SCP SCIENCE has been manufacturing calibration and quality control standards for inorganic analysis according to the guidelines set for by the ISO 9001:2000 international standard. Our ISO program ensures customer satisfaction through the manufacturing and distribution of top quality products. In addition to the products listed in the following pages, please consult a copy of the SCP SCIENCE “Standards, Reagents & Certified Reference Materials” catalog for a complete product listing.

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<td>Certificate of Analysis</td>
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<td>Metallo-Organic Standards</td>
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<td>Certificate of Analysis</td>
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<tr>
<td>Oil Based Standards Quote Request Form</td>
<td>160</td>
</tr>
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</table>
Statement of Quality Assurance

At SCP SCIENCE, quality is not only related to the actual product, but to the entire process. When you interface with our company, we strive to provide you with quality throughout the process - information requests, quotations, order entry, product manufacturing, shipping, and after-sales service. Our staff has been extensively trained and is profoundly dedicated to providing a superior quality of service.

SCP SCIENCE operates a Quality Management System that is certified to the ISO 9001:2000 international standards. Our objective is to ensure full customer satisfaction through the manufacture and distribution of top quality products. By adhering to the requirements of an internationally recognized standard, our customers are guaranteed to receive a quality product, time and time again.

Always striving to better ourselves and to meet or exceed the needs of our customers, we are working on conforming to the stringent requirements of ISO 17025 in order to officially accredit the competency of our laboratory. The scope of our accreditation will include activities such as metals analysis by ICP spectroscopy, ion analysis by ion chromatography (IC), conductivity and pH certifications, and acid-base titration.

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. This catalogue includes 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 in this catalog, please do not hesitate to contact our Customer Service Group.

Standards Management Program

The Standards Management Program is an exclusive SCP SCIENCE feature which assists labs in tracking and stocking calibration standards. With your first order of PlasmaCAL standards, you will receive a 12-month calendar and individual stickers for each standard on your order. Simply affix each sticker to the calendar in the square for the month corresponding to the expiry date. You now have a convenient, visual reminder of expiration dates.

Catalog No. 140-000-000

―Hope is a waking dream.‖  -Aristotle-
PlasmaPURE Plus acids are manufactured with trace metal levels less than 10 ppt (0.01 ppb). They are packaged in Class 100 clean room conditions and supplied in pre leached Teflon® bottles for optimum quality. Commonly used in semiconductor, nuclear, clinical, pharmaceutical, and geochemical analysis. Used for sample and standards preparation for ICP-AES, ICP-MS, Flame AA and Graphite Furnace AA spectroscopy.

- Complete with a Certificate of Analysis with lot number, expiry date, and maximum concentration specification for over 60 elements
  - Complete documentation for audit purposes
  - Available on-line at www.scpscience.com

- Available in sizes from 250 ml to 2 liters
  - Flexibility - Buy only what is required. Save money with large volumes

- 2 expiry dates (up to 3 years unopened and 15 months opened)
  - Long shelf life for unopened bottles

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<tr>
<th>Description</th>
<th>Assay</th>
<th>Molecular Weight</th>
<th>CAS Number</th>
<th>Merck Index</th>
<th>Code</th>
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<th>Catalog Number 500 ml</th>
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<td>250-036-103</td>
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<td>20.01</td>
<td>7664-39-3</td>
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<td>7697-37-2</td>
<td>13.6608</td>
<td>@ ©</td>
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<td>250-036-131</td>
<td>250-036-133</td>
<td>250-036-135</td>
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<tr>
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<td>@ ©</td>
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<td>250-036-139</td>
<td>250-036-141</td>
<td>250-036-143</td>
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</tbody>
</table>

Always in Stock

DigiTUBEs - Disposable Digestion Vessels

- 50 ml graduation meeting Class “A” specifications for volumetric completion
- Made from virgin polypropylene - Ultra low metal content
- Replaces 5 vessels for convenience
  - Volumetric flasks
  - Digestion Tubes
  - Graduation cylinder
  - Autosampler tubes
  - Storage container
PlasmaPURE Acids

PlasmaPURE acids are manufactured with trace metals equal to or less than 1 ppb. Used for environmental and industrial applications in ICP-AES and flame atomic absorption spectroscopy.

- Complete with a Certificate of Analysis with lot number, expiry date, and maximum specification for over 60 analytes
  - Complete documentation for audit purposes
  - Available on-line at www.scpscience.com
- Refined for low level trace metal analysis
- 2 expiry dates (up to 3 years unopened and 15 months opened)
  - Long shelf life for unopened bottles

### Table of Acids

<table>
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<tr>
<th>Element</th>
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<th>CAS Number</th>
<th>Merck Index</th>
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<th>2.5L</th>
<th>2.5L SC*</th>
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<td>250-037-139</td>
<td>250-037-141</td>
<td>---</td>
</tr>
</tbody>
</table>

Applications

Environmental:
- Water, waste water effluents, air particulate and gases

Agriculture:
- Livestock feed, fertilizers, soil and plant tissue

Geology/Geoscience, Mineral Resources, Archaeology:
- Soil, rock, mineral, ice

Food, Beverage, Nutrition:
- Food additives

Always in Stock

* Safety coated glass bottle
** Packaged in LDPE bottle

ICP Glassware

The latest innovations in ICP-AES and ICP-MS glassware and quartzware.
- Offer NEW and innovative products
  - Enhancing signal, lowering background noise, and improving detection limits
  - Offering a complete product line of nebulizers, torches, and spray chambers

“What really matters is what you do with what you have.” - Shirley Lord-
## Certificate of Analysis

**PlasmaPURE Plus Acid**

### NITRIC ACID (67-70% HNO₃)

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<th>Analyte</th>
<th>Maximum Specification</th>
<th>Actual Value (in ppt)</th>
<th>Analyte</th>
<th>Maximum Specification</th>
<th>Actual Value (in ppt)</th>
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</table>

**Certified by:** Alketa Mixha, Chemist  
**Certification Date:** January 27, 2005

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. (Ce certificat est également disponible en français)

Manufactured according to an ISO 9001:2000 Quality System and ISO 17025 (in-process)
Certificate of Analysis

PlasmaPURE HYDROCHLORIC ACID (34-37% HCl)

Catalogue Number: 250-037-113
Lot Number: SC5HS02
Assay (HCl w/w): 36%
Expiry Date: January 2008

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

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<th>Analyte</th>
<th>Maximum Specification (in ppb)</th>
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Certified by: ________________________ Certification Date: January 27, 2005
Alketa Mixha, Chemist

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. (Ce certificat est également disponible en français)

Manufactured according to an ISO 9001:2000 Quality System and ISO 17025 (in-process)
"The Best Quality at the Best Value" - is what defines PlasmaCAL Single Element Calibration Standards for ICP-AES and ICP-MS. PlasmaCAL Standards are directly traceable to National Institute of Standards and Technology (NIST). Our unique Standards Management Program included with each standard ensures that expiry dates are tracked.

- 2 expiry dates (up to 21 months unopened & 15 months opened)
  - Longer shelf life for unopened bottles
- Guaranteed to +/- 0.5% of actual concentration
  - Confidence in long-term stability and accuracy
- Calibration for testing using NIST 3100 Series
  - Direct traceability to NIST

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*Traces of tartaric acid

Did you get your 10-Pak?

- The 10-Pak* of ICP-AES or ICP-MS standards is a cost effective solution for your calibration standard requirements. Save over 10% with every order of ten 1000 µg/ml standards.

* The following elements are excluded from all special offers: Au, Ir, Lu, Os, Pd, Pt, Re, Rh, Ru, Sc & Tm
### PlasmaCAL Single ICP-AES & MS Calibration Standards 1000 µg/ml

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* Osmium (OS) has an expiry date of 12 months opened and 15 months unopened

Glass Container

Dangerous Goods*

Poison

Flammable

Corrosive

Oxidant

* as defined by:

Hazardous Materials Regulations of the U.S. Department of Transportation, Tariff No. BOE-6000-R

Canadian Transportation of Dangerous Goods Act and Regulations, Revised December 2000

International Air Transport Association - Dangerous Goods Regulation, 40th Edition

“Efficiency: The ability to do a job well, plus the desire to do it better.” ~Paul H. Gilbert~
PlasmaCAL Single ICP-AES & MS Calibration Standards 10 000 µg/ml

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* Traces of tartaric acid

Glass Container ✓ Dangerous Goods*
Poison ☑ Flammable ☑ Corrosive ☑ Oxidant

* as defined by : * Hazardous Materials Regulations of the U.S. Department of Transportation, Tariff No. BOE-6000-R
* Canadian Transportation of Dangerous Goods Act and Regulations, Revision December 2000
* International Air Transport Association - Dangerous Goods Regulation, 40th Edition

USA
Tel.: (800) 361-6820
Fax: (800) 253-5549
Canada / International
Tel.: (800) 361-6820 / +1 (514) 457-0701
Fax: (800) 253-5549 / +1 (514) 457-4499
Europe
Tel.: +33 (0) 1 69 18 71 17
Fax: +33 (0) 1 60 92 05 67
### PlasmaCAL Single ICP-AES & MS Calibration Standards 10 000 µg/ml

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*Vanadium (V) has an expiry date of 12 months opened and 15 months unopened

### Single ICP-AES & MS Calibration Standards 50 000 µg/ml

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<th>Element</th>
<th>Symbol</th>
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### Did you get your 10-Pak?

- The 10-PAK of ICP-AES/MS Standards is a cost effective solution for your calibration standard requirements. Save over 10% with every order of ten 1000 µg/ml standards
- The following elements are excluded from all special offers: Au, Ir, Lu, Os, Pd, Pt, Re, Rh, Ru, Sc, & Tm

"Courage is fear holding on a minute longer." - Gen. George S. Patton-
**Multi-Element ICP-AES & MS Calibration Standards for U.S. EPA Methods & CLP Programs**

*PlasmaCAL* Multi-Element Standards for Environmental Protection Agency (EPA) & the Contract Laboratory Program (CLP) provide an economical alternative to preparing in-house multi-element standards. Available for a range of prescribed methods and in multiple volumes.

