RBG 2000

Low-concentration solid particle aerosols from powders are required for many applications in research, development, and quality assurance and for calibrating 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 μm and with a fine fraction of < 100 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 feedstock reservoirs of RBG 2000, which are longer than the feedstock reservoirs of RBG 1000, and the availability of a reservoir with a bigger diameter. The fill level of the feedstock reservoir of RBG 2000 is 180 mm. Thus, the unique advantage of RBG 2000 compared 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.

Optional: Pressure-resistant up to 3 bar

Model Variations

RBG 2000 D

Pressure-resistant at positive pressure values of up to 3 bar, higher mass flows

RBG 2000 SD

Pressure-resistant at positive pressure values of up to 3 bar, also nitrogen as a dispersing gas

OPERATION PRINCIPLE

PROVEN TECHNOLOGY

The powder to be dispersed is gradually poured into 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 a very high speed and blows the particles out.

The dispersing head assembly comprises a dispersing head, dispersing cover, precision brush, and solid material reservoir.

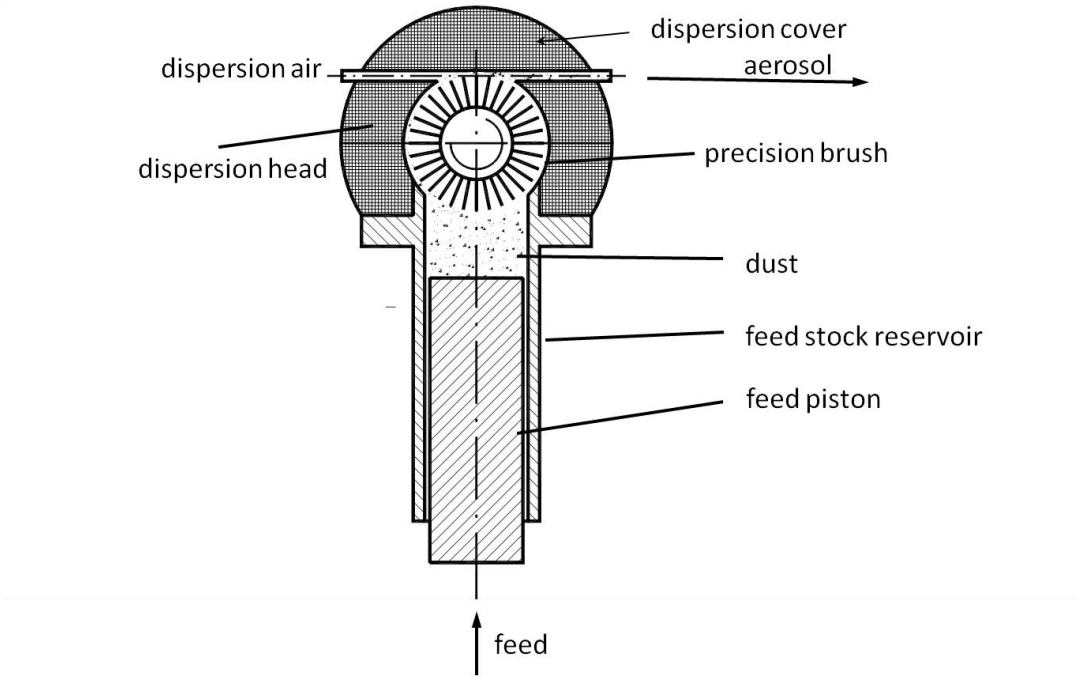

Fig. 1: RBG system schematic diagram

Dosing is performed based on a precisely controlled feed rate on the feed piston. The desired mass flows can be quickly 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.

Reservoir diameter	Fill quantity	Feed rate 1 mm/h	Feed rate10 mm/h	Feed rate 100 mm/h	Feed rate 700 mm/h
7 mm	2.7 g	38 mg/h	380 mg/h	3.8 g/h	26.6 g/h
10 mm	5.5 g	78 mg/h	780 mg/h	7.8 g/h	54.6 g/h
14 mm	17 g	150 mg/h	1.5 g/h	15 g/h	105 g/h
20 mm	35 g	310 mg/h	3.1 g/h	31 g/h	217 g/h
32 mm	88 g	800 mg/h	8 g/h	80 g/h	560 g/h

Tabelle 2: Mass flows of RBG system (compacted density 1 g/cm³)

Table 1: Mass flows of RBG system (compacted density 1 g/cm^3)

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).

