OIL CONDITION MONITORING

REFERENCE MATERIALS

Standards You Can Trust

lgcstandards.com/industrial
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LGC Quality | ISO 17043 | ISO 17034 | ISO/IEC 17025 | ISO 9001

Industrial
VHG | ARMI | MBH
Paragon Scientific

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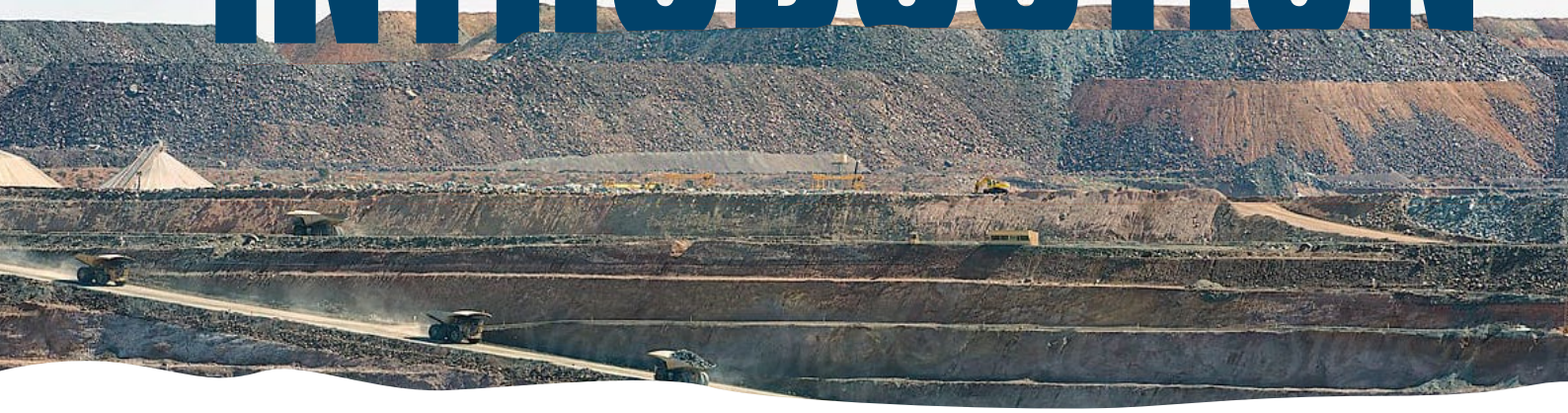
INTRODUCTION



Oil Condition Monitoring

Oil Condition Monitoring (OCM) or Used Oil Analysis (UOA) predictive maintenance programs provide an important view into the state of an engine's lubricants by identifying and then tracking changes in the lubricants' composition, specific characteristics and their overall quality to do the job.

Whether you are a fleet or asset owner testing oils and lubricants onsite, or a testing lab partner for OCM or UOA programs, you need the most accurate standards to measure against in order to deliver the best data. Only then can you make the best mission-critical decisions to drive time- and money-saving actions that prevent expensive component or system failures.

For more than 30 years LGC has been a trusted partner to industry leaders in the heavy machinery, railway and aerospace industries, as well as militaries running OCM programs worldwide.

You've trusted us for decades to create superior reference materials and innovative measurement tools that support the quality of your analyses.

Leveraging the synergies of the LGC Industrials product lines, we are joining together, VHG, ARMI, MBH, and Paragon Scientific, under a single brand; Industrial.

Building on our collective expertise, Industrial fosters the innovation and the agility necessary to create the measurement tools you rely on when developing, using, and transforming materials to achieve your mission.

LGC Industrial – The Material Difference.

Section 1

OCM standards

V-Series Wear Metal Standards

For ICP, RDE, XRF and other techniques

V26 Wear Metal Standards
Elements: Ag, Al, B, Ba, Bi, Ca, Cd, Cr, Cu, Fe, In, Li, K, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Si, Sn, Ti, V, Zn

Conc. (µg/g)	**Matrix**	**Product No.** (100g)	**Product No.** (200g)
10	75 cSt Mineral Oil	VHG-V26-10-100G	VHG-V26-10-200G
30	75 cSt Mineral Oil	VHG-V26-30-100G	VHG-V26-30-200G
50	75 cSt Mineral Oil	VHG-V26-50-100G	VHG-V26-50-200G
100	75 cSt Mineral Oil	VHG-V26-100-100G	VHG-V26-100-200G
300	75 cSt Mineral Oil	VHG-V26-300-100G	VHG-V26-300-200G
500	75 cSt Mineral Oil	VHG-V26-500-100G	VHG-V26-500-200G
900	75 cSt Mineral Oil	VHG-V26-900-100G	VHG-V26-900-200G

V21 Wear Metal Standards
Elements: Ag, Al, B, Ba, Ca, Cd, Cr, Cu, Fe, Mg, Mn, Mo, Na, Ni, P, Pb, Si, Sn, Ti, V, Zn

Conc. (µg/g)	**Matrix**	**Product No.** (100g)	**Product No.** (200g)
10	75 cSt Mineral Oil	VHG-V21-10-100G	VHG-V21-10-200G
30	75 cSt Mineral Oil	VHG-V21-30-100G	VHG-V21-30-200G
50	75 cSt Mineral Oil	VHG-V21-50-100G	VHG-V21-50-200G
100	75 cSt Mineral Oil	VHG-V21-100-100G	VHG-V21-100-200G
300	75 cSt Mineral Oil	VHG-V21-300-100G	VHG-V21-300-200G
500	75 cSt Mineral Oil	VHG-V21-500-100G	VHG-V21-500-200G
900	75 cSt Mineral Oil	VHG-V21-900-100G	VHG-V21-900-200G

V21 + K Wear Metal Standards
Elements: Ag, Al, B, Ba, Ca, Cd, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, Si, Sn, Ti, V, Zn

Conc. (µg/g)	**Matrix**	**Product No.** (100g)	**Product No.** (200g)
10	75 cSt Mineral Oil	VHG-V21+K-10-100G	VHG-V21+K-10-200G
30	75 cSt Mineral Oil	VHG-V21+K-30-100G	VHG-V21+K-30-200G
50	75 cSt Mineral Oil	VHG-V21+K-50-100G	VHG-V21+K-50-200G
100	75 cSt Mineral Oil	VHG-V21+K-100-100G	VHG-V21+K-100-200G
300	75 cSt Mineral Oil	VHG-V21+K-300-100G	VHG-V21+K-300-200G
500	75 cSt Mineral Oil	VHG-V21+K-500-100G	VHG-V21+K-500-200G
900	75 cSt Mineral Oil	VHG-V21+K-900-100G	VHG-V21+K-900-200G

V23 Wear Metal Standards
Elements: Ag, Al, B, Ba, Ca, Cd, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Si, Sn, Ti, V, Zn

