

A high resolution, 'turn on and go' sizer to measure nanometer and micron sized particles!

Features and Benefits

Ultra-high Sensitivity & Superior Resolution

- Dynamic size range: 0.09 to 7.5 μm
- Typical resolution within 2.5% of the particle diameter at 0.1 μm
- Wide concentration range: up to 18,000 particles/ cm^3

Ease of Use and Flexibility

- 100 user configurable particle size channels
- User adjustable flow rate
- Intuitive LabVIEW™ based software
- Remote instrument access via Ethernet

State-of-the-Art Optical & Detection System

- Patented wide angle optics and intracavity laser
- Highly sensitive photodetectors
- Automated gain ratio adjustment and laser reference compensation

Laser Aerosol Spectrometer Model 3340

TSI's Laser Aerosol Spectrometer Model 3340 is a general purpose aerosol particle sizer which combines ultra-high sensitivity and superior resolution with ease-of-use. This high performance workhorse measures complete size distributions in a tenth of a second over a size range of 0.09 (90 nm) to 7.5 μm easily and accurately. Configurable size channels enable users to zero in on a specific size range or match the resolution of another instrument.

Valuable Addition to Your Aerosol Tool Kit

The 3340 is a handy tool to have monitoring your filters or your processes, measuring in the lab, or sampling on field campaigns. It's as useful as your primary aerosol tool, but the 3340 can also provide valuable supplemental information to aerosol measurements based on other sizing techniques (i.e. SMPS, APS, CPC, FMPS, etc).

On-Board PC

The Laser Aerosol Spectrometer features an internal Windows® based PC loaded with Microsoft Office®. No need to procure and dedicate a laptop to operate your instrument. A 30 GB hard drive, keyboard and mouse, and a 10" color LCD display are included—just like your personal PC. Microsoft Excel® data analysis can be performed on the fly or data can easily be transferred via Ethernet, CD or USB port.



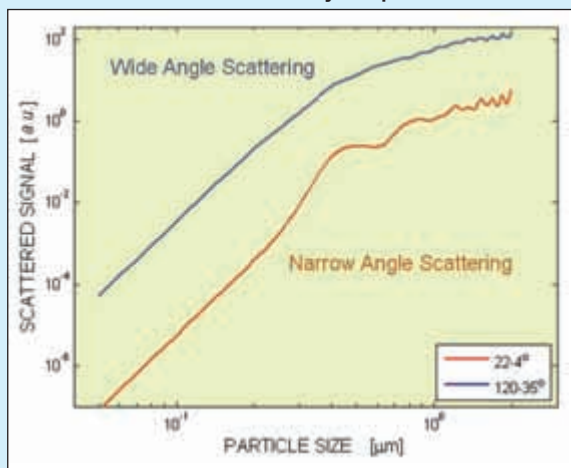


Operation

The Laser Aerosol Spectrometer uses the intensity of light scattered from a laser to measure the particle size. However, the 3340 is not your low precision Optical Particle Counter (OPC) which has gross resolution and bin counting. The Laser Aerosol Spectrometer is truly an Optical Particle Sizer (OPS) featuring sophisticated optics, electronics and flow schemes.

Wide Angle Light Scattering: The wide angle light scatter collection resolves the Mie Scatter sizing issues associated with less sophisticated optical instruments. The instrument features a monotonic response with respect to light scattered intensity which allows the instrument to achieve precise resolution.

Monotonic Intensity Response!

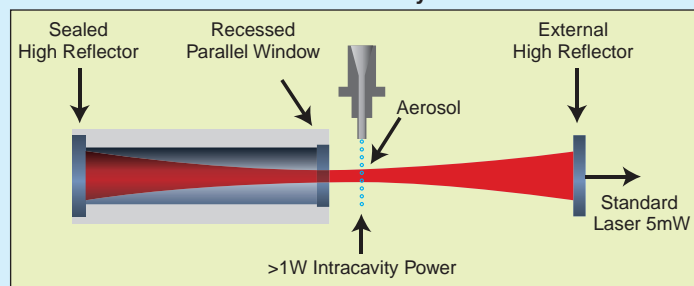


Calibration

The model 3340 is calibrated with NIST traceable Polystyrene Latex (PSL) Spheres. PSL is the industry wide calibration aerosol of choice because it has properties close to many real world aerosols and is traceable to national standards throughout the world.

