	SK-HD-20X-4	
3,000	0.30	SK-30X-4	SK-30X-SHOT	3,000	0.30	SK-HD-30X-4	
4,000	0.40	SK-40X-4	SK-40X-SHOT	4,000	0.40	SK-HD-40X-4	
5,000	0.50	SK-50X-4	SK-50X-SHOT	5,000	0.50	SK-HD-50X-4	
7,000	0.70	-----		7,000	0.70	SK-HD-70X-4	
10,000	1.00	SK-100X-4	SK-100X-SHOT	10,000	1.00	SK-HD-100X-4	
15,000	1.50	-----		15,000	1.50	SK-HD-150X-4	
20,000	2.00	SK-200X-4	SK-200X-SHOT	20,000	2.00	SK-HD-200X-4	
30,000	3.00	-----		30,000	3.00	SK-HD-300X-4	
40,000	4.00	-----		40,000	4.00	SK-HD-400X-4	
50,000	5.00	-----		50,000	5.00	SK-HD-500X-4	
60,000	6.00	-----		60,000	6.00	SK-HD-600X-4	
Set of above Cat. No.'s		SK-CAL-SET-4 12 x 4 oz.	Each AccuShot product contains 5 x 20 mL ampules at the stated conc.	Set of above Cat. No.'s		SK-HD-CAL-SET-4 21 x 4 oz.	
Individual Sulfur Standards 4 oz Bottle		1 -10 units 10 +units		Individual Sulfur Standards 4 oz Bottle		1 -10 units 10 +units	

Technical Note

Sulfur concentration calculated from % sulfur in di-*n*-butyl sulfide.

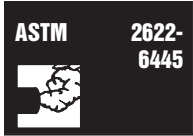
Standards of Interest

For the mandatory real world QC samples stipulated in the Method, see pages 1- 2.

ASTM

SULFUR





Sulfur Standards

ASTM Methods

ASTM

SULFUR

ASTM D-2622, D-4294 Sulfur Calibration Standards

Sulfur Calibration Standards in Isooctane for Gasoline & Reformulated Gasoline Analysis

Originally designed for
D-2622-98
D-4294-98

Cat. No.	Sulfur Conc.	Sulfur Wt. %	Unit
STP-BL-4	Blank	0.0	4 oz.
STP-1X-4	10 µg/g	0.001	4 oz.
STP-2X-4	20 µg/g	0.002	4 oz.
STP-3X-4	30 µg/g	0.003	4 oz.
STP-5X-4	50 µg/g	0.005	4 oz.
STP-10X-4	100 µg/g	0.010	4 oz.
STP-20X-4	200 µg/g	0.020	4 oz.
STP-30X-4	300 µg/g	0.030	4 oz.
STP-40X-4	400 µg/g	0.040	4 oz.
STP-60X-4	600 µg/g	0.060	4 oz.
STP-100X-4	1000 µg/g	0.10	4 oz.
STP-200X-4	2000 µg/g	0.20	4 oz.
STP-300X-4	3000 µg/g	0.30	4 oz.

STP-CAL-SET set of 13 x 4 oz.
In Isooctane Set contains the above 13 individual bottles

Technical Note

A well characterized di-*n*-butyl sulfide starting mat'l is used with a low sulfur Isooctane matrix for RFG/gasoline sulfur standards.

ASTM D-2622, D-6334, D-6445 Low Level Sulfur Calibration Standards

Low Level Sulfur Calibration Standards for use on XRF Energy Dispersive or Wavelength Instruments

Originally designed for
D-2622-98
D-6334-98
D-6445-99

Cat. No.	Sulfur Conc.	Sulfur Wt. %	Unit
D-2622-LL-BL-4	Blank	0.0	4 oz.
D-2622-LL-5X-4	5 µg/g	0.0005	4 oz.
D-2622-LL-10X-4	10 µg/g	0.0010	4 oz.
D-2622-LL-30X-4	30 µg/g	0.0030	4 oz.
D-2622-LL-50X-4	50 µg/g	0.0050	4 oz.
D-2622-LL-75X-4	75 µg/g	0.0075	4 oz.
D-2622-LL-100X-4	100 µg/g	0.010	4 oz.
D-2622-LL-300X-4	300 µg/g	0.030	4 oz.
D-2622-LL-500X-4	500 µg/g	0.050	4 oz.
D-2622-LL-1000X-4	1000 µg/g	0.100	4 oz.

D-2622-LL-CAL-SET 10 x 4 oz.
In Isooctane : Toluene (3:1)
Set contains the above 10 individual bottles

Technical Note

Well characterized Thiophene & 2-Methyl thiophene are used in a low sulfur Isooctane/Toluene matrix for this calibration set.

ASTM D-3120, D-3246 Sulfur Calibration Set

Sulfur Calibration Set

D-3120-92-CAL-SET set of 8 x 1 mL
In Isooctane

Cat. No.	Sulfur Conc.	Sulfur Wt. %	Originally designed for
D-3120-92-BL	Blank	0.0001	D-3120-96
D-3120-92-1X	1 µg/g	0.0003	D-3246-96
D-3120-92-3X	3 µg/g	0.0010	
D-3120-92-10X	10 µg/g	0.0030	
D-3120-92-30X	30 µg/g	0.0050	
D-3120-92-50X	50 µg/g	0.0075	
D-3120-92-75X	75 µg/g	0.010	
D-3120-92-100X	100 µg/g		

Technical Note

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

Standards of Interest

For the mandatory real world QC samples stipulated in many ASTM Sulfur Methods, see page 1-2

ASTM D-2622, D-6334, D-6445 Mid Level Sulfur Calibration Standards

New Requested Additions for use on XRF Energy Dispersive or Wavelength Instruments

Originally designed for
D-2622-98
D-6334-98
D-6445-99

Cat. No.	Sulfur Conc.	Sulfur Wt. %	Unit
D-2622-LL-200X-4	200 µg/g	0.020	4 oz.
D-2622-LL-400X-4	400 µg/g	0.040	4 oz.
D-2622-LL-600X-4	600 µg/g	0.060	4 oz.
D-2622-LL-700X-4	700 µg/g	0.070	4 oz.
D-2622-LL-800X-4	800 µg/g	0.080	4 oz.
D-2622-LL-900X-4	900 µg/g	0.090	4 oz.
D-2622-LL-1100X-4	1100 µg/g	0.110	4 oz.
D-2622-LL-1200X-4	1200 µg/g	0.120	4 oz.

Technical Note

Well characterized Thiophene & 2-Methyl thiophene are used in a low sulfur Isooctane/Toluene matrix for this calibration set.



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, ext. 117 for an updated product.

Sulfur Standards

ASTM Methods

ASTM

2789



Sulfur Standards for ASTM D-2622, D-3120, D-3246, D-4294, D-5453, D-6334, D-6445 & Proposed ASTM Sulfur Methods

ASTM Methods Sulfur Calibration Standards

Sulfur in Crude Oil Standards			Sulfur in Residual Oil Standards		
Concentration	Sulfur in Crude Oil		Concentration	Sulfur in Crude Oil	
µg/g	Wt. %	Cat. No.	µg/g	Wt. %	Cat. No.
1,000	0.10	SCO-10X-4	3,500	0.35	SRO-35X-4
2,500	0.25	SCO-25X-4	7,000	0.70	SRO-70X-4
5,000	0.50	SCO-50X-4	10,000	1.00	SRO-100X-4
10,000	1.00	SCO-100X-4	15,000	1.50	SRO-150X-4
20,000	2.00	SCO-200X-4	20,000	2.00	SRO-200X-4
30,000	3.00	SCO-300X-4	30,000	3.00	SRO-300X-4
40,000	4.00	SCO-400X-4	40,000	4.00	SRO-400X-4
50,000	5.00	SCO-500X-4			
Set of above		SCO-CAL-SET-4	Set of above		SRO-CAL-SET-4
Cat. No.'s		8 x 4 oz.	Cat. No.'s		7 x 4 oz.
Individual Sulfur Standards 4 oz Bottle		1 -10 units 10 +units	Individual Sulfur Standards 4 oz Bottle		1 -10 units 10 +units

Technical Note

AccuStandard's Technical Service Dept. can provide **Ready-to-Inject** working level calibration standards to meet unique laboratory applications. Call or fax us your standard requirements.

