

Marple Personal Cascade Impactors, model 290

The Marple 290 Personal Cascade Impactor is designed to be worn by the worker, giving complete and accurate aerodynamic particle size distributions from 0.4 to 21 microns. A final filter collects all aerosol analyte.

Product Detail

Features

- Only multi-jet, multi-stage personal cascade impactor available
- Aerodynamic range of 21 to 0.5 microns with final filter
- Lightweight design
- Useful as a personal or area sampler
- Available in two to eight stages
- Cut points: 21.3 and above, 14.8, 9.8, 6.0, 3.5, 1.55, 0.93, 0.52 and final filter
- A variety of collection substrates available

Operation

Sampled air enters the inlet cowl and accelerates through six radial slots in the first impactor stage. The cowl eliminates ashes and debris from the sampler. Particles larger than the cut-point of the first stage impact on the pre-cut collection substrate. Airstream flows through the narrower slots in the second impactor stage, smaller particles impact on the second collection substrate, and so on. The width of the radial slots are constant for each stage but are smaller for each succeeding stage. Thus, the jet velocity is higher for each succeeding stage, and smaller particles eventually acquire sufficient momentum to impact on one of the collection substrates. After the last impactor stage, remaining fine particles are collected by the built-in 34mm filter.

Procedure

Media selection and handling is ultimately dependent on sample analysis. The most common quantitative technique is gravimetric (mass abundance). Chemical and many other approaches are possible with proper media selection to meet the selected analytical scope. Prior to sampling, collection substrates and back-up filters are weighed and placed in the impactor. The sampling flow rate of the personal sampling pump is nominally set at 2 lpm. The impactor's personal mounting bracket is attached to the lapel or pocket.

After sampling, the substrates and filter are weighed. Weight increase on each substrate is the mass of particles in the size range of that impactor stage. The total weight of particles on all stages and filter is added and the percent particle mass in each size range is calculated. Respirable particle mass fraction is determined from the particle size distribution.

Applications

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Wood dust
Coal dust
Silica dust
Respirable dust sampling
Inhalation toxicology, aerobacteriology
Indoor air pollution
Low cost, multi-point sampling
Aerosol research