



# CONOSTAN<sup>®</sup>

Oil-Analysis Standards



*“The benchmark  
for accurate  
measurements”*



CALIBRATION AND  
VERIFICATION STANDARDS

Version  
2.0

# CONOSTAN<sup>®</sup>

## *Oil Analysis Standards*

a division of **SCP SCIENCE**

**Calibration and verification standards<sup>™</sup>  
for analysis of:**

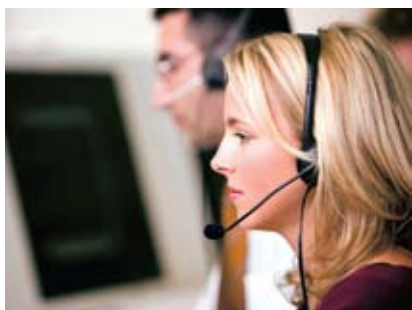
- Lubricants: new and in-service
- Lubricant additives
- Petroleum products
- Organic fluids/materials



## **Sulfur Standards**

See page 9





## How to order

**Telephone (Monday–Friday, 8:30–18:00 EST):**

1-800-361-6820 (toll-free in the U.S. and Canada) or +1 (514) 457-0701

**Fax (24 hours a day):**

1-800-253-5549 (toll-free in the U.S. and Canada) or +1 (514) 457-4499

**E-mail:**

[sales@scpscience.com](mailto:sales@scpscience.com)

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

## President's message

On September 21, 2007, ConocoPhillips and SCP SCIENCE signed a purchase-sale agreement whereby SCP SCIENCE would acquire the complete assets of Conostan from ConocoPhillips Speciality Products Division.

The assets included all aspects of the Conostan business, including trade names, websites, documentation, customer lists, current customer transactions, and the unique chemistry that has made Conostan the leader in metallo-organic standards around the world. The closing of the purchase-sale transaction was November 30, 2007, at which time ConocoPhillips officially handed over the Conostan business to SCP SCIENCE. Training and site conversion had already been underway for several months.



The complete Conostan business — production, quality control, inventory, customer records — is now located at the SCP SCIENCE manufacturing facility in Baie-D'Urfé, a suburb of Montreal, Quebec, Canada.

Conostan customers can now avail themselves of the opportunity for savings by purchasing their Conostan oil-based standards together with instruments, supplies, and aqueous standards for AA, ICP, XRF and rotrode spectroscopy from a single source.

It is our pleasure to welcome new and existing Conostan customers and an honour to serve you.

**George Feilders**

**President**

## Our reputation

SCP SCIENCE is proud to present its Conostan line of metallo-organic elements-in-oil standards. Conostan is 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 traces back over 30 years, when the U.S. Department of Defense's Spectrometric Oil Analysis Program Standards Committee needed standards to analyze metals in lubricating oils to conduct wear-metals-analysis. At the time, commercially available metals-in-oil standards were unreliable and made calibrating analytical instrumentation difficult. Conostan's research and development department discovered and developed 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 reference material NIST-108b 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 33 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 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.



## 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 metals 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.



# Metallo-organic standards

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)

	1000 ppm	5000 ppm		1000 ppm	5000 ppm
<b>Ag</b>	150-100-475	150-500-475	<b>Mg</b>	150-100-125	150-500-125
<b>Al</b>	150-100-135	150-500-135	<b>Mn</b>	150-100-255	150-500-255
<b>B</b>	150-100-055	150-500-055	<b>Mo</b>	150-100-425	150-500-425
<b>Ba</b>	150-100-565	150-500-565	<b>Na</b>	150-100-115	150-500-115
<b>Be</b>	150-100-045	150-500-045	<b>Ni</b>	150-100-285	150-500-285
<b>Bi</b>	150-100-835	150-500-835	<b>P</b>	150-100-155	150-500-155
<b>Ca</b>	150-100-205	150-500-205	<b>Pb</b>	150-100-825	150-500-825
<b>Cd</b>	150-100-485	150-500-485	<b>Sb</b>	150-100-515	150-500-515
<b>Co</b>	150-100-275	150-500-275	<b>Si</b>	150-100-145	150-500-145
<b>Cr</b>	150-100-245	150-500-245	<b>Sn</b>	150-100-505	150-500-505
<b>Cu</b>	150-100-295	150-500-295	<b>Sr</b>	150-100-385	150-500-385
<b>Fe</b>	150-100-265	150-500-265	<b>Ti</b>	150-100-225	150-500-225
<b>In</b>	150-100-495	150-500-495	<b>V</b>	150-100-235	150-500-235
<b>K</b>	150-100-195	150-500-195	<b>W</b>	150-100-745	150-500-745
<b>La</b>	150-100-575	150-500-575	<b>Y</b>	150-100-395	150-500-395
<b>Li</b>	150-100-035	150-500-035	<b>Zn</b>	150-100-305	150-500-305