- Designed specifically for EPA 200.7, 200.8, 6010 and Superfund CLP
  - Save money and time in preparation
- Available in various sizes (100, 250 & 500 ml)
  - Save by buying only what is required
- Complete Certificates of Analysis listing actual concentrations and traceability to NIST
  - Complete documentation for audit purposes

*Note: Some manufacturers may list the same Multi-Element Standard with different element concentrations. Ask your Representative or local distributor about our Custom Multi-Element Standards where most combinations of elements and concentrations are possible.*

---

### Quality Control Standards

#### Quality Control Standard 1 (QC 19)

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Matrix: 5% HNO₃

#### Quality Control Standard 2 (QC 7)

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Matrix: 5% HNO₃

### Quality Control Set

(includes one of QC-1 & QC-2)

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∞ Glass Container  ☐ Poison  ☐ Flammable  ☐ Corrosive

* as defined by:
- Hazardous Materials Regulations of the U.S. Department of Transportation, Tariff No. BOE-6000-R
- Canadian Transportation of Dangerous Goods Act and Regulations, Revision December 2000
- International Air Transport Association - Dangerous Goods Regulations, 40th Edition
Multi-Element ICP-AES & MS Calibration Standards for U.S. EPA Methods & CLP Programs

Quality Control Standard 3 (QC 21)

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Matrix: 5% HNO₃

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Quality Control Standard 4 (QC 26)

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Matrix: 5% HNO₃

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</tr>
<tr>
<td>140-102-045</td>
<td>✔</td>
<td>500 ml</td>
</tr>
</tbody>
</table>

Bonus Custom Standards Offer!!

- With the purchase of every 500 ml bottle of custom ICP AES/MS standard, receive an additional 500 ml of the same multi-element standard at 1/2 price!
- Larger volume discounts also available

Instrument Control Kit - PlasmaTEST ICP-MS

- Perfect for instrument compliance auditing
- A single product providing instrument testing QC for ICP-MS
- Monitor and document 14 different instrument parameters
- Detect operational & mechanical problems before analytical errors occur

“A hunch is creativity trying to tell you something.” - Frank Capra-
**PlasmaQUAL S22**

<table>
<thead>
<tr>
<th>Element</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>As</td>
<td>1000 µg/ml</td>
</tr>
<tr>
<td>Ba</td>
<td>10 µg/ml</td>
</tr>
<tr>
<td>Ca</td>
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</tr>
<tr>
<td>Cd</td>
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</tr>
<tr>
<td>Co</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>Cr</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>Cu</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>Fe</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>K</td>
<td>1000 µg/ml</td>
</tr>
<tr>
<td>Li</td>
<td>10 µg/ml</td>
</tr>
<tr>
<td>Mg</td>
<td>10 µg/ml</td>
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<tr>
<td>Mn</td>
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<tr>
<td>Ni</td>
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<tr>
<td>Ti</td>
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</tr>
<tr>
<td>V</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>Zn</td>
<td>100 µg/ml</td>
</tr>
</tbody>
</table>

**SCP-28-AES for Thermo® ICP-AES**

- **Concentration**: 100 ppm
- **Code**: ◊
- **Catalog Number**: 140-130-301, 140-130-305
- **Matrix**: 5% HNO₃
  - **Element Blend Containing**: Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sr, Ti, Ti, V, Zn

**SCP-11-MS for Thermo® and PE ICP-MS**

- **Concentration**: 10 ppm
- **Code**: ◊
- **Catalog Number**: 140-130-311, 140-130-335
- **Matrix**: 5% HNO₃
  - **Element Blend Containing**: Ba, Be, Ce, Co, In, K, Li, Mg, Pb, Rh, U

**SCP-33-MS for Thermo® and PE ICP-MS**

- **Concentration**: 10 ppm
- **Code**: ◊
- **Catalog Number**: 140-130-321, 140-130-325
- **Matrix**: 5% HNO₃
  - **Element Blend Containing**: Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sn, Sr, Ti, Ti, U, V, Zn

**Free Standards Management Program**

- Accurately track the expiry dates of your standards
- An invaluable tool when compliance auditing of standards is required
- Free with any PlasmaCAL standards order

---

© Glass Container  ◊ Poison  ◎ Flammable  ◎ Oxidant
✓ Dangerous Goods*  ◊ Corrosive  ◎ as defined by:

*Hazardous Materials Regulations of the U.S. Department of Transportation, Tariff No. BDE-6600-R
- Canadian Transportation of Dangerous Goods Act and Regulations, Revision December 2000
- International Air Transport Association - Dangerous Goods Regulations, 40th Edition
**Instrument Calibration Standards**

### Wavecal Standard I for PE 40, 400, 1000, & 2000

<table>
<thead>
<tr>
<th>Element</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>K</td>
<td>100 µg/ml</td>
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<tr>
<td>La</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>Li</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>Mn</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>Mo</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>Na</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>Ni</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>P</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>S</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>Sc</td>
<td>20 µg/ml</td>
</tr>
</tbody>
</table>

Matrix: 2% HNO₃

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Volume</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-128-111</td>
<td>100 ml</td>
<td>☑</td>
</tr>
<tr>
<td>140-128-112</td>
<td>250 ml</td>
<td>☑</td>
</tr>
<tr>
<td>140-128-115</td>
<td>500 ml</td>
<td>☑</td>
</tr>
</tbody>
</table>

### Wavecal Standard II for PE 6000, 6500(XR)

<table>
<thead>
<tr>
<th>Element</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ba</td>
<td>50 µg/ml</td>
</tr>
<tr>
<td>Be</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>La</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>Mn</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>Ni</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>Sc</td>
<td>20 µg/ml</td>
</tr>
<tr>
<td>Zn</td>
<td>20 µg/ml</td>
</tr>
</tbody>
</table>

Matrix: 2% HNO₃

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Volume</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-128-141</td>
<td>100 ml</td>
<td>☑</td>
</tr>
<tr>
<td>140-128-142</td>
<td>250 ml</td>
<td>☑</td>
</tr>
<tr>
<td>140-128-145</td>
<td>500 ml</td>
<td>☑</td>
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</tbody>
</table>

### Wavecal Standard III for Optima 3000

<table>
<thead>
<tr>
<th>Element</th>
<th>Concentration</th>
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<tbody>
<tr>
<td>Ba</td>
<td>1 µg/ml</td>
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<tr>
<td>Ca</td>
<td>1 µg/ml</td>
</tr>
<tr>
<td>K</td>
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<td>La</td>
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<tr>
<td>Li</td>
<td>10 µg/ml</td>
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<tr>
<td>Mn</td>
<td>10 µg/ml</td>
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<tr>
<td>Na</td>
<td>10 µg/ml</td>
</tr>
<tr>
<td>Sr</td>
<td>10 µg/ml</td>
</tr>
</tbody>
</table>

Matrix: 2% HNO₃

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Volume</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-128-231</td>
<td>100 ml</td>
<td>☑</td>
</tr>
<tr>
<td>140-128-232</td>
<td>250 ml</td>
<td>☑</td>
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<tr>
<td>140-128-235</td>
<td>500 ml</td>
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### SCP-12-AES for Thermo® IRIS Tuning Solution

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>100ppm</td>
<td>☑</td>
</tr>
</tbody>
</table>

Matrix: 5% HNO₃

| Element Blend Containing: Al, As, Ba, Cd, Cu, K, Mn, Pb, S, Se, Ti, Zn
| *Note: Ba = 10ppm |

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Volume</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-130-311</td>
<td>125 ml</td>
<td>☑</td>
</tr>
<tr>
<td>140-130-315</td>
<td>500 ml</td>
<td>☑</td>
</tr>
</tbody>
</table>

### SCP-14-AES for Varian® Vista Tuning Solution

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>50ppm</td>
<td>☑</td>
</tr>
</tbody>
</table>

Matrix: 5% HNO₃

| Element Blend Containing: Al, As, Ba, Cd, Co, Cr, Mn, Ni, Pb, Se, Sr, Zn, K* |
| *Note: K = 500ppm |

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Volume</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-130-341</td>
<td>125 ml</td>
<td>☑</td>
</tr>
<tr>
<td>140-130-345</td>
<td>500 ml</td>
<td>☑</td>
</tr>
</tbody>
</table>

### SCP-15-AES for Varian® Vista Tuning Solution

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>50ppm</td>
<td>☑</td>
</tr>
</tbody>
</table>

Matrix: 5% HNO₃

| Element Blend Containing: Al, As, Ba, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sr, Zn, K* |
| *Note: K = 500ppm |

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Volume</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-130-351</td>
<td>125 ml</td>
<td>☑</td>
</tr>
<tr>
<td>140-130-355</td>
<td>500 ml</td>
<td>☑</td>
</tr>
</tbody>
</table>

---

* Glass Container  
* Poison  
* Flammable  
* Dangerous Goods*  
* Corrosive  
* Oxidant  

---

“Children have never been very good at listening to their elders, but they have never failed to imitate them.” - James Baldwin
# Certificate of Analysis

## ICP-AES & MS Single Element Standard

### Mg

<table>
<thead>
<tr>
<th>Catalogue Number</th>
<th>Description</th>
<th>Starting Material</th>
<th>Lot Number</th>
<th>Expiration Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-051-121 / 140-051-122 / 140-051-125</td>
<td>PlasmaCAL Standard - Magnesium 1000 μg/ml</td>
<td>Magnesium Metal 99.99%</td>
<td>SC4363253</td>
<td>October 2006 (Unopened Bottle)</td>
</tr>
</tbody>
</table>

**Analysis of Solution Standard by Inductively Coupled Plasma Spectroscopy (ICP-AES) traceable to NIST Standard Reference Material 3131a.**

