Spectro Scientific
Confidence in knowing

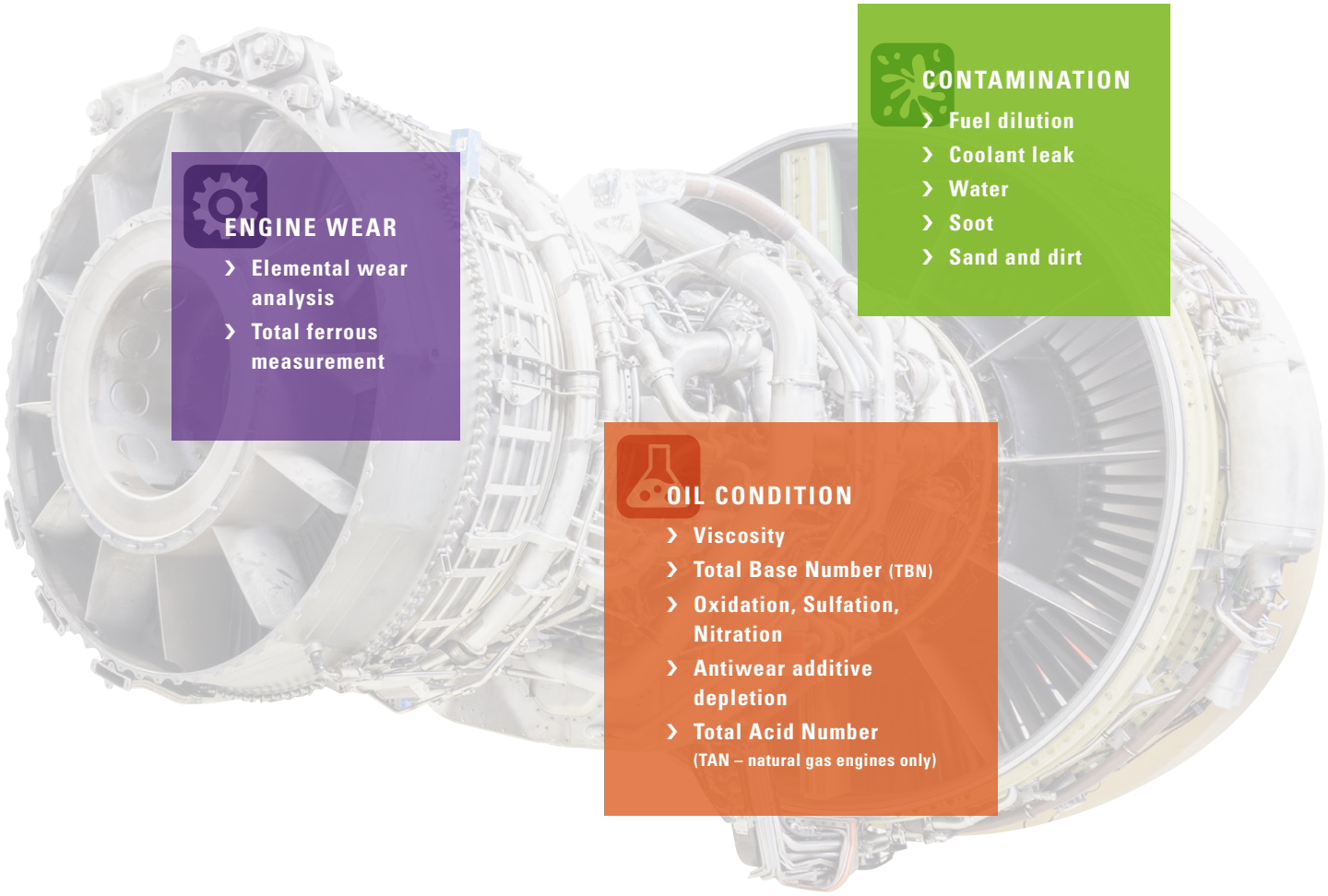
MiniLab EL Series for High Performance Engine Development and Maintenance

AMETEK®

Engine Oil Analysis:

A Reliable Technique for Engine Condition Monitoring

Engine oil analysis is a reliable and mature non-destructive testing (NDT) technique used to monitor the condition of the engine in development, on the production line and for in-service maintenance. High performance reciprocating engines and jet turbines are complicated mechanical systems with many high-speed moving parts. Comprehensive engine oil analysis provides a complete picture of engine wear and other mechanical failures in addition to lubricant condition and contamination, in almost real time with a small amount of oil. This information advances engine design and development, ensures quality in production and reduces maintenance and repair costs.



