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Oil-Analysis Standards

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**CALIBRATION AND
VERIFICATION STANDARDS**

METALS IN OIL STANDARDS

SULFUR IN CRUDE OIL

FLASH POINT STANDARDS

TAN & TBN STANDARDS



VERSION 10.0



*The benchmark
for accurate
measurements*

HOW TO ORDER

For sales and customer service inquiries outside of Canada, China, France, Germany and the USA, please contact the International Department.

We ship worldwide via a wide variety of international carriers; expedited service to most countries is available.



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TERMS OF PAYMENT

Net 30 days: for customers with established credit, payment of the total invoice amount is required within 30 days from the shipping date, unless otherwise arranged. New customers are asked to complete a credit application form listing their bank and three commercial references. Prepayment (including applicable taxes and transportation charges) by credit card or wire transfer is available for customers without established credit for orders to be released immediately for shipment. Based on current exchange rates, and subject to change, prices are equal in Canadian and U.S. funds. Payment in Canadian funds is preferred; special arrangements can be made for payment in U.S. funds. Visa and MasterCard are accepted (American Express is accepted for U.S. orders only).

CUSTOMER RESPONSE

CONOSTAN is at your service. We appreciate comments, criticism, and suggestions, and we will make every effort to meet your expectations for high-quality products and services.

CONOSTAN[®]

Oil Analysis Standards

**Calibration
& Verification
Standards for the
Analysis of:**

- Lubricants: New and In-service
 - Lubricant Additives
 - Petroleum Products
- Organic Fluids / Materials



Metals in Crude Oil
See pages 13

Metals in Residual Oil
See pages 13

Sulfur in Crude Oil
See pages 17

Flash Point Standards
See pages 23

TAN & TBN Standards
See pages 25-26

CONOSTAN[®] a division of **SCP SCIENCE**

QUALITY COMMITMENT

OUR GOAL IS TO SERVE YOU BETTER THROUGH OUR CONTINUOUS IMPROVEMENT

SCP SCIENCE, the manufacturer of CONOSTAN Standards is very proud to announce that the company is registered / accredited to three international Quality Management System standards: ISO 9001, ISO 17025 and ISO Guide 34.



This comprehensive coverage means that you will be receiving a quality product no matter what you purchase from SCP SCIENCE / CONOSTAN 's extensive offering, each and every time you order. We are committed to providing quality products and services upon which customers can depend.

Through our all-encompassing ISO 9001 certification and laboratory focused ISO 17025 / Guide 34 accreditations, SCP SCIENCE / CONOSTAN has proven that it can provide the best and most reliable products and reference materials available in the industry. At SCP SCIENCE / CONOSTAN , we are truly dedicated to providing and exceeding the quality you require.

SCP SCIENCE is a member of the Chemical Reference Material Manufacturers Association (CRMMA); an association of the major manufacturers of calibration standards whose mandate is "...to promote the production and marketing of high quality materials and to promote continuous improvement of industry products and standards..."

SCP SCIENCE is a leader in the field of standards and volumetric solutions and yet one of our key goals is to continually improve to serve you better. Our websites (www.scpscience.com and www.CONOSTAN.com) include many new products in response to your requests and to the new requirements of governments and organizations. Should you require a product that is not listed on our websites, please do not hesitate to contact our Customer Service Group.



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ABOUT CONOSTAN

Our Reputation

SCP SCIENCE is proud to present CONOSTAN - the world's most trusted name in oil standards, whose industry-leading position is the result of a uniquely superior product chemistry and manufacturing technology together with proprietary blending techniques.

The CONOSTAN brand history dates back 35 years, when the U.S. Department of Defense's Spectrometric Oil Analysis Program Standards Committee required calibration standards to analyze metals in lubricating oils to conduct wear metals analyses. At the time, commercially available metals in oil standards were unreliable and made calibrating analytical instrumentation difficult. CONOSTAN's research and development department created the chemistry for producing reliable element in oil standards, which were adopted by the Department of Defense.

CONOSTAN is also the only source of multi-element metallo-organic standards in the history of the National Institute of Standards and Technology (NIST) — the (NIST-1085 b) reference material is CONOSTAN S-21:300.



Our Products

Oil standards are used extensively in the calibration and operation of instruments that analyze elements in oil and other organic fluids. Our product lines offer a wide variety of reference standards, solvents, and reagents for ICP, DCP, rotating disk electrode, XRF, AA, and other analytical spectrometric techniques.

Our products are optimized for:

- **Compatibility** – We offer combinations of 38 different elements over an extensive concentration range.
- **Solubility** – Our standards are soluble in a variety of substances: ketones, mineral oil, xylene, kerosene, etc. We also produce blank oils and *PremSolv*, a kerosene alternative, for use as solvents.
- **Volatility** – Our standards are made in ultra-pure, highly processed hydrocarbon oil only: no solubilizers are used, making our standards extremely stable to volatile loss.
- **Viscosity** – The viscosity range of our standards at room temperature is ideal for instrumental applications.
- **Instrumental response** – Our standards provide excellent analytical response over a wide range of applications.
- **Shelf life** – All CONOSTAN element standards and spectroscopy products have a one-year minimum shelf life from the date of shipment.

METALLO-ORGANIC STANDARDS

Applications

CONOSTAN standards are used extensively in a variety of industries: energy, environmental, aircraft, railroad, automotive, heavy equipment, mining, chemical and others. Essentially, wherever calibration of instruments for analyzing elements in oil and other organics is needed, CONOSTAN standards provide consistent composition and performance.

Typical Uses:

1. For ICP, DCP, AA and rotating disk emission spectrometric determinations of trace metals in organic materials, such as wear metals in used lubricating oils.
2. In AA and ICP spectrometric analyses of oils and other organics for As, Ba, Cd, Cr, Pb, Se, and other metals of environmental concern.
3. In AA and ICP emission analyses for trace metals in organics such as Co and Ni from metal-catalyzed reactions.
4. For XRF determinations of multi-element mixtures in organic systems such as Fe, Ni, Cu, and V in crude oils.
5. For emission spectrometric determinations of additive metals such as Ba, Ca, Mg, P, and Zn for quality control of motor oil formulations.
6. As internal standards and matrix adjustment components, and for the preparation of special multi-element blended standards to meet specific calibration requirements.



