# TVE 3000



With the aid of the TVE 3000, vacuum cleaner tests can be carried out more cost-effectively than in accordance with the standard EN 60312. In addition, it is possible to distinguish the separation behavior of vacuum cleaners with bags and vacuum cleaners with bags and HEPA end filters reliably with dust or as an option with salts – e.g., NaCl or KCl.

## Operation principle

## Vacuum cleaner tests

Dust is introduced into the system using the dust disperser RBG 1000. The reproducibility of the dust concentration is < 10% in quantity.

The RBG 1000 that is used operates much more uniformly than is required in the standard and therefore delivers an optimized dust application, which is a prerequisite for exact measurements of separation efficiency with a particle measurement device. With the particle measurement system Promo® 2000, with the aid of the welas® 2300 aerosol sensor in the clean gas, a vacuum cleaner's emissions can be measured per the standard. As a result, it is possible to accurately compare vacuum cleaners, and the individual filter stages can also be reliably assessed.With the particle measurement system Promo® 3000, users have access to a high-resolution aerosol spectrometer for virtually simultaneous determination of the particle size distribution and the particle concentration in the raw and clean gas.

The welas® 2070 aerosol sensor measures the particle size distribution and the particle concentration in the raw gas (upstream of the vacuum cleaner). The dust is sucked in by the vacuum cleaner and separated in the vacuum cleaner bag and the HEPA end filter. The emissions from the vacuum cleaner are then measured with the welas® 2300 aerosol sensor on the clean gas side (downstream of the vacuum cleaner). The fraction separation efficiency of the vacuum cleaner is determined from the measurements of the raw and clean gas.

The FTControl software allows many fraction separation efficiency measurements for different vacuum cleaners to be displayed simultaneously on the screen.

The dust disperser and the clean gas sensor can be positioned in different locations to investigate the influence of the flow channel on particle sedimentation.

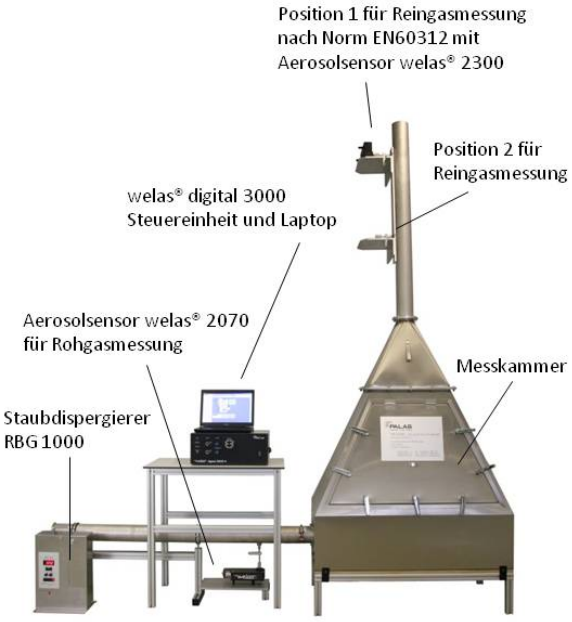



**Bild 1**: Aufbau TVE 3000 Staubsaugerprüfstand

Position

The aerosol sensor for the clean gas measurement can be positioned in two locations. Position 1 is the clean gas measurement point in accordance with standard EN 60312. The clean gas sensor can be operated either in position 1 or 2, e.g., to investigate sedimentation and other transport losses in the suction channel. Position 1 complies with the standard.

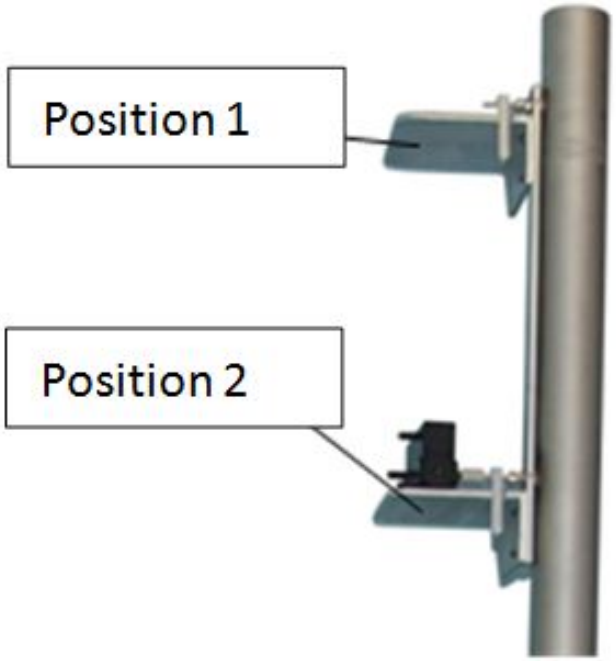



Fig. 2: Clean gas sampling

The RBG 1000 is attached as shown in Fig. 1 in accordance with standard EN 60312 or frontally positioned at the entrance of the flow channel, which ensures that no deposits can build up in the aerosol intake elbow.

