Lubricant Testing Solutions
Laboratory Instruments for quality control, analysis and calibration
Flash Point

Flash point is a key property for lubricating oils and is included in many specifications. All petroleum products will ignite if raised to a sufficiently high temperature. It is essential that lubricating oils have flash and fire points that are well above their expected operating temperatures. Flash point is also used to determine whether lubricating oils have been contaminated with volatile materials and is a common test when assessing used lubricants.

PM-93 Pensky-Martens Flash Point (35000-0)

ASTM D93, IP 34, ISO 2719, FTM 791 1102

- IP 34 and ISO 2719 mandates the use of a fire extinguisher
- The Seta PM-93 is a fully automated Pensky-Martens Closed Cup Flash Point Tester which combines strict method conformance with state of the art control technology and safety systems to provide the next generation of precision flash point instruments.
  - Fully conforms to test method ASTM D93 – Procedure A, B and C
  - Ambient +5°C to 400°C
  - 4 heating rates available
  - Simple operation, touch screen menu
  - Unique ‘SafeFlash’ extinguisher system and pre-dip safety mode
  - Single action lifting arm operation
  - Programmable, 30 test profiles, test methods and sample identities
  - Test memory for 2000 results
  - Gas or electronic ignition using long lasting Seta ‘Ignite’ technology
  - Optional barcode reader available
  - Integrated ASTM D6299 Statistical Quality Assurance and Control Charting Module

Visit: www.stanhope-seta.co.uk/4756/PM-93-Pensky-Martens-Flash-Point-Tester

Cleveland Multiflash (34300-2)

ASTM D92, IP 36, ISO 2592, FTM 791 1103

The Seta Multiflash Cleveland is a fully automatic open cup tester for both flash and fire point determination.
  - Fully automatic heating control, flash and fire detection
  - Ambient to 400°C
  - Gas or electric ignition
  - Automatic snuffer
  - Centigrade or Fahrenheit temperature display

Shown opposite with the Multiflash Universal Base unit (p/n 34000-0).

Visit: www.stanhope-seta.co.uk/4340/Seta-Multiflash-Cleveland-Flash-Point-Module

Lubricating Oil Multi-Test Verification Material (99853-2)

Manufactured and certified in strict accordance with ISO Guide 34, for full details see page 14.

Cleveland Standard (99882-0)

Designed specifically for use in determining flash points in petroleum products by the Cleveland Open Cup method.
  - Fully traceable to National Standards
  - Tested in accordance with ASTM D92/IP 36 and certified to ISO 17025/ISO Guide 34
  - 258°C nominal value
  - Supplied in 80ml bottles
  - Pack of 3, 6 or 12 available
Laboratory instruments for quality control, analysis and calibration

Small Scale Flash Point in Oil Condition Monitoring
Flash point as part of an oil condition monitoring program can assist in reliably identifying degradation and contamination of the oils from fuel dilution. It complements other tests such as viscosity measurement, and can be used to confirm whether a low viscosity result is due to improper blending, lubricant breakdown or fuel dilution. Fuel contamination of under 1% can be detected with the Setaflash small scale instruments.

Setaflash Series 3 Small Scale Testers
ASTM D3278, ASTM D3828, ASTM D7236, IP 523, IP 524, IP 534, ISO 3679, ISO 3680
The Setaflash Series 3 provides fast and reliable flash point results with minimum operator expertise required, ideal for use in the laboratory, production line or for portable test applications.
- Ambient to 300°C
- Results determined in less than 2 minutes
- Small sample size, 2 or 4ml
- Automatic flash detection
- Audible and on-screen prompts
- Simple user interface with touch screen icons
- 1GB data capacity, holding 100,000 results
- Results can be saved to a USB stick
- Compact, portable, rugged design
- Barometric pressure correction

Visit: www.stanhope-seta.co.uk/small-scale-flashpoint-testing.asp

<table>
<thead>
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<th>Seta Part No.</th>
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<th>33000-2</th>
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<td>Temperature Range:</td>
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<td>Ambient to 300°C (527°F)</td>
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<tr>
<td>Sample Size:</td>
<td>2 or 4ml according to method</td>
<td>2 or 4ml according to method</td>
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<tr>
<td>Test Duration: (Rapid Equilibrium Mode)</td>
<td>1 minute &lt;100°C, 2 minutes &gt;100°C</td>
<td>1 minute &lt;100°C, 2 minutes &gt;100°C</td>
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<tr>
<td>Ramp Rate:</td>
<td>°C/min ramp</td>
<td>°C/min ramp</td>
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<tr>
<td>Cup Material:</td>
<td>Aluminium</td>
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<tr>
<td>Size (HxWxD) / Weight:</td>
<td>19.5 x 29.5 x 14cm / 3kg</td>
<td>19.5 x 29.5 x 14cm / 3kg</td>
</tr>
</tbody>
</table>

Setaflash Series 8 Small Scale Tester
ASTM D3278, ASTM D3828, ASTM D7236, IP 523, IP 524, IP 534, ISO 3679, ISO 3680
The Setaflash Series 8 is an automated closed cup flash point tester with a temperature range of ambient to 300°C. The instrument uses an electric hot wire ignitor.
- Flash/no flash and ramp mode
- Ambient +5°C to 300°C
- Small sample size, 2 or 4ml
- Electric ignitor (gas option available)
- Automatic dipping and flash detection
- 64 Test memory & RS232 interface
- °C or °F temperature display
- Barometric pressure correction

Visit: www.stanhope-seta.co.uk/small-scale-flashpoint-testing.asp

<table>
<thead>
<tr>
<th>Seta Part No.</th>
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<td>Test Modes:</td>
<td>Rapid Equilibrium and Ramp</td>
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<tr>
<td>Sample Size:</td>
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<tr>
<td>Test Duration: (Rapid Equilibrium Mode)</td>
<td>1 minute &lt;100°C, 2 minutes &gt;100°C</td>
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<tr>
<td>Ramp Rate:</td>
<td>°C/min ramp</td>
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<tr>
<td>Cup Material:</td>
<td>Aluminium</td>
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<tr>
<td>Heating/Cooling Method:</td>
<td>Ceramic Pad, Forced Air (post-test cooldown)</td>
</tr>
<tr>
<td>Size (HxWxD) / Weight:</td>
<td>19.5 x 29.5 x 14cm / 3kg</td>
</tr>
</tbody>
</table>
Lubricant Testing Solutions

Viscosity
A key property which determines the ability of the lubricating oil to form a film that protects moving machinery components from wear during operation. Kinematic viscosity forms an integral part of lubricating oil specifications.

