

LaserNet 200 Series

PARTICLE COUNTER, FERROUS MONITOR, WEAR CLASSIFIER



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. The system offers:

- Direct imaging laser technology per ASTM D7596
- Ferrous debris monitoring per ASTM D8120

The LaserNet 200 Series is a contamination and wear debris system designed for lubricant condition monitoring for predictive maintenance.

FEATURES INCLUDE:

- Particle count, size distribution and codes (ISO 4406, NAS 1638, NAVAIR 01-1A-17, SAE AS 4059, GOST, ASTM D6786, HAL and user-defined bins)
- Ferrous content measurement in the sample with ferrous particle count and size distribution
- Differentiation of large ferrous particles >25 micron from total ferrous particles. Reporting percentage of large ferrous particles and ferrous wear severity index for easy trending and interpretation of the ferrous measurements. Patent pending.
- Classification of wear particles, image storage and reporting of particle count and size for Cutting, Sliding, Fatigue, Fibers and Non-metallic wear types

Multiple configurations and options cover the needs of commercial laboratories and industrial plants for contamination control and predictive maintenance.

OPTIONS INCLUDE:

Ferrous Monitor to measure ferrous content – enables measurement of both ferrous content and total particle count on the same sample, eliminating the need to measure ferrous content on another instrument

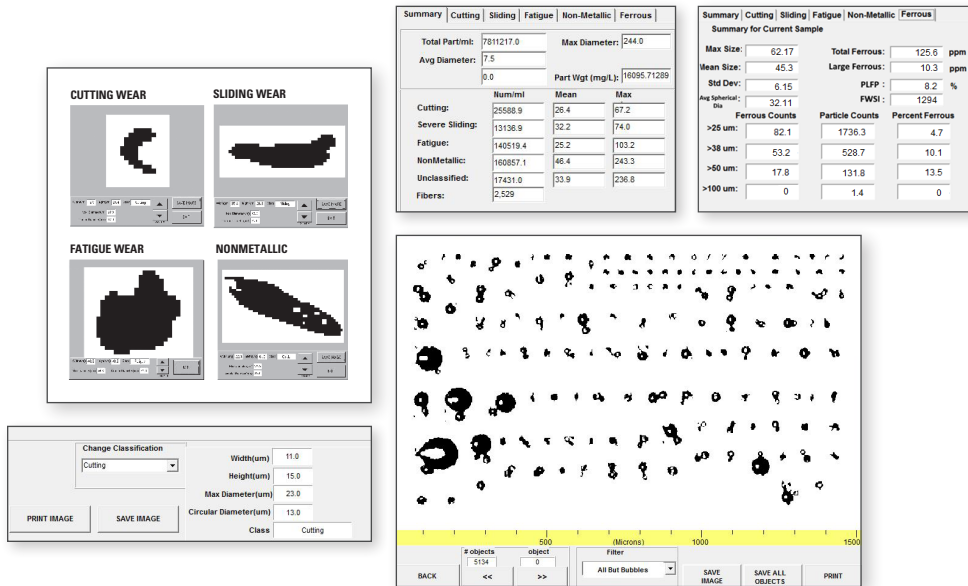
Classification of wear particle shape – directly images wear particle silhouettes and counts and classifies wear particles over 20 microns

Autosampler for high throughput sample processing – provides automated, unattended processing of up to 24 used oil or hydraulic fluid samples

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	✓	✓	✓	✓

Particle Counter, Ferrous Monitor, and Wear Classifier

The LaserNet 200 Series provides particle counts and codes, ferrous wear monitoring, and large wear particle classification.



Wear images are stored and analyzed directly on the LaserNet 200 software. They can be exported to TruVu 360™, OilView™ and other LIMS offerings.

Ferrous Monitor to measure ferrous content

Ferrous wear measurement is a critical requirement for monitoring machine condition. The high sensitivity in line magnetometer measures and reports ferrous content in ppm, and provides ferrous particle count and size distribution for large ferrous particles >25 um.

Measurement of both ferrous content and total particle count on the same sample, provides the ability to report larger ferrous particles and ferrous wear index. These parameters, in addition to wear particle shape provide the user with wear debris analysis metrics eliminating the need to measure ferrous content, or manual ferrography on other instruments.



