



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



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

Applications

Many applications require a test aerosol that is reproducible with a stable and adjustable particle size and a defined particle size distribution. Some typical examples of these applications are described in the following

Aerosol Research

Atomizer aerosol generators are used in various fields of aerosol science, for example for

- Inhalation studies
- Toxicology experiments
- Environment characterization

Stream Visualization

Atomizer aerosol generators are used for stream visualization. Here the user wants to seed the measuring zone with particles of known size and material in order to optically measure stream velocity and profile.

Calibration of Measuring Instruments

The droplet size and output concentration of ATM aerosol generators makes them suitable for dispersing PSL size standards for instrument calibration (particle sizers, optical particle counters and photometers).

Filter Testing

Product quality assurance and safety aspects require regular testing of high-efficiency filters, certification of laminar air flow boxes and clean room measurements in general.

For this purpose a suitable test aerosol needs to be generated as atmospheric aerosols or ambient air do not have stable particle size or concentration. VDI-guideline 3491 suggests using aerosol generators to produce test aerosols in a definite manner. Aerosol generators producing highly concentrated aerosols, whose mean particle size is close to the most penetrating particle size (MPPS) allow leak locations to be found in a quicker time.

Using an oil aerosol material (DEHS, DOP, PAO, Emery 3004) provides long term stability due to the lack of evaporation which can over time alter the size of aerosols generated from a solution with volatile solvent.

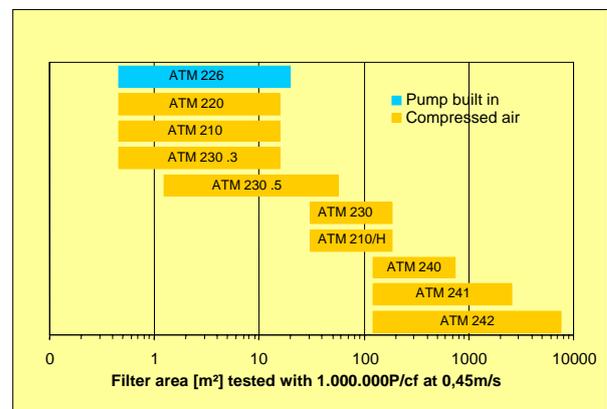
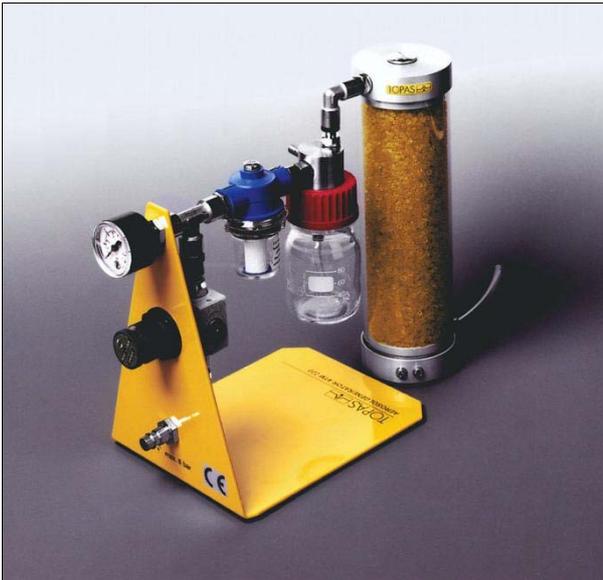


Chart of scanable filter area using various
ATM aerosol generators

Standard Generators ATM 210, 220, 226, 230



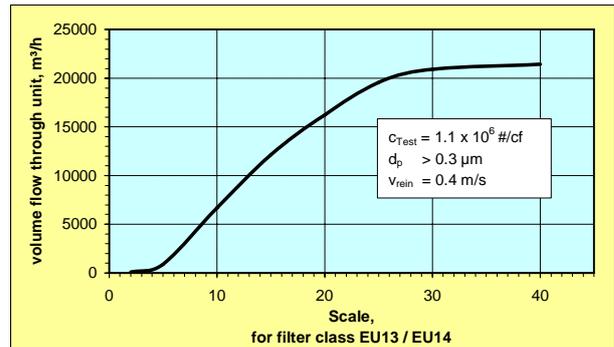
Atomizer Aerosol Generator ATM 220 with Diffusion Dryer suitable for generation of Calibration Aerosols

Features

Compact and robust design characterizes these models. The generators facilitate atomizing various oily liquids, e.g. DEHS, DOP, Emery 3004, salt solutions.

The ATM 220 is designed for use with an external pressurized air supply. At the ATM 226 the required air stream is produced by a built-in air compressor. Power is supplied by the 110...240 VDC mains supply. The instruments feature a smooth surface or stainless steel to permit easy cleaning. Size and weight of these instruments allow mobile use. The flow rate of the generators is easily adjusted by means of a valve, enabling precise control of the particle production rate during operation.

The ATM 210 aerosol generator produces aerosols with known properties in accordance with the VDI 3491 guideline. This special model facilitates generation of aerosols into pressurized vessels (up to 10 bar). All fluid components are certified for pressures up to 20 bar.



Range of volume flow of the ATM 226 Aerosol Generator, needed to check filter classes EU 13 and EU 14

Operation Principle

The essential part of the aerosol generators is a patented atomizer made completely of stainless steel. It works as a two-stream 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 number weighted particle size distribution mainly below 1 μm .

