



Thermodenuder TDD 590

The Model TDD 590 thermodenuder is designed to remove moisture and volatile particles from an aerosol sample for the subsequent measurement of dry particle size.

There are a lot of industrial applications the particle size distribution of hot gases is interesting for. The specification of many particle size measuring instruments does not allow analysing gas with high temperatures which required a cooling of the sample. When cooling takes place condensation processes will occur and volatile particles can be formed by nucleation. Both processes produce particles or change particle size of solid compounds in the gas by heterogeneous condensation on particle surfaces. So results of particle measurements include a systematic error.

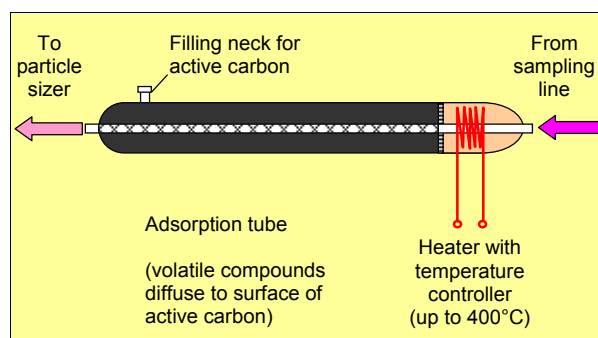
For avoiding such measuring errors thermodenuders are used. By regulating the sample temperature such devices enable reducing moisture as well as volatile particles in the sample aerosol flow. Thus condensation processes during cooling down are widely prevented.

### Special Advantages

- Exact temperature control up to 400°C
- High efficiency by high residence time and by high temperature
- Long operating life of the activated carbon by large storage capacity
- Manufactured with inert material
- Usable as flexible laboratory equipment and as system element

### Applications

- Particle measurements in hot exhaust gases
- Separation of vaporous phases off hot aerosols
- Removing volatile particles and precursors from aerosol sample
- Aerosol research
- Emissions from direct heating boilers
- Biomass burning



Principle of Thermodenuder TDD 590

## Specifications

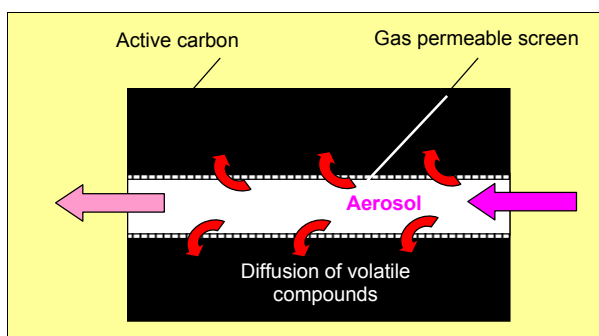
### Details

Active carbon surrounding the flowpath of the particle-gas mixture removes the volatile compounds using the physical effect of adsorption. According to the adjusted temperature, specific components were extracted from the aerosol gas. The size distribution of particles in the aerosol is not influenced.

The hot aerosol or exhaust gas containing particles is directed into the thermodenuder where it is heated to a pre-set temperature. A built-in microprocessor controller displaying actual and set values is used to achieve precise adjustment of the temperature. The temperature can be varied easily with three or four touch keys at the temperature controller.

Volatile particles completely evaporate in the heating section. Hereby volatile particles are defined as particles evaporating during the residence time inside the thermodenuder at the pre-set temperature. Adsorbents in the aerosol diffuse to the surface of the active carbon due to the different concentration of the adsorbents between the volume with carbon and the gas.

As a result only solid particles are left in the aerosol. The TDD 590 thermodenuder operates with minimal loss as the particles never come in direct contact with the active carbon.



Diffusion process of volatile particles of an aerosol to the activated carbon

### Technical Data

Flow rate	0.1 ... 3 l/min
Temperature range	0 ... 400°C
Temperature controller	WIKA MCS-100
Volume of activated carbon	6 l
Materials	glass, stainless steel
Sampling connector	6 mm Swagelok
Power supply	230 V AC / 50-60 Hz
Dimensions (L x H x D)	1200 x 250 x 200 mm
Weight	11.5 kg

QMS certified to  
DIN EN ISO 9001.



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