RBG 2000

Generation of test aerosols from powders, pollen, and spores, mass flow approx. 200 mg/h - 560 g/h

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

RBG 2000

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 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 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.

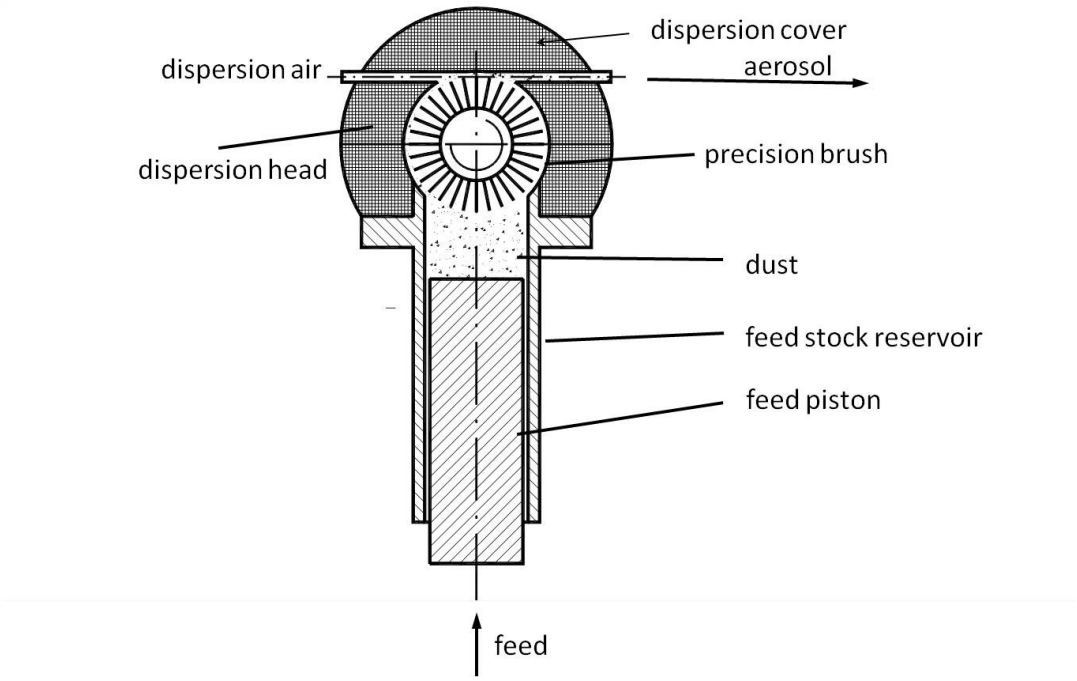

Fig. 1: RBG system schematic diagram **Dosing** Dosing is performed based on a precisely controlled feed rate on the feed piston. The desired mass flows are able to be easily and reproducibly defined based on the cross section of the reservoir, the precisely adjustable feed rate of the feed piston, and the compacted density of the powder in the reservoir.

RBG 2000

RBG 1000				
Reservoir Ø	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/cm^3) **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).

