

Petrochemical standards

Conostan[®] Oil Analysis Standards

Reference standards for lubricant/oil analysis include: Element (metallo-organic) standards and associated blank oils and solvent (for ICP application), Particle Counting (contamination) and standards for Automatic Particle Counters.

The division of SCP science "CONOSTAN[®] Oil Analysis Standards" is the world's leading manufacturer and marketer of elements (metallo-organic) in oil standards and related spectroscopy products. Its leading position is derived from superior product chemistry, manufacturing technology, and blending techniques. CONOSTAN[®] products are used extensively in the calibration and operation of analytical instruments for the analysis of elements in oil and other organic fluids. CONOSTAN[®] is the only source of multi-element metallo-organic standards in the history of the National Institute of Standards & Technology (NIST), for example, NIST-1085b is CONOSTAN[®] S-21:300, Code CON-S214300 and CON-S218300. The variety of products afford convenience as reference and routine analytical materials for ICP, DCP, Rotating Disc Electrode (RDE), XRF, AA, and other analytical spectrometer techniques. CONOSTAN products are optimized for:

- **Compatibility:** 33 elements can be combined over an extensive concentration range
- **Solubility:** CONOSTAN[®] element standards are soluble in CONOSTAN[®] PremiSolv[™] ICP solvent, CONOSTAN[®] base oils, ketones, such as 4-methyl-2-pentanone (MIBK), as well as in paraffinic and aromatic hydrocarbons, such as mineral oil, xylene, and kerosene.
- **Volatility:** CONOSTAN[®] element standards are made in ultra-pure, highly processed hydrocarbon oil only; no solubilizers are used. These element standards are extremely stable to volatile loss.
- **Viscosity:** Viscosity range at room temperature is ideal for instrumental applications.
- **Instrumental Response:** Excellent analytical response over a wide range of analytical applications.
- **Shelf life:** All CONOSTAN[®] element standards and spectroscopy products have a one year minimum shelf life from the date of shipment.

Single element standards in oil

Single-element CONOSTAN[®] standards are especially useful for atomic absorption and X-ray fluorescence determinations. The matrix oil for these standards is high purity hydrocarbon oil with a 17 cSt viscosity at 40°C and flash point of 175°C (20 Blank Oil). They are available at the following metal concentrations.

The 1000 and 5000 ppm standards can be used as a source of single-element calibration standard for your specific applications using all types of spectroscopic methods of analysis.

Cobalt 1000 & 5000 ppm, yttrium 1000 & 5000 ppm, and scandium 2000 ppm are often used as internal standards for inductively coupled plasma (ICP) analysis.

Stock concentrations are listed in the table below.

Concentrations not listed in the table below are available as custom single element standards on request.

Code	Product		Unit
CON-150-100-135	Aluminium in 20 blank oil, 1000 µg/g	Al:1000 ppm	50 g
CON-150-500-135	Aluminium in 20 blank oil, 5000 µg/g	Al:5000 ppm	50 g
CON-150-100-515	Antimony in 20 blank oil, 1000 µg/g	Sb:1000 ppm	50 g
CON-150-500-515	Antimony in 20 blank oil, 5000 µg/g	Sb:5000 ppm	50 g
CON-150-103-331	Arsenic in 20 blank oil, 100 µg/g	As:100 ppm	100 g
CON-150-100-565	Barium in 20 blank oil, 1000 µg/g	Ba:1000 ppm	50 g
CON-150-500-565	Barium in 20 blank oil, 5000 µg/g	Ba:5000 ppm	50 g
CON-150-100-045	Beryllium in 20 blank oil, 1000 µg/g	Be:1000 ppm	50 g
CON-150-500-045	Beryllium in 20 blank oil, 5000 µg/g	Be:5000 ppm	50 g
CON-150-100-835	Bismuth in 20 blank oil, 1000 µg/g	Bi:1000 ppm	50 g
CON-150-500-835	Bismuth in 20 blank oil, 5000 µg/g	Bi:5000 ppm	50 g
CON-150-100-055	Boron in 20 blank oil, 1000 µg/g	B:1000 ppm	50 g
CON-150-500-055	Boron in 20 blank oil, 5000 µg/g	B:5000 ppm	50 g
CON-150-100-485	Cadmium in 20 blank oil, 1000 µg/g	Cd:1000 ppm	50 g
CON-150-500-485	Cadmium in 20 blank oil, 5000 µg/g	Cd:5000 ppm	50 g
CON-150-100-205	Calcium in 20 blank oil, 1000 µg/g	Ca:1000 ppm	50 g
CON-150-500-205	Calcium in 20 blank oil, 5000 µg/g	Ca:5000 ppm	50 g
CON-150-100-245	Chromium in 20 blank oil, 1000 µg/g	Cr:1000 ppm	50 g
CON-150-500-245	Chromium in 20 blank oil, 5000 µg/g	Cr:5000 ppm	50 g

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Code	Product		Unit
CON-150-100-275	Cobalt in 20 blank oil, 1000 µg/g	Co:1000 ppm	50 g
CON-150-500-275	Cobalt in 20 blank oil, 5000 µg/g	Co:5000 ppm	50 g
CON-150-100-295	Copper in 20 blank oil, 1000 µg/g	Cu:1000 ppm	50 g
CON-150-500-295	Copper in 20 blank oil, 5000 µg/g	Cu:5000 ppm	50 g
CON-150-100-495	Indium in 20 blank oil, 1000 µg/g	In:1000 ppm	50 g
CON-150-500-495	Indium in 20 blank oil, 5000 µg/g	In:5000 ppm	50 g
CON-150-100-265	Iron in 20 blank oil, 1000 µg/g	Fe:1000 ppm	50 g
CON-150-500-265	Iron in 20 blank oil, 5000 µg/g	Fe:5000 ppm	50 g
CON-150-100-575	Lanthanum in 20 blank oil, 1000 µg/g	La:1000 ppm	50 g
CON-150-500-575	Lanthanum in 20 blank oil, 5000 µg/g	La:5000 ppm	50 g
CON-150-100-825	Lead in 20 blank oil, 1000 µg/g	Pb:1000 ppm	50 g
CON-150-500-825	Lead in 20 blank oil, 5000 µg/g	Pb: 5000 ppm	50 g
CON-150-100-035	Lithium in 20 blank oil, 1000 µg/g	Li:1000 ppm	50 g
CON-150-500-035	Lithium in 20 blank oil, 5000 µg/g	Li:5000 ppm	50 g
CON-150-100-125	Magnesium in 20 blank oil, 1000 µg/g	Mg:1000 ppm	50 g
CON-150-500-125	Magnesium in 20 blank oil, 5000 µg/g	Mg:5000 ppm	50 g
CON-150-100-255	Manganese in 20 blank oil, 1000 µg/g	Mn:1000 ppm	50 g
CON-150-500-255	Manganese in 20 blank oil, 5000 µg/g	Mn:5000 ppm	50 g
CON-150-103-801	Mercury in 20 blank oil, 100 µg/g	Hg:100 ppm	100 g
CON-150-100-425	Molybdenum in 20 blank oil, 1000 µg/g	Mo:1000 ppm	50 g
CON-150-500-425	Molybdenum in 20 blank oil, 5000 µg/g	Mo:5000 ppm	50 g
CON-150-100-285	Nickel in 20 blank oil, 1000 µg/g	Ni:1000 ppm	50 g
CON-150-500-285	Nickel in 20 blank oil, 5000 µg/g	Ni:5000 ppm	50 g
CON-150-100-155	Phosphorus in 20 blank oil, 1000 µg/g	P:1000 ppm	50 g
CON-150-500-155	Phosphorus in 20 blank oil, 5000 µg/g	P:5000 ppm	50 g
CON-150-100-195	Potassium in 20 blank oil, 1000 µg/g	K:1000 ppm	50 g
CON-150-500-195	Potassium in 20 blank oil, 5000 µg/g	K:5000 ppm	50 g
CON-150-500-215	Scandium in 20 blank oil, 2000 µg/g	Sc:2000 ppm	50 g
CON-150-103-341	Selenium in 20 blank oil, 100 µg/g	Se:100 ppm	100 g
CON-150-100-145	Silicon in 20 blank oil, 1000 µg/g	Si:1000 ppm	50 g
CON-150-500-145	Silicon in 20 blank oil, 5000 µg/g	Si:5000 ppm	50 g
CON-150-100-475	Silver in 20 blank oil, 1000 µg/g	Ag:1000 ppm	50 g
CON-150-500-475	Silver in 20 blank oil, 5000 µg/g	Ag:5000 ppm	50 g
CON-150-100-115	Sodium in 20 blank oil, 1000 µg/g	Na:1000 ppm	50 g
CON-150-500-115	Sodium in 20 blank oil, 5000 µg/g	Na:5000 ppm	50 g
CON-150-100-385	Strontium in 20 blank oil, 1000 µg/g	Sr:1000 ppm	50 g
CON-150-500-385	Strontium in 20 blank oil, 5000 µg/g	Sr:5000 ppm	50 g
CON-150-100-505	Tin in 20 blank oil, 1000 µg/g	Sn:1000 ppm	50 g
CON-150-500-505	Tin in 20 blank oil, 5000 µg/g	Sn:5000 ppm	50 g
CON-150-100-225	Titanium in 20 blank oil, 1000 µg/g	Ti:1000 ppm	50 g
CON-150-500-225	Titanium in 20 blank oil, 5000 µg/g	Ti:5000 ppm	50 g
CON-150-100-745	Tungsten in 20 blank oil, 1000 µg/g	W:1000 ppm	50 g
CON-150-500-745	Tungsten in 20 blank oil, 5000 µg/g	W:5000 ppm	50 g
CON-150-100-235	Vanadium in 20 blank oil, 1000 µg/g	V:1000 ppm	50 g
CON-150-500-235	Vanadium in 20 blank oil, 5000 µg/g	V:5000 ppm	50 g
CON-150-100-395	Yttrium in 20 blank oil, 1000 µg/g	Y:1000 ppm	50 g
CON-150-500-395	Yttrium in 20 blank oil, 5000 µg/g	Y:5000 ppm	50 g
CON-150-100-305	Zinc in 20 blank oil, 1000 µg/g	Zn:1000 ppm	50 g
CON-150-500-305	Zinc in 20 blank oil, 5000 µg/g	Zn:5000 ppm	50 g

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Code	Product	Unit
Multi-element standards in oil		
<p>Multi-element Conostan standards are especially useful for ICP, RDE, and DCP analysis of metals in oil. They are available in high purity hydrocarbon oil solutions and are blended to approximately 70 cSt viscosity at 40°C and flash point of 215°C (75 Blank Oil). They contain equal amounts of each element. Concentrations not listed are available as custom multi-element standards on request. You may create your own S-21 and S-12 standards by adding additional elements to the stocked product standards, listed as follows.</p>		
CON-150-021-002	Multi-element standard in 75 blank oil: S-21:10 ppm	100 g
	Ag 10 µg/g Cu 10 µg/g P 10 µg/g Al 10 µg/g Fe 10 µg/g Pb 10 µg/g B 10 µg/g Mg 10 µg/g Si 10 µg/g Ba 10 µg/g Mn 10 µg/g Sn 10 µg/g Ca 10 µg/g Mo 10 µg/g Ti 10 µg/g Cd 10 µg/g Na 10 µg/g V 10 µg/g Cr 10 µg/g Ni 10 µg/g Zn 10 µg/g	
CON-150-021-018	Multi-element standard in 75 blank oil: S-21:10 ppm	200 g
CON-150-021-008	Multi-element standard in 75 blank oil: S-21:30 ppm	100 g
	Ag 30 µg/g Cu 30 µg/g P 30 µg/g Al 30 µg/g Fe 30 µg/g Pb 30 µg/g B 30 µg/g Mg 30 µg/g Si 30 µg/g Ba 30 µg/g Mn 30 µg/g Sn 30 µg/g Ca 30 µg/g Mo 30 µg/g Ti 30 µg/g Cd 30 µg/g Na 30 µg/g V 30 µg/g Cr 30 µg/g Ni 30 µg/g Zn 30 µg/g	
CON-150-021-027	Multi-element standard in 75 blank oil: S-21:30 ppm	200 g
CON-150-021-010	Multi-element standard in 75 blank oil: S-21:50 ppm	100 g
	Ag 50 µg/g Cu 50 µg/g P 50 µg/g Al 50 µg/g Fe 50 µg/g Pb 50 µg/g B 50 µg/g Mg 50 µg/g Si 50 µg/g Ba 50 µg/g Mn 50 µg/g Sn 50 µg/g Ca 50 µg/g Mo 50 µg/g Ti 50 µg/g Cd 50 µg/g Na 50 µg/g V 50 µg/g Cr 50 µg/g Ni 50 µg/g Zn 50 µg/g	
CON-150-021-030	Multi-element standard in 75 blank oil: S-21:50 ppm	200 g
CON-150-021-003	Multi-element standard in 75 blank oil: S-21:100 ppm	100 g
	Ag 100 µg/g Cu 100 µg/g P 100 µg/g Al 100 µg/g Fe 100 µg/g Pb 100 µg/g B 100 µg/g Mg 100 µg/g Si 100 µg/g Ba 100 µg/g Mn 100 µg/g Sn 100 µg/g Ca 100 µg/g Mo 100 µg/g Ti 100 µg/g Cd 100 µg/g Na 100 µg/g V 100 µg/g Cr 100 µg/g Ni 100 µg/g Zn 100 µg/g	
CON-150-021-019	Multi-element standard in 75 blank oil: S-21:100 ppm	200 g
CON-150-021-009	Multi-element standard in 75 blank oil: S-21:300 ppm	100 g
	Ag 300 µg/g Cu 300 µg/g P 300 µg/g Al 300 µg/g Fe 300 µg/g Pb 300 µg/g B 300 µg/g Mg 300 µg/g Si 300 µg/g Ba 300 µg/g Mn 300 µg/g Sn 300 µg/g Ca 300 µg/g Mo 300 µg/g Ti 300 µg/g Cd 300 µg/g Na 300 µg/g V 300 µg/g Cr 300 µg/g Ni 300 µg/g Zn 300 µg/g	
CON-150-021-028	Multi-element standard in 75 blank oil: S-21:300 ppm	200 g
CON-150-021-011	Multi-element standard in 75 blank oil: S-21:500 ppm	100 g
	Ag 500 µg/g Cu 500 µg/g P 500 µg/g Al 500 µg/g Fe 500 µg/g Pb 500 µg/g B 500 µg/g Mg 500 µg/g Si 500 µg/g Ba 500 µg/g Mn 500 µg/g Sn 500 µg/g Ca 500 µg/g Mo 500 µg/g Ti 500 µg/g Cd 500 µg/g Na 500 µg/g V 500 µg/g Cr 500 µg/g Ni 500 µg/g Zn 500 µg/g	
CON-150-021-031	Multi-element standard in 75 blank oil: S-21:500 ppm	200 g
CON-150-021-015	Multi-element standard in 75 blank oil: S-21:900 ppm	100 g
	Ag 900 µg/g Cu 900 µg/g P 900 µg/g Al 900 µg/g Fe 900 µg/g Pb 900 µg/g B 900 µg/g Mg 900 µg/g Si 900 µg/g Ba 900 µg/g Mn 900 µg/g Sn 900 µg/g Ca 900 µg/g Mo 900 µg/g Ti 900 µg/g Cd 900 µg/g Na 900 µg/g V 900 µg/g Cr 900 µg/g Ni 900 µg/g Zn 900 µg/g	
CON-150-021-035	Multi-element standard in 75 blank oil: S-21:900 ppm	200 g

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Code	Product	Unit
CON-150-012-001	Multi-element standard in 75 blank oil: S-12:10 ppm Ag 10 µg/g Fe 10 µg/g Pb 10 µg/g Al 10 µg/g Mg 10 µg/g Si 10 µg/g Cr 10 µg/g Na 10 µg/g Sn 10 µg/g Cu 10 µg/g Ni 10 µg/g Ti 10 µg/g	100 g
CON-150-012-009	Multi-element standard in 75 blank oil: S-12:10 ppm	200 g
CON-150-012-004	Multi-element standard in 75 blank oil: S-12:30 ppm Ag 30 µg/g Fe 30 µg/g Pb 30 µg/g Al 30 µg/g Mg 30 µg/g Si 30 µg/g Cr 30 µg/g Na 30 µg/g Sn 30 µg/g Cu 30 µg/g Ni 30 µg/g Ti 30 µg/g	100 g
CON-150-012-012	Multi-element standard in 75 blank oil: S-12:30 ppm	200 g
CON-150-012-006	Multi-element standard in 75 blank oil: S-12:50 ppm Ag 50 µg/g Fe 50 µg/g Pb 50 µg/g Al 50 µg/g Mg 50 µg/g Si 50 µg/g Cr 50 µg/g Na 50 µg/g Sn 50 µg/g Cu 50 µg/g Ni 50 µg/g Ti 50 µg/g	100 g
CON-150-012-014	Multi-element standard in 75 blank oil: S-12:50 ppm	200 g
CON-150-012-002	Multi-element standard in 75 blank oil: S-12:100 ppm Ag 100 µg/g Fe 100 µg/g Pb 100 µg/g Al 100 µg/g Mg 100 µg/g Si 100 µg/g Cr 100 µg/g Na 100 µg/g Sn 100 µg/g Cu 100 µg/g Ni 100 µg/g Ti 100 µg/g	100 g
CON-150-012-010	Multi-element standard in 75 blank oil: S-12:100 ppm	200 g
CON-150-012-005	Multi-element standard in 75 blank oil: S-12:300 ppm Ag 300 µg/g Fe 300 µg/g Pb 300 µg/g Al 300 µg/g Mg 300 µg/g Si 300 µg/g Cr 300 µg/g Na 300 µg/g Sn 300 µg/g Cu 300 µg/g Ni 300 µg/g Ti 300 µg/g	100 g
CON-150-012-013	Multi-element standard in 75 blank oil: S-12:300 ppm	200 g
CON-150-012-007	Multi-element standard in 75 blank oil: S-12:500 ppm Ag 500 µg/g Fe 500 µg/g Pb 500 µg/g Al 500 µg/g Mg 500 µg/g Si 500 µg/g Cr 500 µg/g Na 500 µg/g Sn 500 µg/g Cu 500 µg/g Ni 500 µg/g Ti 500 µg/g	100 g
CON-150-012-015	Multi-element standard in 75 blank oil: S-12:500 ppm	200 g
CON-150-012-008	Multi-element standard in 75 blank oil: S-12:900 ppm Ag 900 µg/g Fe 900 µg/g Pb 900 µg/g Al 900 µg/g Mg 900 µg/g Si 900 µg/g Cr 900 µg/g Na 900 µg/g Sn 900 µg/g Cu 900 µg/g Ni 900 µg/g Ti 900 µg/g	100 g
CON-150-012-016	Multi-element standard in 75 blank oil: S-12:900 ppm	200 g
	AM Special This multi-element standard is used in determination of additive elements in lubricant oils by ICP, RDE, and DCP analysis of metals in oil. [Concentrations not listed are available as custom multi-element standards on request. You may create your own AM Special standards by adding additional elements to the stocked product standards, listed as follows]	
CON-150-250-014	Multi-element standard AM-special in 75 blank oil: AM Special 900 ppm Ba 900 µg/g Mg 900 µg/g Zn 900 µg/g Ca 900 µg/g P 900 µg/g	100 g
CON-150-250-027	Multi-element standard AM-special in 75 blank oil: AM Special 900 ppm	200 g
CON-150-250-006	Multi-element standard AM-special in 75 blank oil: AM Special 1000 ppm Ba 1000 µg/g Mg 1000 µg/g Zn 1000 µg/g Ca 1000 µg/g P 1000 µg/g	100 g
CON-150-250-016	Multi-element standard AM-special in 75 blank oil: AM Special 1000 ppm	200 g

Petrochemical standards

Code	Product	Unit
Custom Multi-Element Standards in Mineral Oil		
<p>Customised standards can be prepared if your spectrometric analysis of metals requires a specific combination of elements and concentrations. Custom standards allow testing for unusual combinations and concentrations of elements with minimal spectral interference and repeatable results. Both single element and multi-element custom standards are available. Any element available (All except S, Cl, As, Hg, and Se) can be combined to prepare multi-element custom standards. Create your own S-21, S-12, and AM Special standards by adding additional elements to the stocked product standards. Popular additions to S-21 are potassium, lithium, and antimony. Standards are designated, for example, by S-21+K+Sb:100 ppm, AM Special+Fe:900 ppm, S-12+Mo:100 ppm, etc. Custom standards are available in 100 g, 200 g, and 400 g. Custom standards can be shipped to customers within 5 - 7 days of receipt of an order.</p>		

Sulfur in mineral oil

Sulfur and chlorine calibration standards are specifically designed for analysis of sulfur and chlorine in a wide variety of petroleum products by XRF, ICP and other analytical techniques. All standards are prepared on a weight/weight basis in high purity hydrocarbon oil with a 70 cSt viscosity at 40°C (75 Blank Oil). Stock concentrations are listed in the table below. Concentrations not listed are available as custom standards on request.