Conc. (µg/g)	**Matrix**	**Product No.** (100g)	**Product No.** (200g)
10	75 cSt Mineral Oil	VHG-V23-10-100G	VHG-V23-10-200G
30	75 cSt Mineral Oil	VHG-V23-30-100G	VHG-V23-30-200G
50	75 cSt Mineral Oil	VHG-V23-50-100G	VHG-V23-50-200G
100	75 cSt Mineral Oil	VHG-V23-100-100G	VHG-V23-100-200G
300	75 cSt Mineral Oil	VHG-V23-300-100G	VHG-V23-300-200G
500	75 cSt Mineral Oil	VHG-V23-500-100G	VHG-V23-500-200G
900	75 cSt Mineral Oil	VHG-V23-900-100G	VHG-V23-900-200G

Stabilizer for Wear Metal Standards

Description	**Size** (g)	**Product No.**
Stabilizer for Sulfur-Based Metallo-Organic Standards	50	VHG-STAB-50G

ICP Standards for Oil Condition Monitoring

Metal Additives Standards

Description	Matrix	Product No. (100g)	Product No. (200g)
MA3: Ca @ 5,000; P, Zn @ 1,600 µg/g	75 cSt Mineral Oil	VHG-MA3-100G	VHG-MA3-200G
MA4: Ca @ 5,000; Mg, P, Zn @ 1,600 µg/g	75 cSt Mineral Oil	VHG-MA4-100G	VHG-MA4-200G
MA5: Ba, Ca, Mg, P, Zn @ 900 µg/g	75 cSt Mineral Oil	VHG-MA5-900-100G	VHG-MA5-900-200G
MA5: Ba, Ca, Mg, P, Zn @ 1,000 µg/g	75 cSt Mineral Oil	VHG-MA5-1000-100G	VHG-MA5-1000-200G
MA5: Ba, Ca, Mg, P, Zn @ 3,000 µg/g	75 cSt Mineral Oil	VHG-MA5-3000-100G	VHG-MA5-3000-200G
MA5: Ba, Ca, Mg, P, Zn @ 5,000 µg/g	75 cSt Mineral Oil	VHG-MA5-5000-100G	VHG-MA5-5000-200G
MA6: B, Ba, Ca, Mg, P, Zn @ 900 µg/g	75 cSt Mineral Oil	VHG-MA6-900-100G	VHG-MA6-900-200G

Internal Standards for Oil Analysis

Description	Matrix	Size (g)	Product No.
Cobalt Standard: Co @ 6 wt%	Mineral Spirits	100	VHG-OCO-6PIS-100G
Cobalt Standard: Co @ 6 wt%	Mineral Spirits	200	VHG-OCO-6PIS-200G
Cobalt Standard: Co @ 6 wt%	Mineral Spirits	400	VHG-OCO-6PIS-400G
Cobalt Standard: Co @ 5,000 µg/g	75 cSt Mineral Oil	200	VHG-OCODN-5000-200G
Cobalt Standard: Co @ 5,000 µg/g	75 cSt Mineral Oil	800	VHG-OCODN-5000-800G
Yttrium Standard: Y @ 2 wt%	75 cSt Mineral Oil	200	VHG-OYDN-2P-200G

Single Element Petroleum Standards

Description	Matrix	Size (g)	Product No.
Aluminum Standard: Al @ 1,000 µg/g	75 cSt Mineral Oil	50	VHG-OAL-1000-50G

Standards for Oil Condition Monitoring

Acid Number in Oil*
For the determination of Acid Number in petroleum products by potentiometric titration (ASTM D664) or color-indicator titration (ASTM D974)

Conc. (mg KOH/g)	Matrix	Size (g)	Product No.
0.1	75 cSt Mineral Oil	50	VHG-AN-0.1-50G
0.5	75 cSt Mineral Oil	100	VHG-AN-0.5-100G
1	75 cSt Mineral Oil	50	VHG-AN-1-50G
1.5	75 cSt Mineral Oil	100	VHG-AN-1.5-100G
2	75 cSt Mineral Oil	50	VHG-AN-2-50G

*Available in sizes up to 800g

Base Number in Oil*
For the determination of Base Number in petroleum products by potentiometric perchloric acid titration (ASTM D2896) or potentiometric titration (ASTM D4739)

Conc. (mg KOH/g)	Matrix	Size (g)	Product No.
6	75 cSt Mineral Oil	50	VHG-BN-6-50G
10	75 cSt Mineral Oil	50	VHG-BN-10-50G
15	75 cSt Mineral Oil	50	VHG-BN-15-50G
30	75 cSt Mineral Oil	50	VHG-BN-30-50G
40	75 cSt Mineral Oil	50	VHG-BN-40-50G
70	75 cSt Mineral Oil	50	VHG-BN-70-50G

*Available in sizes up to 800g

Fuel Dilution

Description	Matrix	Size (mL)	Product No.
Blank for Diesel Fuel Dilution	75 cSt Mineral Oil	100	VHG-DSLFD-BLK-100
Blank for Diesel Fuel Dilution	75 cSt Mineral Oil	500	VHG-DSLFD-BLK-500
2% (w/w) Devolatilized Diesel Fuel	75 cSt Mineral Oil	100	VHG-DSLFD-2PW-100
4% (w/w) Devolatilized Diesel Fuel	75 cSt Mineral Oil	100	VHG-DSLFD-4PW-100
5% (w/w) Devolatilized Diesel Fuel	75 cSt Mineral Oil	100	VHG-DSLFD-5PW-100
Custom Fuel Dilution Standard: 6% w/w devolatilized diesel fuel	75 cSt Mineral Oil	100	VHG-XDSL6PWDEV-75OIL-100
10% (w/w) Devolatilized Diesel Fuel	75 cSt Mineral Oil	100	VHG-DSLFD-10PW-100
Blank for Gas Fuel Dilution	75 cSt Mineral Oil	100	VHG-GASFD-BLK-100
2% (w/w) Devolatilized Gasoline	75 cSt Mineral Oil	100	VHG-GASFD-2PW-100
5% (w/w) Devolatilized Gasoline	75 cSt Mineral Oil	100	VHG-GASFD-5PW-100
10% (w/w) Devolatilized Gasoline	75 cSt Mineral Oil	100	VHG-GASFD-10PW-100

Glycol in Oil

Description	Conc. (µg/g)	Matrix	Size (mL)	Product No.
Ethylene Glycol Blank Standard	10	Multi-grade Diesel Engine Oil	80	VHG-EGOIL-BLK-80
Ethylene Glycol Standard	100	Multi-grade Diesel Engine Oil	80	VHG-EGOIL-100-80
	500		80	VHG-EGOIL-500-80
	1,000		80	VHG-EGOIL-1000-80
	2,000		80	VHG-EGOIL-2000-80
Ethylene Glycol QC Check Standard	600	Multi-grade Diesel Engine Oil	80	VHG-EGOILCS-600-80
Ethylene Glycol Standards Set	Various	Multi-grade Diesel Engine Oil	6x80	VHG-EGOIL-SET-6X80

FTIR Soot

Description	Matrix	Size (mL)	Product No.
0 wt% Soot in Diesel Engine Oil	Diesel Engine Oil	50	VHG-SOOT-BLK-50
0.5-2% Soot Standard	Diesel Engine Oil	50	VHG-SOOT-A-50
2-4% Soot Standard	Diesel Engine Oil	50	VHG-SOOT-B-50
4-6% Soot Standard	Diesel Engine Oil	50	VHG-SOOT-C-50
6-9% Soot Standard	Diesel Engine Oil	50	VHG-SOOT-D-50
9-12% Soot Standard	Diesel Engine Oil	50	VHG-SOOT-E-50
Soot Content Standard Set (contains one of each the above)	Diesel Engine Oil	6x50	VHG-SOOT-SET

