biolab

33 1987-2020 YEARS EXPERIENCE

Product Catalog

INDEX

VISCOL 10 Series

Automatic kinematic Viscometer

Viscosity is defined as the rate of a fluid's internal resistance to the force that is required to flow. Intermolecular force, molecular mass and temperature of a fluid is considered as the three main factors effecting the viscosity. Fluids such as water, air, oil etc. that have directly proportional flow rate with friction resistance are called as Newtonian fluids.

Best method to measure viscosity of Newtonian fluids is by using capillary viscometers. With capillary viscometers, viscosity is determined based on the flow time of a fluid which is kept at a specific temperature inside a capillary with known diameter and length.

Viscol 10 Series, fully-automatic kinematic viscometers, equipped with the latest temperature control, detector, chronometer and washing properties with different models for oil, fuel, bitumen, polymer, paper, food and similar industrial demands. Viscol 10 Series viscometers provide the most reliable results for research, development and quality control practices without any user intervention.

Features

- Full automatic operation
- Temperature range from -40°C to 150 °C
- Wide range (125 Fold) viscometer tubes
- Viscosity detection from 0,5 cSt to 25.000 cSt
- Dual solvent usage as a standard
- Automatic cleaning with low solvent consumption
- Easy tube change
- Full control from Windows based touch panel PC
- Low bath oil and over temperature warnings
- Small footprint
- 23 sample capacity autosampler

ASTM D445
ASTM D446
ISO 3104
ISO 3105
IP 71
DIN 51562

Viscol 10A Oil & Fuel Viscometer

Viscol 10A, developed to automatically measure kinematic viscosity of oils and fuels at 40°C and 100°C in a single high precision bath with all necessary components including rapid cooling unit.

Areas of Use
- Mine and base oils
- Used and waste oils
- Light and heavy fuels
- Crude oil
- Marine fuels

Specifications

Measurement Range	*0,5 - 25.000 mm²/s (cSt)*	**Dual Solvent**	*Built-in*
Time Sensitivity	*0,001 s*	**User Interface**	*Touchscreen Windows IPC*
Temperature Range	*from ambient temp. to 120°C*	**Environment**	*10°C - 35°C*
Temperature Sensitivity	*0,001°C*	**Dimensions (WxDxH)**	*30 x 50 x 80 cm*
Sample and Solvent Amount	*12 ml sample 10 ml solvent/test*	**Weight**	*40 kg*
		Power Requirement	*110-240 VAC-50/60 Hz*

ASTM D789
ASTM D871
ASTM D1243
ASTM D1795
ASTM D2857
ASTM D4243
ASTM D4603
ISO 307
ISO 1628
ISO 5351
IEC 60450
TAPPI 230

Viscol 10P Plastic/Polymer Viscometer

Viscol 10P, developed with acid resistive teflon and glass components for various polymer and plastic applications to measure viscosity values between 10°C - 140°C without any user intervation.

Areas of Use
- Plastic Solutions
- Polymer Solutions
- Paper / Pulp

Specifications

Measurement Range	*0,5 - 25.000 mm²/s (cSt)*	**Dual Solvent**	*Built-in*
Time Sensitivity	*0,001 s*	**User Interface**	*Touchscreen Windows IPC*
Temperature Range	*10°C - 140°C*	**Environment**	*10°C - 35°C*
Temperature Sensitivity	*0,001°C*	**Dimensions (WxDxH)**	*30 x 50 x 80 cm*
Sample and Solvent Amount	*12 ml sample 10 ml solvent/test*	**Weight**	*40 kg*
		Power Requirement	*110 - 240 VAC - 50/60 Hz*

ASTM D445
ASTM D446
ASTM D2170
ISO 3104
ISO 3105
IP 71
DIN 51562

Viscol 10B Asphalt/Bitumen Viscometer

Viscol 10B is suitable for viscosity measurements of heavy samples as asphalt, bitumen and etc. up to 170°C with its integrated and external preheating options.

Areas of Use
- Mineral and base oils
- Used and waste oils
- Light and Heavy Fuels
- Crude oil
- Marine Fuels
- Asphalt / Bitumen
- Bituminous Binders

Specifications

Measurement Range	*0,5 - 25.000 mm²/s (cSt)*	**Dual Solvent**	*Built-in*
Time Sensitivity	*0,001 s*	**User Interface**	*Touchscreen Windows IPC*
Temperature Range	*from ambient temp. to 170°C*	**Environment**	*10°C - 35°C*
Temperature Sensitivity	*0,001°C*	**Dimensions (WxDxH)**	*30 x 50 x 80 cm*
Sample and Solvent Amount	*12 ml sample 10 ml solvent/test*	**Weight**	*40 kg*
		Power Requirement	*110-240 VAC-50/60 Hz*

ASTM D445
ASTM D446
ISO 3104
ISO 3105

Viscol 10J Low Temperature Viscometer

Viscol 10J is suitable for sensitive viscosity measurements down to -30°C for jet fuels and similar applications.

Areas of Use
- Jet fuels
- Transmission oils
- Hydraulic oils

Specifications

Measurement Range	*0,5 - 25.000 mm²/s (cSt)*	**Dual Solvent**	*Built-in*
Time Sensitivity	*0,001 s*	**User Interface**	*Touchscreen Windows IPC*
Temperature Range	*-30°C - 120°C*	**Environment**	*10°C - 35°C*
Temperature Sensitivity	*0,001°C*	**Dimensions (WxDxH)**	*30 x 50 x 80 cm*
Sample and Solvent Amount	*12 ml sample 10 ml solvent/test*	**Weight**	*40 kg*
		Power Requirement	*110-240 VAC-50/60 Hz*

Spare Parts & Consumables

- Various sizes of viscosity measuring tubes
- Certified viscosity reference standards
- Silicone bath oil
- Sample cups PE, glass, metal
- Solvent and waste bottles

Optional

- Autosampler with 23 sample capacity
- Preheating unit for analysis of dense and solid samples
- Multiple preheating unit
- Adjustable bath temperature up to 170°C
- Fast cooling circulator

Standards

		Viscol 10A	Viscol 10P	Viscol 10B	Viscol 10J
ASTM D445	Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)	✓	✓	✓	✓
ASTM D446	Standard Specifications and Operating Instructions for Glass Capillary Kinematic Viscometers	✓	✓	✓	✓
ASTM D789	Standard Test Method for Determination of Relative Viscosity of Concentrated Polyamide (PA) Solutions		✓		
ASTM D871	Standard Test Methods of Testing Cellulose Acetate		✓		
ASTM D1243	Standard Test Method for Dilute Solution Viscosity of Vinyl Chloride Polymers		✓		
ASTM D1601	Standard Test Method for Dilute Solution Viscosity of Ethylene Polymers		✓		
ASTM D1795	Standard Test Method for Intrinsic Viscosity of Cellulose		✓		
ASTM D2170	Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)	✓		✓	
ASTM D2857	Standard Practice for Dilute Solution Viscosity of Polymers		✓		
ASTM D4243	Standard Test Method for Measurement of Average Viscometric Degree of Polymerization of New and Aged Electrical Papers and Boards		✓		
ASTM D4603	Standard Test Method for Determining Inherent Viscosity of Poly(Ethylene Terephthalate) (PET) by Glass Capillary Viscometer		✓		
ISO 307	Plastics -- Polyamides -- Determination of viscosity number		✓		
ISO 1628	Plastic -- Determination of the viscosity of polymers in dilute solution using capillary viscometers		✓		
ISO 3104	Petroleum products -- Transparent and opaque liquids -- Determination of kinematic viscosity and calculation of dynamic viscosity	✓	✓	✓	✓
ISO 5351	Pulps -- Determination of limiting viscosity number in cupri-ethylenediamine (CED) solution		✓		
IP 71	Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity	✓	✓	✓	
TAPPI 230	Viscosity of pulp (capillary viscometer method)		✓		
IEC 60450	Measurement of the average viscometric degree of polymerization of new and aged cellulosic electrically insulating materials		✓		
DIN 51562	Viscometry - Measurement of kinematic viscosity by means of the Ubbelohde viscometer	✓	✓	✓	✓

PASOL 10

Oxidation Stability Analyzer

ASTM D942, ASTM D2112, ASTM D2272, ASTM D4742, ASTM D7098, IP 229

Pasol utilizes an oxygen pressured dry vessel to evaluate the oxidation stability of new and used oils. Pasol Oxidation Stability Analyzer utilizes an oxygen pressured dry vessel to evaluate the oxidation stability of new and used oils in the presence of water and a copper catalyst coil at 150°C.

Areas of Use
- Turbine oils
- Insulating oils
- Engine oils
- Greases

Features:

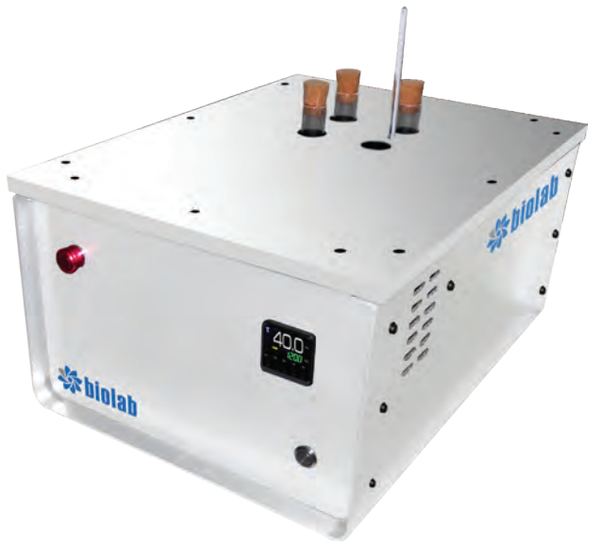
- Full automatic operation
- Display pressure in bar/psi/Kpa
- Precise temperature control at 150 °C
- Cooling coil for rapid cooling
- Insulated stainless steel test chamber
- Customer defined methods
- Sample temperature monitoring
- One touch oxygen charge and discharge
- Contactless magnetic rotation
- Full control from Windows based touch panel PC
- Over temperature and over pressure locks
- Small footprint

Specifications

Heating	Dry block heating chamber
Test Chamber	Stainless steel
Temperature	Rapid heating to 200°C
Oxygen Pressure	to 100 psi
Mixer	100 rpm magnetic contactless mixing
Control	Touchscreen panel
Graphics	Instant & total graphical viewing
Data Transfer	USB & PC
Security	High voltage, high temperature
Dimensions (WxDxH)	30 x 50 x 55 cm
Weight	30 kg

COPOL 10

Copper Corrosion Analyzer



ASTM D130, ASTM D4048, ASTM D7095
EN/ISO 216, IP 154, IP 112, DIN 51811

Copol Copper & Silver Corrosion Test System performs all copper and silver corrosion tests up to 150°C in accordance with international standards with its aluminum dry block test chamber. Available in 4, 8 and 12 sample containers Copol Analyzer, is suitable for aviation gasoline, aviation turbine fuel, automotive gasoline, natural gasoline or other petroleum products' corrosiveness tests according to ASTM D130, D1838, D4048, D4814 Annex, IP227, and ISO 2160.