The need for real time engine oil analysis for high performance engines

Achieving and maintaining optimal performance from high performance engines in airplanes, racing cars or locomotives requires much care in engineering, production, and maintenance due to size, high speed or high power output. They also need great sensitivity in oil analysis as only a few parts per million (ppm) of trace metals in the oil can indicate abnormal wear of a critical part. Near real time, lab quality engine oil analysis can significantly improve the productivity of research and development, production quality, and performance and reliability of these engines.

MiniLab EL Series: A new non-destructive tool for use throughout an engine's lifecycle

The new MiniLab EL Series oil analyzer is an ideal non-destructive testing (NDT) tool for engineers in research and development, production QC or in-service maintenance. The MiniLab EL system allows organizations to gain deep insights into engine and lubricant condition when and where it is needed.

HIGH PERFORMANCE
- Comprehensive (up to 36 parameters)
- Full ASTM compliance
- Wear, contamination, oil condition

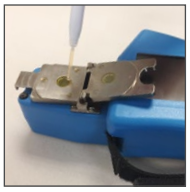
CONVENIENT
- Fast (less than 5 minutes)
- No sample preparation
- No special facility requirements

ENVIRONMENTALLY FRIENDLY
- Low waste (total 4ml of oil used)
- No solvent
- No hazardous chemicals

EXPANDABLE
- Extended metals (up to 31 elements)
- Coolant analysis
- Fuel analysis

