

MiniLab 53

NEXT GENERATION ON-SITE OIL ANALYSIS SYSTEM
FOR INDUSTRIAL MACHINERY



Oil analysis provides early indications of equipment wear mechanisms and identifies the root causes of corrosion. On-site oil analysis eliminates the wait associated with sending samples off-site and enables immediate decision making.

The MiniLab 53 addresses the questions:

- ▶ *Is it the right oil?*
- ▶ *Is the oil clean?*
- ▶ *Is it dry?*
- ▶ *Is it fit for use?*
- ▶ *And most importantly:*

Is the machine in good condition?

The MiniLab 53 delivers comprehensive on-site oil analysis, providing immediate actionable results, saving time and reducing costs.

Increase equipment availability by reducing unexpected downtime

- Early identification and trending of machinery wear and failure modes allows preventative maintenance before a catastrophic failure occurs
- MiniLab 53 measures oil chemistry, sources of contamination and machinery wear debris
- Makes it easy to track and trend the key oil parameters necessary for optimizing Machinery Health™



Reduce maintenance costs

- Extends component lifetime through effective contamination control
- Proactively schedule maintenance based on the predictive analytics of machine wear, rather than reacting to unexpected component failure
- Extending oil drain intervals based on oil chemistry

Verify new oil is the right oil and fit for use

- Features SpectroVisc, a portable viscometer and FluidScan, a handheld spectrometer, allowing QA testing at the receiving dock and in-service testing at the machine
- Verify that it is the right oil and fit-for-use

Fast, simple and easy to use

- Comprehensive oil analysis in less than 10 minutes
- Can be operated by plant staff, no chemist required
- Easy to interpret results and maintenance actions
 - Generates sample and trend reports automatically
 - Color coded alarm limits prompt maintenance actions



The MiniLab 53 monitors lubricant chemistry, contamination and machinery wear and provides the information needed to enable informed preventative maintenance decisions.

Oil Analysis Trivector™



Wear

- › Total Ferrous content (ppm) and Ferrous Particle count with size distribution
- › Wear classification into cutting, sliding, fatigue, fibers and non-metallics (oxides)



Contamination

- › Particle count, size, distribution and ISO codes
- › Differentiates contaminants (silica) from machine wear (metal)
- › Water



Chemistry & Viscosity

- › Total Acid Number (TAN)
- › Oxidation
- › Viscosity



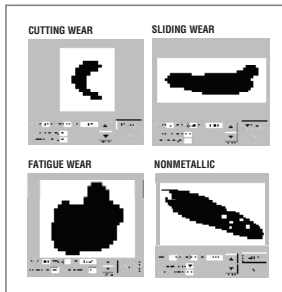
WEAR

Ferrous Monitor to measure ferrous content

Ferrous wear measurement is a critical requirement for monitoring machine condition. The high sensitivity Ferrous Monitor measures ferrous content to low ppm levels, and provides ferrous particle count and size distribution.

Wear Classification

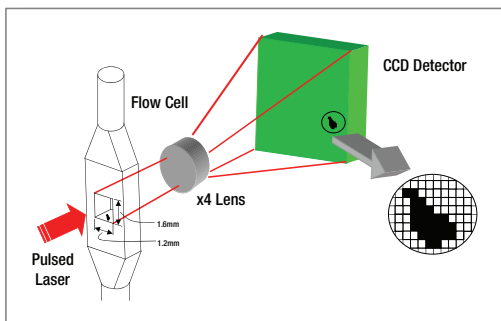
The Minilab 53 LNF directly images wear particle silhouettes and counts and classifies all particles over 20 microns diameter to identify the type of wear debris, wear mode and potential source from internal machinery components. Machine Wear classes include "cutting," "fatigue" and "severe sliding" particles. The "non-metallic" classification identifies oxides, typically from contamination (dirt or dust). "Fibers" are typically from the disintegration of mechanical seals.



PARTICLE CONTAMINATION

The LNF (LaserNetFines®) is the best particle counter technology for lubrication oils. It provides ISO Codes, Particle Count and size distribution for all particles from 4 to 100 µm. With a high saturation limit, it images

through dark fluids containing up to 2% soot using automatic laser gain control. The shape classification capability provides error corrections for water and air bubbles, removing them from the particle count.



Direct particle imaging with LNF



CHEMISTRY & VISCOSITY

Viscosity

The SpectroVisc portable viscometer provides high accuracy 40C kinematic viscosity measurements.

Chemistry

The FluidScan infrared spectrometer measures Total Acid Number (TAN), oxidation and water for machinery oils and hydraulics. For engines such as back-up generators, it measures Total Base Number (TBN), soot, oxidation, nitration and sulfation.

The FluidScan includes over 500 common machinery and engine oils in its database and is linked to the OilView reference oil database.