Areas of Use

- Diesel
- Fuel oil
- Automotive fuels
- Solvents
- Jet fuels
- Mineral and synthetic oils

Specifications

Analysis temperature	25°C - 200°C
Temperature control precision	0.02°C
Number of samples	4 / 8 / 12
Heating power	300 W
Block depth	100 mm
Weight	30 Kg
Power Requirement	220 VAC 50 Hz
Dimensions (WxDxH)	38 x 52 x 27 cm

VAPOL 10

Universal Evaporator

ASTM D6304, ASTM D6869

The Universal Evaporator can be used in conjunction with Karl Fischer Moisture Titrator to measure the moisture concentration of oils, liquids, solids and all in between which are insoluble in Karl Fischer reagents or contain interfering substances.

NSN 6650015354273
NSN 6650015354274

SPECTROIL RDE-OES

Multi-Elemental Analysis System

ASTM D6595, ASTM D6792

Rapid elemental analysis of wear metals, contaminants and additives in lubricants and fuels.

The SpectrOil 100 Rotating Disc Electrode Optical Emission Spectrometer (RDE-OES) is the eighth generation of the market leading RDE elemental spectrometer. It is widely used in commercial oil laboratories, on-site or trailer labs, as a proven means of precisely determining elemental composition in lubricating oil, coolant, light or heavy fuels, grease, and process water. The Spectroil Q100 uses the same technology and design concepts that Spectro has successfully applied over the years to the Spectroil M family of spectrometers. It is the next step in design and performance utilizing the most up-to-date solid-state electronics and optical systems.

Areas of Use
- Mineral and base oils
- Used and waste oils
- Light and heavy fuels
- Marine fuels
- Coolants

Key Features

- No sample dilution, no solvent
- Only use 2 ml of oil
- 30 second test time with up to 31 elements simultaneously measured
- Sub PPM lower limit of detection (LOD) for most elements
- Push button operation, simple to use for both laboratory and on site applications
- Conforms to ASTM-D6595 (Oil) and ASTM-D6728 (Fuel)

Specifications

Measurement unit	mg/kg (ppm)
Standard analytical measuring range	Up to 32 elements
Spectral measuring range	203 nm - 810 nm
Temperature control	40°C ± 1°C
Sample volume	2 mL
Environment requirement	0° - 40°C
Operating system	Windows 10 Pro
Power requirement	120/240 VAC, 50/60 Hz
Dimensions (WxDxH)	38.5 x 66 x 71 cm

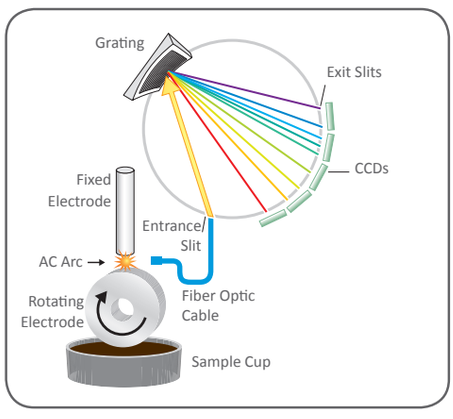
Spectroil Elements

ELEMENT	110E	120C			120F
	BASIC ENGINE	STANDARD LUBRICANTS	EXTENDED OPTION	COOLANT OPTION	FUELS
Ag	0 - 1000	0 - 1000			
Al	0 - 1000	0 - 1000		0 - 50	0 - 500
As			0 - 100		
B	0 - 1000	0 - 1000		0 - 1,000	
Ba		0 - 6,000			
Bi			0 - 100		
Ca	0 - 3,000	0 - 6,000		0 - 50	0 - 500
Cd		0 - 1000			
Ce			0 - 100		
Co			0 - 100		
Cr	0 - 1000	0 - 1000			0 - 500
Cu	0 - 1000	0 - 1000		0 - 50	0 - 500
Fe	0 - 1000	0 - 1000		0 - 50	0 - 500
In			0 - 100		
K		0 - 1000		0 - 10,000	0 - 500
Li		0 - 1000			0 - 500
Mg		0 - 6,000		0 - 50	0 - 1,500
Mn		0 - 1000			0 - 500
Mo	0 - 1000	0 - 1000		0 - 500	
Na	0 - 3,000	0 - 6,000		0 - 10,000	0 - 100
Ni	0 - 1000	0 - 1000			0 - 500
P	0 - 3,000	0 - 6,000		0 - 2,500	
Pb	0 - 1000	0 - 1000		0 - 50	0 - 500
Sb		0 - 100			
Si	0 - 1000	0 - 1000		0 - 500	0 - 300
Sn	0 - 1000	0 - 1000			
Ti		0 - 1000			
V		0 - 1000			0 - 500
W			0 - 100		
Zn	0 - 3,000	0 - 6,000		0 - 50	0 - 500
Zr			0 - 100		
Toplam#	15	24	+7	13	15

SpectrOil RDE technology is a proven means of precisely determining elemental composition in engine oil, coolant, fuel, grease, process water, and a wide variety of critical operating fluids. For decades this robust technology has been used as both a quality control tool and machine health monitor. Wear metals analysis with SpectrOil 100 is the backbone of used oil analysis programs, enabling effective condition-based maintenance programs. The precision of RDE spectrometry enables reliable, low concentration measurement of additive packages or harmful contaminants in virgin fuels, blended oil, coolants and wash down water.

How It Works ?

The RDE-OES technology utilizes a high-purity carbon electrode to transmit high-voltage electricity across a small gap to a nearby carbon disk. The rotating disk is partially submerged in a miniature cup of fluid sample and continuously carries the sample into the electrical discharge gap between electrodes. When the electricity arcs across the gap containing the sample, it forms a high-temperature plasma which emits a unique, sample-dependent spectrum of light from the ultraviolet, through the visible, and into the infrared wavelengths. The emitted light is collected and fiber-optically coupled to the SpectrOil 100's sensitive optics, which includes a diffraction grating to sort the light by wavelength and focus it onto an array of highly sensitive CCD cameras. Sophisticated spectral analysis software processes the CCDs' spectra to precisely determine concentration of dozens of elements with sub-ppm precision.



LNF Q200

Particle Counter & Ferrous Content Analyzer

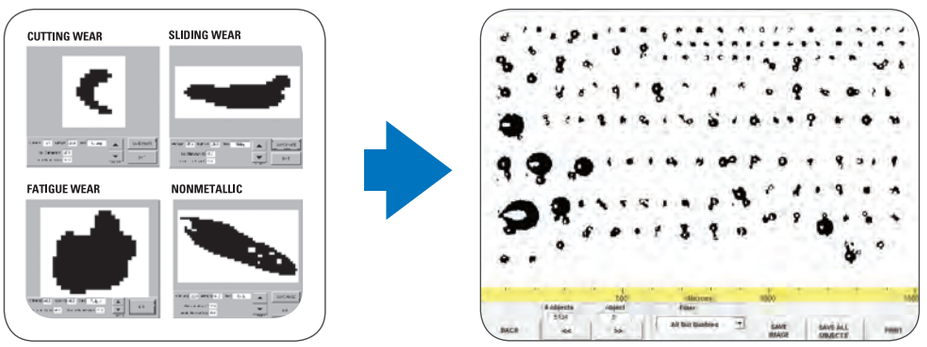
NSN 6635015101712

ASTM D6786, ASTM D8120, ASTM D7596, ISO 4406, NAS 1638, NAVAIR 01-1A-17, SAE 4059

The LaserNet 200 Series allows reliability professionals to quickly and easily assess machinery health in just minutes. By testing only a few milliliters of fluid, users see a complete picture of machine wear and particulate contamination. This enables the user to determine filtration efficiency, the type of wear mode occurring, and the change in ferrous debris concentration, for maintenance action.

With a simple push of a button, a comprehensive picture of machine wear is generated with only a few parameters:

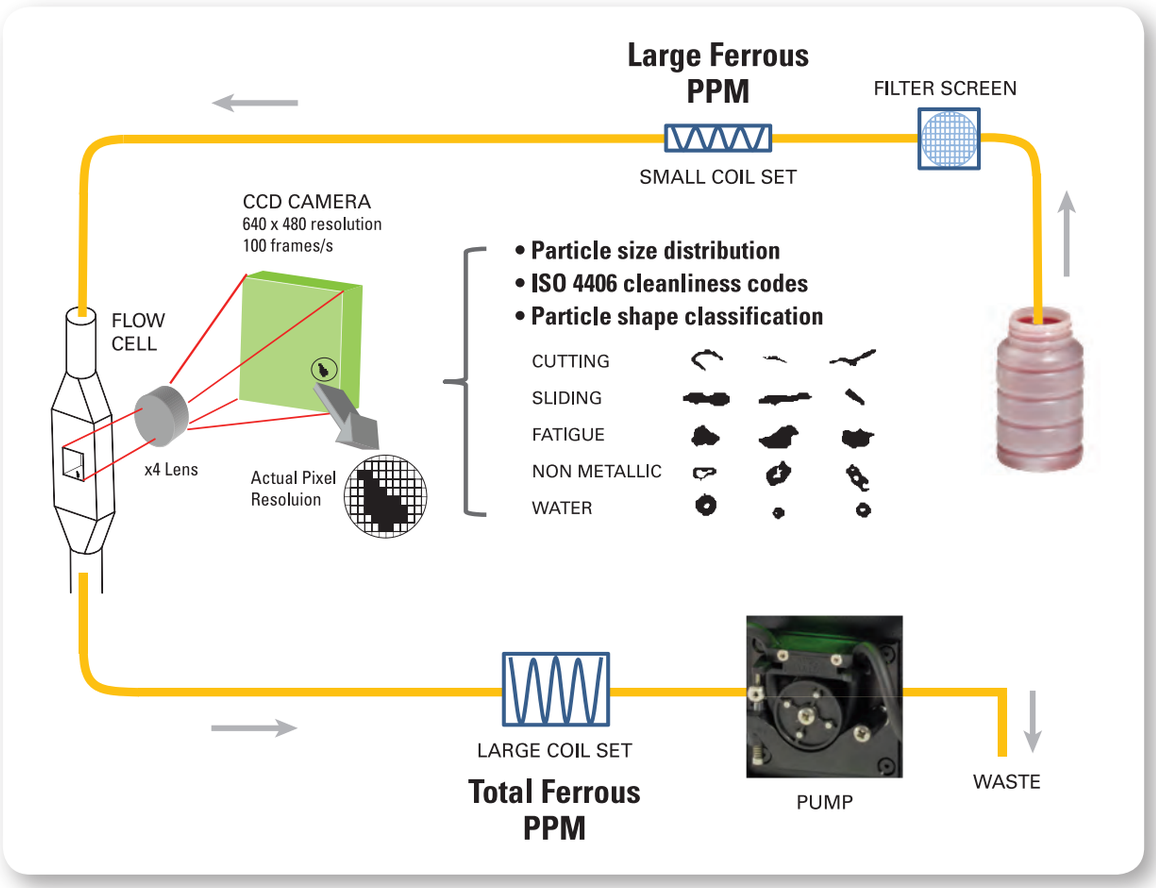
- Particle cleanliness codes, such as ISO 4406 and ASTM D6786, indicate the overall cleanliness of the oil
- Ferrous Wear Severity Index (FWSI) indicates overall severity of the machine wear condition
- Count of large cutting, sliding and fatigue wear, along with non-metallic particles, indicates the source of the particles