MiniLab EL Series

5 simple tests to comprehensive engine oil analysis



Oil Chemistry

ASTM D7889

60 microliters of oil with no sample preparation

1 minute test time

No solvent or chemicals

Viscosity

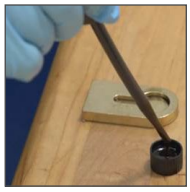
ASTM D8092

60 microliters of oil with no sample preparation

2 sec- 6 min, viscosity dependent

Temperature controlled at 40C

No solvent or chemicals



Elements

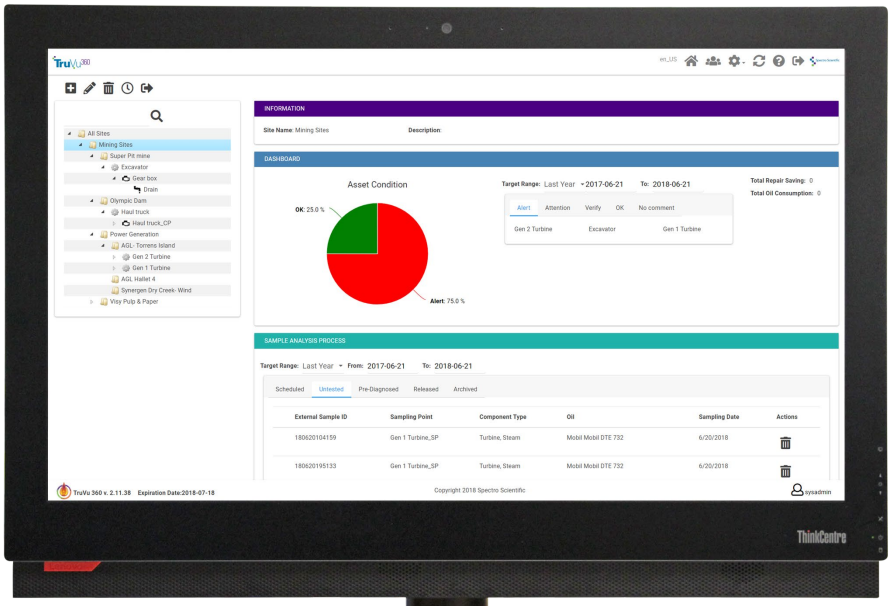
ASTM D6595

2 ml of oil with no sample preparation

30 seconds test time

No solvent or chemicals

24 elements by default



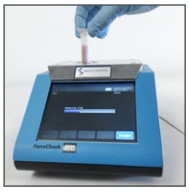
Fuel Dilution

ASTM D8004

0.5 ml of sample with no sample preparation

1 minute test time

No solvent or chemicals



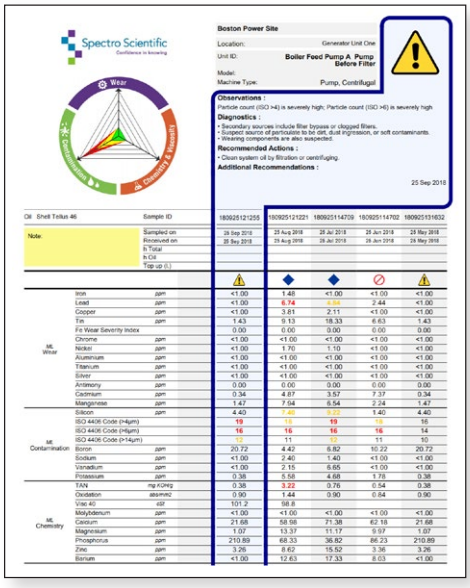
Total Ferrous

ASTM D8120

2 ml sample with no sample preparation

30 sec test time

No solvent or chemicals



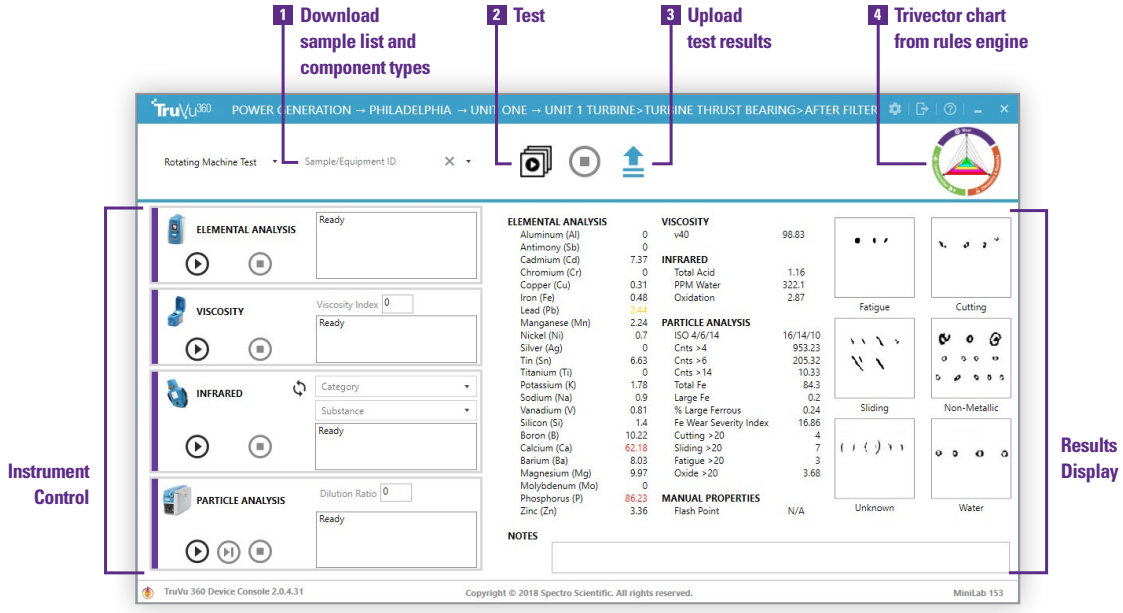
Sample report

TruVu 360 Software Suite

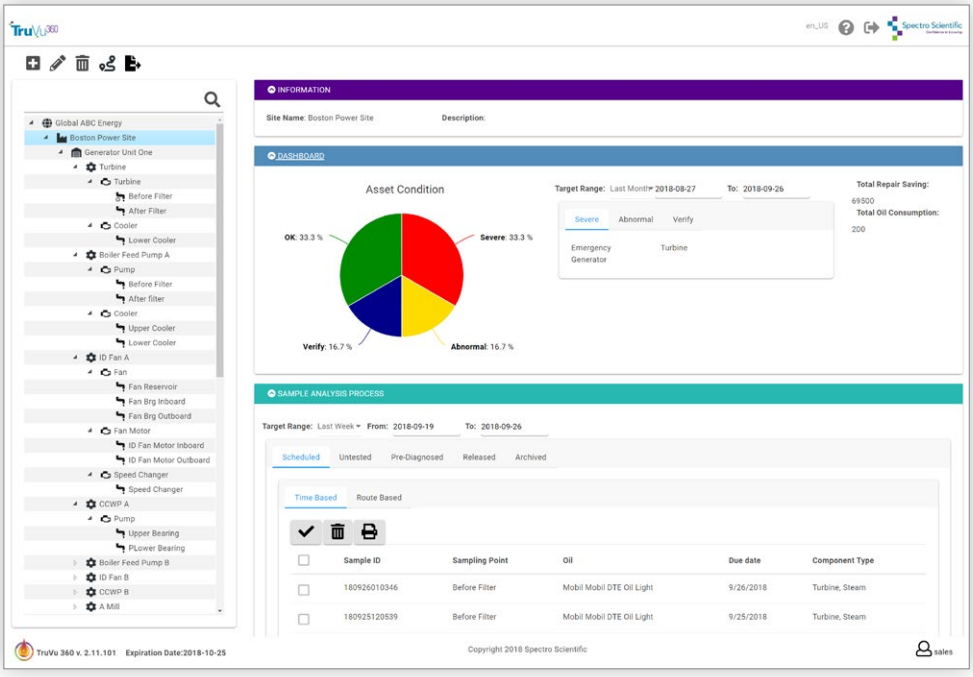
The TruVu 360 Software Suite is powerful yet easy to use and includes two components: the TruVu 360 Device Console (MDC) and the TruVu 360 LIMS system.

