



Product data sheet

Palas® Aerosol Generator for solid particles RBG 2000



Applications

- Filter industry
- Determination of fractional separation efficiency
- Determination of total separation efficiency
- Long-term dusting
- Filter media and assembled filters
- Dust filters
- Vacuum cleaners and vacuum filters
- Car interior filters
- Engine air filters
- Calibrating particle measurement devices
- Flow visualization
- Inhalation experiments
- Tracer particles for LDV, PIV, etc.
- Surface coatings

Benefits

- Optimal short-term and long-term dosing constancy
- Double the dosing time in comparison with the RGB 1000
- Disperses virtually any non-cohesive dusts
- Easy to switch out different solid material reservoirs and dispersion covers
- Easy to determine and adjust the mass flow
- Able to adjust higher mass flows than the RGB 1000
- Pulse mode
- Easy to clean
- Quick and easy to operate

Description

Low-concentration solid particle aerosols from powders are required for many applications in research, development, and quality assurance and for the calibration of particle measurement devices.

For more than 25 years, the RBG system has been successfully used worldwide for the reliable dispersion of non-cohesive powders, e.g. mineral dusts, active pharmaceutical ingredients, pollen, etc., within the size range of $< 100 \mu\text{m}$ and with a fine fraction of $< 100 \text{ nm}$. Monolithic solid materials, e.g. blackboard chalk, are finely dispersed with optimal dosing constancy.

The difference between RBG 2000 and RBG 1000 make the feed stock reservoirs of RBG 2000, which are longer than the feed stock reservoirs of RBG 1000, and the availability of a reservoir with a bigger diameter. The fill level of the feed stock reservoir of RBG 2000 is 180 mm. Thus, the special advantage of RBG 2000 in comparison to RBG 1000 is that the dosing time with the same mass flow can be extended by more than a factor of 3. Mass flows of between approx. 200 mg/h and 560 g/h are dispersed with optimal dosing constancy due to the quick and easy replacement of the feed stock reservoir.

Optional: Pressure-resistant up to 3 bar

Startup

The powder to be dispersed is gradually poured in the cylindrical solid material reservoir and compressed with a tamper. The filled reservoir is inserted into the dispersing head on the RBG and the powder, which has been uniformly compressed at the filling level, is conveyed onto a rotating brush at a precisely controlled feed rate. The adjustable volume flow moves over the tightly woven precision brush at very high speed and pulls the particles out of the brush.

The dispersing head assembly comprises a dispersing head, dispersing cover,

precision brush, and solid material reservoir.

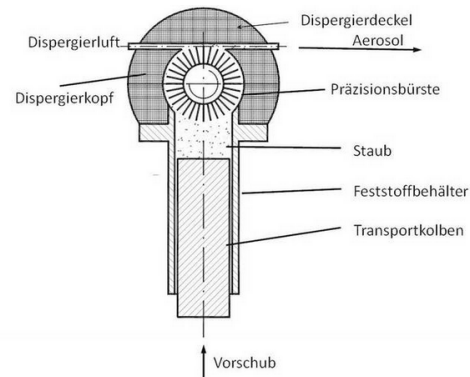


Fig. 1: RBG system schematic diagram

Dosing

Dosing is performed based on a precisely controlled feed rate on the feed piston. The desired mass flows are able to be easily and reproducibly defined based on the cross section of the reservoir, the precisely adjustable feed rate of the feed piston, and the compacted density of the powder in the reservoir.

RBG 1000				
Reservoir \varnothing	Fill quantity	Feed rate 1 mm/h	Feed rate 5 mm/h	Feed rate 700 mm/h
7 mm	2.7 g	38 mg/h	190 mg/h	27 g/h
10 mm	5.5 g	79 mg/h	395 mg/h	55 g/h
14 mm	10.8 g	154 mg/h	770 mg/h	107 g/h
20 mm	22 g	314 mg/h	1570 mg/h	219 g/h
28 mm	43 g	616 mg/h	3080 mg/h	430 g/h
RBG 2000				
16 mm	36 g	0.2 g/h	1 g/h	140 g/h
20 mm	56 g	0.3 g/h	1.5 g/h	220 g/h
28 mm	110 g	0.6 g/h	3 g/h	430 g/h
32 mm	144 g	0.8 g/h	4 g/h	562 g/h

Table 1: Mass flows of RBG system (compacted density 1 g/cm³)

Dispersing

The powder conveyed from the reservoir by the precision brush is virtually completely dispersed into individual particles up to $<$

100 nm by the dispersing air in the dispersing head (see Fig. 2).

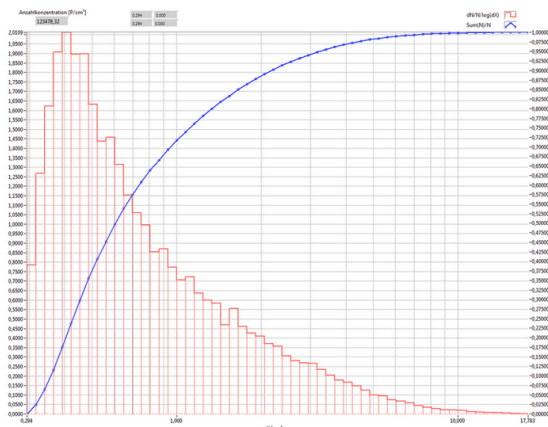


Fig. 2: Particle size distribution with welas® digital 2000



Fig. 3: Type A dispersing cover

Two different dispersing covers can be used for optimal dispersion (see Fig. 3, additional details under "Accessories"), including: Type A and type D.

Pulse mode

The RBG system is designed to enable operation in "powder"/"no powder" pulse mode in cycles as short as 1 second. The system can be operated manually using the "Stop", "Up", and "Down" keys or automatically using an electric timer switch.

All RBG versions can be optionally controlled using a remote control or PC.

Specifications

Volume flow	2.5 – 5.0 m ³ /h
Power supply	115 - 230 V, 50 - 60 Hz
Dimensions	1160 • 530 • 500 mm
Weight	Approx. 40 kg
Particle material	Non-cohesive powders and bulks
Dosing time	24h, depending on mass rate and reservoir size
Maximum particle number concentration	Approx. 10 ⁷ particles/cm ³
Mass flow (particles)	1 – 560 g/h (with an assumed compacted density of 1 g/cm ³)
Particle size range	0.1 – 100 µm
Carrier/dispersion gas	Random (generally air)
Pre-pressure	4 – 8 barg
Feed rate	5 – 700 mm/h
Reservoir diameter	16, 20, 28, 32 mm
Maximum counter pressure	200 mbarg
Reservoir length	180 mm
Dispersion cover	Type A, type D
Compressed air connection	Quick coupling
Aerosol outlet connection dispersion cover type A	Øoutside = 8 mm / Øinside = 5 mm
Aerosol outlet connection dispersion cover type D	Øoutside = 8 mm / Øinside = 5 mm