Specifications

Analysis data	Particle Count: ISO 4406, NAS 1638, NAVAIR 01-1A-17, SAE AS 4059, GOST, ASTM D6786, HAL & user defined, free water, soot wt. %; particle shape, particle classification, total and large metallic particle count
Standard measuring range	4 µm - 100 µm
Numune hacmi	5-30 mL
Sample volume	25°C - 35°C, %10 - %80 Relative humidity
Dimensions (WxDxH)	43 x 18 x 23 cm
Weight	7.65 kg
Power requirement	110/240 VAC, 50/60 Hz, 10 Watt

LNF Q200 Working Principle



LaserNet Comparison	210	215	220	230
Total particle count & codes	✔	✔	✔	✔
Non-metallic particles (sand/dirt)	✔	✔	✔	✔
Free water measurement	✔	✔	✔	✔
Air bubble/water droplet correction	✔	✔	✔	✔
Wear particle classification			✔	✔
Total ferrous concentration		✔		✔
Ferrous particle count & size distribution		✔		✔
Large ferrous concentration		✔		✔
Autosampler option	✔	✔	✔	✔

ASP Autosampler

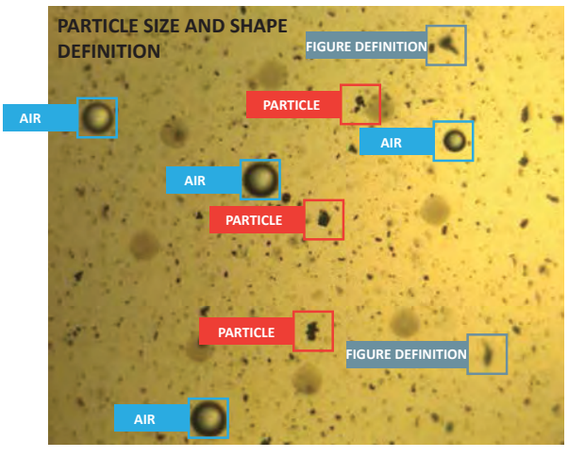
- 24 sample chambers
- Automatic mixer
- Two stage washing
- Automatic waste management

PASA

Portable Particle Counter

ISO 4406, SAE AS 4059 & NAS 1638

With the latest particle counting technology in new Pasa Particle Counter Series, giving ISO 4406 counts as well as 4, 6, 14, 21, 38, 70 & >100 micron sizing and bubble elimination. Digital imaging, combined with advanced algorithms, sorts particles into fatigue wear, cutting wear and sliding wear categories to give root cause analysis. This powerful technology, when coupled with additional sensors for measuring water content and oil life, gives unprecedented, on-the-spot insight into the condition of your oil.



Specifications

Sample type	Synthetic, organic, mineral oils, diesel fuels
Analysis data	Particles: ISO 4406, SAE AS 4059 & NAS 1638 Water: Relative humidity (RH%) Oil condition: Remaining life calculation
Usage	Sampling from pressurized system (up to 350 Bar) Sampling from the bottle or tank
Data	Internal memory Data transfer in CSV and PDF format
Dimensions (WxDxH)	40 x 45 x 22 cm
Weight	7 Kg

	PASA PARTICLE COUNTER MODELS					
	PS Particle counting system for oil and fuel samples	**PS-HP** Particle counting system with reducer valve (max.350 bar) for high pressure systems	**PS-RH** Particle count and % moisture determination system	**PS-RH-HP** Particle counting and % moisture determination system with reducer valve for high pressure systems (max.350 bar)	**PS-PPM** Particle counting and moisture determination (ppm) system for fuels	**PS-PPM-DEN** Particle counting, density (kg / L) and moisture determination (ppm) system for fuels
RELEVANCE						
Mineral oils	✓	✓	✓	✓	✗	✗
Organic Oils	✓	✓	✓	✓	✗	✗
Synthetic Oils	✓	✓	✓	✓	✗	✗
Diesel	✓	✗	✗	✗	✓	✓
PARAMETERS						
ISO 4406, SAE AS4059 & NAS 1638	✓	✓	✓	✓	✓	✓
Percent (%) humidity	✗	✗	✓	✓	✗	✗
Water rate (ppm)	✗	✗	✗	✗	✓	✓
Density (kg/L)	✗	✗	✗	✗	✗	✓
ANALYSIS MODES						
Sampling from the bottle	✓	✓	✓	✓	✓	✓
Sampling from the warehouse	✓	✓	✓	✓	✓	✓
High pressure system connection	✗	✓	✗	✓	✗	✗
SOFTWARE / MEMORY						
Instant trend tracking via ROC software. All data can be exported as .csv.	✓	✓	✓	✓	✓	✓
USB data transfer	✓	✓	✓	✓	✓	✓
Continuous data memory	✓	✓	✓	✓	✓	✓

FLUIDSCAN

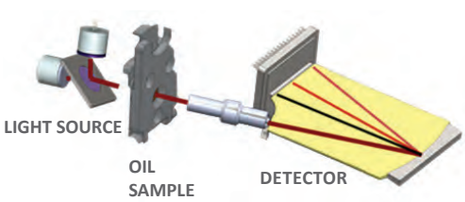
Infrared Oil Analyzer

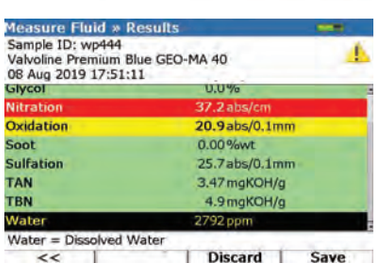
ASTM D7889, ASTM E1655, ASTM E2412

The FluidScan® 1000 series handheld Infrared oil analyzer provides direct quantitative measurement of a lubricant's condition and plays an important role in Machine Condition Monitoring (MCM) for proactive and predictive maintenance in Reliability Management programs. It determines when oil needs to be serviced due to degradation of the oil chemistry or contamination by other fluids such as water or the wrong oil. It is compliant with ASTM D7889 "Standard Test Method for Field Determination of In-Service Fluid Properties Using IR Spectroscopy".

NSN 7025016516207

APPLICATION CATEGORIES	PROPERTIES MEASURED BY FLUIDSCAN
Transmission	Water (ppm), Oxidation (Abs/0.1mm), Fluid Integrity (unit)
Hydraulic – Fire resistant (Phosphate Ester)	Water (ppm), TAN (mg KOH/g)
Hydraulic – Aerospace (Synthetic Hydraulic Fluid)	Water (ppm), Oxidation (Abs/0.1mm), Alien Fluid mineral based (MIL-H-2304) (%), and Alien Fluid engine oil (MIL-H-23699) (%)
Heat Transfer (Quenching Oil)	Water (ppm), Oxidation (Abs/0.1mm)
Industrial (Steam and CCGT Turbine, Hydraulic, Compressor, Chiller, Gear, etc.)	Water (ppm), Oxidation (Abs/0.1mm), TAN (mg KOH/g)
Turbine Aerospace (Synthetic Gas Turbine Oil)	Water (ppm), TAN (mg KOH/g), Antioxidant (% depletion)
Engines (Engine oil for different engine types, including Gasoline, Diesel, Heavy Duty Diesel, HFO, Natural Gas, etc)	Water (ppm), Oxidation (Abs/0.1mm), TBN (mg KOH/g), TAN (mg KOH/g) (Natural Gas only), Sulfation (Abs/0.1mm), Nitration (Abs/cm), Soot (%), Glycol (%), Anti Wear (%), Biodiesel Dilution (%) (Diesel & Heavy Duty Diesel – Engine Oils)
Grease	Water, Oxidation, Water Index
Ethanol in Gasoline	Ethanol (%)
FAME in Diesel	FAME (%)
Biodiesel Feedstock	Water (ppm), FFA %
Biodiesel	Water (ppm), TAN (mg KOH/g), Total Glycerin (%)





Specifications

Analytical measuring range	Mid infrared 900 cm^{-1} - 3700 cm^{-1}
Analysis stability	≤ ± 3%
Sample volume	0.03µL (1-2 drop)
Environment requirement	10°C - 50°C
Power requirement	AC 110/240 V, 50/60 Hz, 10 Watt
Dimensions (WxDxH)	14 x 7 x 24 cm

NSN 6630016222461

Q3000 Portable Kinematic Viscometer

ASTM D8092

MiniVisc 3000 Series viscometers use a patented split cell design that enables measurement of kinematic viscosity using only a few drops (60 µl) of oil. When closed, the center pieces of the split cell form a funnel with a 100 micron gap allowing oil to flow down by gravity. Sensors along the funnel are triggered when oil flows by and flow time between two sensors is measured. The kinematic viscosity is then calculated. When opened, the split cell can be easily cleaned with a non-abrasive cleaning pad and it is ready for the next sample. The split cell is controlled at 40°C throughout the measurement.