Moisture Content

Description	Matrix	Size (mL)	Product No.
Crackle Test Standard: 0 wt% H_2O	10W30 Motor Oil	100	VHG-CTR-BLK-100
Crackle Test Standard: 0.1 wt% H_2O	10W30 Motor Oil	100	VHG-CTR-0.1P-100
Crackle Test Standard: 0.5 wt% H_2O	10W30 Motor Oil	100	VHG-CTR-0.5P-100
Crackle Test Standard: 1 wt% H_2O	10W30 Motor Oil	100	VHG-CTR-1.0P-100
Karl Fischer Standard: 0.05 wt% H_2O	10W30 Motor Oil	100	VHG-KF-0.05P-100
Karl Fischer Standard: 0.1 wt% H_2O	10W30 Motor Oil	100	VHG-KF-0.1P-100
Karl Fischer Standard: 0.5 wt% H_2O	10W30 Motor Oil	100	VHG-KF-0.5P-100
Karl Fischer Standard: 1 wt% H_2O	10W30 Motor Oil	100	VHG-KF-1.0P-100

Particle Count			
Description	**Matrix**	**Size** (mL)	**Product No.**
Parti-Count™ Particle Count Calibration Fluid: 5 mg/L ISO MTD. 4 - 30 µm channels reported	Hydraulic Fluid	100	VHG-PCMTD-CAL-100
Parti-Count™ Particle Count Verification Fluid: 5 mg/L ISO MTD. 4, 6, 10, 14, 18, 21, 38, 50, & 70 µm channels reported	Hydraulic Fluid	125	VHG-PCMTD-5-125
		500	VHG-PCMTD-5-500

Viscosity Standards			
Standard Type	**Description**	**Size** (mL)	**Product No.**
General Purpose	Type D10	500 mL	ALK-D10
	Type D1000	500 mL	ALK-D1000
	Type D5	500 mL	ALK-D5
	Type D500	500 mL	ALK-D500
	Type D5000	500 mL	ALK-D5000
	Type D7500	500 mL	ALK-D7500
	Type N.4	500 mL	ALK-N.4
	Type N.8	500 mL	ALK-N.8
	Type N1.0	500 mL	ALK-N1.0
	Type N10	500 mL	ALK-N10
	Type N14	500 mL	ALK-N14
	Type N100	500 mL	ALK-N100
	Type N10200	500 mL	ALK-N10200
	Type N140	500 mL	ALK-N140
	Type N1000	500 mL	ALK-N1000
	Type N1400	500 mL	ALK-N1400
	Type N15000	500 mL	ALK-N15000
	Type N18000	500 mL	ALK-N18000
	Type N2	500 mL	ALK-N2
	Type N250	500 mL	ALK-N250
	Type N2500	500 mL	ALK-N2500
	Type N26	500 mL	ALK-N26
	Type N35	500 mL	ALK-N35
	Type N350	500 mL	ALK-N350
	Type N44	500 mL	ALK-N44
	Type N415	500 mL	ALK-N415
	Type N4000	500 mL	ALK-N4000
	Type N5100	500 mL	ALK-N5100

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Viscosity Standards			
Standard Type	**Description**	**Size** (mL)	**Product No.**
General Purpose cont.	Type N7.5	500 mL	ALK-N7.5
	Type N75	500 mL	ALK-N75
	Type N750	500 mL	ALK-N750
	Type S20	500 mL	ALK-S20
	Type S200	500 mL	ALK-S200
	Type S2000	500 mL	ALK-S2000
	Type S3	500 mL	ALK-S3
	Type S30000	500 mL	ALK-S30000
	Type S6	500 mL	ALK-S6
	Type S60	500 mL	ALK-S60
	Type S600	500 mL	ALK-S600
	Type S8000	500 mL	ALK-S8000
Low Temperature	Type J10 912cSt @ -40°C	500 mL	ALK-J10
	Type JF1-H Certified @ -20°C & -40°C	500 mL	ALK-JF1-H
	Type JF1-L Certified @ -20°C & -40°C	500 mL	ALK-JF1-L
	Type N105B	500 mL	ALK-N105B
	Type N115B	500 mL	ALK-N115B
	Type N120B	500 mL	ALK-N120B
	Type N1400B	500 mL	ALK-N1400B
	Type N14B	500 mL	ALK-N14B
	Type N27B	500 mL	ALK-N27B
	Type N2B	500 mL	ALK-N2B
	Type N480B	500 mL	ALK-N400B
	Type N480B	500 mL	ALK-N480B
High Temperature	Type S3S	500 mL	ALK-S3S
	Type S6S	500 mL	ALK-S6S
	Type S20S	500 mL	ALK-S20S
	Type S60S	500 mL	ALK-S60S
	Type N100S	500 mL	ALK-N100S
	Type S200S	500 mL	ALK-S200S
	Type S600S	500 mL	ALK-S600S
	Type S2000S	500 mL	ALK-S2000S
	Type S8000S	500 mL	ALK-S8000S
	Type N30000S	500 mL	ALK-S30000S
	Type N600	500 mL	ALK-N600
	Type N2000	500 mL	ALK-N2000

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Viscosity Standards			
Standard Type	**Description**	**Size** (mL)	**Product No.**
High Temperature cont.	Type N100HT, Temperature Ranges of 100 to 150 °C	500 mL	ALK-N100HT
	Type S200HT, Temperature Ranges of 100 to 150 °C	500 mL	ALK-S200HT
	Type S600HT, Temperature Ranges of 100 to 150 °C	500 mL	ALK-S600HT
Certified Viscosity Check Oil	5W30, Kinematic Viscosity, CCS Dynamic Viscosity & Density	500 mL	ALK-CVCO5W30
	5W30, Kinematic Viscosity, CCS Dynamic Viscosity & Density	5 L	ALK-CVCO5W30-5L
	10W30, Kinematic Viscosity, CCS Dynamic Viscosity & Density	500 mL	ALK-CVCO10W30
	10W30, Kinematic Viscosity, CCS Dynamic Viscosity & Density	5 L	ALK-CVCO10W30-5L
	15W40, Kinematic Viscosity, CCS Dynamic Viscosity & Density	500 mL	ALK-CVCO15W40
	15W40, Kinematic Viscosity, CCS Dynamic Viscosity & Density	5 L	ALK-CVCO15W40-5L
Small Sample Viscosity Reference Standard, certified value (cSt) @ 40°C & 100°C	Nominal 2.882 cSt @ 40°C	60 mL	ALK-HVS01
	Nominal 5.781 cSt @ 40°C	60 mL	ALK-HVS02
	Nominal 10.01 cSt @ 40°C	60 mL	ALK-HVS03
	Nominal 32.42 cSt @ 40°C	60 mL	ALK-HVS04
	Nominal 54.29 cSt @ 40°C	60 mL	ALK-HVS05
	Nominal 100.2 cSt @ 40°C	60 mL	ALK-HVS06
	Nominal 183.0 cSt @ 40°C	60 mL	ALK-HVS07
	Nominal 306.9 cSt @ 40°C	60 mL	ALK-HVS08
	Nominal 528.1 cSt @ 40°C	60 mL	ALK-HVS09