### Actual Concentration: 1004 μg/ml

- **Matrix:** 4% HNO₃
- **Density:** 1.021 g/ml @ 21.8 °C

### Trace Metallic Impurities

<table>
<thead>
<tr>
<th>Element</th>
<th>Conc. (ppm)</th>
<th>Element</th>
<th>Conc. (ppm)</th>
<th>Element</th>
<th>Conc. (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al, Fe, Si, Zn</td>
<td>5-15</td>
<td>Al</td>
<td>&lt; 0.013</td>
<td>In</td>
<td>&lt; 0.034</td>
</tr>
<tr>
<td>Cu, Mn</td>
<td>5-10</td>
<td>As</td>
<td>&lt; 0.001</td>
<td>K</td>
<td>&lt; 0.093</td>
</tr>
<tr>
<td>Bi</td>
<td>&lt; 0.026</td>
<td>Mg</td>
<td>N/A</td>
<td>Sr</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Ca</td>
<td>0.014</td>
<td>Mn</td>
<td>0.019</td>
<td>Ta</td>
<td>&lt; 0.013</td>
</tr>
<tr>
<td>Cd</td>
<td>&lt; 0.003</td>
<td>Mo</td>
<td>&lt; 0.016</td>
<td>Tb</td>
<td>&lt; 0.006</td>
</tr>
<tr>
<td>Ce</td>
<td>&lt; 0.019</td>
<td>Na</td>
<td>&lt; 0.011</td>
<td>Te</td>
<td>&lt; 0.014</td>
</tr>
<tr>
<td>Co</td>
<td>&lt; 0.007</td>
<td>Nb</td>
<td>&lt; 0.009</td>
<td>Th</td>
<td>&lt; 0.012</td>
</tr>
<tr>
<td>Cr</td>
<td>&lt; 0.004</td>
<td>Nd</td>
<td>&lt; 0.018</td>
<td>Ti</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Cs</td>
<td>*</td>
<td>Ni</td>
<td>&lt; 0.006</td>
<td>Ti</td>
<td>&lt; 0.013</td>
</tr>
<tr>
<td>Cu</td>
<td>&lt; 0.003</td>
<td>Os</td>
<td>*</td>
<td>Tm</td>
<td>&lt; 0.007</td>
</tr>
<tr>
<td>Dy</td>
<td>&lt; 0.004</td>
<td>P</td>
<td>&lt; 0.034</td>
<td>U</td>
<td>&lt; 0.137</td>
</tr>
<tr>
<td>Er</td>
<td>&lt; 0.008</td>
<td>Pb</td>
<td>&lt; 0.041</td>
<td>V</td>
<td>&lt; 0.001</td>
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<tr>
<td>Eu</td>
<td>&lt; 0.002</td>
<td>Pb</td>
<td>&lt; 0.007</td>
<td>W</td>
<td>&lt; 0.015</td>
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<tr>
<td>Fe</td>
<td>&lt; 0.002</td>
<td>Pr</td>
<td>&lt; 0.213</td>
<td>Y</td>
<td>&lt; 0.003</td>
</tr>
<tr>
<td>Ga</td>
<td>&lt; 0.011</td>
<td>Pt</td>
<td>&lt; 0.017</td>
<td>Yb</td>
<td>&lt; 0.0008</td>
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<tr>
<td>Gd</td>
<td>&lt; 0.003</td>
<td>Pr</td>
<td>&lt; 0.027</td>
<td>Zn</td>
<td>0.024</td>
</tr>
<tr>
<td>Ge</td>
<td>&lt; 0.011</td>
<td>Re</td>
<td>&lt; 0.004</td>
<td>Zr</td>
<td>&lt; 0.007</td>
</tr>
<tr>
<td>Hf</td>
<td>&lt; 0.025</td>
<td>Rh</td>
<td>&lt; 0.024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hg</td>
<td>*</td>
<td>Ru</td>
<td>&lt; 0.008</td>
<td>*: Not Tested</td>
<td></td>
</tr>
</tbody>
</table>

Certified by: Alketa Mixha, Chemist

Certification Date: January 19, 2005

This ICP-AES & ICP-MS Standard is guaranteed to be stable and accurate to within ± 0.5% of the actual concentration up to the unopened expiry date, if sealed, or 15 months after opening, up to the unopened expiry date, provided the solution is kept tightly capped and stored under normal laboratory conditions. For these solutions, 18 meghom/cm double deionized water, high-purity acids, Class A glassware and acid-cleaned bottles are used. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. (Ce certificat est également disponible en français)
Certificate of Analysis
ICP-AES & MS Quality Control Standard

Catalogue Number: 140-102-051/140-102-052/140-102-055
Description: PlasmaCAL- Q.C. Standard 3
Lot Number: SC4365281
Expiration Date: April 2006

Analysis of Solution Standard by Inductively Coupled Plasma Spectroscopy (ICP-AES) traceable to NIST Standard Reference Materials: 3103a, 3105a, 3109a, 3108, 3113, 3112a, 3114, 3126a, 3129a, 3131a, 3132, 3134, 3136, 3128, 3102a, 3149, 3153a, 3162a, 3158, 3165, 3168a

Actual Concentrations

<table>
<thead>
<tr>
<th>Element</th>
<th>Concentration (µg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>As</td>
<td>100.5</td>
</tr>
<tr>
<td>Fe</td>
<td>100.9</td>
</tr>
<tr>
<td>Sb</td>
<td>101.0</td>
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<tr>
<td>Be</td>
<td>99.8</td>
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<td>100.1</td>
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<td>Ca</td>
<td>100.8</td>
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<td>Mg</td>
<td>101.0</td>
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<td>Sr</td>
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</tr>
<tr>
<td>Pb</td>
<td>100.6</td>
</tr>
<tr>
<td>Zn</td>
<td>100.4</td>
</tr>
</tbody>
</table>

Matrix: 5% HNO₃

Certified by: Alketa Mixha, Chemist
Certification Date: January 13, 2005

This ICP-AES & ICP-MS Standard is guaranteed to be stable and accurate to within plus or minus 1.0% of the actual concentration up to the expiry date, provided the solution is kept tightly capped and stored under normal laboratory conditions. For these solutions, 18 megohm/cm double deionized water, high-purity acids, Class A glassware and acid-cleaned bottles are used.

The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. (Ce certificat est également disponible en français)

Manufactured according to an ISO 9001:2000 Quality System and ISO 17025 (in-process)

SCP SCIENCE
21800 Clark Graham, Baie D’Urfé, QC, Canada H9X 4B6
Phone: (514) 457-0701 Fax: (514) 457-4499
Web Site: www.scpscience.com

“Justice is a constant and perpetual wish to render every one his due.” -Justinian I-
**Certificate of Analysis**

**Catalogue Number:** 901-6A8-102  
**Description:** *PlasmaCAL - Multi-Element Standard*  
**Lot Number:** SC5026493  
**Expiration Date:** February 2006

Analysis of Solution Standard by Inductively Coupled Plasma Spectroscopy (ICP-AES) traceable to NIST Standard Reference Materials: 3151, 3101a, 3103a, 3107, 3104a, 3105a, 3106, 3109a, 3108, 3113, 3112a, 3114, 3126a, 3119a, 3141a, 3127a, 3129a, 3131a, 3132, 3134, 3152a, 3136, 3128, 3102a, 3149, 3153a, 3159, 3162a, 3158, 3165, 3168a

<table>
<thead>
<tr>
<th>Element</th>
<th>Actual Concentration</th>
<th>Units/ml</th>
<th>Certificate of Analysis: ICP-AES &amp; MS Custom Multi Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag</td>
<td>9.94</td>
<td>µg/ml</td>
<td></td>
</tr>
<tr>
<td>Cu</td>
<td>9.95</td>
<td>µg/ml</td>
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<tr>
<td>Pb</td>
<td>10.08</td>
<td>µg/ml</td>
<td></td>
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<td>Al</td>
<td>9.97</td>
<td>µg/ml</td>
<td></td>
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<td>Fe</td>
<td>10.03</td>
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<td>As</td>
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<td>Ga</td>
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<tr>
<td>Se</td>
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<tr>
<td>B</td>
<td>10.05</td>
<td>µg/ml</td>
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</tr>
<tr>
<td>K</td>
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<td></td>
</tr>
<tr>
<td>Sr</td>
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<td>Ba</td>
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<td>µg/ml</td>
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<tr>
<td>La</td>
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<td>Th</td>
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<td>Be</td>
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<tr>
<td>Li</td>
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<td>µg/ml</td>
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<td>10.01</td>
<td>µg/ml</td>
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<tr>
<td>Ni</td>
<td>9.97</td>
<td>µg/ml</td>
<td></td>
</tr>
</tbody>
</table>

**Matrix:** 5% HNO₃

Certified by: Alketa Mixha, Chemist  
Certification Date: February 3, 2005

This ICP-AES & ICP-MS Standard is guaranteed to be stable and accurate to within plus or minus 1.0% of the actual concentration up to the expiry date, provided the solution is kept tightly capped and stored under normal laboratory conditions. For these solutions, 18 megohm/cm double deionized water, high-purity acids, Class A glassware and acid-cleaned bottles are used. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. (Ce certificat est également disponible en français)
**PlasmaCAL Single Element Standards Quote Request Form**

Complete this form to place an order or to receive a quotation for your specific PlasmaCAL Single Element Standard. Photocopy for use with multiple requests.

### Contact Information:

| Name: | ____________________________ |
| Title: | ____________________________ |
| Company: | ____________________________ |
| Mailing Address: | ____________________________ |
| City: | ____________________________ | Province/State: | ____________________________ | PC/Zip: | ____________________________ | Country: | ____________________________ |
| Telephone: | ____________________________ | Fax: | ____________________________ |
| E-mail: | ____________________________ | Account No: | ____________________________ |

### Please indicate the element, volume and concentration required:

<table>
<thead>
<tr>
<th>Element</th>
<th>125 ml</th>
<th>250 ml</th>
<th>500 ml</th>
<th>1000 µg/ml</th>
<th>10,000 µg/ml</th>
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<tbody>
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<td>Al</td>
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<td>Hf</td>
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</tbody>
</table>

Fax form back to:

**USA**

Canada / International

Europe

(800) 253-5549

(800) 253-5549 / (514) 457-4499

+33 (0)1 60 92 05 67

*"Every new adjustment is a crisis in self-esteem."* -Eric Hoffer-
PlasmaCAL Custom
Standard Quote Request Form

Complete this form to receive a quotation for your specific Custom Multi-Element Standard. Purchase 500 ml of a custom standard and receive an additional 500 ml bottle of the same standard at 1/2 price. Photocopy for use with multiple requests.

Contact Information:

Name: 
Title: 
Company: 
Mailing Address: 
City: Province/State: PC/Zip: Country:
Telephone: Fax: 
E-mail: Account No: 

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

<table>
<thead>
<tr>
<th>Element</th>
<th>Concentration Required</th>
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<tbody>
<tr>
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<td>Aluminum</td>
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<tr>
<td>Ag</td>
<td>Silver</td>
</tr>
<tr>
<td>As</td>
<td>Arsenic</td>
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<tr>
<td>Au</td>
<td>Gold</td>
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<td>B</td>
<td>Boron</td>
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<td>Copper</td>
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<td>Iron</td>
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<td>Mercury</td>
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<tr>
<td>Ho</td>
<td>Holmium</td>
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</tbody>
</table>

Matrix Required: 
Rate of Use (L/yr): 
Special Requirements: 
Custom Name: 

Fax form back to:
USA (800) 253-5549
Canada / International (800) 253-5549 / (514) 457-4499
Europe +33 (0)1 60 92 05 67
Certified Reference Materials

EnviroMAT™ & AgroMAT™

Certified Reference Materials (CRM) can be an invaluable component of any laboratory quality control program. Consensus certification removes any chance of analytical bias. A wide range of matrices are available.