Eliminate the need to change ICP Sample Introduction components for different applications by using the

MINI X-FLOW NEBULIZER

Whether your samples are new or used oils, clean waters, suspensions, sludges or in HF, the Mini X-Flow Nebulizer (Cat. # 020-060-611) can handle them all - and with the best performance coupled to a Cyclonic Spray Chamber.

METALLO-ORGANIC STANDARDS (CONT'D)

CONOSTAN metallo-organic standards are oil-based metal calibration standards for use with ICP, AA, rotrode, XRF, DCP, flame emission, and other instruments.

Single-Element Standards

Blended in 20 cSt blank oil (size: 50 g)

Elements	1000 ppm	5000 ppm
	50 g	50 g
Ag	150-100-475	150-500-475
Al	150-100-135	150-500-135
As	150-100-335	-
B	150-100-055	150-500-055
Ba	150-100-565	150-500-565
Be	150-100-045	150-500-045
Bi	150-100-835	150-500-835
Ca	150-100-205	150-500-205
Ce	150-100-585	150-500-585
Cd	150-100-485	150-500-485
Co	150-100-275	150-500-275
Cr	150-100-245	150-500-245
Cu	150-100-295	150-500-295
Fe	150-100-265	150-500-265
Hg	150-100-805	-
In	150-100-495	150-500-495
K	150-100-195	150-500-195
La	150-100-575	150-500-575

Elements	1000 ppm	5000 ppm
	50 g	50 g
Li	150-100-035	150-500-035
Mg	150-100-125	150-500-125
Mn	150-100-255	150-500-255
Mo	150-100-425	150-500-425
Na	150-100-115	150-500-115
Ni	150-100-285	150-500-285
P	150-100-155	150-500-155
Pb	150-100-825	150-500-825
Sb	150-100-515	150-500-515
Si	150-100-145	150-500-145
Sn	150-100-505	150-500-505
Sr	150-100-385	150-500-385
Ti	150-100-225	150-500-225
V	150-100-235	150-500-235
W	150-100-745	150-500-745
Y	150-100-395	150-500-395
Zn	150-100-305	150-500-305

	100 ppm
As*	150-103-331
Sc*	150-103-341

* size: 100 g, 20 cSt

	2000 ppm
Sc**	150-500-215

** size: 50 g, 20 cSt

	100 ppm	1000 ppm
As***	150-101-331	150-102-331
Hg***	150-101-801	150-101-805
Se***	150-101-341	-

*** size: 100 g, 75 cSt

Multi-Element Standards

See detailed

Certificate of Analysis

on page 31



Blended in 75 cSt blank oil

ppm	S-12		S-21		S-21+K	
	100 g	200 g	100 g	200 g	100 g	200 g
10	150-012-001	150-012-009	150-021-002	150-021-018	150-021-042	150-021-051
30	150-012-004	150-012-012	150-021-008	150-021-027	150-021-045	150-021-056
50	150-012-006	150-012-014	150-021-010	150-021-030	150-021-047	150-021-058
100	150-012-002	150-012-010	150-021-003	150-021-019	150-021-043	150-021-052
300	150-012-005	150-012-013	150-021-009	150-021-028	150-021-046	150-021-037
500	150-012-007	150-012-015	150-021-011	150-021-031	150-021-048	150-021-059
900*	150-012-008	150-012-016	150-021-015	150-021-035	150-021-049	150-021-061

* 900 ppm nominal value, 885 ppm actual value.

S-12: Ag, Al, Cr, Cu, Fe, Mg, Na, Ni, Pb, Si, Sn, Ti

S-21: Ag, Al, B, Ba, Ca, Cd, Cr, Cu, Fe, Mg, Mn, Mo, Na, Ni, P, Pb, Si, Sn, Ti, V, Zn

ppm	AM-Special		
	100 g	200 g	400 g
500	150-250-010	150-250-023	-
900	150-250-014	150-250-027	150-250-004
1000	150-250-006	150-250-016	150-250-001
2000	-	150-250-017	-
2500	150-250-007	150-250-018	-
3000	150-250-009	150-250-020	-
4000	-	150-250-021	-
5000	150-250-011	150-250-024	150-250-003
6000	150-250-012	-	-
7000	150-250-013	150-250-025	-

AM-Special: Ba, Ca, Mg, P, Zn

Custom Blends

If you require a combination or concentration of elements that we do not routinely stock, custom blends are available and can be shipped within two working days. To order, you may fill out and mail the form on page 27 of this booklet. We can make:

- Any combination of elements listed here at custom concentrations
- Single-element standards at custom concentrations
- S-21, S-12, and AM-Special blends at custom concentrations
- Additions to S-21, S-12, and AM-Special blends

Size: available in 100 g, 200 g, and 400 g

Complete the custom quotation request form on page 27 and return it to us.

Or, visit www.scpscience.com and request a custom quote online.

METALLO-ORGANIC STANDARDS (CONT'D)

D-Series Standards for Joint Oil Analysis Program (JOAP)

Direct from the Original Source

CONOSTAN D-Series standards are available directly from SCP SCIENCE. Each D3, D12, and D19 standard is furnished with a Certificate of Analysis.

CONOSTAN is the original source of D-Series standards. More than 35 years ago, the U.S. Department of Defense's Spectrometric Oil Analysis Program Standards Committee required standards for its wear metals analysis programs.

With no reliable commercial source of metals in oil standards, CONOSTAN's research department set to work in developing a reliable standard. The result was CONOSTAN's uniquely superior product chemistry, which was adopted by the Department of Defense for its D-Series standards.

As with all CONOSTAN products, you are guaranteed that the D-Series of standards are extremely stable and accurate.