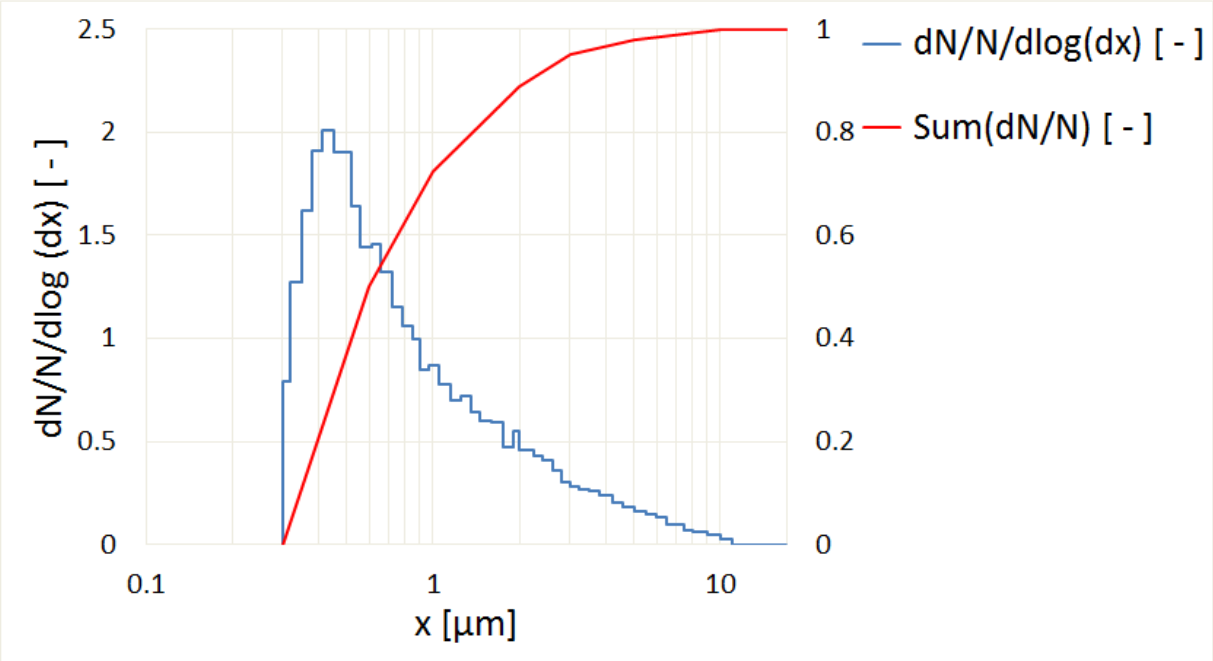

Fig. 2: Particle size distribution with welas® digital 2000

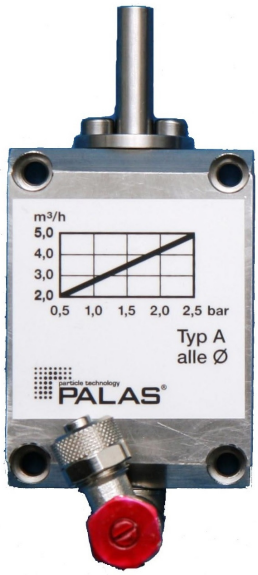

Fig. 3: Type A dispersing cover Two different dispersing covers can be used for optimal dispersion (see Fig. 3, additional details under "Accessories"), including: Type A and type D.

	Particle size	Reservoir Ø	Volume flows
Cover A	<0,1–100 µm	7-32 mm	2–5 m³/h
Cover B	<0,1–100 µm	7, 10 and 14 mm	1–2.5 m³/h
Cover C	<0.1–100 µm	7 mm	0.5–1.2 m³/h
Cover D	200–1000 µm	7-32 mm	2–5 m³/h

Table 2: Dispersion covers

RBG 2000

	Feed rate mm/h	Reservoir Ø mm	Reservoir length 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

Table 3: Different versions of the RBG system I = version for inhalation= pressure-resistant= low feed rate= easily removable and weighable dosing unit= nitrogen version **Pulse mode** 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.

RBG 2000

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

RBG 2000

Datasheet

Parameter	*Description*
Volume flow	2.5 – 5.0 m^3/h
Power supply	115/230 V, 50 – 60 Hz
Dimensions	1,160 • 530 • 500 mm (H • W • D)
Weight	approx. 40 kg
Particle material	Non-cohesive powders and bulks
Dosing time	Several hours nonstop
Maximum particle number concentration	ca. 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 bar
Feed rate	5 – 700 mm/h
Reservoir diameter	16, 20, 28, 32 mm
Maximum counter pressure	200 $mbar_g$
Reservoir length	180 mm
dispersion cover	Type A, type D
Compressed air connection	Quick coupling
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
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)

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

Palas GmbH
Partikel- und Lasermesstechnik
Greschbachstrasse 3 b
76229 Karlsruhe
Germany

Managing Partner:
Dr.-Ing. Maximilian Weiß
Commercial Register:
register court: Mannheim
company registration number: HRB 103813
USt-Id: DE143585902

Contact: E-Mail: mail@palas.de Internet: www.palas.de Tel: +49 (0)721 96213-0 Fax: +49 (0)721 96213-33