	2000 ppm
<b>Sc</b>	150-500-215

	100 ppm
<b>As*</b>	150-101-331
<b>Hg*</b>	150-101-801
<b>Se*</b>	150-101-341

\* size: 100 g

# Multi-element standards

Blended in 75 cSt blank oil

ppm	S-21		S-21+K	
	100 g	200 g	100 g	200 g
10	150-021-002	150-021-018	150-021-042	150-021-051
30	150-021-008	150-021-027	150-021-045	150-021-056
50	150-021-010	150-021-030	150-021-047	150-021-058
100	150-021-003	150-021-019	150-021-043	150-021-052
300	150-021-009	150-021-028	150-021-046	150-021-057
500	150-021-011	150-021-031	150-021-048	150-021-059
900	150-021-015	150-021-035	150-021-049*	150-021-061*

\* 900 ppm nominal value \* 885 ppm actual value

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

ppm	S-12	
	100 g	200 g
10	150-012-001	150-012-009
30	150-012-004	150-012-012
50	150-012-006	150-012-014
100	150-012-002	150-012-010
300	150-012-005	150-012-013
500	150-012-007	150-012-015
900	150-012-008	150-012-016



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

ppm	AM-Special	
	100 g	200 g
900	150-250-014	150-250-027

**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.

We can make:

- Any combination of elements listed here (excluding As, Hg, and Se) 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



## Sulfur-in-oil standards

### 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 new 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 blends

For concentrations not listed in the table below, custom blends are available in both mineral oil and diesel fuel. Iso-octane-based sulfur standards are under development. Contact us for further information.

## Sulfur standards (size: 100 g)

ppm	In mineral oil	In diesel fuel
0 (blank)	150-400-025	150-410-012
50	150-400-018	150-410-009
100	150-400-002	150-410-002
250	150-400-010	*
500	150-400-019	150-410-010
750	150-400-023	*
1000	150-400-003	150-410-003
2500	150-400-011	*
5000	150-400-020	150-410-011
7500	150-400-024	*
10,000	150-400-004	150-410-004
15,000	150-400-005	150-410-006
20,000	150-400-008	150-410-007
25,000	150-400-012	*
30,000	150-400-014	*
40,000	150-400-016	*
50,000	150-400-021	*

\* Custom ppm preparations available

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

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.

Conostan offers a growing product line of sulfur standards which includes our new sulfur in residual oil and sulfur in isooctane standards. Custom concentrations are available.



## Sulfur in Residual Oil

ppm	Residual Oil, 50mL	Residual Oil, 100mL
2,500	150-420-100	150-420-005
3,500	150-420-105	150-420-010
5,000	150-420-110	150-420-015
7,500	150-420-120	150-420-020
10,000	150-420-125	150-420-025
15,000	150-420-130	150-420-030
20,000	150-420-135	150-420-035
25,000	150-420-140	150-420-040
30,000	150-420-145	150-420-045
35,000	150-420-150	150-420-050
40,000	150-420-155	150-420-055
50,000	150-420-160	150-420-060



## Sulfur in Isooctane by UV Set of 7 x 10 mL

Concentration (ppm)	Catalogue no.	Description
0, 0.5, 1.0, 2.5, 5.0, 7.5, 10	150-430-010	For very low Sulfur level, set of 7 x 10 mL vials. Complete with a Certificate of Analysis.
0, 5.0, 10, 25, 50, 100, 250	150-430-020	For low Sulfur level, set of 7 x 10 mL vials. Complete with a Certificate of Analysis.
0, 50, 100, 250, 500, 750, 1000	150-430-030	For high Sulfur level, set of 7 x 10 mL vials. Complete with a Certificate of Analysis.