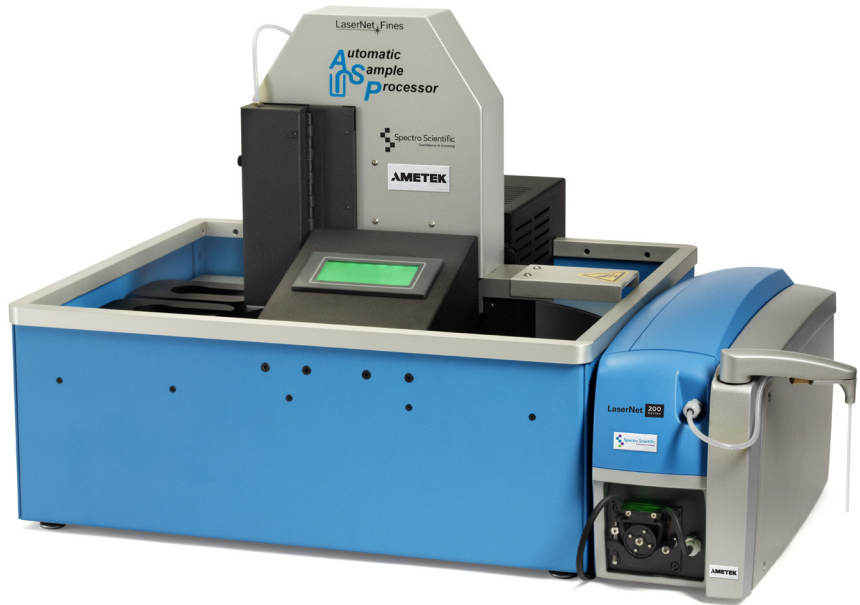
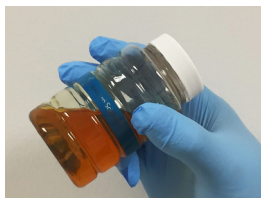
LaserNet Flush cleans the system and offers the following:

- Reduces cross-contamination due to highly contaminated wet samples.
- Uses less solvents
- Provides more accurate data
- Non-flammable and non-hazardous for easy shipping

Sample preparation

Sample preparation is efficient with the LaserNet 200 Series – viscosities up to 320cSt can be processed without dilution due to the wide dynamic range. And, unlike conventional light blockage particle counters, there are no flow control valve adjustments needed when testing different sample viscosities.

With an intuitive, configurable graphical user interface and no calibration required, the LaserNet 200 Series is fast, accurate and easy to use.



ASP Autosampler

The ASP autosampler is a low cost solution for automatic and unattended processing of a batch of up to 24 samples. The ASP may be added to existing LaserNet 200 installations with minimal setup. Features include:

- Automatic reversing stirrer
- Two-stage wash system using focused spray jets
- Quick disconnect/shutoff for solvent supply and drainline

Data Management

The LaserNet 200 Series has a data export capability to laboratory LIMS systems as well as comma or tab delimited text file formats. The wear images can be exported as .jpeg or .bmp files.

Spectro Scientific's TruVu 360 Device Console (TDC) fully integrates the LaserNet 200 with the TruVu 360 Enterprise Fluid Intelligence platform.

The screenshot displays the TruVu 360 Device Console interface with the following sections:

- Navigation:** POWER GENERATION → PHILADELPHIA → UNIT ONE → UNIT 1 TURBINE>TURBINE THRUST BEARING>AFTER FILTER
- Control Panel:** Rotating Machine Test, Sample/Equipment ID, and various status icons.
- Analysis Modules:**
 - ELEMENTAL ANALYSIS:** Ready
 - VISCOSITY:** Viscosity Index 0, Ready
 - INFRARED:** Category, Substance, Ready
 - PARTICLE ANALYSIS:** Dilution Ratio 0, Ready
- Data Tables:**

ELEMENTAL ANALYSIS		VISCOSITY	
Aluminum (Al)	0	v40	98.83
Antimony (Sb)	0		
Cadmium (Cd)	7.37		
Chromium (Cr)	0	INFRARED	
Copper (Cu)	0.31	Total Acid	1.16
Iron (Fe)	0.48	PPM Water	322.1
Lead (Pb)	2.44	Oxidation	2.87
Manganese (Mn)	2.24		
Nickel (Ni)	0.7	PARTICLE ANALYSIS	
Silver (Ag)	0	ISO 4/6/14	16/14/10
Tin (Sn)	6.63	Cnts >4	953.23
Titanium (Ti)	0	Cnts >6	205.32
Potassium (K)	1.78	Cnts >14	10.33
Sodium (Na)	0.9	Total Fe	84.3
Vanadium (V)	0.81	Large Fe	0.2
Silicon (Si)	1.4	% Large Ferrous	0.24
Boron (B)	10.22	Fe Wear Severity Index	16.86
Calcium (Ca)	62.18	Cutting >20	4
Barium (Ba)	8.03	Sliding >20	7
Magnesium (Mg)	9.97	Fatigue >20	3
Molybdenum (Mo)	0	Oxide >20	3.68
Phosphorus (P)	86.23	MANUAL PROPERTIES	
Zinc (Zn)	3.36	Flash Point	N/A
- Wear Images:** Fatigue, Cutting, Sliding, Non-Metallic, Unknown, Water.
- NOTES:** Empty text box.