CON-150-400-025	Sulfur in mineral oil, blank	S:blank	100 g
CON-150-400-018	Sulfur in mineral oil, 50 µg/g	S:50 ppm; 0.005 wt%	100 g
CON-150-400-002	Sulphur in mineral oil, 100 µg/g	S:100 ppm; 0.01 wt%	100 g
CON-150-400-010	Sulfur in mineral oil, 250 µg/g	S:250 ppm; 0.025 wt%	100 g
CON-150-400-019	Sulfur in mineral oil, 500 µg/g	S:500 ppm; 0.05 wt%	100 g
CON-150-400-023	Sulfur in mineral oil, 750 µg/g	S:750 ppm; 0.075 wt%	100 g
CON-150-400-003	Sulphur in mineral oil, 1000 µg/g	S:1000 ppm; 0.1 wt%	100 g
CON-150-400-011	Sulfur in mineral oil, 2500 µg/g	S:2500 ppm; 0.25 wt%	100 g
CON-150-400-020	Sulfur in mineral oil, 5000 µg/g	S:5000 ppm; 0.5 wt%	100 g
CON-150-400-024	Sulfur in mineral oil, 7500 µg/g	S:7500 ppm; 0.75 wt%	100 g
CON-150-400-004	Sulphur in mineral oil, 10000 µg/g	S:10000 ppm; 1.0 wt%	100 g
CON-150-400-005	Sulphur in mineral oil, 15000 µg/g	S:15000 ppm; 1.5 wt%	100 g
CON-150-400-008	Sulfur in mineral oil, 20000 µg/g	S:20000 ppm; 2.0 wt%	100 g
CON-150-400-012	Sulfur in mineral oil, 25000 µg/g	S:25000 ppm; 2.5 wt%	100 g
CON-150-400-014	Sulfur in mineral oil, 30000 µg/g	S:30000 ppm; 3.0 wt%	100 g
CON-150-400-016	Sulfur in mineral oil, 40000 µg/g	S:40000 ppm; 4.0 wt%	100 g
CON-150-400-021	Sulfur in mineral oil, 50000 µg/g	S:50000 ppm; 5.0 wt%	100 g

Sulfur in residual oil

New	CON-150-420-100	Sulfur in residual oil, 2500 µg/g	50 mL
New	CON-150-420-005	Sulfur in residual oil, 2500 µg/g	100 mL
New	CON-150-420-105	Sulfur in residual oil, 3500 µg/g	50 mL
New	CON-150-420-010	Sulfur in residual oil, 3500 µg/g	100 mL
New	CON-150-420-110	Sulfur in residual oil, 5000 µg/g	50 mL
New	CON-150-420-015	Sulfur in residual oil, 5000 µg/g	100 mL
New	CON-150-420-120	Sulfur in residual oil, 7500 µg/g	50 mL
New	CON-150-420-020	Sulfur in residual oil, 7500 µg/g	100 mL
New	CON-150-420-125	Sulfur in residual oil, 10000 µg/g	50 mL
New	CON-150-420-025	Sulfur in residual oil, 10000 µg/g	100 mL
New	CON-150-420-130	Sulfur in residual oil, 15000 µg/g	50 mL
New	CON-150-420-030	Sulfur in residual oil, 15000 µg/g	100 mL
New	CON-150-420-135	Sulfur in residual oil, 20000 µg/g	50 mL
New	CON-150-420-035	Sulfur in residual oil, 20000 µg/g	100 mL
New	CON-150-420-140	Sulfur in residual oil, 25000 µg/g	50 mL
New	CON-150-420-040	Sulfur in residual oil, 25000 µg/g	100 mL

	Code	Product	Unit
New	CON-150-420-145	Sulfur in residual oil, 30000 µg/g	50 mL
New	CON-150-420-045	Sulfur in residual oil, 30000 µg/g	100 mL
New	CON-150-420-150	Sulfur in residual oil, 35000 µg/g	50 mL
New	CON-150-420-050	Sulfur in residual oil, 35000 µg/g	100 mL
New	CON-150-420-155	Sulfur in residual oil, 40000 µg/g	50 mL
New	CON-150-420-055	Sulfur in residual oil, 40000 µg/g	100 mL
New	CON-150-420-160	Sulfur in residual oil, 50000 µg/g	50 mL
New	CON-150-420-060	Sulfur in residual oil, 50000 µg/g	100 mL

Sulfur in Isooctane

New	CON-150-430-010	Sulfur in isooctane, set of 7 x 10 ml vials: 0, 0.5, 1.0, 2.5, 5.0, 7.5, 10 ppm	7 x 10 mL
New	CON-150-430-020	Sulfur in isooctane, set of 7 x 10 ml vials: 0, 5, 10, 25, 50, 100, 250 ppm	7 x 10 mL
New	CON-150-430-030	Sulfur in isooctane, set of 7 x 10 ml vials: 0, 50, 100, 250, 500, 750, 1000 ppm	7 x 10 mL
New	CON-150-430-100	Sulfur in isooctane, Set of 7	7 x 60 mL
New	CON-150-430-101	Sulfur in isooctane (blank)	60 mL
New	CON-150-430-108	Sulfur in isooctane, 5 µg/g	60 mL
New	CON-150-430-109	Sulfur in isooctane, 10 µg/g	60 mL
New	CON-150-430-102	Sulfur in isooctane, 50 µg/g	60 mL
New	CON-150-430-103	Sulfur in isooctane, 100 µg/g	60 mL
New	CON-150-430-104	Sulfur in isooctane, 250 µg/g	60 mL
New	CON-150-430-105	Sulfur in isooctane, 500 µg/g	60 mL
New	CON-150-430-106	Sulfur in isooctane, 750 µg/g	60 mL
New	CON-150-430-107	Sulfur in isooctane, 1000 µg/g	60 mL

Chlorine in oil

	CON-150-200-008	Chlorine in oil, blank	Cl:blank	100 g
	CON-150-200-001	Chlorine in oil, 10 µg/g	Cl:10 ppm; 0.001 wt%	100 g
	CON-150-200-002	Chlorine in oil, 100 µg/g	Cl:100ppm; 0.01 wt%	100 g
	CON-150-200-005	Chlorine in oil, 500 µg/g	Cl:500 ppm; 0.05 wt%	100 g
	CON-150-200-003	Chlorine in oil, 1000 µg/g	Cl:1000 ppm; 0.1 wt%	100 g
	CON-150-200-006	Chlorine in oil, 5000 µg/g	Cl:5000 ppm; 0.5 wt%	100 g
	CON-150-200-004	Chlorine in oil, 10000 µg/g	Cl:10000 ppm; 1.0 wt%	100 g
	CON-150-200-007	Chlorine in oil, 50000 µg/g	Cl:50000 ppm; 5.0 wt%	100 g

Blank and base oils

Blank oils are used for blending calibration standards for spectrometric analysis of metals in oil.

	CON-150-020-002	20 Blank oil		100 g
		<u>Viscosity</u>		
		40 °C (104 °F).....14-18 cSt	100 °C (212 °F) 3-4 cSt	
		Any trace metal..... <0.10 ppm		
	CON-150-020-001	20 Blank oil		400 g
	CON-150-020-005	20 Blank oil		3.78 L
	CON-150-075-003	75 Blank oil		100 g
		<u>Viscosity</u>		
		40 °C (104 °F).....65-72 cSt	100 °C (212 °F) 8.1-8.7 cSt	
		Any trace metal..... <0.10 ppm		
	CON-150-075-002	75 Blank oil		400 g
	CON-150-075-006	75 Blank oil		3.78 L
	CON-150-020-004	20 Base Oil		500 mL
	CON-150-020-003	20 Base Oil		3.76 L
	CON-150-075-005	75 Base Oil		500 mL
	CON-150-075-004	75 Base Oil		3.76 L

Petrochemical standards

Code	Product	Unit
Stabilizer		
CON-150-010-001	Stabilizer for Conostan® Standards	50 g
Sulfur in diesel fuel		
CON-150-410-012	Sulfur in diesel fuel blank	100 g
CON-150-410-008	Sulfur in diesel fuel, 5 µg/g	100 g
CON-150-410-001	Sulfur in diesel fuel, 10 µg/g	100 g
CON-150-410-005	Sulfur in diesel fuel, 15 µg/g	100 g
CON-150-410-013	Sulfur in diesel fuel, 25 µg/g	100 g
CON-150-410-009	Sulfur in diesel fuel, 50 µg/g	100 g
CON-150-410-014	Sulfur in diesel fuel, 75 µg/g	100 g
CON-150-410-002	Sulfur in diesel fuel, 100 µg/g	100 g
CON-150-410-015	Sulfur in diesel fuel, 200 µg/g	100 g
CON-150-410-016	Sulfur in diesel fuel, 300 µg/g	100 g
CON-150-410-017	Sulfur in diesel fuel, 400 µg/g	100 g
CON-150-410-010	Sulfur in diesel fuel, 500 µg/g	100 g
CON-150-410-018	Sulfur in diesel fuel, 750 µg/g	100 g
CON-150-410-003	Sulfur in diesel fuel, 1000 µg/g	100 g
CON-150-410-019	Sulfur in diesel fuel, 1500 µg/g	100 g
CON-150-410-020	Sulfur in diesel fuel, 3000 µg/g	100 g
CON-150-410-011	Sulfur in diesel fuel, 5000 µg/g	100 g
CON-150-410-021	Sulfur in diesel fuel, 7500 µg/g	100 g
CON-150-410-004	Sulfur in diesel fuel, 10000 µg/g	100 g
CON-150-410-006	Sulfur in diesel fuel, 15000 µg/g	100 g
CON-150-410-007	Sulfur in diesel fuel, 20000 µg/g	100 g
CON-150-410-022	Sulfur in diesel fuel, 30000 µg/g	100 g
CON-150-410-023	Sulfur in diesel fuel, 40000 µg/g	100 g
PremiSolv™ ICP solvent		
<p>PremiSolv™ ICP solvent is a superior product vs. low odour kerosene or xylene for use as a diluent and "zero" point standard in ICP/DCP analysis of metals in oil and other organic fluids. PremiSolv™ ICP solvent features:</p> <ul style="list-style-type: none"> • Extremely low odour: No sulfur/aromatic odor for increased worker comfort and less occupational exposure. • Extremely low toxicity compared to kerosene or xylene. • Non-hazardous for shipping/disposal. • Supplied with certificate of analysis listing the concentration of 33 different metals and sulfur. 		
CON-150-700-003	PremiSolv™ ICP solvent	3.78 L
CON-150-700-002	PremiSolv™ ICP solvent	5 x 3.78 L

Code Product Unit

PartiStan™ particle standards- Compliant with ISO 11171:1999

Automatic particle counters (APC), using a laser source, are used for measurement of contamination in lubrication products, especially hydraulic fluids. These products are necessary for instrument calibration and verification of performance, and may, also, be used for non-laser based particle counting instruments.

PartiStan™ Particle Standard Features:

- Traceable to NIST SRM 2806.
- ISO 11171 compliant, Per Annex F; uses ISO medium test dust.
- Certificate of analysis for 4-30 um(c) (micrometers, certified).
- Maintain conformance to ISO programs (ISO 4402 is obsolete).
- Independent of APC manufacturer.

Routine Products Usage:

- PartiStan™ 2806.
 - Sizing calibration (Clause 6, ISO 11171).
 - Verification fluid for APC performance.
- PartiStan™ SCF (Super Clean Fluid).
 - APC system cleaning.
 - Test sample dilution.
- PartiStan™ Calibration Kits - All fluids for ISO 11171 APC calibration.
- PartiStan™ UFTD.
 - Ultra fine test dust suspensions for ISO 11171 - Annexes A,B,C, & E.

CON-150-701-001	PartiStan™ 2806 - 2.8 mg/L ISO Medium Test Dust suspension in Super Clean Fluid	400 g
CON-150-701-002	PartiStan™ resolution standard	400 g
CON-150-701-003	PartiStan™ SCF - Super Clean Fluid	400 mL
CON-150-701-004	PartiStan™ SCF - Super Clean Fluid	1 gallon
CON-150-701-005	PartiStan™ UFTD - Ultra Fine test dust suspension in Super Clean Fluid	400/250 mL

CONOSTAN D-Series® Element (metallo-organic) Standards: D-3, D-12, D-19 (JOAP)

The CONOSTAN-D-Series® standards are specially designed for military laboratories required to conform to the JOAP (Joint Oil Analysis Program –U.S.) program for emission spectrometers. These standards **should not be used unless the laboratory instrument is JOAP certified**. Refer to and use CONOSTAN multi-element standards, otherwise.

D-3 series (Note: U.S. Dept. Of Defense NSN # equivalent shown with product identity)

CON-150-300-019	CONOSTAN D-Series® Standard: D-3:100 (NSN 9150-01-283-0249)	200 g
	B 100 µg/g Mo 100 µg/g Zn 100 µg/g	

D-12 series (Note: U.S. Dept. Of Defense NSN # equivalent shown with product identity)

CON-150-300-005	CONOSTAN D-Series® Standard: D-12:5 ppm (NSN: 9150-01-307-3343)	200 g
	Ag 5 µg/g Fe 5 µg/g Pb 5 µg/g Al 5 µg/g Mg 5 µg/g Si 5 µg/g Cr 5 µg/g Na 5 µg/g Sn 5 µg/g Cu 5 µg/g Ni 5 µg/g Ti 5 µg/g	

CON-150-300-001	CONOSTAN D-Series® Standard: D-12:10 ppm (NSN: 9150-00-179-5145)	200 g
	Ag 10 µg/g Fe 10 µg/g Pb 10 µg/g Al 10 µg/g Mg 10 µg/g Si 10 µg/g Cr 10 µg/g Na 10 µg/g Sn 10 µg/g Cu 10 µg/g Ni 10 µg/g Ti 10 µg/g	

CON-150-300-003	CONOSTAN D-Series® Standard: D-12:30 ppm (NSN: 9150-00-179-5144)	200 g
	Ag 30 µg/g Fe 30 µg/g Pb 30 µg/g Al 30 µg/g Mg 30 µg/g Si 30 µg/g Cr 30 µg/g Na 30 µg/g Sn 30 µg/g Cu 30 µg/g Ni 30 µg/g Ti 30 µg/g	

CON-150-300-006	CONOSTAN D-Series® Standard: D-12:50 ppm (NSN: 9150-00-179-5143)	200 g
	Ag 50 µg/g Fe 50 µg/g Pb 50 µg/g Al 50 µg/g Mg 50 µg/g Si 50 µg/g Cr 50 µg/g Na 50 µg/g Sn 50 µg/g Cu 50 µg/g Ni 50 µg/g Ti 50 µg/g	

CON-150-300-002	CONOSTAN D-Series® Standard: D-12:100 ppm (NSN: 9150-00-179-5142)	200 g
	Ag 100 µg/g Fe 100 µg/g Pb 100 µg/g Al 100 µg/g Mg 100 µg/g Si 100 µg/g Cr 100 µg/g Na 100 µg/g Sn 100 µg/g Cu 100 µg/g Ni 100 µg/g Ti 100 µg/g	