ASTM

SULFUR

ASTM Methods Sulfur Standards

<p>Total Sulfur in Aromatic Compounds by Hydrogenolysis & Rateometric Colorimetry</p> <p>ASTM-P-0010-PAK 1000 µg/mL in Toluene Sulfur (as Thiophene)</p> <p>5 x 1 mL</p>	<p>Trace Quantities of Sulfur in Liquid Aromatic Hydrocarbons by Oxidative Microcoulometry</p> <p>ASTM-P-0020-PAK 1000 µg/mL in Xylenes Sulfur (as Dibenzothiophene)</p> <p>5 x 1 mL</p>																																	
<p>ASTM-SSTD-A/B-SET 10 x 2 mL The set contains the following 10 standards in isooctane</p> <table border="1"> <thead> <tr> <th>Cat. No.</th> <th>Description</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>ASTM-SSTD-A-BL</td> <td>Sulfur Blank</td> <td>2 mL</td> </tr> <tr> <td>ASTM-SSTD-A-01</td> <td>Sulfur @ 0.5 µg/g in Isooctane</td> <td>2 mL</td> </tr> <tr> <td>ASTM-SSTD-A-02</td> <td>Sulfur @ 1.0 µg/g in Isooctane</td> <td>2 mL</td> </tr> <tr> <td>ASTM-SSTD-A-03</td> <td>Sulfur @ 2.5 µg/g in Isooctane</td> <td>2 mL</td> </tr> <tr> <td>ASTM-SSTD-A-04</td> <td>Sulfur @ 5.0 µg/g in Isooctane</td> <td>2 mL</td> </tr> <tr> <td>ASTM-SSTD-B-BL</td> <td>Sulfur Blank</td> <td>2 mL</td> </tr> <tr> <td>ASTM-SSTD-B-04</td> <td>Sulfur @ 5.0 µg/g in Isooctane</td> <td>2 mL</td> </tr> <tr> <td>ASTM-SSTD-B-05</td> <td>Sulfur @ 10.0 µg/g in Isooctane</td> <td>2 mL</td> </tr> <tr> <td>ASTM-SSTD-B-06</td> <td>Sulfur @ 25.0 µg/g in Isooctane</td> <td>2 mL</td> </tr> <tr> <td>ASTM-SSTD-B-07</td> <td>Sulfur @ 50.0 µg/g in Isooctane</td> <td>2 mL</td> </tr> </tbody> </table>		Cat. No.	Description	Unit	ASTM-SSTD-A-BL	Sulfur Blank	2 mL	ASTM-SSTD-A-01	Sulfur @ 0.5 µg/g in Isooctane	2 mL	ASTM-SSTD-A-02	Sulfur @ 1.0 µg/g in Isooctane	2 mL	ASTM-SSTD-A-03	Sulfur @ 2.5 µg/g in Isooctane	2 mL	ASTM-SSTD-A-04	Sulfur @ 5.0 µg/g in Isooctane	2 mL	ASTM-SSTD-B-BL	Sulfur Blank	2 mL	ASTM-SSTD-B-04	Sulfur @ 5.0 µg/g in Isooctane	2 mL	ASTM-SSTD-B-05	Sulfur @ 10.0 µg/g in Isooctane	2 mL	ASTM-SSTD-B-06	Sulfur @ 25.0 µg/g in Isooctane	2 mL	ASTM-SSTD-B-07	Sulfur @ 50.0 µg/g in Isooctane	2 mL
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ASTM D-2789 Hydrocarbon Types in Low Olefinic Gas by MS

<p>Composition Test Mix</p> <p>D-2789-CTM D-2789-CTM-PAK</p> <p>1 x 1 mL 5 x 1 mL 9 comps.</p> <p>Originally designed for D-2789-95</p>	<p>SAVE 20%</p>																								
<table border="1"> <thead> <tr> <th></th> <th>(Vol. %)</th> <th></th> <th>(Vol. %)</th> </tr> </thead> <tbody> <tr> <td>2-Methylpentane</td> <td>7.2</td> <td>cis-1,2-Dimethylcyclohexane</td> <td>15.5</td> </tr> <tr> <td>2,4-Dimethylpentane</td> <td>9.4</td> <td>Benzene</td> <td>7.7</td> </tr> <tr> <td>n-Octane</td> <td>16.6</td> <td>Toluene</td> <td>10</td> </tr> <tr> <td>Methylcyclopentane</td> <td>7.1</td> <td>p-Xylene</td> <td>16.5</td> </tr> <tr> <td>Methylcyclohexane</td> <td>10</td> <td></td> <td></td> </tr> </tbody> </table>		(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			
	(Vol. %)		(Vol. %)																						
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Methylcyclopentane	7.1	p-Xylene	16.5																						
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Technical Note

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

PIANO, PONA, PNA

PIANO

PIANO
PONA
PNA

AccuStandard has introduced the **PIANO** line of quantitative and qualitative Petrochemical Standards for class type analysis of petrochemical samples or product streams. **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.

Mini Inert Valves Seal

The **PIANO** standards are supplied in convenient to use crimp top vials with Viton septa that resist mineral oil, aliphatic, aromatics hydrocarbons, and higher temperatures. Mini inert valve seals are available for an additional \$1.00. To order, add "-MIV" to any of the **PIANO** catalog numbers on this page.



PIANO, PONA, PNA Analysis

PIANO Mixture

ASTM-P-0030

100 µL
135 comps.

The PIANO formulation contains the *n*-Paraffins, Isoparaffins, Aromatics, Naphthenes, and Olefins from the five Cat. No.'s: **ASTM-P-0031, ASTM-P-0032, ASTM-P-0033, ASTM-P-0034, ASTM-P-0035**

Approximate weight percentages for the total: *n*-Paraffins 18.5%, Isoparaffins 17.9%, Aromatics 23.6%, Naphthenes 20.9%, Olefins 19.0%.

The actual certificate will list the weight % for all analytes in the formulation.

High Aromatic PIAN Blend

ASTM-P-0037

100 µL
110 comps.

High Aromatic blend contains the PIAN components blended to resemble a reformat. The actual certificate will have the exact weight % for each analyte accurate to four decimal places. Analyte list is drawn from Cat. No.'s: **ASTM-P-0031, ASTM-P-0032, ASTM-P-0033, ASTM-P-0034**

Low Aromatic PIAN Blend

ASTM-P-0036

100 µL
110 comps.

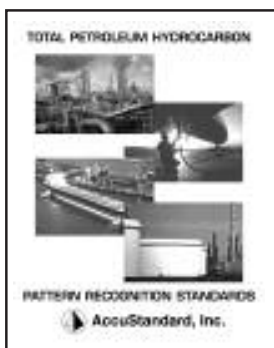
Low Aromatic blend contains the PIAN components blended to resemble a light naphtha. The actual certificate will have the exact weight % for each analyte accurate to four decimal places. Analyte list is drawn from Cat. No.'s: **ASTM-P-0031, ASTM-P-0032, ASTM-P-0033, ASTM-P-0034**

Standards of Interest

For individual PIANO descriptions see next page

PIANO

AccuStandard, Your Standards and Technical Information Source!



Total Petroleum Hydrocarbon Pattern Recognition Standards

BOOK-TPH



Analytical Standards and Reference Material for all 209 PCB Congeners

S-3571

PIANO, PONA, PNA

PIANO
PONA
PNA

PIANO

PIANO, PONA, PNA Analysis

PIANO Mix Set

ASTM-PIANO-SET 6 x 100 µL
Set includes the following Cat. No.:
**ASTM-P-0030, ASTM-P-0031, ASTM-P-0032,
ASTM-P-0033, ASTM-P-0034, ASTM-P-0035**

Special Packaging

Mini inert valve seals are available for an additional via.
To order, add "-MIV" to any of the PIANO cat.# on this page.



