PALAS®

TÜVRheinland® CERTIFIED

Suitability Tested
Complying with
2008/50/EC
EN 15267
Regular
Surveillance

www.tuv.com
ID 0000040212

FIDAS®

FINE DUST MONITORING SYSTEMS

Fidas® – The world's only certified optical fine dust measurement system with single particle analysis for $PM_{2.5}$ | PM_{10}

APPLICATIONS

- Measurements at workplaces and in indoor areas
- Environmental measurements and long-term studies

PALASCOUNTS

MEASURING FINE DUST

APPLICATIONS

– ENVIRONMENTAL MEASUREMENTS

- Environmental monitoring in measurement networks
- Immission
- Long-term studies
- Emission source classification
- Distribution studies (e.g. fires, volcanoes)

– WORK SAFETY / INDOOR AREAS

- Workplace measurements
- Indoor air quality studies
- Exhaust air monitoring
- Emission measurement

DustView II - Measurement of the dust behaviour in the workplace

Fine dust cannot be detected by smell or taste. The extremely small particles are only visible when they are present in the air in very high concentrations. The smallest fine dust particles penetrate deeply into the airways and can reach the bloodstream through the pulmonary alveoli. This can result not only in respiratory diseases but also disorders of the cardiovascular system, cancer and other diseases.

The precise determination of fine dust concentration in the air is becoming more and more important. This applies both to research and monitoring of air quality by environmental measurements, as well as for protection of health through fine dust measurements in schools, workplaces and in industrial processes.

$PM_{2.5}$ – Equipped for the future

PM_{10} measures the mass concentration of airborne particles. In the future, the measurement of the respirable $PM_{2.5}$ fraction in particular will become increasingly important. Furthermore, studies show that not only is the particle mass medically significant, but the particle number is as well. The particle number for $PM_{2.5}$ and PM_{10} has until now not been measured by any routinely used fine dust monitor with only one single measurement device.

The precondition for reliable measurements of fine dust load are calibrated and tested measurement devices that deliver exact data on particle number and particle size reliably and reproducibly. This requirement is met by all Fidas® fine dust monitoring systems by Palas®.

FIDAS® IS THE WORLD'S ONLY CERTIFIED OPTICAL FINE DUST MEASUREMENT SYSTEM WITH SINGLE PARTICLE ANALYSIS FOR FINE DUST FRACTIONS $PM_{2.5}$ AND PM_{10}

Fidas® 200 S

TÜVRheinland® CERTIFIED

Suitability Tested
Complying with
2008/50/EC
EN 15267
Regular
Surveillance

www.tuv.com
ID 0000040212

TÜV-TESTED

The Fidas® 200 and Fidas® 200 S fine dust monitoring systems by Palas® passed the equivalence and suitability testing by TÜV Rheinland and were officially licensed for environmental monitoring by regulatory authorities with the announcement in the German Federal Gazette. This approval applies for all measurement networks in Europe.

This means that the Fidas® 200 and Fidas® 200 S are currently the world's only optical measurement systems with single particle analysis of PM_{10} and $PM_{2.5}$ fine dust fractions that have passed this test in accordance with DIN EN 12341 and DIN EN 14907 and have been certified in accordance with DIN EN 15267-1 & -2.

Reliable results through experience

The Fidas® system was developed based on over 30 years of expertise and its own patented technologies. The suitability test proved its:

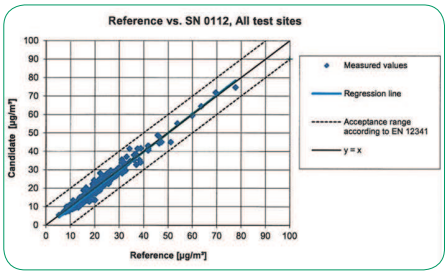
- High data availability (> 99 % in test with 322 measurement days)
- Low measurement uncertainty between test devices: 0.44 µg/m³ for $PM_{2.5}$, 0.64 µg/m³ for PM_{10} (2.5 µg/m³ is allowed)
- Low extended measurement uncertainty (comparison of all measured values): 10.17 % for $PM_{2.5}$, 7.22 % for PM_{10} (25 % is allowed)
- Online status monitoring (incl. calibration status)
- Minimal maintenance activities
- Easy to operate

FIDAS® 200 / FIDAS® 200 S – TESTED ACCORDING TO

- VDI 4202-1, VDI 4203-3, DIN EN 12341 (PM_{10}), DIN EN 14907 ($PM_{2.5}$) and the equivalence guideline

CERTIFIED IN ACCORDANCE WITH

- DIN EN 15267-1 and -2 especially for measurements ordered by authorities.
- Further information is available in the report on suitability testing of the immission measurement system by Palas® GmbH for the airborne particles components PM_{10} and $PM_{2.5}$, TÜV report: 936/21218896/A at www.qal1.de



Reference equivalence function for PM_{10} for Fidas® 200 and Fidas® 200 S

QUALITY + COST-EFFECTIVENESS

All device components undergo a strict quality assurance test at Palas® and are assembled 100 % in-house. All models of the Fidas® product line use the same optics, electronics, mathematics and identical components.

Fidas® 200 S - measurements on the Zugspitze

Fidas® 200 S - Measurements in the city

Optical aerosol measurement

The aerosol spectrometers from Palas® (welas® digital, Promo®, Inas® and Fidas®) use the special technology of Lorenz-Mie **optical light scattering on single particles**, which is protected by three patents. The devices are equipped with a **white light source** and an **unambiguous calibration curve**. Depending on the type of device, Palas® aerosol spectrometers can be used to measure a particle size range of 120 nm to 100 µm and very high concentrations up to 10^6 particles/cm^3. The measuring range of Fidas® devices is 0.18 µm to 18 µm.