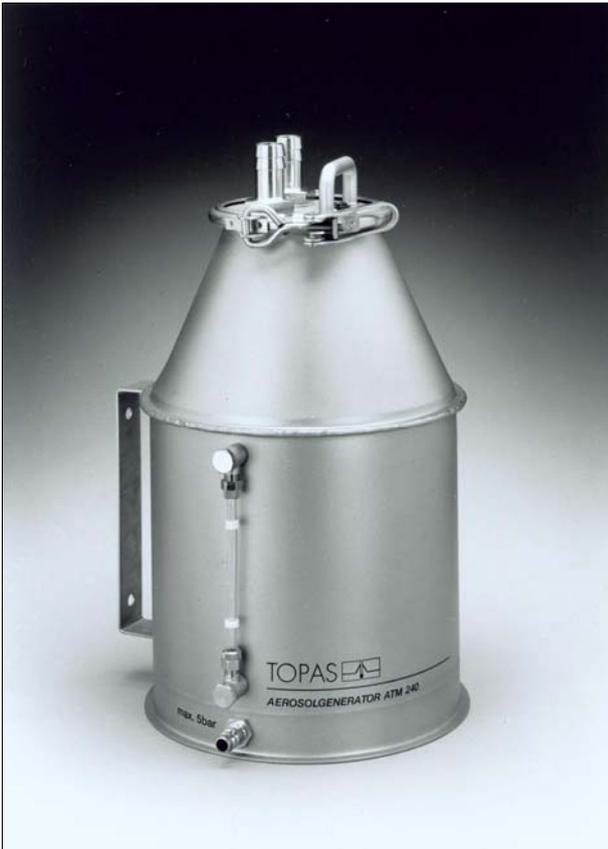


ATM 226 Aerosol Generator

The main application of this atomizer aerosol generator is challenging the integrity of large filter areas. The generated particle size distribution has been found to be close to that of the smaller generators. Particles bigger than 1 μm are removed by a baffle plate.

The ATM 230 works similar to the principle of the ATM 220, but its design allows a 10 times higher particle production rate.

High Particle Production Rates with ATM 240, 241, 242



ATM 240 Aerosol Generator

Aerosol Generators for higher mass throughputs

The highest aerosol production rates can be realised with the ATM 240, ATM 241 and ATM 242. The aerosol flow rates of these generators are adjustable by setting the nozzle operation pressure and switching the number of nozzles (4 nozzles at ATM 241, 12 nozzles at ATM 242), respectively.

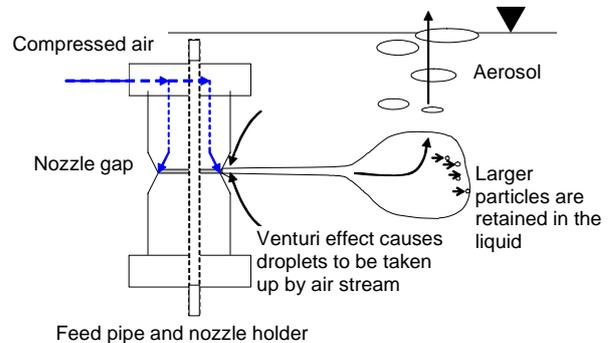
Their big liquid reservoirs enable long term operation.

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

The generators feature very robust designs and are easy to operate and to clean as well.

A New Nozzle Type...

has been developed (patented, P 198 21 552) for the ATM 240, 241 and 242. 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. Inertial effects prevent big droplets from leaving the liquid.



Principle of slit nozzle of ATM 240, ATM 241 and ATM 242

More than 10 hours of nonstop operating time is provided by the huge liquid reservoirs. The atomizers are also constructed 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.



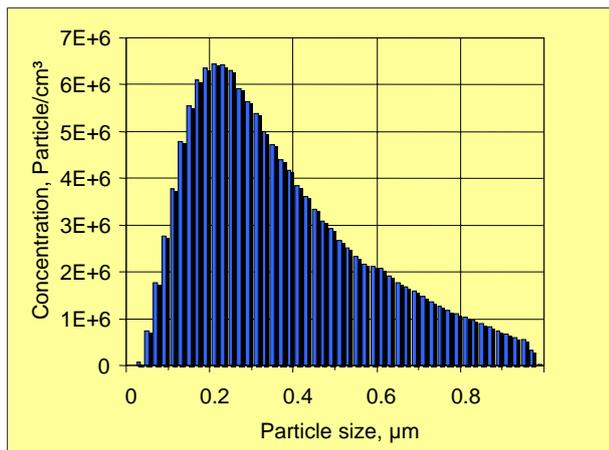
ATM 242, special development for generating tracer particles (Seeding)



ATM 241

Specifications of Atomizer Aerosol Generators

	210	210/H	220	226	230	240	241	242
Compressed air supply	Max. 1500 kPa (15 bar)		Max. 800 kPa (8 bar)	Built-in Compressor	Max. 800 kPa (8 bar)	Max. 800 kPa (8 bar)	Max. 800 kPa (8 bar)	Max. 800 kPa (8 bar)
Counter-pressure	10 bar	10 bar	200 mbar	200 mbar	200 mbar	12 mbar	12 mbar	600 mbar
Filling volume	10...80 ml				0.1... 0.5 l	1.5... 3.5 l	4.7... 8.0 l	1.5... 3.5 l
Flow rate	50... 250 l/h	500... 2500 l/h	50... 250 l/h	70... 300 l/h	500... 2500 l/h	3000... 10000 l/h (3...10 m ³ /h)	Max. 40000 l/h (40 m ³ /h)	Max. 120000 l/h (120 m ³ /h)
Mass flow	Max. 2.0 g/h	Max. 20 g/h	Max. 2.0 g/h	Max. 2.5 g/h	Max. 20 g/h	Max. 60 g/h	Max. 240 g/h	Max. 720 g/h
Aerosol materials	DEHS, DOP, PAO (Emery 3004), salt solutions, PSL etc							



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

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