- Each CRM is certified through a round-robin study employing specific methods of analysis
  - Independent verification from multiple laboratories
- Includes Certificate of Analysis listing Consensus Values, Confidence and Tolerance Intervals, and Instructions for Use
  - Complete documentation for audit purposes
- Each SCP SCIENCE CRM is economically priced

### EnviroMAT™ Standards

<table>
<thead>
<tr>
<th>Standards</th>
<th>Symbol</th>
<th>Code</th>
<th>Quantity</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil, Contaminated</td>
<td>SS-1</td>
<td>P</td>
<td>100 g</td>
<td>140-025-001</td>
</tr>
<tr>
<td>Soil, Contaminated</td>
<td>SS-2</td>
<td>P</td>
<td>100 g</td>
<td>140-025-002</td>
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<tr>
<td>Sludge, Sewage</td>
<td>BE-1</td>
<td>P</td>
<td>50 g</td>
<td>140-025-011</td>
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<td>140-025-032</td>
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<td>140-025-030</td>
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<td>Water, Ground, Low Level, Concentrate</td>
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<td>250 ml</td>
<td>140-025-034</td>
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<td>140-025-035</td>
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<td>P</td>
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<td>140-025-033</td>
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<td>EU-L-1</td>
<td>P</td>
<td>250 ml</td>
<td>140-025-037</td>
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<td>Water, Waste, High Level, Concentrate</td>
<td>EU-H-1</td>
<td>P</td>
<td>250 ml</td>
<td>140-025-038</td>
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<td>Water, Waste, High &amp; Low</td>
<td>SET</td>
<td>P</td>
<td>250 ml</td>
<td>140-025-036</td>
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<td>Oil, Used</td>
<td>HU-1</td>
<td>P</td>
<td>125 ml</td>
<td>140-025-041</td>
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### AgroMAT™ Standards

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<tr>
<td>Soil, Clay</td>
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<td>P</td>
<td>175 g</td>
<td>140-025-101</td>
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<td>Soil, Sandy</td>
<td>AG-2</td>
<td>P</td>
<td>175 g</td>
<td>140-025-102</td>
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<td>Compost</td>
<td>CP-1</td>
<td>P</td>
<td>100 g</td>
<td>140-025-111</td>
</tr>
</tbody>
</table>

Coming Soon!
New Mat Standards for TOC • Fertilizer • Moss
• Plastic • Electronic Circuit Cards

**DigIPREP MS - Soil Testing Solutions**

An acid resistant digestion system for multiple digestion applications:
- Complete with programmable digital controller
- 48 sample tube capacity, ideal for EPA 3000 Series digestions
- Optional DigIPROBE for improved accuracy in sample temperature control

"Speak when you are angry and you will make the best speech you will ever regret." -Ambrose Bierce-
Certificate of Analysis

General Information

Sewage Sludge
Certified Reference Material BE-1

Organization responsible for the certification:

SCP SCIENCE
Manufacturing Division
21800 Clark Graham
Baie d’Urfé, QC, Canada
H9X 4B6
Ph: (514) 457-0701 Fax: (514) 457-4499

Date of initial Certification: September 29, 1999
Date of last Verification: February 8, 2005

Description:

The Reference Standard BE-1 is a natural sewage sludge (not spiked or fortified) with a particle size of -200 mesh. It is designed to be used for quality control verification, internal standards validation or methods development for the analysis of the listed parameters using the indicated methods.

This certification is valid for 12 months from the shipping date or 24 months after the verification date, whichever comes first, provided the material is kept tightly capped and stored under normal laboratory conditions. SCP SCIENCE will monitor the stability of representative samples annually and, if any changes occur that invalidate this certification, SCP SCIENCE will notify purchasers.
Directions:
Before weighing, mix the material by shaking the container to avoid segregation in the bottle. In order to have a representative sample, the minimum use quantity must be 250 mg to conform with previous homogeneity testing. The procedure used for digestion is based on the EPA 3050 Method i.e. strong acid digest. Do not use a total digestion procedure. The results are on a dry weight basis so you need to dry the material at 105 °C to constant weight before weighing.

Preparation method:
The initial sample has been dried and crushed. The “fines” portion has been further crushed and sieved with 80% of the material passing through a 200 mesh screen. The final material has then been packaged in 50 g containers and tested for homogeneity.

The homogeneity of the material has undergone third party verification by Particle Size Analysis and by Total Digestion using ICP-AES for analysis. 15 bottles were taken at random from the lot. 12 of these bottles were analysed once and the 3 remaining bottles were analysed 12 times each. The resulting data was analysed statistically and the elemental standard deviations were consistent with a homogenous material.

The method used for the determination of the homogeneity of the material is based on ISO Guide 35.

Certification and Calculation Methods:
The Certification Method is based on a round-robin analysis involving 18 laboratories. Each laboratory was asked to supply analysis data in duplicate for a specific list of parameters. Not all the laboratories supplied data for the different parameters. Certified Values are based on an average of 19 values per parameter (27 values being the highest and 10 values being the lowest). Values in brackets are not certified as less than 10 values were received. They are provided for information only.

The outliers were removed using the Dixon Test after confirmation that there was neither a connection between outliers and the methods used for analysis nor between the outliers and the nature of the sample.
The Confidence Interval has been calculated using the 95% Confidence Level (equivalent to 2\sigma) using the following formula:

\[ x \pm \frac{ts}{\sqrt{n}} \]

where
- \( n \): number of data
- \( s \): Standard Deviation of the Average
- \( t \): factor for Student Test
- \( x \): Reference Value

The Confidence Interval should be used for routine quality control.

The Tolerance Interval has been calculated using a 95% probability with a 95% inclusion of the population. The following formula was used:

\[ x \pm ks \]

where
- \( k \): factor for two-sided Tolerance Limits
- \( s \): Standard Deviation of the Average
- \( x \): Reference Value

The Tolerance Interval is an indication of the lowest possible value and the highest possible value based on the complete set of data, exclusive of outliers, used to calculate the Certified Value.

The following table is a guideline on how to interpret the results:

| Results within Confidence Interval | Method working properly |
| Results consistently outside Confidence Interval but within Tolerance Interval | Method needs improvement |
| Results outside Tolerance Interval | Method not working properly |

References:

ISO Guide 30 (1992): Terms and definitions used in connection with reference materials
Quality Assurance of Chemical Measurements - John K. Taylor
## CALIBRATION & QUALITY CONTROL STANDARDS

### Certificate of Analysis:

**EnviroMAT™ Example**

Catalog number: **140-025-011**

Consensus Values for **EnviroMAT – Sewage Sludge BE-1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
<th>Tolerance Interval</th>
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<td>Ag</td>
<td>mg/kg</td>
<td>21</td>
<td>20 – 22</td>
<td>15 – 27</td>
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<tr>
<td>Al</td>
<td>mg/kg</td>
<td>43917</td>
<td>42324 – 45510</td>
<td>34552 – 53282</td>
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<tr>
<td>As</td>
<td>mg/kg</td>
<td>4.6</td>
<td>4.1 – 5.1</td>
<td>1.8 – 7.4</td>
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<tr>
<td>B</td>
<td>mg/kg</td>
<td>(9.9)</td>
<td>-----</td>
<td>-----</td>
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<tr>
<td>Ba</td>
<td>mg/kg</td>
<td>446</td>
<td>413 – 479</td>
<td>251 – 641</td>
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<td>Be</td>
<td>mg/kg</td>
<td>0.21</td>
<td>0.17 – 0.25</td>
<td>0.01 – 0.41</td>
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<tr>
<td>Ca</td>
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<td>27185 – 30087</td>
<td>20253 – 37019</td>
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<td>mg/kg</td>
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<td>1.6 – 2.2</td>
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<tr>
<td>Co</td>
<td>mg/kg</td>
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<td>2.1 – 2.5</td>
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<td>31 – 37</td>
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<td>Cu</td>
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<td>1.1 – 1.5</td>
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<td>2034 – 2512</td>
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<td>0.7 – 6.5</td>
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<td>20757 – 38895</td>
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</tr>
<tr>
<td>U</td>
<td>mg/kg</td>
<td>(2.1)</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>V</td>
<td>mg/kg</td>
<td>12</td>
<td>11.5 – 12.5</td>
<td>9 – 15</td>
</tr>
<tr>
<td>Zn</td>
<td>mg/kg</td>
<td>381</td>
<td>367 – 395</td>
<td>296 – 466</td>
</tr>
</tbody>
</table>

**Note:** Values in bracket are not certified. They are listed for information only.

Manufactured according to an ISO 9001:2000 Quality System and ISO 17025 (in-process)

**SCP SCIENCE**

21800 Clark Graham, Baie D’Urfé, QC, Canada  H9X 4B6

Phone : (514) 457-0701  Fax : (514) 457-4499

Web Site:  www.scpscience.com

“Nothing has been said that has not been said before.”  -Terence-
peCHECK standards are cost effective performance evaluation standards for routine analysis compliance testing. These standards are available for minerals, nutrients, and solids in water/wastewater matrices and are certified through a comprehensive round-robin study providing independent verification from multiple laboratories.