Specifications

Sample volume	60 µL	Measuring range	1-700 cSt
Temp. control	+/- 0.1	Data transfer	USB
Control	Touchscreen	Battery life	6-8 hours
Dimensions (WxDxH)	13 x 20 x 15 cm	Weight	1.8 kg

FDM Q6000 Portable Fuel Dilution Meter

ASTM D8004

The FDM 6000 is a portable, battery operated fuel dilution meter that determines the concentration of fuel dilution present in an oil sample within a matter of minutes. The FDM 6000 uses a unique patent pending fang design to pierce the cap of a disposable sample vial and draws in the headspace from the vial. The headspace flows over a SAW (Surface Acoustic Wave) sensor which reacts specifically to the presence of fuel vapor with a detection range of 0 – 15%. It can detect diesel, gasoline or jet fuel in engine oil. It conforms to ASTM D8004 - “Standard Test Method for Fuel Dilution of In-Service Lubricants Using Surface Acoustic Wave Sensing”

NSN 6630015100495

Specifications

Sample volume	0.5 mL	Analysis time	1 m.
Memory	4GB	Data transfer	USB
Dimensions (WxDxH)	20 x 14 x 15 cm	Weight	1.4 kg

FERROCHECK 2000 Ferrous Metal Analyzer

ASTM D8120

The FerroCheck 2000 Series of portable ferrous analyzers offer accuracy and convenience for total ferrous measurement of in-service lubricating oil and grease. Fast and easy to use samples are analyzed in less than 30 seconds. Small sample volumes of just 1.5 ml of oil or 0.75 ml of grease are needed to measure ferrous content in part per million (ppm) by weight. The FerroCheck measures the total ferrous content of both small particles from normal machine wear and large abnormal wear particles.

Specifications

Measuring range	• Mineral oil: 0-10000 ppm	• Grease: 0 ppm - %15	
Analysis time	<30 s .	MDL	3 ppm
Dimensions (WxDxH)	20 x 14 x 15 cm	Weight	1.4 kg

MINILAB Series

Oil Analysis Systems

MiniLab 153 - 4 Test

MiniLab 153 – provides a complete oil analysis report with elemental analysis, comprehensive wear particle analysis, solid and water contamination, fluid chemistry and viscosity.

MiniLab 53 – provides a Trivector report with comprehensive wear particle analysis, solid and water contamination, fluid chemistry and viscosity.

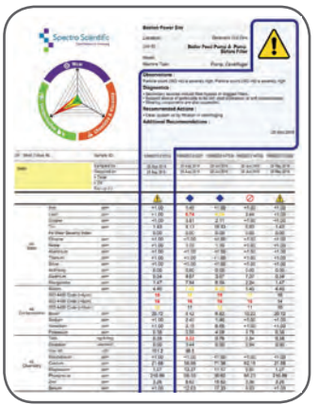
MiniLab 33 – provides a basic Trivector report with total ferrous wear, fluid chemistry, water in oil and viscosity.

MiniLab 23 – provides basic oil condition information including viscosity, chemistry and water in oil.

MiniLab 53 - 3 Test

MiniLab 33 - 3 Test

MiniLab 23 - 2 Test



Truvu 360 trend report

TruVu360 Insight. On-site.

PARAMETER	Elemental ASTM D6595	Particle Count Ferrous ASTM D7596	Ferrous ASTM D8120	Viscosity ASTM D8092	Chemistry ASTM D7889
Particle count and ISO codes		✓			
Nonmetal particle count, distribution and images		✓			
Sodium and silicon	✓				
Total water					✓
Viscosity				✓	
Total Acid Number (TAN)					✓
Oxidation					✓
Total Base Number (TBN), Oxidation, Nitration and Sulfation					✓
Magnesium, Calcium, Barium, Zinc, Molybdenum & Phosphorus	✓				
Particle counting, display and distribution		✓			
Total Metal (Fe, Ni, Co) content		✓	✓		
Large Metal content and distribution		✓			
Copper, Silver, Chrome, Titanium, Aluminum, Nickel Iron, Manganese, Lead, Tin, Cadmium and Vanadium	✓				

MICROLAB Series

On-Site Oil Analyzer

MicroLab is designed primarily for fleets operating equipment with hydraulic components or heavy equipment gears and transmissions. This would include off-road mining and construction vehicles as well as over-the-road equipment with hydraulics such as bucket trucks, fire engine ladder trucks or solid waste trucks. The MicroLab is also used in applications for offshore drilling equipment. In addition to the basic oil chemistry and extended elemental analysis provided with the MicroLab 30, the MicroLab 40 model includes a particle counter which provides critical analysis for cleanliness of hydraulic oils and gear oils to determine the health of those oils and mechanical condition of those components.

	MicroLab 30	MicroLab 40
Infrared Spectrometer	✓	✓
Kinematic Viscometer	✓	✓
Elemental Analysis	✓	✓
Particle Count	✓	

Infrared Spectrometer

- Oil degradation: oxidation, nitration, total base number
- Oil contamination: soot, water, glycol

Viscosity

- Kinematic viscosity at 40°C and 100°C
- Viscosity Index (VI)

Elemental Analysis

- **MicroLab 30:** Aluminum, Chrome, Copper, Iron, Lead, Molybdenum, Potassium, Silicon, Sodium and Tin
- **MicroLab 40:** Aluminum, Chrome, Copper, Iron, Lead, Molybdenum, Potassium, Silicon, Sodium, Tin, Barium, Boron, Calcium, Magnesium, Manganese, Nickel, Phosphorus, Titanium, Vanadium and Zinc

Particle Count

- Total number of particles
- ISO 4406 particle distribution

COOLCHECK

Automated Coolant and DEF Analyzer

The core of CoolCheck 2 coolant and DEF analyzer is the patented near IR (NIR) and UV/Visible dual spectrometer that measures the absorption spectrum at these two wavelengths simultaneously using a unique sample vial. Physical parameters are extrapolated from the obtained spectrum with special calibrations (done in the factory). Alarm limits stored in the device provide a traffic light style report for immediate decision making. The entire test takes less than a minute.

INFRACAL 2

Total Oil Grease Determination System

ASTM D7066, EPA 1664, SM5520

Industrial and food processing plants that have high levels of fats, oil and grease (FOG) in their effluent face strict wastewater regulations. The InfraCal 2 analyzers provide accurate, easy on-site analysis to help both regulators and industry reduce excessive oil/grease discharges and comply with permit requirements. On-site results are attained in 10-15 minutes, eliminating the wait for remote lab results which can take several days to a week. The extraction and measurement procedure is simple enough for an operator with minimal training to do the analysis.

Specifications	ATR-SP	TRANS-SP
MDL water	0,3 ppm	0,1 ppm
MDL soil	3 ppm	1 ppm
Solvent	Hexane, Pentane, Cyclohexane, Vertrel MCA	Tetrachlorethylene, S-316, Freon-113
Method	EPA 1667, ISO 9377-2	ASTM D7066, EPA 413.2, EPA 418.1
Internal memory	✓	✓
Data transfer	✓	✓
Multiple calibration	✓	✓
Touchscreen	✓	✓
Internal battery	✓	✓
Dimensions (WxDxH)	20 x 17 x 13 cm	20 x 17 x 13 cm
Power requirement	18 VDC	18 VDC

INFRACAL 2 ATR-SP

- Minimum detection limit, water: 0.3 ppm
- Minimum detection limit, soil: 3 ppm
- Standards: EPA 1664, SM 5520

INFRACAL 2 TRAN-SP

- Minimum detection limit, water: 0.1 ppm
- Minimum detection limit, soil: 1 ppm
- Standards: ASTM D7066, EPA 413.2, EPA 418.1, EPA 1664 & ISO 9377-2

NEWLAB SERIES

Cold Property Analyzer

ASTM D97, ASTM D2500, ASTM D5853, ASTM D6371, ASTM D6422, IP 15, IP 16, IP 219, IP 309, IP 441, ISO 3015, ISO 3016, DIN 51597, EN 116, EN 23015, NF T 60-105, FTM 791 201

According to the analysis method, the sample is cooled down at a specified rate and at the prescribed temperature intervals. The mechanical arm of the analyser can be modified for pour point, cloud point, cold filter plugging point and for similar cold properties analysis requirements. NewLab Series Analyzers are also equipped with thermal probs and optical detectors, allowing full automatic analysis during whole process.

Areas of Use

- Mineral & Base Oils
- Used and Waste Oils
- Light and Heavy Fuels

Specifications

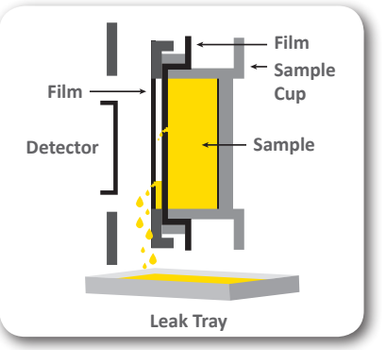
Display	Real time temperature and pressure values
Test Chamber	Stainless Steel
Temperature Sensitivity	0.01°C
Time Sesitivity	0.1 s
User Interface	Touch Panel Windows IPC
Data Transfer	USB & PC
Memory	Built-in results memory
Dimensions (WxDxH)	30 x 50 x 80 cm
Weight	20 Kg
Power Requirements	220 VAC - 50 Hz

PETRA[4294] & PETRAMAX

Sulfur & Multi Element Analyzer

ASTM D4294, ISO 8754

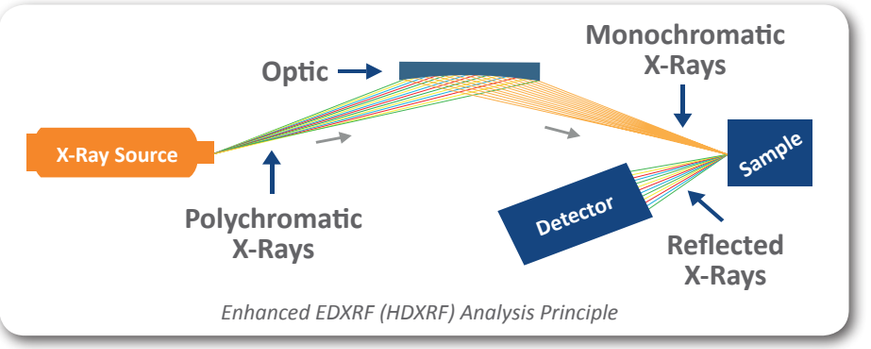
Petra 4294 is a high-precision XRF analyzer that delivers D4294 sulfur analysis across a broad measurement range. This instrument offers advanced precision with HDXRF, advanced reliability, and advanced software and data management. Petroleum laboratories depend on reliable, robust analytical solutions for their fast-paced environment. Petra 4294 was designed to meet these needs with an innovative sample introduction system that directs accidental spills to a drip tray and away from valuable components.