Petrochemical standards

Code	Product	Unit
CON-150-300-004	CONOSTAN D-Series® Standard: D-12:300 ppm (NSN: 9150-00-179-5141)	200 g
	Ag 300 µg/g Fe 300 µg/g Pb 300 µg/g Al 300 µg/g Mg 300 µg/g Si 300 µg/g Cr 300 µg/g Na 300 µg/g Sn 300 µg/g Cu 300 µg/g Ni 300 µg/g Ti 300 µg/g	
	D-19 series (Note: U.S. Dept. Of Defense NSN # equivalent shown with product identity)	
CON-150-300-008	CONOSTAN D-Series® Standard (blank): D-19:0 (NSN:9150-00-179-5137)	100 g
CON-150-300-013	CONOSTAN D-Series® Standard: D-19:5 ppm (no NSN number; not offered by U.S. Dept. Of Defense; see CON-D19 Set, below)	100 g
	Ag 5 µg/g Fe 5 µg/g Si 5 µg/g Al 5 µg/g Mg 5 µg/g Sn 5 µg/g B 5 µg/g Mn 5 µg/g Ti 5 µg/g Ba 5 µg/g Mo 5 µg/g V 5 µg/g Cd 5 µg/g Na 5 µg/g Zn 5 µg/g Cr 5 µg/g Ni 5 µg/g Cu 5 µg/g Pb 5 µg/g	
CON-150-300-009	CONOSTAN D-Series® Standard: D-19:10 ppm (no NSN number; not offered by U.S. Dept. Of Defense; see CON-D19 Set, below)	100 g
	Ag 10 µg/g Fe 10 µg/g Si 10 µg/g Al 10 µg/g Mg 10 µg/g Sn 10 µg/g B 10 µg/g Mn 10 µg/g Ti 10 µg/g Ba 10 µg/g Mo 10 µg/g V 10 µg/g Cd 10 µg/g Na 10 µg/g Zn 10 µg/g Cr 10 µg/g Ni 10 µg/g Cu 10 µg/g Pb 10 µg/g	
CON-150-300-011	CONOSTAN D-Series® Standard: D-19:30 ppm (no NSN number; not offered by U.S. Dept. Of Defense; see CON-D19 Set, below)	100 g
	Ag 30 µg/g Fe 30 µg/g Si 30 µg/g Al 30 µg/g Mg 30 µg/g Sn 30 µg/g B 30 µg/g Mn 30 µg/g Ti 30 µg/g Ba 30 µg/g Mo 30 µg/g V 30 µg/g Cd 30 µg/g Na 30 µg/g Zn 30 µg/g Cr 30 µg/g Ni 30 µg/g Cu 30 µg/g Pb 30 µg/g	
CON-150-300-014	CONOSTAN D-Series® Standard: D-19:50 ppm (no NSN number; not offered by U.S. Dept. Of Defense; see CON-D19 Set, below)	100 g
	Ag 50 µg/g Fe 50 µg/g Si 50 µg/g Al 50 µg/g Mg 50 µg/g Sn 50 µg/g B 50 µg/g Mn 50 µg/g Ti 50 µg/g Ba 50 µg/g Mo 50 µg/g V 50 µg/g Cd 50 µg/g Na 50 µg/g Zn 50 µg/g Cr 50 µg/g Ni 50 µg/g Cu 50 µg/g Pb 50 µg/g	
CON-150-300-010	CONOSTAN D-Series® Standard: D-19:100 ppm (no NSN number; not offered by U.S. Dept. Of Defense; see CON-D19 Set, below)	100 g
	Ag 100 µg/g Fe 100 µg/g Si 100 µg/g Al 100 µg/g Mg 100 µg/g Sn 100 µg/g B 100 µg/g Mn 100 µg/g Ti 100 µg/g Ba 100 µg/g Mo 100 µg/g V 100 µg/g Cd 100 µg/g Na 100 µg/g Zn 100 µg/g Cr 100 µg/g Ni 100 µg/g Cu 100 µg/g Pb 100 µg/g	
CON-150-300-012	CONOSTAN D-Series® Standard: D-19:300 ppm (no NSN number; not offered by U.S. Dept. Of Defense; see CON-D19 Set, below)	100 g
	Ag 300 µg/g Fe 300 µg/g Si 300 µg/g Al 300 µg/g Mg 300 µg/g Sn 300 µg/g B 300 µg/g Mn 300 µg/g Ti 300 µg/g Ba 300 µg/g Mo 300 µg/g V 300 µg/g Cd 300 µg/g Na 300 µg/g Zn 300 µg/g Cr 300 µg/g Ni 300 µg/g Cu 300 µg/g Pb 300 µg/g	
CON-150-300-015	CONOSTAN D-Series® Standard: D-19:500 ppm (no NSN number; not offered by U.S. Dept. Of Defense; see CON-D19 Set, below)	100 g
	Ag 500 µg/g Fe 500 µg/g Si 500 µg/g Al 500 µg/g Mg 500 µg/g Sn 500 µg/g B 500 µg/g Mn 500 µg/g Ti 500 µg/g Ba 500 µg/g Mo 500 µg/g V 500 µg/g Cd 500 µg/g Na 500 µg/g Zn 500 µg/g Cr 500 µg/g Ni 500 µg/g Cu 500 µg/g Pb 500 µg/g	

Code	Product	Unit
CON-150-300-016	CONOSTAN D-Series® Standard: D-19:700 ppm (no NSN number; not offered by U.S. Dept. Of Defense; see CON-D19 Set, below)	100 g
	Ag 700 µg/g Fe 700 µg/g Si 700 µg/g Al 700 µg/g Mg 700 µg/g Sn 700 µg/g B 700 µg/g Mn 700 µg/g Ti 700 µg/g Ba 700 µg/g Mo 700 µg/g V 700 µg/g Cd 700 µg/g Na 700 µg/g Zn 700 µg/g Cr 700 µg/g Ni 700 µg/g Cu 700 µg/g Pb 700 µg/g	
CON-150-300-017	CONOSTAN D-Series® Standard: D-19:900 ppm (no NSN number; not offered by U.S. Dept. Of Defense; see CON-D19 Set, below)	100 g
	Ag 900 µg/g Fe 900 µg/g Si 900 µg/g Al 900 µg/g Mg 900 µg/g Sn 900 µg/g B 900 µg/g Mn 900 µg/g Ti 900 µg/g Ba 900 µg/g Mo 900 µg/g V 900 µg/g Cd 900 µg/g Na 900 µg/g Zn 900 µg/g Cr 900 µg/g Ni 900 µg/g Cu 900 µg/g Pb 900 µg/g	
CON-150-300-018	CONOSTAN D-Series® Standards: D-19:Set (NSN: 9150-01-355-1178)	set
	Each set includes CON-D19/0A 4 x 100 g CON-D19/50A 1 x 100 g CON-D19/100A 3 x 100 g CON-D19/5A 1 x 100 g CON-D19/500A 1 x 100 g CON-D19/300A 2 x 100 g CON-D19/10A 1 x 100 g CON-D19/700A 1 x 100 g CON-D19/30A 1 x 100 g CON-D19/900A 1 x 100 g	

Oils and liquid fuels

ERM-EF213 – ERM-EF211		
Petroleum products containing Sulfur (S) in its natural forms, closely matching petrol fuels. The material is supplied in 19mL units in glass ampoules.		
ERM-EF213	Petrol - Sulfur Certified value S 9.1 ± 0.8 mg/kg	Amp.
ERM-EF212	Petrol - Sulfur Certified value S 20.2 ± 1.1 mg/kg	19 mL
ERM-EF211	Petrol - Sulfur Certified value S 48.8 ± 1.7 mg/kg	Amp.
ERM-EF674 – ERM-EF673		
Petroleum products containing Sulfur (S) in its natural forms, closely matching diesel fuels. The material is supplied in 100mL units in glass bottles with tamper evident tops.		
ERM-EF673	Diesel - Sulfur Certified value S 52.4 ± 1.3 mg/kg Indicative value for density	100 mL
ERM-EF672 - ERM-EF104		
The material is intended to control that gas oil does not contain more sulfur than allowed by Directive 1999/32/EEC so that maximum atmospheric sulfur emissions are not exceeded. It can be used to validate and/or calibrate analytical methods applied.		
ERM-EF674	Diesel - Sulfur Certified value S 11.0 ± 0.9 mg/kg Indicative value for density	100 mL
ERM-EF672	Gas oil - Sulfur Certified value S 0.0203 %	8 mL
ERM-EF671	Gas oil - Sulfur Certified value S 0.0452 %	8 mL
ERM-EF104	Gas oil - Sulfur Certified value S 0.1019 %	8 mL

Petrochemical standards

Code	Product	Unit																					
BCR-106	Gas oil - Sulfur Certified value S 0.502 %	25 g																					
BCR-107	Gas oil - Sulfur Certified value S 1.040 %	25 g																					
ERM-EF317	Gas oil - Solvent Yellow 124 (SY124) Certified value Uncertainty Solvent Yellow 124 (SY124) content 0.141 mg/kg 0.018 mg/kg	20 mL																					
ERM-EF318	Gas oil - Solvent Yellow 124 (SY124) Certified value Uncertainty Solvent Yellow 124 (SY124) content 7.0 mg/kg 0.4 mg/kg	20 mL																					
NIST-2037	Solvent Red 24 diesel fuel dye This Standard Reference Material® (SRM®) is intended for the verification and calibration of spectrophotometers used to measure the concentration of Solvent Red dyes employed as colorants to mark "off-road" diesel fuel. NIST-2037 is certified for the purity of the Solvent Red 24 Dye (C ₂₄ H ₂₀ N ₄ O, molecular mass 380.45) and for the second-derivative-based molecular absorption coefficients (extinction coefficients) of solutions of Solvent Red 24 Dye in p-xylene and in 97:3 (v:v) kerosene:p-xylene. Each unit of NIST-2037 consists of an amber 30 mL (1 oz), screw-capped bottle containing approximately 100 mg of solid Solvent Red 24 Dye. Certified values Mass Fraction (Purity) of Solvent Red 24 Dye <table border="1"> <thead> <tr> <th>Constituent</th> <th>Mass Fraction (%)</th> <th>95% Uncertainty Interval</th> </tr> </thead> <tbody> <tr> <td>Solvent Red 24 Dye</td> <td>98.0</td> <td>92.3 % to 100 %</td> </tr> </tbody> </table> Second-Derivative-Based Molecular Absorption Coefficients for Solutions of Solvent Red 24 Dye <table border="1"> <thead> <tr> <th></th> <th>Wavelength of Second Derivative Maximum (nm)</th> <th>Wavelength of Second Derivative Minimum (nm)</th> <th>Second-Derivative-Based Solvent Absorption Coefficients (L g⁻¹ cm⁻¹)</th> <th>Second-Derivative-Based Solvent Absorption Coefficients (L mol⁻¹ cm⁻¹)</th> </tr> </thead> <tbody> <tr> <td>p-Xylene</td> <td>534</td> <td>557</td> <td>0.088 ± 0.005</td> <td>33 ± 2</td> </tr> <tr> <td>Kerosene:p-Xylene</td> <td>531</td> <td>555</td> <td>0.101 ± 0.006</td> <td>39 ± 3</td> </tr> </tbody> </table>	Constituent	Mass Fraction (%)	95% Uncertainty Interval	Solvent Red 24 Dye	98.0	92.3 % to 100 %		Wavelength of Second Derivative Maximum (nm)	Wavelength of Second Derivative Minimum (nm)	Second-Derivative-Based Solvent Absorption Coefficients (L g ⁻¹ cm ⁻¹)	Second-Derivative-Based Solvent Absorption Coefficients (L mol ⁻¹ cm ⁻¹)	p-Xylene	534	557	0.088 ± 0.005	33 ± 2	Kerosene:p-Xylene	531	555	0.101 ± 0.006	39 ± 3	100 mg
Constituent	Mass Fraction (%)	95% Uncertainty Interval																					
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p-Xylene	534	557	0.088 ± 0.005	33 ± 2																			
Kerosene:p-Xylene	531	555	0.101 ± 0.006	39 ± 3																			
SS99859-0	Gas oil - Sulfur ED X-ray ASTM D4294-IP336, Sulphur in the range 0.003 to 0.016 %m/m	50 mL																					
SS99867-0	Gas oil - Sulfur WD X-ray ASTM D2622, Sulfur in the range 0.001 to 0.013 %m/m	50 mL																					
BCR-420	Waste mineral oil - PCBs (low level) Certified values PCB 28 0.61 mg/kg PCB 118 1.69 mg/kg PCB 180 0.195 mg/kg PCB 101 1.45 mg/kg PCB 153 0.92 mg/kg	7.5 g																					
BCR-449	Waste mineral oil - PCBs (high level) Certified values PCB 28 0.80 mg/kg PCB 118 46.6 mg/kg PCB 170 6.6 mg/kg PCB 52 31.4 mg/kg PCB 128 12.5 mg/kg PCB 180 10.4 mg/kg PCB 101 57.2 mg/kg PCB 153 39.0 mg/kg PCB 105 17.4 mg/kg PCB 156 6.9 mg/kg	50 g																					
BAMCRM5001	Transformer oil - PCBs Set (2 x 15 g) of a PCB-free transformer oil and a PCB-containing transformer oil. PCB-containing transformer oil: PCB 44 240 µg/kg PCB 118 860 µg/kg PCB 153 700 µg/kg PCB 52 790 µg/kg PCB 138+163 800 µg/kg PCB 180 110 µg/kg PCB 101+84 1430 µg/kg PCB 149 650 µg/kg	kit																					
New RTC-CRM920-010	Transformer oil - PCBs Oil taken from an electrical transformer. The sample was certified by USEPA SW846, 3 rd edition Method 3540A/8081 and is suitable for use by these and other similar methods. Certified value Aroclor 1260 35.2 mg/kg	10 g																					
NIST-1818A	Lubricating base oil - Chlorine Set of 5 x 20 mL ampoules Certified values I Cl 31.6 mg/kg II Cl 60.0 mg/kg III Cl 78.2 mg/kg IV C 154.4 mg/kg V Cl 234.0 mg/kg	set																					

Petrochemical standards

Code	Product	Unit
NIST-2720	Di-n-butyl sulfide - Sulfur This Standard Reference Material® (SRM) is intended for use as an internal standard in X-ray fluorescence spectrometry (XRF) measurements of sulfur in oils and other liquid hydrocarbon matrices. Certified value of sulfur (mass fraction)21.91 % ± 0.15 %	5 x 4.5 mL
NIST-1819A	Lubricating base oil - Sulfur NIST-1819a consists of five lubricating base oils at different sulphur concentrations. Certified values I S 423.5 mg/kg II S 741.1 mg/kg III S 4022 mg/kg IV S 4689 mg/kg V S 6135 mg/kg	set
SS99863-0	Lube oil - Trace elements ASTM-IP method ICP, Ca in the range 0.18 to 0.35 % m/m ASTM-IP method ICP, P in the range 0.08 to 0.16 %m/m ASTM-IP method ICP, Zn in the range 0.09 to 0.15 %m/m	50 mL
NIST-1848	Lubricating oil additive package This Standard Reference Material (SRM®) is intended primarily for use in the evaluation of methods and the calibration of equipment used in the analysis of lubricating oil additive packages, engine lubricating oils, and materials of a similar matrix. NIST-1848 consists of a typical additive package used in the manufacture of crankcase lubricating oil for gasoline engines. Certified values B 0.137 ± 0.019 % Mg0.821 ± 0.038 % Zn..... 0.873 ± 0.022 % Ca 0.359 ± 0.01 % P0.788 ± 0.028 % Cl 0.0927 ± 0.020 % S2.3270 ± 0.043 % Indicative values for H, N, Si, total base number by ASTM D 2896, total base number by ASTM D 4739	100 g
NIST-1634C	Fuel oil - Trace elements Certified values As..... 0.1426 mg/kg Ni..... 17.54 mg/kg V 28.19 mg/kg Co 0.1510 mg/kg Se..... 0.1020 mg/kg Indicative values for Ba, Cl, Na, S	100 mL
SS99860-0	Fuel oil - Vanadium and nickel ASTM-IP method IP288, V in the range 16 to 140 µg/g ASTM-IP method IP288, Ni in the range 7 to 45 µg/g	50 mL
SS99862-0	Fuel oil - Sulfur ED X-ray ASTM D4294-IP336, Sulfur in the range 0.981 to 2.572 %m/m	50 mL
SS99866-0	Fuel oil - Sulfur WD X-ray ASTM D2622, Sulfur in the range 0.9931 to 2.578 %m/m	50 mL
SS99898-0	Gas oil - Aromatics HPLC ASTM D6379, Aromatics- Di HPLC in the range 1.44 to 2.82 %m/m ASTM D6379, Aromatics- Mono HPLC in the range 15.2 to 21.2 %m/m ASTM D6379, Aromatics- Total HPLC in the range 16.9 to 22.82 %m/m	50 mL
SS99857-0	Kerosene - Naphthalenes ASTM D1840, Naphthalenes in the range 1.35 to 2.4 %vol	50 mL
NIST-1580	Shale oil - PAHs Set of 5 x 2 mL ampoules Certified values Benzo[a]pyrene..... 21 mg/kg o-Cresol 385 mg/kg Pyrene 104 mg/kg Benzo[e]pyrene..... 18 mg/kg Phenol 407 mg/kg 2,6-Dimethylphenol... 175 mg/kg Fluoranthene..... 54 mg/kg Perylene 3.4 mg/kg Benzo[f]quinoline 16 mg/kg	set
NIST-1582	Petroleum crude oil - PAHs Set of 5 x 2 mL Certified values Benzo[a]anthracene... 3.0 mg/kg Fluoranthene 2.5 mg/kg Phenanthrene 101 mg/kg Benzo[e]pyrene..... 1.1 mg/kg Perylene 31 mg/kg Dibenzothiophene..... 33 mg/kg	set (5)
NIST-2721	Crude oil (light-sour) - Sulfur and mercury Certified values S 1.5832 % Hg..... 41.7 ng/kg	5 x 10 mL
NIST-2722	Crude oil (heavy-sweet) - Sulfur and mercury Certified values S 0.21037 % Hg..... 129 ng/kg	5 x 10 mL
NIST-1616b	Kerosene - Sulfur Certified value S 8.41 mg/kg	100 mL

Petrochemical standards

Code	Product	Unit
NIST-2298	Gasoline (High-Octane) - Sulfur Certified value S 4.7 µg/g Indicative value for the density	5 x 20 mL
NIST-2299	Gasoline (Reformulated) - Sulfur Certified value S 13.6 µg/g Indicative value for the density	5 x 20 mL
SS99868-0	Gasoline - Sulfur UVF ASTM D5453, Sulfur in the range 2.2 to 129 mg/kg	50 mL
SS99858-0	Kerosene - Sulfur ED X-ray ASTM D4294-IP336, Sulphur in the range 0.0032 to 0.07 %m/m	50 mL
NIST-1619B	Residual fuel oil - Sulfur Certified value S 0.6960 % Hg 3.46 ng/kg	100 mL
NIST-1621E	Residual fuel oil - Sulfur Certified value S 0.9480 %	100 mL
NIST-1622E	Residual fuel oil - Sulfur Certified value S 2.1468 %	100 mL
NIST-2717A	Residual fuel oil - Sulfur Certified value S 2.9957 %	100 mL
NIST-1620C	Residual fuel oil - Sulfur Certified value S 4.561 %	100 mL
NIST-2770	Diesel fuel oil - Sulfur NIST-2770 is a commercial "No. 2-D" distillate fuel oil as defined by ASTM D 975-97 Standard Specification for Diesel Fuel Oils. A unit of NIST-2770 consists of 10 amber ampoules, each containing approximately 10 mL of diesel fuel sealed under an argon atmosphere. Certified value S 41.57 mg/kg	10 x 10 mL
New NIST-2771	Diesel fuel blend stock - Sulfur Certified value Sulfur (S)..... 0.102 ± 0.014 mg/kg	100 mL
NIST-1624d	Diesel fuel oil - Sulphur NIST-1624d is a commercial "No. 2-D" distillate fuel oil as defined by ASTM D 975-97 Standard Specification for Diesel Fuel Oils. A unit of NIST-1624d consists of 10 amber ampoules, each containing approximately 10 mL of diesel fuel sealed under an argon atmosphere. Certified value S 3882 mg/kg	100 mL
	IRMM-441 and IRMM-442 High purity n-heptane and isooctane intended for use as a primary standard in the octane rating of motor and aviation fuels as specified in ASTM test methods (see Volume 05.04, Annual Book of ASTM Standards) and in evaluating ASTM methods for chemical analysis of fuels by gas chromatography (D2268).	
IRMM-441	n-Heptane <u>n-Heptane</u> Certified value: Purity by difference 99.985% <u>Impurities</u> Certified values Total organics (other than n-Heptane)..... 0.012 % Water 0.003 % Isooctane 0.007 % Pb <0.5 µg/L	100 mL
IRMM-442	Isooctane <u>Isooctane</u> Certified value: Purity by difference 99.985% <u>Impurities</u> Certified values Total organics (other than Isooctane)..... 0.011% Water 0.004%, n-Heptane 0.002 % Pb <1 µg/L	100 mL