Cross Reference with U.S. Department of Defense Stock Numbers

CONOSTAN product	Dept. of Defense NSN	Catalogue #
D3-100	9150-01-283-0249	150-300-019
D12-5	9150-01-307-3343	150-300-005
D12-10	9150-00-179-5145	150-300-001
D12-30	9150-00-179-5144	150-300-003
D12-50	9150-00-179-5143	150-300-006
D12-100	9150-00-179-5142	150-300-002
D12-300	9150-00-179-5141	150-300-004
D19-0	9150-00-179-5137	150-300-008
D19 set	9150-01-355-1178	150-300-018

METALLO-ORGANIC STANDARDS (CONT'D)

D-Series Standards

ppm	D3	D12	D19
	200 g	200 g	100 g
0 (Blank)	150-300-030	150-300-030	150-300-008
5	-	150-300-005	150-300-013
10	-	150-300-001	150-300-009
30	-	150-300-003	150-300-011
50	-	150-300-006	150-300-014
100	150-300-019	150-300-002	150-300-010
300	-	150-300-004	150-300-012
500	-	-	150-300-015
700	-	-	150-300-016
900	-	-	150-300-017

* Custom ppm preparations available.

D3: B, Mo, Zn **D12:** Ag, Al, Cr, Cu, Fe, Mg, Na, Ni, Pb, Si, Sn, Ti

D19: Ag, Al, B, Ba, Cd, Cr, Cu, Fe, Mg, Mn, Mo, Na, Ni, Pb, Si, Sn, Ti, V, Zn

Blank oil for D-Series: 150-300-008

D19 Set

Product	Catalogue #
D19 set	150-300-018

The D19 set comprises the following concentrations and quantities:

ppm	Quantity	D19 (100 g)
0 (Blank)	4	150-300-008
5	1	150-300-013
10	1	150-300-009
30	1	150-300-011
50	1	150-300-014
100	3	150-300-010
300	2	150-300-012
500	1	150-300-015
700	1	150-300-016
900	1	150-300-017



METALLO-ORGANIC STANDARDS (CONT'D)

Custom Blends of D-Series Standards

If you require a combination or concentration of elements that we do not routinely stock, custom blends are available.

We can make:

- Any combination of elements listed previously as custom concentrations
- Single-element standards at custom concentrations
- D3, D12, and D19 blends at custom concentrations
- Additions to D3, D12, and D-19 blends

Size: Available in 100 g or 200 g

Available elements: Ag, Al, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, In, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Si, Sn, Sr, Ti, V, W, Y, Zn

Used Oil - Certified Reference Material - *EnviroMAT™*

EnviroMAT™ Certified Reference Materials (CRM) can be an invaluable component of any laboratory quality control program. Consensus certification removes any chance of analytical bias. Used as a method performance Quality Control standard and / or QC in oil analysis by ICP-OES and AA.



- Each CRM is certified through a round-robin study employing specific methods of analysis:

- Independant verification from multiple laboratories

- Includes Certificate of Analysis listing consensus values, confidence and tolerance intervals, and instructions for use:

- Complete documentation for audit purposes

EnviroMAT™ Standards	Symbol	Quantity	Catalogue #
Oil, used	HU-1	125 ml	140-025-041

BIODIESEL STANDARDS



Biodiesel is a clean burning alternative fuel, produced from domestic, renewable resources, such as virgin soybean and rapeseed (canola) oils. Biodiesel contains no petroleum, but it can be blended at any concentration with petroleum diesel to create a biodiesel blend. Blends of biodiesel and pure unblended biodiesel can be used in modern diesel engines with no modification required.

SCP SCIENCE-CONOSTAN offers a new line of 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. Each Standard is supplied a Certificate of Analysis.

Metals in Biodiesel

SCP SCIENCE-CONOSTAN offers multi-element standards for Ca, K, Mg, Na and P in B100 Biodiesel. Blank standard is also available. Manufactured in accordance to methods D4951, EN14531, EN14017, EN14108 and EN14109 for ICP analysis. Single element, multi element and custom multi element in biodiesel standards are available upon request.

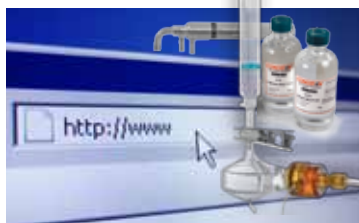
METALS IN BIODIESEL	100% BIODIESEL (B100) BDM5 (100 g)	100% BIODIESEL (B100) BDM2A (100 g)	100% BIODIESEL (B100) BDM2B (100 g)
Elements	Ca, K, Mg, Na, P	K, Na	Ca, Mg
ppm	Catalogue #	Catalogue #	Catalogue #
0 (Blank)	150-441-000	150-441-000	150-441-000
2.5	150-441-005	150-441-030	150-441-065
5	150-441-010	150-441-035	150-441-070
10	150-441-015	150-441-040	150-441-075
15	150-441-020	150-441-045	150-441-080
20	150-441-025	150-441-050	150-441-085
25	-	150-441-055	150-441-090
50	-	150-441-060	150-441-095

BIODIESEL STANDARDS (CONT'D)

Sulfur in Biodiesel

CONOSTAN offers sulfur in biodiesel standards in 5% (B5) and 20% (B20) biodiesel blends. Blank standard is also available. Manufactured in accordance to ASTM methods D7039, D6751, D5453 and EN14214 for ICP and XRF analysis. Custom blended biodiesel standards are available upon request.

SULFUR IN BIODIESEL	5% BIODIESEL (B5) SULFUR (100 g)	20% BIODIESEL (B20) SULFUR (100 g)	100% BIODIESEL (B100) SULFUR (100 g)
ppm	Catalogue #	Catalogue #	Catalogue #
0 (Blank)	150-440-000	150-440-050	150-440-100
5	150-440-005	150-440-055	150-440-105
10	150-440-010	150-440-060	150-440-110
15	150-440-015	150-440-065	150-440-115
30	150-440-020	150-440-070	150-440-120
50	150-440-025	150-440-075	150-440-125
75	150-440-030	150-440-080	150-440-130
100	150-440-035	150-440-085	150-440-135
200	150-440-040	150-440-090	150-440-140
500	150-440-045	150-440-095	150-440-145



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METALS IN OIL STANDARDS



Metals in Crude Oil

Metals in Crude Oil for use in accordance with ASTM D5708 and D5863.
Complete with a Certificate of Analysis.

