# RBG BASIC




Low-concentration solid particle aerosols produced from powders are required for many applications in research, development, and quality assurance and for calibrating particle measurement devices.The RBG system disperses non-cohesive powders such as mineral dusts, active pharmaceutical ingredients, pollen, etc., in the size range of < 200 $\mu$m and with a fine fraction of < 100 nm. Monolithic solid materials like blackboard chalk are finely dispersed with the highest dosing constancy.The unique advantage of this dosing and dispersion system is that in the RBG system, mass flows range from approx. 40 mg/h up to approx. 800 g/h are dispersed with the highest level of dosing constancy.

RBG basic can be operated with compressed air and nitrogen as carrier gas.

## OPERATION PRINCIPLE

## PROVEN TECHNOLOGY UP-TO-DATE

The powder to be dispersed is filled little by little into the cylindrical solid material reservoir and compressed with a tamper. The Lucerne University determined an excellent reproducibility of the tamping density in the solid material reservoir with a deviation of 3.4 %. The filled solid material reservoir is inserted into the dispersing head of the RBG. The powder, which has thus been uniformly compressed across the filling level, is then conveyed onto a rotating brush at a precisely controlled feed rate. An adjustable volume flow streams over the tightly woven precision brush at a very high speed and blows the particles out of the brush. The dispersing head assembly consists of a dispersing holder, dispersing cover, precision brush, and solid material reservoir.

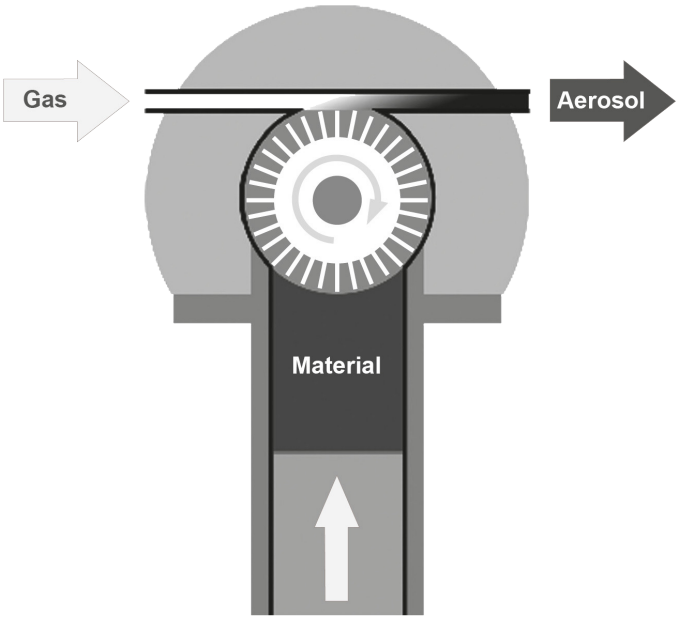



Fig. 1: Schematic diagram of RBG system

Dosing is performed via the precisely controlled feed rate of the feed piston. The desired mass flows can be quickly and reproducibly specified based on the cross-section of the solid material reservoir, the precisely adjustable feed rate of the feed piston, and the easy-to-determine tamping density of the powder in the reservoir.

| Reservoir diameter | Fill quantity | Feed rate 1 mm/h | Feed rate10 mm/h | Feed rate 100 mm/h | Feed rate 1000 mm/h |
|---|---|---|---|---|---|
| 7 mm | 2.7 g | 38 mg/h | 380 mg/h | 3.8 g/h | 38 g/h |
| 10 mm | 5.5 g | 78 mg/h | 780 mg/h | 7.8 g/h | 78 g/h |
| 14 mm | 17 g | 150 mg/h | 1.5 g/h | 15 g/h | 150 g/h |
| 16 mm | 30 g | 200 mg/h | 2 g/h | 20 g/h | 200 g/h |
| 20 mm | 35 g | 310 mg/h | 3.1 g/h | 31 g/h | 310 g/h |
| 32 mm | 88 g | 800 mg/h | 8 g/h | 80 g/h | 800 g/h |

Table 2: Mass flows of RBG basic / solo / professional (compacted density 1 g/cm³)

The powder separated from the reservoir by the precision brush is almost wholly dispersed into the constituent particles (see Fig. 2) in the dispersing head by air flowing at high speed. The manual setting of pre-pressure regulates the dispersing air flow.

