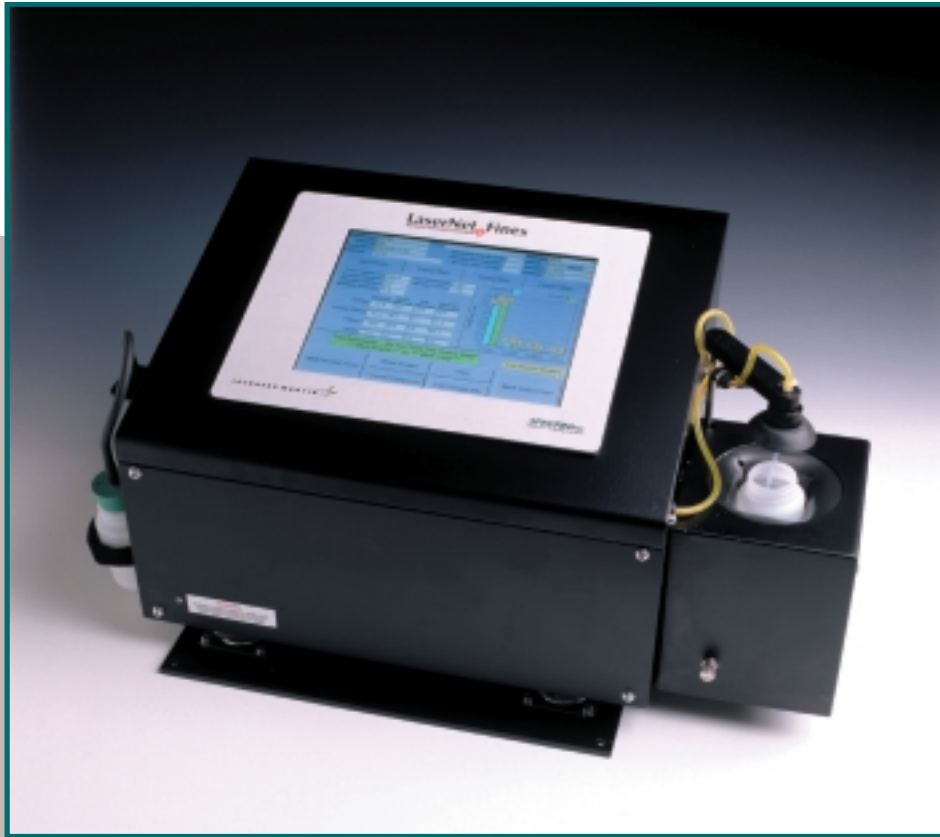


LaserNet Fines

Features

- ▶ Small size and rugged construction for shipboard or field deployment.
- ▶ Algorithms to perform shape analysis, wear particle identification and machine condition assessment.
- ▶ Particles counted are greater than 5µm.
- ▶ Particles greater than 20µm are classed by neural net as "cutting, fatigue, severe sliding and oxides."
- ▶ Touch screen and LCD user interface.
- ▶ Provides ISO 4406 cleanliness rating.
- ▶ Provides NAS 1638 cleanliness rating.
- ▶ Automatic adjustment for fluid darkness.
- ▶ Built-in database for machine condition trending.



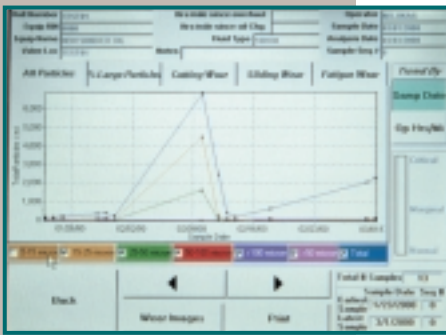
"LaserNet Fines was developed by Lockheed Martin in cooperation with the Naval Research Laboratory for the Office of Naval Research on its Accelerated Capabilities Initiative for Condition-Based Maintenance."

Particle Counter and Shape Classifier

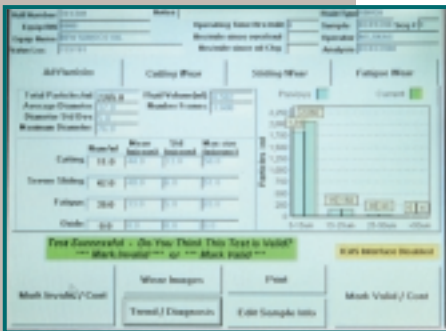
Machine condition monitoring based on oil analysis has become an accepted practice in any well-run maintenance management program. With prior knowledge of the wear metals and contaminants present in a lubricating system, it can be determined if that equipment is operating properly or if preventive maintenance is required. LaserNet Fines combines the standard oil analysis techniques of particle counting and shape classification into a single analytical instrument. Lockheed Martin and Naval Research Laboratory combined space age imaging technology and neural net shape classification into the development of LaserNet Fines. LaserNet Fines can be used as a stand-alone analytical instrument, or in conjunction with a full service oil analysis program.

Operation

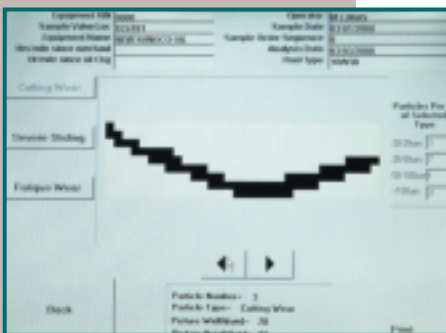
A powerful laser transmits a light pulse through a thin cell (approximately 90 μm thick) which contains an oil sample flowing slowly between two glass plates. Using magnifying optics, an image of the sample is captured by a CCD video camera and stored in computer memory. Each image is processed with a raster scan analysis to identify individual objects. The objects are then analyzed for maximum size and several shape characteristics which are used to classify particles into mechanical wear classes. Each laser pulse provides a single image frame to be analyzed, and the results of thousands of frames are combined for a complete record of the sample under study.



Particle Trending



Particle Counter



Particle Shape Classifier

Particle Counter

LaserNet Fines processes and stores thousands of images to obtain good counting statistics. Particles are sized directly and put into size bins of 5-15 μm , 15-25 μm , 25-50 μm and greater than 50 μm . The direct imaging capability of this instrument eliminates the need for calibration with a test dust, the exact particle size distribution of which itself may be questionable. Air bubbles and water droplets are ignored and the laser is powerful enough to process heavily sooted (black) oils.

Particle Shape Classifier

The unique capability of this instrument is shape recognition of all particles greater than 20 μm by using a neural net. An algorithm is used to sort particles into four categories: *cutting*, *fatigue*, *severe sliding* and *oxides*. The shape recognition software identifies and eliminates bubbles and droplets.

Spectro Incorporated is the only company dedicated exclusively to providing instrumentation, software and applications support for machine condition monitoring through oil analysis. Contact us for your instrumentation needs and complete turnkey systems for oil analysis.

Your local representative for sales and service is:

SPECTRO INC.
Industrial Tribology Systems

160 Ayer Road • Littleton, MA 01460 USA
Tel: (978) 486-0123 • Fax: (978) 486-0030

E-mail: sales@spectroinc.com • World Wide Web: www.spectroinc.com