

Atomizer Aerosol Generators

Series ATM



ATM 230 (left) and ATM 220 (right) Aerosol Generator



ATM 210 Aerosol Generator (left) and
ATM 226 Aerosol Generator with stainless steel housing (right)

The products of the ATM series are used to generate test aerosols with defined properties (VDI 3491). The technological and design solutions of the ATM ensure a high consistency of particle size distribution and particle concentration. The generated aerosol is highly reproducible.

Quality assurances as well as health and safety aspects require regular testing of filters, the certification of safety cabinets, and testing and validation measurements of clean rooms.

Special Advantages

- Aerosol generators according to guideline VDI 3491
- Long-term stable test-aerosol
- Submicron particle size distribution
- Adjustable particle production
- Individual device solution by use case

Applications

- Filter testing
- Aerosol research, i. e. for inhalation studies, toxicological experiments or for environmental research
- Calibration of measuring instruments
- Flow visualisation
- Cleanroom validation

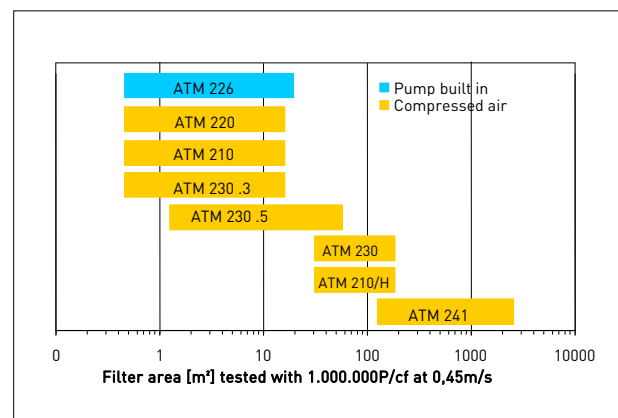


Chart of scanable filter area using various ATM aerosol generators



Specifications



Atomizer Aerosol Generator ATM 220 with Diffusion Dryer suitable for generation of Calibration Aerosols

Device Designs

Depending on the application the individual device models differ in their technical implementation of this operating principle.

The **ATM 220** is powered by compressed air and is therefore particularly suitable for use in the lab or on the filter test stand.

The **ATM 226** has an internal compressor, thus being suitable for mobile use for example for validation measurements in clean rooms. The stainless steel casing can be cleaned very easily.

The **ATM 210** is pressure tight. With this device, mainly compressed air filters are tested under real operating pressure.

The **ATM 230** is also operated with compressed air, but has a ten times higher particle production rate in comparison with the ATM 220.

The devices **ATM 221 and ATM 231** are designed as "Laskin version", which allows a very accurate and reproducible adjustment of the aerosol generation for very low mass flows. Here, the ATM 221 works with a two-substance nozzle in submerged operation, the ATM 231 with a Laskin nozzle.

Applications

The generators of the ATM series generate test aerosols according to VDI guideline 3491, and feature stable and reliable operation. The generators facilitate atomizing various oily liquids, e.g. DEHS, PAO or paraffin oil (Shell Ondina). Alternatively, salt aerosols and latex aerosols (PSL) can be generated.

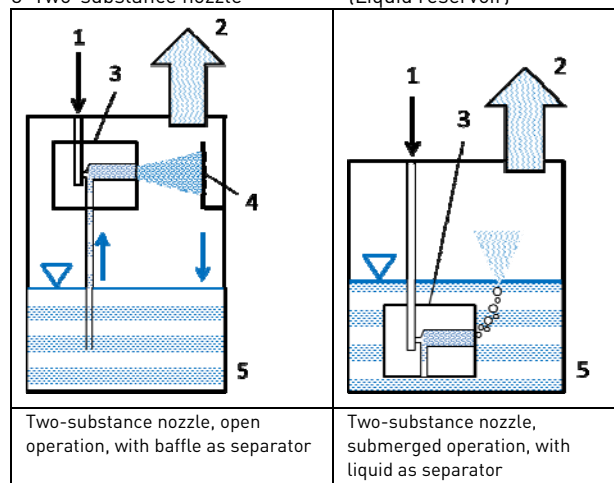
Operating Principle

The essential part of the aerosol generators is a patented atomizer completely made of stainless steel, which has been developed by Topas. It works as a two-substance nozzle based on the injection principle and is combined with a baffle placed close to the spray outlet. This integrated particle impaction section removes coarse spray droplets and results in a submicron particle size distribution. Alternatively, these aerosol generators can be operated in the Laskin mode, meaning the nozzle is dipped into the test liquid. This results in significantly reduced particle production rates at almost unchanged particle size distribution.