PIANO n-Paraffins Mix

ASTM-P-0031 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 100 µL
35 Isoparaffins listed below at varying Wt. % typically in the range from 0.5 to 6.0 Wt. %. The actual certificate will have the exact Wt. % for each analyte.

	Typ. Wt. %		Typ. Wt. %		Typ. Wt. %
Isopentane	2.1928	2,2-Dimethylhexane	1.3061	2,3-Dimethylheptane	1.4870
2,3-Dimethylbutane	0.4466	2,5-Dimethyl hexane	3.6975	3,4-Dimethylheptane	3.7450
2-Methylpentane	3.2815	2,2,3-Trimethylpentane	1.7371	2-Methyloctane	3.7576
3-Methylpentane	5.3865	2,4-Dimethylhexane	1.6252	3-Methyloctane	5.6020
2,2-Dimethylpentane	1.7747	2,3-Dimethylhexane	1.6212	3,3-Diethylpentane	1.5755
2,4-Dimethylpentane	3.6993	2-Methylheptane	4.4073	2,2-Dimethyloctane	3.4135
2,2,3-Trimethylbutane	3.9291	4-Methylheptane	3.2015	3,3-Dimethyloctane	3.2582
3,3-Dimethylpentane	1.1848	3-Methylheptane	5.5186	2,3-Dimethyloctane	3.8842
2-Methylhexane	2.2384	3-Ethylhexane	0.6999	3-Ethylheptane	3.7482
2,3-Dimethylpentane	1.7883	3,3-Dimethylheptane	1.7011	2,3-Dimethyloctane	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 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	7.1437
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
trans-1-Butyl-2-methylbenzene	0.7641
n-Pentylbenzene	4.4828
t-1-Butyl,3,5-dimethylbenzene	2.1641
t-1-butyl-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 100 µL
30 Naphthenes listed below at varying Wt. % typically in the range from 0.5 to 8.0 Wt. %. The actual certificate will have the exact Wt. % for each analyte.

	Typ. Wt. %
Cyclopentane	4.9143
Methylcyclopentane	3.2829
Cyclohexane	5.3268
1,1-Dimethylcyclopentane	3.4612
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
cct-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 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

Production Note

AccuStandard 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 100 µL (135 comps.)

The PIANO formulation contains the n-Paraffins, Isoparaffins, Aromatics, Naphthenes, and Olefins from the Five Cat. No.'s: **ASTM-P-0031, ASTM-P-0032, ASTM-P-0033, ASTM-P-0034, ASTM-P-0035**

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



Detailed Hydrocarbon Analysis

Detailed Hydrocarbon Analysis

Proposed ASTM Method for Detailed Hydrocarbon Analysis (DHA)

Determination of Individual Components and Groups of Components in Spark Ignition Engine fuels by High Efficiency Open Tubular Column Gas Chromatography (Detailed Hydrocarbon Analysis)

Detailed Hydrocarbon Analysis (includes oxygenates)

ASTM-P-0038

100 µL

30 Analytes listed below at varying targeted weight %. The actual certificate will have the exact Wt. % for each analyte.

Ethanol	Benzene	p-Xylene	Decane
Pentane	Cyclohexane	Ethylbenzene	Undecane
2-Methyl-2-propanol	3-Ethylpentane	Octane	1,2,3,5-Tetramethylbenzene
2-Methylbutene	1-1,2-Dimethylcyclopentane	2,3-Dimethylheptane	Naphthalene
2,3-Dimethylbutane	Heptane	Nonane	Dodecane
Methyl-t-butyl ether	2,2,3-Trimethylpentane	5-Methylnonane	1-Methylnaphthalene
Hexane	2,3,3-Trimethylpentane	1-Ethyl-2-methylbenzene	Tridecane
Methylcyclopentene	Toluene		

DHA - PONA-VI (PONA 6) is a qualitative mixture of various gasoline and refinery materials prepared to provide nearly every component that may be encountered in feedstock and finished gasolines. Some oxygenates have been added to allow this blend to be used for DHA method setup. This blend contains approximately 450 components (peaks).

ASTM-P-0139

100 µL

ASTM D-2887 Boiling Range Distribution of Petroleum Fractions by GC

Calibration Mix

DRH-002N
DRH-002N-10X

100 mg
1 gm

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

ASTM-D2887
1% v/v in n-Octane

1 x 1 mL
2 comps.

n-Hexadecane n-Octadecane

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

DRH-005S-10X

1 x 1 mL

2.0 mg/mL each in CH₂Cl₂ : CS₂ (1:1) 4 comps.

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

Complete Hydrocarbon Analysis

Hydrocarbon Window Defining Standard*

DRH-008S-R2

DRH-008S-R2-PAK **SAVE 20%**

500 µg/mL each in Chloroform

1 x 1 mL

5 x 1 mL

35 comps.

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

Originally designed for D-2887-99

ASTM D-2887 Reference Gas Oil Sample Lot #2

D-2887-REFOIL

1 x 1 mL

Technical Note

This sample is a petroleum fraction having a boiling range from 250°F to 850°F, evaluated in round robin studies by the ASTM D-02 committee. Use of this sample and the supplied ASTM boiling range consensus values helps to evaluate system performance

Technical Note

AccuStandard offers a hydrocarbon window defining standard with the C₉ to C₄₀ odd and even Alkanes. As an added benefit, AccuStandard included pristane and phytane in the formulation. Use of this one standard measuring the C₁₇/pristane and C₁₈/phytane ratio can be used to estimate degradation of fuel oil.

If you prefer, AccuStandard has also developed a fuel oil degradation mixture containing just the four required analytes to determine the C₁₇/pristane and C₁₈/phytane ratio Catalog Numbers DRH-005S-10X.

Calibration Solution *

DRH-002S-R1

DRH-002S-R1-PAK

At stated conc. in Chloroform

1 x 1 mL

5 x 1 mL

17 comps.

n-Hexane	µg/mL 600	n-Octadecane	µg/mL 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		

Calibration Solution *

DRH-002S-R2

DRH-002S-R2-PAK

1 % Wt./Wt. each in Chloroform

1 x 1 gm

5 x 1 gm

20 comps.

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

* Can be shipped by Air and Sea

Petrochemical Standards

Method SIM DIS



ASTM

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, Polywax 655, Polywax 850 and Polywax 1000 standards have been incorporated to perform SIM DIS analysis of heavy petroleum fractions with boiling points up to 1350 °F. If you require additional analytes added to the formulations for extended SIM DIS work, use our custom quotation request form located in the back of the catalog.

SIM DIS Standards Simulated Distillation

Stock SIM DIS Paraffin Solution ASTM-P-0050				Working Level SIM DIS Paraffin Solution with Polywax 500			
		1 x 5 mL 14 comps.				1 x 1 mL 5 x 1 mL 15 comps.	
	Wt. %		Wt. %		Wt. %		Wt. %
<i>n</i> -Pentane	6.66	<i>n</i> -Dodecane	13.33	<i>n</i> -Pentane	0.0333	<i>n</i> -Tetradecane	0.0333
<i>n</i> -Hexane	6.66	<i>n</i> -Tetradecane	6.66	<i>n</i> -Hexane	0.0333	<i>n</i> -Pentadecane	0.0333
<i>n</i> -Heptane	6.66	<i>n</i> -Pentadecane	6.66	<i>n</i> -Heptane	0.0333	<i>n</i> -Hexadecane	0.0333
<i>n</i> -Octane	6.66	<i>n</i> -Hexadecane	6.66	<i>n</i> -Octane	0.0333	<i>n</i> -Heptadecane	0.0333
<i>n</i> -Nonane	6.66	<i>n</i> -Heptadecane	6.66	<i>n</i> -Nonane	0.0333	<i>n</i> -Octadecane	0.0333
<i>n</i> -Decane	6.66	<i>n</i> -Octadecane	6.66	<i>n</i> -Decane	0.0333	<i>n</i> -Eicosane	0.0333
<i>n</i> -Undecane	6.66	<i>n</i> -Eicosane	6.66	<i>n</i> -Undecane	0.0333	Polywax 500	0.5
				<i>n</i> -Dodecane	0.0666		

Polywax 500® ASTM-P-0051N-2G	2 grams	Polywax 850® ASTM-P-0137N-2G	2 grams
Polywax 500		Polywax 850	
Polywax 655® ASTM-P-0053N-2G	2 grams	Polywax 1000® ASTM-P-0138N-2G	2 grams
Polywax 655		Polywax 1000	

Standards of Interest

See ASTM Methods D-3710, D-5307, D-5442, D-6352 for additional calibration standards for hydrocarbon analysis.