Seta KV-6 Ultra Stable 6-Place Viscosity Bath (84200-3)
ASTM D445, IP 71, ISO 3104, FTM 791 305
The Seta KV-6 gives the user a high quality, robust solution for kinematic viscosity determinations. Ultra precise temperature stability and uniformity is achieved with an integrated heating and stirring system. All internal components are made of stainless steel construction to ensure long term durability. The large 50 litre capacity ensures minimum temperature recovery time after loading of bath, improving sample throughput.

- Accommodates up to 6 viscometer tubes
- Temperature range ambient to 150°C (cooling coil included)
- Oil, silicone fluid or water
- Temperature Stability: ±0.005° at 40°C; ±0.01° at 100°C; ±0.02° at 150°C
- Temperature Uniformity: ±0.005° at 40°C; ±0.01° at 100°C
- Integral safety features
- LED illumination
- Two positions for reference thermometers

Each bath is supplied with a full factory calibration and graphical temperature trace of stability. Visit: www.stanhope-seta.co.uk/5406/KV6-Viscometer-Bath

Calibrated Cannon-Fenske Viscometers
ASTM D445, ASTM D446, IP 71, ISO 3104, ISO 3105

- Supplied with works certificate of calibration (calibration data at 40°C with the constant quoted at 40°C and 100°C).
- UKAS certificate of calibration available on request
- Routine Viscometers (11634/**): For transparent liquids requiring approximately 7ml of sample
- Opaque Viscometers (11641/**): For transparent and opaque liquids requiring approximately 12ml of sample

<table>
<thead>
<tr>
<th>Viscosity Range (mm²/s)</th>
<th>Nominal Constant</th>
<th>Size Code</th>
<th>Viscosity Std A</th>
<th>Viscosity Std B</th>
<th>Seta Part Number Routine</th>
<th>Seta Part Number Opaque</th>
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<tr>
<td>0.5 to 2</td>
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<td>25</td>
<td>N0.8</td>
<td>N1</td>
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<td>11641/01</td>
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<td>0.8 to 4</td>
<td>0.004</td>
<td>50</td>
<td>N1</td>
<td>N2</td>
<td>11634/02</td>
<td>11641/02</td>
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<td>1.6 to 8</td>
<td>0.008</td>
<td>75</td>
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<td>S6</td>
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<td>D10</td>
<td>11634/04</td>
<td>11641/04</td>
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<td>S20</td>
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<td>S60</td>
<td>11634/06</td>
<td>11641/06</td>
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<td>300</td>
<td>N100</td>
<td>S200</td>
<td>11634/07</td>
<td>11641/07</td>
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</tbody>
</table>

Viscosity Reference Standards
A range of ISO 17025 (UKAS) quality standards are available, for full details see page 14.

- Full compliance with ASTM, IP and other method protocols
- Supplied in 500ml containers with 2 year shelf life

Typical example of stability at 40°C and 100°C.
Laboratory instruments for quality control, analysis and calibration

4-Ball and Shear Stability

Shear stability is a measure of a lubricants resistance to viscosity loss when it is passed through narrow passageways such as bearings or gears. A common test for this property is the Taper Roller Bearing Rig (KRL) test CEC-L-45-99.

Seta-Shell 4-Ball Lubricant Testers (19800-7 & 19900-3)

ASTM D2783, FTM 791 6503, IP 239, CEC-L-45-99, ISO 26422

The 4-Ball Lubricant Testers are floor standing instruments designed to determine the friction properties of extreme pressure oils and greases. They are used in tribology research laboratories and in the routine quality control of finished lubrication products.

- Applied loads range up to 800kgf
- Drive speed from 1200 to 1760rpm
- Digital timer and display with selectable range 0.1s to 9999hr
- Digital displays and microprocessor control of Applied Load and Torque (19900-3)
- Interlocked guards for maximum safety
- Optional heating pad and controller

Visit: [www.stanhope-seta.co.uk/4913/Seta-Shell-4-Ball-Tester-Autoload](http://www.stanhope-seta.co.uk/4913/Seta-Shell-4-Ball-Tester-Autoload)

<table>
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<tr>
<th>Seta Part No</th>
<th>19900-3 (Autoload)</th>
<th>19800-7 (Manual)</th>
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<tr>
<td>Speed Range</td>
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<td>1200 to 1760rpm</td>
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<td>Load Range</td>
<td>40 to 800kgf</td>
<td>0 to 800kgf</td>
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<tr>
<td>Timing</td>
<td>0.1s to 9999hr</td>
<td>0.1s to 9999hr</td>
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<tr>
<td>Voltage</td>
<td>220/240V 50/60Hz</td>
<td>220/240V 50/60Hz</td>
</tr>
<tr>
<td>Power</td>
<td>2.6kW</td>
<td>2.6kW</td>
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<tr>
<td>Size (HxWxD) / Weight:</td>
<td>169 x 63 x 62cm / 150kg</td>
<td>169 x 82 x 62cm / 161kg</td>
</tr>
</tbody>
</table>

Viscosity Shear Stability Head (19820-3)

CEC L-45-99. ISO 26422

- Temperature control via an External Chiller
- PC connectivity for temperature datalogging
- Secondary over temperature monitoring with automatic shutdown
- Quick release mounting system for easy bearing access

The shear stability head fits into the test aperture of the 4-Ball Lubricant tester and comprises of a tapered roller bearing, jacket, drive lug, thermocouple spacer ring, bearing pad and plunger spacer disk. An integral temperature probe connects to a external temperature control system.

Microscope with Digital Camera (19750-3)

The Microscope is used for x/y linear measurement and allows direct viewing of the ball scar with x50 magnification. The 1.3 Megapixel CCD camera fits any Seta microscope to allow image capture of the scars and on-screen measurement of the size.

Comprises Microscope, ball holder, lamp kit, grounding wire, leads. Camera supplied with software, calibration graticule slide and a 0.45x lens, 23.2mm/30.5mm/31.5mm c-mount adapters, and USB cable.

Existing users of the Microscope can upgrade to digital measurement by purchasing the camera (19755-0).
Foaming Characteristics

The performance of a lubricant depends upon its ability to resist foaming and air entrapment. Foaming causes the protective film on the operating surfaces to be broken down and the effectiveness of the lubricant to reduce. This quickly leads to component wear. Foaming can also cause increased lubricant loss and premature oxidation.