Petrochemical standards

Code	Product	Unit
NIST-1815a	n-Heptane Certified purity..... 99.987 %	100 mL
NIST-1816A	Isooctane (2,2,4-Trimethylpentane) Certified purity..... 99.987 %	100 mL
NIST-2724b	Diesel fuel oil - Sulfur and mercury This Standard Reference Material® (SRM®) is intended for use in the evaluation of methods and the calibration of instruments used in the determination of total sulfur and mercury in fuel oils or materials of similar matrix. NIST-2724B is a commercial "No. 2-D" distillate fuel oil as defined by ASTM D 975-96a Standard Specification for Diesel Fuel Oils. Certified value S 0.04265 % Hg 0.034 ng/kg	10 x 10 mL
NIST-2890	Water saturated octanol NIST-2890 is a solution of water saturated 1-octanol which is certified for its water content. Certified values Water 47.3 mg/g Water 39.24 mg/mL	5 x 2 mL
NIST-RM 8505	Crude oil - Vanadium Reference value V 390 mg/kg	275 mL
NIST-RM 8506A	Transformer oil - Water A unit of NIST-RM 8506a consists of five ampoules with each ampoule containing 9.5 mL of petroleum electrical insulating oil. The first coulometric value is the NIST result corrected for the coulometrically detected material present in the oil that reacts with iodine but is not water (interfering substances). Because the correction is new, two additional uncorrected values determined by the coulometric method in ASTM Standard D 1533-99 are provided: the NIST result and a consensus result obtained from an interlaboratory study conducted among 14 laboratories from industry. The volumetric reference value, which has not been corrected for interfering substances, is significantly different from the coulometric results. Applying the coulometrically determined correction for interfering substances does not resolve this difference. The basis of the difference between coulometric and volumetric results in this material has not been fully resolved. Reference values for water content NIST coulometric mass concentration of water, ASTM method minus interferences 12.1 mg/kg ± 1.9 mg/kg NIST coulometric mass concentration of water, ASTM method 18.3 mg/kg ± 1.9 mg/kg Consensus coulometric mass concentration of water, ASTM method: 21.2 mg/kg ± 1.7 mg/kg NIST volumetric mass concentration of water, modified ASTM method: 34.5 mg/kg ± 2.2 mg/kg	set
NIST-RM 8509	Methanol - Water Set of 5 x 5 mL Reference value Water 93 mg/kg Indicative values for Ag, Al, Cr, Cu, Fe, Mg, Mn, Mo, Na, Ni, Pb, S, Si, Sn, Ti, V, Zn	set
NIST-RM 8510	Methanol - Water Set of 5 x 5 mL Reference value Water 325 mg/kg	set
NIST-1083	Oil (base oil) - Wear metals Indicative values for Ag, Al, Cr, Cu, Fe, Mg, Mn, Mo, Na, Ni, Pb, S, Si, Sn, Ti, V, Zn	150 mL
NIST-1084A	Oil - Wear metals Set of 5 x approx. 1.6 g of the oil blend Certified values Ag 101.4 mg/kg Mg 99.5 mg/kg Sn 97.2 mg/kg Cr 98.3 mg/kg Mo 100.3 mg/kg Ti 100.4 mg/kg Cu 100.0 mg/kg Ni 99.7 mg/kg V 95.9 mg/kg Fe 98.9 mg/kg Pb 101.1 mg/kg Indicative values for Al, S, Si	set
New NIST-1085B	Oil - Wear metals This Standard Reference Material® (SRM®) is intended primarily for use in the evaluation of methods and in the calibration of apparatus used in the analysis of engine lubricating oils and other materials of similar matrix for metal content. A unit of NIST-085b consists of 10 ampoules: five 5 mL amber borosilicate ampoules, each containing approximately 1.2 g of a blend of 21 constituent elements in a base oil at a nominal concentration of 300 mg/kg; and five ampoules, each containing approximately 1.2 g of a matching base oil intended for use as an analytical blank and for matrix matching. Certified values for elements in NIST-1085b Cadmium (Cd) 302.9 ± 5.1 mg/kg Nickel (Ni) 295.9 ± 7.4 mg/kg Chromium (Cr) 302.9 ± 3.9 mg/kg Silver (Ag) 304.6 ± 8.9 mg/kg Copper (Cu) 295.6 ± 8.5 mg/kg Sodium (Na) 305.2 ± 7.0 mg/kg Lead (Pb) 297.7 ± 6.8 mg/kg Vanadium (V) 297.8 ± 4.6 mg/kg Magnesium (Mg) 297.3 ± 4.1 mg/kg Zinc (Zn) 296.8 ± 6.8 mg/kg Indicative values for further elements.	set (5)

Petrochemical standards

Code	Product	Unit
NIST-1829	Reference fuel - Alcohols Certified values Methanol 0.335 % Methanol and t-butanol 10.33 + 6.63 % Ethanol 11.39 %	set (6)
NIST-1837	Reference fuel - Methanol and t-butanol Certified values Methanol and t-butanol 10.33 + 6.63 %	set
NIST-1838	Reference fuel - Ethanol Certified value Ethanol 11.39 %	5 x 20 mL
NIST-1839	Reference fuel - Methanol Certified value Methanol 0.335 %	set
NIST-2286	Ethanol in gasoline - Oxygen and oxygenate Set of 3 x 20 mL Certified values Oxygenate 5.73 % Oxygen 2.02 %	set (3)
NIST-2287	Ethanol in gasoline - Oxygen and oxygenate Set of 3 x 20 mL Certified values Oxygenate 10.07 % Oxygen 3.53 %	set (3)
NIST-2288	t-Amyl methyl ether in gasoline - Oxygen and oxygenate Set of 3 x 20 mL Certified values Oxygenate 12.78 % Oxygen 2.02 %	set (3)
NIST-2289	t-Amyl methyl ether in gasoline - Oxygen and oxygenate Set of 3 x 20 mL Certified values Oxygenate 17.30 % Oxygen 2.73 %	set (3)
NIST-2290	Ethyl t-butyl ether in gasoline - Oxygen and oxygenate Set of 3 x 20 mL Certified values Oxygenate 12.78 % Oxygen 2.01 %	set (3)
NIST-2291	Ethyl-t-butyl ether in gasoline - Oxygen and oxygenate Set of 3 x 20 mL Certified values Oxygenate 17.18 % Oxygen 2.70 %	set (3)
NIST-2293	Methyl t-butyl ether in gasoline - Oxygen and oxygenate A unit of NIST-2292 consists of two 20 mL ampoules of the methyl-t-butyl ether in reference gasoline solution each containing 18 mL, and one 20 mL ampoule containing 18 mL of the reference gasoline, intended for use as a measurement blank. Certified values Oxygenate 14.86 % Oxygen 2.71 %	set (3)
NIST-2294	Reformulated gasoline - Sulfur, benzene, MTBE and toluene Certified values S (total) 40.9 mg/kg MTBE 10.97 % Benzene 1.03 % Toluene 8.29 % Indicative values for a wide range of additional constituents	2 x 20 mL
NIST-2295	Reformulated gasoline - Sulfur, benzene, MTBE and toluene Certified values S (total) 308 mg/kg MTBE 14.54 % Benzene 0.99 % Toluene 7.89 % Indicative values for a wide range of additional constituents	2 x 20 mL
NIST-2296	Reformulated gasoline - Sulfur, benzene, MTBE and toluene Certified values S (total) 40.0 mg/kg ETBE 13.02 % Benzene 1.0 % Toluene 8.02 % Indicative values for a wide range of additional constituents	2 x 20 mL

Code	Product	Unit
NIST-2297	Reformulated gasoline - Sulfur, benzene, MTBE and toluene Certified values S (total) 303.7 mg/kg MTBE 9.91 % Benzene 1.04 % Toluene 8.27 % Indicative values for a wide range of additional constituents	2 x 20 mL
SS99865-0	Gasoline - Benzene ASTM D3606, Benzene in the range 0.4 to 0.9 %vol	5 x 5 mL
SS99869-0	Gas oil - Aromatics HPLC ASTM D6591, Aromatics in the range 0.6 to 3.6 %m/m	50 mL
SS99905-0	Kerosene (Jet turbine fuel) - Boiling range distribution Test Name ASTM-IP Method Sample result Amount/test SIMDIS IBP D2887-IP406 102.4 °C 1 mL SIMDIS 10% D2887-IP406 150.5 °C 1 mL SIMDIS 50% D2887-IP406 193.5 °C 1 mL SIMDIS 90% D2887-IP406 246.8 °C 1 mL SIMDIS 95% D2887-IP406 256.4 °C 1 mL SIMDIS FBP D2887-IP406 288.8 °C 1 mL	10 mL
SS99906-0	Gas oil - Boiling range distribution Test Name ASTM-IP Method Range Amount/test SIMDIS IBP D2887-IP406 160 to 190 °C 1 mL SIMDIS 10% D2887-IP406 200 to 242 °C 1 mL SIMDIS 50% D2887-IP406 260 to 290 °C 1 mL SIMDIS 90% D2887-IP406 320 to 350 °C 1 mL SIMDIS 95% D2887-IP406 335 to 368 °C 1 mL SIMDIS FBP D2887-IP406 350 to 385 °C 1 mL	10 mL

Multi-test verification materials (MTVMs)

The Multi-Test Verification Materials (MTVMs) are unique because, unlike most other reference materials, they enable a laboratory to use a single sample to validate different tests and instrumentation. Each unit is supplied with data for multiple types of internationally accepted test methods.

SS99850-0	SETA MTVM Kerosine (Jet turbine fuel) Test Name ASTM-IP Method Range Amount/test Distillation IBP D86-IP123 140-180 °C 100 mL Distillation 10 % D86-IP123 159-188 °C 100 mL Distillation 50 % D86-IP123 192-218 °C 100 mL Distillation 90 % D86-IP123 220-247 °C 100 mL Distillation FBP D86-IP123 244-268 °C 100 mL Distillation residue D86-IP123 1.1-1.3 %vol 100 mL Distillation loss D86-IP123 0.4-0.7 %vol 100 mL Flashpoint IP170 35-60 °C 85 mL Freezing point D2386-IP16 -62 to -44°C 25 mL Aromatics FIA D1319-IP156 18.1-22.7 %vol 0.75 mL Smoke point D1322 20-25 mm 20 mL Acid number D3242-IP354 <0.100 mg KOH/g 100 mL Mercaptans D3227-IP342 .. 0.0003 to 0.0100% (m/m) 40 mL	500 mL
SS99851-0	SETA MTVM Gas oil Test Name ASTM-IP Method Range Amount/test Density at 15 °C D1298-IP160 0.83-0.854 kg/L 200 mL Distillation IBP D86-IP123 160-190 °C 100 mL Distillation 10 % D86-IP123 200-242 °C 100 mL Distillation 50 % D86-IP123 260-290 °C 100 mL Distillation 90 % D86-IP123 320-350 °C 100 mL Distillation 95 % D86-IP123 335-368 °C 100 mL Distillation FBP D86-IP123 350-385 °C 100 mL Distillation residue D86-IP123 1.25-1.42 %vol 100 mL Distillation loss D86-IP123 0.26-0.55 %vol 100 mL Flashpoint D93-IP34 56-80°C 75 mL Cloud point D2500-IP219 -17 to -4 °C up to 38 mL CFPP IP309 -30.0 to -o °C 45 mL Pour point D97-IP15 -33 to -6 °C up to 38 mL Kin. Visc. (40 °C) D445-IP71 2.3-3.5 mm ² /s up to 40 mL Lubricity HFRR D6079; IP450 271 to 512 µm 2 mL Water Karl Fischer D1744; IP438 23.4 to 63.9 mg/kg 5 mL	500 mL
SS99852-0	SETA MTVM Fuel oil Test Name ASTM-IP Method Range Amount/test Density at 15 °C D1298-IP160 0.94-0.994 kg/L 200 mL Pour point D97-IP15 -14 to 17 °C up to 38 mL Kin. Visc. (50 °C) D445-IP71 150-1800 mm ² /s up to 500 mL Kin. Visc. (100 °C) D445-IP71 20-95 mm ² /s up to 500 mL Micro carbon D4530;IP398 0.10 to 30.0 % (m/m) 2 mL Flash point D93 (b) - IP34(b); 92.3 to 121.6 °C 75 mL	500 mL

Biodiesel standards

Code	Product	Unit																																																				
SS99853-0	SETA MTVM lubricating oil	500 mL																																																				
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Biodiesel standards

Biodiesel standards

Code	Product	Unit
New NIST-2772	<p>B100 Biodiesel (Soy-based)</p> <p>This Standard Reference Material (SRM) is a commercial 100 % biodiesel produced from soy. NIST-2772 is intended for use in evaluating analytical methods for the determination of selected chemical and physical properties in pure biodiesel (B100). A unit of NIST-2772 consists of five 10-mL ampoules, each containing approximately 10 mL of biodiesel.</p> <p>Certified concentration values for fatty acid methyl esters</p> <p>Tetradecanoic acid, methyl ester (C14:0).....0.755 ± 0.089 g/kg (Myristic acid, methyl ester)</p> <p>Hexadecanoic acid, methyl ester (C16:0).....107 ± 2 g/kg (Palmitic acid, methyl ester)</p> <p>(Z)-9-Hexadecenoic acid, methyl ester (C16:1 n-7).....1.32 ± 0.18 g/kg (Palmitoleic acid, methyl ester)</p> <p>Octadecanoic acid, methyl ester (C18:0).....43.0 ± 2.7 g/kg (Stearic acid, methyl ester)</p> <p>(Z)-9-Octadecenoic acid, methyl ester (C18:1 n-9).....233 ± 6 g/kg (Oleic acid, methyl ester)</p> <p>(Z)-11-Octadecenoic acid, methyl ester (C18:1 n-7).....14.3 ± 1.5 g/kg (Vaccenic acid, methyl ester)</p> <p>(Z,Z)-9,12-Octadecadienoic acid, methyl ester (C18:2 n-6).....523 ± 17 g/kg (Linoleic acid, methyl ester)</p> <p>(Z,Z,Z)-9,12,15-Octadecatrienoic, methyl ester (C18:3 n-3).....78.2 ± 2 g/kg (Linolenic acid, methyl ester)</p> <p>Eicosanoic acid, methyl ester (C20:0)3.66 ± 0.52 g/kg (Arachidic acid, methyl ester)</p> <p>Certified concentration value for water</p> <p>Water0.018 ± 0.002 %</p> <p>Certified value for density at 20 °C and kinematic viscosity at 20 °C, 30 °C, and 40 °C</p> <p>Density at 20 °C.....0.88132 ± 0.00006 g/cm³</p> <p>Kinematic Viscosity at 20 °C6.4310 ± 0.0098 mm²/s</p> <p>Kinematic Viscosity at 30 °C5.0532 ± 0.0069 mm²/s</p> <p>Kinematic Viscosity at 40 °C4.0843 ± 0.0057 mm²/s</p> <p>Indicative values for fatty acid methyl esters and for additional chemical and physical properties, trace elements, glycerides, and ethanol.</p>	5 x 10 mL

