

CFD STUDY ON EFFECT OF CONE DIVERGENCE ON THE EFFICIENCY OF CYCLONE SEPARATOR

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ABSTRACT

Cyclone separators are commonly used for separating dispersed solid particles from gas phase. This paper reports, the effect of parameters like inlet velocity on pressure drop and collection efficiency of cyclone separator using a RANS CFD code. Incompressible RANS equations are solved with SST k- ω model for the turbulence modelling. A discrete phase consisting of spherical particles of anthracite dispersed in the fluid –Air are considered for the purpose of analysis of cyclone efficiency. The calculation shows that collector efficiency is poor, for particle size less than 120 μm .

Finally to improve the efficiency, optimization study is carried out considering the diffuser angle and direction of the flow in the divergence section of the flow. Reducing the collector diffuser angle by 4 degree improves the efficiency of the cyclone separator

Key words: Cyclone separator, Incompressible RANS, Diffuser angle