Technical Note

AccuStandard designed the following formulations for a Proposed ASTM Method under development for Motor Oil Volatility analysis & SIM DIS applications.

For our complete line of Organic Standards, request a copy of our Organic Catalog



For our complete line of Inorganic Standards, request a copy of our Inorganics Catalog



Method 3120
3230
3231
3237



ASTM Standards

ASTM

ASTM D-3120 & D-3246 Trace Quantities of Sulfur in Light Liquid Petroleum Hydrocarbons by Oxidative Microcoulometry

Sulfur Calibration Set

D-3120-92-CAL-SET
In Isooctane

set of 8 x 1 mL

Originally designed for
D-3120-96
D-3246-96

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

Technical Note

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

Standards of Interests

See page 1 for AccuStandard's comprehensive line of Certified Sulfur calibration standards, AccuPetroCheck, and AccuPetroTest quality control products.

ASTM D-3230 Salts in Crude Oil

Mixed Salt Solution

D-3230-89-1
D-3230-89-5

100 mL
500 mL

Originally designed for
D-3230-99

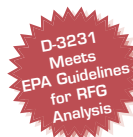
At stated conc. in Alcohol Solution (1-butanol : MeOH) (ratio 63:37) tr. H₂O 3 comps.

Calcium chloride	10 µg/mL	Sodium chloride	70 µg/mL
Magnesium chloride	20 µg/mL		

ASTM D-3231 Phosphorus in Gasoline

Originally designed for D-3231-99

Element Matrix	Quantity Conc.	Cat. No.
Phosphorus H ₂ O	100 mL 1000 µg/mL	ICP-41W-1
Phosphorus H ₂ O	500 mL 1000 µg/mL	ICP-41W-5



ASTM D-3237 Lead in Gasoline by AA Spectroscopy

Lead Standard Calibration Curve

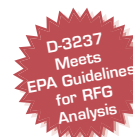
D-3237-CAL-SET

4 x 100 mL

Originally designed for
D-3237-97

Set includes the following Catalog Numbers:

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



Ready-to-Inject Petrochemical Standards and Calibration Curves

- Reduce Costs
- Increase Time Spent for Sample Analysis
- Are Validated Against Independent Lots
- Include Internal Standards or Surrogates
- Follow ASTM Method Guidelines
- Allow Direct Transfer to Autosampler Vials



Working Level Standards & Continuing Calibration Check (CCC)

ASTM Standards

Method 3246
3340
3524
3605



ASTM

WEAR METALS

ASTM D-3246 Sulfur in Petroleum Gas by Oxidative Microcoulometry

See pages 6 - 11 for AccuStandards comprehensive line of certified sulfur calibration standards

ASTM D-3340 Lithium & Na in Lubricating Greases by Flame Photometer

AccuStandard AccuTrace brand AA standards are produced under our rigorous ISO 9001 quality system to exacting specifications. Each standard is prepared from high purity starting materials; deionized water and high purity acids. Every standard is instrumentally assayed to verify 1000 ppm concentration of specified element; Actual Lot Analysis is provided on the label and a Certificate of Analysis is included for ease of record keeping and availability at audits.

Originally designed for
D-3340-98

Element	Unit	Cat. No.
Matrix		1,000 µg/mL
Lithium *	100 mL	AA30H-1
HCl	500 mL	AA30H-5
Sodium *	100 mL	AA54H-1
HCl	500 mL	AA54H-5

Technical Note

* For your convenience these elements are also available in HNO₃. To order HNO₃ change the H to N at the end of the Cat. No.

ASTM D-3524 (Reapproved 1999) Diesel Fuel Diluent in Used Diesel Engine Oils by GC

D-3524 Calibration Curve

D-3524-CAL-SET-5ML
D-3524-CAL-SET-10ML

set of 6 x 5 mL
set of 6 x 10 mL

Originally designed for
D-3524-90

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

Internal Standard Solution

D-3524-IS-10ML

D-3524-IS-10ML-PAK

At stated conc. in *n*-Heptane

n-Decane

n-Octadecane

1 x 10 mL

5 x 10 mL

2 comps.

Wt. / Wt. %

1.0

0.2

Mid Level Daily QC Solution

D-3524-QC-10ML

1 x 10 mL

2 comps.

Wt. / Wt. %

2 Diesel

30 W Motor oil

5.0

95

Column Resolution Mix

D-3524-CR

D-3524-CR-PAK

At stated conc. in *n*-Heptane

n-Hexadecane

n-Octadecane

1 x 1 mL

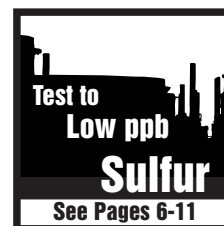
5 x 1 mL

2 comps.

Wt. / Wt. %

1.0

1.0



ASTM D-3605 Trace Metals in Gas Turbine Fuels by AA & Flame Emission Spectroscopy (Reapproved 1995)

D-3605-91 Trace Metals Standard

D-3605-91-1

At stated conc. in 1,2,3,4-Tetrahydronaphthalene

1 x 100 mL

4 comps.

Na (Sodium)

(250 µg/mL)

Ca (Calcium)

(250 µg/mL)

Pb (Lead)

(250 µg/mL)

V (Vanadium)

(250 µg/mL)

Originally designed for
D-3605-91

Standards of Interests

See Table of Contents for the
Wear Metals Group pages

ASTM Standards

ASTM

ASTM D-3606 Benzene & Toluene in Finished Motor & Aviation Gasoline by GC

Originally designed for D-3606-99



Aromatics Quantitative Calibration Standard (without Internal Standards)

D-3606-SET-25ML

set of 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

Aromatics Quantitative Calibration Standard (with Internal Standard: MEK)

D-3606/IS-SET

D-3606/IS-SET-2ML

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

set of 7 x 1 mL

set of 7 x 2 mL

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

Gasoline Refinery Quality Control Standards

Daily Quality Control Standard (with Internal Standard: MEK)

D-3606-QC/IS-10ML

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

Each at stated quantities

1 x 10 mL

5 x 10 mL

4 comps.

Compound	Target Vol. %
Benzene	0.6432
Toluene	4.8000
Isooctane	90.5568
Methyl ethyl ketone (ISTD)	4.0
	<hr/> 100

Daily Quality Control Standard (without Internal Standard)

D-3606-QC-25ML

D-3606-QC-25ML-PAK

Each at stated quantities

1 x 25 mL

5 x 25 mL

3 comps.

Compound	Target Vol. %
Benzene	0.67
Toluene	5.00
Isooctane	94.33
	<hr/> 100

Aromatics Quantitative Calibration Standard (w/ Internal Standard: sec Butanol)

D-3606/IS2-SET

D-3606/IS2-SET-PAK

set of 7 x 1 mL

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 Standard)		4.0	4.0	4.0	4.0	4.0	4.0	4.0

Gasoline Refinery Quality Control Standards

Daily Quality Control Standard (with Internal Standard: sec Butanol)

D-3606-QC-IS2-25ML

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

Each at stated quantities

1 x 25 mL

5 x 25 mL

4 comps.