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Viscosity Standards

Standard Type	Description	Size (mL)	Product No.
Small Sample Viscosity Reference Standard, certified value (cSt) @ 40°C & 100°C cont.	Nominal 1003 cSt @ 40°C	60 mL	ALK-HVS10
	Nominal 1706 cSt @ 40°C	60 mL	ALK-HVS11
	Nominal 2100 cSt @ 40°C	60 mL	ALK-HVS12
	Nominal 3420 cSt @ 40°C	60 mL	ALK-HVS13
	Nominal 6846 cSt @ 40°C	60 mL	ALK-HVS14
	Nominal 13014 cSt @ 40°C	60 mL	ALK-HVS15
	Nominal 23192 cSt @ 40°C	60 mL	ALK-HVS16

Viscosity Bath Media

Description	Size (mL)	Product No.
White Oil for use 40°C to 80°C	20 L	ALK-BM1-20L
White Oil for use 40°C to 80°C	5 L	ALK-BM1-5L
White Oil for use 80°C to 120°C	20 L	ALK-BM2-20L
White Oil for use 80°C to 120°C	5 L	ALK-BM2-5L
Silicone Fluid 26 cSt @ 25°C for use 120 to 150°C	20 L	ALK-BM5-20L
Silicone Fluid 26 cSt @ 25°C for use 120 to 150°C	5 L	ALK-BM5-5L
Silicone Fluid 20 cSt @ 25°C for use 90 to 135°C	20 L	ALK-BM6-20L
Silicone Fluid 20 cSt @ 25°C for use 90 to 135°C	5 L	ALK-BM6-5L
Silicone Fluid 10 cSt @ 25°C for use 50 to 100°C	20 L	ALK-BM7-20L
Silicone Fluid 10 cSt @ 25°C for use 50 to 100°C	5 L	ALK-BM7-5L
Silicone Fluid 5 cSt @ 25°C for use 20 to 60°C	20 L	ALK-BM8-20L
Silicone Fluid 5 cSt @ 25°C for use 20 to 60°C	5 L	ALK-BM8-5L

Distillation Standards
For use with ASTM D86, IP 123, EN ISO 3405

Description	Size (mL)	Product No.
Distillation Standard, Diesel (Nominal Values from 160.8 to 355°C)	250 mL	ALK-CRMU-DIGO
Distillation Standard, Gasoline (Nominal Values from 32.8 to 173.3°C)	250 mL	ALK-CRMU-DIGA
Distillation Standard, Jet Aviation Fuel (nominal values from 158.7 to 268.2°C)	250 mL	ALK-CRMU-DIKR

Flash Point Standards
For use with ASTM D92, ASTM D93 and ASTM D56

Description	**Size** (mL)	**Product No.**
Flash Point Standard Pensky Martens, Diesel (Nominal Value: 66.1°C)	250 mL	ALK-CRMU-PMGO
Flash Point Standard - PMCC Procedure B, Lubricant (Nominal Value: 100.7°C)	250 mL	ALK-CRMU-PMLUB
Flash Point Standard - PMCC Procedure B, Lubricant (Nominal Value: 190.5°C)	250 mL	ALK-CRMU-PMLU
Certified Reference Material, Pensky Martens Flash Point (Nominal Value: 76.5 °C)	3 x 80 mL	ALK-CRMU-PMCC-LOW
Certified Reference Material, Pensky Martens Flash Point (Nominal Value: 135.4 °C)	3 x 80 mL	ALK-CRMU-PMCC-MID
Certified Reference Material, Pensky Martens Flash Point (Nominal Value: 210.5 °C)	3 x 80 mL	ALK-CRMU-PMCC-HIGH
Flash Point Reference Standard, Pensky Martens (Nominal Value: 55.0 °C)	3 x 80 mL	ALK-FP-PMCC-1
Flash Point Reference Standard, Pensky Martens (Nominal Value: 75.5 °C)	3 x 80 mL	ALK-FP-PMCC-2
Flash Point Reference Standard, Pensky Martens (Nominal Value: 109.0 °C)	3 x 80 mL	ALK-FP-PMCC-3
Flash Point Reference Standard, Pensky Martens (Nominal Value: 137.5 °C)	3 x 80 mL	ALK-FP-PMCC-4
Flash Point Reference Standard, Pensky Martens (Nominal Value: 175.0 °C)	3 x 80 mL	ALK-FP-PMCC-5
Flash Point Reference Standard, Pensky Martens (Nominal Value: 219.5 °C)	3 x 80 mL	ALK-FP-PMCC-6
Certified Reference Material, Cleveland Open Cup Flash Point (Nominal Value: 111.0 °C)	3 x 80 mL	ALK-CRMU-COC-LOW
Certified Reference Material, Cleveland Open Cup Flash Point (Nominal Value: 161.4 °C)	3 x 80 mL	ALK-CRMU-COC-MID
Certified Reference Material, Cleveland Open Cup Flash Point (Nominal value: 262.0 °C)	3 x 80 mL	ALK-CRMU-COC-HIGH
Flash Point Reference Standard, Cleveland Open Cup (Nominal Value: 84 °C)	3 x 80 mL	ALK-FP-COC-1
Flash Point Reference Standard, Cleveland Open Cup (Nominal Value: 164 °C)	3 x 80 mL	ALK-FP-COC-3
Flash Point Reference Standard, Cleveland Open Cup (Nominal Value: 205 °C)	3 x 80 mL	ALK-FP-COC-4
Flash Point Reference Standard, Cleveland Open Cup (Nominal Value: 259 °C)	3 x 80 mL	ALK-FP-COC-5
Flash Point Reference Standard, Cleveland Open Cup (Nominal Value: 118 °C)	3 x 80 mL	ALK-FP-COC-6
Flash Point Standard - Cleveland, Lubricant (Nominal Value: 257.5°C)	250 mL	ALK-CRMU-FCLU

Cloud Point Standards
For use with ASTM D2500 / ISO 3015, IP 219

Description	Size (mL)	Product No.
Cloud Point Standard, Diesel (Nominal: -7.7°C)	250 mL	ALK-CRMU-CPGO

Cold Filter Plugging Point Standards
For use with ASTM D6371, EN 116 / IP 309

Description	Size (mL)	Product No.
Cold Filter Plugging Point, Diesel (Nominal: -10.8°C)	250 mL	ALK-CRMU-CFGO1
Cold Filter Plugging Point, Diesel (Nominal: -21.7°C)	250 mL	ALK-CRMU-CFGO

Pour Point Standards
For use with ASTM D97, IP 15, ISO 3016

Description	Size (mL)	Product No.
Pour Point Standard, Diesel (Nominal Value: -34.0°C)	250 mL	ALK-CRMU-PPGO
Pour Point Standard, Lubricant (Nominal Value: -11.2°C)	250 mL	ALK-CRMU-PPLU
Pour Point Standard, Lubricant (Nominal Value: -26.1°C)	250 mL	ALK-CRMU-PPLU1
Pour Point Standard, Lubricant (Nominal Value: -38.4°C)	250 mL	ALK-CRMU-PPLU2