Code	Product	Unit																																																																																					
New NIST-2773	B100 Biodiesel (Animal-based) This Standard Reference Material (SRM) is a commercial 100 % biodiesel produced from animal feedstocks. NIST-2773 is intended for use in evaluating analytical methods for the determination of selected chemical and physical properties in pure biodiesel (B100). A unit of NIST-2773 consists of five 10-mL ampoules, each containing approximately 10 mL of biodiesel. Certified concentration values for fatty acid methyl esters Dodecanoic acid, methyl ester (C12:0).....0.470 ± 0.017 g/kg (Lauric acid, methyl ester) Tetradecanoic acid, methyl ester (C14:0).....9.20 ± 0.45 g/kg (Myristic acid, methyl ester) Pentadecanoic acid, methyl ester (C15:0).....0.305 ± 0.013 g/kg Hexadecanoic acid, methyl ester (C16:0).....184 ± 6 g/kg (Palmitic acid, methyl ester) (Z)-9-Hexadecenoic acid, methyl ester (C16:1 n-7).....23.3± 0.9 g/kg (Palmitoleic acid, methyl ester) Octadecanoic acid, methyl ester (C18:0).....87.8 ± 4.2 g/kg (Stearic acid, methyl ester) (Z)-9-Octadecenoic acid, methyl ester (C18:1 n-9)343 ± 8 g/kg (Oleic acid, methyl ester) (Z)-11-Octadecenoic acid, methyl ester (C18:1 n-7)19.4 ± 0.7 g/kg (Vaccenic acid, methyl ester) (Z,Z)-9,12-Octadecadienoic acid, methyl ester (C18:2 n-6)226 ± 5 g/kg (Linoleic acid, methyl ester) (Z,Z,Z)-9,12,15-Octadecatrienoic acid, methyl ester (C18:3 n-3)25.0 ± 1.0 g/kg (Linolenic acid, methyl ester) Eicosanoic acid, methyl ester (C20:0)2.28 ± 0.12 g/kg (Arachidic acid, methyl ester) (Z)-5,8,11,14-Eicosatetraenoic acid, methyl ester (C20:4 n-6).....2.53 ± 0.09 g/kg (Arachidonic acid, methyl ester) Docosanoic acid, methyl ester (C22:0).....1.66 ± 0.06 g/kg (Behenic acid, methyl ester) Certified concentration value for water Water0.046 ± 0.002 % Certified concentration value for sulfur Sulfur7.39 ± 0.39 mg/kg Certified value for density at 20 °C and kinematic viscosity at 20 °C, 30 °C, and 40 °C Density at 20 °C 0.87628 ± 0.00010 g/cm ³ Kinematic Viscosity at 20 °C7.147 ± 0.021 mm ² /s Kinematic Viscosity at 30 °C5.543 ± 0.010 mm ² /s Kinematic Viscosity at 40 °C4.428 ± 0.009 mm ² /s Indicative values for fatty acid methyl esters and for additional chemical and physical properties, trace elements, glycerides, and ethanol.	5 x 10 mL																																																																																					
SS99908-0	SETA BIO MTVM Gas oil A unique secondary reference material that provides traceable validation of different test parameters from one sample. Internationally tested by a statistically significant number of laboratories to determine certified values. Supplied with traceable certification. - ULSD EN590 Biofuel - 5% FAME (EN 14214) in Diesel - Covers major specification tests - A highly cost effective solution to laboratory verification requirements - Verification to ASTM/CEN/ISO/IP and equivalent test procedures - Cross-checks instrument performance using real Bio product - Ideal assistance for operator training <table border="1"> <thead> <tr> <th>Test Name</th> <th>Method</th> <th>Sample Result</th> <th>Units</th> <th>Amount/ test</th> </tr> </thead> <tbody> <tr> <td>Density @ 15°C</td> <td>D1298-IP160</td> <td>0.8404</td> <td>kg/L</td> <td>200 mL</td> </tr> <tr> <td>Distillation IBP</td> <td>D86-IP123</td> <td>173.6</td> <td>°C</td> <td>1100 mL</td> </tr> <tr> <td>Distillation 10%</td> <td>D86-IP123</td> <td>204.7</td> <td>°C</td> <td>100 mL</td> </tr> <tr> <td>Distillation 50%</td> <td>D86-IP123</td> <td>260.7</td> <td>°C</td> <td>100 mL</td> </tr> <tr> <td>Distillation 90%</td> <td>D86-IP123</td> <td>327.2</td> <td>°C</td> <td>100 mL</td> </tr> <tr> <td>Distillation 95%</td> <td>D86-IP123</td> <td>346.2</td> <td>°C</td> <td>100 mL</td> </tr> <tr> <td>Distillation FBP</td> <td>D86-IP123</td> <td>358.1</td> <td>°C</td> <td>100 mL</td> </tr> <tr> <td>Distillation Residue</td> <td>D86-IP123</td> <td>1.3</td> <td>%vol</td> <td>100 mL</td> </tr> <tr> <td>Distillation Loss</td> <td>D86-IP123</td> <td>0.6</td> <td>%vol</td> <td>100 mL</td> </tr> <tr> <td>Flash Point</td> <td>D93-IP34</td> <td>66.6</td> <td>°C</td> <td>75 mL</td> </tr> <tr> <td>Cloud Point</td> <td>D2500-IP219</td> <td>-6.3</td> <td>°C</td> <td>Up to 38 mL</td> </tr> <tr> <td>CFPP</td> <td>IP309</td> <td>-19.7</td> <td>°C</td> <td>45 mL</td> </tr> <tr> <td>Pour Point</td> <td>D97-IP15</td> <td>-28.3</td> <td>°C</td> <td>Up to 38 mL</td> </tr> <tr> <td>Kin Visc. @ 40°C</td> <td>D445-IP71</td> <td>2.567</td> <td>mm²/s</td> <td>Up to 40 mL</td> </tr> <tr> <td>Lubricity HFRR</td> <td>D6079; IP450</td> <td>207.1</td> <td>µm</td> <td>2 mL</td> </tr> <tr> <td>Water Karl Fischer</td> <td>D1744; IP438</td> <td>60.138</td> <td>mg/kg</td> <td>5 mL</td> </tr> </tbody> </table>	Test Name	Method	Sample Result	Units	Amount/ test	Density @ 15°C	D1298-IP160	0.8404	kg/L	200 mL	Distillation IBP	D86-IP123	173.6	°C	1100 mL	Distillation 10%	D86-IP123	204.7	°C	100 mL	Distillation 50%	D86-IP123	260.7	°C	100 mL	Distillation 90%	D86-IP123	327.2	°C	100 mL	Distillation 95%	D86-IP123	346.2	°C	100 mL	Distillation FBP	D86-IP123	358.1	°C	100 mL	Distillation Residue	D86-IP123	1.3	%vol	100 mL	Distillation Loss	D86-IP123	0.6	%vol	100 mL	Flash Point	D93-IP34	66.6	°C	75 mL	Cloud Point	D2500-IP219	-6.3	°C	Up to 38 mL	CFPP	IP309	-19.7	°C	45 mL	Pour Point	D97-IP15	-28.3	°C	Up to 38 mL	Kin Visc. @ 40°C	D445-IP71	2.567	mm ² /s	Up to 40 mL	Lubricity HFRR	D6079; IP450	207.1	µm	2 mL	Water Karl Fischer	D1744; IP438	60.138	mg/kg	5 mL	500 mL
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Distillation 95%	D86-IP123	346.2	°C	100 mL																																																																																			
Distillation FBP	D86-IP123	358.1	°C	100 mL																																																																																			
Distillation Residue	D86-IP123	1.3	%vol	100 mL																																																																																			
Distillation Loss	D86-IP123	0.6	%vol	100 mL																																																																																			
Flash Point	D93-IP34	66.6	°C	75 mL																																																																																			
Cloud Point	D2500-IP219	-6.3	°C	Up to 38 mL																																																																																			
CFPP	IP309	-19.7	°C	45 mL																																																																																			
Pour Point	D97-IP15	-28.3	°C	Up to 38 mL																																																																																			
Kin Visc. @ 40°C	D445-IP71	2.567	mm ² /s	Up to 40 mL																																																																																			
Lubricity HFRR	D6079; IP450	207.1	µm	2 mL																																																																																			
Water Karl Fischer	D1744; IP438	60.138	mg/kg	5 mL																																																																																			
SS99904-0	SETA BIO STVM Gas oil Biodiesel Single Test Verification Material. Aromatics HPLC, ASTM D6591-IP391; EN 12916	50 mL																																																																																					
SS99903-0	SETA BIO STVM Gas oil Biodiesel Single Test Verification Material. Sulfur WD X-Ray, ASTM D2622	50 mL																																																																																					

Biodiesel standards

Code	Product	Unit
SS99902-0	SETA BIO STVM Gas oil Biodiesel Single Test Verification Material. Sulfur ED X-Ray, ASTM D4294 – IP336, EN ISO 8754	50 mL

CONOSTAN® Biodiesel standards

A new line of CONOSTAN® biodiesel standards for the analysis of metals and sulfur in biodiesel fuel. Manufactured in accordance to ASTM methods D7039, D6751, D5453 and EN14214 for ICP and XRF analysis. Complete with a certificate of analysis.

Metals in Biodiesel

New	CON-150-441-000	Metals in Biodiesel, Blank Matrix	100g
New	CON-150-441-005	Metals in Biodiesel, P, Na, Mg, K, Ca 2.5ppm	100g
New	CON-150-441-010	Metals in Biodiesel, P, Na, Mg, K, Ca 5ppm	100g
New	CON-150-441-015	Metals in Biodiesel, P, Na, Mg, K, Ca 10ppm	100g
New	CON-150-441-020	Metals in Biodiesel, P, Na, Mg, K, Ca 15ppm	100g
New	CON-150-441-025	Metals in Biodiesel, P, Na, Mg, K, Ca 20ppm	100g
New	CON-150-441-030	Metals in Biodiesel, Na, K 2.5ppm	100g
New	CON-150-441-035	Metals in Biodiesel, Na, K 5ppm	100g
New	CON-150-441-040	Metals in Biodiesel, Na, K 10ppm	100g
New	CON-150-441-045	Metals in Biodiesel, Na, K 15ppm	100g
New	CON-150-441-050	Metals in Biodiesel, Na, K 20ppm	100g
New	CON-150-441-055	Metals in Biodiesel, Na, K 25ppm	100g
New	CON-150-441-060	Metals in Biodiesel, Na, K 50ppm	100g
New	CON-150-441-065	Metals in Biodiesel, Ca, Mg 2.5ppm	100g
New	CON-150-441-070	Metals in Biodiesel, Ca, Mg 5ppm	100g
New	CON-150-441-075	Metals in Biodiesel, Ca, Mg 10ppm	100g
New	CON-150-441-080	Metals in Biodiesel, Ca, Mg 15ppm	100g
New	CON-150-441-085	Metals in Biodiesel, Ca, Mg 20ppm	100g
New	CON-150-441-090	Metals in Biodiesel, Ca, Mg 25ppm	100g
New	CON-150-441-095	Metals in Biodiesel, Ca, Mg 50ppm	100g

Sulfur in Biodiesel

New	CON-150-440-000	Sulfur in B5 Bd Std, Blank Matrix	100g
New	CON-150-440-005	Sulfur in B5 Biodiesel Std, 5ppm	100g
New	CON-150-440-010	Sulfur in B5 Biodiesel Std, 10ppm	100g
New	CON-150-440-015	Sulfur in B5 Biodiesel Std, 15ppm	100g
New	CON-150-440-020	Sulfur in B5 Biodiesel Std, 30ppm	100g
New	CON-150-440-025	Sulfur in B5 Biodiesel Std, 50ppm	100g
New	CON-150-440-030	Sulfur in B5 Biodiesel Std, 75ppm	100g
New	CON-150-440-035	Sulfur in B5 Biodiesel Std, 100ppm	100g
New	CON-150-440-040	Sulfur in B5 Biodiesel Std, 200ppm	100g
New	CON-150-440-045	Sulfur in B5 Biodiesel Std, 500ppm	100g
New	CON-150-440-050	Sulfur in B20 Bd Std, Blank Matrix	100g
New	CON-150-440-055	Sulfur in B20 Biodiesel Std, 5ppm	100g
New	CON-150-440-060	Sulfur in B20 Biodiesel Std, 10ppm	100g
New	CON-150-440-065	Sulfur in B20 Biodiesel Std, 15ppm	100g
New	CON-150-440-070	Sulfur in B20 Biodiesel Std, 30ppm	100g
New	CON-150-440-075	Sulfur in B20 Biodiesel Std, 50ppm	100g
New	CON-150-440-080	Sulfur in B20 Biodiesel Std, 75ppm	100g
New	CON-150-440-085	Sulfur in B20 Biodiesel Std, 100ppm	100g
New	CON-150-440-090	Sulfur in B20 Biodiesel Std, 200ppm	100g
New	CON-150-440-095	Sulfur in B20 Biodiesel Std, 500ppm	100g
New	CON-150-440-100	Sulfur in B100 Bd Std, Blank Matrix	100g
New	CON-150-440-105	Sulfur in B100 Biodiesel Std, 5ppm	100g

	Code	Product	Unit
New	CON-150-440-110	Sulfur in B100 Biodiesel Std, 10ppm	100g
New	CON-150-440-115	Sulfur in B100 Biodiesel Std, 15ppm	100g
New	CON-150-440-120	Sulfur in B100 Biodiesel Std, 30ppm	100g
New	CON-150-440-125	Sulfur in B100 Biodiesel Std, 50ppm	100g
New	CON-150-440-130	Sulfur in B100 Biodiesel Std, 75ppm	100g
New	CON-150-440-135	Sulfur in B100 Biodiesel Std, 100ppm	100g
New	CON-150-440-140	Sulfur in B100 Biodiesel Std, 200ppm	100g
New	CON-150-440-145	Sulfur in B100 Biodiesel Std, 500ppm	100g

Biodiesel fuel calibration standards (ASTM D6584, EN 14105:2003)

Oil companies and vehicle manufacturers are actively working with biofuel extender producers to have agreed standards for esterified vegetable oils suitable for blending with conventional diesel to ensure that the product meets the technical requirements of modern diesel engines. The minimum test requirements for biodiesel blend extenders are specified in ASTM D6751 in USA and EN14214 within Europe. All road fuels are subject to strict quality controls, these are vital to maintain standards and provide authorities with the ability to assess safety risks and environmental pollution. In 1997 the European committee for standardisation was given the task to develop a uniform standard for fatty acid methyl esters (FAME). The result was the EN14214 specification. This standard was introduced in 2004 and is valid for all member states of the European Union. In particular this standard gives engine and automobile makers the ability to give warranties to those vehicles which run on biodiesel. At present a limit of 5% FAME is allowed in diesel and this 5% must conform to the EN14214 standard.

Both ASTM D-6751 and EN 14214 specify the use of ASTM Method D-6584 for glycerin determination.

ASTM D 6584 standard solutions

This test method covers the quantitative determination of free and total glycerin in B-100 methyl esters by gas chromatography. The range of detection for free glycerin is 0.005 to 0.05 mass %, and total glycerin from 0.05 to 0.5 mass %. This procedure is not applicable to vegetable oil methyl esters obtained from lauric oils, such as coconut oil and palm kernel oil.

U-RGO-310-1	ASTM D-6584 Standard Solution 1 Solvent: Pyridine Diolein..... 50 µg/mL Monoolein..... 100 µg/mL Glycerol..... 5 µg/mL Triolein 50 µg/mL	1 mL
U-RGO-310	ASTM D-6584 Standard Solution 1	4 x 1 mL
U-RGO-311-1	ASTM D-6584 Standard Solution 2 Solvent: Pyridine Diolein..... 100 µg/mL Monoolein..... 100 µg/mL Glycerol..... 15 µg/mL Triolein 100 µg/mL	1 mL
U-RGO-311	ASTM D-6584 Standard Solution 2	4 x 1 mL
U-RGO-312-1	ASTM D-6584 Standard Solution 3 Solvent: Pyridine Diolein..... 200 µg/mL Monoolein..... 200 µg/mL Glycerol..... 25 µg/mL Triolein 200 µg/mL	1 mL
U-RGO-312	ASTM D-6584 Standard Solution 3	4 x 1 mL
U-RGO-313-1	ASTM D-6584 Standard Solution 4 Solvent: Pyridine Diolein..... 315 µg/mL Monoolein..... 350 µg/mL Glycerol..... 35 µg/mL Triolein 350 µg/mL	1 mL
U-RGO-313	ASTM D-6584 Standard Solution 4	4 x 1 mL
U-RGO-314-1	ASTM D-6584 Standard Solution 5 Solvent: Pyridine Diolein..... 500 µg/mL Monoolein..... 500 µg/mL Glycerol..... 50 µg/mL Triolein 500 µg/mL	1 mL
U-RGO-314	ASTM D-6584 Standard Solution 5	4 x 1 mL

Individual standards for biodiesel testing

U-RGO-220	Monoolein 5000 µg/mL in Pyridine	2 mL
U-RGO-230	Diolein 5000 µg/mL in Pyridine	2 mL
U-RGO-210	Glycerin 500 µg/mL in Pyridine	2 mL
U-RGO-240	Triolein 5000 µg/mL in Pyridine	2 mL

ASTM Methods for petrochemical analysis

Code	Product	Unit
U-RGO-250	Monopalmitin 5000 µg/mL in Pyridine	2 mL

Internal standards

U-RGO-260	1,2,4-Butanetriol 1000 µg/mL in pyridine (ASTM Method D-6584)	5 mL
U-RGO-270	Tricaprin 8000 µg/mL in pyridine (ASTM Method D-6584)	2 mL

Derivatizing agent

U-RGO-200	MSTFA (N-methyl-N-(trimethylsilyl) trifluoroacetamide)	5 g
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EN 14105:2003 standard solutions

Free and total glycerol and mono-, di-, tri-glyceride content

Method EN 14105 is used to determine glycerin and total glycerine in fatty acid methyl esters (FAME) used in biodiesel products. Samples are derivatized, then analyzed by high temperature gas chromatography (HTGC). It is similar to ASTM D6584.

U-RGO-300-1	EN 14105:2003 Standard Solution 1 Solvent: Pyridine Butanetriol..... 80 µg/mL Glycerol5 µg/mL Tricaprin 800 µg/mL 1,3-Diolein..... 50 µg/mL Monoolein250 µg/mL Tiolein 50 µg/mL	1 mL
U-RGO-300	EN 14105:2003 Standard Solution 1	4 x 1 mL
U-RGO-301-1	EN 14105:2003 Standard Solution 2 Solvent: Pyridine Butanetriol..... 80 µg/mL Glycerol20 µg/mL Tricaprin 800 µg/mL 1,3-Diolein..... 200 µg/mL Monoolein600 µg/mL Tiolein 150 µg/mL	1 mL
U-RGO-301	EN 14105:2003 Standard Solution 2	4 x 1 mL
U-RGO-280	Monoglycerine Stock Solution Solvent: Pyridine Monoolein 10000 µg/mL Monopalmitin 10000 µg/mL Monostearin 10000 µg/mL	1 mL
U-RGO-302-1	EN 14105:2003 Standard Solution 3 Solvent: Pyridine Butanetriol..... 80 µg/mL Glycerol35 µg/mL Tricaprin 800 µg/mL 1,3-Diolein..... 350 µg/mL Monoolein950 µg/mL Tiolein 300 µg/mL	1 mL
U-RGO-302	EN 14105:2003 Standard Solution 3	4 x 1 mL
U-RGO-303-1	EN 14105:2003 Standard Solution 4 Solvent: Pyridine Butanetriol..... 80 µg/mL Glycerol50 µg/mL Tricaprin 800 µg/mL 1,3-Diolein..... 500 µg/mL Monoolein1250 µg/mL Tiolein 400 µg/mL	1 mL
U-RGO-303	EN 14105:2003 Standard Solution 4	4 x 1 mL

ASTM Methods for petrochemical analysis

ASTM Method D2887

Boiling range distribution of petroleum fractions

Method D2887 covers the determination of the boiling range distribution of petroleum products. The test method is applicable to petroleum products and fractions having a final boiling point of 538°C (1000°F) or lower at atmospheric pressure as measured by this test method. The test method is limited to samples having a boiling range greater than 55°C (100°F), and having a vapor pressure sufficiently low to permit sampling at ambient temperature.

Code	Product	Unit
U-ASTM-120-1	ASTM Method D2887 Column Test Mix 1% (w/v) in n-Octane Each analyte at 1 % (w/v) in n-Octane n-Hexadecane n-Octadecane	1 mL
U-ASTM-120	ASTM Method D2887 Column Test Mixture	4 x 1 mL
U-ASTM-110-1	ASTM Method D2887 Column Test Mixture n-Hexane 6 % (w/w) n-Dodecane 12 % (w/w) n-Octacosane 1 % (w/w) n-Heptane 6 % (w/w) n-Tetradecane 12 % (w/w) n-Dotriacontane 1 % (w/w) n-Octane 8 % (w/w) n-Hexadecane 10 % (w/w) n-Hexatriacontane..... 1 % (w/w) n-Nonane 8 % (w/w) n-Octadecane 5 % (w/w) n-Tetracontane 1 % (w/w) n-Decane 12 % (w/w) n-Eicosane 2 % (w/w) n-Tetratetracontane ... 1 % (w/w) n-Undecane 12 % (w/w) n-Tetracosane 2 % (w/w)	1 mL

ASTM Methods for petrochemical analysis

Code	Product	Unit
U-ASTM-110	ASTM Method D2887 Column Test Mixture	4 x 1 mL

ASTM Method D3710

Boiling range distribution of gasoline and gasoline fractions

Method D3710 covers the determination of the boiling range distribution of gasoline and gasoline components. The test method is applicable to petroleum products and fractions with a final boiling point of 500°F (260°C) or lower.