The fraction separation efficiency of the vacuum cleaner or the filter stages is determined from the raw and clean gas measurements.

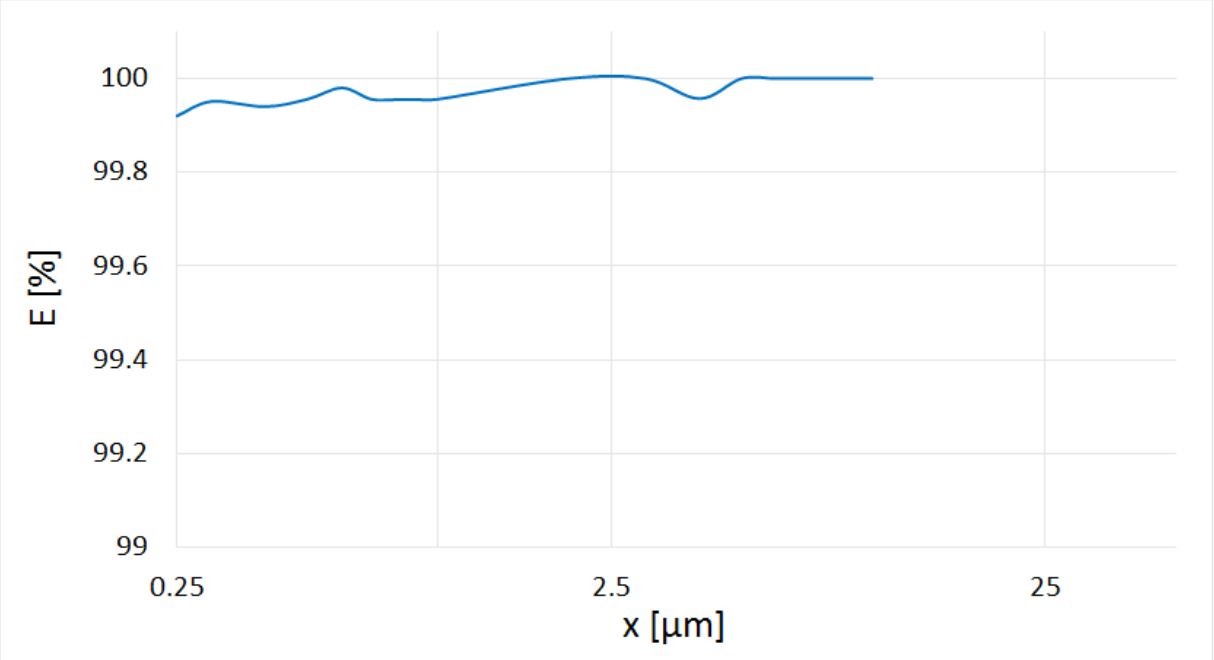



Fig. 3: Measurement of the fraction separation efficiency of a complete vacuum cleaner, including vacuum cleaner bag and HEPA end filter

## BENEFITS

- Virtually simultaneous particle measurement in the raw gas and clean gas
- Highest dosing consistency with the dust disperser RBG 1000 or with the AGK 2000
- Measurement of the particle size distribution and particle concentration in the raw gas and clean gas
- Emission measurements in accordance with standard EN 60312
- Measurement of the fraction separation efficiency for the dust bag
- Measurement of the fraction separation efficiency for the HEPA end filter
- Measurement of the fraction separation efficiency for the entire vacuum cleaner
- Low-maintenance
- Easy operation

## NORMS AND CERTIFICATES

EN 60312

## DATASHEET

| | |
|---|---|
| Measurement range (number $C_N$) | $< 1 – 10^6$ Partikel/$cm^3$ |
| Measurement range (size) | 0.2 – 40 $\mu$m |
| Volume flow (suction flow) | Volume flow of the system is depending on the vacuum cleaner |
| Power supply | 115 – 230 V, 50/60 Hz |
| Compressed air connection | 6 – 8 bar |
| Dimensions | 2,100 • 2,600 • 600 mm (H • W • D) |
| Weight | Approx. 170 kg |

## Applications

- Emission measurements in accordance with standard EN 60312
- Measurement of the fraction separation efficiency for the vacuum cleaner with bag and the vacuum cleaner with HEPA end filter

Mehr Informationen:
https://www.palas.de/en/product/tve3000