Freezing Point Standards
For use with ASTM D2386, IP 16, ISO 3013

Description	Size (mL)	Product No.
Freezing Point, Jet Aviation Fuel (Nominal Value: -53.7°C)	250 mL	ALK-CRMU-FRKR

Smoke Point Standards		
Description	**Size** (mL)	**Product No.**
Smoke Point - Automatic Certified Reference Material, Jet Aviation Fuel (Nominal Value: 23.76 mm)	250 mL	ALK-CRMU-SPKR
Smoke Point Reference Fuel Blend 1 for 14.7 mm (40/60 %v/v)	100 mL	ALK-SPRF-1
Smoke Point Reference Fuel Blend 2 for 20.2 mm (25/75 %v/v)	100 mL	ALK-SPRF-2
Smoke Point Reference Fuel Blend 3 for 22.7 mm (20/80 %v/v)	100 mL	ALK-SPRF-3
Smoke Point Reference Fuel Blend 4 for 25.8 mm (15/85 %v/v)	100 mL	ALK-SPRF-4
Smoke Point Reference Fuel Blend 5 for 30.2 mm (10/90 %v/v)	100 mL	ALK-SPRF-5
Smoke Point Reference Fuel Blend 6 for 35.4 mm (5/95 %v/v)	100 mL	ALK-SPRF-6
Smoke Point Reference Fuel Blend 7 for 42.8 mm (0/100 %v/v)	100 mL	ALK-SPRF-7
Smoke Point Reference Fuel Blend Kit, (Blends 1 – 7: 14.7 mm, 20.2 mm, 22.7 mm, 25.8 mm, 30.2 mm, 35.4 mm and 42.8 mm)	7 X 100 mL	ALK-SPRF-KIT-7

Density Standards For use with ASTM D4052, IP 365, ISO 12185		
Description	**Size** (mL)	**Product No.**
Density Standard, Diesel (Nominal Value 0.83418 g/mL @ 15°C)	250 mL	ALK-CRMU-DEGO
Density Standard, Gasoline (Nominal Value 0.72587 g/mL @ 15°C)	250 mL	ALK-CRMU-DEGA
Density Standard, Jet Aviation Fuel (Nominal Value 0.79684 g/mL @ 15°C)	250 mL	ALK-CRMU-DEKR
Density Standard, Lubricant, (Nominal Value 0.86709 g/mL @ 15°C)	250 mL	ALK-CRMU-DELU
Density Standard 15 °C, (Nominal Density Value 0.6654 at 15 °C)	60 mL	ALK-DEN15-01
Density Standard 15 °C, (Nominal Density Value 0.7183 at 15 °C)	60 mL	ALK-DEN15-02
Density Standard 15 °C, (Nominal Density Value 0.7807 at 15 °C)	60 mL	ALK-DEN15-03
Density Standard 15 °C, (Nominal Density Value 0.8111 at 15 °C)	60 mL	ALK-DEN15-04
Density Standard 15 °C, (Nominal Density Value 0.8494 at 15 °C)	60 mL	ALK-DEN15-05
Density Standard 15 °C, (Nominal Density Value 0.8648 at 15 °C)	60 mL	ALK-DEN15-06
Density Standard 15 °C, (Nominal Density Value 0.8811 at 15 °C)	60 mL	ALK-DEN15-07
Density Standard 15 °C, (Nominal Density Value 0.9413 at 15 °C)	60 mL	ALK-DEN15-08
Density Standard 15 °C, (Nominal Density Value 0.9823 at 15 °C)	60 mL	ALK-DEN15-09
Density Standard 15 °C, (Nominal Density Value 1.0248 at 15 °C)	60 mL	ALK-DEN15-10
Density Standard 15 °C, (Nominal Density Value 1.0687 at 15 °C)	60 mL	ALK-DEN15-11
Density Standard 15 °C, (Nominal Density Value 1.1280 at 15 °C)	60 mL	ALK-DEN15-12
Density Standard 15 °C, (Nominal Density Value 1.1962 at 15 °C)	60 mL	ALK-DEN15-13
Density Standard 15 °C, (Nominal Density Value 1.2829 at 15 °C)	60 mL	ALK-DEN15-14
Density Standard 15 °C, (Nominal Density Value 1.6300 at 15 °C)	60 mL	ALK-DEN15-15
Density Standard 20 °C, (Nominal Density Value 0.6609 at 20 °C)	60 mL	ALK-DEN20-01
Density Standard 20 °C, (Nominal Density Value 0.7142 at 20 °C)	60 mL	ALK-DEN20-02

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Density Standards
For use with ASTM D4052, IP 365, ISO 12185

Description	Size (mL)	Product No.
Density Standard 20 °C, (Nominal Density Value 0.7769 at 20 °C)	60 mL	ALK-DEN20-03
Density Standard 20 °C, (Nominal Density Value 0.8386 at 20 °C)	60 mL	ALK-DEN20-04
Density Standard 20 °C, (Nominal Density Value 0.8452 at 20 °C)	60 mL	ALK-DEN20-05
Density Standard 20 °C, (Nominal Density Value 0.8723 at 20 °C)	60 mL	ALK-DEN20-06
Density Standard 20 °C, (Nominal Density Value 0.9378 at 20 °C)	60 mL	ALK-DEN20-07
Density Standard 20 °C, (Nominal Density Value 0.9811 at 20 °C)	60 mL	ALK-DEN20-08
Density Standard 20 °C, (Nominal Density Value 1.0236 at 20 °C)	60 mL	ALK-DEN20-09
Density Standard 20 °C, (Nominal Density Value 1.0669 at 20 °C)	60 mL	ALK-DEN20-10
Density Standard 20 °C, (Nominal Density Value 1.1256 at 20 °C)	60 mL	ALK-DEN20-11
Density Standard 20 °C, (Nominal Density Value 1.1915 at 20 °C)	60 mL	ALK-DEN20-12
Density Standard 20 °C, (Nominal Density Value 1.2800 at 20 °C)	60 mL	ALK-DEN20-13
Density Standard 20 °C, (Nominal Density Value 1.6218 at 20 °C)	60 mL	ALK-DEN20-14
Density Standard 25 °C, (Nominal Density Value 0.6564 at 25 °C)	60 mL	ALK-DEN25-01
Density Standard 25 °C, (Nominal Density Value 0.7101 at 25 °C)	60 mL	ALK-DEN25-02
Density Standard 25 °C, (Nominal Density Value 0.7730 at 25 °C)	60 mL	ALK-DEN25-03
Density Standard 25 °C, (Nominal Density Value 0.8352 at 25 °C)	60 mL	ALK-DEN25-04
Density Standard 25 °C, (Nominal Density Value 0.8693 at 25 °C)	60 mL	ALK-DEN25-05
Density Standard 25 °C, (Nominal Density Value 0.9342 at 25 °C)	60 mL	ALK-DEN25-06
Density Standard 25 °C, (Nominal Density Value 0.9797 at 25 °C)	60 mL	ALK-DEN25-07
Density Standard 25 °C, (Nominal Density Value 1.0222 at 25 °C)	60 mL	ALK-DEN25-08
Density Standard 25 °C, (Nominal Density Value 1.0650 at 25 °C)	60 mL	ALK-DEN25-09
Density Standard 25 °C, (Nominal Density Value 1.1231 at 25 °C)	60 mL	ALK-DEN25-10
Density Standard 25 °C, (Nominal Density Value 1.1868 at 25 °C)	60 mL	ALK-DEN25-11
Density Standard 25 °C, (Nominal Density Value 1.2771 at 25 °C)	60 mL	ALK-DEN25-12
Density Standard 25 °C, (Nominal Density Value 1.6136 at 25 °C)	60 mL	ALK-DEN25-13
Density Standard 40 °C, (Nominal Density Value 0.6426 at 40 °C)	60 mL	ALK-DEN40-01
Density Standard 40 °C, (Nominal Density Value 0.6977 at 40 °C)	60 mL	ALK-DEN40-02
Density Standard 40 °C, (Nominal Density Value 0.7934 at 40 °C)	60 mL	ALK-DEN40-03
Density Standard 40 °C, (Nominal Density Value 0.8250 at 40 °C)	60 mL	ALK-DEN40-04
Density Standard 40 °C, (Nominal Density Value 0.8716 at 40 °C)	60 mL	ALK-DEN40-05
Density Standard 50 °C, (Nominal Density Value 0.7864 at 50 °C)	60 mL	ALK-DEN50-01
Density Standard 50 °C, (Nominal Density Value 0.8102 at 50 °C)	60 mL	ALK-DEN50-02
Density Standard 50 °C, (Nominal Density Value 0.8659 at 50 °C)	60 mL	ALK-DEN50-03
Density Standard 60 °C, (Nominal Density Value 0.7924 at 60 °C)	60 mL	ALK-DEN60-01
Density Standard 60 °C, (Nominal Density Value 0.8201 at 60 °C)	60 mL	ALK-DEN60-02
Density Standard 60 °C, (Nominal Density Value 0.8688 at 60 °C)	60 mL	ALK-DEN60-03