Setafoam Dual Twin Foam Test Baths (14020-8)

ASTM D892, IP 146, FTM 791 3211

Setafoam Dual Twin Foam Test Baths are a pair of highly transparent water baths for detecting foaming characteristics in lubricating oils. A known volume of air is passed through foam-stones and into the sample, the height of the foam is then recorded.

- High and low temperature baths
- Temperature range ambient to 100°C
- Up to two simultaneous tests per bath
- Two pre-heating stations per bath
- Two integral normalising coils
- Local verification of the stones possible using the verification kit
- Digital Mass Flow or Glass Flowmeters
- LED backlighting

Tests for Maximum Pore Diameter and Permeability of Gas Diffusers

ASTM D892 mandates the regular verification of foam stones prior to use to ensure that the pore diameter and permeability meets the requirements of the test method.

Seta Verification Kit (14028-4)

ASTM D892 Annex A1, ASTM E128

The Seta Verification kit provides an accurate method of determining the pore diameter and permeability of gas diffusers in accordance with Annex A1 of D892. The equipment comprises of an air pump, a test selector valve, air control regulators, glassware, digital manometer and a flowmeter, all mounted on a chassis with the necessary manifolds and interconnecting tubes. The flowmeter and manometer are supplied with UKAS certification.

Visit: www.stanhope-seta.co.uk/3292/Foam-Verification-Kit

Automatic Diffuser Washing

Appendix X1 in ASTM D892 provides guidance on a procedure for cleaning the diffusers. This includes a flush with toluene, heptane and dry air sequence which is repeated 5 times.

Seta Autowash (14024-2)

The Seta Autowash automates the washing sequence detailed in ASTM D892 and allows unattended washing of the diffusers.

- Automatic and unattended cleaning of diffusers
- Up to 10 factory washing programs available
- Consistent cleaning provides reliable and repeatable results
- Up to 2 solvents can be used
- Low solvent use
- No operator exposure to solvents
- Can prolong the life of the diffuser

Visit: www.stanhope-seta.co.uk/2385/Seta-Autowash
Go-No-Go Viscosity Checks for In-Service Testing

Comparator (22950-2)

- Ideal for in-service lubricant oil testing
- Rapid and easy Go / No-Go viscosity test
- 10ml sample and reference oil size
- Suitable for clear and opaque liquids

Visit: www.stanhope-seta.co.uk/1372/Seta-Tri-Gauge-Viscosity-Comparator

Portable Oil Condition Test Kit (86000-4)

- Suitable for lubricating oils, crank case, hydraulic, gear, turbine and compressor oils
- Ready to use
- Five simple to use tests
- Rugged fitted case

Visit: www.stanhope-seta.co.uk/4692/Seta-Portable-Oil-Condition-Test-Kit

Density

Portable Density Measurement Kit (12600-0)

ASTM D1298, IP 160, ISO 3675, ASTM D4052, ISO 12185

The oscillating U Tube type density meter draws sample into the measurement chamber via a spring loaded plunger action pump, providing a rapid density measurement.

- 0 to 3g/cm³ range
- Single hand operation
- Density and SG measurements
- Explosion-proof - Ex II 2 G EEx ib IIC T4
- Petrol and organic solvent resistant
- Automatic temperature compensation
- Density standards included in the kit

Visit: www.stanhope-seta.co.uk/3627/Portable-Density-Measurement-Kit

Distillation

Provides information on volatility and residues. Typically this parameter is included in mineral oil specifications where a high degree of purity is required.

Setastill (11860-3)

ASTM D86, IP 123, ISO 3405, FTM 791 1001

The Setastill is a simple, manual, small footprint distillation unit comprising a flask support mechanism, heater elements, and the heater controller. The flask is supported by a drop-in ceramic-glass support board mounted to a platform that is adjustable for height.

- Ambient to 400°C distillation range
- Adjustable height heater/flask platform
- Toughened glass window
- Cooling fan

Visit: www.stanhope-seta.co.uk/3391/Setastill-Distillation
Oxidation Characteristics

Oxidation stability provides an indication of the service life of the oil. ASTM D943 covers the Oxidation Characteristics of inhibited mineral oils. ASTM D4310 covers the sludging and corrosion tendencies of the oil in the presence of a metal catalyst.

Seta Oxidation Bath (16900-7)

ASTM D943, ISO 4263, ASTM D4310

The Seta Oxidation Bath comprises of a 35 litre oil bath which can accept up to six sets of glassware. A Seta Oxflo control unit includes a gas inlet pressure regulator, pressure gauge and six precision flowmeters calibrated for oxygen at 3 litres/hour, 21°C and 0.4 bar pressure.

- Ambient +5°C to 100°C temperature range
- 6 position oil bath
- Digital thermostat unit
- Seta Oxflo Controller and 6 flowmeters included
- Low liquid protection and over temperature cut out

Visit: www.stanhope-seta.co.uk/5099/Oxidation-Bath-with-Oxflo-Controller

Oxidation Stability for Steam Turbine, Automotive and Mineral Insulating Transformer Oils

A range of test methods are covered by RõBOT bath, these methods are designed to provide a more rapid assessment of the oxidation characteristics of steam turbine, automotive and mineral insulating oils.

Seta RõBot Bath (15200-5)

ASTM D2272, ASTM D4742, ASTM D2112

The Seta RõBot Bath is a floor standing 72 litre oil bath with digital temperature control. Two oxidation test vessels can be accommodated which are supported at an angle of 30° and rotated at 100 rev/min. The pressure within the test vessel is monitored and reported in real time using the Seta AutoRõBOT Pressure Monitoring System (15205-2).

- Ambient to 160°C
- 2 test stations
- Fume extraction
- Gear drive
- Real time automatic pressure monitoring

Visit: www.stanhope-seta.co.uk/3467/Seta-RöBot-Bath

Oxidation Stability for In Service Lubricating Oils and Inhibited Mineral Insulating Transformer Oils

The two tests within this category are designed to assess the stability of the oil when exposed to prescribed conditions. ASTM D4636 is typically used for in-service formulated lubricating fluids. Catalysts and air agitation are used to accelerate the results. ASTM D2440 is primarily used to assess the oxidation characteristics of a transformer oil under specific conditions and an assessment of sludge and acid formation is made.