Compound	Target Vol. %
Benzene	0.6432
Toluene	4.8000
Isooctane	90.5568
sec-Butanol (ISTD)	4.0
	<hr/> 100

Daily Quality Control Standard (without Internal Standard)

D-3606-QC-25ML

D-3606-QC-25ML-PAK

Each at stated quantities

1 x 25 mL

5 x 25 mL

3 comps.

Compound	Target Vol. %
Benzene	0.67
Toluene	5.00
Isooctane	94.33
	<hr/> 100

Technical Note

Due to changes in the possible use of other oxygenates like ethanol added to gasoline, AccuStandard formulated a new calibration curve using sec-butanol as an Internal Standard. The use of this new ISTD minimizes coelution caused by the oxygenate(s) and pre column - standard column configuration in the GC system.

ASTM D-3610 Total Cobalt in Alumina-Base Cobalt-Molybdenum Catalyst by Potentiometric Titration

Cobalt Oxide Standard

D-3610-93-1

1 x 100 mL

Cobalt oxide @ 1500 µg/mL in Water

Originally designed for

D-3610-88 (Re-Approved 1993)

On-Line Ordering

ASTM

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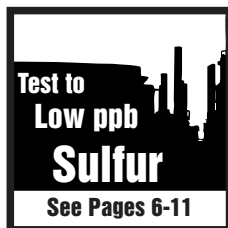
On-Line Custom Services

AccuStandard specializes in **synthesizing** chemicals of high purity to be used as reference standards, and offers custom synthesis capability for milligram to kilogram batches. If you can't find the specific standard you need, we can prepare **Custom Formulations** and **Custom Packaging** for both Organic and Inorganic needs. See our Website for more info.




*Over 30,000 Standards
just a click away*

Cross Reference Table
ASTM IP ISO DIN JIS AFNOR sorted by
ASTM Method see beginning of Catalog



Method **3710**
3798
3831



ASTM Standards

ASTM

ASTM D-3710 (Reapproved 1999) 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 D-3710 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 D-86 distillation curve can be made.

Originally designed for D-3710-95

Qualitative Calibration Standard

D-3710-QUAL	1 x 1 mL
D-3710-QUAL-PAK	5 x 1 mL
	19 comps.
Approx. Wt./Wt. %	Approx. Wt./Wt. %
<i>n</i> -Butane 4.5	<i>n</i> -Octane 5.4
<i>n</i> -Butylbenzene 3.2	<i>n</i> -Pentadecane 2.2
<i>n</i> -Decane 3.2	<i>n</i> -Pentane 7.6
2,4-Dimethylpentane 5.4	<i>n</i> -Propane 1.5
<i>n</i> -Dodecane 3.2	<i>n</i> -Propylbenzene 4.3
<i>n</i> -Heptane 9.7	<i>n</i> -Tetradecane 2.2
<i>n</i> -Hexane 5.4	Toluene 10.8
2-Methylbutane 9.7	<i>n</i> -Tridecane 2.2
2-Methylpentane 5.4	<i>p</i> -Xylene 13
2-Methylpropane 1.5	

Quantitative Calibration Standard

ASTM-D3710	1 x 1 mL
ASTM-D3710-PAK	5 x 1 mL
	16 comps.
Vol./Vol. %	Vol./Vol. %
<i>n</i> -Butylbenzene 3.5	<i>n</i> -Octane 5.8
<i>n</i> -Decane 3.5	<i>n</i> -Pentadecane 2.3
2,4-Dimethylpentane 5.8	<i>n</i> -Pentane 8.1
<i>n</i> -Dodecane 3.5	<i>n</i> -Propylbenzene 4.7
<i>n</i> -Heptane 10.5	<i>n</i> -Tetradecane 2.3
<i>n</i> -Hexane 5.8	Toluene 11.6
2-Methylbutane 10.5	<i>n</i> -Tridecane 2.3
2-Methylpentane 5.8	<i>p</i> -Xylene 14.0



Standards of Interests

See page 3 for AccuStandard's new D-86 QA/QC Standards.

ASTM D-2887-99 Boiling Range Distribution of Petroleum Fractions by GC Calibration Solution *

DRH-002S-R1	1 x 1 mL		
DRH-002S-R1-PAK	5 x 1 mL		
At stated conc. in Chloroform	17 comps.		
µg/mL	µg/mL	µg/mL	µg/mL
<i>n</i> -Hexane 600	<i>n</i> -Undecane 1200	<i>n</i> -Octadecane 500	<i>n</i> -Dotriacontane 100
<i>n</i> -Heptane 600	<i>n</i> -Dodecane 1200	<i>n</i> -Eicosane 200	<i>n</i> -Hexatriacontane 100
<i>n</i> -Octane 800	<i>n</i> -Tetradecane 1200	<i>n</i> -Tetracosane 200	<i>n</i> -Tetracontane 100
<i>n</i> -Nonane 800	<i>n</i> -Hexadecane 1000	<i>n</i> -Octacosane 100	<i>n</i> -Tetratetracontane 100
<i>n</i> -Decane 1200			

* Can be shipped by Air and Sea

ASTM D-3798 Analysis of *p*-Xylene by GC

AccuStandard's R & D team has developed a special highly purified *p*-Xylene designed for ASTM Method D-3798 specifications. The incorporation of this *p*-Xylene into the formulation allows the analytical chemist to qualitatively and quantitatively measure the impurities in the *p*-Xylene feedstock streams.

p-Xylene Impurity Standard with ISTD

D-3798-IS	1 x 1 mL
D-3798-IS-PAK	5 x 1 mL
At stated conc. by weight	11 comps.
Wt./Wt. %	Wt./Wt. %
<i>n</i> -Pentane 0.15	<i>o</i> -Xylene 0.15
<i>n</i> -Octane 0.15	Cumene 0.15
Benzene 0.15	Propylbenzene 0.15
Toluene 0.15	
Ethylbenzene 0.15	Total Analytes 100
<i>p</i> -Xylene 98.65	plus <i>n</i> -Undecane* (ISTD) 0.500
<i>m</i> -Xylene 0.15	grams

p-Xylene Impurity Standard without ISTD

D-3798-10ML	1 x 10 mL
D-3798-10ML-PAK	5 x 10 mL
At stated conc. by weight	10 comps.
Wt./Wt. %	Wt./Wt. %
<i>n</i> -Pentane 0.15	<i>p</i> -Xylene 98.65
<i>n</i> -Octane 0.15	<i>m</i> -Xylene 0.15
Benzene 0.15	<i>o</i> -Xylene 0.15
Toluene 0.15	Cumene 0.15
Ethylbenzene 0.15	Propylbenzene 0.15

Technical Note

Bulk Packaged *p*-Xylene without Internal Standard

Other suggested internal standards can be used in conjunction with the bulk packaged D-3789 1 x 10 mL ampule to meet your company's application. If you prefer to eliminate making standards, contact AccuStandard's Technical Department with your unique formulation for a custom quotation. The custom quotation request form is located in the back of this catalog.