Custom Calibration Option: If users would like to calibrate the model 3340 to a specific aerosol, a custom calibration can easily be performed. The calibration screen in the software allows users to quickly generate calibration data and automatically calculate the custom calibration curve.

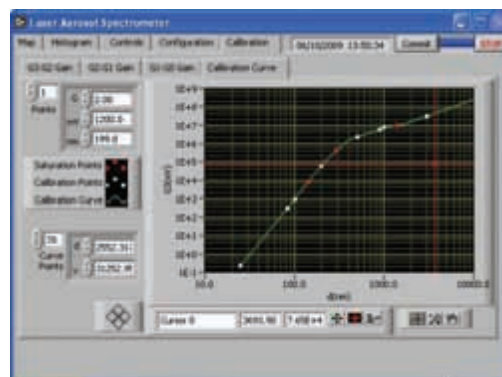
Patented IntraCavity Laser



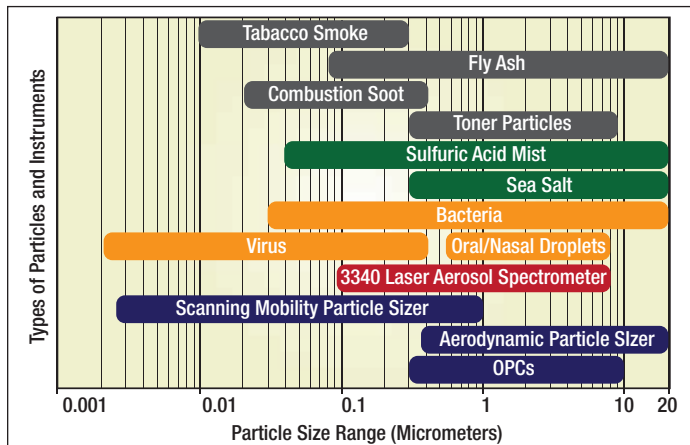
*US Patents Numbers: 5,907,575; 7,079,243; 7,295,585

IntraCavity Laser: The model 3340 uses a He-Ne laser with a novel intracavity laser design to achieve higher light scattering sensitivity at a lower laser power. You get a >1W laser at a 5mW price! This enables the Laser Aerosol Spectrometer to measure >50% of particles at 0.09 μm while at the same time boasting excellent laser lifetimes.

Patented Optical Design*: The patented optical design also prevents laser degradation issues due to contamination by using 1) parallel transmission surfaces, 2) a recessed intracavity optical surface, 3) carefully designed components to focus the in the viewing volume and 4) a sheathe flow scheme.



Optimal Size Range



With a size range of 0.09 (90 nm) to 7.5 µm this is the right instrument to bridge the 1 µm particle size regime, measuring both the accumulation and course particle modes.

Featured Applications

The 3340 Laser Aerosol Spectrometer is suitable for a wide range of applications. A few are highlighted below:

Filter Testing: The high resolution, wide concentration range, low end size detection limit and fast measurement time make the 3340 ideally suited for filter testing applications.

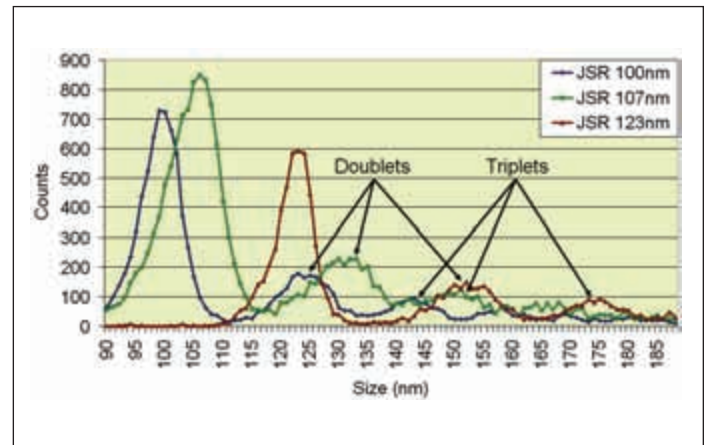
- Filter Efficiency Testing
- Disk Drive Filter testing
- Disk Drive Development and Research