The TruVu 360 Device Console is installed on a local PC and controls:

- Sample or asset ID entry
- Instrument operation
- Data acquisition
- Automatic data transfer to TruVu 360 LIMS system



TruVu 360 Device Console



TruVu 360 Enterprise cloud software

The TruVu 360 software is a browser-based tool; it can be installed on local PCs, local networks, or hosted in the cloud server. TruVu 360 software includes:

- Asset management
- Alarm limits and alarm management
- Customizable reports, including multi-parameter trend graphs
- Enhanced notification and email options
- Option to support multiple MiniLab EL Series analyzers in different locations across an enterprise

MiniLab 143EL or 123EL

Two MiniLab EL Series models are available:

MiniLab 143EL – Elements, Oil Chemistry, Viscosity, Fuel Dilution, Total Ferrous

MiniLab 123EL – Elements, Oil Chemistry, Viscosity

MiniLab 143EL

MiniLab 123EL

	PARAMETER	Elements ASTM D6595	Oil Chemistry ASTM D7889	Viscosity ASTM D8092	Fuel Dilution ASTM D8004	Total Ferrous ASTM D8120
Contamination	Boron, Sodium, and Potassium	✔				
	Water		✔			
	Soot		✔			
	Glycol		✔			
	Fuel dilution				✔	
Chemistry & Viscosity	Total Base Number (TBN)		✔			
	Oxidation, Nitration, and Sulfation		✔			
	Additive depletion (ZDDP)		✔			
	Total Acid Number (TAN) for NatGas engines and lube oils		✔			
	Magnesium, Calcium, Barium, Zinc, Molybdenum, and Phosphorus	✔				
	Viscosity			✔		
Wear	Total Ferrous					✔
	Copper, Silver, Chromium, Titanium, Aluminum, Nickel, Iron, Manganese, Lead, Tin, Cadmium, and Vanadium	✔				

Optional Accessory

The **CoolCheck 2** complements the MiniLab EL Series by providing measurement and profiling of coolant condition with a near IR (NIR) and UV/Visible dual spectrometer design that measures 8 different properties in less than 45 seconds.

- 15 ml sample volume with no sample preparation
- 45 second test time
- No solvents needed for cleaning
- Parameters reported are:
  - Type of coolant
  - Clarity
  - Contamination
  - Freeze point
  - Glycol content
  - Boiling point
  - Nitrites

SpectroCare

SpectroCare is a service designed to provide the best customer experience using TruVu 360 enabled solutions, which include:

- Onboarding/startup service
- Expedited customer support response
- Unlimited software upgrade
- Annual preventive maintenance and calibration
- Extended warranty
- Off-site laboratory support for emergency and special diagnostics from our partner labs worldwide