Petra 4294 Autosampler offers a more efficient workflow with sample tracking and continuous sample loading. Users can eliminate data errors and add urgent samples to the queue as needed.

The Autosampler Upgrade Kit can be added to any Petra Series analyzer. Users have the option to use X-ID Sample Cups (QR-coded) or standard XRF cups.

Petra Autosampler



Enhanced EDXRF (HDXRF) Analysis Principle

Specifications

Measurement time	30 - 900 s
Calibration	30 calibration curve
Sample cup volume	7 mL
Data output	Printer, USB ve Ethernet
Environment requirement	5°C to 40°C
Dimensions (WxDxH)	37 x 42 x 16 cm
Weight	12.7 kg
Power requirement	110-220 VAC +- 10%, 50-60 Hz

RANGES AND LIMITS

PetraMax — **Measuring range**: Sulfur 5.7 ppm - %10

Measuring limits (ppm)

P	Cl	K	Ca	V	Cr
17	3	0.7	0.4	0.1	0.09
Mn	**Fe**	**Co**	**Ni**	**Cu**	**Zn**
0.07	0.07	0.07	0.04	0.1	0.1

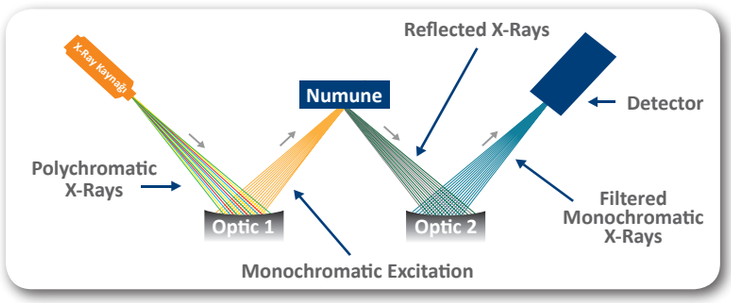
Petra 4294 — **Measuring range**: Sulfur 2.6 ppm - %10

SINDIE

WDXRF Sulfur Analyzer

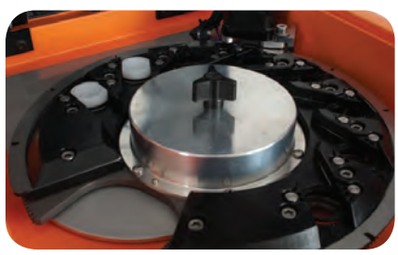
ASTM D7039, ISO 20884

Sindie 7039 complies with ASTM D7039 and ISO 20884 methods, and enables fast batch testing from 0.15 – 3000 ppm for sulfur fuel samples at petroleum pipeline terminals, refineries, and test laboratories. This unit is compact and fits on any lab bench with an easy-to-use and robust design requiring minimal maintenance. Sindie 7039 offers many advantages over competing technologies: It has exceptional signal-to-noise ratio, and does not require consumable gases or high-temperature operations. From ultra low sulfur diesel and gasoline, to heavy fuel oil and crudes, Sindie® 7039 delivers improved precision and accuracy. Sindie 7039 is the ideal analytical solution for the refining industry where detection, performance and reliability are critical.



Sindie analysis principle

Sindie OTG



8 sampling autosampler unit

Accucell sample cups

Sindie Sea 16

Specifications

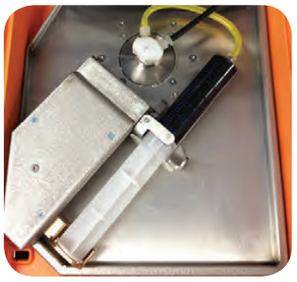
Analysis time	30-900 s (user selectable)
Calibration	8 different calibration curves
Min. measurement limits	0.7 ppm (Sindie OTG) 0.4 ppm (Sindie Gen2) 0.15 ppm (Sindie Gen3)
Max. measurement limit	%10
Sample cup volume	1 mL
Ambient conditions	5-40°C
Power requirement	200-240 VAC, 47-63 Hz at 6.0 Amps
Dimensions (WxDxH)	37 x 50 x 34 cm (Gen2 & Gen3) 34 x 23,5 x 30 cm (OTG)

CLORA

MWDXRF Total Chlorine Analyzer

ASTM D4929, ASTM D7536

Clora benchtops are compliant with ASTM D7536 and D4929 standards, and deliver a limit of detection of 0.13 ppm and a dynamic range up to 3000 ppm. Clora is powered by MWDXRF, the same technology found in our signature sulfur analyzer, Sindie. This direct measurement technique does not require gasses or high temperature processes equating to easy operation and minimum maintenance requirements. Clora offers many features such as extended range with and without catalyst, autosampler, and Accu-flow. Accu-flow technology eliminates particle settling and delivers results that better reflect crude streams as they exist in the refinery. Over a typical measurement cycle, the heavier particles can settle to the bottom of the sample cup and cause higher than normal results.



ACCU-FLOW

Accu-flow allows the sample to flow continuously during measurement. This continuous flow eliminates the settling of chlorine, producing accurate and precise total chlorine results.

Specifications

MDL	0.13 ppm (600 s)
Measurement ranges	0.13 ppm - %4 wt
Control	Touchscreen
Analysis time	30 - 900 s
Areas of Use	Field and laboratory
X-Ray Source	Cooled X-ray excitation source
Sample cup volume	10 mL
I/O Ports	Ethernet 10/100 T, RS 232
Ambient conditions	5 - 40°C
Dimensions (WxDxH)	37 x 50 x 34 cm
Power requirement	100 – 120 VAC, 47 – 63 Hz at 6 Amp

SINDIE+CL

WDXRF Sulfur & Chlorine Content Analyzer

Sindie +Cl is a sulfur and chlorine analyzer delivering two critical measurements with one push of a button and zero hassle. It is the ideal solution for refineries and independent labs to certify sulfur levels in finished products and assess chlorine for corrosion mitigation, all with one instrument.

Specifications

Measuring range	Sulfur: 0.4 ppm - 5 wt% Chlorine: 0.3 ppm - 3000 ppm
Analysis time	30 - 900 s
Dimensions (WxDxH)	37 x 50 x 34 cm

PHOEBE

Total Phosphorus Analysis System

From crude oil to bio-fuels, in additives or water, Phoebe benchtop analyzers deliver exceptional precision and accuracy for complete phosphorus analysis. It is very easy to operate with an intuitive touchscreen enabling use in various industrial environments. Phoebe is hassle-free and does not require extensive sample preparation, consumable gasses or sample conversion.

Specifications

Measuring range	0.4 ppm - 3000 ppm
Analysis time	30 - 900 s
Dimensions (WxDxH)	37 x 50 x 34 cm

SIGNAL

WDXRF Silicon Detection System

ASTM D7757

Signal complies with ASTM D7757 and delivers quantitative analysis of silicon (Si) from gasoline to ethanol, and toluene. Silicon contamination continues to impact fuel quality, resulting in costly engine failures and catalyst fouling.

Specifications

Measuring range	0.65 ppm - 3000 ppm
Analysis time	30 - 900 s
Dimensions (WxDxH)	37 x 50 x 34 cm

PETRODIST 300

Vacuum Distillation System

ASTM D1160

Fully automatic crude oil distillation system, processor controlled according to ASTM D-1160 for the determination of boiling ranges of crude oil products under vacuum. The system can be operated in strict accordance to the ASTM procedure with 1 single receiver or alternatively, by using the automatic fraction collector, with 4 receivers.

PetroDist 300CC

Key Features:

- Parameter input, display as well as calculation of distillation and final data and print out of the distillation curve via PC
- Easy operation due to userfriendly software, operated under WINDOWS XP
- Sophisticated safety system
- Automatic heating and distillation rate as well as detection of initial boiling point (ibp)
- Individual distillation reports and curves can be re-called any time
- Precise distillation data due to automatic calibration of volume measuring system
- Anti foaming by foam breaker
- Precise vacuum control
- Automatic washing run
- Calculation of charge according to receiver temperature and charge density
- Easy installation effort as the system is delivered ready for operation
- Manual override of automatic operation
- Automatic controlled termination of distillation process and start of cooling
- Automatic fraction collector with 4 receivers (Petrodist 300CC-F)

PetroDist 350CC

Specifications

Sample cup volume	500 mL
Sample volume	200 mL
Operating temperature	up to 400 °C
Max. temperature	up to 650 °C AET
Operating pressure	Vacuum 1 Torr (PD300CC) Vacuum 0.1 Torr (PD350CC)
Distillation Rate	6 mL/m (adjustable)
Fractional addition	5 pieces (PD350CC)
Dimensions (WxDxH)	96 x 64 x 65 cm (PD300CC) 100 x 67 x 130 cm (PD350CC)
Power Requirement	208 - 250 V, 50 / 60 Hz, 3500 W

PETRODIST 100

TBP Crude Oil Distillation System

ASTM D2892

Processor controlled crude oil distillation system for fully automatic operation exactly conforming to ASTM D-2892 (TBP), latest revision. These different distillation runs are performed automatically without any intervention of the operator. The system automatically manages the changes of all involved operation pressure changes from atmospheric to the different vacuum conditions automatically with. The duration of the intermediate cooling procedure in between the different runs is minimized by an intensive cooling of the flask charge as well as introduction of N2 into the system.

Specifications

Sample cup volume	2-33 Liter	Fractional collection	20 x 1 Liter
Control	Internal or external PC	Reflux control	Auto (adjustable)
Max. temperature	400°C	Power requirements	3 x 208 - 260 V, 50 Hz
Vacuum	up to 1 Torr	Power usage	6000 W
Volume control	Auto	Dimensions (WxDxH)	260 x 90 x 350 cm

PETRODIST 200

Potstill Distillation System

ASTM D5236

Processor controlled crude oil distillation system for fully automatic operation according to ASTM D-5236 (Standard Test Method for Distillation of Heavy Hydrocarbon Mixtures, Vacuum Potstill Method). This new edition is summarizing our long term experience and taking into account all our customers feedbacks for improved performance and even more easy handling and reduced service necessity. The new design specifically highlights the high viscous residues that are being processed in this system by guaranteeing a continuously operating tempered discharge into an open fraction collector with automatic and precise weight measurement.