- 20 ml vials. No pipetting necessary. Just dilute to volume. Each standard dilutes to 1 L
  - Eliminate a source of potential error, save time with single step preparation

- Certificate of Analysis listing consensus values as well as confidence and tolerance intervals.
  - Monitor lab performance in a cost effective, simple manner

- Prepared in large batches
  - Same lot number available time after time allows the possibility of control charting

### Level 1 Solids

<table>
<thead>
<tr>
<th>Sample Parameters</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspended Solids</td>
<td>mg/l</td>
<td>238</td>
<td>235 - 242</td>
</tr>
<tr>
<td>Dissolved Solids</td>
<td>mg/l</td>
<td>33.0</td>
<td>18.7 - 47.3</td>
</tr>
<tr>
<td>Total Solids</td>
<td>mg/l</td>
<td>254</td>
<td>242 - 267</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Code</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-702-101</td>
<td></td>
<td>20 ml</td>
</tr>
</tbody>
</table>

### Level 2 Solids

<table>
<thead>
<tr>
<th>Sample Parameters</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspended Solids</td>
<td>mg/l</td>
<td>380</td>
<td>374 - 385</td>
</tr>
<tr>
<td>Dissolved Solids</td>
<td>mg/l</td>
<td>44.8</td>
<td>21.3 - 68.3</td>
</tr>
<tr>
<td>Total Solids</td>
<td>mg/l</td>
<td>400</td>
<td>380 - 419</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Code</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-702-102</td>
<td></td>
<td>20 ml</td>
</tr>
</tbody>
</table>

### Level 3 Solids

<table>
<thead>
<tr>
<th>Sample Parameters</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspended Solids</td>
<td>mg/l</td>
<td>1928</td>
<td>1895 - 1961</td>
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<tr>
<td>Dissolved Solids</td>
<td>mg/l</td>
<td>46.0</td>
<td>25.3 - 66.8</td>
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<tr>
<td>Total Solids</td>
<td>mg/l</td>
<td>1970</td>
<td>1942 - 1999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Code</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-702-103</td>
<td></td>
<td>20 ml</td>
</tr>
</tbody>
</table>
## peCHECK Performance Evaluation Standards - Nutrients

### Level 1 Nutrients

<table>
<thead>
<tr>
<th>Sample Parameters</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia (as N)</td>
<td>mg/l</td>
<td>0.97</td>
<td>0.91 - 1.03</td>
</tr>
<tr>
<td>Nitrate (as N)</td>
<td>mg/l</td>
<td>1.40</td>
<td>1.34 - 1.45</td>
</tr>
<tr>
<td>O-Phosphate (as P)</td>
<td>mg/l</td>
<td>0.74</td>
<td>0.69 - 0.80</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen</td>
<td>mg/l</td>
<td>1.04</td>
<td>0.93 - 1.16</td>
</tr>
<tr>
<td>Total Phosphorus (as P)</td>
<td>mg/l</td>
<td>0.79</td>
<td>0.74 - 0.84</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Code</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-701-101</td>
<td></td>
<td>20 ml</td>
</tr>
</tbody>
</table>

### Level 2 Nutrients

<table>
<thead>
<tr>
<th>Sample Parameters</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia (as N)</td>
<td>mg/l</td>
<td>8.59</td>
<td>7.98 - 9.21</td>
</tr>
<tr>
<td>Nitrate (as N)</td>
<td>mg/l</td>
<td>13.3</td>
<td>12.9 - 13.7</td>
</tr>
<tr>
<td>O-Phosphate (as P)</td>
<td>mg/l</td>
<td>4.42</td>
<td>4.17 - 4.66</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen</td>
<td>mg/l</td>
<td>20.2</td>
<td>19.2 - 21.2</td>
</tr>
<tr>
<td>Total Phosphorus (as P)</td>
<td>mg/l</td>
<td>4.64</td>
<td>4.31 - 4.98</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Code</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-701-102</td>
<td></td>
<td>20 ml</td>
</tr>
</tbody>
</table>

### Level 3 Nutrients

<table>
<thead>
<tr>
<th>Sample Parameters</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia (as N)</td>
<td>mg/l</td>
<td>14.7</td>
<td>14.2 - 15.2</td>
</tr>
<tr>
<td>Nitrate (as N)</td>
<td>mg/l</td>
<td>26.5</td>
<td>25.6 - 27.3</td>
</tr>
<tr>
<td>O-Phosphate (as P)</td>
<td>mg/l</td>
<td>9.33</td>
<td>9.11 - 9.55</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen</td>
<td>mg/l</td>
<td>45.3</td>
<td>42.8 - 47.8</td>
</tr>
<tr>
<td>Total Phosphorus (as P)</td>
<td>mg/l</td>
<td>9.76</td>
<td>8.75 - 10.77</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Code</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-701-103</td>
<td></td>
<td>20 ml</td>
</tr>
</tbody>
</table>

---

### Hazardous Materials Regulations

- Hazardous Materials Regulations of the U.S. Department of Transportation, Tariff No. BDE-6000-R
- Canadian Transportation of Dangerous Goods Act and Regulations, Revision December 2000
- International Air Transport Association - Dangerous Goods Regulation, 40th Edition

---

### High Temperature Digestion System - DigiPREP HT

The DigiPREP HT is available in two models - a 40 tube (100 ml) or a 20 tube (250 ml) system. Ideal for digestion applications such as:

- Soil
- Kjeldahl / TKN
- Plant
- Compost
- Plastics
- Oils

---

“Everybody loves success, but they hate successful people.” - John McEnroe-
**Level 1 Minerals**

<table>
<thead>
<tr>
<th>Sample Parameters</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductivity</td>
<td>µS</td>
<td>188</td>
<td>183 - 193</td>
</tr>
<tr>
<td>Total Hardness (CaCO₃)</td>
<td>mg/l</td>
<td>11.6</td>
<td>11.3 - 12.0</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>mg/l</td>
<td>102</td>
<td>91 - 112</td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>mg/l</td>
<td>2.62</td>
<td>2.50 - 2.75</td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>mg/l</td>
<td>8.77</td>
<td>8.46 - 9.08</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>mg/l</td>
<td>1.22</td>
<td>1.16 - 1.27</td>
</tr>
<tr>
<td>Sodium (Na)</td>
<td>mg/l</td>
<td>18.1</td>
<td>17.4 - 18.7</td>
</tr>
<tr>
<td>Chloride (Cl)</td>
<td>mg/l</td>
<td>19.7</td>
<td>19.1 - 20.2</td>
</tr>
<tr>
<td>Fluoride (F)</td>
<td>mg/l</td>
<td>0.50</td>
<td>0.48 - 0.53</td>
</tr>
<tr>
<td>Sulfate (SO₄)</td>
<td>mg/l</td>
<td>8.41</td>
<td>7.90 - 8.92</td>
</tr>
</tbody>
</table>

**Level 2 Minerals**

<table>
<thead>
<tr>
<th>Sample Parameters</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductivity</td>
<td>µS</td>
<td>1980</td>
<td>1915-2044</td>
</tr>
<tr>
<td>Total Hardness (CaCO₃)</td>
<td>mg/l</td>
<td>221</td>
<td>215-227</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>mg/l</td>
<td>998</td>
<td>949-1048</td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>mg/l</td>
<td>62.0</td>
<td>59.3-64.6</td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>mg/l</td>
<td>164</td>
<td>155-172</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>mg/l</td>
<td>15.3</td>
<td>14.8-15.8</td>
</tr>
<tr>
<td>Sodium (Na)</td>
<td>mg/l</td>
<td>90.9</td>
<td>88.2-93.6</td>
</tr>
<tr>
<td>Chloride (Cl)</td>
<td>mg/l</td>
<td>95.7</td>
<td>92.2-99.1</td>
</tr>
<tr>
<td>Fluoride (F)</td>
<td>mg/l</td>
<td>4.20</td>
<td>4.03-4.37</td>
</tr>
<tr>
<td>Sulfate (SO₄)</td>
<td>mg/l</td>
<td>150</td>
<td>144-156</td>
</tr>
</tbody>
</table>

**Level 3 Minerals**

<table>
<thead>
<tr>
<th>Sample Parameters</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductivity</td>
<td>µS</td>
<td>5803</td>
<td>5603-6002</td>
</tr>
<tr>
<td>Total Hardness (CaCO₃)</td>
<td>mg/l</td>
<td>531</td>
<td>520-542</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>mg/l</td>
<td>3051</td>
<td>2990-3111</td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>mg/l</td>
<td>136</td>
<td>132-140</td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>mg/l</td>
<td>466</td>
<td>434-497</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>mg/l</td>
<td>45.4</td>
<td>44.9-46.0</td>
</tr>
<tr>
<td>Sodium (Na)</td>
<td>mg/l</td>
<td>342</td>
<td>331-353</td>
</tr>
<tr>
<td>Chloride (Cl)</td>
<td>mg/l</td>
<td>430</td>
<td>420-441</td>
</tr>
<tr>
<td>Fluoride (F)</td>
<td>mg/l</td>
<td>12.3</td>
<td>11.8-12.9</td>
</tr>
<tr>
<td>Sulfate (SO₄)</td>
<td>mg/l</td>
<td>397</td>
<td>384-411</td>
</tr>
</tbody>
</table>
Certificate of Analysis

Sample

peCHECK MINERALS, level 1
Certified Performance Evaluation Standard
140-704-101

Organization responsible for the certification:

SCP SCIENCE
Manufacturing Division
21800 Clark Graham
Baie d’Urfé, QC, Canada
H9X 4B6

Phone: (514) 457-0701
Fax: (514) 457-4499

Date of initial Certification: January 16, 2001
Date of last Verification: February 8, 2005

Description:

peCHECK MINERALS level 1 is a concentrated performance evaluation standard in two bottles (Alpha and Beta) for drinking and waste water analysis. This standard was designed specifically for periodic quality control verification, and methods development for water analyses of the listed parameters.

Stability:

This certification is valid for 12 months from the shipping date or 24 months after the verification date, whichever comes first, provided the material is kept sealed and stored under normal laboratory conditions. SCP SCIENCE will monitor the stability of representative samples annually and if any changes occur that invalidate this certification, SCP SCIENCE will notify purchasers.
Certification and Calculation Methods:

The Certification Method is based on a round-robin analysis involving 28 North American laboratories. Each laboratory was asked to supply analysis data in duplicate for a specific list of parameters. Not all the laboratories supplied data for the different parameters. Certified Values are based on an average of 22 values per parameter (25 values being the highest and 17 values being the lowest).

The outliers were removed using the Dixon Test after confirmation that there was neither a connection between outliers and the methods used for analysis, nor between the outliers and the nature of the sample.

The Confidence Interval has been calculated using the 95% Confidence Level (equivalent to 2σ) using the following formula:

\[
x \pm \frac{ts}{\sqrt{n}}
\]

where

- \( n \): Number of data
- \( s \): Standard Deviation of the Average
- \( t \): Factor for Student Test
- \( x \): Consensus value

The Tolerance Interval has been calculated using a 95% probability with a 95% inclusion of the population. The following formula was used:

\[
x \pm ks
\]

where

- \( k \): Factor for two-sided Tolerance Limits
- \( s \): Standard Deviation of the Average
- \( x \): Consensus value

The Tolerance Interval is an indication of the lowest possible value and the highest possible value based on the complete set of data, exclusive of outliers, used to calculate the Certified Value.

The following table is a guideline on how to interpret the results:

<table>
<thead>
<tr>
<th>Results within Confidence Interval</th>
<th>Method working properly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results consistently outside Confidence Interval but within Tolerance Interval</td>
<td>Method needs improvement</td>
</tr>
<tr>
<td>Results outside Tolerance Interval</td>
<td>Method not working properly</td>
</tr>
</tbody>
</table>

References:

ISO Guide 30 (1992): Terms and definitions used in connection with reference materials
Quality Assurance of Chemical Measurements - John K. Taylor
Instructions:

1. Shake each bottle well before use;
2. Put 600ml of deionized water into a 1-liter volumetric flask;
3. Open both bottles (Alpha and Beta) carefully and transfer all contents of each bottle into the volumetric flask;
4. Ensure that all the standard is added to the flask by carefully rinsing each bottle AND each cap three times with deionized make-up water;
5. Dilute to the mark with deionized water, and mix;
6. Test as soon as possible for the listed parameters.