Seta Universal Oxidation Hightemp Bath (16600-3)

ASTM D4636, ASTM D2440

The 16600 universal series baths provide a variety of options for these methods.

- Solid block bath
- 50 to 400°C temperature range
- 15 test wells – range of sizes

Visit: www.stanhope-seta.co.uk/5068/Seta-Universal-Oxidation-Hightemp-Bath
Corrosion

Corrosion testing was introduced to automotive lubricating oil specifications in response to concerns over corrosion damage to engine components. The ASTM D130 test utilizes Copper tokens that are exposed to the sample in the presence of heat and the resulting change in token colour is compared to an ASTM colour standard.

Copper Corrosion Baths

ASTM D130, IP 154, ISO 2160, FTM 791 S235

A range of stainless steel water or oil baths which are digitally temperature controlled to ±0.1°C over a temperature range of ambient +5°C to 150°C.

The baths have two or nine test stations, each with a lid and hook for suspending either a copper corrosion test vessel or a test tube support. A test tube support can hold up to three test tubes.

9 Station Bath (11400-7): www.stanhope-seta.co.uk/4444/Silver-and-Copper-Corrosion-Bath
2 Station Bath (11300-2): www.stanhope-seta.co.uk/4440/Seta-Cu-Ag-Corrosion-Bath
4 Station Solid Block Bath (11310-0): www.stanhope-seta.co.uk/4951/Seta-Copper-Silver-Block-Bath

Rust Preventing Characteristics

A test that is included in most lubricating and hydraulic oil specifications and is frequently used as part of an oil condition monitoring program. In use water can become entrained in the oil and the test provides a guide on how well the oil will protect metal surfaces from rusting due to the water content, it also indicates whether rust inhibitors are required.

Seta Rust Prevention Test Bath (11200-7)

ASTM D665, IP 135, FTM 791 4011, NACE TM0172-2001

The Seta Rust Prevention Test Bath is a 31 litre oil bath with a temperature range of ambient +5°C to 120°C. The top panel of the bath accepts up to 7 test beakers with stirrers.

- Ambient +5°C to 120°C temperature range
- 7 test stations
- Quick release stirrers
- Digital temperature controller
- Bath viewing window and door

Visit: www.stanhope-seta.co.uk/5397/Seta-Rust-Prevention-Test-Bath

Cloud and Pour Point

Cloud and pour point tests are called up in most lubricating oil specifications. These parameters provide an indication of the expected physical condition of an oil when operated at low temperatures.

Seta Cloud and Pour Point Cryostat (93531-7)

ASTM D97, IP 15, ISO 3016, FTM 791 201, ASTM D2500, IP 219, ISO 3015

The Seta Cloud and Pour Point Cryostat is a floor standing unit with four independently temperature controlled compartments each accommodating four Air Wells. The lid is electrically heated to prevent the formation of ice and condensation.

- Four individually temperature controlled compartments
- Four air wells in each compartment
- Three compartments ambient to -35°C, one compartment ambient to -51°C
- 'CFC free' refrigeration system
- Heated 'anti-condensation' lid

Visit: www.stanhope-seta.co.uk/3892/Seta-Cloud-and-Pour-Point-Cryostat
Lubricant Testing Solutions

Water Separability
A test that is included in most lubricating and hydraulic oil specifications and used as part of an oil condition monitoring program. Water in oil can form emulsions and sludges. The water separability test assesses the effectiveness of the oil to separate from the water.

Herschel Emulsifier (96700-2)
ASTM D1401, IP 412, ISO 6614
The Herschel Emulsifier is a compact and efficient benchtop instrument designed to measure the ability of oil to separate from water. The instrument incorporates 4 test stirrers, with independent control and motorised raising and lowering. Samples can be test simultaneously or individually to suit laboratory requirements.
Each stirrer is held by a self centering collet to ensure concentricity within 1mm and can remain in situ when removing or replacing cylinders. Positioning within 6mm from the bottom of the cylinder is automatically achieved using a motorised actuator.
Test cylinders are located in a temperature controlled bath with an adjustable set point of either 54°C or 82°C in accordance with ASTM and ISO test methods. A large viewing window and non-reflective LED lighting assists operator reading. The bath top plate is designed to allow cylinders to tilt for easy removal. A drain valve is provided for service and maintenance.
A large colour touch screen display is used to initiate tests and provides automated sequencing with an audible and visual reminder at each recording interval. Custom test parameters are also user adjustable.

- 4 independently controlled test stations
- Multiple operator safety features
- Motorised raising and lowering
- Automated test sequence
- No removal of paddles required
- Guaranteed paddle rotation speed
- Intuitive software package

Visit: www.stanhope-seta.co.uk/5582/Herschel-Emulsifier

Insolubles and Trace Sediment
Lubricating oils should be clear of sediment and insoluble contamination. The presence of sediment can lead to wear and premature machinery failure, and insoluble material can be indicative of oil or additive breakdown.

Seta Oil Test Centrifuge
ASTM D893, FTM 791 3121, ASTM D2273, FTM 791 3004
Seta Oil Test Centrifuge is a microprocessor controlled, heated centrifuge. The instrument is fully programmable allowing automatic configuration to the specified oil test parameters.

- Conforms to safety requirements IEC 1010-1; 1010-2-D
- 4 or 6 place swing out rotor
- Static, near vertical bucket positioning
- Maximum rpm 3000
- Heated chamber, ambient to 80°C
- Universal buckets for 12.5ml, 6 and 8 inch glassware
- Microprocessor control with 99 memories

4 Place (90000-3): www.stanhope-seta.co.uk/3943/Seta-Oil-Test-Centrifuge
6 Place (90100-0): www.stanhope-seta.co.uk/4807/Seta-Oil-Test-Centrifuge
Laboratory instruments for quality control, analysis and calibration

Carbon Residue

Typically called up in base oil specifications this test provides an indication of carbon deposits that may remain after an oils exposure to high temperatures. Two tests cover this property, ASTM D4530 – Micro carbon residue and ASTM D189 Conradson Carbon residue. The tests require different volume of sample, ASTM D4530 is accepted as the referee test.

Carbon Residue (97400-3)

ASTM D4530, IP 398, ISO 10370

The Seta Micro Carbon Residue Tester is an automatic instrument designed to run tests to determine the carbon residue formed after evaporation and pyrolysis of petroleum products as per ASTM and IP test methods. The instrument comprises of an oven and insulating lid with curved top plug as defined in ASTM D4530 and IP 398. Nitrogen gas purging and temperature RAMP sequences are fully automatic and no operator intervention is required when running the test. A digital mass flow meter and high precision temperature control system ensure compliance to the methods.