## Sulfur in Isooctane

ppm	Isooctane, 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
1,000	150-430-107
Set of 7	150-430-100

## Chlorine standards (size: 100 g)

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.

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
10,000	150-200-004
50,000	150-200-007



## PartiStan 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 2.8 µg/l of ISO medium test dust in super-clean hydraulic fluid. This is available from Conostan as PartiStan 2806.

Conostan also offers a secondary standard for conducting verifications of working instruments or to calibrate more than one instrument in a laboratory. PartiStan secondary standards are compliant with ISO 11171 and prepared using 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)	1 gallon	150-701-004
PartiStan UFTD (ultra-fine test-dust suspension in SCF)	400 ml	150-701-005

## 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 33 different metals and sulfur
- Non-hazardous – for shipping and disposal



Size	Catalogue #
1 gallon	150-700-003
5 gallons	150-700-002

**Want to see the difference yourself?**  
**Ask for a free 400 ml sample.**  
**Cat. No. 150-700-000**

## Blank and base oils

Base oils are used for blending calibration standards for spectrometric analysis of metals in oil. Typical properties are:

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

### Blank oils

Size	20 cSt	75 cSt
100 g	150-020-002	150-075-003
400 g	150-020-001	150-075-002
1 gal.	150-020-005	150-075-006

### Base oils

Size	20 cSt	75 cSt
500 ml	150-020-004	150-075-005
1 gal.	150-020-003	150-075-004

### Stabilizer

Size	Catalogue #
50 g	150-010-001

## 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 D-3, D-12, and D-19 standard is furnished with a certificate of analysis.

Conostan is the original source of D-Series standards. More than 30 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. Dept. of Defense stock numbers

Conostan product	Dept. of Defense NSN	Catalog #
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

## D-Series standards

ppm	D3 (200 g)	D12 (200 g)	D19 (100 g)
0 (blank)	(see below)		
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

**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

\*\* Custom ppm preparations available

## D-19 set

Product	Catalogue #
D-19 set	150-300-018

The D-19 set comprises the following concentrations and quantities:

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

## 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
- D-3, D-12, and D-19 blends at custom concentrations
- Additions to D-3, D-12, 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

## 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)

# CONOSTAN<sup>®</sup>

## Oil Analysis Standards

a division of **SCP SCIENCE**

**SCP SCIENCE** is a leading manufacturer of analytical chemistry instruments and supplies. Call us to find out how we can meet all your ICP, AA, and XRF needs.

### ICP

- Torches
- Spray chambers
- Nebulizers
- High-purity acids

### AA

- Hollow-cathode lamps
- Graphite furnace tubes
- Autosampler tubes

### XRF

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

### Sample Prep

- *DigiPREP* digestion systems
- Automated presses
- Grinders



Visit us online at [www.scpscience.com](http://www.scpscience.com)

Or call 1-800-361-6820 (toll-free) or +1 (514) 457-0701  
to ask for a **free** catalogue.



## Custom quotation request form for metallo-organic standards

Complete this form to receive a quotation for your specific oil-based standard or to enter your purchase order number. 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:

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

Size (g): \_\_\_\_\_ Rate of use (L/year): \_\_\_\_\_

Special requirements: \_\_\_\_\_ Custom name: \_\_\_\_\_

Application: \_\_\_\_\_

Base Oil:     20 cSt     75 cSt     245 cSt

#### Fax this form to:

USA/Canada ..... 1-800-253-5549

International ..... +1 (514) 457-4499

E-mail ..... sales@scpscience.com

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### **Head Office**

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