Product Detail

(Series 20-800 Mark II)

Our Eight Stage Cascade Impactor is a multi-stage, multi-orifice sampler designed to measure the aerodynamic size distribution and mass concentration levels of solid particulates and liquid aerosols directly. Empirically proven with over 30 years of data, only the flow rate of our Impactor needs to be verified to provide "calibrated performance."

The Thermo Scientific (formerly Andersen) design cascade impactors are made up of classification stages consisting of a series of jets and impaction surfaces. At each stage, an aerosol stream passes through the jets and impacts upon the surface. Particles in the aerosol stream with significant inertia will settle upon the impaction plate. Smaller particles pass as aerosols on to the next jet stage. By designing the following consecutive stages with higher aerosol jet velocities, smaller diameter particles are collected at each subsequent stage giving the cascade affect of separation.

The particle size range collected at each of the eight stages depends on the jet orifice velocity of the specific stage the distance between the orifices and the collection surface, and the collection characteristics of the preceding stage.

The combination of a constant flow rate and successively smaller diameter orifices increase the velocity of sample air as it cascades through the sampler, resulting in the impaction of progressively smaller particles in the succeeding stages. At 1 CFM (28.3 LPM), the particle fractionation ranges from 10.0 to 0.4 micrometer (um) aerodynamic diameters. Particles too small to be impacted on the last collection plate are collected in the backup filter. Typically the final filter utilized is a fiber media.

Pharmaceutical Research, Development and Approvals
The Andersen 20-800 series design is specifically cited within various world *pharmacopoeia* (e.g.,United States Pharmacopoeia Chapter 601 "USP <601>") to characterize metered-dose (MDI) and dry powder-dose inhalers (DPI), nebulizers, nasal sprays and other pulmonary drugs. Non-Viable Cascade Impactors are especially relevant during research, quality assurance and equivalency testing. Various introduction kits are available for these specialized applications (See USP Accessory Parts). The testing of inhalation drugs relates well to the cascade impactor. The size ranges collected are considered inhalable (generally <10 um). Just as the inhalation drugs should consistently arrive within the respiratory system into their target regions, the various stages represent the cut-off sizes when deposition may occur within the lungs.

Features

- Sample wet or dry particulates
- Gravimetric analysis allows reference method precision
- Ease of operation and calibration
- Particle bounce and wall losses virtually eliminated
- High mass collection and high flow rate
- Gravimetric or chemical sample analysis
- Stainless steel, glass, and filter substrates available

Series 20-800 Mark II
The Eight Stage Cascade Impactor utilizes eight jet stages enabling classification of aerosols from 9 micrometers and above to 0.4 micrometers (at 28.3 lpm) and allows airborne particulate to impact upon stainless steel impaction surfaces or a variety of filtration media substrates. A final filter collects all particles smaller than 0.4um. Pre-separators and special jet stages and optional inlets allow the cascade impactor to operate at higher flow rates, specifically 60 lpm and 90 lpm, enabling collection of sub-micron particulate.

Cut Points for the Eight Stage Non-Viable Impactor

Note: Every jet on every stage of the impactor is individually inspected by our exclusive advanced digital video optical comparator. Our **ACIVIS** system (Andersen Cascade Impactor Visual Inspection System) and procedure allows us to document the most jet critical diameters in a graphical report. This permanent record verifies the placement and diameters of each jet to verify initial instrument performance and is a future reference to recertify the impactor. USP <601> for Pharmaceutical applications require this **Stage Mensuration** procedure initially as well as a periodic routine inspection to insure jet opening quality is maintain and optimum performance is received.

Standard Flow Configuration

Operating at 28.3 lpm (um)
Stage 0 = 9.0
Stage 1 = 5.8
Stage 2 = 4.7
Stage 3 = 3.3
Stage 4 = 2.1
Stage 5 = 1.1
Stage 6 = 0.7
Stage 7 = 0.4

60 lpm Flow Rate Configuration Kit Installed

Operating at 60 lpm (um)
Stage -1 = 8.6
Stage -0 = 6.5
Stage 1 = 4.4
Stage 2 = 3.3
Stage 3 = 2.0
Stage 4 = 1.1
Stage 5 = 0.54
Stage 6 = 0.25

90 lpm Flow Rate Configuration Kit installed

Operating at 90 lpm (um)
Stage -2 = 8.0
Stage -1 = 6.5
Stage -0 = 5.2
Stage 1 = 3.5
Stage 2 = 2.6
Stage 3 = 1.7
Stage 4 = 1.0
Stage 5 = 0.43