Complete Set 150-451-060

Iron, ppm	Nickel, ppm	Vanadium, ppm	Catalogue # (100 ml)
1	2	2	150-451-000
300	10	500	150-451-005
500	100	25	150-451-010
100	80	250	150-451-015
200	40	100	150-451-020
400	5	400	150-451-025
1	60	300	150-451-030
500	2	200	150-451-035
100	100	2	150-451-040
300	50	250	150-451-045
200	20	500	150-451-050
50	100	50	150-451-055

Metals in Residual Oil

Metals in Residual Oil for use in accordance with ASTM D5708 and D5863.
Complete with a Certificate of Analysis.

Complete Set 150-421-060

Iron, ppm	Nickel, ppm	Vanadium, ppm	Catalogue # (100 ml)
1	2	2	150-421-000
300	10	500	150-421-005
500	100	25	150-421-010
100	80	250	150-421-015
200	40	100	150-421-020
400	5	400	150-421-025
1	60	300	150-421-030
500	2	200	150-421-035
100	100	2	150-421-040
300	50	250	150-421-045
200	20	500	150-421-050
50	100	50	150-421-055

MISCELLANEOUS PRODUCTS FOR METALLO-ORGANIC ANALYSIS

Base & Blank Standards

Typical Base & Blank Oil Properties

	20 cSt	75 cSt
Specific Gravity (25°C/25°C)	0.84–0.86	0.86–0.89
Viscosity: 40°C 100°C	14–18 cSt 3–4 cSt	65–72 cSt 8.1–8.7 cSt
Pour Point	–7°C (+20°F)	–15°C (+5°F)
Flash Point (minimum)	175°C (345°F)	215°C (420°F)
Trace Metals	<0.10 ppm	<0.15 ppm

Base Oils

Base oils are used for blending calibration standards for spectrometric analysis of metals in oil. Typical properties are tabled above. Note that these oils are not certified.

Size	20 cSt	75 cSt
500 ml	150-020-004	150-075-005
3.78 L (1 gallon)	150-020-003	150-075-004

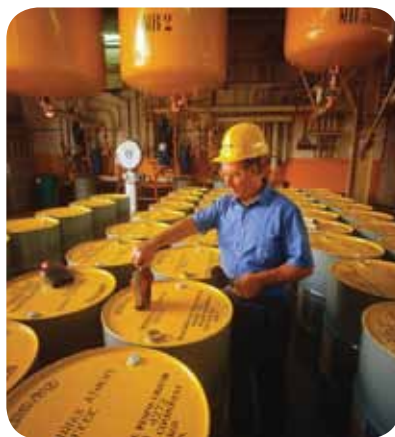
Blank Oils

Blank oils are supplied with a Certificate of Analysis including actual elemental concentration useful for blank subtraction in ICP-AES/MS. Physical properties are noted above.

Size	20 cSt	75 cSt
100 g	150-020-002	150-075-003
400 g	150-020-001	150-075-002
3.78 L (1 gallon)	150-020-005	150-075-006

Stabilizer

Size	Catalogue #
50 g	150-010-001



PREMISOLV ICP SOLVENT

PremiSolv is a zero-odor alternative to kerosene or xylene for use as a diluent or zero-point standard in ICP/DCP analysis of metals in oil and other organic fluids.



PremiSolv Features:

- Extremely low odor – for a safer, more comfortable working environment
- Extremely low toxicity – compared with kerosene or xylene
- Extremely low metal content – comes with a certificate of analysis listing the concentrations of 34 different metals including sulfur
- Non-hazardous – for shipping and disposal

Size	Catalogue #
3.78 L (1 gallon)	150-700-003
18.9 L (5 gallons)	150-700-002

**WANT TO SEE
THE DIFFERENCE YOURSELF?**
Ask for a free 400 ml sample.
Cat. No. 150-700-000

CHLORINE IN OIL STANDARDS

The chlorine product line is designed for calibration of XRF, ICP, and other analytical techniques. Stocked concentrations are shown in the table below.

Custom concentrations are available.

Chlorine Standards (size: 100 g)

ppm	Catalogue #
0 (Blank)	150-200-008
10	150-200-001
100	150-200-002
500	150-200-005
1000	150-200-003
5000	150-200-006
10000	150-200-004
50000	150-200-007



SULFUR IN OIL STANDARDS

CONOSTAN offers an expanding line of Sulfur standards that today encompasses several matrices described below and on the following pages.

The quality of many petroleum products are related to the amount of sulfur present. In fuels, the amount of sulfur is related to its performance characteristics and vehicle emission levels. Levels of sulfur in petroleum and petroleum products are regulated through federal, state and local agencies.



Sulfur in Isooctane

Sulfur in Isooctane by UV Fluorescence

ppm	Description	Catalogue #
0, 0.5, 1.0, 2.5, 5.0, 7.5, 10	For very low Sulfur level, set of 7 x 10 ml vials. Complete with a Certificate of Analysis.	150-430-010
0, 5.0, 10, 25, 50, 100, 250	For low Sulfur level, set of 7 x 10 ml vials. Complete with a Certificate of Analysis.	150-430-020
0, 50, 100, 250, 500, 750, 1000	For high Sulfur level, set of 7 x 10 ml vials. Complete with a Certificate of Analysis.	150-430-030

Sulfur in Isooctane

Sulfur in Isooctane by X-Ray Fluorescence

ppm	Catalogue # (60 ml)
0 (Blank)	150-430-101
50	150-430-102
100	150-430-103
250	150-430-104
500	150-430-105
750	150-430-106
1000	150-430-107
Set of 7	150-430-100



SULFUR IN OIL STANDARDS (CONT'D)

Sulfur in Residual Oil

ppm	Catalogue # (50 ml)	Catalogue # (100 ml)
2500	150-420-100	150-420-005
3500	150-420-105	150-420-010
5000	150-420-110	150-420-015
7500	150-420-120	150-420-020
10000	150-420-125	150-420-025
15000	150-420-130	150-420-030
20000	150-420-135	150-420-035
25000	150-420-140	150-420-040
30000	150-420-145	150-420-045
35000	150-420-150	150-420-050
40000	150-420-155	150-420-055
50000	150-420-160	150-420-060

Sulfur in Crude Oil

We have 10 standards from 500 to 50000 ppm. Sulfur in Crude Oil is in accordance with Method ASTM D2622 and D4294. Complete with a Certificate of Analysis.

ppm	Catalogue # (100 ml)
500	150-450-000
1,000	150-450-005
1,500	150-450-020
2,500	150-450-010
5,000	150-450-015
10,000	150-450-025
20,000	150-450-030
30,000	150-450-035
40,000	150-450-040
50,000	150-450-045



SULFUR IN OIL STANDARDS (CONT'D)

Sulfur Standards in Mineral Oil and Diesel Fuel (100 g)

Sulfur in Mineral Oil

The sulfur in oil product line is designed for calibration of XRF, ICP, and other analytical instruments according to various ASTM methods (such as D2622, D3246, D4294, D5453, D6334, and D6443). Stocked concentrations are shown in the table below.