ASTM D-3831 Manganese in Gasoline by AA Spectroscopy

Manganese Stock Solution

D-3831	1 x 100 mL
Manganese @ 1.0 g Mn / gal (264.2 mg Mn / L) in Methyl isobutyl ketone	

Originally designed for D-3831-98

ASTM Standards

Method 4059
4291
4294
4377



ASTM

ASTM D-4059 Polychlorinated Biphenyls in Insulating Liquids by GC

Originally designed for D-4059-96

Aroclors in PCB-Free Transformer Oil (At 2 concentrations in Transcrest W130)

Aroclor #	Conc. (ppm w/w)	Cat. No.	1 x 1 mL	PAK Cat. No.	5 x 1 mL
Aroclor 1016	50	C-216-ST-1		C-216-ST-1-PAK	
Aroclor 1016	500	C-216-ST-2		C-216-ST-2-PAK	
Aroclor 1221	50	C-221-ST-1		C-221-ST-1-PAK	
Aroclor 1221	500	C-221-ST-2		C-221-ST-2-PAK	
Aroclor 1232	50	C-232-ST-1		C-232-ST-1-PAK	
Aroclor 1232	500	C-232-ST-2		C-232-ST-2-PAK	
Aroclor 1242	50	C-242-ST-1		C-242-ST-1-PAK	
Aroclor 1242	500	C-242-ST-2		C-242-ST-2-PAK	
Aroclor 1248	50	C-248-ST-1		C-248-ST-1-PAK	
Aroclor 1248	500	C-248-ST-2		C-248-ST-2-PAK	
Aroclor 1254	50	C-254-ST-1		C-254-ST-1-PAK	
Aroclor 1254	500	C-254-ST-2		C-254-ST-2-PAK	
Aroclor 1260	50	C-260-ST-1		C-260-ST-1-PAK	
Aroclor 1260	500	C-260-ST-2		C-260-ST-2-PAK	
Aroclor 1262	50	C-262-ST-1		C-262-ST-1-PAK	
Aroclor 1262	500	C-262-ST-2		C-262-ST-2-PAK	
Aroclor 1268	50	C-268-ST-1		C-268-ST-1-PAK	
Aroclor 1268	500	C-268-ST-2		C-268-ST-2-PAK	

Additional Aroclors and PCB Congener Standards available in our Organic Catalog



Neat Individual Aroclors

Aroclor #	Cat. No.	Unit	Z-008 (Kit)
Aroclor 1016	C-216N	100 mg	100 mg
Aroclor 1221	C-221N	100 mg	100 mg
Aroclor 1232	C-232N	10 mg	10 mg
Aroclor 1242	C-242N	100 mg	100 mg
Aroclor 1248	C-248N	10 mg	10 mg
Aroclor 1254	C-254N	100 mg	100 mg
Aroclor 1260	C-260N	100 mg	10 mg
Aroclor 1262	C-262N	100 mg	10 mg
Aroclor 1268	C-268N	10 mg	10 mg
Kit of above 9 Aroclors	Z-008		9 vials

Aroclor-free transformer oil also available as:

T-W130 1 x 1 mL

ASTM D-4291 (Reapproved 1998) Trace Ethylene Glycol in Used Engine Oil

Ethylene Glycol Stock Standard

D-4291-93
D-4291-93-PAK

1 x 1 mL
5 x 1 mL

Originally designed for D-4291-93

Ethylene glycol @ 2000 µg/mL in water

ASTM D-4294 Sulfur in Petroleum Products by ED-XRF Spectroscopy

See page 8-11 for AccuStandard's comprehensive line of Certified Sulfur Calibration Standards designed for matrix specific applications as described in Method D-4294 in section 9.0 (Calibration & Standardization).



ASTM D-4377 Water in Crude oils by Potentiometric Karl Fischer Titration

See page 5 for AccuStandard's comprehensive line of Certified Karl Fischer Water Standards.

Method **4420**
4628



ASTM Standards

ASTM D-4420 Aromatics in Finished Gasolines by GC

Aromatics in Gasoline by GC/TC

D-4420-CAL-SET

set of 7 x 1 mL

Originally designed for
D-4420-94

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

Aromatics in Gasoline by GC/TX

D-4420-94

D-4420-94-PAK

1 x 1 mL

5 x 1 mL

5 comps.

	Vol. %		Vol. %
Benzene	3.00	n-Butylbenzene(C ₉ + aromatics)	15.00
Toluene	10.00	Isooctane	57.00
Total Xylenes (C ₈ aromatics)	15.00		

ASTM D-4628 Barium, Calcium, Magnesium & Zinc in Unused Lubricating Oil

Lubricating Oil, Elements (Nominal Value) Wt.% listed below

ASTM-P-0113-SET

17 x 100 mL

Originally designed for
D-4628-97

Cat. No.	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

Standards of Interests

See Table of Contents for the
Wear Metals Group pages.



Ready-to-Inject Petrochemical Standards and Calibration Curves

- Reduce Costs
- Increase Time Spent for Sample Analysis
- Are Validated Against Independent Lots
- Include Internal Standards or Surrogates
- Follow ASTM Method Guidelines
- Allow Direct Transfer to Autosampler Vials

Cross Reference Table

ASTM IP ISO DIN JIS AFNOR sorted by
ASTM Method see beginning of Catalog

ASTM Standards

Method

4629



ASTM

ASTM D-4629

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

 Originally designed for
D-4629-96

Method D-4629 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-4629-91-LB-CAL-SET
set of 7 x 1 mL

Set includes the following Cat. No.s

Technical Note

Nitrogen introduced using Pyridine

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

Stock Nitrogen Solution for Low Boiling Solvents

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

 Nitrogen @ 1000 µg/mL in Isooctane
(Pyridine @ 5.65 mg/mL in Isooctane)

Nitrogen Calibration Set-High Boiling Solvents

D-4629-91-HB-CAL-SET
set of 7 x 1 mL

Set includes the following Cat. No.s

Technical Note

Nitrogen introduced using Carbazole

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

Stock Nitrogen Solution for High Boiling Solvents

D-4629-91-HB-CON
1 x 1 mL
D-4629-91-HB-CON-PAK
5 x 1 mL

 Nitrogen @ 1000 µg/mL in Toluene : Acetone (9:1)
(Carbazole @ 11.95 mg/mL in Toluene : Acetone (9:1))

Low level Nitrogen Calibration Set

ASTM-P-0070-SET
6 x 1 mL

Set includes the following Cat. No.s

Technical Note

Nitrogen introduced using Aniline

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

Low level Nitrogen & Sulfur Calibration Set

ASTM-P-0071-SET
4 x 1 mL

Set includes the following Cat. No.s

Technical Note

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

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

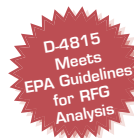


ASTM Standards

ASTM

ASTM D-4815 MiBE, EtBE, TAME, DIPE, Tertiary-amyl Alcohol and C₁ to C₄ Alcohols in Gasoline by GC

Originally designed for D-4815-99



Oxygenate Quantitative Calibration Mixtures (without Internal Standard)

D-4815-SET-10ML 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. %
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 (MiBE)	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

Oxygenate Quantitative Calibration Mixtures (with Internal Standard)

D-4815/IS-SET of 6 component mix set of 5 x 1 mL
D-4815/IS-SET-PAK 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. %
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 (MiBE)	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)		71.87	73.06	71.73	70.54	72.0
Total Oxygenates & Internal Standard 28.14		26.95	28.28	29.46	28.00	

Technical Note
Additional Oxygenate calibration, check standards, and independent reference standards can be found in ASTM method D-5599 (pages 34-36) or D-5622-94 (page 37). 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 our check standards to meet this increased usage.

Quantitative Peak ID and Retention Time Mixture

D-4815-RT 1 x 1 mL
D-4815-RT-PAK 5 x 1 mL

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 (MiBE)	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
16 comp. core mix	

Valve Timing Mixture

D-4815-VT 1 x 1 mL
D-4815-VT-PAK 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 (MiBE)	10.00
n-Hexane	60.00

Oxygenate Internal Standard Mixture

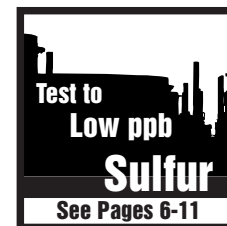
M-GRO-IS-5ML 1 x 1 mL
M-GRO-IS-5ML-PAK 5 x 1 mL

1,2-Dimethoxyethane (ISTD) (neat)

Oxygenate Free Refinery Gasoline Blank

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

RFA Gasoline (neat)



Custom Formulations

AccuStandard offers over 30,000 different standards, and if you can't find the specific standard you need, we will prepare a custom formulation. Our custom organic and inorganic standards are a fast, economical way to address your unique requirements. To make an inquiry for Custom Quotes visit our website.

