



Dust measuring device for comparing the dust formation of powders and bulk materials

Description



Fig. 1: DustView II Dust is generated during the production, conveyance, and filling of powders, bulk materials, granulates, pellets, etc. This dust can have negative impacts on occupational safety and the reliability of production. In addition, dust pollutes the environment and plays a not inconsiderable role in the loss of production. The first essential step in the prevention of undesirable dust is to measure dust formation following free fall and impact. The DustView II fully automated dust measurement system enables rapid and precise measurement of even the smallest fractions of dust generated following free fall and impact. By means of the DustView II, the individual dust formation behavior can be determined quickly, clearly and reproducibly, so that the application of the system especially in the area of quality assurance of powders is outstandingly possible. **Principle of operation**

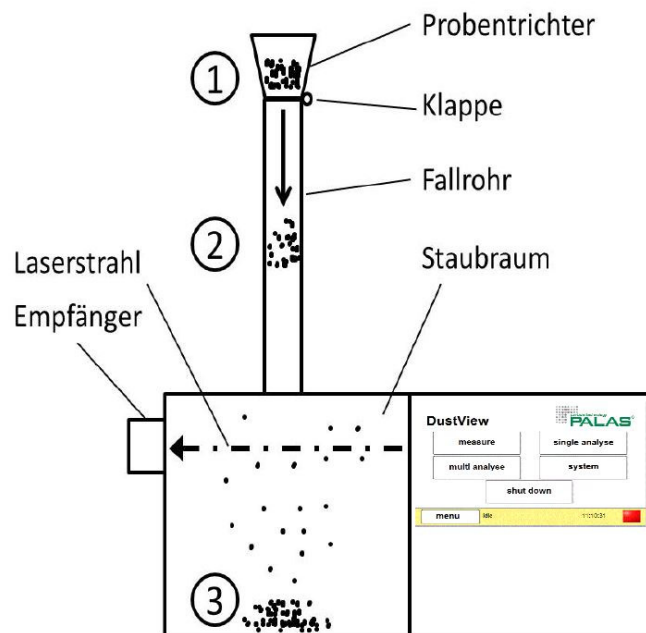


Fig. 2: Schematic design of the DustView II

- Pour the sample (typically 30 g bulk material) into the sample funnel.
- Start of measurement: Valve opens automatically and sample falls into dust reservoir.
- Measurement begins immediately after the valve opens.
- The dust is dispersed in the reservoir. The resulting dust development causes an attenuation of the laser beam (extinction measurement). This attenuation is observed during measurement and classified as a dust value between 0 and 100 0 = No attenuation of the laser beam due to dust development, i.e. there are only minor dust fractions in the reservoir 100 = Complete attenuation of the laser beam due to dust development
- The dust values change over time and indicate the attenuation of the laser beam in relation to the 0 value (= no attenuation). The 0 value is automatically determined without dust prior to each measurement (calibration).
- End of measurement and automatic storage of the data

Determination of the dust number as a reference value for dust behavior The dust number (STZ) consists of the maximum dust value and the dust value indicated 30 seconds after the maximum dust value has been reached: **Dust number (STZ) = Max. value + 30-s value** Measurement results (example)