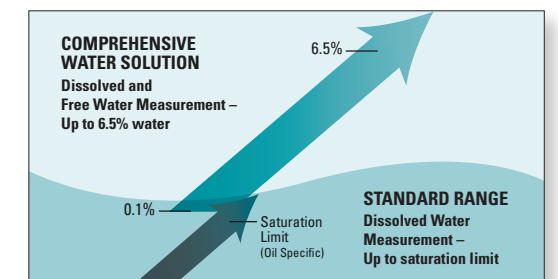


WATER CONTAMINATION

Comprehensive test for water contamination (patent pending)

The MiniLab 53 incorporates FluidScan IR technology to provide measurements for both dissolved and free water. The analyzer is a practical alternative to more complex tests such as Karl Fischer titration.

A simple 20 second sample preparation procedure provides excellent repeatability for water measurements over a wide range.



OilView™ LIMS Asset Management Software and Database

The MiniLab 53 seamlessly integrates with the Machinery Health Manager OilView software module. Samples, Batches, Routes or Sample Lists are created in OilView, and downloaded to the MiniLab 53. Once measurements are made, the data is automatically transferred to the user database.

- Easy to interpret results
- Generates sample and trend reports automatically
- Color coded alarm limits prompt maintenance actions

MiniLab 53 Product Information

PART NUMBER	
800-00017	MiniLab 53, 115VAC, 60Hz Requires 800-00019 Standard Accessories Kit and OilView LIMS module
800-00018	MiniLab 53, 220VAC, 50Hz Requires 800-00019 Standard Accessories Kit and OilView LIMS module
800-00025	MiniLab 53, 115VAC, 60Hz with OilView LIMS Requires 800-00019 Standard Accessories Kit
800-00026	MiniLab 53, 230VAC, 50Hz with OilView LIMS Requires 800-00019 Standard Accessories Kit

ACCESSORIES AND CONSUMABLES	
800-00019	MiniLab 53 Standard Accessories Kit, includes Consumables for 100 samples
400-00088	MiniLab 53 Consumables Kit for 500 samples
400-00101	Wear Debris Analysis Kit, 115V Requires A475103 WDA software
400-00102	Wear Debris Analysis Kit, 220V Requires A475103 WDA software
A475103	Wear debris analysis (WDA) software

PRODUCT INFORMATION	
Applications	Mineral and synthetic lubricants including gear, engine, hydraulic, turbine and distillate fuels
Output	Particle count, size distribution and ISO codes per ISO 4402/4406 Wear particle counts and size distribution by wear mode-cutting, fatigue, sliding, non-metallic, fibers Total Ferrous, ppm Ferrous particle count and size distribution Total Acid Number (TAN), mg KOH/g Oxidation, Abs/mm ² Water, ppm 40C Kinematic viscosity, cSt
Methodology	ASTM D7596, ASTM D7889, ASTM WK40831
Calibration	Factory calibrated, field calibration not required. Validation standards supplied.

OPERATIONAL SPECIFICATIONS		
Environmental Requirements	5-40C ambient temperature, 10-80% RH non-condensing, 2000 m maximum altitude	
Sample Volume	5-30 ml, varies with viscosity	
Solvents	Lamp oil, odorless kerosene, or Electron 22	
USER INTERFACE SPECIFICATIONS		
Software/Operating System	Requires AMS OilView LIMS module, Monitor and PC with Windows 7 Pro, 32 or 64 bit, US English version.	
POWER REQUIREMENTS		
Power	1 Phase, 110VAC/60 Hz or 220VAC/50 Hz, 110 W	
MECHANICAL SPECIFICATIONS		
Dimensions (H x W x D)	MiniLab 53:	35 cm x 50 cm x 53 cm (13.8" x 19.7" x 21")
	Homogenizer and stand:	68 cm x 15 cm x 22 cm (27" x 6" x 9")
Weight	MiniLab 53 with Homogenizer: 14 kg (31 lbs)	
COMPLIANCE		
CE Mark-EMC directive, RoHS		

Analytical Range and Repeatability

	Analytical Range	Repeatability
Particle Count	4 um - 100 um	≤ 6% RSD
Total Ferrous	10-2,000 ppm	≤ 5% RSD
Ferrous Particle Count	25-100 um	≤ 5% RSD
Viscosity	1-700 cSt at 40C	≤ 3% RSD ≤ 5% RSD
TAN	0-6 mgKOH/g*	≤ 3% RSD
Oxidation	0-3 abs/mm ²	≤ 3% RSD
Water-dissolved	100 ppm-saturation*	≤ 6% RSD
Water-free	0.1-6.5% (1,000-65,000 ppm)	≤ 25% RSD

*Oil specific. RSD = Relative Standard Deviation.

Sample Preparation – 3 Simple Steps

1. Homogenize the sample for better water measurement
2. Ultrasonically degas the sample for particle analysis
3. Spectro Scientific consumables ensure high accuracy and repeatability



Homogenizer (on stand)



Ultrasonic Degasser



Consumables