- Carbon residue range 0.1% to 30.0% (m/m)
- 12 sample capacity
- Automatic temperature ramp and gas control
- Digital display flowmeter
- Equivalent to ASTM D189; IP 13
- Temperature range ambient to 500°C

Visit: www.stanhope-seta.co.uk/4882/Micro-Carbon-Residue-Tester

Conradson Carbon Residue

ASTM D189, IP 13, ISO 6615, FTM 791 5001

Comprises of a cast iron tripod stand, Skidmore iron crucible with cover, spun sheet iron crucible with cover, spun steel circular hood with chimney, spun steel circular insulation block, and Nichrome wire support.

Available as a single test unit (10610-0) or 4-way test unit (10600-0).

Visit: www.stanhope-seta.co.uk/36/Seta-Conradson-Test-Unit

Ash from Petroleum Products

Ash tests are recommended where the sample is known to contain inorganic ash. This will contribute to the quantity of carbon residue. ASTM D482 can be followed to determine the mass of the ash and this can be used to adjust the result from the carbon residue tests.

Seta Ash Furnace (99220-2)

ASTM D482, IP 4, ISO 6245, FTM 791 5421

The Seta Ash Furnace and accessories are suitable for ASTM D482. The furnace comes with pre-heated airflow system and extended chimney. Maximum temperature 1100°C with over-temperature cut-out and door safety power cut off switch.

Visit: www.stanhope-seta.co.uk/4038/Seta-Ash-Furnace
Air Release Properties

Lubricant and oils containing excess amounts of entrained air can lead to serious disruptions of equipment in operation, increased oxidation tendency and shortened lubricating efficiency. The Air Release Value test determines the time taken for hydraulic fluids and lubricating oils to release entrained air and gases.

Air Release Value Apparatus (15840-0)

ASTM D3427, IP 313, BS 2000 Part 313, ISO 9120

The Air Release Value Apparatus is designed to determine the air release properties of hydrocarbon based oils in accordance with ASTM, IP and other methods. The apparatus is a benchtop instrument with integrated density balance, heater, temperature control system, pressure regulation and microprocessor based control system. A unique slider arrangement allows easy positioning of the sinker and movement throughout the test cycle. The new integrated control system with large touch screen display prompts the user through all stages of the test.

- No need to handle hot sample vessel
- Touch screen display with simple test menu
- Automated and integrated density monitoring
- Circulated sample heating
- Quick connectors minimise assembly and cleaning time
- Integral sinker warming jacket and temperature indicator
- Ambient to 75°C temperature range
- Safety cut out prevents overheating
- Sliding, raising and lowering platform to avoid delay test or risk to operator
- Automatic result calculation
- Results storage for over 10,000 tests, full LIMS connectivity

Visit: www.stanhope-seta.co.uk/5268/Air-Release-Value-Apparatus

Dielectric Breakdown Voltage

The dielectric breakdown voltage is a measure of the ability of an insulating liquid to withstand electrical stress. The presence of contaminants such as particles, dirt, and water can significantly reduce the breakdown voltage.

Seta Dielectric Oil Tester (99620-3)

ASTM D877, IP 295, FTM 791 5702, ASTM D1816

The Seta Dielectric Oil Tester is the smallest and lightest portable oil test set of its rating available.

- Automatic test sequence
- Pre-set and user defined programs
- Bluetooth connection & USB drive
- Fully interlocked

Visit: www.stanhope-seta.co.uk/4230/Automatic-Oil-Tester-100kv

Colour

Colour can be indicative of the condition of an oil. Within the pharmaceutical industry white mineral is typically required to be colourless and is measured using ASTM D156. Automotive products are generally measured using the ASTM D1500 test method.

Seta Multi-Colour Automatic Colorimeter (15260-4)

ASTM D156, FTM 791 101, ASTM D1500, IP 196, ISO 2049, FTM 791 102

- Automatic operation
- Multiple colour scales including ASTM and Saybolt
- Rapid measurement < 25 seconds

Visit: www.stanhope-seta.co.uk/4164/Seta-Multi-Colour-Automatic-Colorimeter

Water in Petroleum Products

Typically measured in used lubricating oils as part of an oil condition monitoring program. This test provides an indication of the volume of water present using the Dean and Stark distillation procedure.

ASTM D95, IP 74, ISO 3733, FTM 791 3001

Seta offer a range of flask heaters, stands and condensers for Dean and Stark Assembly, please visit our website for more information.
Laboratory instruments for quality control, analysis and calibration

Particle Counting

The understanding of particle contamination in lubricating and hydraulic oils is the single most important parameter when evaluating the cleanliness of new and used lubricating and hydraulic oils. Laser particle counting offers a quick and quantitative way of evaluating the particulate contamination or cleanliness of oil, allowing an operator to determine whether the oil is suitable for operation. Particle counting methods are written into many specifications and the instruments report particle count and size distribution in industry standard formats such as ISO 4406 and NAS 1638.

Seta AvCount2 (SA1000-2)

ASTM D6786, ASTM D7647

The Seta AvCount2 is a laser based particle analyser used for determining the particle concentration in liquid fuels and oils. It can be used throughout distribution networks and in the laboratory.

- NAS 1638, ISO 4402, GOST 17216-71: 2µm to >200µm
- Cumulative & distributive particle numbers
- Uses "Straight from the Bottle" samples
- Integrated printer
- Easy to use large touch screen display
- Rugged, stainless steel case suitable for portable use
- Integral Data storage for up to 2000 measurements across 60 memories
- Optional in-line high pressure testing up to 310 Bar

Visit: www.stanhope-seta.co.uk/4161/AvCount2-Particle-Counter

Seta AvCount Lube (SA1900-0)

ASTM D7647, ASTM D6786, ISO 60970, ISO 11171, ISO 1500, ISO 4406, AS 4059, NAS 1638, SAE A6D, SAE 749D

The AvCount Lube is a fully configured particle counter suitable for higher viscosity samples such as lubricating and transformer oils. The instrument comprises a particle counter and Sample Delivery System.

The instrument can be used as a stand-alone system or connected to and operated from a PC workstation. The particle counter additionally has the capability to run fuel samples, and using a unique pump configuration system it is possible to change the system configuration, allowing a direct flow through the cell, or the pump to be configured before or after the measurement cell.