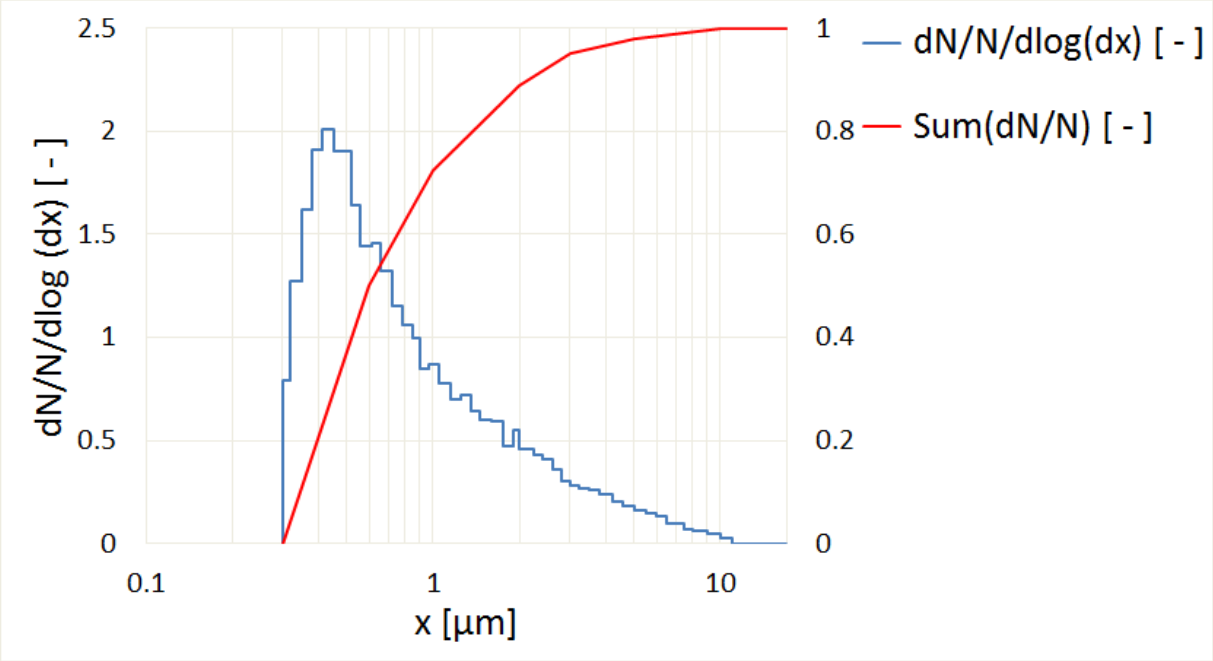

Fig. 2: Particle size distribution with welas® digital 2000

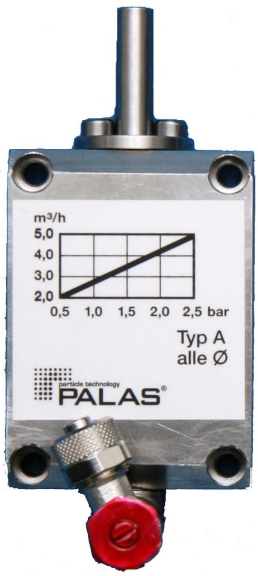

Fig. 3: Type A dispersing cover

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

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

Tabelle 4: Dispersion covers RBG system

Table 2: Dispersion covers

System	Feed rate nm/h	Reservoir diameter in mm	Reservoir length in mm
RBG 1000	700	7 - 28	70
RBG 1000 D	700	7 - 20	70
RBG 1000 G	300	7 - 28	70
RBG 1000 GD	300	7 - 20	70
RBG 1000 L	700	10, 14	70
RBG 1000 SD	700	7 - 20	70
RBG 1000 SG	300	7 - 20	70
RBG 1000 I	700	7 - 28	70
RBG 1000 ID	700	7 - 20	70
RBG 1000 ISD	700	7 - 20	70
RBG 2000	700	16 - 32	180
RBG 2000 D	700	16, 20, 28	180
RBG 2000 SD	700	16, 20, 28	180

Tabelle 6: Different versions of the RBG system

Table 3: Different versions of the RBG system

I = version for inhalation
D = pressure-resistant
G = low feed rate
L = easily removable and weighable dosing unit
S = nitrogen version

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 set manually via the "Stop/Start" and "Forward" keys or automatically via an electric timer switch.

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

Benefits

- Optimal short-term and long-term dosing constancy
- Double the dosing time in comparison with the RBG 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
- Reliable function
- Low maintenance
- Reduces your operating expenses

DATASHEET

Particle size range	0.1 – 100 μm
Maximum particle number concentration	Ca. 10^7 particles/cm^3
Volume flow	40 – 80 Nl/min
Mass flow (particles)	1 – 560 g/h (with an assumed compacted density of 1 g/cm^3)
Filling height	180 mm
Filling quantity	36 g (reservoir Ø = 16 mm), 56 g (reservoir Ø = 20 mm), 110 g (reservoir Ø = 28 mm), 144 g (reservoir Ø = 32 mm)
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	Random (generally air)
Maximum counter pressure	0.2 barg
Compressed air connection	Quick coupling
Feed rate	5 – 700 mm/h
Reservoir inner diameter	16, 20, 28, 32 mm
Aerosol outlet connection	Dispersion cover type A: $Ø_{inside}$= 5 mm, $Ø_{outside}$ = 8 mm; Dispersion cover type D: $Ø_{inside}$= 5 mm, $Ø_{outside}$ = 8 mm
Dispersion cover	Type A, Type D
Dimensions	1.160 • 530 • 500 mm (H • B • T)
Weight	Approx. 40 kg

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

Mehr Informationen:
https://www.palas.de/product/rbg2000