Principles of pneumatic atomizers

(Taking into account the VDI 3491-2, preliminary draft 2013)

- | | |
|------------------------------|--------------------|
| 1 Dispersion gas volume flow | 4 Baffle |
| 2 Aerosol | 5 Feed tank |
| 3 Two-substance nozzle | (Liquid reservoir) |



Aerosol Generators for High Particle Production Rates ATM 241



ATM 241 Aerosol Generator

Aerosol Generators for Higher Mass Throughputs

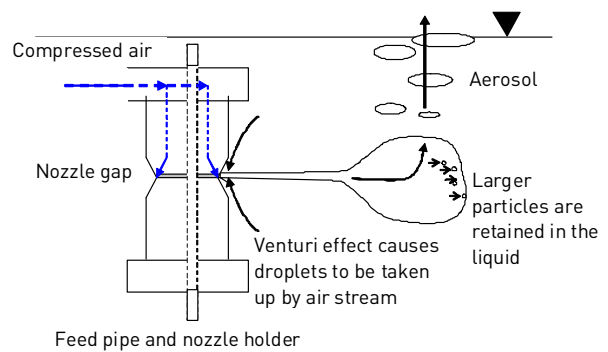
Very high aerosol production rates can be realised with the aerosol generators of the ATM 241 series. The aerosol flow rate of these generators is adjustable by setting the nozzle operation pressure and switching the number of nozzles (1 to 4 nozzles). The big liquid reservoir enables long term operation.

For safety reasons a protection valve is included in each generator.

Operating Principle

For the ATM 241 series, a new nozzle type has been developed (patented).

Compressed air is blown through a thin ring slit into the liquid to be nebulised. Shear forces acting between air jet and the liquid at the circumference of this so-called ring slit nozzle form the droplet aerosol. The resulting aerosol stream is fed directly into the aerosol liquid (Laskin-mode). Inertial effects prevent big droplets from leaving the liquid.



Principle of slit nozzle of ATM 241

More than 10 hours of nonstop operating time is provided by the huge liquid reservoir. The atomizers are made of materials that are resistant against corrosive liquids.

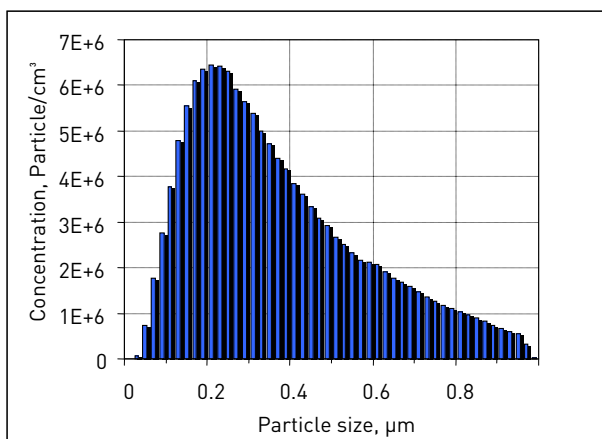
The liquid level can easily be checked at the indicator outside the generator or at a dipstick.



Specifications

	210	210/H	220	221	226	230	231	241
Compressed air supply	max. 1500 kPa (15 bar)		max. 800 kPa (8 bar)	max. 250 kPa (2.5 bar)	Built-in Compressor	max. 800 kPa (8 bar)	max. 250 kPa (2.5 bar)	max. 800 kPa (8 bar)
Counter-pressure	10 bar	10 bar	200 mbar	200 mbar	200 mbar	200 mbar	200 mbar	200 mbar
Filling volume			10...80 ml			0.1... 0.5 l	0.1... 0.5 l	4.7... 8.0 l
Flow rate	50... 250 l/h	500... 2500 l/h	50... 250 l/h	50... 140 l/h	70... 300 l/h	500... 2500 l/h	800... 1700 l/h	max. 40000 l/h (40 m ³ /h)
Mass flow	max. 2.0 g/h	max. 20 g/h	max. 2.0 g/h	max. 0.6 g/h	max. 2.5 g/h	max. 20 g/h	max. 3.5 g/h	max. 240 g/h
Aerosol materials	DEHS, PAO (Emery 3004), DOP ¹⁾ , salt solutions (not for ATM 210 and ATM 210/H), paraffin oil, PSL etc.							

¹⁾In the Globally Harmonised System (GHS), DOP is classified as a hazardous substance. DEHS or PAO are recommended as a replacement for DOP.



Particle size distribution of a DEHS aerosol measured by the Scanning Mobility Particle Sizer system in the size range 0.15 µm to 1 µm.

QMS certified to DIN EN ISO 9001



12 100 11908 TMS

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

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