Specifications

Sample cup volume	2-20 Liter	Fractional collection	12 x 1 Liter
Control	Internal or external PC	Power requirements	208 - 260 V, 50 Hz
Max. temperature	565 °C	Power usage	5000 W
Vacuum	up to 0.1 Torr	Dimensions (WxDxH)	181 x 87 x 203 cm

PILODIST 1120

Coolant Distillation System

ASTM D1120
SAE-J1704

The system is designed for fully-automatic operation conforming to ASTM-D1120 to determine very precise and reproduceable the boiling point of engine coolants and brake fluids. A complete test can be done in approx. 8-15 minutes. An indelible print out with all results is peformed automatically and additionally a PDF-file can be created for network connectivity. PILODIST 1120 CC can be operated in different measuring modes to be selected via an integrated touchpanel. All parameters are indicated during the measuring process as well as the results.

FILMDIST TF650

Thin-Film Evaporation System

Universal apparatus for thin-film evaporation for lab-scale and pilot-scale application, complete with all necessary accessories for continuous operation. Rotary thin-film evaporator with thermostat mantle and external condenser. The model TF 650 is excellently suited for universal lab-scale and pilot-scale application and is completely equipped with all necessary accessories for the continuous operation.

Specifications

Evaporator surface	6.5 dm^2, Thin-film	Distillation rate	0.5 - 10 L/h
Max. temperature	250 °C	Power requirements	208 - 260 V, 50 Hz
Vacuum	0.1 mbar	Dimensions (WxDxH)	120 x 60 x 180 cm

PILODIST SP500

Short-Path Evaporator System

Short-path evaporator apparatus for lab-scale or pilot operation. Rotary thin-film evaporator with thermostat mantle and internal condenser for continuous short-path distillation or gentle concentration of thermally sensible products. Suited for laboratory or pilot operation. The pilot operation data and experimental values can be transferred to bigger systems. The standard system uses PTFE rolling wiper elements. Other wiper elements are available.

Specifications

Evaporator surface	5 dm^2, Short-Path	Distillation rate	0.5 - 10 L/h
Max. temperature	250 °C	Power requirements	208 - 250 V, 50 Hz
Vacuum	0.001 - 1000 mbar	Dimensions (GxDxY)	120 x 60 x 180 cm

PILOEX SL5

Solid-Liquid Extractor

The solvent circulates between extraction vessel, evaporator and condenser. The solid matter in the extraction vessel is continuously rinsed with purified solvent until all solubles are leached out of the solid matter. The solvent, which is charged with the extract, flows from the extraction vessel into the evaporator, where the extract will be collected and concentrated. After terminating the leaching process, a further purification of the extract by evaporation is possible. The system is designed for batch (discontinuous) operation but can also be operated semi-continuously. The standard system can be operated either for vacuum operation or overpressure operation as well. The system can be designed either in glass, stainless steel or other material, depending on the application.

PILODIST PD104

High Precision Distillation System

These systems, which are developed for the separation processes of essential oil, aroma, fatty acids and similar, offer up to 6 different fractions. The system does not require any user intervention during the analysis except for determining the desired parameters for the analysis. Sample temperature, steam temperature, distillation rate, vacuum value etc. The parameters are controlled by the device control unit and simultaneously monitored on the computer screen. After the analysis, the process is completed by reporting all distillation values.

PILODIST PD107

Recovery Unit

PILODIST 107 is an easy to handele solvent recovery system for extremely pure solvents. The solvent mixtures are side products of extraction's, washing processes, chemical and biochemical reactions, chromatographic operations in clinical range, especially in anatomical and pathological institutes.

X-PERT

EDXRF Analysis System

X-Pert (Secondary Targets) EDXRF spectrometer offers a cost-effective solution in today's market of elemental analysis. The analyzer provides a non-destructive qualitative and quantitative determination from Carbon(6) to Fermium(100), providing detection limits from sub-ppm to high weight percent concentrations.

Specifications	SDD	SDD LE
Detector	SDD with 125 eV accuracy (Silicon Drift Detector)	Optimized light element detector
Elements	F(9) - Fm (100)	C(6) - Fm(100)
Measuring range	0.1 ppm - %100	
Excitation	50 kV, 50W Rh anode X-Ray source	
Excitation type	Via direct or secondary target	
Filters	8 pieces	
Analysis environment	Air / Helium / Vacuum	
Sample chamber	8 or 16 autosampler unit	
Dimensions (WxDxH)	55 x 32 x 55 cm	
Power requirements	110 - 230 VAC 50/60 Hz	

Portable Systems

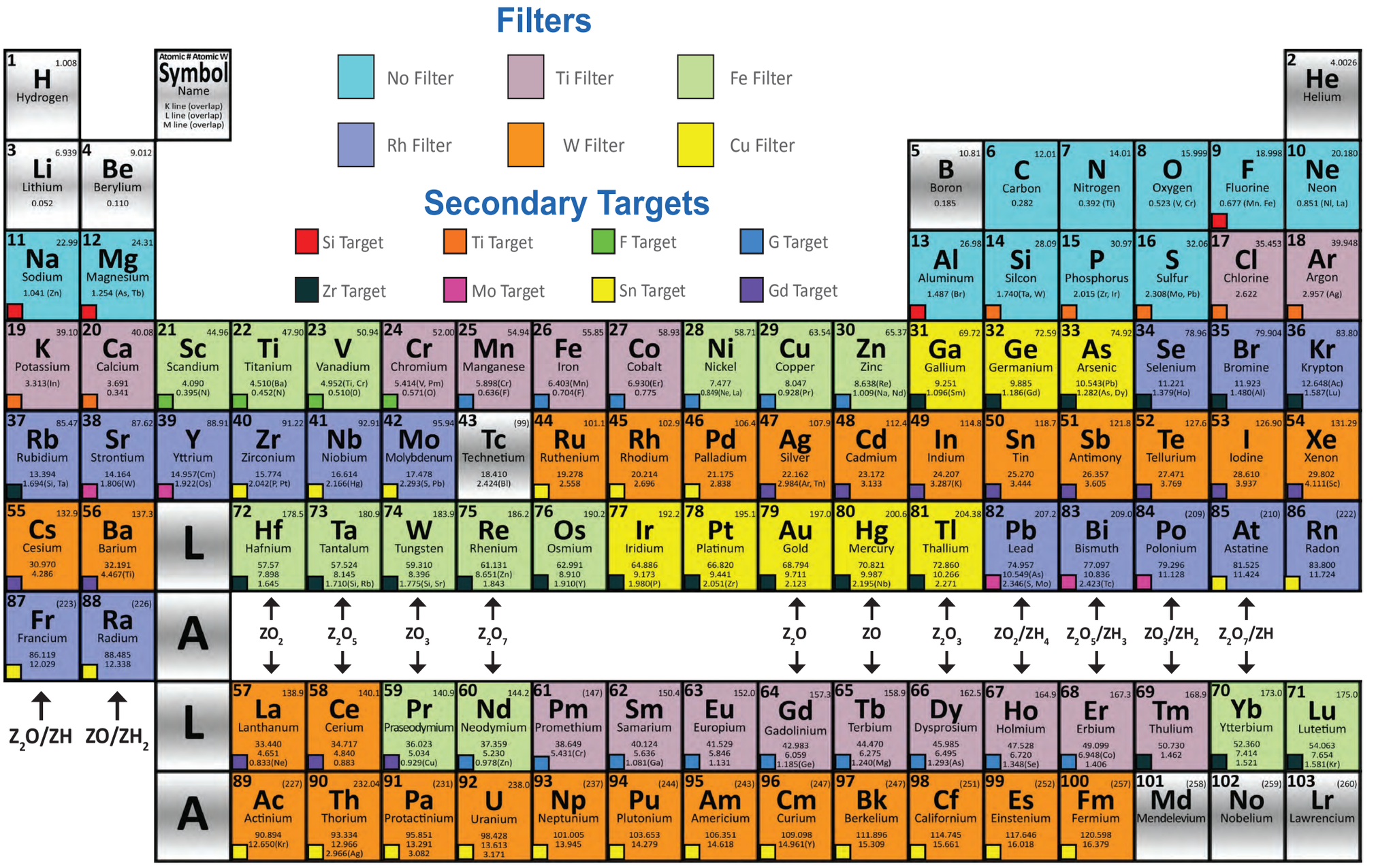
X-Port portable EDXRF analyzers offer fast and accurate elemental analysis in laboratory or on-site with built-in battery and touch control panel.

Benchtop Systems

X-Ceed, DMT-X, X-Pert & YMT-X PD model benchtop EDXRF analyzers offer accurate and sensitive elemental analysis down to sub-ppm levels for different types of applications.

Laboratory Systems

With the high power X-Ray capability X-POSE, X-PAND & X-TEND Laboratory EDXRF elemental analyzers offer the highest accuracy and detection limit for all various size of solid and liquid samples.