You can also Email your requirements to techservice@accustandard.com or Fax us at 203-786-5287. Please include the following information: List of analytes and concentrations, Solvent or matrix, Quantity required (milliliters), Packaging unit size (milliliters per ampule, bottle, or vial).

Quality Control Options

1. Gravimetric/Volumetric Certification: Each standard is measured gravimetrically and then QC'ed instrumentally (where available). Every component in the standard is guaranteed to be within ±0.5% of the requested value unless otherwise stated. The solutions are made up to volume using class A glassware. A certificate comes with each standard and documents the gravimetric values used.
2. Quantitative Validation: Full QA/QC method includes extended GC analysis using both internal and calibration standards plus statistical analysis. A data package is provided containing analytical and gravimetric data (Organic customs only).

Also available: OEM Standards - Privately labeled standards manufactured and tested to your specifications.

ASTM Standards

Method
4927
4928
4929



ASTM

WEAR METALS

ASTM D-4927

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

Lubricating Oil, Elements (Nominal Value) Wt.% listed below

ASTM-P-0110-SET

17 x 100 mL

Originally designed for D-4927-96

Cat. No.	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

Standards of Interests

See Table of Contents for the Wear Metals Group pages

ASTM D-4928

Water in Crude Oils by Potentiometric Karl Fischer Titration

See page 5 for AccuStandard's new line of Karl Fischer Water Standards.

ASTM D-4929

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

Originally designed for D-4929-99

Working Level Chlorine Standard

D-4929-94

1 x 5 mL

D-4929-94-PAK

5 x 5 mL

Chlorine @ 10 µg/mL in Isooctane

Stock Chlorine Standard

D-4929-94-100X

1 x 5 mL

D-4929-94-100X-PAK

5 x 5 mL

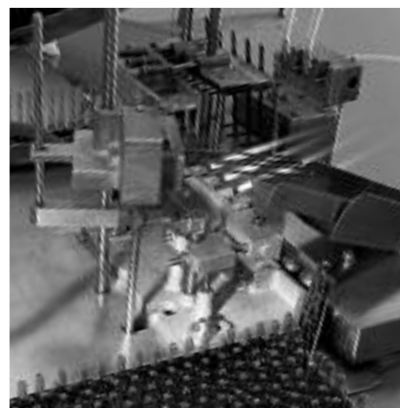
Chlorine @ 1000 µg/mL in Isooctane

Standards of Interests

See page 66 for additional proposed and promulgated Chlorine in Lube Oil standards

Custom Ampulling for Bulk Quantity Requirements

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



We can reduce your costs using the Cozzoli Auto Filling/ Sealing Machine to package just the right size product for your application.

Method **4951**
5056



ASTM Standards

ASTM D-4951 Additive Elements in Lubricating Oils by Inductively Coupled Plasma Atomic Emission Spectrometry

Originally designed for D-4951-96

20 Wear Metal Multi-Element Standard containing no metallic sulfonates

Each Wear Metal Standard contains the below list of 20 elements in hydrocarbon oil at the stated concentration

Conc. (µg/g)	Cat. No.	
10	WM-20-NMS-1X-1	
30	WM-20-NMS-3X-1	
50	WM-20-NMS-5X-1	
100	WM-20-NMS-10X-1	
300	WM-20-NMS-30X-1	
500	WM-20-NMS-50X-1	
900	WM-20-NMS-90X-1	
WM-20-NMS-SET-1		
set of above 7 x 100 mL		

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

Standards of Interests

See Table of Contents for the Wear Metals Group pages.

Technical Notes

This calibration curve has been formulated with starting materials containing no metal sulfonates. This way a sulfur calibration curve can easily be developed using a high concentration sulfur standard.

Recommended Internal Standard (IS)

Element	Sulfur free Organometallic (IS) @ 1000 µg/g		Sulfur free Organometallic (IS) @ 5000 µg/g	
	Cat. No.	50 mL	Cat. No.	50 mL
Cobalt	WM-NMS-14		WM-NMS-14-5X	

Originally designed for D-5056-96

ASTM D-5056 Trace Metals in Petroleum Coke by Atomic Absorption

Element @ 1000 µg/mL	Unit	Cat. No.	Matrix		
Matrix			Silicon	100 mL	AA52W-1
* Aluminum	100 mL	AA01N-1	H ₂ O tr. NaOH	500 mL	AA52W-5
	500 mL	AA01N-5			
* Calcium	100 mL	AA09N-1	HNO ₃	500 mL	AA54N-1
	500 mL	AA09N-5			
* Iron	100 mL	AA27N-1	HNO ₃	100 mL	AA67N-1
	500 mL	AA27N-5			
Nickel	100 mL	AA37N-1	* For your convenience these elements are available in HCl. To order, change the N to H at the end of the catalog numbers.	500 mL	AA67N-5
	500 mL	AA37N-5			
Element @ 1000 µg/mL	Unit	Cat. No.			

Cross Reference Table

ASTM IP ISO DIN JIS AFNOR sorted by ASTM Method see beginning of Catalog

ASTM Standards

Method **5059**
5134



Originally designed for
D-5059-98

ASTM D-5059 Lead in Gasoline by X-Ray Spectroscopy IP Designation 228/79

Technical Notes

AccuStandard has formulated the following standards to measure the lead content in gasoline for both high and low concentrations using bismuth as an internal standard. For long term stability and ease of use AccuStandard provides the internal standard in two convenient packaging sizes. The bulk 4 oz. bottles 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 conveniently packaged in single-use ampules, contact AccuStandard's technical department for a quotation. Bulk volumes of 250 mL or more can be sealed into ampules (your choice up to 20 mL size). Use of our ampulling services can provide substantial saving for the Laboratory.



ASTM

Part A - Lead in Gasoline Standards

D-5059-A-CAL-SET set of 7 x 4 oz
The Set contains the following 7 solutions in iso-octane

Cat. No.	Lead Concentration			Unit
	g Pb/US gal	g Pb/ UK gal	mg Pb/mL	
D-5059-A-01	0.0000	0.000	0.000	4 oz
D-5059-A-02	0.1000	0.120	0.026	4 oz
D-5059-A-03	1.0000	1.200	0.264	4 oz
D-5059-A-04	2.0000	2.400	0.528	4 oz
D-5059-A-05	3.0000	3.600	0.793	4 oz
D-5059-A-06	4.0000	4.800	1.057	4 oz
D-5059-A-07	5.0000	6.000	1.321	4 oz

Internal Standard

D-5059-IS-4 1 x 4 oz bottle
D-5059-IS-10ML-PAK 5 x 10 mL amps
Bismuth @ 0.793 mg/mL (3.00 g/US gal)
(3.60 g/UK gal) in Mineral oil

Technical Notes

All D-5059 Certificates have the concentrations for the Standard listed in three convenient Lead Concentration units.

Part C - Lead in Gasoline Standards

D-5059-C-CAL-SET set of 7 x 4 oz
The Set contains the following 7 solutions in iso-octane

Cat. No.	Lead Concentration			Unit
	g Pb/US gal	g Pb/ UK gal	µg Pb/mL	
D-5059-C-01	0.0000	0.000	0.000	4 oz
D-5059-C-02	0.0010	0.001	0.264	4 oz
D-5059-C-03	0.0050	0.006	1.321	4 oz
D-5059-C-04	0.0100	0.012	2.642	4 oz
D-5059-C-05	0.0500	0.060	13.209	4 oz
D-5059-C-06	0.1000	0.120	26.417	4 oz
D-5059-C-07	0.3000	0.360	79.252	4 oz

ASTM D-5134 Petroleum Naphthas through n-Nonane by Capillary GC

Qualitative Reference Petroleum Set

D-5134-92-SET 3 x 1 mL

Originally designed for
D-5134-98

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

Standards of Interests

See page 14 for additional Detailed Hydrocarbon Analysis (DHA) blends.

Column Evaluation Mix

D-5134-92-CEM 1 x 1 mL
7 comps.