Indoor Air Quality: As a stand alone instrument, the Laser Aerosol Spectrometer provides highly resolved particle size information over a wide concentration range. Pair the 3340 with a CPC, and you can measure the nanometer size fraction (<100 nm) easily and in real-time.

Atmospheric Research & Environmental Monitoring: The size range, measurement time, and lack of radioactive sources or working fluids make this a very useful instrument to fly in aircraft or to transfer from environmental sampling point to environmental sampling point.

Inhalation Toxicology & Exposure Monitoring: Ease of use, fast measurement time and accuracy when measuring aerosols of a known composition make this a frequent application for the model 3340.

Superior Resolution



Typical resolution is within 2.5% of the particle diameter at 0.1 µm. The Laser Aerosol Spectrometer can differentiate between 100 nm and 107 nm PSL!

Additional Applications

- General aerosol research
- Instrument calibration
- Biohazard detection
- Process monitoring
- Pharmaceutical research
- Powders and food products research
- Combustion and emission studies
- Spray analysis
- Condensation and nucleation studies



Specifications

Model 3340 Laser Aerosol Spectrometer

Particle Size Range

0.09 to 7.5 μm

Particle Sizing Accuracy

Within $\leq 5\%$ of particle diameter at 0.1 microns (typically within $\leq 2.5\%$)

Zero Count

<1 particle counted in 5 minutes (JIS standard)

Counting Efficiency

 $\geq 50\%$ at 90 nm

Particle Concentration Range

18,000 particles/cm³ at 10 cm³/min.3,600 particles/cm³ at 50 cm³/min.1,800 particles/cm³ at 95 cm³/min.

Number of Channels

User-selectable, up to 100

Flow

Sample Flow Rate

User-selectable, 10-95 cm³/min. $\pm 5\%$

Sheath Flow Rate

650 cm³/min. $\pm 5\%$

Atmospheric Pressure Correction

Sample flow automatically corrected by internal flow controller.

Environmental Operating Conditions

Operating Temperature

10 to 30°C (50 to 86°F)

Operating Humidity

10 to 90% RH non-condensing

Operating Altitude

Sea level to 4,000 meters (13,000 ft)

Aerosol Medium

Designed for use with air. Do NOT use with pressurized, explosive, corrosive, toxic, or other hazardous gases.

Calibration Particles

NIST traceable Polystyrene Latex Spheres

Laser Source

Helium-Neon (HeNe) gas laser, 633 nm, >1W intracavity power

Detectors

Avalanche Photo Diode (APD) and PIN photodiode

Front Panel Display

10" Color, 640 x 480 pixels

Operating System & Software

Windows® XP, executable VI (virtual instrument) based on LabVIEW 7.1 - generated executable, Microsoft Office®

Communication

10/100 Ethernet (RJ45 female plug) for input/output; RS-232 for output only (9-pin D connector), USB port, for keyboard/mouse or solid-state memory devices, CD and 3.5" disk drives

Dimensions

22 x 17 x 10 inches (56 x 43 x 25 cm)

Weight

53 lbs. (24 kg)

Power

100-240 VAC; 50/60 Hz; 200 watts required



To Order

Laser Aerosol Spectrometer

Specify	Description
3340	Laser Aerosol Spectrometer

Includes USB keyboard and mouse, Tygon® tubing (1/16-inch ID, 1/8-inch OD), zero count filter, operator's manual, power cord

Accessories

Specify	Description
3079-US	Atomizer with built in pump (115V US Plug)
3079-EU	Atomizer with built in pump (230V EU Plug)
3079-UK	Atomizer with built in pump (230V UK Plug)
3433	Small Scale Powder Dispenser

Accessories must be ordered separately.

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