TruVu 360 Device Console interface

LaserNet 200 Series Product Information

PART NUMBER	
800-00122	LaserNet 210 particle counter. Requires SA1023 or SA1024 accessory kit and a PC.
800-00123	LaserNet 215 particle counter with ferrous monitor. Requires SA1025 or SA1026 accessory kit and a PC.
800-00124	LaserNet 220 particle counter with wear particle shape classifier. Requires SA1023 or SA1024 accessory kit and a PC.
800-00125	LaserNet 230 particle counter, wear particle classifier, and ferrous monitor. Requires SA1025 or SA1026 accessory kit and a PC.
800-00127	LaserNet 210, Skydrol Compatible, including LaserNet 210 optical particle counter, software, user manual, connection cables and power cord. Requires 800-00156 or 800-00158 Standard Accessory Kits.
800-00128	LaserNet 215, Skydrol Compatible, including LaserNet 215 optical particle analyzer with particle count and distribution, and ferrous particle analysis, software, user manual, connection cables and power cord. Requires 800-00157 or 800-00159 Standard Accessory Kits.
800-00129	LaserNet 220, Skydrol Compatible, including LaserNet 220 optical particle analyzer with particle count and distribution, and wear particle classification, software, user manual, connection cables and power cord. Requires 800-00156 or 800-00158 Standard Accessory Kits.
800-00130	LaserNet 230, Skydrol Compatible, including LaserNet 230 optical particle analyzer with particle count and distribution, wear particle classification and ferrous particle analysis, software, user manual, connection cables and power cord. Requires 800-00157 or 800-00159 Standard Accessory Kits.
ACCESSORIES AND CONSUMABLES	
LNF-909	LaserNet 200 Series routine maintenance kit
LNF-910	LaserNet 200 Series with Skydrol configuration routine maintenance kit
LNF-509	Calibration check fluid 2806, 400 ml
LNF-545	Ferrous validation standard, 400 ml
600-00008	Spectro certified sample bottle, PET, 120 ml (4 oz), package of 50
PRODUCT INFORMATION	
Applications	Mineral and synthetic lubricants including gear, engine, hydraulic, turbine and distillate fuels
Output	Particle count: ISO 4406, NAS 1638, NAVAIR 01-1A-17, SAE AS 4059, GOST, ASTM D6786, HAL and user defined Total ferrous, ppm Large ferrous, ppm Ferrous particle count and distribution Percentage large ferrous particles, % Ferrous wear severity index Free water, ppm; Soot wt. %; Particle shape per LaserNet 200 Series method

Methodology	ASTM D7596
Standard Analytical Range	Particles 4 µm - 100 µm
Calibration	Not required. Validation standards supplied with instrument.
OPERATIONAL SPECIFICATIONS	
Sample Volume	5-30 ml, varies with viscosity
Solvents/Reagents	Recommended solvents when processing mineral based oils: LaserNet Flush Alternative solvent for dry oils: Lamp Oil/Kerosene Diesel or Jet Fuel Notes: 1. Lamp oil/Kerosene, diesel, or jet fuel not effective for flushing after samples with high water content. 2. Higher flammability solvents (Isopropyl Alcohol (IPA), Hexane, Heptane, Naptha, Mineral Spirits, Toluene, Petrol) may be used with appropriate caution in the LaserNet, however; these may NOT be used with an ASP. 3. Solvent options when processing Skydrol: IPA (Isopropyl Alcohol) or Acetone only.
Environmental Operating Requirements	5C to 40C ambient temperature, 10-80% relative humidity, non-condensing, 2000 m maximum altitude
USER INTERFACE SPECIFICATIONS	
Software/Operating System	Windows®7, Windows 10 Pro, 32 or 64 bit, US English version
POWER REQUIREMENTS	
Power	LaserNet 200 Series: AC 110/240 V, 50/60 Hz, 10 Watts
MECHANICAL SPECIFICATIONS	
Dimensions H x W x D	LaserNet 200 Series: 22.9 cm x 17.8 cm x 43.2 cm (9 in x 7 in x 17 in)
Weight	LaserNet 200 Series: 7.7 kg (17 lbs)
Shipping Package Dimensions H x W x L	LaserNet 200 Series: 35.6 cm x 36.8 cm x 78.7 cm (14 in x 14.5 in x 31 in)
Shipping Package Weight	LaserNet 200 Series: 12.2 kg (27 lbs)
COMPLIANCE	
CE Mark: EMC Directive (2004/108/EC); RoHS, UL, CSA, ETL	
SUPPORT RESOURCES	
SVC107	Global one year support agreement
EDC303	Online live training, 3 hours
SVC026	Factory preventive maintenance & calibration
SVC026-F	In field (continental US) preventive maintenance & calibration