Consensus Values:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Consensus Value</th>
<th>Confidence Interval</th>
<th>Tolerance Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductivity</td>
<td>µS</td>
<td>188</td>
<td>183 – 193</td>
<td>158 – 218</td>
</tr>
<tr>
<td>Total Hardness</td>
<td>mg/l</td>
<td>11.6</td>
<td>11.3 – 12.0</td>
<td>9.8 – 13.5</td>
</tr>
<tr>
<td>(as CaCO₃)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>mg/l</td>
<td>102</td>
<td>91 – 112</td>
<td>37 – 166</td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>mg/l</td>
<td>2.62</td>
<td>2.50 – 2.75</td>
<td>1.88 – 3.36</td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>mg/l</td>
<td>8.77</td>
<td>8.46 – 9.08</td>
<td>6.89 – 10.65</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>mg/l</td>
<td>1.22</td>
<td>1.16 – 1.27</td>
<td>0.89 – 1.55</td>
</tr>
<tr>
<td>Sodium (Na)</td>
<td>mg/l</td>
<td>18.1</td>
<td>17.4 – 18.7</td>
<td>14.1 – 22.0</td>
</tr>
<tr>
<td>Chloride</td>
<td>mg/l</td>
<td>19.7</td>
<td>19.1 – 20.2</td>
<td>16.2 – 23.1</td>
</tr>
<tr>
<td>Fluoride</td>
<td>mg/l</td>
<td>0.50</td>
<td>0.48 – 0.53</td>
<td>0.35 – 0.65</td>
</tr>
<tr>
<td>Sulfate</td>
<td>mg/l</td>
<td>8.41</td>
<td>7.90 – 8.92</td>
<td>5.32 – 11.50</td>
</tr>
</tbody>
</table>

Lot number: SC1018915  Catalogue number: 140-704-101
Ion Chromatography is a vital component of inorganic analysis. Traditional single ion calibration standards, multi ion standards and eluents as well as custom solutions are available.

- Complete Certificate of Analysis is included with NIST traceability
  - Complete documentation for audit purposes
  - Available on-line at www.scpscience.com

- Multi-Element Standards available
  - Custom standards designed to your specifications
  - Popular “Off the Shelf” multi-element standards for quick delivery and cost savings

- Eluents available as concentrates or working solutions
  - Eluents prepared following rigid specifications
  - See Standards, Reagents and Certified Reference Materials catalog for specifications

### Single Ion Chromatography Standards

<table>
<thead>
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<th>Anion Standard</th>
<th>Symbol</th>
<th>Matrix</th>
<th>Code</th>
<th>125 ml</th>
<th>500 ml</th>
<th>1000 µg/ml</th>
<th>125 ml</th>
<th>500 ml</th>
<th>10 000 µg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetate</td>
<td>CH₃COO⁻</td>
<td>H₂O</td>
<td>250-220-100</td>
<td>250-220-101</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonia-Nitrogen</td>
<td>NH₃ as N</td>
<td>H₂O</td>
<td>250-220-115</td>
<td>250-220-116</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bromate</td>
<td>BrO₃⁻</td>
<td>H₂O</td>
<td>250-220-220</td>
<td>250-220-221</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bromide</td>
<td>Br⁻</td>
<td>H₂O</td>
<td>250-220-235</td>
<td>250-220-236</td>
<td>250-221-235</td>
<td>250-221-236</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorate</td>
<td>ClO₃⁻</td>
<td>H₂O</td>
<td>250-220-355</td>
<td>250-220-356</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluoride</td>
<td>F⁻</td>
<td>H₂O</td>
<td>250-220-400</td>
<td>250-220-401</td>
<td>250-221-400</td>
<td>250-221-401</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formate</td>
<td>HCOO⁻</td>
<td>H₂O</td>
<td>250-220-415</td>
<td>250-220-416</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrate</td>
<td>NO₃⁻</td>
<td>H₂O</td>
<td>250-220-505</td>
<td>250-220-506</td>
<td>250-221-505</td>
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<td>Nitrate-Nitrogen</td>
<td>NO₃⁻ as N</td>
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<tr>
<td>Nitrite-Nitrogen</td>
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<td>Oxalate</td>
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<tr>
<td>Perchlorate</td>
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<td>250-221-595</td>
<td>250-221-596</td>
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<tr>
<td>Phosphate-Phosphorus</td>
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<td>H₂O</td>
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<td>250-220-611</td>
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<tr>
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<td>250-220-701</td>
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<td>Sulfate-Sulfur</td>
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<th>125 ml</th>
<th>500 ml</th>
<th>10 000 µg/ml</th>
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### AccuSPEC Multi-Ion Chromatography Standards

**Multi-Ion Standard 1**

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<th>Ion</th>
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<td>30 µg/ml</td>
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<tr>
<td>F⁻</td>
<td>20 µg/ml</td>
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<tr>
<td>NO₃⁻</td>
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<tr>
<td>PO₄³⁻</td>
<td>150 µg/ml</td>
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<td>SO₄²⁻</td>
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Matrix: H₂O

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<tr>
<th>Catalog Number</th>
<th>Code</th>
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<td>140-315-001</td>
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<td>140-315-005</td>
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<td>500 ml</td>
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**Multi-Ion Standard 2**

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<th>Ion</th>
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</thead>
<tbody>
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<td>Cl⁻</td>
<td>10 µg/ml</td>
</tr>
<tr>
<td>F⁻</td>
<td>10 µg/ml</td>
</tr>
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<td>10 µg/ml</td>
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<tr>
<td>SO₄²⁻</td>
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Matrix: H₂O

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<td>141-315-015</td>
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**Multi-Ion Standard 3**

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<td>100 µg/ml</td>
</tr>
<tr>
<td>Cl⁻</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>F⁻</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>NO₃⁻</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>PO₄³⁻</td>
<td>100 µg/ml</td>
</tr>
<tr>
<td>SO₄²⁻</td>
<td>100 µg/ml</td>
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Matrix: H₂O

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<th>Catalog Number</th>
<th>Code</th>
<th>Volume</th>
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</thead>
<tbody>
<tr>
<td>251-225-011</td>
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<td>125 ml</td>
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<tr>
<td>251-225-015</td>
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**Multi-Ion Standard 4**

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<tbody>
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<td>1000 µg/ml</td>
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<tr>
<td>Cl⁻</td>
<td>1000 µg/ml</td>
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<tr>
<td>F⁻</td>
<td>1000 µg/ml</td>
</tr>
<tr>
<td>NO₃⁻</td>
<td>1000 µg/ml</td>
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<tr>
<td>PO₄³⁻</td>
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<tr>
<td>SO₄²⁻</td>
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Matrix: H₂O

<table>
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</thead>
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<tr>
<td>250-225-101</td>
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<tr>
<td>250-225-105</td>
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<td>500 ml</td>
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**Solution A & B Set**

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Code</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>140-315-011</td>
<td></td>
<td>125 ml</td>
</tr>
<tr>
<td>140-315-015</td>
<td></td>
<td>500 ml</td>
</tr>
</tbody>
</table>

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**“What you want to do, you do. The rest is just talk.”** -John Cleek-
Certificate of Analysis:
Ion Chromatography Standard

Description: AccuSPEC – IC Standard Chloride 1000 µg/ml
Lot Number: SC4328999
Expiry Date: September 2006 (unopened bottle)

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date
Date bottle opened

This standard analyzed by Ion chromatography (IC) is traceable to NIST Standard Reference Material: 3182

Actual Value: 993 µg/ml

Certified by: Alketa Mixha, Chemist
Date of certification: December 7, 2004

This IC Standard is guaranteed to be stable and accurate to within ± 1% of the actual concentration up to the unopened expiry date, if sealed, or 12 months after opening of the bottle, up to the unopened expiry date provided the solution is kept tightly capped and stored, at 4°C, under normal laboratory conditions. For these solutions, 18 megohm/cm double deionized water, and Class A glassware are used. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. (Ce certificat est également disponible en français)

Manufactured according to an ISO 9001:2000 Quality System and ISO 17025 (in-process)

SCP SCIENCE
21800 Clark Graham, Baie D’Urfé, QC, Canada   H9X 4B6
Phone: (514) 457-0701  Fax: (514) 457-4499
Web Site: www.scpscience.com
Ion Chromatography
Standard Custom Quote Request

Complete this form to receive a quotation for your specific Custom Multi-Ion Standard or to enter your purchase order. Photocopy for use with multiple requests.

Contact Information:

Name: ____________________________________________________________
Title: ____________________________________________________________
Company: ________________________________________________________
Mailing Address: ___________________________________________________
City: ______________Province/State: __________PC/Zip: ________________Country: __________
Telephone: ______________Fax: ______________
E-mail: _______________________________Account No: _____________________________

Please indicate the concentration required for each analyte:

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<th>Anion Custom Multi-Ion Standard</th>
<th>Cation Custom Multi-Ion Standard</th>
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</thead>
<tbody>
<tr>
<td>Acetate (CH₃COO⁻)</td>
<td>Ammonium (NH₄⁺)</td>
</tr>
<tr>
<td>Ammonia as Nitrogen (NH₃ as N)</td>
<td>Barium (Ba²⁺)</td>
</tr>
<tr>
<td>Bromate (BrO₃⁻)</td>
<td>Calcium (Ca²⁺)</td>
</tr>
<tr>
<td>Bromide (Br⁻)</td>
<td>Lithium (Li⁺)</td>
</tr>
<tr>
<td>Chlorate (ClO₃⁻)</td>
<td>Magnesium (Mg²⁺)</td>
</tr>
<tr>
<td>Chloride (Cl⁻)</td>
<td>Potassium (K⁺)</td>
</tr>
<tr>
<td>Fluoride (F⁻)</td>
<td>Sodium (Na⁺)</td>
</tr>
<tr>
<td>Formate (HCOO⁻)</td>
<td>Strontium (Sr²⁺)</td>
</tr>
<tr>
<td>Nitrate (NO₃⁻)</td>
<td>Matrix Required:</td>
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<tr>
<td>Nitrate as Nitrogen (NO₃⁻ as N)</td>
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<tr>
<td>Nitrite (NO₂⁻)</td>
<td>Rate of Use (L/yr):</td>
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<tr>
<td>Nitrite as Nitrogen (NO₂⁻ as N)</td>
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<tr>
<td>Oxalate (C₂O₄²⁻)</td>
<td>Special Requirements:</td>
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<tr>
<td>Perchlorate (ClO₄⁻)</td>
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<tr>
<td>Phosphate (PO₄³⁻)</td>
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<td>Phosphate as Phosphorus (PO₄³⁻ as P)</td>
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<td>Sulfate as Sulfur (SO₄²⁻ as S)</td>
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☐ Please Send me a Quotation
☐ Please Enter my Purchase Order # ____________________________

Fax form back to: USA (800) 253-5549
                      Canada / International (800) 253-5549 / (514) 457-4499
                      Europe +33 (0)1 60 92 05 67

“It is difficult for a rich person to be modest, or a modest person rich.” -Epictetus-
Atomic Absorption
Single Element Calibration Standards

Popular standards are available for Flame and Graphite Furnace Atomic Absorption. Each standard includes a detailed Certificate of Analysis and direct traceability to NIST.