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Density Standards
For use with ASTM D4052, IP 365, ISO 12185

Description	Size (mL)	Product No.
Density Standard 80 °C, (Nominal Density Value 0.7785 at 80 °C)	60 mL	ALK-DEN80-01
Density Standard 80 °C, (Nominal Density Value 0.8246 at 80 °C)	60 mL	ALK-DEN80-02
Density Standard 80 °C, (Nominal Density Value 0.8578 at 80 °C)	60 mL	ALK-DEN80-03
Density Standard 100 °C, (Nominal Density Value 0.7645 at 100 °C)	60 mL	ALK-DEN100-01
Density Standard 100 °C, (Nominal Density Value 0.8124 at 100 °C)	60 mL	ALK-DEN100-02
Density Standard 100 °C, (Nominal Density Value 0.8550 at 100 °C)	60 mL	ALK-DEN100-03
Density Standard 150 °C, (Nominal Density Value 0.7288 at 150 °C)	60 mL	ALK-DEN150-01
Density Standard 150 °C, (Nominal Density Value 0.7816 at 150 °C)	60 mL	ALK-DEN150-02
Density Standard 150 °C, (Nominal Density Value 0.8287 at 150 °C)	60 mL	ALK-DEN150-03

Refractive Index Certified Reference Material, Certified at 20°C, 25°C and 30°C

Description	Size (mL)	Product No.
Nominal RI Value 1.3325 at 25°C	10 mL	ALK-PS-RI-01
Nominal RI Value 1.3325 at 25°C	5 x 10 mL	ALK-PS-RI-01K
Nominal RI Value 1.3891 at 25°C	10 mL	ALK-PS-RI-02
Nominal RI Value 1.3891 at 25°C	5 x 10 mL	ALK-PS-RI-02K
Nominal RI Value 1.4023 at 25°C	10 mL	ALK-PS-RI-03
Nominal RI Value 1.4023 at 25°C	5 x 10 mL	ALK-PS-RI-03K
Nominal RI Value 1.4196 at 25°C	10 mL	ALK-PS-RI-04
Nominal RI Value 1.4196 at 25°C	5 x 10 mL	ALK-PS-RI-04K
Nominal RI Value 1.4206 at 25°C	10 mL	ALK-PS-RI-05
Nominal RI Value 1.4206 at 25°C	5 x 10 mL	ALK-PS-RI-05K
Nominal RI Value 1.4573 at 25°C	10 mL	ALK-PS-RI-06
Nominal RI Value 1.4573 at 25°C	5 x 10 mL	ALK-PS-RI-06K
Nominal RI Value 1.4941 at 25°C	10 mL	ALK-PS-RI-07
Nominal RI Value 1.4941 at 25°C	5 x 10 mL	ALK-PS-RI-07K
Nominal RI Value 1.5349 at 25°C	10 mL	ALK-PS-RI-08
Nominal RI Value 1.5349 at 25°C	5 x 10 mL	ALK-PS-RI-08K
Nominal RI Value 1.5440 at 25°C	10 mL	ALK-PS-RI-09
Nominal RI Value 1.5440 at 25°C	5 x 10 mL	ALK-PS-RI-09K
Nominal RI Value 1.6556 at 25°C	10 mL	ALK-PS-RI-10
Nominal RI Value 1.6556 at 25°C	5 x 10 mL	ALK-PS-RI-10K

Color Standards
For use with ASTM D6045, ASTM D1500, ASTM D156, ASTM D1544, ASTM D6166

Description	Size (mL)	Product No.
Color Reference Standard ASTM <0.5 Color	500 mL	ALK-134290.00
Color Reference Standard ASTM 1 Color	500 mL	ALK-134000
Color Reference Standard ASTM 3 Color	500 mL	ALK-134010
Color Reference Standard ASTM 5 Color	500 mL	ALK-134020
Color Reference Standard ASTM 7 Color	500 mL	ALK-134030
Color Reference Standard Saybolt Color -10	500 mL	ALK-134040.00
Color Reference Standard Saybolt Color 0	500 mL	ALK-134050
Color Reference Standard Saybolt Color +12	500 mL	ALK-134060
Color Reference Standard Saybolt Color +25	500 mL	ALK-134070
Color Reference Standard Gardner Color Value 2	500 mL	ALK-134200
Color Reference Standard Gardner Color Value 5	500 mL	ALK-134210
Color Reference Standard Gardner Color Value 8	500 mL	ALK-134220

Section 2

Matrix Oils & Solvents

V-Solv™ is a proprietary solvent that is used for diluting oil and other organic liquids for analysis by ICP-OES, ICP-MS, and other analytical techniques that require dilution. Use V-Solv™ as a matrix blank and as a diluent for your calibration standards and samples for outstanding nebulization characteristics.