The Sample Delivery System is also available separately (SA1950-0) and can be added as an accessory to any particle counter, allowing higher viscosity samples to be measured.

- Cumulative Particles/ml
- ISO 11171, ISO 4406
- Up to 200 mm²/s viscosity
- 4µm(c) to 70µm(c)
- Simple operation
- High visibility screen
- Integral compressor
- Stand-alone or PC controlled
- Programmable via PC
- Typically 3 minutes for ASTM D7647

Visit: www.stanhope-seta.co.uk/5159/AvCount-Lube-Particle-Counter

<table>
<thead>
<tr>
<th>Seta Part No</th>
<th>SA1000-2</th>
<th>SA1900-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counts per Measurement (max):</td>
<td>600,000 particles</td>
<td>600,000 particles</td>
</tr>
<tr>
<td>Sample Viscosity (max):</td>
<td>68mm²/s (from sample bottle)</td>
<td>200mm²/s (from sample bottle)</td>
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<tr>
<td>Sample Viscosity (max):</td>
<td>250mm²/s (pressurised 10 bar G max)</td>
<td></td>
</tr>
<tr>
<td>Number of Measuring Channels:</td>
<td>15 fixed</td>
<td>6 and 15 (programmable)</td>
</tr>
<tr>
<td>Results:</td>
<td>64 result memory</td>
<td>Up to 601 internal, unlimited on PC</td>
</tr>
<tr>
<td>Voltage:</td>
<td>100/230 VAC, 50/60Hz, max 30W or 24 VAC</td>
<td>12 VAC, 1A (mains adaptor supplied 100 to 240 Vac, 50/60Hz, 650mA)</td>
</tr>
<tr>
<td>Size (HxWxD) / Weight:</td>
<td>24 x 33 x 24cm / 12kg</td>
<td>50 x 32 x 22cm / 16kg</td>
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</tbody>
</table>
Aromatics and Saturates in Base Oils
Analysis of the aromatic and saturates content in oils is a key parameter needed to determine compatibility between base oils prior to the blend process.

Evochrom Base Oil HPLC System (SA2400-2)
ASTM D6379
The Evochrom Base Oil HPLC instrument is a complete plug and go system, fully specified for Aromatic and Saturates. The system is ready for use out of the box with minimal configuration required.

Reference Standards
A test to quantify the ability of an oil to release entrained air. Typically found in turbine, hydraulic and gear oil specifications.

Multi Test Verification Material (MTVM)
Seta Lubricating Oil (99853-2)
The Seta Lubricating Oil MTVM is a unique secondary reference material that provides traceable validation of different test parameters from one sample. Multi Test Verification Materials (MTVM) allow routine monitoring of instrument performance and are particularly useful in training. The MTVM Lube oil is manufactured and certified in strict accordance with ISO Guide 34.

<table>
<thead>
<tr>
<th>Test Parameter</th>
<th>Test Method Employed/ASTM</th>
<th>Nominal Ranges</th>
<th>Amount/Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>D93 Procedure A</td>
<td>196 to 225°C</td>
<td>80ml</td>
</tr>
<tr>
<td>Pour Point</td>
<td>D97 - IP 15</td>
<td>-49.1 to -33°C</td>
<td>50ml</td>
</tr>
<tr>
<td>Kinematic Viscosity 40°C</td>
<td>D445</td>
<td>53 to 185 mm²/s</td>
<td>30ml</td>
</tr>
<tr>
<td>Kinematic Viscosity 100°C</td>
<td>D445</td>
<td>9 to 22 mm²/s</td>
<td>30ml</td>
</tr>
<tr>
<td>Viscosity Index</td>
<td>D2270</td>
<td>139 to 180</td>
<td>60ml</td>
</tr>
<tr>
<td>Density</td>
<td>D4052</td>
<td>0.85 to 0.88 g/mL</td>
<td>10ml</td>
</tr>
<tr>
<td>Zinc</td>
<td>D5185</td>
<td>800 to 1350 mg/kg</td>
<td>5ml</td>
</tr>
<tr>
<td>Calcium</td>
<td>D5185</td>
<td>3000 to 5000 mg/kg</td>
<td>5ml</td>
</tr>
<tr>
<td>Phosphorous</td>
<td>D5185</td>
<td>800 to 1600 mg/kg</td>
<td>5ml</td>
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<tr>
<td>Acid Number</td>
<td>D664</td>
<td>1 to 5 KOH/g</td>
<td>2ml</td>
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<tr>
<td>Base Number</td>
<td>D2886</td>
<td>5 to 15 KOH/g</td>
<td>2ml</td>
</tr>
</tbody>
</table>

Density Standards
• Full compliance with ASTM, IP and other method protocols
• Manufactured in accordance with ISO 17025 and UKAS certified
• Supplied in 100ml containers with 2 year shelf life

Viscosity Standards
A range of ISO 17025 (UKAS) quality standards are available
• Full compliance with ASTM, IP and other method protocols
• Manufactured in accordance with ISO 17025 and UKAS certified
• Supplied in 500ml containers with 2 year shelf life

Kinematic Viscosity mm²/s (cSt)