Sulfur in Diesel Fuel

Our line of sulfur in diesel fuel is specially engineered to have an elevated flash point, making it suitable for shipping as a non-hazardous product. Stocked concentrations are shown in the table below.

Custom Concentrations

For concentrations not listed in the table below, custom concentrations are available in both mineral oil and diesel fuel. Contact us for further information.

ppm	In Mineral Oil (100 g)	In Diesel Fuel (100 g)
0 (Blank)	150-400-025	150-410-012
5	CB2-000-018	150-410-008
10	150-400-001	150-410-001
25	150-400-009	150-410-013
50	150-400-018	150-410-009
100	150-400-002	150-410-002
250	150-400-010	CB2-000-023
500	150-400-019	150-410-010
750	150-400-023	150-410-018
1000	150-400-003	150-410-003
2500	150-400-011	CB2-000-024
5000	150-400-020	150-410-011
7500	150-400-024	150-410-021
10000	150-400-004	150-410-004
15000	150-400-005	150-410-006
20000	150-400-008	150-410-007
25000	150-400-012	CB2-000-028
30000	150-400-014	150-410-022
40000	150-400-016	150-410-023
50000	150-400-021	150-410-024

* Custom ppm preparations available

** A Certificate of Analysis reporting concentration and density are included with each standard

VISCOSITY STANDARDS

The same product reliability and stability that our customers trust in metallo-organic standards are now available in General Purpose Viscosity standards. These certified, mineral oil based, viscosity standards were developed for calibration and verification of all types of viscometers, such as glass capillary viscometers.

All standards are traceable to National Standards in accordance to ASTM & IP methods. Each standard carries a two year stability guarantee. The determination of kinematic and dynamic viscosity were made in accordance with ASTM D445/446 and ISO 3104/3105, ISO/IEC 17025 and are traceable to the NIST (National Institute of Standards and Technology).



See detailed
Certificate of Analysis
on page 30



VOLUME					
Viscosity Standards	125 ml	500 ml	1 Litre	4 Litre	20 Litre
S3	150-600-351	150-600-352	150-600-353	150-600-354	150-600-355
S6	150-600-141	150-600-142	150-600-143	150-600-144	150-600-145
N4	150-600-441	150-600-442	150-600-443	150-600-444	150-600-445
N10	150-600-181	150-600-182	150-600-183	150-600-184	150-600-185
S20	150-600-221	150-600-222	150-600-223	150-600-224	150-600-225
N35	150-600-261	150-600-262	150-600-263	150-600-264	150-600-265
N44	150-600-461	150-600-462	150-600-463	150-600-464	150-600-465
S60	150-600-301	150-600-302	150-600-303	150-600-304	150-600-305
N100	150-600-341	150-600-342	150-600-343	150-600-344	150-600-345
S200	150-600-231	150-600-232	150-600-233	150-600-234	150-600-235
N350	150-600-361	150-600-362	150-600-363	150-600-364	150-600-365
N415	150-600-471	150-600-472	150-600-473	150-600-474	150-600-475
S600	150-600-241	150-600-242	150-600-243	150-600-244	150-600-245
N1000	150-600-371	150-600-372	150-600-373	150-600-374	150-600-375
S2000	150-600-381	150-600-382	150-600-383	150-600-384	150-600-385
N4000	150-600-391	150-600-392	150-600-393	150-600-394	150-600-395
S8000	150-600-401	150-600-402	150-600-403	150-600-404	150-600-405
N15000	150-600-411	150-600-412	150-600-413	150-600-414	150-600-415
S30000	150-600-421	150-600-422	150-600-423	150-600-424	150-600-425

VISCOSITY STANDARDS (CONT'D)

KINEMATIC VISCOSITY IN MM ² /S (CENTISTOKES)										Saybolt Viscosity
	20 °C/ 68 °F	25 °C/ 77 °F	37.78 °C/ 100 °F	40 °C/ 104 °F	50 °C/ 122 °F	60 °C/ 140 °F	80 °C/ 176 °F	98.89 °C/ 210 °F	100 °C/ 212 °F	37 °C/ 100 °F
S3	4.5	4.0	3.0	2.8	2.4	2.0	1.5	1.2	1.2	
S6	10	8.8	6.0	5.7	4.5	3.6	2.5	1.9	1.9	
N4	6.7	5.8	4.2	4.0	3.2	2.6	1.9	1.5	1.4	
N10	21	17	11	10	7.5	5.8	3.7	2.7	2.6	
S20	46	35	20	18	13	9.0	5.6	3.6	3.5	87
N35	90	67	36	32	21	15	8.4	5.4	5.3	167
N44	110	86	48	44	30	21	12	7.6	7.4	220
S60	160	119	60	54	35	26	12	7.7	7.5	281
N100	318	228	110	97	60	39	20	11	11	509
S200	715	487	206	180	103	64	30	17	16	954
N350	1400	940	370	330	180	110	46	24	23	1730
N415	1900	1200	480	410	220	130	55	29	28	2200
S600	2400	1600	600	520	280	160	66	34	32	
N1000	5100	3300	1200	1000	520	290	110	52	50	
S2000	8200	5200	1900	1600	780	400	150	70	68	
N4000	18000	11000	3900	3300	1600	840	280	123	117	
S8000	37000	23000	7900	6700	3200	1600	520	210	200	
N15000	64000	40000	13000	11000	5300	2700	850	340	320	
S30000		80000	28000	23000	11000	5800	1700	670	640	



All calibrations and tests are based on a master viscometer procedure located in ASTM D2162 and the National Institute of Standards and Technology (NIST) value of 1.0016 mPa.s (centipoise) for water at 20°C (68°F). Custom standards are available. Please contact us for more information.