V-Solv™ offers the following advantages over conventional low odor/odorless kerosene, xylene and other commercial solvents:

- Very high-purity (essentially no trace metals or sulfur) - each bottle is accompanied by a Certificate of Analysis (CoA) that states the trace impurity levels of 36 metals and sulfur
- Makes very stable dilutions of metallo-organic standards and oil samples
- Extremely low odor – no kerosene or aromatic smell – resulting in a comfortable work environment and is also VOC-exempt for consumer products applications (EPA Title 40, Volume 5, Parts 53-59)
- Extremely low toxicity compared with kerosene or xylene
- Non-hazardous to ship (flashpoint of 260 °F)
- One gallon or five gallon bottles available for ease of use and for shipment via common carrier

V-Solv™ ICP Solvent

Description	Size	Product No.
V-Solv™ ICP Solvent	1 Gal	VHG-V-SOLV-1GAL
	55 Gal	VHG-V-SOLV-55GAL
Pre-Mixed ICP Solvent + Cobalt: Co @ 40.0 µg/g in V-Solv™	1 Gal	VHG-V-SOLV+CO-1GAL
	5 Gal	V-SOLV+CO-5GAL
	55 Gal	V-SOLV+CO-55GAL

Matrix Oil

Description	Size	Product No.
75 cSt Mineral Oil Blank (trace metals reported to <0.1 ppm)	500 mL	VHG-OIL-75-500
	1 Gal	VHG-OIL-75-1GAL
75 cSt Mineral Oil Blank (trace metals & sulfur reported)	500 mL	VHG-OIL-MIN-500
	0.5 Gal	VHG-OIL-MIN-1/2GAL
20 cSt Mineral Oil Blank (trace metals reported)	500 mL	VHG-OIL-20-500
	1 Gal	VHG-OIL-20-1GAL
20 cSt Mineral Oil Blank (trace metals & sulfur reported)	500 mL	VHG-OIL-20MIN-500
	0.5 Gal	VHG-OIL-20MIN-1/2GAL

Section 3

Sulfur, Chlorine & Biodiesel Standards

Sulfur Standards

Sulfur in Diesel Fuel
Intended for determining sulfur content in petroleum products by XRF in accordance with ASTM D2622, D4294, D5453, D7039, D7212, D7220 and others.

Description	Matrix	Size (mL)	Product No.
Sulfur Blank in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-BLK-100
Sulfur Standard: S @ 5 µg/g (0.0005 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-5-100
Sulfur Standard: S @ 10 µg/g (0.0010 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-10-100
Sulfur Standard: S @ 15 µg/g (0.0015 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-15-100

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Sulfur in Diesel Fuel
Intended for determining sulfur content in petroleum products by XRF in accordance with ASTM D2622, D4294, D5453, D7039, D7212, D7220 and others.

Description	Matrix	Size (mL)	Product No.
Sulfur Standard: S @ 20 µg/g (0.0020 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-20-100
Sulfur Standard: S @ 25 µg/g (0.0025 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-25-100
Sulfur Standard: S @ 50 µg/g (0.0050 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-50-100
Sulfur Standard: S @ 75 µg/g (0.0075 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-75-100
Sulfur Standard: S @ 100 µg/g (0.0100 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-100-100
Sulfur Standard: S @ 200 µg/g (0.0200 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-200-100
Sulfur Standard: S @ 300 µg/g (0.0300 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-300-100
Sulfur Standard: S @ 400 µg/g (0.0400 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-400-100
Sulfur Standard: S @ 500 µg/g (0.0500 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-500-100
Sulfur Standard: S @ 750 µg/g (0.0750 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-750-100
Sulfur Standard: S @ 1,000 µg/g (0.100 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-1000-100
Sulfur Standard: S @ 1,500 µg/g (0.150 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-1500-100
Sulfur Standard: S @ 3,000 µg/g (0.300 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-3000-100
Sulfur Standard: S @ 5,000 µg/g (0.500 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-5000-100
Sulfur Standard: S @ 7,500 µg/g (0.750 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-7500-100
Sulfur Standard: S @ 10,000 µg/g (1.00 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-1P-100
Sulfur Standard: S @ 20,000 µg/g (2.00 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-2P-100
Sulfur Standard: S @ 30,000 µg/g (3.00 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-3P-100
Sulfur Standard: S @ 40,000 µg/g (4.00 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-4P-100
Sulfur Standard: S @ 50,000 µg/g (5.00 wt%) in #2 Diesel Fuel	#2 Diesel Fuel	100	VHG-SDSL-5P-100

Chlorine Standards

Chlorine in Oil Standards for XRF
Intended for use with ASTM D4929 and D5384

Description	Matrix	Size (mL)	Product No.
Chlorine Standard: Cl @ 10 µg/g (0.0010 wt%)	75 cSt Mineral Oil	100	VHG-CLOIL-10-100
Chlorine Standard: Cl @ 20 µg/g	75 cSt Mineral Oil	100	VHG-CLOIL-20-100
Chlorine Standard: Cl @ 25 µg/g	75 cSt Mineral Oil	100	VHG-CLOIL-25-100
Chlorine Standard: Cl @ 50 µg/g	75 cSt Mineral Oil	100	VHG-CLOIL-50-100
Chlorine Standard: Cl @ 75 µg/g	75 cSt Mineral Oil	100	VHG-CLOIL-75-100
Chlorine Standard: Cl @ 100 µg/g (0.0100 wt%)	75 cSt Mineral Oil	100	VHG-CLOIL-100-100
Chlorine Standard: Cl @ 200 µg/g (0.0200 wt%)	75 cSt Mineral Oil	100	VHG-CLOIL-200-100
Chlorine Standard: Cl @ 250 µg/g (0.0250 wt%)	75 cSt Mineral Oil	100	VHG-CLOIL-250-100
Chlorine Standard: Cl @ 500 µg/g (0.0500 wt%)	75 cSt Mineral Oil	100	VHG-CLOIL-500-100
Chlorine Standard: Cl @ 750 µg/g (0.0750 wt%)	75 cSt Mineral Oil	100	VHG-CLOIL-750-100
Chlorine Standard: Cl @ 1,000 µg/g (0.100 wt%)	75 cSt Mineral Oil	100	VHG-CLOIL-1000-100
Chlorine Standard: Cl @ 2,000 µg/g (0.200 wt%)	75 cSt Mineral Oil	100	VHG-CLOIL-2000-100
Chlorine Standard: Cl @ 10,000 µg/g (1.00 wt%)	75 cSt Mineral Oil	100	VHG-CLOIL-1P-100
Chlorine Standard: Cl @ 50,000 µg/g (5.00 wt%)	75 cSt Mineral Oil	100	VHG-CLOIL-5P-100

