RBG 1000



The RBG system disperses reliable non-cohesive powders such as mineral dusts, active pharmaceutical ingredients, pollen, etc., in size range of < 100 μm and with a fine fraction of < 100 nm. Also, monolithic solid materials such as blackboard chalk are finely dispersed with the highest dosing constancy.The unique advantage of this dosing and dispersion system is that in the case of the RBG 1000, mass flows ranging from approx. 10 mg/h up to approx. 430 g/h are dispersed with the highest level of dosing constancy.

Optional:

- Pressure-resistant up to 3 bar
- Low-pressure operation from 300 mbar (absolute pressure), operation with nitrogen

Model Variations



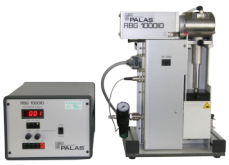
RBG 1000 D
Pressure-resistant version at positive pressure values of up to 3 bar, optional low pressure operation from 300 mbar (absolute pressure)



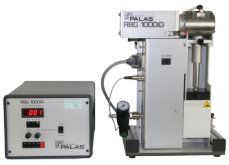
RBG 1000 G
Version for very low feed rates starting at 3 mm/h



RBG 1000 GD
Version for very low feed rates starting at 3 mm/h, pressure-resistant at positive pressure values of up to 3 bar, optional low pressure operation from 300 mbar (absolute pressure)



RBG 1000 I
Version with separate dispersing unit and control unit



RBG 1000 ID
Version with seperate dispersing unit and control unit, pressure-resistant up to 3 bar overpressure, optional vacuum operation from 300 mbar (absolute pressure)



RBG 1000 IGD
Version with separate dispersing unit and control unit, pressure-resistant at positive pressure values of up to 3 bar, optional low pressure operation from 300 mbar (absolute pressure)



RBG 1000 ISD
Separate dispersion and control unit, pressure resistant at overpressure values up to 3 bar, optional low pressure operation from 300 mbar (absolute pressure), nitrogen as dispersion gas as well



RBG 1000 L
Version with removable and weighable dispersing unit



RBG 1000 SD
Pressure-resistant version at positive pressure values of up to 3 bar, optional low pressure operation from 300 mbar (absolute pressure), also nitrogen as a dispersing gas

OPERATION PRINCIPLE

PROVEN TECHNOLOGY

The powder to be dispersed is put little by little into the cylindrical solid material reservoir and compressed with a tamper. In the context of the validation of the guideline "Prüfverfahren für mobile Raumluftreinigungsgeräte" at the Lucerne University of Applied Sciences and Arts, an excellent reproducibility of the tamping density in the solid material reservoir was determined. The deviation of the tamping densities of five fillings was just 3.4 %.

The filled solid material reservoir is inserted into the dispersing head of the RBG, and the powder, which has thus been uniformly compressed across the filling level, is 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 entire material delivered can optionally be determined gravimetrically with the RBG 1000 L.

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

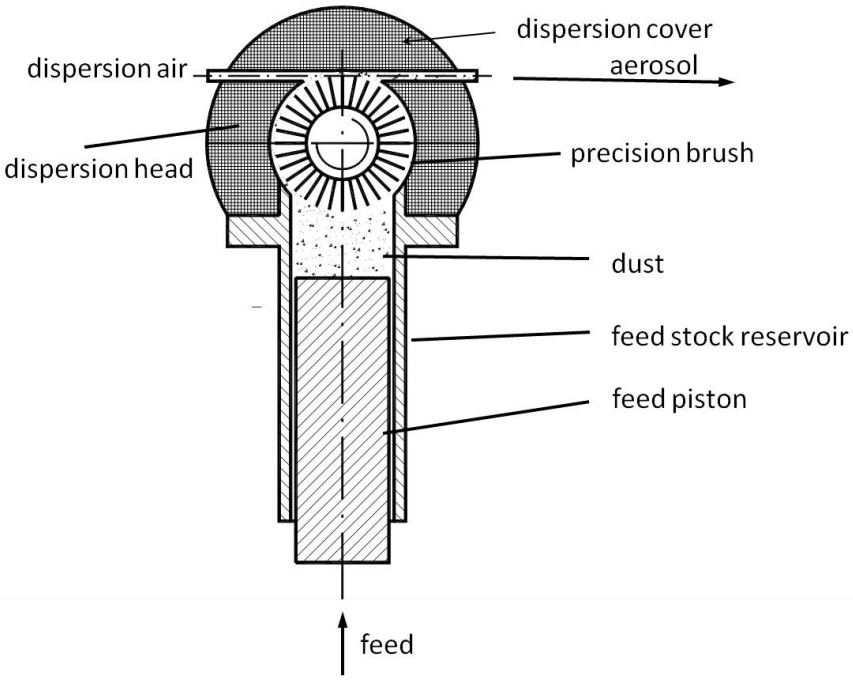


Fig. 1: Schematic diagram of RBG system

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 700 mm/h
7 mm (RBG 1000)	2.7 g	38 mg/h	380 mg/h	3.8 g/h	26.6 g/h
10 mm (RBG 1000)	5.5 g	78 mg/h	780 mg/h	7.8 g/h	54.6 g/h
14 mm (RBG 1000)	17 g	150 mg/h	1.5 g/h	15 g/h	105 g/h
16 mm (RBG 2000)	30 g	200 mg/h	2 g/h	20 g/h	140 g/h
20 mm (RBG 1000)	35 g	310 mg/h	3.1 g/h	31 g/h	217 g/h
28 mm (RBG 1000)	49.2 g	616 mg/h	6.16 g/h	61.6 g/h	430 g/h
32 mm (RBG 2000)	88 g	800 mg/h	8 g/h	80 g/h	560 g/h

Table 2: Mass flows of RBG 1000 / 2000 (compacted density 1 g/cm³)

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

The filling height of the solid material reservoir is 70 mm.