- Certificate of Analysis with actual matrix, actual concentration, and traceability to NIST 3100 Series Standards
  - Complete documentation for audit purposes
- 2 expiry dates (up to 21 months unopened & 15 months opened)
  - Longer shelf life for unopened bottles
- Immediate availability for most common elements

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<td>Sb</td>
<td>HNO₃ / tr. Tartaric Acid</td>
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- Glass Container
- Dangerous Goods
- Poison
- Flammable
- Oxidant
- Corrosive

* Hazardous Materials Regulations of the U.S. Department of Transportation, Tariff No. 80E-8000-R
* Canadian Transportation of Dangerous Goods Act and Regulations, Revision December 2000
* International Air Transport Association - Dangerous Goods Regulation, 40th Edition

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Fax: (800) 253-5549 / +1 (514) 457-4499

Europe
Tel.: +33 (0) 169 18 71 17
Fax: +33 (0) 160 92 05 67
Certificate of Analysis:
Atomic Absorption Standard

Catalog number: 140-001-285
Description: Nickel – AA Standard
Nominal Concentration: 1000 μg/ml
Lot number: SC5004999
Expiration Date: October 2006 (unopened bottle)
Starting Material: Ni metal

Analysis of Solution Standard by Inductively Coupled Plasma Spectroscopy (ICP-AES) traceable to NIST Standard Reference Material 3136.

Actual Concentration: 1000 μg/ml
Matrix: 4% HNO₃

Certified by: Alketa Mixha, Chemist
Date of certification: January 28, 2005

This AA Standard is guaranteed to be stable and accurate to within ±0.5% of the actual concentration up to the unopened expiry date, if sealed, or 12 months after opening of the bottle, up to the unopened expiry date provided the solution is kept tightly capped and stored under normal laboratory conditions. For these solutions, 18 megohm/cm double deionized water, ACS-grade acids and Class A glassware are used. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. (Ce certificat est également disponible en français)

Manufactured according to an ISO 9001:2000 Quality System and ISO 17025 (in-process)

SCP SCIENCE
21800 Clark Graham, Baie D’Urfé, QC, Canada  H9X 4B6
Phone: (514) 457-0701  Fax: (514) 457-4499
Web Site: www.scpscience.com

“If you can think you can, you can. And if you think you can’t, you’re right.”  -Mary Kay Ash-
XRF analysis for sulfur in oil requires matrix matching in order to guarantee accurate results. Sulfur in Oil Standards are available in #2 Diesel Fuel, White Mineral Oil, Kerosene, and NEW Iso-Octane. Expanded product lines offer more selection to meet your sulfur analysis requirements.

- Available as individual standards or complete sets
- Concentrations range from 0.0000% to 6%
- Complete with a Certificate of Analysis
  - Directly traceable to NIST

### Sulfur in #2 Diesel Fuel (125 ml / 4 oz bottle)

<table>
<thead>
<tr>
<th>Concentration (wt%)</th>
<th>Code</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0000</td>
<td>✓</td>
<td>140-081-002</td>
</tr>
<tr>
<td>0.0005</td>
<td>✓</td>
<td>140-081-018</td>
</tr>
<tr>
<td>0.0010</td>
<td>✓</td>
<td>140-081-001</td>
</tr>
<tr>
<td>0.0025</td>
<td>✓</td>
<td>140-081-005</td>
</tr>
<tr>
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<td>140-081-03</td>
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<tr>
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<td>140-081-020</td>
</tr>
<tr>
<td>0.0100</td>
<td>✓</td>
<td>140-081-004</td>
</tr>
<tr>
<td>0.0200</td>
<td>✓</td>
<td>140-081-006</td>
</tr>
<tr>
<td>0.0300</td>
<td>✓</td>
<td>140-081-008</td>
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</tr>
<tr>
<td>0.0750</td>
<td>✓</td>
<td>140-081-014</td>
</tr>
<tr>
<td>0.1000</td>
<td>✓</td>
<td>140-081-016</td>
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<tr>
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<tr>
<td>0.3000</td>
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<td>0.5000</td>
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</tr>
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<td>4.0000</td>
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<td>5.0000</td>
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<td>140-082-020</td>
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<td>6.0000</td>
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**Complete Set**

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<tr>
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<th>Catalog Number</th>
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<tr>
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<td>High Range (0.15-6.0)</td>
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### Sulfur in Mineral Oil (125 ml / 4 oz bottle)

<table>
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<th>Concentration (wt%)</th>
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</tr>
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<td>☺</td>
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<td>0.0010</td>
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<tr>
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<td>140-083-005</td>
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<tr>
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<td>140-083-011</td>
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<tr>
<td>0.0100</td>
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<td>140-083-004</td>
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<tr>
<td>0.0200</td>
<td>☺</td>
<td>140-083-006</td>
</tr>
<tr>
<td>0.0300</td>
<td>☺</td>
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<tr>
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<td>140-084-004</td>
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<tr>
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<td>140-084-006</td>
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<td>0.7500</td>
<td>☺</td>
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<td>4.0000</td>
<td>☺</td>
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</tr>
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<td>5.0000</td>
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**Complete Set**

<table>
<thead>
<tr>
<th>Range</th>
<th>Code</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Range (0.00-0.10)</td>
<td>☺</td>
<td>140-083-000</td>
</tr>
<tr>
<td>High Range (0.15-5.0)</td>
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</table>
Sulfur in Oil Calibration Standard

### Sulfur in Residual Oil (125 ml / 4 oz bottle)

<table>
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<th>Catalog Number</th>
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<td>0.50</td>
<td>⊗</td>
<td>140-074-108</td>
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<tr>
<td>0.70</td>
<td>⊗</td>
<td>140-074-103</td>
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<tr>
<td>5.00</td>
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<td>140-074-115</td>
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</table>

### Sulfur in Kerosene (125 ml / 4 oz bottle)

<table>
<thead>
<tr>
<th>Concentration (wt%)</th>
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<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0010</td>
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<tr>
<td>0.0050</td>
<td>⊗</td>
<td>140-085-005</td>
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<tr>
<td>0.0100</td>
<td>⊗</td>
<td>140-085-004</td>
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<td>140-085-010</td>
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<tr>
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### Sulfur in Iso-Octane (125 ml / 4 oz bottle)

<table>
<thead>
<tr>
<th>Concentration (wt%)</th>
<th>Code</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0000</td>
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<tr>
<td>0.0005</td>
<td>⊗</td>
<td>140-077-002</td>
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<td>0.0010</td>
<td>⊗</td>
<td>140-077-004</td>
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<td>0.0025</td>
<td>⊗</td>
<td>140-077-006</td>
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<tr>
<td>0.0050</td>
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<td>140-077-008</td>
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<td>0.0075</td>
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<td>0.0100</td>
<td>⊗</td>
<td>140-077-012</td>
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<td>0.0200</td>
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<td>0.0300</td>
<td>⊗</td>
<td>140-077-016</td>
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<tr>
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<td>⊗</td>
<td>140-077-028</td>
</tr>
</tbody>
</table>

### X-Ray Fluorescence Analysis

A variety of sample preparation and supply items are available.
- A range of thin film materials
- Plastic sample cups for major XRF instrument manufacturers
- Volume discounts on cups and film available

### Oil-Based Standards

Oil-based metal standards are available for emission and XRF analysis.
- Common multi-element blends and single element standards are shipped from stock
- Custom formulations are available on special order

---

© Glass Container ⊗ Poison ③ Flammable
✔ Dangerous Goods* ⊗ Corrosive ⊗ Oxidant

* as defined by:
- Hazardous Materials Regulations of the U.S. Department of Transportation, Tariff No. BOE-6000-R
- Canadian Transportation of Dangerous Goods Act and Regulations, Revision December 2000
- International Air Transport Association - Dangerous Goods Regulation, 49th Edition

X-Ray Fluorescence Analysis

Understanding is the beginning of approving.”  -Andre Gide-
Certificate of Analysis:
Sulfur in Oil Calibration Standard

Catalog number: 140-081-001
Description: Sulfur in #2 Diesel Fuel Standard
S @ 0.0010 % w/w
Lot number: SC5032547
Expiration Date: July 2006

Concentrations:

\[ S : 10 \mu g/g \]

Matrix: #2 Diesel Fuel

Certified by: __________________________  Date: February 2, 2005
Alketa Mixha, Chemist

This solution is intended for use in the determination of total sulfur in #2 Diesel Fuel. The certified value is based upon gravimetric procedures used to prepare the final standard, which are traceable to NIST according to ME Report #2793ME and NIST Test #39760. In order to verify this certified value, the final solution was analyzed by x-ray fluorescence spectroscopy (XRF) against NIST SRM 2724b.

This standard is guaranteed to be accurate to within plus or minus 1% of the concentration shown above, up to the expiry date, provided the solution is kept tightly capped and stored under normal laboratory conditions. We recommend that the solution be thoroughly mixed, by shaking the bottle, immediately prior to use. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. (Ce certificat est également disponible en français)

Manufactured according to an ISO 9001:2000 Quality System and ISO 17025 (in-process)

SCP SCIENCE
21800 Clark Graham, Baie D’Urfé, QC, Canada  H9X 4B6
Phone: (514) 457-0701  Fax: (514) 457-4499
Web Site:  www.scpscience.com
Metallo-Orgnic Single
Element Standards

Metallo-Orgnic calibration standards are required for metal analysis in organic matrices. “Off the shelf” single element standards as well as multi-element standards are available.