Biodiesel Standards

B100 / Diesel Blends
For use with ASTM Method D7371 or EN 14078

Description	Matrix	Size (mL)	Product No.
100% High Cetane Diesel Fuel	High Cetane Diesel Fuel	20	VHG-BDBLEND-BLK-20
2% Biodiesel / 98% High Cetane Diesel Fuel, v/v	High Cetane Diesel Fuel/ Biodiesel	20	VHG-BDBLEND-2P-20
5% Biodiesel / 95% High Cetane Diesel Fuel, v/v	High Cetane Diesel Fuel / Biodiesel	20	VHG-BDBLEND-5P-20
10% Biodiesel / 90% High Cetane Diesel Fuel, v/v	High Cetane Diesel Fuel/ Biodiesel	20	VHG-BDBLEND-10P-20
15% Biodiesel / 85% High Cetane Diesel Fuel, v/v	High Cetane Diesel Fuel/ Biodiesel	20	VHG-BDBLEND-15P-20
20% Biodiesel / 80% High Cetane Diesel Fuel, v/v	High Cetane Diesel Fuel/ Biodiesel	20	VHG-BDBLEND-20P-20
25% Biodiesel / 75% High Cetane Diesel Fuel, v/v	High Cetane Diesel Fuel/ Biodiesel	20	VHG-BDBLEND-25P-20
30% Biodiesel / 70% High Cetane Diesel Fuel, v/v	High Cetane Diesel Fuel/ Biodiesel	20	VHG-BDBLEND-30P-20
100% Biodiesel	High Cetane Diesel Fuel/ Biodiesel	20	VHG-BDBLEND-100P-20

Section 4

Aqueous Inorganic Standards

Ion Chromatography & Liquid Chromatography Standards

Description	Matrix	Size (mL)	Product No.
Chloride (from KCl) Standard: Cl- @ 1,000 µg/mL	Water	100	VHG-ICL1K-100
Nitrite Standard: NO2- @ 1,000 µg/mL	Water	500	VHG-INO2-500
Glycolate Standard: C2H3O3- @ 1,000 µg/mL	Water	100	VHG-IGLY-100
Nitrate Standard: NO3- @ 1,000 µg/mL	Water	500	VHG-INO3-500
Sulfate Standard: SO4(-2) @ 1,000 µg/mL	Water	100	VHG-ISO41K-100

Multi-Element Standards for use with IP501

Description	Matrix	Size (mL)	Product No.
IP 501 Concentrate: Al, Ca, Fe, Na, Ni, P, Si, V, Zn @ 1000 µg/mL	5% HNO3	100	VHG-IP501-100
		500	VHG-IP501-500
IP501 + Common metals, 500ppm: Al, Ca, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Si, V, Zn @ 500 µg/mL	10% HNO3/tr. HF	100	VHG-IP501M500-100
		500	VHG-IP501M500-500
IP501 + Common metals, 100ppm: Al, Ca, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Si, V, Zn @ 100 µg/mL	5% HNO3/tr HF.	100	VHG-IP501M100-100
		500	VHG-IP501M100-500

Multi-Element Standards for Analysis of Elements in Engine Coolant

For use with DIN 51852-3, ASTM D6130

Description	Matrix	Size (mL)	Product No.
DIN 51852-3 Mixture: Al @ 3000; Ca, P @ 1000; Fe @ 500; Mg @ 400; Cu, Pb, S, Sr, Zn @ 200; Cr, Mn, Ni @ 100 µg/g	2% HNO3	100	VHG-ECM-1-100
Elements in Engine Coolant, High Calibration Standard: Na @ 10000; K @ 5000; P @ 2000; B @ 1000; Cu, Fe, Pb, Zn @ 50; Ca @ 32; Mg @ 20; Al @ 10 ug/g in 3% HNO3	3% HNO3	100	VHG-ECM-HIGH-100
		500	VHG-ECM-HIGH-500
Elements in Engine Coolant, Low Calibration Standard: Al, Cu @ 2; Mg, Zn @ 4; Fe @ 5; Ca, Pb @ 10; B @ 50; P @ 400; K , Na @ 1000 ug/g in 3% HNO3	3% HNO3	100	VHG-ECM-LOW-100
		500	VHG-ECM-LOW-500
Elements in Engine Coolant, QC Standard: Na @ 5000; K @ 2500; P @ 1000; B @ 250; Ca @ 50; Fe, Pb @ 25; Zn @ 20; Mg @ 10; Al, Cu @ 5 ug/g in 3% HNO3	3% HNO3	100	VHG-ECM-QC-100
		500	VHG-ECM-QC-500
Multi-Element Coolant Standard: P @ 2,500 µg/g; B, K, Na @ 1,000 µg/g; Mo, Si @ 500 µg/g; Al, Ca, Cu, Fe, Mg, Pb, Zn @ 50 µg/g	dil. HNO3, tr. HF	100	VHG-GLYCOLSTD-100
		250	VHG-GLYCOLSTD-250
		500	VHG-GLYCOLSTD-500

Section 5

Consumables

Instrument Consumables		
Description	**Pack Size**	**Product No.**
Polypropylene Sample Tubes, Round Bottom, 17 x 100 mm (~15 mL)	1,200	VHG-FPSC1-MP
Polypropylene Sample Tubes, Round Bottom, 13 x 100 mm (~8 mL)	1,200	VHG-FPSC4-MP
Plug/cap to fit VHG-FPSC4-MP (13 x 100 mm tube)	1,200	VHG-FPSC4-MP-PLUG
Plug/cap to fit VHG-FPSC1-MP (17 x 100 mm tube)	1,200	VHG-FPSC1-MP-PLUG
Polypropylene Sample Tubes for Viscometer Autosamplers, Cylindrical Bottom, 2.3 x 6 cm (15 mL)	1,000	VHG-FVISC-MPA
Titration Beakers for use with Mettler (100 mL)	450	VHG-FSB1-MP
Titration Beakers for use with Metrohm (120 mL)	300	VHG-FSB2-MP
Black/Black Solvent Flex Peri-Pump Tubing, 2-Bridge, 0.76 mm (0.03")	12	VHG-D180209
Red/Red Solvent Flex Peri-Pump Tubing, 2-Bridge, 1.14 mm (0.045")	12	VHG-D180207

Section 6

Proficiency Testing

Our Proficiency Testing Program (PTP) was designed to provide rapid validation of measurements, with results available on your timeline. Program includes test samples for metals, sulfur, viscosity,and particle count in new or in-service oils.

The PTP enables participating labs to monitor their analytical performance as measured against Certified Reference Materials (CRMs) in three quick and easy steps:

1) **Analyze the PTP Sample**
2) **Enter results online**
3) **Check your accuracy and receive your immediate results**

Instant Feedback Proficiency Test Samples			
Description	**Matrix**	**Size**	**Product No.**
PTP Sample for Elemental Analysis of Oils	75 cSt Mineral Oil	25 g	VHG-VPTPMO-25G
PTP Sample for Viscosity Analysis	75 cSt Mineral Oil	50 mL	VHG-VPTPVISC-50
PTP Sample for Particle Count Analysis	75 cSt Mineral Oil	125 mL	VHG-VPTPPC-125
PTP Set (contains one of each of the above)	75 cSt Mineral Oil	3 bottles	VHG-VPTPSET1
PTP Sample for Sulfur	#2 Diesel Fuel	25 mL	VHG-PTPSDSL-25
PTP Sample for Particle Count Analysis (traceable to NIST SRM 2806a)	Hydraulic Fluid	100 mL	VHG-VPTPPC-2806A-100

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We leverage an extensive distributor network where there is no sales office represented.

* Indicates a Centre of Excellence

For full listing of offices and distributors please see **lgcstandards.com**