VISCOSITY STANDARDS (CONT'D)

DYNAMIC VISCOSITY IN MPA.S (CENTIPOISE)										Saybolt Viscosity
	20 °C/ 68 °F	25 °C/ 77 °F	37.78 °C/ 100 °F	40 °C/ 104 °F	50 °C/ 122 °F	60 °C/ 140 °F	80 °C/ 176 °F	98.89 °C/ 210 °F	100 °C/ 212 °F	37 °C/ 100 °F
S3	3.7	3.3	2.4	2.3	1.9	1.6	1.2	0.9	0.9	
S6	8.7	7.3	5.0	4.7	3.6	2.9	2.0	1.5	1.4	
N4	5.6	4.8	3.4	3.2	2.6	2.1	1.5	1.1	1.1	
N10	18	14	9.0	8.4	6.2	4.7	3.0	2.1	2.1	
S20	40	30	17	15	11	7.6	4.7	2.9	2.9	87
N35	78	59	31	28	18	13	7.0	4.4	4.3	167
N44	91	71	39	36	24	17	9.4	6.0	5.8	220
S60	138	102	52	46	30	22	9.9	6.3	6.1	281
N100	276	197	94	83	51	33	16	9.4	9.1	509
S200	613	416	174	152	87	54	24	15	13	954
N350	1200	810	320	280	150	92	38	20	19	1730
N415	1600	1100	410	350	190	110	45	23	23	2200
S600	2100	1400	510	440	240	140	55	28	26	
N1000	4400	2800	1000	940	440	240	92	43	41	
S2000	7200	4500	1600	1400	670	340	130	58	56	
N4000	16000	9700	3400	2900	1400	720	240	100	98	
S8000	33000	20000	6900	5900	2800	1400	440	180	170	
N15000	57000	36000	11000	9700	4700	2400	730	290	270	
S30000		72000	25000	20000	9700	5100	1500	570	550	



VISCOSITY STANDARDS (CONT'D)

DENSITY IN G/ML IN ACCORDANCE WITH ASTM D7042

	20 °C/ 68 °F	25 °C/ 77 °F	37.78 °C/ 100 °F	40 °C/ 104 °F	50 °C/ 122 °F	60 °C/ 140 °F	80 °C/ 176 °F	98.89 °C/ 210 °F	100 °C/ 212 °F
S3	0.833	0.830	0.821	0.820	0.813	0.806	0.792	0.779	0.778
S6	0.831	0.828	0.819	0.818	0.811	0.805	0.791	0.779	0.778
N4	0.834	0.831	0.822	0.820	0.814	0.807	0.793	0.780	0.780
N10	0.842	0.839	0.831	0.829	0.823	0.816	0.804	0.791	0.791
S20	0.871	0.868	0.860	0.859	0.852	0.846	0.833	0.821	0.820
N35	0.872	0.869	0.861	0.860	0.853	0.847	0.834	0.823	0.822
N44	0.828	0.825	0.817	0.816	0.809	0.803	0.791	0.779	0.779
S60	0.863	0.860	0.852	0.851	0.845	0.839	0.826	0.815	0.814
N100	0.867	0.864	0.857	0.855	0.849	0.843	0.831	0.820	0.819
S200	0.858	0.855	0.847	0.846	0.840	0.834	0.822	0.910	0.810
N350	0.863	0.860	0.852	0.851	0.845	0.839	0.827	0.816	0.815
N415	0.865	0.862	0.854	0.853	0.847	0.841	0.830	0.819	0.818
S600	0.866	0.864	0.856	0.855	0.849	0.843	0.832	0.820	0.820
N1000	0.872	0.869	0.862	0.860	0.855	0.849	0.837	0.826	0.826
S2000	0.876	0.873	0.865	0.864	0.858	0.853	0.841	0.831	0.830
N4000	0.882	0.879	0.872	0.871	0.865	0.860	0.849	0.838	0.838
S8000	0.888	0.885	0.878	0.877	0.872	0.866	0.855	0.845	0.845
N15000	0.893	0.891	0.884	0.883	0.877	0.872	0.861	0.851	0.851
S30000		0.896	0.889	0.888	0.883	0.877	0.867	0.857	0.857



FLASH POINT STANDARDS

Flash Point Standards for use in accordance with ASTM D93. Complete with a detailed Certificate of Analysis. Contact your local Sales Representative for volume discounts.

ASTM D 93 Nominal Flash Point (°C)	Catalogue # (80 ml)	Catalogue # (250 ml)
53	150-900-000	150-900-050
69	150-900-005	150-900-055
81	150-900-010	150-900-060
104	150-900-015	150-900-065
112	150-900-020	150-900-070
116	150-900-025	150-900-075
134	150-900-030	150-900-080
186	150-900-035	150-900-085
231	150-900-040	150-900-090
260	150-900-110	150-900-115



TORCHES WITH FIXED ALUMINA INJECTOR

A 99.6% alumina injector is fused into a torch body offering a longer torch life. These models are compatible with Agilent®, Spectro® EOP and PerkinElmer®. Patent pending.



PARTISTAN - PARTICLE COUNTER STANDARDS

PartiStan particle standards are designed for calibration and verification of automatic particle counters.

Product History

In 1999, a new calibration procedure (ISO 11171) for automatic particle counters was introduced, rendering previous procedures (i.e. ISO 4402) obsolete. With the new procedure, primary calibration requires NIST SRM 2806 - a suspension of 3.3 mg/L of ISO medium test dust in super-clean hydraulic fluid.

CONOSTAN offers a secondary standard for the cost-effective calibration and verification of automatic particle counters. PartiStan secondary standards are compliant with ISO 11171 and directly traceable to NIST SRM 2806.



Description	Size	Catalogue #
PartiStan 2806	400 ml	150-701-001
PartiStan resolution standard	400 ml	150-701-002
PartiStan SCF (super-clean fluid)	400 ml	150-701-003
PartiStan SCF (super-clean fluid)	3.78 L (1 gallon)	150-701-004
PartiStan UFTD (ultra-fine test-dust suspension in SCF)	400 ml	150-701-005

FTIR STANDARDS

Our FTIR operational test standard is a petroleum oil-based fluid that looks and handles like routinely tested used-oil samples. It is designed for validating FTIR instrument performance in order to ensure repeatability and reproducibility.