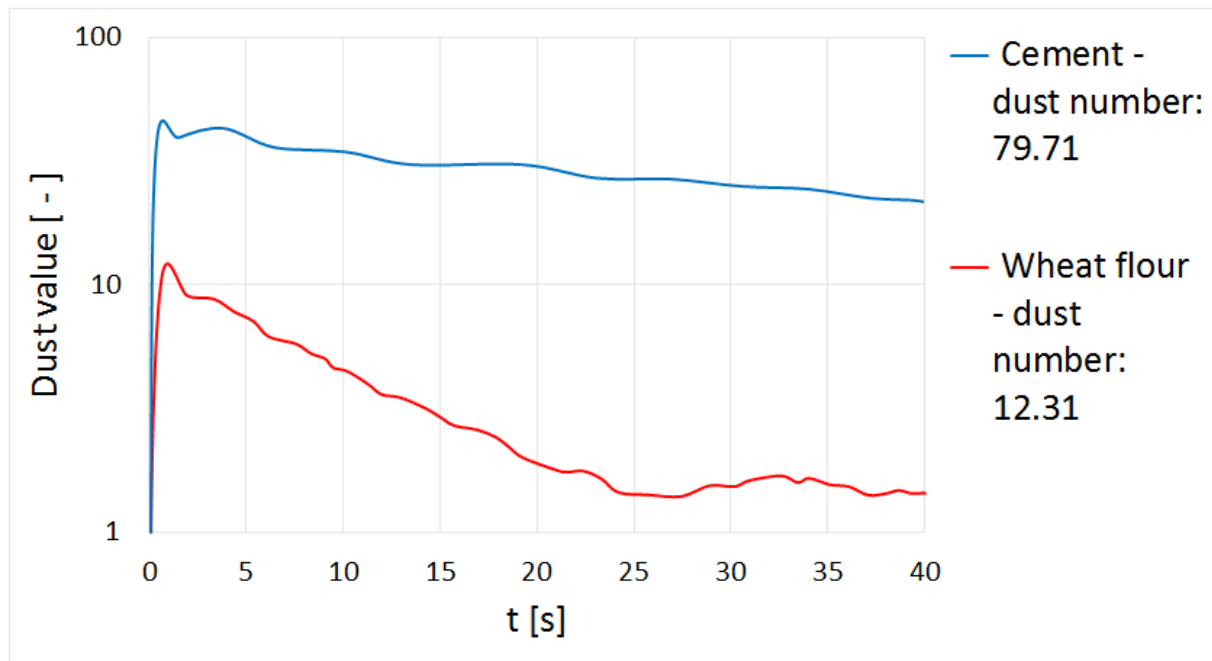


Fig. 3: Comparison of two bulk materials Due to its finer particle size distribution and the specific characteristics of the material, the cement sample clearly generates more dust than the wheat flour sample. Wheat flour contains considerably larger particles that quickly settle to the bottom of the reservoir, while nearly all of the finer cement particles remain suspended in the air even after 30 s. These comparisons enable a product to be easily and verifiably optimized with respect to dust behavior. The high reproducibility of these measurements enables easy and economical production controls of bulk materials. **Firmware and software** Following completion of the measurement, the results are displayed directly on the device and are shown as numerical values and in the form of a chronological sequence. Automatic storage of the results enables the analysis of earlier measurements without an additional PC. The system provides the option to create reports as a PDF or text file. In addition, a report can be printed out immediately using a printer. In addition to the analysis of individual measurements, the DustView II firmware also enables the comparison of up to ten different measurements. The report creation options mentioned above are also available here. Multiple measurements can also be averaged easily and quickly using the series measurement option. Evaluation software for the analysis of measurements on an external PC is also included. The DustView II measurement device was developed during the AIF Pro INNO II Research project (KF 0295803WZ8) in cooperation with the Bergischen Universität Wuppertal, Prof.-Dr. E. Schmidt during the time 2008 and 2010.

Benefits

- High information content with respect to bulk material dust behavior
- Ideal tool for quality assurance when handling with powdery goods
- DustView II based on CIPAC MT 171
- Fully automated, reproducible measuring process
- Fully automated control and evaluation using on-board PC, no need for an external PC
- Easy and intuitive operation using the touch screen
- Rapid measuring process (40 s)
- Compact and portable device
- Comparison of multiple measurements
- Individual measurements/serial measurements
- Creation of reports as PDF, text file or printout
- Reliable function
- Self-calibrating by means of automatic offset adjustment
- Automatic internal service message
- Network-compatible
- Low maintenance
- Reduces your operating expenses

Datasheet

<i>Parameter</i>	<i>Description</i>
Interfaces	USB, Ethernet, RS232/485, Wi-Fi
Measuring principle	Extinction (30 g sample weight, 750 mm drop height)
Data acquisition	24 bit AD-converter
User interface	Touch screen, 800 • 480 pixel, 7"
Power supply	115 – 230 V, 50 – 60 Hz
Dimensions	approx. 500 • 250 • 950 mm
Weight	16 kg
Operating system	Windows embedded
Data logger storage	4 GB
Installation conditions	+5 – +40 °C

DustView II



Applications

- Quality control
- Product development
- Process optimization
- Occupational safety

Palas GmbH
Partikel- und Lasermesstechnik
Greschbachstrasse 3 b
76229 Karlsruhe
Germany

Managing Partner:
Dr.-Ing. Maximilian Weiß
Commercial Register:
register court: Mannheim
company registration number: HRB 103813
USt-Id: DE143585902



Contact: E-Mail: mail@palas.de Internet: www.palas.de Tel: +49 (0)721 96213-0 Fax: +49 (0)721 96213-33