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Seta Reference</th>
<th>20.0°C/88.0°F</th>
<th>25.0°C/77.0°F</th>
<th>37.8°C/100.0°F</th>
<th>40.0°C/104.0°F</th>
<th>50.0°C/122.0°F</th>
<th>60.0°C/140.0°F</th>
<th>80.0°C/176.0°F</th>
<th>98.9°C/210.0°F</th>
<th>100.0°C/212.0°F</th>
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<tr>
<td>S3</td>
<td>99774-0</td>
<td>4.626</td>
<td>4.081</td>
<td>3.065</td>
<td>2.929</td>
<td>2.423</td>
<td>2.044</td>
<td>1.524</td>
<td>1.207</td>
<td>1.192</td>
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<tr>
<td>S6</td>
<td>99785-0</td>
<td>10.46</td>
<td>8.883</td>
<td>6.045</td>
<td>5.697</td>
<td>4.454</td>
<td>3.583</td>
<td>2.479</td>
<td>1.864</td>
<td>1.836</td>
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<tr>
<td>S20</td>
<td>99786-0</td>
<td>42.83</td>
<td>33.76</td>
<td>19.79</td>
<td>18.21</td>
<td>12.91</td>
<td>9.554</td>
<td>5.791</td>
<td>3.962</td>
<td>3.884</td>
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<tr>
<td>N35</td>
<td>99832-0</td>
<td>84.99</td>
<td>64.77</td>
<td>35.19</td>
<td>31.99</td>
<td>21.59</td>
<td>15.31</td>
<td>8.675</td>
<td>5.656</td>
<td>5.530</td>
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<tr>
<td>S60</td>
<td>99787-0</td>
<td>158.2</td>
<td>117.4</td>
<td>59.96</td>
<td>53.97</td>
<td>34.97</td>
<td>23.92</td>
<td>12.77</td>
<td>7.970</td>
<td>7.774</td>
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<tr>
<td>N100</td>
<td>99833-0</td>
<td>320.4</td>
<td>232.1</td>
<td>111.8</td>
<td>99.71</td>
<td>61.95</td>
<td>40.83</td>
<td>22.69</td>
<td>12.17</td>
<td>11.85</td>
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<tr>
<td>S2000</td>
<td>99788-0</td>
<td>7946</td>
<td>5232</td>
<td>1988</td>
<td>1705</td>
<td>892.9</td>
<td>502.4</td>
<td>190.0</td>
<td>90.83</td>
<td>87.34</td>
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<tr>
<td>N350</td>
<td>99834-0</td>
<td>1194</td>
<td>825.4</td>
<td>355.8</td>
<td>311.9</td>
<td>179.7</td>
<td>110.6</td>
<td>49.33</td>
<td>26.94</td>
<td>26.09</td>
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<td>S600</td>
<td>99789-0</td>
<td>2053</td>
<td>1409</td>
<td>593.7</td>
<td>517.7</td>
<td>292.4</td>
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<td>39.63</td>
<td>38.30</td>
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<tr>
<td>N1000</td>
<td>99837-0</td>
<td>4256</td>
<td>2866</td>
<td>1153</td>
<td>997.4</td>
<td>543.0</td>
<td>316.2</td>
<td>127.0</td>
<td>63.52</td>
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</table>
### Laboratory Instruments for Quality Control, Analysis and Calibration