Description	Size	Catalogue #
FTIR operational test standard	100 g	150-702-001

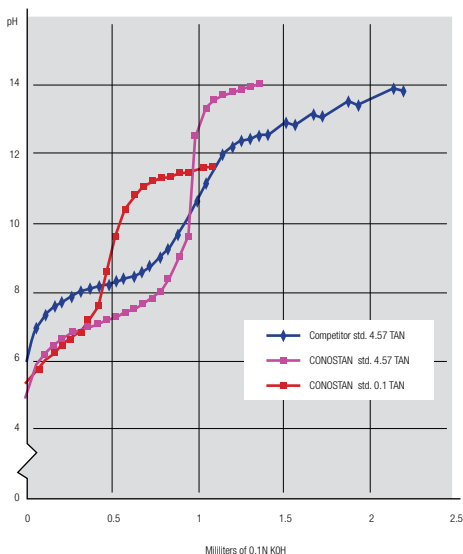
For initial setup, we include a disk containing the analytical methods necessary to perform tests with information specific to your instrument:

- DigiLab (Varian®) – available
- PerkinElmer® – not yet available (contact the manufacturer)
- Thermo Nicolet® – not yet available (contact the manufacturer)

TOTAL ACID NUMBER (TAN) STANDARDS

The titration curves for every concentration of the CONOSTAN family of TAN standards have more prominent inflection points and a wider difference between the starting pH and final pH during the titration, in comparison with other suppliers. At minimum concentration for TAN standards, the pH change in the titration curve is now greater than even the highest concentrations of competitive standards. Because the inflection point is more prominent, CONOSTAN TAN standards offer uncertainties of less than 1% of stated concentration providing customers the opportunity for better calibration of their titrator and TAN titration method.

Comparison of Titration Curves



Description	Size	Catalogue #
0.05 mg/g KOH *	75 g	150-800-005
0.1 mg/g KOH *	75 g	150-800-011
0.5 mg/g KOH *	75 g	150-800-051
1.0 mg/g KOH *	75 g	150-800-101
1.5 mg/g KOH	75 g	150-800-151
2.0 mg/g KOH	75 g	150-800-205
2.5 mg/g KOH	75 g	150-800-255
3.0 mg/g KOH	75 g	150-800-305
4.5 mg/g KOH	75 g	150-800-455

* Available in packs of 3.

TOTAL BASE NUMBER (TBN) STANDARDS

Each CONOSTAN TBN standard is formulated to provide a strong leveraging influence on the titration curve creating dramatic and easy to determine inflection points. Concentration uncertainties for TBN are less than 1%.

Description	Size	Catalogue #
1.0 mg/g KOH	75 g	150-801-011
3.0 mg/g KOH	75 g	150-801-031
6.0 mg/g KOH	75 g	150-801-065
10.0 mg/g KOH	75 g	150-801-105
15.0 mg/g KOH	75 g	150-801-155
30.0 mg/g KOH	75 g	150-801-305
40.0 mg/g KOH	75 g	150-801-405
70.0 mg/g KOH	75 g	150-801-705



CUSTOM MULTI-ELEMENT STANDARDS ORDER ONLINE

SCP SCIENCE / CONOSTAN ISO 9001 Manufacturing Division can prepare custom multi-element calibration standards to exact specifications. Indicate the desired elements and their concentrations, together with the desired matrix, and we will recommend a mix stability with a minimum of 12 months. A Certificate of Analysis, reporting the actual values and not simply the calculated values, accompanies each standard.



CUSTOM QUOTATION REQUEST FORM FOR METALLO-ORGANIC STANDARDS

Complete this form to receive a quotation for your specific oil-based standard.
Photocopy for use with multiple requests.

Contact Information

Name: _____

Company: _____

Mailing address: _____

City: _____ State/Province: _____

Country: _____ Zip/Postal code: _____

Telephone: _____ Fax: _____

E-mail: _____ Account number: _____

Please indicate the concentration (ppm) required for each element:

Elements	ppm	Elements	ppm	Elements	ppm
Ag		Fe		Pb	
Al		Hg		Sb	
As		In		Sc	
B		K		Se	
Ba		La		Si	
Be		Li		Sn	
Bi		Mg		Sr	
Ca		Mn		Ti	
Cd		Mo		V	
Co		Na		W	
Cr		Ni		Y	
Cu		P		Zn	

Size (g): _____ Rate of use (L/year): _____

Special requirements: _____ Custom name: _____

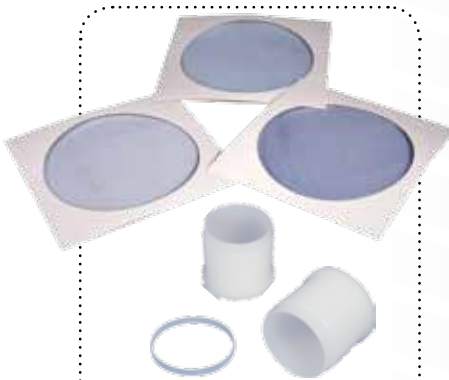
Application: _____

Base Oil: 20 cSt 75 cSt 245 cSt

Products & Supplies for the Oil Analysis Laboratory

ICP AES/MS Supplies

- Torches, spray chambers and nebulizers
- Flared and Non-Flared Peristaltic pump tubing
- Skimmer and Samples Cones



XRF Supplies

- Sample cells
- XRF thin film (Mylar®, Prolene®, Kapton®, etc.)



DigiPREP MS

• A 48 positions block digestion system is perfect for all digestions up to 180°C. The Teflon-coated graphite block is specially designed to resist aggressive corrosion attack and is guaranteed for long life. It's non-metallic construction ensures that no cross-contamination occurs from the digestion system to samples. **DigiPREP MS** operates with a KeYPad or Color Touch Screen Controller to: program set-point temperature; set timer and shut down system; activate audible alarm; and display actual block and sample temperature. The Touch Screen Controller also offers the possibility to store up to 12 multi-step user programs.