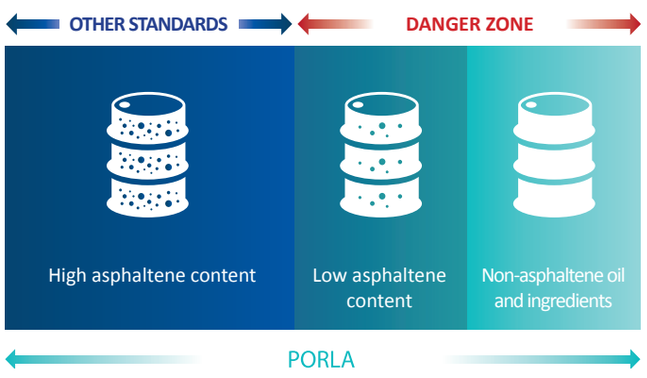

Filters
No Filter
Ti Filter
Fe Filter
Rh Filter
W Filter
Cu Filter
Secondary Targets
Si Target
Ti Target
F Target
G Target
Zr Target
Mo Target
Sn Target
Gd Target
Atomic # Atomic W
Symbol
Name
K line (overlap)
L line (overlap)
M line (overlap)
1 1.008 H Hydrogen
2 4.0026 He Helium
3 6.939 Li Lithium 0.052
4 9.012 Be Berylium 0.110
5 10.81 B Boron 0.185
6 12.01 C Carbon 0.282
7 14.01 N Nitrogen 0.392 (Ti)
8 15.999 O Oxygen 0.523 (V, Cr)
9 18.998 F Fluorine 0.677 (Mn. Fe)
10 20.180 Ne Neon 0.851 (Nl, La)
11 22.99 Na Sodium 1.041 (Zn)
12 24.31 Mg Magnesium 1.254 (As, Tb)
13 26.98 Al Aluminum 1.487 (Br)
14 28.09 Si Silcon 1.740(Ta, W)
15 30.97 P Phosphorus 2.015 (Zr, Ir)
16 32.06 S Sulfur 2.308(Mo, Pb)
17 35.453 Cl Chlorine 2.622
18 39.948 Ar Argon 2.957 (Ag)
19 39.10 K Potassium 3.313(In)
20 40.08 Ca Calcium 3.691 0.341
21 44.96 Sc Scandium 4.090 0.395(N)
22 47.90 Ti Titanium 4.510(Ba) 0.452(N)
23 50.94 V Vanadium 4.952(Ti, Cr) 0.510(O)
24 52.00 Cr Chromium 5.414(V, Pm) 0.571(O)
25 54.94 Mn Manganese 5.898(Cr) 0.636(F)
26 55.85 Fe Iron 6.403(Mn) 0.704(F)
27 58.93 Co Cobalt 6.930(Er) 0.775
28 58.71 Ni Nickel 7.477 0.849(Ne, La)
29 63.54 Cu Copper 8.047 0.928(Pr)
30 65.37 Zn Zinc 8.638(Re) 1.009(Na, Nd)
31 69.72 Ga Gallium 9.251 1.096(Sm)
32 72.59 Ge Germanium 9.885 1.186(Gd)
33 74.92 As Arsenic 10.543(Pb) 1.282(As, Dy)
34 78.96 Se Selenium 11.221 1.379(Ho)
35 79.904 Br Bromine 11.923 1.480(Al)
36 83.80 Kr Krypton 12.648(Ac) 1.587(Lu)
37 85.47 Rb Rubidium 13.394 1.694(Si, Ta)
38 87.62 Sr Strontium 14.164 1.806(W)
39 88.91 Y Yttrium 14.957(Cm) 1.922(Os)
40 91.22 Zr Zirconium 15.774 2.042(P, Pt)
41 92.91 Nb Niobium 16.614 2.166(Hg)
42 95.94 Mo Molybdenum 17.478 2.293(S, Pb)
43 (99) Tc Technetium 18.410 2.424(Bl)
44 101.1 Ru Ruthenium 19.278 2.558
45 102.9 Rh Rhodium 20.214 2.696
46 106.4 Pd Palladium 21.175 2.838
47 107.9 Ag Silver 22.162 2.984(Ar, Tn)
48 112.4 Cd Cadmium 23.172 3.133
49 114.8 In Indium 24.207 3.287(K)
50 118.7 Sn Tin 25.270 3.444
51 121.8 Sb Antimony 26.357 3.605
52 127.6 Te Tellurium 27.471 3.769
53 126.90 I Iodine 28.610 3.937
54 131.29 Xe Xenon 29.802 4.111(Sc)
55 132.9 Cs Cesium 30.970 4.286
56 137.3 Ba Barium 32.191 4.467(Ti)
L
72 178.5 Hf Hafnium 57.57 7.898 1.645
73 180.9 Ta Tantalum 57.524 8.145 1.710(Si, Rb)
74 183.9 W Tungsten 59.310 8.396 1.775(Si, Sr)
75 186.2 Re Rhenium 61.131 8.651(Zn) 1.843
76 190.2 Os Osmium 62.991 8.910 1.910(Y)
77 192.2 Ir Iridium 64.886 9.173 1.980(P)
78 195.1 Pt Platinum 66.820 9.441 2.051(Zr)
79 197.0 Au Gold 68.794 9.711 2.123
80 200.6 Hg Mercury 70.821 9.987 2.195(Nb)
81 204.38 Tl Thallium 72.860 10.266 2.271
82 207.2 Pb Lead 74.957 10.549(As) 2.346(S, Mo)
83 209.0 Bi Bismuth 77.097 10.836 2.423(Tc)
84 (209) Po Polonium 79.296 11.128
85 (210) At Astatine 81.525 11.424
86 (222) Rn Radon 83.800 11.724
87 (223) Fr Francium 86.119 12.029
88 (226) Ra Radium 88.485 12.338
A
ZO2
Z2O5
ZO3
Z2O7
Z2O
ZO
Z2O3
ZO2/ZH4
Z2O5/ZH3
ZO3/ZH2
Z2O7/ZH
Z2O/ZH
ZO/ZH2
L
57 138.9 La Lanthanum 33.440 4.651 0.833(Ne)
58 140.1 Ce Cerium 34.717 4.840 0.883
59 140.9 Pr Praseodymium 36.023 5.034 0.929(Cu)
60 144.2 Nd Neodymium 37.359 5.230 0.978(Zn)
61 (147) Pm Promethium 38.649 5.431(Cr)
62 150.4 Sm Samarium 40.124 5.636 1.081(Ga)
63 152.0 Eu Europium 41.529 5.846 1.131
64 157.3 Gd Gadolinium 42.983 6.059 1.185(Ge)
65 158.9 Tb Terbium 44.470 6.275 1.240(Mg)
66 162.5 Dy Dysprosium 45.985 6.495 1.293(As)
67 164.9 Ho Holmium 47.528 6.720 1.348(Se)
68 167.3 Er Erbium 49.099 6.948(Co) 1.406
69 168.9 Tm Thulium 50.730 1.462
70 173.0 Yb Ytterbium 52.360 7.414 1.521
71 175.0 Lu Lutetium 54.063 7.654 1.581(Kr)
A
89 (227) Ac Actinium 90.894 12.650(Kr)
90 232.04 Th Thorium 93.334 12.966 2.966(Ag)
91 (231) Pa Protactinium 95.851 13.291 3.082
92 238.0 U Uranium 98.428 13.613 3.171
93 (237) Np Neptunium 101.005 13.945
94 (244) Pu Plutonium 103.653 14.279
95 (243) Am Americium 106.351 14.618
96 (247) Cm Curium 109.098 14.961(Y)
97 (247) Bk Berkelium 111.896 15.309
98 (251) Cf Californium 114.745 15.661
99 (252) Es Einstenium 117.646 16.018
100 (257) Fm Fermium 120.598 16.379
101 (258) Md Mendelevium
102 (259) No Nobelium
103 (260) Lr Lawrencium

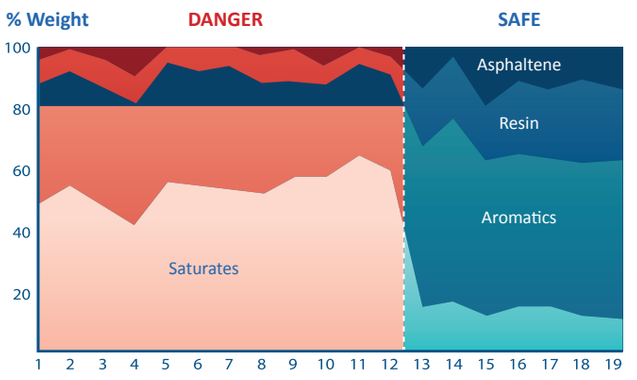
PORLA

Stability and Compatibility Analyzer

ASTM D7112

The basis of the Porla analyser technology was originally developed more than 30 years ago within Neste Oil Ltd, the Finnish oil company. In 1996, this technology was utilised by Finnish Measurement Systems Ltd and FMS has commercialised Porla technology since then, developing it further and also creating new applications in close co-operation with prominent global partners and customers. The Porla method has been an ASTM standard method D 7112 since 2005. In 2013-2014, FMS developed the New Generation Porla analyser, during which we took into account the comments, wishes and ideas of Porla end-users.





BOCLE 5001

Lubrication Feature Analysis System

ASTM D5001

The BOCLE-equipment according to ASTM D-5001 measures the actual wear scar size with a test ball specimen. The wear scar is generated by the friction between the stationary ball and a rotating cylinder. A part of the rotating cylinder is immersed in the turbine fuel tank (50 ml) and covered with the turbine fuel. The temperature of the fuel tank is controlled, as well as the relative humidity of the air which is circulated into and above the test fluid – the air flow rate is controlled, too. The Test Ball is loaded by a constant weight for the test period 30 min. After the test the minor & major axis of the resultant wear scar are measured with a microscope. The wear scar defines the lubricity of the aviation turbine fuel or other liquids.

SINDIE ONLINE

On-Line Sulfur Analyzer

ASTM D7039

Sindie Online is an industrial grade process sulfur analyzer with breakthrough detection capability to monitor ultra-low sulfur in petroleum or aqueous process streams. This process analyzer presents the ultimate solution for refineries and pipeline terminals where measurement speed and reliability are essential. Powerd by MWDXRF, Sindie Online uses ASTM D7039 technology and delivers real-time, continuous analysis of total sulfur from 0.5 ppmw up to 3000 ppmw. This process analyzer is ATEX and NEC certified for hazardous area locations.

CLORA ONLINE

Online Chlorine Analyzer

ASTM D7536

Chlorine contributes significantly to the corrosion of plant equipment and must be treated accordingly. With ever-changing crude quality and potential for process upsets, chlorine levels can shift quickly, making real-time analytical results invaluable. Powered by MWDXRF®, Clora® Online uses ASTM D7536 technology and delivers real-time, continuous analysis of total chlorine from 0.2 ppmw up to 3000 ppmw. By monitoring desalted crude, a plant can optimize performance and immediately see impacts of crude changes (including organic chloride). This process analyzer is ATEX and NEC certified for hazardous area locations.

OTHER ONLINE SYSTEMS

Vapor pressure, pour point, cloud point, stability and similar online analysis systems for the determination of real-time parameters, provide continuous monitoring of refineries, terminals, filling facilities and pipelines. These systems, which are suitable for use in high risk areas, are presented to the user with ATEX and NEC certificates.