<table>
<thead>
<tr>
<th>Test Method</th>
<th>Test Description:</th>
<th>Instrument:</th>
<th>Seta Part No:</th>
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<tbody>
<tr>
<td>ASTM D85</td>
<td>IP 123 ISO 3405 FTM 791 1001 Distillation of Petroleum Products at Atmospheric Pressure</td>
<td>Manual Distillation</td>
<td>11860-3</td>
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<tr>
<td>ASTM D93</td>
<td>IP 34 ISO 2719 FTM 791 1102 Flash Point by Pensky-Martens Closed Cup Test</td>
<td>Automatic / Multiflash / Manual</td>
<td>35000-0 / 34000-0 / 15661-4</td>
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<tr>
<td>ASTM D92</td>
<td>IP 36 ISO 2592 FTM 791 1103 Flash and Fire Points by Cleveland Open Cup Test</td>
<td>Multiflash Automatic or Manual</td>
<td>34300-2 or 13811-3</td>
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<tr>
<td>ASTM D95</td>
<td>IP 74 ISO 3733 FTM 791 3101 Water in Petroleum Products and Bituminous Materials by Distillation</td>
<td>Dean and Stark Apparatus</td>
<td>24410-4</td>
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<tr>
<td>ASTM D97</td>
<td>IP 15 ISO 3016 FTM 791 201 Pour Point of Petroleum Products</td>
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<td>ASTM D130</td>
<td>IP 154 ISO 2560 FTM 791 5325 Corrosiveness to Copper from Petroleum Products by Copper Strip Test</td>
<td>Amb to -51°C Four Compartment</td>
<td>93531-7 or 94100-3</td>
</tr>
<tr>
<td>ASTM D156</td>
<td>FTM 791 101 Saybolt Color of Petroleum Products</td>
<td>Automatic Colorimeter</td>
<td>15260-4</td>
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<tr>
<td>ASTM D189</td>
<td>IP 13 ISO 6615 FTM 791 5101 Corrosion Carbon Dioxide of Petroleum Products</td>
<td>Corrosion Carbon Dioxide unit</td>
<td>12610-0</td>
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<tr>
<td>ASTM D445</td>
<td>IP 71 ISO 3104 FTM 791 305 Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)</td>
<td>RIV Viscometer Bath, 6 position bath</td>
<td>84200-3</td>
</tr>
<tr>
<td>ASTM D482</td>
<td>IP 4 ISO 6245 FTM 791 5421 Ash from Petroleum Products</td>
<td>Ash Furnace</td>
<td>99280-2</td>
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<td>ASTM D665</td>
<td>IP 135 FTM 791 4011 Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water</td>
<td>Rust Prevention Test Bath</td>
<td>11220-7</td>
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<tr>
<td>ASTM D892</td>
<td>IP 146 FTM 791 3211 Foaming Characteristics of Lubricating Oils</td>
<td>Dual-Twin Foam Bath</td>
<td>14020-8</td>
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<td>ASTM D893</td>
<td>FTM 791 3212 Instabilities in Used Lubricating Oils</td>
<td>4 or 6 place Oil Test Centrifuge</td>
<td>90000-3 or 90100-0</td>
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<tr>
<td>ASTM D943</td>
<td>ISO 4263 Oxidation Characteristics of Inhibited Mineral Oils</td>
<td>Solid block bath 32 or 6 position Liquid bath 6 position / with windows</td>
<td>16640-0 or 16645-0</td>
</tr>
<tr>
<td>ASTM D1298</td>
<td>IP 160 ISO 3675 Density and Relative Density (Specific Gravity) of Liquids</td>
<td>Hydrometers</td>
<td>Please contact Seta</td>
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<tr>
<td>ASTM D1401</td>
<td>IP 412 ISO 6614 Water Separability of Petroleum Oils and Synthetic Fluids</td>
<td>Herschel Emulsifier 3 place</td>
<td>96700-2</td>
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<tr>
<td>ASTM D1500</td>
<td>IP 196 ISO 2049 FTM 791 102 ASTM Color of Petroleum Products</td>
<td>Colour Comparator Automatic Colorimeter</td>
<td>15295-4 or 15260-4</td>
</tr>
<tr>
<td>ASTM D1816</td>
<td>Dielectric Breakdown Voltage of Insulating Liquids Using VDE Electrodes</td>
<td>Automatic Dielectric Tester</td>
<td>99620-3</td>
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<tr>
<td>ASTM D2012</td>
<td>Oxidation Stability of Inhibited Mineral Insulating Oil by Pressure Vessel</td>
<td>ROBOT Bath</td>
<td>15200-5</td>
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<tr>
<td>ASTM D2272</td>
<td>Oxidation Stability of Steam Turbine Oils By Rotating Pressure Vessel</td>
<td>ROBOT Bath</td>
<td>15200-5</td>
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<tr>
<td>ASTM D2500</td>
<td>IP 219 ISO 3016 Cloud Point of Petroleum Products</td>
<td>Amb to -51°C Four Compartment</td>
<td>93531-7 or 94100-3</td>
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<td>ASTM D2273</td>
<td>FTM 791 3004 Trace Sediment in Lubricating Oils</td>
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<td>ASTM D2440</td>
<td>Oxidation Stability of Mineral Insulating Oil</td>
<td>Universal Oxidation High-temp Bath</td>
<td>16600-2</td>
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<tr>
<td>ASTM D2783</td>
<td>FTM 791 6503 Measurement of Extreme-Pressure Properties of Lubricating Fluids</td>
<td>Seta-Shell 4-Ball Lubricant Tester</td>
<td>19900-3 or 19800-7</td>
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<tr>
<td>ASTM D3247</td>
<td>IP 133 ISO 3531 Air Release Properties of Petroleum Oils</td>
<td>Air Release Apparatus</td>
<td>15840-0</td>
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<tr>
<td>ASTM D3378</td>
<td>IP 523 ISO 3679 FTM 791 1001 Flash Point by Small Scale Closed Cup Test</td>
<td>Series ‘F Manual or Series ‘F Auto’</td>
<td>30000-2, 33000-2 or 82000-0</td>
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<tr>
<td>ASTM D4052</td>
<td>IP 559 ISO 12185 Density, Relative Density and API Gravity of Liquids by Digital Density Meter</td>
<td>Hand Held Density meter</td>
<td>12600-0</td>
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<tr>
<td>ASTM D4572</td>
<td>Wear Preventive Characteristics of Lubricating Fluid (Four-Ball Method)</td>
<td>Seta-Shell 4-Ball Lubricant Tester</td>
<td>19900-1 or 19800-7</td>
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<tr>
<td>ASTM D4510</td>
<td>Sludging and Corrosion Tendencies of Inhibited Mineral Oils</td>
<td>Liquid bath 6 way</td>
<td>16908-7</td>
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<tr>
<td>ASTM D4636</td>
<td>Corrosiveness and Oxidation Stability of Hydraulic Oils, Aircraft Turbine Engine Lubricants, and Other Highly Refined Oils</td>
<td>Universal Oxidation High-temp Bath</td>
<td>16600-3</td>
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<tr>
<td>ASTM D4742</td>
<td>Oxidation Stability of Gasoline Automatic Engine Oils by Thin-Film Oxygen Uptake (TFOUT)</td>
<td>ROBOT Bath</td>
<td>15200-5</td>
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<tr>
<td>ASTM D6786</td>
<td>Particle Count in Mineral Insulating Oil using Automatic Optical Particle Counters</td>
<td>Automatic Multi-Mode Particle counter</td>
<td>5A1000-2 or 5A1900-0</td>
</tr>
<tr>
<td>ASTM D7214</td>
<td>Oxidation of Used Lubricants by FT-IR Using Peak Area Increase Calculation</td>
<td>Seta-FTIR</td>
<td>Please contact Seta</td>
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<tr>
<td>ASTM D7236</td>
<td>IP 534 Flash Point by Small Scale Closed Cup Test (Ramp Method)</td>
<td>Series ‘F Manual or Series ‘F Auto’</td>
<td>30000-2, 33000-2 or 82000-0</td>
</tr>
<tr>
<td>ASTM D7412</td>
<td>Condition Monitoring of Phosphate Antioxid Additives in In-Service Petroleum and Hydrocarbon Based Lubricants by Trend Analysis Using FT-IR Spectrometry</td>
<td>Seta-FTIR</td>
<td>Please contact Seta</td>
</tr>
<tr>
<td>ASTM D7414</td>
<td>Condition Monitoring of Oxidation in In-Service Petroleum and Hydrocarbon Based Lubricants by Trend Analysis Using FT-IR Spectrometry</td>
<td>Seta-FTIR</td>
<td>Please contact Seta</td>
</tr>
<tr>
<td>ASTM D7415</td>
<td>Condition Monitoring of Sulfate By-Products in In-Service Petroleum and Hydrocarbon Based Lubricants by Trend Analysis Using FT-IR Spectrometry</td>
<td>Seta-FTIR</td>
<td>Please contact Seta</td>
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<tr>
<td>ASTM D7416</td>
<td>Set-Up and Operation of FT-IR Spectrometers for In-Service Oil Condition Monitoring</td>
<td>Seta-FTIR</td>
<td>Please contact Seta</td>
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<tr>
<td>ASTM D7419</td>
<td>Total Aromatics and Total Saturates in Lube Basestocks by HPLC</td>
<td>Evochrom Base Oil HPLC System</td>
<td>5A2500-0</td>
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<tr>
<td>ASTM D7624</td>
<td>Condition Monitoring of Mixture in In-Service Petroleum and Hydrocarbon-Based Lubricants by Trend Analysis Using FT-IR Spectrometry</td>
<td>Seta-FTIR</td>
<td>Please contact Seta</td>
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<tr>
<td>ASTM D7647</td>
<td>Automatic Particle Counting of Lubricating and Hydraulic Fluids</td>
<td>Automatic Multi-Mode Particle counter</td>
<td>5A1000-2 or 5A1900-0</td>
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<td>ASTM E1252</td>
<td>General Techniques for Obtaining Infrared Spectra for Qualitative Analysis</td>
<td>Seta-FTIR</td>
<td>Please contact Seta</td>
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<tr>
<td>ASTM E2412</td>
<td>Condition Monitoring of Used Lubricants by Trend Analysis Using FT-IR Spectrometry</td>
<td>Seta-FTIR</td>
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<tr>
<td>CEC-L-45-99</td>
<td>ISO 26422 Viscosity Shear Stability of Transmission Lubricants (Taper Roller Bearing Rig)</td>
<td>Shear Stability (90L) Head</td>
<td>19820-3</td>
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## Lubricant Testing Solutions

### Lubricant Methods and Description

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