- Single-element standards available
  - For spiking or matrix-matching, if necessary
- 21 element, multi-element standard (SCP-21) available in 7 different concentrations and in 2 sizes
  - Complete choice to reduce dilution errors
- Certificate of Analysis with each standard listing the lot number, the expiry date and the concentration or each element
  - Complete documentation for audit purposes
  - Available on-line at www scpscience.com

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<thead>
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<th>Single Element</th>
<th>Symbol</th>
<th>Matrix</th>
<th>Code</th>
<th>1000 µg/g</th>
<th>Catalog Number</th>
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<tbody>
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<td></td>
<td></td>
<td></td>
<td>62.5 ml /</td>
<td>2 oz*</td>
</tr>
<tr>
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<td>Al</td>
<td>Oil</td>
<td>140-074-132</td>
<td>140-076-138</td>
<td>140-071-132</td>
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<tr>
<td>Arsenic</td>
<td>As</td>
<td>Oil</td>
<td>140-072-332</td>
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<td>140-071-262**</td>
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* In 20 cSt oil
** In 75 cSt oil

NOTE: Other elements and concentrations are available on request.
### Metallo-Organic Multi-Element Standards

#### SCP-12 Multi-Element Standard

<table>
<thead>
<tr>
<th>Concentration (µg/g)</th>
<th>Code</th>
<th>Catalog Number 125 ml / 4 oz</th>
<th>Catalog Number 250 ml / 8 oz</th>
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<td>140-073-302</td>
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<td>140-073-502</td>
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<tr>
<td>900</td>
<td>140-073-901</td>
<td>140-073-902</td>
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</table>

12 Element Blend Containing: Ag, Al, Cr, Cu, Fe, Mg, Na, Ni, Pb, Si, Sn, Ti

#### SCP-21 Multi-Element Standard

<table>
<thead>
<tr>
<th>Concentration (µg/g)</th>
<th>Code</th>
<th>Catalog Number 125 ml / 4 oz</th>
<th>Catalog Number 250 ml / 8 oz</th>
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</thead>
<tbody>
<tr>
<td>10</td>
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<tr>
<td>100</td>
<td>140-072-101</td>
<td>140-072-102</td>
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<tr>
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<tr>
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<td>140-072-902</td>
<td></td>
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</tbody>
</table>

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

#### SCP-21+K Multi-Element Standard

<table>
<thead>
<tr>
<th>Concentration (µg/g)</th>
<th>Code</th>
<th>Catalog Number 125 ml / 4 oz</th>
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</tr>
</thead>
<tbody>
<tr>
<td>10</td>
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<td>100</td>
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<tr>
<td>900</td>
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</tr>
</tbody>
</table>

22 Element Blend Containing: Ag, Al, B, Ba, Ca, Cd, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, Si, Sn, Ti, V, Zn

#### SCP-23 Multi-Element Standard

<table>
<thead>
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<th>Concentration (µg/g)</th>
<th>Code</th>
<th>Catalog Number 125 ml / 4 oz</th>
<th>Catalog Number 250 ml / 8 oz</th>
</tr>
</thead>
<tbody>
<tr>
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<td>140-078-002</td>
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<td>100</td>
<td>140-078-007</td>
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<tr>
<td>300</td>
<td>140-078-009</td>
<td>140-078-010</td>
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</tr>
<tr>
<td>500</td>
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<tr>
<td>900</td>
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<td>140-078-014</td>
<td></td>
</tr>
</tbody>
</table>

23 Element Blend Containing: Ag, Al, B, Ba, Ca, Cd, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Si, Sn, Ti, V, Zn

#### Metal Additive Standard

<table>
<thead>
<tr>
<th>Concentration (µg/g)</th>
<th>Code</th>
<th>Catalog Number 125 ml / 4 oz</th>
<th>Catalog Number 250 ml / 8 oz</th>
</tr>
</thead>
<tbody>
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<td>900</td>
<td>140-074-901</td>
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<tr>
<td>1000</td>
<td>140-074-903</td>
<td>140-074-904</td>
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<tr>
<td>5000</td>
<td>140-074-907</td>
<td>140-074-908</td>
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</tr>
</tbody>
</table>

5 Element Blend Containing: Ba, Ca, Mg, P, Zn

#### Stabilizer* in Mineral Oil

- **Viscosity**: 75 cSt
- **Code**: @
- **Catalog Number**: 140-070-950

* Add 0.6% by weight

#### Matrix Oil

- **Viscosity**: 75 cSt, 20 cSt
- **Code**: 140-075-001, 140-075-003, 140-075-004
- **Catalog Number**: 500 ml / 8 oz, 3.7L / 1 gal

---

* Glass Container
* Poison
* Flammable
* Corrosive
* Oxidant

* as defined by:
  - Hazardous Materials Regulations of the U.S. Department of Transportation, Tariff No. BOE-6000-R
  - Canadian Transportation of Dangerous Goods Act and Regulations, Revision December 2000
  - International Air Transport Association - Dangerous Goods Regulation, 40th Edition
Certificate of Analysis

Catalog number: 140-071-272
Description: Metallo-Organic Standard
Lot number: SC4322893
Expiration Date: November 2005

Concentrations:

Co: 4997 µg/g

Matrix: 75 cSt Hydrocarbon Oil

Certified by: Alketa Mixha, Chemist
Date: November 18, 2004

This solution is intended for use as a calibration standard for plasma emission spectroscopy (ICP or DCP), rotating disk (rotrode) or atomic absorption spectroscopy (AAS). The certified values are based upon assayed concentrations of the raw materials and the gravimetric procedures used to prepare the final standard, which are traceable to NIST according to ME Report #2793ME and NIST test #39760. In order to verify these certified values, the final solution was analyzed by plasma emission spectroscopy (ICP or DCP).

This standard is guaranteed to be accurate to within plus or minus 1% of the concentration shown above, up to the expiry date, provided the solution is kept tightly capped and stored under normal laboratory conditions. We recommend that the solution be thoroughly mixed, by shaking the bottle, immediately prior to use. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. (Ce certificat est également disponible en français)

Manufactured according to an ISO 9001:2000 Quality System and ISO 17025 (in-process)

SCP SCIENCE
21800 Clark Graham, Baie D’Urfé, QC, Canada H9X 4B6
Phone: (514) 457-0701 Fax: (514) 457-4499
Web Site: www.scpscience.com

“Meekness takes injury like pills, not chewing, but swallowing them.” - Sir Thomas Browne-
Certificate of Analysis

Catalog number: 140-072-032
Description: Multi Metallo-Organic Standard
Lot number: SC4345116
Expiration Date: December 2005

Concentrations:

<table>
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<th>Element</th>
<th>Concentration</th>
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<tbody>
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<tr>
<td>Fe</td>
<td>30.0 μg/g</td>
</tr>
<tr>
<td>Si</td>
<td>30.1 μg/g</td>
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<tr>
<td>Al</td>
<td>29.9 μg/g</td>
</tr>
<tr>
<td>Mg</td>
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<td>29.9 μg/g</td>
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<tr>
<td>B</td>
<td>29.9 μg/g</td>
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<tr>
<td>Mn</td>
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<tr>
<td>Ti</td>
<td>29.9 μg/g</td>
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<tr>
<td>Ba</td>
<td>29.9 μg/g</td>
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<tr>
<td>Mo</td>
<td>29.9 μg/g</td>
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<tr>
<td>V</td>
<td>30.0 μg/g</td>
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<tr>
<td>Ca</td>
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</tr>
<tr>
<td>Na</td>
<td>30.0 μg/g</td>
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<tr>
<td>Zn</td>
<td>29.9 μg/g</td>
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<tr>
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</tr>
<tr>
<td>Ni</td>
<td>29.9 μg/g</td>
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<tr>
<td>Cr</td>
<td>29.9 μg/g</td>
</tr>
<tr>
<td>P</td>
<td>29.9 μg/g</td>
</tr>
<tr>
<td>Cu</td>
<td>29.9 μg/g</td>
</tr>
<tr>
<td>Pb</td>
<td>29.9 μg/g</td>
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</tbody>
</table>

Matrix: 75 cSt Hydrocarbon Oil

Certified by: Alketa Mixha, Chemist
Date: December 10, 2004

This solution is intended for use as a calibration standard for plasma emission spectroscopy (ICP or DCP), rotating disk (rotrode) or atomic absorption spectroscopy (AAS). The certified values are based upon assayed concentrations of the raw materials and the gravimetric procedures used to prepare the final standard, which is traceable to NIST according to ME Report #2793ME and NIST Test #39760. In order to verify these certified values, the final solution was analyzed by plasma emission spectroscopy (ICP or DCP), and is traceable to NIST SRM 1085b.

This standard is guaranteed to be accurate to within plus or minus 1% of the concentration shown above, up to the expiry date, provided the solution is kept tightly capped and stored under normal laboratory conditions. We recommend that the solution be thoroughly mixed, by shaking the bottle, immediately prior to use. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. (Ce certificat est également disponible en français)

Manufactured according to an ISO 9001:2000 Quality System and ISO 17025 (in-process)

SCP SCIENCE
21800 Clark Graham, Baie D’Urfé, QC, Canada  H9X 4B6
Phone: (514) 457-0701  Fax: (514) 457-4499
Web Site: www.scpscience.com
Metallo Organic Standard
Custom Quote Request Form

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: ____________________________________________

Title: ____________________________________________

Company: ________________________________________

Mailing Address: ____________________________

City: ___________ Province/State: ___________ PC/Zip: ___________ Country: ___________

Telephone: ___________ Fax: ___________

E-mail: ___________________________ Account No: ___________________________

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

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Al</td>
<td>Aluminum</td>
<td>Cu</td>
<td>Copper</td>
</tr>
<tr>
<td>Sb</td>
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<tr>
<td>As</td>
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<td>La</td>
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<tr>
<td>Co</td>
<td>Cobalt</td>
<td>Pt</td>
<td>Platinum</td>
</tr>
</tbody>
</table>

Solvent: (place a check mark)

- [ ] Mineral Oil - Light Hydrocarbon (20 cSt)
- [ ] Heavy Hydrocarbon Oil (75 cSt)
- [ ] Xylene
- [ ] Kerosene
- [ ] Other: ___________________________

Matrix Required: ___________________________

Rate of Use (L/yr): ___________________________

Special Requirements: ___________________________

Application: ___________________________

Custom Name: ___________________________

Fax form back to:  
USA (800) 253-5549  
Canada / International (800) 253-5549 / (514) 457-4499  
Europe +33 (0)1 60 92 05 67

“We work to become, not to acquire” - Elbert Hubbard-