The optical light scattering measurement technology allows the **continuous** and **high resolution** measurement of **particle number and particle size** in contrast to other methods and the **simultaneous output of different PM values with only one device**.

Cost-effective in operation

The quality and the technological advantages are the reason that the Fidas® fine dust monitoring systems are not only extremely reliable but also **especially cost-effective** to operate due to the **minimal maintenance expenditure** and **very low energy consumption**. With the Fidas® system, users reduce their operational costs for fine dust measurement.

FIDAS® – SPECIAL FEATURES

Measured values and particle number information

All Fidas® devices measure PM_1, $PM_{2.5}$, PM_4, PM_{10}, TSP, the respirable, thoracic and inhalable mass fractions simultaneously and with high time resolution according to DIN EN 481 as well as the particle size distribution **with 256 raw data channels**.

Sigma-2 sampling head

The **nearly maintenance-free** Sigma-2 sampling head (VDI 2119) allows representative measurements even in extreme weather conditions, such as strong wind.

Intelligent Aerosol Drying System (IADS)

The **sampling system with drying system** prevents measurement inaccuracies caused by condensation effects resulting from high humidity. It also works reliably in the presence of fog and low temperatures (-20 °C).

Calibration and online status monitoring

With many fine dust measurement devices, calibration is time-consuming and expensive. With the Fidas® system, the user can perform an **unambiguous calibration** himself or herself at any time with the calibration dust provided. In addition, the devices have patented online status monitoring available. This allows the calibration to be verified online at any time.

Optimized operation and analytical approach

The intuitive touchscreen user interface allows **simple operation** of the devices. **Remote access** is also supported and can be used to spare unnecessary trips to sites. The software provided offers versatile options for analysis.

Interfaces and communication protocols

Numerous interfaces (RS-232/485, LAN, WiFi, USB) and communication protocols (*Bayern/Hessen*, ASCII, ModBus) are supported.

Fidas® Fly on the octocopter from Airclip GmbH

Fidas® 200 S - Agricultural measurements

WORK SAFETY + INDOOR AREAS

Fidas® mobile

Fidas® 100

Fidas® mobile - workplace measurement

We spend the majority of our lives inside. In many cases the dust exposure there is even higher than outdoors. Therefore requirements for the measurement technology are just as high as for environmental measurement. Before making an investment, the technical specifications of the respective fine dust measurement device should be examined very carefully.

The Fidas® mobile and Fidas® 100 meet the requirements for measurements at workplaces and in indoor areas.

Fidas® mobile

The Fidas® mobile is a **portable hand-held unit with battery or mains operation**. It includes data storage as well as WiFi support and therefore is very fast and flexible to use.

Fidas® 100

The Fidas® 100, equipped with two simultaneously switched and redundant aerosol pumps, is designed especially for **long-term measurements**.

The Fidas® 100 works with a volume flow of 4.8 l/min and is also equipped with a filter holder to insert an absolute filter with a 47 or 50 mm diameter. This allows subsequent testing of the chemical composition of the aerosol.

ENVIRONMENTAL MEASUREMENTS

For environmental monitoring in networks, immission measurements, long-term studies, emission source classification or distribution studies, such as from volcano eruptions or major fires, Palas® has developed Fidas® 200 series devices. The system is used successfully in governmental measurement networks, urban centres as well as on coastlines, in mountains, in the Arctic and desert regions.

Fidas® 200

The Fidas® 200 along with the Fidas® 200 S are currently **the only certified optical fine dust monitoring devices** with single particle analysis for simultaneous measurement of $PM_{2.5}$ and PM_{10} levels, e.g. in measurement networks. Both devices are therefore officially approved for regulatory environmental measurements. The Fidas® 200 model is designed for installation in a measurement container.

Fidas® 200 S

The Fidas® 200 S is also certified and has the same features as the Fidas® 200. It is additionally equipped with an IP65 weather-proof housing (-20 °C/+50 °C) and can be operated as a stand-alone device completely independently from a measurement container in open air, in high-altitude mountains as well as on coastlines.

Fidas® 300 / Fidas® 300 S

Identical to Fidas® 200 with higher volume flow and $PM_{2.5}$/PM_{10} heads.

Fidas® Fly

Fidas® capable of flying with an octocopter for rapid and large-scale measurements (e.g. after volcanic eruptions).

Other fine dust monitoring devices by Palas®

- **DustView II** - Dust monitoring device for powder and bulk materials
- **Promo® 2000** - Time-resolved particle measurement in ex areas

Fidas® 200 - Certified fine dust monitoring system

Fidas® 200 S - Certified fine dust monitoring system

PALAS®

PALAS® – MORE THAN 30 YEARS OF EXPERTISE IN AEROSOL TECHNOLOGY

With over 50 patents submitted, Palas® has set the standard in aerosol and particle technology for more than 30 years. Through continuous innovations, we achieve extraordinary quality and durability in our products.

The result is unique technical and economic advantages for our customers. Palas® has established itself as a global market leader in the fields of aerosol generation, aerosol dilution and aerosol particle measurement technology. Renowned companies, universities and research institutions in approximately 60 countries put their trust in Palas® precision technology.

OUR CORE COMPETENCIES

- Filter test systems*
- Aerosol spectrometer systems*
- Fine dust monitoring systems
- Nanoparticle measurement technology
- Particle generation systems*
- Dilution systems*
- Clean room particle technology
- Special developments
- Calibration systems*
- Services
- Training courses and seminars

* *Palas® is the market leader in these product groups.*

CONTACT

Palas GmbH
Greschbachstrasse 3b | 76229 Karlsruhe, Germany
Phone: +49 721 96213-0 | Fax: +49 721 96213-33
Email: mail@palas.de | Internet: www.palas.de

Quality Management ISO 9001:2008