

Increased Sustainability Via the Use of Abbreviated Impactor Measurements (AIM) for Aerodynamic Particle Size Distribution (APSD) of Oral Pressurised Metered Dose Inhalers (pMDIs).

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Determination of Aerodynamic Particle Size Distribution (APSD) is one of the most significant tests within an inhaler laboratory and the preferred instrument of choice for this test is the multistage full resolution Cascade Impactor (CI). Abbreviated Impactor Measurements (AIM) are a possible alternative with numerous benefits including a reduction in carbon footprint, reducing analysis times and solvent usage.

A key attraction of the AIM approach undertaken here is the simple addition of a filter paper on to an existing stage of a Next Generation Impactor (NGI) to provide product optimised reduced Next Generation Impactor (rNGI) configurations. A combination pMDI containing an ethanol free suspension formulation of Salbutamol Sulphate and Ipratropium Bromide Monohydrate was assessed.

The impactor mass (IM), impactor sized mass (ISM), fine particle mass (FPM) and ratio of large particle mass (LPM) and small particle mass (SPM) were compared for both active pharmaceutical ingredients (APIs) by both the full NGI and rNGI and were shown to be in very close agreement (less than 10% difference), with no statistical difference for all four parameters ($p > 0.05$).

Mass Median Aerodynamic Diameter (MMAD) was also determined for both the full NGI and rNGI and were shown to be in very close agreement (less than 5% difference). For the rNGI, an appropriate size fractionation stage had been chosen to allow this to be determined by interpolation.