U-ASTM-100-1	ASTM Method D3710 Calibration Mixture	1 mL																		
	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">2-Methylbutane 10 % (v/v)</td> <td style="width: 33%;">Toluene 12 % (v/v)</td> <td style="width: 33%;">n-Dodecane 4 % (v/v)</td> </tr> <tr> <td>n-Pentane 8 % (v/v)</td> <td>n-Octane 5 % (v/v)</td> <td>n-Tridecane 2 % (v/v)</td> </tr> <tr> <td>2-methylpentane 6 % (v/v)</td> <td>p-Xylene 14 % (v/v)</td> <td>n-Tetradecane 2 % (v/v)</td> </tr> <tr> <td>n-Hexane 6 % (v/v)</td> <td>n-Propylbenzene 5 % (v/v)</td> <td>n-Pentadecane 2 % (v/v)</td> </tr> <tr> <td>2,4-Dimethylpentane.... 6 % (v/v)</td> <td>n-Decane 4 % (v/v)</td> <td></td> </tr> <tr> <td>n-Heptane 10 % (v/v)</td> <td>n-Butylbenzene 4 % (v/v)</td> <td></td> </tr> </table>	2-Methylbutane 10 % (v/v)	Toluene 12 % (v/v)	n-Dodecane 4 % (v/v)	n-Pentane 8 % (v/v)	n-Octane 5 % (v/v)	n-Tridecane 2 % (v/v)	2-methylpentane 6 % (v/v)	p-Xylene 14 % (v/v)	n-Tetradecane 2 % (v/v)	n-Hexane 6 % (v/v)	n-Propylbenzene 5 % (v/v)	n-Pentadecane 2 % (v/v)	2,4-Dimethylpentane.... 6 % (v/v)	n-Decane 4 % (v/v)		n-Heptane 10 % (v/v)	n-Butylbenzene 4 % (v/v)		
2-Methylbutane 10 % (v/v)	Toluene 12 % (v/v)	n-Dodecane 4 % (v/v)																		
n-Pentane 8 % (v/v)	n-Octane 5 % (v/v)	n-Tridecane 2 % (v/v)																		
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n-Hexane 6 % (v/v)	n-Propylbenzene 5 % (v/v)	n-Pentadecane 2 % (v/v)																		
2,4-Dimethylpentane.... 6 % (v/v)	n-Decane 4 % (v/v)																			
n-Heptane 10 % (v/v)	n-Butylbenzene 4 % (v/v)																			

U-ASTM-100	ASTM Method D3710 Calibration Mixture	4 x 1 mL
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ASTM Method E1387

Saponification number (empirical) of synthetic and natural waxes

Method E1387 covers the determination of the saponification number of synthetic waxes and natural waxes.

U-ASTM-130-1	ASTM E1387-90 Column Resolution Check Mixture	1 mL																
	<p>2000 µg/mL of each analyte in Methylene chloride (Dichloromethane)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">n-Hexane</td> <td style="width: 33%;">n-Tetradecane</td> <td style="width: 33%;">Toluene</td> <td style="width: 33%;">p-Xylene</td> </tr> <tr> <td>n-Octane</td> <td>n-Hexadecane</td> <td>1,2,4-Trimethylbenzene</td> <td></td> </tr> <tr> <td>n-decane</td> <td>n-Octadecane</td> <td>2-Ethyltoluene</td> <td></td> </tr> <tr> <td>n-Dodecane</td> <td>n-Eicosane</td> <td>3-Ethyltoluene</td> <td></td> </tr> </table>	n-Hexane	n-Tetradecane	Toluene	p-Xylene	n-Octane	n-Hexadecane	1,2,4-Trimethylbenzene		n-decane	n-Octadecane	2-Ethyltoluene		n-Dodecane	n-Eicosane	3-Ethyltoluene		
n-Hexane	n-Tetradecane	Toluene	p-Xylene															
n-Octane	n-Hexadecane	1,2,4-Trimethylbenzene																
n-decane	n-Octadecane	2-Ethyltoluene																
n-Dodecane	n-Eicosane	3-Ethyltoluene																

U-ASTM-130	ASTM E1387-90 Column Resolution Check Mixture	4 x 1 mL
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ASTM Method D4815

MTBE, ETBE, TAME, DIPE, tertiary-Amyl alcohol and C1 to C4 alcohols in gasoline

Method D4815 covers the determination of ethers and alcohols in gasolines by gas chromatography.

U-RGO-422-1	ASTM D4815 Quantitative Peak ID Mixture	1 mL																
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Methanol 7.30 % (w/w)</td> <td style="width: 50%;">n-Butyl alcohol 7.30 % (w/w)</td> </tr> <tr> <td>Ethyl alcohol (Ethanol)..... 7.30 % (w/w)</td> <td>tert-Amyl methyl ether (TAME) 7.30 % (w/w)</td> </tr> <tr> <td>Isopropyl alcohol (Isopropanol)..... 7.30 % (w/w)</td> <td>1,2-Dimethoxyethane (DME)..... 6.00 % (w/w)</td> </tr> <tr> <td>tert-Butanol 7.30 % (w/w)</td> <td>Benzene 5.00 % (w/w)</td> </tr> <tr> <td>1-Propanol 7.30 % (w/w)</td> <td>Methylcyclopentane 4.00 % (w/w)</td> </tr> <tr> <td>sec-Butanol (2-Butanol)..... 7.30 % (w/w)</td> <td>tert-Dutylmethyl ether (MTBE) 4.00 % (w/w)</td> </tr> <tr> <td>Isobutyl alcohol 7.30 % (w/w)</td> <td>Isopropyl ether 4.00 % (w/w)</td> </tr> <tr> <td>tert-Pentanol (tert-Amyl alcohol)..... 7.30 % (w/w)</td> <td>tert-Butyl ethyl ether (ETBE) 4.00 % (w/w)</td> </tr> </table>	Methanol 7.30 % (w/w)	n-Butyl alcohol 7.30 % (w/w)	Ethyl alcohol (Ethanol)..... 7.30 % (w/w)	tert-Amyl methyl ether (TAME) 7.30 % (w/w)	Isopropyl alcohol (Isopropanol)..... 7.30 % (w/w)	1,2-Dimethoxyethane (DME)..... 6.00 % (w/w)	tert-Butanol 7.30 % (w/w)	Benzene 5.00 % (w/w)	1-Propanol 7.30 % (w/w)	Methylcyclopentane 4.00 % (w/w)	sec-Butanol (2-Butanol)..... 7.30 % (w/w)	tert-Dutylmethyl ether (MTBE) 4.00 % (w/w)	Isobutyl alcohol 7.30 % (w/w)	Isopropyl ether 4.00 % (w/w)	tert-Pentanol (tert-Amyl alcohol)..... 7.30 % (w/w)	tert-Butyl ethyl ether (ETBE) 4.00 % (w/w)	
Methanol 7.30 % (w/w)	n-Butyl alcohol 7.30 % (w/w)																	
Ethyl alcohol (Ethanol)..... 7.30 % (w/w)	tert-Amyl methyl ether (TAME) 7.30 % (w/w)																	
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tert-Butanol 7.30 % (w/w)	Benzene 5.00 % (w/w)																	
1-Propanol 7.30 % (w/w)	Methylcyclopentane 4.00 % (w/w)																	
sec-Butanol (2-Butanol)..... 7.30 % (w/w)	tert-Dutylmethyl ether (MTBE) 4.00 % (w/w)																	
Isobutyl alcohol 7.30 % (w/w)	Isopropyl ether 4.00 % (w/w)																	
tert-Pentanol (tert-Amyl alcohol)..... 7.30 % (w/w)	tert-Butyl ethyl ether (ETBE) 4.00 % (w/w)																	

U-RGO-422	ASTM D4815 Quantitative Peak ID Mixture	4 x 1 mL
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U-RGO-711-1	ASTM Surrogate Base Gasoline	1 mL														
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Benzene 1 % (v/v)</td> <td style="width: 50%;">n-Octane 15 % (v/v)</td> </tr> <tr> <td>n-Decane 10 % (v/v)</td> <td>1,2,4,5-Tetramethylbenzene (Durene) 5 % (w/v)</td> </tr> <tr> <td>n-Dodecane 5 % (v/v)</td> <td>Toluene 9 % (v/v)</td> </tr> <tr> <td>Ethylbenzene 5 % (v/v)</td> <td>1,2,4-Trimethylbenzene 5 % (v/v)</td> </tr> <tr> <td>n-Heptane 15 % (v/v)</td> <td>o-Xylene 5 % (v/v)</td> </tr> <tr> <td>n-Hexane 10 % (v/v)</td> <td>m-Xylene 5 % (v/v)</td> </tr> <tr> <td>2,2,4-Trimethylpentane (iso-Octane) 10 % (v/v)</td> <td></td> </tr> </table>	Benzene 1 % (v/v)	n-Octane 15 % (v/v)	n-Decane 10 % (v/v)	1,2,4,5-Tetramethylbenzene (Durene) 5 % (w/v)	n-Dodecane 5 % (v/v)	Toluene 9 % (v/v)	Ethylbenzene 5 % (v/v)	1,2,4-Trimethylbenzene 5 % (v/v)	n-Heptane 15 % (v/v)	o-Xylene 5 % (v/v)	n-Hexane 10 % (v/v)	m-Xylene 5 % (v/v)	2,2,4-Trimethylpentane (iso-Octane) 10 % (v/v)		
Benzene 1 % (v/v)	n-Octane 15 % (v/v)															
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n-Dodecane 5 % (v/v)	Toluene 9 % (v/v)															
Ethylbenzene 5 % (v/v)	1,2,4-Trimethylbenzene 5 % (v/v)															
n-Heptane 15 % (v/v)	o-Xylene 5 % (v/v)															
n-Hexane 10 % (v/v)	m-Xylene 5 % (v/v)															
2,2,4-Trimethylpentane (iso-Octane) 10 % (v/v)																

U-RGO-711	ASTM Surrogate Base Gasoline	4 x 1 mL
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ASTM Method D-5453

Standard test method for determination of total sulfur in light hydrocarbons, spark ignition engine fuel, diesel engine fuel, and engine oil by ultraviolet fluorescence

ASTM D5453 - Total sulfur by UV fluorescence (low) (Solvent: Toluene)

New	U-PANAL0211	ASTM D5453 - Total sulfur by UV fluorescence kit (low)	6 x 2 mL
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Each kit contains:

Description.	Concentration
Ampoule 1 ... Toluene.....	Solvent blank
Ampoule 2 ... Butylsulfide (as S) in Toluene.....	1.0 mg/L
Ampoule 3 ... Butylsulfide (as S) in Toluene.....	2.5 mg/L
Ampoule 4 ... Butylsulfide (as S) in Toluene.....	5.0 mg/L
Ampoule 5 ... Butylsulfide (as S) in Toluene.....	7.5 mg/L
Ampoule 6 ... Butylsulfide (as S) in Toluene.....	10.0 mg/L

New	U-PANAL0211-1	ASTM D5453 - Toluene (blank)	2 mL
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New	U-PANAL0211-2	ASTM D5453 - Butyl sulfide (as S) - 1 mg/L in Toluene	2 mL
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ASTM Methods for petrochemical analysis

	Code	Product	Unit
New	U-PANAL0211-3	ASTM D5453 - Butyl sulfide (as S) - 2.5 mg/L in Toluene	2 mL
New	U-PANAL0211-4	ASTM D5453 - Butyl sulfide (as S) - 5 mg/L in Toluene	2 mL
New	U-PANAL0211-5	ASTM D5453 - Butyl sulfide (as S) - 7.5 mg/L in Toluene	2 mL
New	U-PANAL0211-6	ASTM D5453 - Butyl sulfide (as S) - 10 mg/L in Toluene	2 mL

ASTM D5453 - Total sulfur by UV fluorescence (medium) (Solvent: Toluene)

New	U-PANAL0212	ASTM D5453 - Total sulfur by UV fluorescence kit (medium) Each kit contains:	6 x 2 mL
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Description .	Concentration
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Ampoule 1.... Toluene.....	Solvent blank
Ampoule 2.... Butylsulfide (as S) in Toluene.....	5.0 mg/L
Ampoule 3.... Butylsulfide (as S) in Toluene.....	25 mg/L
Ampoule 4.... Butylsulfide (as S) in Toluene.....	50 mg/L
Ampoule 5.... Butylsulfide (as S) in Toluene.....	100 mg/L
Ampoule 6.... Butylsulfide (as S) in Toluene.....	200 mg/L

New	U-PANAL0212-1	ASTM D5453 - Toluene (blank)	2 mL
New	U-PANAL0212-2	ASTM D5453 - Butyl sulfide (as S) - 5 mg/L in Toluene	2 mL
New	U-PANAL0212-3	ASTM D5453 - Butyl sulfide (as S) - 25 mg/L in Toluene	2 mL
New	U-PANAL0212-4	ASTM D5453 - Butyl sulfide (as S) - 50 mg/L in Toluene	2 mL
New	U-PANAL0212-5	ASTM D5453 - Butyl sulfide (as S) - 100 mg/L in Toluene	2 mL
New	U-PANAL0212-6	ASTM D5453 - Butyl sulfide (as S) - 200 mg/L in Toluene	2 mL

ASTM D5453 - Total sulfur by UV fluorescence (high) (Solvent: Toluene)

New	U-PANAL0213	ASTM D5453 - Total sulfur by UV fluorescence kit (high) Each kit contains:	6 x 2 mL
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Description .	Concentration
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Ampoule 1.... Toluene.....	Solvent blank
Ampoule 2.... Butylsulfide (as S) in Toluene.....	100 mg/L
Ampoule 3.... Butylsulfide (as S) in Toluene.....	250 mg/L
Ampoule 4.... Butylsulfide (as S) in Toluene.....	500 mg/L
Ampoule 5.... Butylsulfide (as S) in Toluene.....	750 mg/L
Ampoule 6.... Butylsulfide (as S) in Toluene.....	1000 mg/L

New	U-PANAL0213-1	ASTM D5453 - Toluene (blank)	2 mL
New	U-PANAL0213-2	ASTM D5453 - Butyl sulfide (as S) - 100 mg/L in Toluene	2 mL
New	U-PANAL0213-3	ASTM D5453 - Butyl sulfide (as S) - 250 mg/L in Toluene	2 mL
New	U-PANAL0213-4	ASTM D5453 - Butyl sulfide (as S) - 500 mg/L in Toluene	2 mL
New	U-PANAL0213-5	ASTM D5453 - Butyl sulfide (as S) - 750 mg/L in Toluene	2 mL
New	U-PANAL0213-6	ASTM D5453 - Butyl sulfide (as S) - 1000 mg/L in Toluene	2 mL

ASTM D5453 - Total sulfur by UV fluorescence (low) (Solvent: Isooctane)

	U-PANAL0214	ASTM D5453 - Total sulfur by UV fluorescence kit (low) Each kit contains:	6 x 2 mL
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Description .	Concentration
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Ampoule 1.... Isooctane.....	Solvent blank
Ampoule 2.... Butylsulfide (as S) in Isooctane.....	1.0 mg/L
Ampoule 3.... Butylsulfide (as S) in Isooctane.....	2.5 mg/L
Ampoule 4.... Butylsulfide (as S) in Isooctane.....	5.0 mg/L
Ampoule 5.... Butylsulfide (as S) in Isooctane.....	7.5 mg/L
Ampoule 6.... Butylsulfide (as S) in Isooctane.....	10.0 mg/L

	U-PANAL0214-1	ASTM D5453 - Isooctane (blank)	2 mL
	U-PANAL0214-2	ASTM D5453 - Butyl sulfide (as S) - 1.0 mg/L in Isooctane	2 mL
	U-PANAL0214-3	ASTM D5453 - Butyl sulfide (as S) - 2.5 mg/L in Isooctane	2 mL
	U-PANAL0214-4	ASTM D5453 - Butyl sulfide (as S) - 5.0 mg/L in Isooctane	2 mL
	U-PANAL0214-5	ASTM D5453 - Butyl sulfide (as S) - 7.5 mg/L in Isooctane	2 mL
	U-PANAL0214-6	ASTM D5453 - Butyl sulfide (as S) - 10 mg/L in Isooctane	2 mL

Code	Product	Unit
ASTM D5453 - Total sulfur by UV fluorescence (medium) (Solvent: Isooctane)		
U-PANAL0215	ASTM D5453 - Total sulfur by UV fluorescence kit (medium) Each kit contains: Description. Ampoule 1 ... Isooctane Solvent blank Ampoule 2 ... Butylsulfide (as S) in Isooctane5.0 mg/L Ampoule 3 ... Butylsulfide (as S) in Isooctane25 mg/L Ampoule 4 ... Butylsulfide (as S) in Isooctane50 mg/L Ampoule 5 ... Butylsulfide (as S) in Isooctane100 mg/L Ampoule 6 ... Butylsulfide (as S) in Isooctane200 mg/L Concentration	6 x 2 mL
New	U-PANAL0215-1 ASTM D5453 - Isooctane (blank)	2 mL
New	U-PANAL0215-2 ASTM D5453 - Butyl sulfide (as S) - 5 mg/L in Isooctane	2 mL
	U-PANAL0215-3 ASTM D5453 - Butyl sulfide (as S) - 25 mg/L in Isooctane	2 mL
	U-PANAL0215-4 ASTM D5453 - Butyl sulfide (as S) - 50 mg/L in Isooctane	2 mL
	U-PANAL0215-5 ASTM D5453 - Butyl sulfide (as S) - 100 mg/L in Isooctane	2 mL
	U-PANAL0215-6 ASTM D5453 - Butyl sulfide (as S) - 200 mg/L in Isooctane	2 mL
ASTM D5453 - Total sulfur by UV fluorescence (high) (Solvent: Isooctane)		
U-PANAL0216	ASTM D5453 - Total sulfur by UV fluorescence kit (high) Each kit contains: Description. Ampoule 1 ... Isooctane Solvent blank Ampoule 2 ... Butylsulfide (as S) in Isooctane100 mg/L Ampoule 3 ... Butylsulfide (as S) in Isooctane250 mg/L Ampoule 4 ... Butylsulfide (as S) in Isooctane500 mg/L Ampoule 5 ... Butylsulfide (as S) in Isooctane750 mg/L Ampoule 6 ... Butylsulfide (as S) in Isooctane1000 mg/L Concentration	6 x 2 mL
New	U-PANAL0216-1 ASTM D5453 - Isooctane (blank)	2 mL
New	U-PANAL0216-2 ASTM D5453 - Butyl sulfide (as S) - 100 mg/L in Isooctane	2 mL
	U-PANAL0216-3 ASTM D5453 - Butyl sulfide (as S) - 250 mg/L in Isooctane	2 mL
	U-PANAL0216-4 ASTM D5453 - Butyl sulfide (as S) - 500 mg/L in Isooctane	2 mL
	U-PANAL0216-5 ASTM D5453 - Butyl sulfide (as S) - 750 mg/L in Isooctane	2 mL
	U-PANAL0216-6 ASTM D5453 - Butyl sulfide (as S) - 1000 mg/L in Isooctane	2 mL
ASTM D3120, D3246 & D3961 sulfur by oxidative microcoulometry		
New	U-PANAL0217 ASTM D3120, D3246, D3961 Sulfur by oxidatative microcoulometry kit Each kit contains: Description. Ampoule 1 ... Isooctane Solvent blank Ampoule 2 ... Butylsulfide (as S) in Isooctane1.0 mg/L Ampoule 3 ... Butylsulfide (as S) in Isooctane10 mg/L Ampoule 4 ... Butylsulfide (as S) in Isooctane40 mg/L Ampoule 5 ... Butylsulfide (as S) in Isooctane75 mg/L Ampoule 6 ... Butylsulfide (as S) in Isooctane100 mg/L Concentration	6 x 2 mL
New	U-PANAL0217-1 ASTM D3120, D3246 and D3961 - Isooctane (blank)	2 mL
New	U-PANAL0217-2 ASTM D3120, D3246 and D3961 - Butyl sulfide (as S) - 1 mg/L in Isooctane	2 mL
New	U-PANAL0217-3 ASTM D3120, D3246 and D3961 - Butyl sulfide (as S) - 10 mg/L in Isooctane	2 mL
New	U-PANAL0217-4 ASTM D3120, D3246 and D3961 - Butyl sulfide (as S) - 40 mg/L in Isooctane	2 mL
New	U-PANAL0217-5 ASTM D3120, D3246 and D3961 - Butyl sulfide (as S) - 75 mg/L in Isooctane	2 mL
New	U-PANAL0217-6 ASTM D3120, D3246 and D3961 - Butyl sulfide (as S) - 100 mg/L in Isooctane	2 mL

ASTM Methods for petrochemical analysis

Code	Product	Unit
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ASTM Method D4629

Trace nitrogen in liquid petroleum hydrocarbons

Method D4629 covers the determination of trace total nitrogen in liquid petroleum hydrocarbons by syringe/inlet oxidative combustion and chemiluminescence detection.

