Spectro Scientific
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FieldLab 58

EXPEDITIONARY FLUID ANALYSIS SYSTEM

Owners of critical assets in the military, mining and marine industries need immediate information about oil and equipment condition. The portable FieldLab 58 oil analyzer eliminates the wait for lab results, so you won't miss early signs of contamination or abnormal wear.

Key applications include:

- In-service oil analysis for engines, gearboxes, hydraulics and turbines
  - Comprehensive oil analysis report
- Grease analysis for bearings, couplings and motor operated valves
  - Wear metals
  - Oxidation
  - Water (trending only)

FieldLab 58 is a battery-powered, integrated oil analysis system that provides quick and comprehensive oil analysis in the field.

Military and commercial field service professionals managing fleets of high-value assets require portable, lightweight devices that provide rapid oil analysis results with quality similar to oil analysis labs. Funded by the United States Department of Defense (DoD) in 2009, then developed and commercialized by Spectro Scientific, the FieldLab 58 Expeditionary Fluid Analysis System (EFAS) was designed.

The FieldLab 58 integrated system requires only a few milliliters of oil to complete four comprehensive tests to help maintain readiness of critical assets while economically managing maintenance costs.

Key Features

- Rugged design with battery power for on-site field use
- No solvents or chemicals required
- Complete oil analysis lab with 4 technologies integrated into a small case
  - X-Ray Florescence (XRF) spectrometer for elemental analysis
  - Filter Particle Quantifier (FPQ) pore blockage particle counter
  - Infrared (IR) spectrometer
  - Kinematic viscometer (40°C)
- 4 tests generate more than 20 oil analysis parameters in 5 to 7 minutes
- Built-in controller for measurement, data, and asset with touch screen interface
- Uses only 3 ml of oil
- ASTM compliant

FieldLab 58

Complete in-service oil analysis lab in the field

KEY PARAMETERS

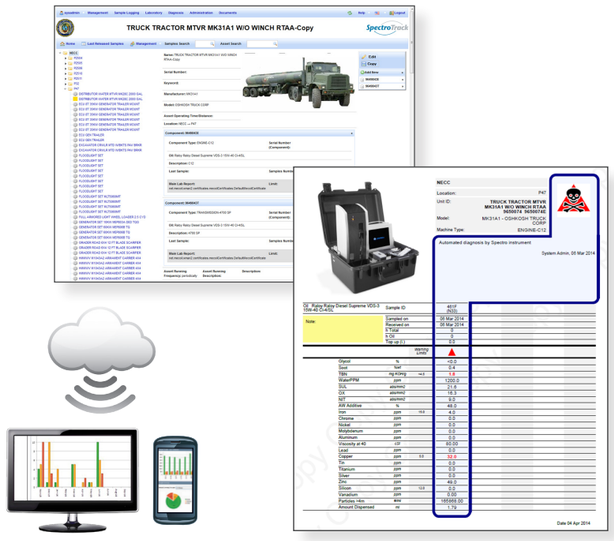
MACHINE WEAR
- 13 elements for particles > 5 µm (Si, Al, Cr, Ti, Fe, Ni, Pb, Cu Sn, Mo,Ag, Zn, V)

CONTAMINATION
- Particle count, ISO codes
- Water, glycol, soot

OIL CONDITION
- Oxidation, nitration, sulfation, TAN, TBN
- Viscosity @40°C, calculated viscosity @100°C

Link with LIMS software

- Connects directly to the cloud-based SpectroTrack LIMS using the FluidManager software
- Data transfer with the push of button
- Fleet level oil analysis tracked and reported in SpectroTrack
- Email notifications, trending reports and asset management readily available to reliability managers
- FieldLab 58 data can also be imported into AMS OilView™ software



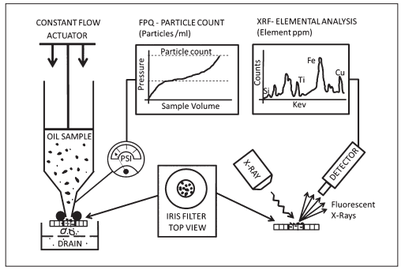
PRINCIPLES OF OPERATION

Particle count and elemental analysis — ASTM D8127

Particle counts are generated using our patented FPQ pore blockage particle counter (ISO 21018-3). It captures the particles of interest for severe wear detection onto a unique filtergram. This debris may now be measured on the companion XRF spectrometer for immediate results in ppm for 13 elements.

Wear and contamination particles larger than 4 microns deposit on the filtergram, and are tested using an X-Ray Florescence (XRF) spectrometer. The concentration (in ppm) for thirteen different elements is reported.

The filtergram coupon can be stored for future analysis, such as microscopic wear debris analysis of particle colors and shapes.

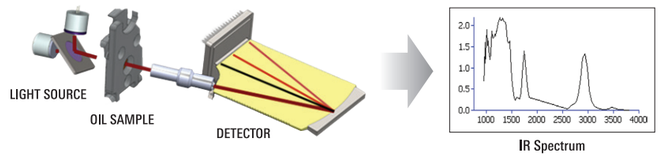


Oil Insertion | Particles | Filtergram

Fluid chemistry and contamination — ASTM D7889

The IR spectrometer measures the chemistry of the lubricant and contamination in one minute using only one drop of oil; no chemicals or solvents are required. It combines ease of use, ruggedness and laboratory precision in a small package, which is ideal for field use.