The powder separated from the reservoir by the precision brush is almost wholly dispersed into the constituent particles, down to < 100 nm (see Fig. 2), in the dispersing head by the dispersing air flowing at high speed.

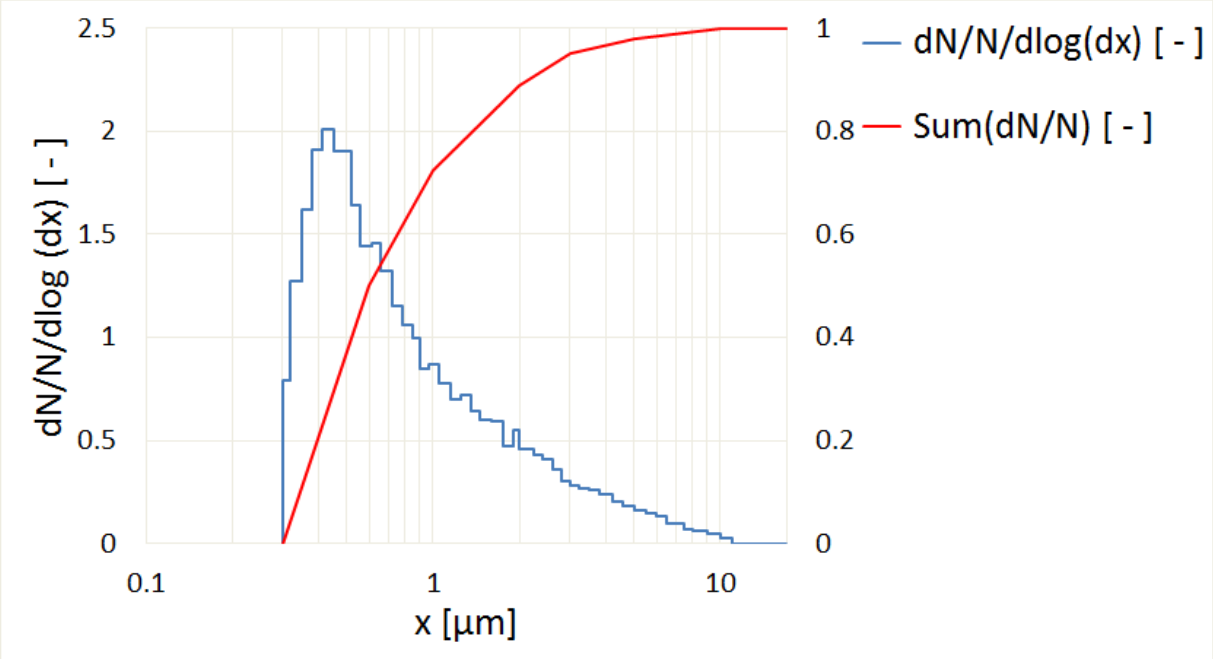


Fig. 2: Particle size distribution with the welas® digital 2000



Fig. 3: Dispersing covers, type A, Type B and Type C

Four different dispersing covers can be used for optimal dispersion (see Fig. 3, additional details under ”Accessories”).

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

Table 2: Dispersion covers

System	Feed rate mm/h	Reservoir diameter in mm	Reservoir length in mm	Min. mass flow	Max. mass flow
RBG 1000	700	7 - 28	70	3.8 g/h	430 g/h
RBG 1000 D	700	7 - 20	70	3.8 g/h	219 g/h
RBG 1000 G	300	7 - 28	70	3.8 g/h	184 g/h
RBG 1000 GD	300	7 - 20	70	3.8 g/h	94 g/h
RBG 1000 L	700	10, 14	70	3.8 g/h	107 g/h
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		

Table 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 via remote control or computer.

Benefits

- Highest short-term and long-term dosing constancy
- Disperses virtually all non-cohesive dusts
- Easy exchange of different solid material reservoirs and dispersing covers
- Easy determination and adjustment of the mass flow
- Pulse mode
- Device easy to clean
- Quick and easy to operate
- Reliable operation
- Little maintenance required
- Reduces your operating expenses

DATASHEET

Particle size range	0.1 – 100 μm
Maximum particle number concentration	Ca. 10^7 particles/cm^3
Volume flow	0.5 – 5.0 m^3/h
Mass flow (particles)	0.04 – 430 g/h (with an assumed compacted density of 1 g/cm^3)
Filling height	70 mm
Filling quantity	2.7 g (reservoir Ø = 7 mm), 5.5 g (reservoir Ø = 10 mm), 10.8 g (reservoir Ø = 14 mm), 22 g (reservoir Ø = 20 mm), 43 g (reservoir Ø = 28 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	7, 10, 14, 20, 28 mm
Aerosol outlet connection	Dispersion cover type A: $Ø_{inside}$= 5 mm, $Ø_{outside}$ = 8 mmDispersion cover type B: $Ø_{inside}$= 3.6 mm, $Ø_{outside}$ = 6 mmDispersion cover type: $Ø_{inside}$= 2.5 mm, $Ø_{outside}$ = 6 mm
Dispersion lid	Type A, type B, type C, type D
Dimensions	465 • 320 • 200 mm (H • W • D)
Weight	Approx. 19 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/rbg1000