



SAG 410 Solid Aerosol Generator

The SAG 410 is a general-purpose dry powder disperser that may be used for a variety of applications in aerosol and powder science, industrial processes and quality assurance tasks.

Principle

The technique for the dispersion of dry dust and powders comprises two steps, viz. the continuous supply of material to the disperser and the dispersal of the material as an aerosol.

A proven method for metering powder to the disperser is to use a moving toothed belt whereby the well defined spaces between the teeth ensure a constant and reproducible supply of powder, even at low feed rates. The resulting particle concentration of the output aerosol can easily be adjusted over a wide range by changing the speed of the feed belt.

The powder is removed from the belt by an ejector nozzle (similar to the type specified in DIN ISO 5011) and the shear forces created in the ejector nozzle disperse and deagglomerate the powder to form an aerosol.

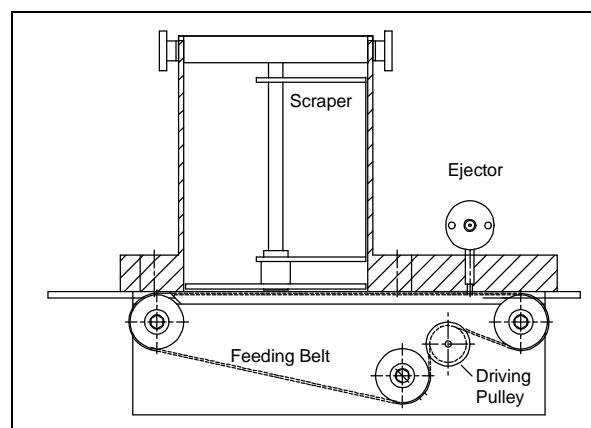
A specially designed scraper ensures an even filling of the belt spaces and minimises the influence of the powder level in the reservoir.

Applications

- Inhalation and toxicology studies
- Determination filter efficiencies
- Aerosol research
- Optimization of combustion processes
- Flow visualisation, LDV and PIV applications
- Mixing and coating processes
- Performance, evaluation and calibration of dust samplers and monitors

Special Features

- Constant and reproducible feed rate over a wide range – suitable for wide range of applications.
- Refillable during operation – ideal for long term studies.
- High concentration even at small flow rates – speeds up testing in low flow applications.
- Easy to strip down and clean – permits quick change between aerosol materials
- Optional remote control unit for manual or computer control – Allows the generator to be isolated from the operator.

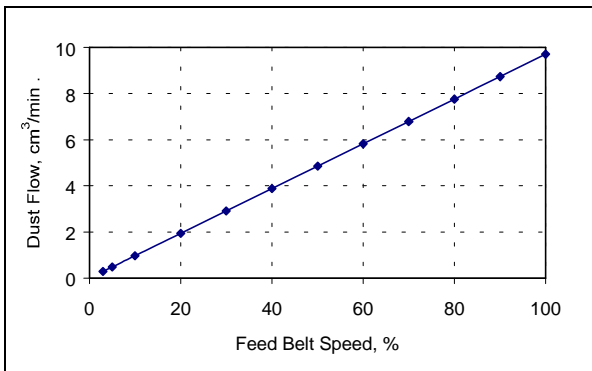


Schematic of the SAG 410 Solid Aerosol Generator

Calibration and Specifications

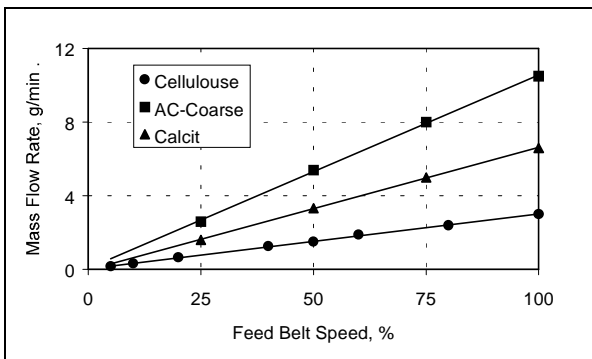
Calibration

The user can adjust the required volumetric flow rate of dust by controlling the speed of the feed belt. The following diagram shows the volumetric flow vs. the feed belt speed.



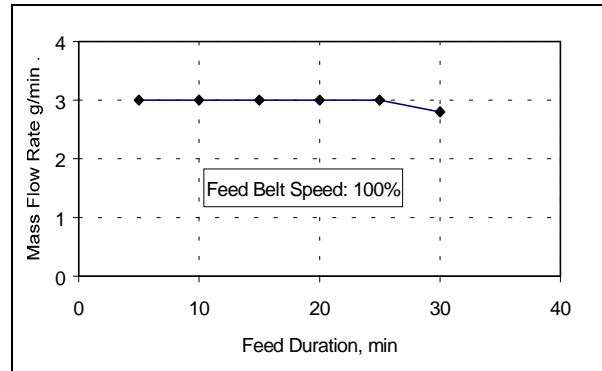
Volumetric Dust Flow Rate vs. Feed Belt Speed

The mass flow rate of the solid material depends on its bulk density. It can be easily determined by measuring the mass of material that is fed over a specific time interval for various belt speeds. The following diagram shows an example for such a calibration.



Mass Flow Rate vs. Feed Belt Speed - Determined for Different Powders

The design of the SAG 410 ensures a highly accurate and constant metering of the powder that is nearly independent of the powder level in the reservoir. The powder reservoir can be refilled during operation without any effect on the aerosol concentration. By refilling the reservoir regularly, a continuous operation with a constant output can be achieved over long periods. The required volumetric flow rate can be set by adjustment of the belt feed speed.



Constant Mass Flow With Changing Powder Level in Reservoir (Last Value Corresponds to Minimum Powder Level)

Specifications

| | |
|--|---|
| Particle type | Non-sticky dry powders |
| Powder reservoir | 0.32m ³ (approx. 220g ^{*)}) |
| Nonstop operation | 1 ... 50h ^{**)} |
| Feeding range ^{*)} | 3 ... 640g/h (SAG 410) 50 ... 4000g/h (SAG 410/H) |
| Aerosol flow rate | 0.5 ... 2.5m ³ /h (SAG 410) 5 ... 20 m ³ /h (SAG 410/H) |
| Particle concentrations ^{**)} | 1.2 ... 1200g/m ³ (SAG 410) 2.5 ... 800g/m ³ (SAG 410/H) |
| Power supply | 90 ... 260VAC |
| Size | 320 x 400 x 200mm |
| Weight | 9.5kg (20lb) |

^{*)} depends on bulk density

^{**)} depends on belt speed