Solid Aerosol Generator
SAG 410

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. The technique for the dispersion of dry dust and powders comprises two steps, 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. The well defined spaces between the teeth ensure a constant and reproducible supply of powder, even at low feed rates. The 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 DIN ISO 5011).

A specially designed scraper ensures even filling of the belt spaces and minimises the influence of the powder level in the reservoir on aerosol mass flow.

Applications
- Filter efficiency measurement
- Aerosol research
- Inhalation and toxicology studies
- Optimization of combustion processes
- Flow visualisation, LDV and PIV applications
- Mixing and coating processes
- Performance, evaluation and calibration of dust samplers and monitors

Main Advantages
- Constant and reproducible feed rate over a wide range – suitable for many applications
- Highly accurate and constant metering of the powder that is nearly independent of the powder level in the reservoir
- Refillable during operation without any effect on the aerosol concentration – ideal for long term studies
- High concentration even at small flow rates – speeds up testing in low flow applications
- Easy to clean and change material
- Interchangeable dispersing units allow a single instrument to have an output range from 1…6000 g/hour
- Remote control units for both manual or computer control are available

Principle

Schematic of the SAG 410 Dispersing Unit
Specifications

Calibration
The specific mass output of the SAG is easily determined. The user can adjust the required volumetric flow rate of dust by controlling the speed of the feed belt. The following diagram shows volumetric dust flow vs. feeding belt speed.

Volumetric Dust Flow vs. Feeding Belt Speed (Model SAG 410)

The mass flow rate of the solid material depends on its bulk density. Bulk density can be easily determined by measuring the mass of material fed over a specific time at various belt speeds. The following diagram shows examples for such a calibration. Once this calibration is determined the user can easily adjust the SAG to a desired mass output.

Mass Flow Rate vs. Feeding Belt Speed determined for different powders (Model SAG 410)

Specifications

Particle type: non-sticky dry powders
Powder reservoir: 400 cm³ SAG 410
400 cm³ SAG 410/L
1420 cm³ SAG 410/H
Operation time without refilling: 0.8 ... 44 h (SAG 410)
Compressed air supply: max. 6 bar / 600 kPa
Power supply: 100 ... 260 V AC
Dimensions: 320 x 400 x 320 mm
Weight: 12 kg

Feeding Range
Three models of the SAG 410 with different dosing ranges are available. The following table summarizes individual model performance:

<table>
<thead>
<tr>
<th>SAG Model</th>
<th>410/L</th>
<th>410</th>
<th>410/H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powder volume flow, cm³/h</td>
<td>2...260</td>
<td>9...520</td>
<td>120...6487</td>
</tr>
<tr>
<td>Powder mass flow, g/h *)</td>
<td>2...245</td>
<td>9...490</td>
<td>114...6162</td>
</tr>
<tr>
<td>Aerosol flow rate, m³/h</td>
<td>1...4</td>
<td>1...4</td>
<td>5...20</td>
</tr>
<tr>
<td>Powder concentration, g/m³ *)</td>
<td>0.5...245</td>
<td>2...490</td>
<td>6...1230</td>
</tr>
</tbody>
</table>

*) Depends on bulk density, data in the table: SAE Fine, 0.95 g/cm³

As manufacturers of instruments in the field of particle technology and filter testing Topas GmbH has been certified to comply with the high requirements as specified in DIN EN ISO 9001:2000 (and its predecessors) since 1999.

For more information please visit our website at www.topas-gmbh.de.