

PERFORMANCE OF COMPACT CYCLONES WITH TAPER-SHAPED BODIES

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Cyclones have been widely applied in a variety of industrial sectors for removing or recovering particulate matters (PM). It is due to the low cost of machining, operation and maintenance of cyclones. Extended researches have been performed to investigate the performance of cyclones in various geometrical designs. This poster introduces a new type of cyclones whose bodies are tapered instead of straight in conventional cyclones. The performance of cyclones with three different contraction angles were experimentally evaluated in order to study the effect of contraction angle. It is found that the studied cyclones with tapered bodies could remove particles in smaller sizes than cyclones with cylindrical bodies at the same operational flow rate. The linear correlation between the dimensionless cutoff particle size and annual flow Reynolds number for the studied cyclones was also found in this study. The regression equation of the linear correlation could serve as the guidance for the future design of cyclones in this new type. Because of their compact size, studied cyclones can also be applied as the size-selective inlet for miniaturized aerosol sensors.