ASTM D4629 - Trace nitrogen by chemiluminescence kit (low)

New	U-PANAL0218	ASTM D4629 Trace nitrogen by chemiluminescence kit (low)	6 x 2 mL
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Each kit contains:

Description .	Concentration
Ampoule 1.... Isooctane	Solvent blank
Ampoule 2.... Pyridine (as N) in Isooctane.....	1 mg/L
Ampoule 3.... Pyridine (as N) in Isooctane.....	2 mg/L
Ampoule 4.... Pyridine (as N) in Isooctane.....	5 mg/L
Ampoule 5.... Pyridine (as N) in Isooctane.....	10 mg/L
Ampoule 6.... Pyridine (as N) in Isooctane.....	20 mg/L

New	U-PANAL0218-1	ASTM D4629 - Isooctane (blank)	2 mL
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New	U-PANAL0218-2	ASTM D4629 - Pyridine (as N) - 1 mg/L in Isooctane	2 mL
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New	U-PANAL0218-3	ASTM D4629 - Pyridine (as N) - 2 mg/L in Isooctane	2 mL
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New	U-PANAL0218-4	ASTM D4629 - Pyridine (as N) - 5 mg/L in Isooctane	2 mL
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New	U-PANAL0218-5	ASTM D4629 - Pyridine (as N) - 10 mg/L in Isooctane	2 mL
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New	U-PANAL0218-6	ASTM D4629 - Pyridine (as N) - 20 mg/L in Isooctane	2 mL
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ASTM D4629 - Trace nitrogen by chemiluminescence (medium)

New	U-PANAL0219	ASTM D4629 Trace nitrogen by chemiluminescence kit (medium)	6 x 2 mL
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Each kit contains:

Description .	Concentration
Ampoule 1.... Isooctane	Solvent blank
Ampoule 2.... Pyridine (as N) in Isooctane.....	50 mg/L
Ampoule 3.... Pyridine (as N) in Isooctane.....	100 mg/L
Ampoule 4.... Pyridine (as N) in Isooctane.....	200 mg/L
Ampoule 5.... Pyridine (as N) in Isooctane.....	500 mg/L
Ampoule 6.... Pyridine (as N) in Isooctane.....	1000 mg/L

New	U-PANAL0219-1	ASTM D4629 - Isooctane (blank)	2 mL
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New	U-PANAL0219-2	ASTM D4629 - Pyridine (as N) - 50 mg/L in Isooctane	2 mL
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New	U-PANAL0219-3	ASTM D4629 - Pyridine (as N) - 100 mg/L in Isooctane	2 mL
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New	U-PANAL0219-4	ASTM D4629 - Pyridine (as N) - 200 mg/L in Isooctane	2 mL
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New	U-PANAL0219-5	ASTM D4629 - Pyridine (as N) - 500 mg/L in Isooctane	2 mL
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New	U-PANAL0219-6	ASTM D4629 - Pyridine (as N) - 1000 mg/L in Isooctane	2 mL
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ASTM D4629 - Trace nitrogen by chemiluminescence (high)

New	U-PANAL0220	ASTM D4629 Trace nitrogen by chemiluminescence kit	6 x 2 mL
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Each kit contains:

Description .	Concentration
Ampoule 1.... Isooctane	Solvent blank
Ampoule 2.... Pyridine (as N) in Isooctane.....	500 mg/L
Ampoule 3.... Pyridine (as N) in Isooctane.....	1000 mg/L
Ampoule 4.... Pyridine (as N) in Isooctane.....	2000 mg/L
Ampoule 5.... Pyridine (as N) in Isooctane.....	5000 mg/L
Ampoule 6.... Pyridine (as N) in Isooctane.....	10000 mg/L

New	U-PANAL0220-1	ASTM D4629 - Isooctane (blank)	2 mL
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New	U-PANAL0220-2	ASTM D4629 - Pyridine (as N) - 500 mg/L in Isooctane	2 mL
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New	U-PANAL0220-3	ASTM D4629 - Pyridine (as N) - 1000 mg/L in Isooctane	2 mL
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New	U-PANAL0220-4	ASTM D4629 - Pyridine (as N) - 2000 mg/L in Isooctane	2 mL
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New	U-PANAL0220-5	ASTM D4629 - Pyridine (as N) - 5000 mg/L in Isooctane	2 mL
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New	U-PANAL0220-6	ASTM D4629 - Pyridine (as N) - 10000 mg/L in Isooctane	2 mL
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Code Product Unit

ASTM D5762 - Trace nitrogen by chemiluminescence

New U-PANAL0221 ASTM D5762 Trace Nitrogen by Chemiluminescence kit 6 x 2 mL

Each kit contains:

Description.	Concentration
Ampoule 1 ... Toluene.....	Solvent blank
Ampoule 2 ... Acridine (as N) in Toluene.....	1 mg/L
Ampoule 3 ... Acridine (as N) in Toluene.....	5 mg/L
Ampoule 4 ... Acridine (as N) in Toluene.....	10 mg/L
Ampoule 5 ... Acridine (as N) in Toluene.....	50 mg/L
Ampoule 6 ... Acridine (as N) in Toluene.....	100 mg/L

New U-PANAL0221-1 ASTM D5762 - Toluene (blank) 2 mL

New U-PANAL0221-2 ASTM D5762 - Pyridine (as N) - 1 mg/L in Toluene 2 mL

New U-PANAL0221-3 ASTM D5762 - Pyridine (as N) - 5 mg/L in Toluene 2 mL

New U-PANAL0221-4 ASTM D5762 - Pyridine (as N) - 10 mg/L in Toluene 2 mL

New U-PANAL0221-5 ASTM D5762 - Pyridine (as N) - 50 mg/L in Toluene 2 mL

New U-PANAL0221-6 ASTM D5762 - Pyridine (as N) - 100 mg/L in Toluene 2 mL

ASTM D4929 (B) organic chloride in crude oil

New U-PANAL0223 ASTM D4929 (B) Organic chloride in crude Oil kit 6 x 2 mL

Each kit contains:

Description.	Concentration
Ampoule 1 ... Isooctane.....	Solvent blank
Ampoule 2 ... Chlorobenzene (as Cl) in Isooctane.....	5 mg/L
Ampoule 3 ... Chlorobenzene (as Cl) in Isooctane.....	10 mg/L
Ampoule 4 ... Chlorobenzene (as Cl) in Isooctane.....	25 mg/L
Ampoule 5 ... Chlorobenzene (as Cl) in Isooctane.....	50 mg/L
Ampoule 6 ... Chlorobenzene (as Cl) in Isooctane.....	100 mg/L

ASTM D5808 organic chlorine in hydrocarbons

Organic chloride in aromatic hydrocarbons

Method D5808 covers the determination of organic chloride in aromatic hydrocarbons and related chemicals by microcoulometry.

New U-PANAL0224 ASTM D5808 Organic chloride in hydrocarbons kit 6 x 2 mL

Each kit contains:

Description.	Concentration
Ampoule 1 ... Methanol.....	Solvent blank
Ampoule 2 ... Trichlorophenol (as Cl) in Isooctane.....	1 mg/L
Ampoule 3 ... Trichlorophenol (as Cl) in Isooctane.....	5 mg/L
Ampoule 4 ... Trichlorophenol (as Cl) in Isooctane.....	10 mg/L
Ampoule 5 ... Trichlorophenol (as Cl) in Isooctane.....	15 mg/L
Ampoule 6 ... Trichlorophenol (as Cl) in Isooctane.....	25 mg/L

Viscosity oil standards

PSL2700V01 - PSL2700V19

These standards are calibrated by the PSL Calibration ISO 17025 Accredited Laboratory. The standards will be supplied complete with UKAS calibration certificates and have direct traceability to NIST and other international laboratories. Uncertainties of measurement are stated on the calibration certificates. Long shelf lives are provided by using stable base oils. The viscosity oil standards are suitable for the calibration and verification of the following:

- Glass Capillary viscometers
- Automated Kinematic Viscometer Systems
- Rotational/Cone & Plate Viscometers
- Low Temperature Viscometer Systems
- Cold Cranking Simulators
- Flow Cups

PSL2700V01 N4 - Viscosity oil standard 500 mL

Kinematic viscosity (nominal)

0.47 mm²/s,cSt (20 °C) 0.45 mm²/s,cSt (25 °C) 0.40 mm²/s,cSt (40 °C)

Dynamic viscosity (nominal)

0.31 mPa.s,cP (20 °C) 0.29 mPa.s,cP (25 °C) 0.26 mPa.s,cP (40 °C)

ASTM Methods for petrochemical analysis

Code	Product	Unit
PSL2700V02	N8 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	1. mm ² /s,cSt (20 °C) 0.89 mm ² /s,cSt (25 °C) 0.75 mm ² /s,cSt (40 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	0.77 mPa.s,cP (20 °C) 0.72 mPa.s,cP (25 °C) 0.56 mPa.s,cP (40 °C)	
PSL2700V03	N1.0 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	1.3 mm ² /s,cSt (20 °C) 1.2 mm ² /s,cSt (25 °C) 0.97 mm ² /s,cSt (40 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	1.0 mPa.s,cP (20 °C) 0.93 mPa.s,cP (25 °C) 0.76 mPa.s,cP (40 °C)	
New PSL2700-V03A	N2 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	2.9 mm ² /s,cSt (20 °C) 2.6 mm ² /s,cSt (25 °C) 2.0 mm ² /s,cSt (40 °C) 1.7 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	2.2 mPa.s,cP (20 °C) 2.0 mPa.s,cP (25 °C) 1.5 mPa.s,cP (40 °C) 1.3 mPa.s,cP (50 °C)	
PSL2700V04	S3 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	5.0 mm ² /s,cSt (20 °C) 2.9 mm ² /s,cSt (40 °C) 1.3 mm ² /s,cSt (100 °C)	
	4.4 mm ² /s,cSt (25 °C) 2.6 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	4.1 mPa.s,cP (20 °C) 2.4 mPa.s,cP (40 °C) 0.98 mPa.s,cP (100 °C)	
	3.6 mPa.s,cP (25 °C) 2.1 mPa.s,cP (50 °C)	
PSL2700V05	S6 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	11 mm ² /s,cSt (20 °C) 5.7 mm ² /s,cSt (40 °C) 1.9 mm ² /s,cSt (100 °C)	
	8.9 mm ² /s,cSt (25 °C) 4.6 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	8.8 mPa.s,cP (20 °C) 4.8 mPa.s,cP (40 °C) 1.5 mPa.s,cP (100 °C)	
	7.4 mPa.s,cP (25 °C) 3.7 mPa.s,cP (50 °C)	
PSL2700V06	N10 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	21 mm ² /s,cSt (20 °C) 10 mm ² /s,cSt (40 °C) 2.7 mm ² /s,cSt (100 °C)	
	17 mm ² /s,cSt (25 °C) 7.5 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	17 mPa.s,cP (20 °C) 9.0 mPa.s,cP (40 °C) 2.1 mPa.s,cP (100 °C)	
	14 mPa.s,cP (25 °C) 6.2 mPa.s,cP (50 °C)	
PSL2700V07	S20 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	47 mm ² /s,cSt (20 °C) 18 mm ² /s,cSt (40 °C) 4.0 mm ² /s,cSt (100 °C)	
	37 mm ² /s,cSt (25 °C) 13 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	40 mPa.s,cP (20 °C) 16 mPa.s,cP (40 °C) 3.2 mPa.s,cP (100 °C)	
	31 mPa.s,cP (25 °C) 11 mPa.s,cP (50 °C)	
PSL2700V08	N35 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	95 mm ² /s,cSt (20 °C) 32 mm ² /s,cSt (40 °C) 5.8 mm ² /s,cSt (100 °C)	
	72 mm ² /s,cSt (25 °C) 23 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	82 mPa.s,cP (20 °C) 27 mPa.s,cP (40 °C) 4.7 mPa.s,cP (100 °C)	
	62 mPa.s,cP (25 °C) 19 mPa.s,cP (50 °C)	
PSL2700V09	S60 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	160 mm ² /s,cSt (20 °C) 54 mm ² /s,cSt (40 °C) 7.7 mm ² /s,cSt (100 °C)	
	120 mm ² /s,cSt (25 °C) 35 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	140 mPa.s,cP (20 °C) 47 mPa.s,cP (40 °C) 6.3 mPa.s,cP (100 °C)	
	104 mPa.s,cP (25 °C) 30 mPa.s,cP (50 °C)	
PSL2700V10	N100 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	320 mm ² /s,cSt (20 °C) 97 mm ² /s,cSt (40 °C) 11.0 mm ² /s,cSt (100 °C)	
	230 mm ² /s,cSt (25 °C) 59 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	280 mPa.s,cP (20 °C) 84 mPa.s,cP (40 °C) 9.1 mPa.s,cP (100 °C)	
	200 mPa.s,cP (25 °C) 51 mPa.s,cP (50 °C)	

ASTM Methods for petrochemical analysis

Code	Product	Unit
PSLN140	N140 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	400 mm ² /s,cSt (20 °C) 140 mm ² /s,cSt (40 °C)	18.0 mm ² /s,cSt (100 °C)
	300 mm ² /s,cSt (25 °C) 90 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
350 mPa.s,cP (20 °C) 120 mPa.s,cP (40 °C)	15.0 mPa.s,cP (100 °C)	
260 mPa.s,cP (25 °C) 77 mPa.s,cP (50 °C)		
PSL2700V11	S200 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	660 mm ² /s,cSt (20 °C) 180 mm ² /s,cSt (40 °C)	17 mm ² /s,cSt (100 °C)
	460 mm ² /s,cSt (25 °C) 110 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
590 mPa.s,cP (20 °C) 150 mPa.s,cP (40 °C)	14 mPa.s,cP (100 °C)	
410 mPa.s,cP (25 °C) 91 mPa.s,cP (50 °C)		
New PSL2700V11A	N230 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	860 mm ² /s,cSt (20 °C) 230 mm ² /s,cSt (40 °C)	21 mm ² /s,cSt (100 °C)
	600 mm ² /s,cSt (25 °C) 145 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
770 mPa.s,cP (20 °C) 190 mPa.s,cP (40 °C)	17.0 mPa.s,cP (100 °C)	
535 mPa.s,cP (25 °C) 120 mPa.s,cP (50 °C)		
PSL2700V12	N350 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	1400 mm ² /s,cSt (20 °C) 310 mm ² /s,cSt (40 °C)	24 mm ² /s,cSt (100 °C)
	920 mm ² /s,cSt (25 °C) 180 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
1200 mPa.s,cP (20 °C) 270 mPa.s,cP (40 °C)	20 mPa.s,cP (100 °C)	
790 mPa.s,cP (25 °C) 150 mPa.s,cP (50 °C)		
PSL2700V12A	N415 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	1900 mm ² /s,cSt (20 °C) 415 mm ² /s,cSt (40 °C)	34 mm ² /s,cSt (100 °C)
	1240 mm ² /s,cSt (25 °C) 240 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
1630 mPa.s,cP (20 °C) 360 mPa.s,cP (40 °C)	28.0 mPa.s,cP (100 °C)	
1065 mPa.s,cP (25 °C) 200 mPa.s,cP (50 °C)		
PSL2700V13	S600 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	2400 mm ² /s,cSt (20 °C) 520 mm ² /s,cSt (40 °C)	35 mm ² /s,cSt (100 °C)
	1600 mm ² /s,cSt (25 °C) 290 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
2100 mPa.s,cP (20 °C) 450 mPa.s,cP (40 °C)	29 mPa.s,cP (100 °C)	
1400 mPa.s,cP (25 °C) 240 mPa.s,cP (50 °C)		
New PSL2700-V13A	N730 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	3390 mm ² /s,cSt (20 °C) 730 mm ² /s,cSt (40 °C)	49 mm ² /s,cSt (100 °C)
	2260 mm ² /s,cSt (25 °C) 410 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
2970 mPa.s,cP (20 °C) 630 mPa.s,cP (40 °C)	40.0 mPa.s,cP (100 °C)	
1980 mPa.s,cP (25 °C) 340 mPa.s,cP (50 °C)		
PSL2700V14	N1000 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	4800 mm ² /s,cSt (20 °C) 940 mm ² /s,cSt (40 °C)	55 mm ² /s,cSt (100 °C)
	3100 mm ² /s,cSt (25 °C) 520 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
4100 mPa.s,cP (20 °C) 800 mPa.s,cP (40 °C)	45 mPa.s,cP (100 °C)	
2700 mPa.s,cP (25 °C) 450 mPa.s,cP (50 °C)		
PSLN1300	N1300 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	6760 mm ² /s,cSt (20 °C) 1320 mm ² /s,cSt (40 °C)	77 mm ² /s,cSt (100 °C)
	4365 mm ² /s,cSt (25 °C) 730 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
5775 mPa.s,cP (20 °C) 1120 mPa.s,cP (40 °C)	63.0 mPa.s,cP (100 °C)	
3800 mPa.s,cP (25 °C) 630 mPa.s,cP (50 °C)		