NovaWAVE Automated Microwave Digestion System

- *NovaWAVE* delivers a dramatic improvement in sample throughput and speed of digestion plus a major reduction in labor and human intervention compared to any other digestion system. The instrument incorporates a tunnel system employing 12 dynamically operating micro cavities to process 12 samples simultaneously. Other features include individual sample temperature control and monitoring; seamless microwave power control with no duty cycle; built-in EPA and DIN methods; and USB/Ethernet port connectivity for data processing and storage.

- *MinWAVE* microwave digestion system and controller is a top-loading, compact, microwave digestion system consisting of a Touch Screen Controller and up to 4 digestion inter-connecting modules. Each module is able to digest up to 6 samples simultaneously. 6 IR sensors, located on the side walls, monitor each sample temperature. A single magnetron is located below the floor. With its unique design, microwave energy is evenly distributed throughout the digestion chamber to provide reproducible results sample to sample. Ideal for environmental, agricultural, petroleum, geological and biological samples.



Sample Preparation Systems



Certificate of Analysis

- 1.0 DESCRIPTION:** **CONOSTAN Viscosity Reference Standard, N350**
 Catalogue Number: 150-600-361 / 150-600-362 / 150-600-363/ 150-600-364 / 150-600-365
 Lot Number: **1015**
 Matrix: White mineral oil
 Expiration Date: **September 2015**

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:

Temperature		Kinematic Viscosity mm ² /s (cSt)	Dynamic Viscosity mPa-s (cP)	Density (g/ml)	Saybolt Viscosity (SUS)
°C	°F				
20.00	68.00	1345	1160	0.8622	
25.00	77.00	888.8	763.5	0.8591	
37.78	100.00	350.5	298.5	0.8516	1624
40.00	104.00	303.1	257.7	0.8502	
50.00	122.00	166.3	140.4	0.8444	
60.00	140.00	99.09	83.09	0.8385	
80.00	176.00	42.27	34.94	0.8266	
98.89	210.00	22.54	18.38	0.8153	109.4
100.00	212.00	21.82	17.78	0.8147	

***Expanded Uncertainty**

Viscosity Range	Kinematic Viscosity mm ² /s (cSt)	Dynamic Viscosity mPa-s (cP)
0.3 to 10	±0.12%	±0.12%
10 to 100	±0.17%	±0.17%
100 to 1000	±0.21%	±0.21%
1000 to 6000	±0.22%	±0.22%

Method of analysis and traceability:

This viscosity standard has been prepared according to ASTM methods D445, D446 and corresponding ISO methods 3104 and 3105. Kinematic viscosities have been determined using Master Viscometers calibrated according to ASTM method D2162 and based on the established kinematic viscosity of 1.0034mm²/s for distilled water at 20.00°C per ISO/TR3666. Conversion of Kinematic to Saybolt viscosity has been calculated according to ASTM method D2161. Density has been determined according to ASTM method D7042. Thermometers used for temperature measurements are NIST traceable.

* The uncertainty of the certified values have been calculated from applicable uncertainty contributors (u). The combined uncertainty ($u_c = \sqrt{\sum u_i^2}$) has been multiplied by a coverage factor (k) of 2 to provide a 95% confidence interval.

- 3.0 REFERENCE VALUES:** None

- 4.0 APPROVAL AND DATE OF CERTIFICATION:**

Certification Approval:

Certification Date: Alketa Mixha, Conostan Production Manager
September 16, 2013

Certificate of Analysis

SAMPLE COA

1.0 DESCRIPTION: **CONOSTAN Multi-Element Standard**
S-21:10 ppm
Catalogue Number: **150-021-002 / 150-021-018**
Lot Number: **21426010**
Matrix: **Base Oil 75 cSt**
Expiration Date: **12 months from date of shipment (see bottle for date of shipment)**

2.0 CERTIFIED VALUES AND ASSOCIATED UNCERTAINTY:

Certified Concentrations, ppm ($\mu\text{g/g}$):

Ag	10.00 \pm 0.04	Al	10.00 \pm 0.04	B	10.00 \pm 0.02	Ba	10.00 \pm 0.01
Ca	10.00 \pm 0.04	Cd	10.00 \pm 0.05	Cr	10.00 \pm 0.05	Cu	10.00 \pm 0.02
Fe	10.00 \pm 0.05	Mg	10.00 \pm 0.04	Mn	10.00 \pm 0.02	Mo	10.00 \pm 0.01
Na	10.00 \pm 0.03	Ni	10.00 \pm 0.04	P	10.00 \pm 0.05	Pb	10.00 \pm 0.08
Si	10.00 \pm 0.02	Sn	10.00 \pm 0.06	Ti	10.00 \pm 0.03	V	10.00 \pm 0.04
Zn	10.00 \pm 0.06						

Method of analysis and traceability:

This standard was prepared by weight measurements originating from assayed element Concentrates. A precursor blend was verified by atomic emission or absorption spectroscopy. Element concentrations for this standard are based on the Concentrate assay* values and were prepared to within the uncertainty values listed above at the 95% Confidence Interval, as determined by weight measurements of blend components conducted on balances calibrated and verified with NIST traceable weights.

*Each element Concentrate was assayed by classical wet chemical methods. Precision of assay measurement is ± 0.5 percent maximum, but typically ± 0.3 percent, or less. Assay accuracy is within one percent of measured value, but typically much less, as determined by co-measurement of, and traceability to, NIST Standards, or Certified Analytical Reagent Grade Chemicals, if no suitable NIST standards exists.

3.0 REFERENCE VALUES:

None

4.0 APPROVAL AND DATE OF CERTIFICATION:

Certification Date: January 15, 2014

Certification Approval:

Alketa Mixha, Chemist
Conostan Production Manager

www.instrument-solutions.com

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For sales and customer service inquiries outside of Canada, China, France, Germany and the USA, please contact the International Department.

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Deutschland

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#2 Building room 727,
106 Ma Jia Pu Road, Feng Tai District,
Beijing, China 100068

The CONOSTAN Division of **SCP SCIENCE** is the world's leading manufacturer of Elements in Oil standards and related spectroscopy products. CONOSTAN's industry 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.