OTHER ANALYSIS SYSTEMS

Karl Fischer Water Content

ASTM D1364 IP 356
ASTM D1533 IP 471
ASTM D4377 ISO 10336
ASTM E203 ISO 6296
DIN 51777

Pour Point

ASTM D97
ASTM D5853
ASTM D5950
ASTM D6922
IP 15
IP 441
ISO 3016

Pensky Martens Flash Point

ASTM D93
ASTM D3941
ASTM E502
DIN EN 22719
IP 34
ISO 2719

Freezing Point

ASTM D852 IP 16
ASTM D1177 IP 435
ASTM D1493 IP 528
ASTM D1655 IP 529
ASTM D2386 ISO 3013
ASTM D5901
ASTM D5972
ASTM D7154

Cleveland Flash Point

ASTM D92
DIN 51376
EN 22592
IP 36
ISO 2592

CloudPoint

ASTM D2500 IP 219
ASTM D5771 IP 444
ASTM D5772 IP 445
ASTM D5773 IP 446
DIN 51597 ISO 3015

TAN/TBN Analysis

ISO 3012
ASTM D 3227
UOP 163
UOP 212

Cold Filter Plugging Point (CFPP)

ASTM D6371
IP 309
IP 419
EN 116
EN 16329

H2S Analysis

ASTM D 664
ASTM D 2896
ASTM D 4739
IEC 62021-1
ISO 3771

Filter Plugging Tendency

ASTM D2068
ASTM D6426
IP 387

OTHER ANALYSIS SYSTEMS

Softening Point

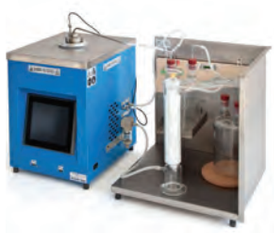
ASTM D36
ASTM E28
EN 1427
IP 58
ISO 4625
DIN 52011
NF T 66-008
AASHTO T53
JIS K2207

Evaporation Bath

ASTM D381
DIN 51784
IP 131
IP 540
ISO 6246

Determination of Grease Permeability

ISO 13357

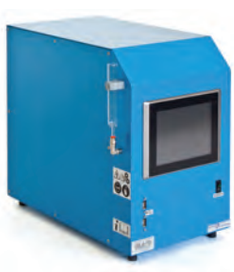


NOACK Test

ASTM D5800
IP 421

Low Temperature Flow Test

ASTM D4539

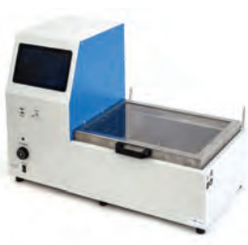


Vapor Pressure Test

ASTM D1267
ASTM D5191
IP 161
IP 394
IP 410
ISO 4256

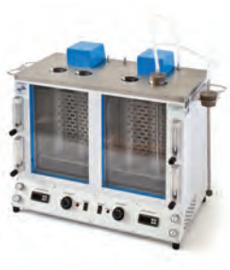
Aniline Point

ASTM D611-E
IP 2-A, B, C, D, E



REID Vapor Pressure

ASTM D323
IP 69
ISO 3007



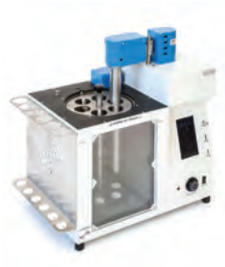
Foaming Test

ASTM D892
ASTM D1881
DIN 51566
IP 146

Saybolt Viscometer

ASTM D88
ASTM D7496
ASTM E102
IP 55
FTM 791-0304
JIS K 2207

OTHER ANALYSIS SYSTEMS



Demulsibility Test

ASTM D2711

Rust Prevention Characteristic

ASTM D665
ASTM D3603
ASTM D5534
DIN 51585
IP 135
ISO 7120

Atmospheric Distillation

ASTM D86
ASTM D216
ASTM D447
ASTM D850
ASTM D1078
ASTM E133
DIN 51751
IP 123
IP 195
ISO 3405

Rolling Thin-Film

ASTM D2872
ASTM D2862
EN 12607

Ramsbottom Carbon Residue

ASTM D524
IP 14
ISO 4262

Heat of Combustion

ASTM D240
ASTM D2382
ASTM D3286
ASTM D4809
ASTM D5865
IP 12
ISO 1716

Grease Dropping Point Test

ASTM D566
ASTM D2265
ASTM D4950
DIN 51801
DIN 51801-2
IP 132

Sulfonation Number

ASTM D1019
IP 145
ISO 3840

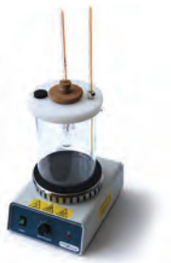
Total Sediment Analysis

ASTM D473
ASTM D4870
IP 53
IP 375
IP 390
ISO 3735
ISO 10307
DIN 51789

Density Bath

ASTM D70
ASTM D71
ASTM D287
ASTM D1298
ASTM D1481
ASTM E100
IP 160
IP 189
IP 190
ISO 3675
ISO 3838
JIS K 2207
JIS K 2249
JIS K 2265

OTHER ANALYSIS SYSTEMS



Melting Point

ASTM D127
IP 133

Evaporation Lost

ASTM D972
ASTM D2595
IP 183

Dew Point

ASTM D1142

Jet Fuels Freezing Point

ASTM D2386
DIN 51421
IP 16
ISO 3013

Humidity Cabinet

ASTM D1748

Oil Separation from Lubricating Grease

ASTM D1742
ASTM D6184
FTM 791-321
IP 121

LPG Copper Corrosion

ASTM D1838
IP 411
ISO 6251

LPG Density Determination

ASTM D1657
IP 235
ISO 3993

Lead, Acid and Salt Content

ASTM D2547
IP 77
IP 182
IP 248
ISO 2083

Herschel Emulsifying Test

ASTM D1401
DIN 51599
ISO 6614

OTHER ANALYSIS SYSTEMS

LPG Hydrogen Sulphate Analysis

ASTM D2420

Saybolt Chromometer

ASTM D156
DIN 51411

Vapor Generator

Crude Oil Water Determination

ASTM D4006
IP 358
ISO 9029

Ash Oven

ASTM D482
ASTM D874
ASTM D4422
IP 4
IP 163
ISO 3987
ISO 6245

Water Bath

Penetration Test

ASTM D381, DIN 51784, IP 131,
IP 540, ISO 6246

Paraffin Melting point

ASTM D87
IP 55

Leakage Tendencies of Wheel Bearing Greases

ASTM D1263

Fluorescent Indicator Adsorption

ASTM D1319
EN 10
FTM 791-3703
IP 156
JIS K 2536
ISO 3837
NF M07-024

Low Temperature Torque Test

ASTM D1478
ASTM D4693
ASTM D4950

Heated Centrifuge

ASTM D91
ASTM D96
ASTM D893
ASTM D1290
ASTM D1796
ASTM D1966
ASTM D2273
ASTM D2709
ASTM D2711
ASTM D4007
DIN 51793
IP 75
IP 359

OTHER ANALYSIS SYSTEMS

Dean & Stark

ASTM D95
ASTM D4006
IP 74
IP 358
ISO 9029

Loss on Heating

ASTM D6
ASTM D1754
IP 45

TAG Flash Point

ASTM D56
ASTM D3278
ASTM D3934
ASTM D3941
IP 304
IP 491
IP 492
ISO 1516
ISO 1523
ISO 3679

Particle Contamination

ASTM D5452
IP 440

Solidification Point

ASTM D852

Residue by Distillation of Emulsified Asphalts

ASTM D244
ASTM D6997

Thermostatic Bath

ASTM D323
ASTM D972
ASTM D1267
ASTM D1657
ASTM D1838
IP 12
IP 69

Metals Corrosion of Engine Coolants

ASTM D1384

Oil and Solvent in Wax

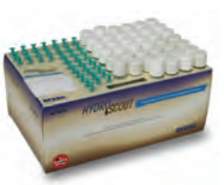
ASTM D721
ASTM D3235
DIN 51571
IP 158

ABEL Flash Point

EN 924
EN 13736
IP 170
IP 491
IP 492
ISO 1516
ISO 3679
ISO 13736

PCB Kits

U.S. EPA SW - 846 Method 9079
20, 50, or 500 ppm



Water Analysis Kits

High range: 1500 ppm - 100%
Low Range: 50ppm to 10,000 ppm

PETROCHEMICAL STANDARDS

- Color Standards
- Viscosity Standards
- Total Acid Number /
- Total Base Number Standards
- PIANO, PONA & PNA Standards
- Density Standards
- Melting Point Standards
- Refractive Index Standards
- Polycyclic Aromatic
- Hydrocarbon Standards
- Hopan Standards
- Tetralin Standards
- Thiophene Standards
- Gas Calibration Standards
- Benzene Calibration Standards
- Cetane Developer Calibration Sets
- Fatty Acid Methyl Ester (FAME) Standards
- Volatile Organic Component (VOC) Standards

ELECTROCHEMICAL STANDARDS

- Conductivity Standards
- pH Buffer Solutions
- Electrode Care Solutions
- Redox Standards
- Turbidity Standards
- Chemical Oxygen Demand Standards
- Ion-Selective Electrode Standards & Ionic Boosters

ANION & CATION ANALYSIS STANDARDS

- ICP-MS / ICP-OES Standards
- Ion Chromatography Standards
- Atomic Absorption Standards
- Flame Photometry Standards

PHYSICOCHEMICAL STANDARDS

- Color Standards
- Spectrophotometry Standards
- Melting Point Standards
- Density Standards
- Viscosity Standards
- Sucrose Standards in Water
- Brix Standards
- Refractive Index Standards
- Osmolality Standards
- Cryoscope Standards

ORGANIC STANDARDS

- Volatile Organic Component (VOC) Standards
- Phenol Standards
- Polycyclic Aromatic Hydrocarbon Standards
- Pesticide Standards
- Azo Dyes Metabolite Standards
- Fatty Acid Methyl Ester & Fatty Acid Ethyl
- Ester Standards (FAME & FAEE)
- Nitrosamine Standards
- Polybrominated Biphenyl Standards
- Polybrominated Diphenyl Ethers and
- Other Fire Retardant Standards
- Polychlorinated Biphenyl Standards
- Phthalate Standards
- Semi Volatile Organic Component (SVOC) Standards
- PIANO, PONA & PNA Standards
- Petrochemical Standards

OTHER STANDARDS

- Total Organic Carbon Standards
- Total Inorganic Krabon Standards
- Analytical Volumetric Titration Solutions
- Total Acid Number Standards and Reagents
- Total Base Number Standards and Reagents
- Pharmacopoeia Standards and Solutions
- Dairy Standards and Reagents
- APHA, AWWA & WEF Standards and Reagents
- Soil Tests Standards
- Paper and Pulp Standards

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