Solid fuels

Code	Product	Unit
PSL2700V15	S2000 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	8600 mm ² /s,cSt (20 °C) 1700 mm ² /s,cSt (40 °C) 81 mm ² /s,cSt (100 °C)	
	5600 mm ² /s,cSt (25 °C) 880 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
7500 mPa.s,cP (20 °C) 1500 mPa.s,cP (40 °C) 68 mPa.s,cP (100 °C)		
4800 mPa.s,cP (25 °C) 760 mPa.s,cP (50 °C)		
PSL2700V16	N4000 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	18000 mm ² /s,cSt (20 °C) 3400 mm ² /s,cSt (40 °C) 130 mm ² /s,cSt (100 °C)	
	11000 mm ² /s,cSt (25 °C) 1700 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
16000 mPa.s,cP (20 °C) 2900 mPa.s,cP (40 °C) 112 mPa.s,cP (100 °C)		
10000 mPa.s,cP (25 °C) 1500 mPa.s,cP (50 °C)		
PSL2700V17	S8000 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	35000 mm ² /s,cSt (20 °C) 6700 mm ² /s,cSt (40 °C) 220 mm ² /s,cSt (100 °C)	
	22000 mm ² /s,cSt (25 °C) 3200 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
31000 mPa.s,cP (20 °C) 5900 mPa.s,cP (40 °C) 190 mPa.s,cP (100 °C)		
20000 mPa.s,cP (25 °C) 2700 mPa.s,cP (50 °C)		
PSL2700V18	N15000 - Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	65000 mm ² /s,cSt (20 °C) 13000 mm ² /s,cSt (40 °C) 370 mm ² /s,cSt (100 °C)	
	41000 mm ² /s,cSt (25 °C) 5800 mm ² /s,cSt (50 °C)	
	<u>Dynamic viscosity (nominal)</u>	
58000 mPa.s,cP (20 °C) 11000 mPa.s,cP (40 °C) 320 mPa.s,cP (100 °C)		
37000 mPa.s,cP (25 °C) 5100 mPa.s,cP (50 °C)		
PSL2700V19	S30000-Viscosity oil standard	500 mL
	<u>Kinematic viscosity (nominal)</u>	
	82000 mm ² /s,cSt (25 °C) 23000 mm ² /s,cSt (40 °C) 11000 mm ² /s,cSt (50 °C) 670 mm ² /s,cSt (100 °C)	
	<u>Dynamic viscosity (nominal)</u>	
	74000 mPa.s,cP (25 °C) 21000 mPa.s,cP (40 °C) 9900 mPa.s,cP (50 °C) 580 mPa.s,cP (100 °C)	

Solid fuels

Code	Product	Unit
BCR-331	Low volatile steam coal - Sulfur	20 g
	Certified value S 4.99 g/kg	
BCR-332	High volatile industrial coal - Sulfur	20 g
	Certified value S 9.61 g/kg	
BCR-333	Coking steam coal - Sulfur	20 g
	Certified value S 13.44 g/kg	
BCR-334	Anthracite - Sulfur	20 g
	Certified value S 16.09 g/kg	
BCR-335	Flame coal - Sulfur	20 g
	Certified value S 50.8 g/kg	
BCR-336	High volatile steam coal - Sulfur	20 g
	Certified value S 32.90 g/kg	
BCR-460	Coal - Fluorine	40 g
	Certified value F 225 mg/kg	
	Indicative value for Cl	

Solid fuels

Code	Product	Unit
NCS FC82007	Coal - Fluorine Certified value F..... 248±12 µg/g	50 g
NCS FC82008	Coal - Fluorine Certified value F..... 864±16 µg/g	50 g
NCS FC82009	Coal - Fluorine Certified value F..... 1496±20 µg/g	50 g
NIST-2682b	Coal (sub-bituminous) - Sulphur, mercury and heat of combustion Certified values S 0.4917 % Hg 108.8 µg/kg Indicative values for chlorine, ash content, gross calorific value	50 g
New NIST-2692C	Coal (bituminous) - Sulfur, mercury Certified values (dry mass basis) S 1.064 ± 0.013 % Hg 0.1790 ± 0.00.69 µg/g Reference values (dry mass basis) Chlorine (Cl)..... 1338 ± 22 µg/g Ash Content (mass fraction) 7.499 ± 0.024%	50 g
NIST-2693	Coal (bituminous) - Sulfur and mercury Certified values S 0.4571 % Hg..... 37.3 µg/kg Cl 369.6 mg/kg	50 g
NCS FC28003G	Coal - Elements and properties Coal type: Anthracite Certified values C 70.95 % Ash 24.38 % H 0.76 % Volatile matter 5.39 % N 0.30 % Relative density (20°C) 2.04 Total S 0.39 % Calorific value 23.93 MJ/kg	50 g
New NIM-GBW11104F	Coal - Elements and properties Coal type: Anthracite Certified values C 79.17 % Ash 13.85 % H 2.15 % Volatile matter 6.97 % N 1.14 % Relative density (20°C) 1.65 Total S 1.14 % Calorific value 29.54 MJ/kg	50 g
New NIM-GBW11108G	Coal (bitumite) - Elements and properties Coal type: Bitumite Certified values C 68.29 % Ash 14.66 % H 4.22 % Volatile matter 34.56 % N 1.21 % Relative density (20°C) 1.48 Total S 1.84 % Calorific value 27.61 MJ/kg	50 g
New NCS FC28007H	Coal (bitumite) - Elements and properties Coal type: Bitumite Certified values C 68.77 % Ash 14.77 % H 4.25 % Volatile matter 34.46 % N 1.20 % Relative density (20°C) 1.47 Total S 1.83 % Calorific value 27.42 MJ/kg	50 g
New NIM-GBW11112D	Coal - Elements and properties Coal type: Anthracite Certified values C 72.26 % Ash 20.52 % H 1.81 % Volatile matter 6.17 % N 0.85 % Density (20°C)..... 1.79 Total S 2.26 % Gross calorific value..... 26.52 MJ/kg	50 g
New NCS FC28012C	Coal - Elements and properties Coal type: Anthracite Certified values C 70.35 % Ash 19.67 % H 2.86 % Volatile matter 10.84 % N 1.09 % Relative density (20°C) 1.60 S 3.07 % Gross calorific value..... 27.29 MJ/kg	50 g

Solid fuels

Code	Product	Unit
New NCS FC28005E	Coal (anthracite) - Elements and properties Coal type: Anthracite Certified values C 77.83 % Ash 14.25 % H 2.76 % Volatile matter 8.82 % N 0.85 % Relative density (20 °C) 1.57 Total S 1.76 % Calorific value 29.58 MJ/kg	50 g
NCS FC28101	Coal - Elements and properties Coal type: Anthracite Certified values C 90.27 % Ash 3.95 % H 3.01 % Volatile matter 6.64 % N 0.60 % Relative density (20 °C) 1.47 Total S 0.20 % Calorific value 34.34 MJ/kg	50 g
NCS FC28102	Coal - Elements and properties Coal type: Anthracite Certified values C 87.47 % Ash 6.46 % H 2.86 % Volatile matter 7.90 % N 0.60 % Relative density (20 °C) 1.5 Total S 0.19 % Calorific value 33.1 MJ/kg	50 g
NCS FC28103	Coal - Elements and properties Coal type: Anthracite Certified values C 81.55 % Ash 10.51 % H 3.33 % Volatile matter 9.45 % N 1.30 % Relative density (20 °C) 1.47 Total S 0.36 % Calorific value 31.8 MJ/kg	50 g
NCS FC28104	Coal - Elements and properties Coal type: Anthracite Certified values C 81.60 % Ash 10.09 % H 3.52 % Volatile matter 11 % N 1.34 % Relative density (20 °C) 1.45 Total S 0.41 % Calorific value 32.04 MJ/kg	50 g
NCS FC28105	Coal - Elements and properties Coal type: Anthracite Certified values C 81.54 % Ash 9.61 % H 3.70 % Volatile matter 12.21 % N 1.16 % Relative density (20 °C) 1.43 Total S 1.06 % Calorific value 32.31 MJ/kg	50 g
NCS FC28106	Coal - Elements and properties Coal type: Bitumite Certified values C 79.09 % Ash 8.56 % H 4.95 % Volatile matter 31.92 % N 1.38 % Relative density (20 °C) 1.35 Total S 1.72 % Calorific value 32.98 MJ/kg	50 g
NCS FC28107	Coal - Elements and properties Coal type: Bitumite Certified values C 79.80 % Ash 10.41 % H 3.80 % Volatile matter 15.30 % N 1.10 % Relative density (20 °C) 1.43 Total S 0.66 % Calorific value 31.64 MJ/kg	50 g
NCS FC28108	Coal - Elements and properties Coal type: Bitumite Certified values C 72.94 % Ash 13.68 % H 4.46 % Volatile matter 30.84 % N 1.26 % Relative density (20 °C) 1.42 Total S 0.57 % Calorific value 29.9 MJ/kg	50 g

Solid fuels

Code	Product	Unit
NCS FC28109	Coal - Elements and properties Coal type: Anthracite Certified values C 79.42 % Ash 11.98 % H 3.28 % Volatile matter 11.30 % N 1.09 % Relative density (20 °C) 1.49 Total S 0.58 % Calorific value 30.66 MJ/kg	50 g
NCS FC28110	Coal - Elements and properties Coal type: Bitumite Certified values C 75.96 % Ash 8.42 % H 4.56 % Volatile matter 32.94 % N 1.33 % Relative density (20 °C) 1.41 Total S 0.87 % Calorific value 30.92 MJ/kg	50 g
NCS FC28111	Coal - Elements and properties Coal type: Bitumite Certified values C 60.24 % Ash 25.19 % H 3.73 % Volatile matter 28.39 % N 1.04 % Relative density (20 °C) 1.57 Total S 1.28 % Calorific value 24.35 MJ/kg	50 g
NCS FC28112	Coal - Elements and properties Coal type: Bitumite Certified values C 78.78 % Ash 8.08 % H 5.01 % Volatile matter 33.70 % N 1.31 % Relative density (20 °C) 1.33 Total S 2.10 % Calorific value 32.82 MJ/kg	50 g
NCS FC28113	Coal - Elements and properties Coal type: Bitumite Certified values C 74.80 % Ash 7.06 % H 4.47 % Volatile matter 33.40 % N 1.02 % Relative density (20 °C) 1.41 Total S 0.27 % Calorific value 30.03 MJ/kg	50 g
NCS FC28114	Coal - Elements and properties Coal type: Bitumite Certified values C 76.36 % Ash 4.66 % H 4.54 % Volatile matter 33.07 % N 1.08 % Relative density (20 °C) 1.4 Total S 0.20 % Calorific value 30.73 MJ/kg	50 g
NCS FC28115	Coal - Elements and properties Coal type: Bitumite Certified values C 77.44 % Ash 6.38 % H 4.42 % Volatile matter 32.22 % N 1.21 % Relative density (20 °C) 1.41 Total S 0.42 % Calorific value 31.05 MJ/kg	50 g
NCS FC28116	Coal - Elements and properties Coal type: Bitumite Certified values C 78.68 % Ash 6.08 % H 4.59 % Volatile matter 32.34 % N 1.34 % Relative density (20 °C) 1.39 Total S 0.54 % Calorific value 31.82 MJ/kg	50 g
NCS FC59001	Coke - Sulphur, ash and volatile matter Certified values Total Sulfur 0.63±0.03 % Ash 7.22±0.06 % Volatile matter 1.39±0.08 %	60 g
NCS FC82004	Coal - Chlorine Certified value Cl 0.010±0.002 %	50 g
NCS FC82005	Coal - Chlorine Certified value Cl 0.057±0.003 %	50 g

Solid fuels

Code	Product	Unit
NCS FC82006	Coal - Chlorine Certified value Cl 0.110±0.006 %	50 g
New NCS FC28001N	Coal (bitumite) - Elements and properties Coal type: Bitumite Certified values C 52.61% Ash 35.58 % H 3.45 % Volatile matter 24.31 % N 1.00 % Relative density (20°C) 1.65 Total S 0.47 % Calorific value 21.15 MJ/kg	50 g
NCS FC82002	Coal - Arsenic and Phosphorus Certified value As 34±2 µg/g P 0.007±0.001%	50 g
NCS FC82003	Coal - Arsenic and Phosphorus Certified value As 51±3 µg/g P 0.092±0.005%	50 g
NCS FC62001	Bituminous Coal Certified values M _{ad} 4.51% V _{ad} 22.89% S _{t,d} 1.53% A _{ad} 21.17% V _d 23.97% Q _{gr,ad} 23.91 MJ/kg A _d 22.17% S _{t,ad} 1.46% Q _{gr,d} 25.04 MJ/kg M _{ad} , A _{ad} , V _{ad} , S _{t,ad} and Q _{gr,ad} mean moisture, ash, volatile material, total sulfur and calorific value of air dried sample; A _d , V _d , S _{t,d} and Q _{gr,d} mean ash, volatile material, total sulfur and calorific value of dried sample.	20 g
NCS FC62002	Bituminous Coal Certified values M _{ad} 2.27% V _{ad} 4.21% S _{t,d} 2.95% A _{ad} 25.82% V _d 4.31% Q _{gr,ad} 23.48 MJ/kg A _d 26.42% S _{t,ad} 2.88% Q _{gr,d} 24.02 MJ/kg M _{ad} , A _{ad} , V _{ad} , S _{t,ad} and Q _{gr,ad} mean moisture, ash, volatile material, total sulfur and calorific value of air dried sample; A _d , V _d , S _{t,d} and Q _{gr,d} mean ash, volatile material, total sulfur and calorific value of dried sample.	20 g
NIST-2775	Foundry coke - Sulfur Certified value S 0.5816 % Indicative values for ash, volatile matter, carbon, hydrogen and nitrogen	50 g
NIST-2776	Foundry coke - Sulfur, ash and volatile matter Certified values S 0.825 ± 0.016 % Indicative values for ash, volatile matter, carbon, hydrogen, nitrogen	50 g
NIST-2718	Green petroleum coke - Trace elements Certified values Al 16.5 mg/kg Fe 290 mg/kg S 47032 mg/kg Ca 174 mg/kg Ni 139.1 mg/kg V 302 mg/kg Indicative values for C, Co, H, N, Na, Si, Ash, Volatile matter, Gross calorific value	50 g
NIST-2719	Calcinated petroleum coke - Trace elements Certified values Al 58.9 mg/kg Fe 201.6 mg/kg S 8877 mg/kg Ca 57.7 mg/kg Ni 204 mg/kg V 58.6 mg/kg Indicative values for C, Co, H, N, Na, Si, Ash, Volatile content, Gross calorific value	50 g
NJV 94-1	Energy peat (Carex) - Trace elements Milled peat from Sweden with an approximate composition of 80:20 Carex: Sphagnum. Certified values Al 0.090 % Fe 0.39 % Pb 2.4 mg/kg Ca 1.02 % Mg 0.077 % S 0.29 % Cd 0.062 mg/kg Mn 0.0036 % Zn 9 mg/kg Cl 0.028 % N 2.09 % Ash 4.07 % Cu 2.0 mg/kg P 0.045 % Calorific value 22.3 MJ/kg Indicative values for As, C, Cr, H, K, Na, Si, Ti, Volatile matter	50 g
NJV 94-2	Energy peat (sphagnum) - Trace elements Sod peat from Sweden with an approximate composition of 90:10 Sphagnum: Peat wool. Certified values Al 0.095 % Fe 0.13 % Pb 10.1 mg/kg Ca 0.12 % Mg 0.11 % S 0.217 % Cd 0.16 mg/kg Mn 0.0008 % Zn 9 mg/kg Cl 0.061 % N 1.10 % Ash 1.57 % Cu 1.7 mg/kg P 0.024 % Calorific value 21.8 MJ/kg Indicative values for C, Cr, H, K, Na, Si, Ti, Volatile matter	50 g

Code	Product	Unit
NJV 94-3	Energy forest (salix) - Trace elements Salix cultivated in Sweden. Certified values Ca 0.44 % Mg 0.034 % Zn 75 mg/kg Cd 1.8 mg/kg Mn 0.006 % Ash 1.56 % Cu 4.0 mg/kg N 0.37 % Calorific value 19.5 MJ/kg Fe 0.0026 % P 0.05 % K 0.20 % S 0.028 % Indicative values for Al, C, Cl, H, Na, Si, Pb, Volatile matter	50 g
NJV 94-4	Energy grass (phalaris arudinaceae L.) - Trace elements Spring harvested reed canary grass (Phalaris arudinaceae L.) from Sweden. Certified values Al 0.18 % Fe 0.106 % S 0.132 % As 0.4 mg/kg K 0.38 % Si 2.1 % Ca 0.21 % Mg 0.088 % Zn 42 mg/kg Cd 0.09 mg/kg Mn 0.016 % Ash 6.87 % Cl 0.058 % N 1.04 % Calorific value 18.5 MJ/kg Cr 3.4 mg/kg P 0.109 % Cu 6.8 mg/kg Pb 2.1 mg/kg Indicative values for C, H, Na, Ti, Volatile matter	50 g
NJV 94-5	Wood fuel - Trace elements Pine wood waste from a saw mill in Sweden with a composition of approximately 70:30 bark: chip Certified values Al 0.026 % Fe 0.007 % Pb 0.68 mg/kg As 0.8 mg/kg K 0.09 % S 0.018 % Ca 0.35 % Mg 0.030 % Zn 38 mg/kg Cd 0.27 mg/kg Mn 0.021 % Ash 1.22 % Cr 0.8 mg/kg Na 0.004 % Calorific value 20.6 MJ/kg Cu 2.2 mg/kg P 0.021 % Indicative values for C, Cl, H, N, Si, Ti, Volatile matter	50 g

Cement

Code	Product	Unit
NIST-634a	Portland cement - Constituents Certified values SiO ₂ 20.493 % CaO 65.07 % K ₂ O 0.3572 % Al ₂ O ₃ 5.015 % MgO 1.0057 % TiO ₂ 0.2463 % Fe ₂ O ₃ 3.362 % SO ₃ 2.780 % P ₂ O ₅ 0.1767 % Indicative values for Na ₂ O, Cr ₂ O ₃ , ZnO, Mn ₂ O ₃ , SrO	100 g
New NIST-1880B	Portland cement - Constituents Certified values SiO ₂ 20.42 ± 0.36 % SO ₃ 2.710 ± 0.099 % Mn ₂ O ₃ 0.1981 ± 0.0020 % Al ₂ O ₃ 5.183 ± 0.073 % Na ₂ O 0.0914 ± 0.0052 % Cl 0.01830 ± 0.00057 % Fe ₂ O ₃ 3.681 ± 0.023 % K ₂ O 0.646 ± 0.014 % Cr ₂ O ₃ 0.01927 ± 0.00042 % CaO 64.16 ± 0.40 % TiO ₂ 0.236 ± 0.012 % MgO 1.176 ± 0.020 % P ₂ O ₅ 0.2443 ± 0.0027 % Reference values for LOI*, ZnO, sulfide sulfur, insoluble residue, CaO (free), SrO, and fluoride * Loss on Ignition	4 x 5 g
NIST-1881a	Portland cement - Constituents Certified values Al ₂ O ₃ 7.060 % MgO 2.981 % SO ₃ 3.366 % CaO 57.58 % Mn ₂ O ₃ 0.013 % SrO 0.036 % Cr ₂ O ₃ 0.0588 % Na ₂ O 0.199 % TiO ₂ 0.3663 % Fe ₂ O ₃ 3.09 % P ₂ O ₅ 0.1459 % ZnO 0.0489 K ₂ O 1.228 % SiO ₂ 22.26 % Indicative values for Cl, F, LOI*, Insoluble residue * Loss on Ignition	4 x 5 g
NIST-1882a	Calcium aluminate cement (formally orange) - Constituents Certified values Al ₂ O ₃ 39.14 % MgO 0.51 % SrO 0.024 % CaO 39.29 % Mn ₂ O ₃ 0.060 % TiO ₂ 1.786 % Cr ₂ O ₃ 0.113 % Na ₂ O 0.021 % ZnO 0.004 % Fe ₂ O ₃ 14.67 % P ₂ O ₅ 0.070 % LOI* 0.20 % K ₂ O 0.051 % SiO ₂ 4.01 % Indicative value for Total * Loss on Ignition	4 x 5 g