The oil condition parameters measured by FluidScan include oxidation, nitration, sulfation, anti-wear additive, Total Base Number (TBN), glycol, soot, and water for engine oil; and oxidation, Total Acid Number, and water for rotating machine lubricants such as gear oil, transmission oil and hydraulic oil.

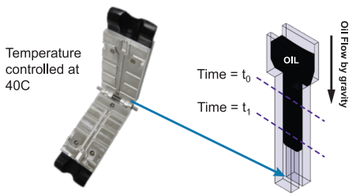


IR Spectrum

Viscosity — ASTM D8092

Viscosity is measured using a temperature-controlled kinematic viscometer with a patented split-cell design.

A funnel, with a 100 micron gap, is formed in the center of the cell. Optical sensors in the cell detect the flow of oil under the influence of gravity. The time it takes the oil to flow through the cell is proportional to the viscosity of the oil. When open, the cells can be cleaned using a non-abrasive wipe. No solvents are required.



Kinematic Viscosity (40C) = $A^* (t_1-t_0) + B$

*A and B are calibration coefficients

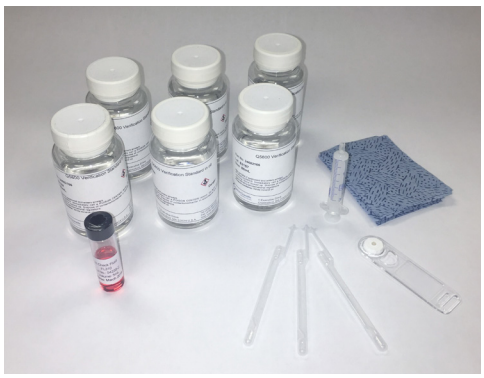
FieldLab 58 Ordering Information

PRODUCT INFORMATION	
Part Number	800-00094
Applications	Mineral and synthetic lubricants including gear, engines, transmissions, hydraulics, turbine as well as military, marine and mining applications In-service grease for industrial plants
ELEMENTAL MODULE	
Detector	25 mm^2 SDD detector; Peltier cooled
Resolution	122 eV FWHM resolution at 5.9 keV
Excitation Source	X-ray tube with Rhodium target; max voltage 50 kV
OPERATIONAL SPECIFICATIONS	
Sample Volume Required (all tests)	3 ml
Sample Time Required	Viscosity: 20 secs to 10 mins, dependent on grade Fluid Chemistry: less than 60 secs Particle Count: 20 secs to 3 minutes, sample dependent XRF: 3-4 minutes
Ambient Operating Temperature	0° to 40°C
Operational Humidity	RH< 80% non-condensing
Ambient Altitude	Up to 5,000 meters (16,404 feet)
USER INTERFACE SPECIFICATIONS	
Instrument OS	SQL database on Windows CE
Display	Fixed-angle 7" color touch screen display
Data Storage	Internal flash memory (SD card expansion)
Data Transfer	Ethernet, mini USB
Data Entry	Touch screen, FluidManager desktop software (asset loading and synchronization)
POWER REQUIREMENTS	
Battery Power Source	Lithium-ion battery pack
Charge Power	120/240 Vac, 50/60 Hz, 10 watts
Typical Runtime	4-6 hours
Recharge Time	2.5 hours
MECHANICAL SPECIFICATIONS	
Dimensions	48 cm (L) x 39 cm (W) x 23 cm (H); 19.2" x 15.2" x 9"
Weight	16.5 kg (36.4 lbs); 20 kg (44.4 lbs with backpack and power supply)

COMPLIANCE

CENELEC EN 60610-1:2010
EN 61010-2-030
CENEIEC EN 61326-2-1
MIL-STD 461 EMI
MIL-PRF 28800F Class II Drop Test

OUTPUTS	
Elemental Concentration (ppm)	Silicon (Si); Aluminum (Al); Chromium (Cr); Titanium (Ti); Iron (Fe); Nickel (Ni); Lead (Pb); Copper (Cu); Tin (Sn); Molybdenum (Mo); Silver (Ag); Zinc (Zn); Vanadium (V)
Fluid Chemistry	TAN & TBN (mg KOH/g); Oxidation, Nitration, Sulfation (Abs/.1mm); Water (parts per million); Glycol (% by weight); Soot (% by weight); Incorrect fluid (% by weight); Antioxidant Depletion (% remaining); Antiwear Depletion (% by weight)
Viscosity	Kinematic viscosity @ 40C Calculated viscosity @ 100C
Particle Count	Particle count #/ml (> 4 µm) ISO Codes 4/6/14 ISO codes >6 and >14 are extrapolated
Methodology	ASTM D7889 (IR), ASTM D8092 (viscosity), ASTM D8127 (FPQ-XRF)
Calibration	Factory, verification standards: NIST traceable verification standards provided
CONSUMABLES	
34682210	FieldLab 58 startup consumable kit (100 samples)
P-11160	3 ml syringe (100 pack)
PV1012	60 ml disposable pipettes & non-abrasive cleaning pad kit (100 pack)
34683143	FPQ waste container (3 pack)
34682166	FieldLab 58 verification standards (6 bottles)
FL310	IR Check Fluid 5 ml
34683142	FPQ filtergrams (25 pack)
34683014	FieldLab 58 consumable kit (500 samples)
OPTIONAL ACCESSORIES	
600-00116	XRF calibration standard set



FieldLab 58 consumables and standards

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