MiniLab EL Series Product Information

PART NUMBER	
800-00084	MiniLab 123EL with TruVu 360 Software Suite, 115VAC, 60Hz Includes Windows 10 Pro Workstation, 1 Site User License (1 year) and access to the TruVu 360 Cloud (1 year).
800-00085	MiniLab 123EL with TruVu 360 Software Suite, 230VAC, 50Hz Includes Windows 10 Pro Workstation, 1 Site User License (1 year) and access to the TruVu 360 Cloud (1 year).
800-00086	MiniLab 123EL with TruVu 360 Software Suite, 115VAC, 50Hz Includes Windows 10 Pro Workstation, 1 Site User License (1 year) and access to the TruVu 360 Cloud (1 year).
800-00087	MiniLab 123EL with TruVu 360 Software Suite, 230VAC, 60Hz Includes Windows 10 Pro Workstation, 1 Site User License (1 year) and access to the TruVu 360 Cloud (1 year).
800-00089	MiniLab 143EL with TruVu 360 Software Suite, 115VAC, 60Hz Includes Windows 10 Pro Workstation, 1 Site User License (1 year) and access to the TruVu 360 Cloud (1 year).
800-00090	MiniLab 143EL with TruVu 360 Software Suite, 230VAC, 50Hz Includes Windows 10 Pro Workstation, 1 Site User License (1 year) and access to the TruVu 360 Cloud (1 year).
800-00091	MiniLab 143EL with TruVu 360 Software Suite, 115VAC, 50Hz Includes Windows 10 Pro Workstation, 1 Site User License (1 year) and access to the TruVu 360 Cloud (1 year).
800-00092	MiniLab 143EL with TruVu 360 Software Suite, 230VAC, 60Hz Includes Windows 10 Pro Workstation, 1 Site User License (1 year) and access to the TruVu 360 Cloud (1 year).
ACCESSORIES AND CONSUMABLES	
800-00088	MiniLab 123EL standard accessories
600-00034	MiniLab 123EL consumables kit for 500 samples
800-00093	MiniLab 143EL standard accessories
600-00035	MiniLab 143EL consumables kit for 500 samples
600-00126	MiniLab 123EL validation standards kit
600-00127	MiniLab 143EL validation standards kit
M99948	Extended Wear Metals calibration program for SpectrOil 120C (31 elements, factory install)
M99903	Coolant analysis capability program for SpectrOil 120C (factory install)
450-00030	MiniLab tray assembly for FluidScan and MiniVisc
42000-00	Coolcheck 2, 115/220VAC, 50
29701-00	Coolcheck 2 standard accessories
PRODUCT INFORMATION	
Applications	Mineral and synthetic lubricants including gear, engine, hydraulic, turbine and distillate fuels
Methodology	ASTM D6595, D8120, D8092, D7889 , D8004
Calibration	Factory calibrated, field calibration not required. Validation and standardization fluids supplied.
OPERATIONAL SPECIFICATIONS	
Environmental requirements:	5-40°C ambient temperature, 10-80% RH non-condensing
Sample volume	< 5 ml
Solvents:	None required

USER INTERFACE SPECIFICATIONS	
Software/ operating system	Win 10 Pro Workstation included with system, or user supplied personal computer with Windows 7 Pro or Win 10 Pro, 32 or 64 bit, US English version. Quad core microprocessor speed 2.6 GHz or higher and 8 GB RAM minimum.
POWER REQUIREMENTS	
Power	1 phase power, 1200W maximum (123EL and 143EL)
MECHANICAL SPECIFICATIONS	
Dimensions (H x W x D)	MiniLab 123EL: 71 cm x 183 cm x 66 cm (28" x 72" x 26") MiniLab 143EL: 71 cm x 214 cm x 66 cm (28" x 84" x 26")
Weight	MiniLab 123EL: 76 kg (167 lbs) MiniLab 143EL: 82 kg (180 lbs)
COMPLIANCE	
CE Mark-EMC directive, RoHS.	

ANALYTICAL RANGE		
Output	Analytical Range	Repeatability
Elemental concentration of 24 elements, ppm	Range and repeatability varies with element	
Total ferrous, ppm	0-10,000 ppm	≤ 3% RSD
Fuel dilution	0.2-15%	≤ 5% RSD + 0.2% fuel dilution
40°C Kinematic viscosity, cSt (100°C Kinematic viscosity calculated from V40C and viscosity index)	1-320 cSt at 40°C 320-700 cSt at 40°C	≤ 3% RSD ≤ 5% RSD
Total Acid Number (TAN), mg KOH/g	0-6 mg KOH/g	≤ 3% RSD
Total Base Number (TBN), mg KOH/g	0-70 mg KOH/g	≤ 3% RSD
Oxidation, abs/0.1 mm	5-32	≤ 3% RSD
Nitration, abs/cm	0.5-18	≤ 3% RSD
Sulfation, abs/0.1 mm	16-39	≤ 3% RSD
Soot	0-2%	≤ 3% RSD
Glycol	0.2-10%	≤ 3% RSD
Additive depletion (ZDDP)	0-100%	≤ 3% RSD
Water, dissolved ppm	100 ppm-saturation*	≤ 3% RSD

*Oil specific. RSD = Relative Standard Deviation.

Validation standards for MiniLab 143EL

Consumables for MiniLab 143EL

To learn more about Spectro Scientific products please call 978-431-1120 or visit us online at www.spectrosci.com.

Spectro Scientific
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AMETEK Spectro Scientific | One Executive Drive, Suite 101, Chelmsford, MA 01824-2563
978-431-1120 | www.spectrosci.com | sales@spectrosci.com | An ISO 9001:2015 company

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