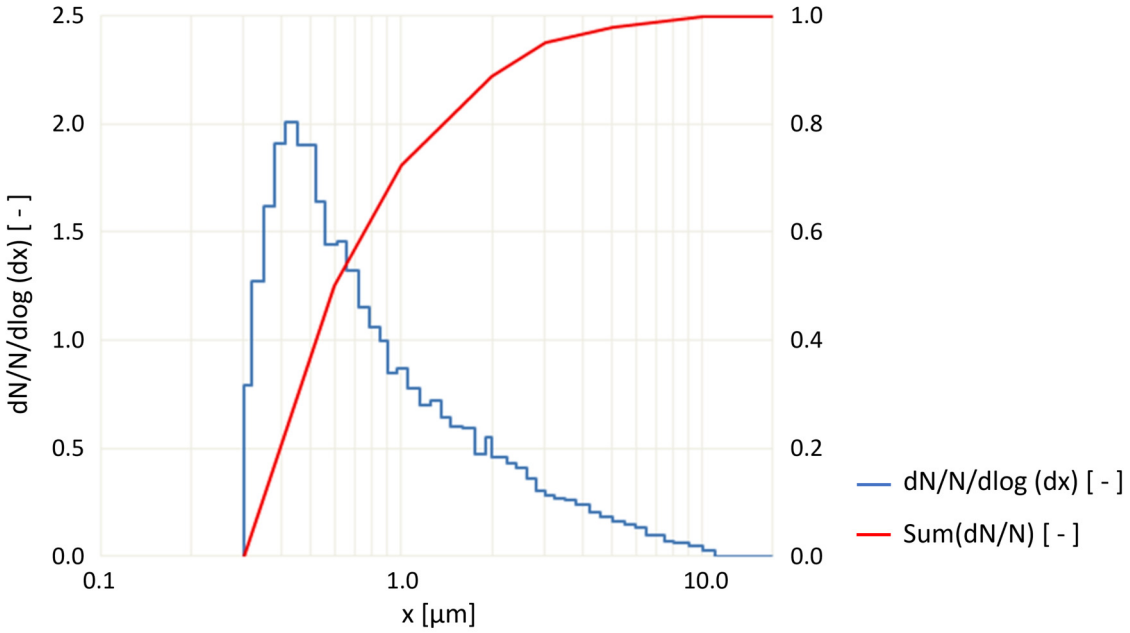



Fig. 2: Particle size distribution with the welas® digital 2000

Four different dispersing covers can be used for optimal dispersion.

| Cover | Particle size | Reservoir diameter | Volume flow |
|---|---|---|---|
| A | < 0.1 – 200 µm | 7 – 32 mm | 33 – 80 l/min |
| B | < 0.1 – 200 µm | 7, 10 and 14 mm | 17 – 40 l/min |
| C | < 0.1 – 200 µm | 7 mm | 8 – 20 l/min |
| D | 200 – 1,000 µm | 7 – 32 mm | 33 – 80 l/min |

Table 4: Dispersion covers RBG system

The construction design of the RBG system allows for operation in ″powder″/″no powder″ pulse mode with cycle lengths ranging down to a second. The function can be used manually on the unit or via a connected computer.

RBG basic can be optionally controlled via the delivered software from a Windows computer or tablet.

## Benefits

- Very high short-term and long-term dosing constancy
- Dispersion of virtually all non-cohesive dusts
- Easy and fast exchange of different solid material reservoirs and dispersing covers

- Remote operation with included software
- Device easy to clean
- Little maintenance required
- Low operating expenses

## DATASHEET

| | |
|---|---|
| Particle size range | 0.1 – 200 $\mu$m |
| Maximum particle number concentration | Approx.$10^7$ particles/cm³ |
| Volume flow | 8 – 85 Nl/min |
| Mass flow (particles) | 0.04 – 800 g/h (with an assumed compacted density of 1 g/cm$^3$) |
| Filling height | 110 mm |
| Filling quantity | 2.7 g (reservoir Ø = 7 mm), 5.5 g (reservoir Ø = 10 mm), 17 g (reservoir Ø = 14 mm), 35 g (reservoir Ø = 20 mm), 88 g (reservoir Ø = 32 mm) (with an assumed compacted density of 1 g/cm$^3$) |
| Interfaces | USB type B |
| Power supply | 115–230 V, 50/60 Hz |
| Particle material | Non-cohesive powders and bulks |
| Dosing time | Several hours nonstop |
| Pre-pressure | 4 – 8 bar |
| Carrier/dispersion gas | Air, nitrogen |
| Maximum counter pressure | 0.2 barg |
| Compressed air connection | Quick coupling |
| Feed rate | 1 – 1,000 mm/h |
| Reservoir inner diameter | 7, 10, 14, 20, 32 mm |
| Aerosol outlet connection | Øinside= 5 mm,<br>Øoutside = 8 mm |
| Dispersion lid | Type A, type B, type C, type D |
| Dimensions | 515 • 330 • 240 mm (H • W • D) |
| Weight | Approx. 15 kg |

## Applications

- Filter industry:
  - Determination of fractional separation efficiency
  - Determination of total separation efficiency
  - Long-term dusting
  - Filter media and ready-made filters
  - Dust removal filters
  - Vacuum cleaners and vacuum cleaner filters
  - Car interior filters
  - Engine air filters
- Calibration of particle measurement devices
- Flow visualization
- Inhalation tests
- Tracer particles for LDA, PIV, etc.
- Coating of surfaces

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