	Wt. / Wt. %		Wt. / Wt. %
Toluene	0.5	4-Methylheptane	1.0
n-Heptane	1.0	n-Octane	1.0
2,3,3-Trimethylpentane	1.0	2-Methylpentane	94.5
2-Methylheptane	1.0		

Linearity Check Mix

D-5134-92-LCM 1 x 1 mL
10% w/w each component

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

Method **5184**
5185
5186



ASTM Standards

ASTM

ASTM D-5184 (Reapproved 1995)

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

Originally designed for
D-5184-91

Tartaric Acid / Hydrochloric Acid Solution

D-5184-91-TA-5 1 x 500 mL

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

Aluminum Standard Solution

D-5184-91-AL-1 1 x 100 mL
D-5184-91-AL-5 1 x 500 mL

Al @ 1000 µg/mL in 5 % HCl

Silicon Standard Solution

D-5184-91-SI-1 1 x 100 mL
D-5184-91-SI-5 1 x 500 mL

Silicon @ 1000 µg/mL in trace NaOH

Technical Note

Contact the our Technical department for **Ready-to-Aspirate** working level calibration curves designed for your laboratories' specific calibration ranges.

WEAR METALS

ASTM D-5185 Additive Elements, Wear Metals, & Contaminants in Used Lubricating Oils by ICP-AES

21 Wear Metal Multi-Element Standard Containing No Metallic Sulfonates

Conc. (µg/g)	Cat. No.	
10	WM-21-NMS-1X-1	
30	WM-21-NMS-3X-1	
50	WM-21-NMS-5X-1	
100	WM-21-NMS-10X-1	
300	WM-21-NMS-30X-1	
500	WM-21-NMS-50X-1	
WM-21-NMS-SET-1		
set of above 6 x 100 mL		

Each Wear Metal Standard contains the below list of 21 elements in hydrocarbon oil at the stated concentration

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

Originally designed for
D-5185-97

Standards of Interests

See Table of Contents for the Wear Metals Group pages

Technical Notes

This calibration curve has been formulated with starting materials containing no metal sulfonates. So a sulfur calibration curve can easily be developed using a high concentration sulfur standard.

Recommended Internal Standard (IS)

Element	Sulfur free Organometallic (IS) @ 1000 µg/g Cat. No. 50 mL	Sulfur free Organometallic (IS) @ 5000 µg/g Cat. No. 50 mL
Cobalt	WM-NMS-14	WM-NMS-14-5X

ASTM D-5186 Aromatic Content & Polynuclear Aromatic Content of Diesel Fuels & Aviation Turbine Fuels by SFC

Originally designed for
D-5186-99

Performance Solution

D-5186-96-PM 1 x 1 mL
D-5186-96-PM-PAK 5 x 1 mL
4 comps.

	Wt. / Wt. %		Wt. / Wt. %
n-Hexadecane	75	Tetralin	3.0
Naphthalene	2.0	Toluene	20

Detector Linearity Check Solution Set

D-5186-96-DLC-SET 2 x 1 mL

Set includes the below two Cat. No.'s

D-5186-96-DLC-25X 25% w/w #2 Diesel Fuel in n-Hexadecane
D-5186-96-DLC-50X 50% w/w #2 Diesel Fuel in n-Hexadecane



ASTM Standards

Method 5188
5191 &
5482
5307



ASTM

ASTM D-5188 Vapor - Liquid Ratio Temperature Standards

Performance Check Samples for daily monitoring of instrument performance

Cat. No.	V/L Temp	Set	Originally designed for
ASTM-P-125-01-VAP	36.1°C (96.9°F)	5 x 20 mL	D-5188-99
ASTM-P-125-02-VAP	68.0°C (155.7°F)	5 x 20 mL	

ASTM D-5191 & D-5482 Vapor Pressure Standards

Originally designed for
D-5191-99 & D-5482-99

Vapor Pressure Quality Control Samples

Cat. No.	Vapor Pressure	Set	Technical Note
ASTM-P-124-01-VAP	68.3kPa (9.91 psi)	10 x 10 mL	Consists of pure solvents with known vapor pressure
ASTM-P-124-02-VAP	68.0kPa (9.86 psi)	10 x 10 mL	
ASTM-P-124-03-VAP	51.1kPa (7.41 psi)	10 x 10 mL	
ASTM-P-124-04-VAP	46.7kPa (6.77 psi)	10 x 10 mL	
ASTM-P-124-05-VAP	22.5kPa (3.26 psi)	10 x 10 mL	
ASTM-P-124-06-VAP	7.1kPa (1.03 psi)	10 x 10 mL	

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

ASTM D-5307-97 Boiling Range Distribution of Crude Petroleum by GC

Quantitative Paraffins Standard

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

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

Qualitative Paraffins Standard

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

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

Column Resolution Mixture

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

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

Internal Standard

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

	Wt./Wt. %		Wt./Wt. %
<i>n</i> -Tetradecane	25	<i>n</i> -Hexadecane	25
<i>n</i> -Pentadecane	25	<i>n</i> -Heptadecane	25



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, ext. 117 for an updated product.



ASTM Standards

ASTM

ASTM D-5441 Analysis of Methyl tert-butyl ether (MtBE) by GC

Originally designed for D-5441-98

The ASTM Committee D-02 on Petroleum Products and Lubricants has issued the Standard Method D-5441-98 for the determination of the purity of methyl *tert*-butyl ether (MtBE) by Gas Chromatography. This method provides a procedure to measure impurities in MtBE such as C₄ to C₁₂ olefins, methyl, isopropyl and *tert*-butyl alcohols, methyl *sec*-butyl & 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. AccuStandard has formulated the following reference standards to meet the method specifications. Different packaging sizes are available to meet various sample testing capacities .

MtBE Contaminant Standard Low Concentration

D-5441	1 x 1 mL
D-5441-PAK	5 x 1 mL
D-5441-5ML	1 x 5 mL
D-5441-5ML-PAK	5 x 5 mL
<i>Each comp. at 0.1% Wt./Wt. in MtBE</i>	
	12 comps.

- tert*-Amyl methyl ether
- tert*-Butanol
- tert*-Butyl ethyl ether
- 4,4-Dimethyl-2-neopentyl-1-pentene
- Methanol
- 2-Methylbutane
- 2-Methyl-2-butene
- 2,2',4,6,6'-Pentamethyl-3-heptene
- Pentane
- cis*-2-Pentene
- trans*-2-Pentene
- 2,4,4-Trimethyl-1-pentene

MtBE Contaminant Standard High Concentration

D-5441-10X	1 x 1 mL
D-5441-10X-PAK	5 x 1 mL
D-5441-10X-5ML	1 x 5 mL
D-5441-10X-5ML-PAK	5 x 5 mL
<i>Each comp. at 1% Wt./Wt. in MtBE</i>	
	12 comps.

- tert*-Amyl methyl ether
- tert*-Butanol
- tert*-Butyl ethyl ether
- 4,4-Dimethyl-2-neopentyl-1-pentene
- Methanol
- 2-Methylbutane
- 2-Methyl-2-butene
- 2,2',4,6,6'-Pentamethyl-3-heptene
- Pentane
- cis*-2-Pentene
- trans*-2-Pentene
- 2,4,4-Trimethyl-1-pentene

Qualitative Standard

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

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

Quantitative Standard

D-5441-QUANT	1 x 1 mL
<i>0.1% Wt./Wt. in n-Dodecane</i>	
	29 comps.

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

MtBE Resolution Test Mixture

D-5441-RES	1 x 1 mL
D-5441-RES-PAK	5 x 1 mL
D-5441-RES-5ML	1 x 5 mL
D-5441-RES-5ML-PAK	5 x 5 mL
<i>Each comp. at 1% Wt./Wt. in MtBE</i>	
	3 comps.

- | | |
|-------------------------|---------------------|
| <i>trans</i> -2-Pentene | <i>cis</i> -Pentene |
| <i>tert</i> -Butanol | |



For our complete line of Organic Standards and Inorganic Standards, request a copy of the Catalog(s).

