

On-line / In-line Particle Analysis

- Measurement of aerosols and suspensions
- Mean diameter range from 10 nm to 10 μm ¹⁾
- Optical on-line, in-line, in-situ measurement based on the spectral extinction of three laser wavelengths
- Optionally available measurement chamber with an optical path length of up to 15 m

Further advantages of WIZARD-DQL:

- ◆ No sampling necessary – in situ measurements for most applications
- ◆ On-line data presentation of mean diameter and volume concentration
- ◆ Suitable for medium to high particle concentrations
- ◆ Usable for stationary and transient particle systems
- ◆ Process adaptation by windows causes practically no limitations in flow speed, pressure and temperature
- ◆ Simple adaptation of sensor head

White cell
WIZARD-DQL

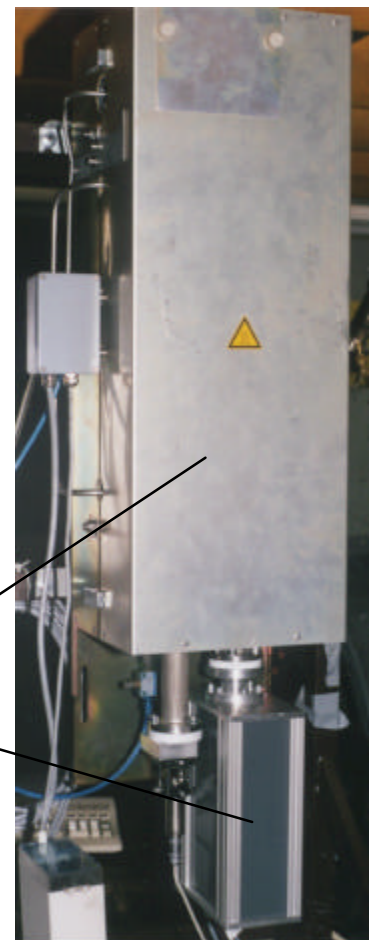


Fig. 1: **Sensor head at optionally available long path cell**
(White-Principle, optical path length from 2.5 to 15 m)

¹⁾ depending on the optical behaviour of the particles, see following page

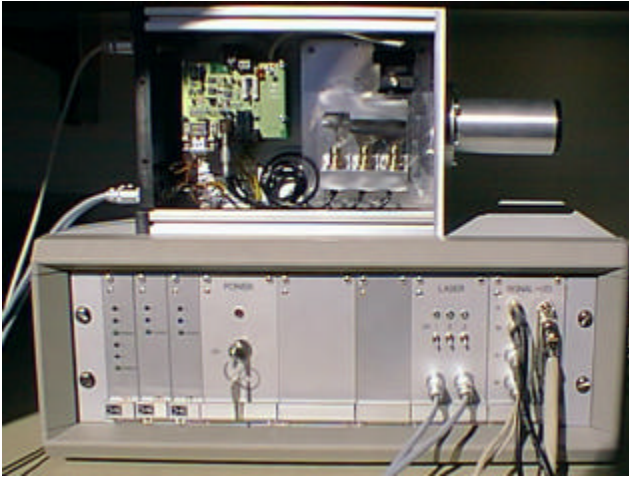


Fig. 2: Sensor head with control unit

Measurement principle

WIZARD-DQL uses the optical multi-wavelength principle. The individual extinctions of three diode laser sources with different wavelengths are analyzed and to deliver the relevant particle parameters (size and concentration).

Fields of use

- ◆ Measurement of aerosol systems (droplets or particles in gaseous atmospheres)
- ◆ Measurement in suspensions (particles or micro bubbles in fluids)
- ◆ Analysis of steady state and of transient particle processes, e.g. in flow field systems
- ◆ Analysis of crystallisation, condensation, nucleation, particle growth processes
- ◆ Analysis of emission processes, e.g. particle emission of diesel engines

Diameter ranges (volume mean diameter)

Strong absorbing particles in gases,
e.g. soot aerosols: approx. 10 nm to 800 nm

Non-absorbing particles in gases,
e.g. water droplets: approx. 0,1 µm to 5 µm

Suspensions, non-absorbing particles in water,
e.g. lattices, crystals: approx. 0,1 µm to 10 µm

Concentration ranges

Depending on the optical path length; actually realized $L = 1 \text{ mm}$ to 15 m . This makes WIZARD-DQL suitable to be used for medium to high concentration ranges. Typical values are in the range from 10^{-3} to $10^{-11} \text{ m}^3/\text{m}^3$.

The concentration range can be adapted by a change in the optical path length; shorter path lengths lead to higher measurable concentrations and vice versa.

Data presentation

Fig. 3 shows the online screen of mean diameter and volume concentration of measured soot particles in the exhaust gas of a diesel engine. All data are available for post calculation, evaluation and customer specific documentation.

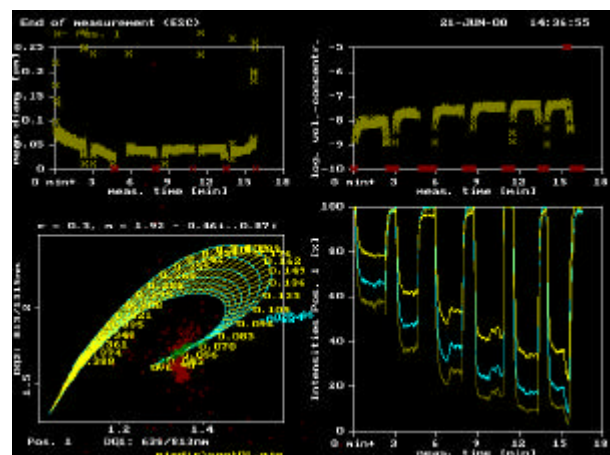


Fig. 3: On-line screen (diameter, concentration, intensities, quality of results)

Available options

- ◆ Long path cell for small concentrations (2.5 up to 15 m, temperature controlled up to 150°C)
- ◆ Measurement cells for monitoring industrial wet scrubbing processes (exhaust gas cleaning) and particle processing industrial plants.
- ◆ Customized software
- ◆ WIZARD-DQ – a particle analyzer with up to three sensor heads for parallel measurements at three different measurement stations.

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