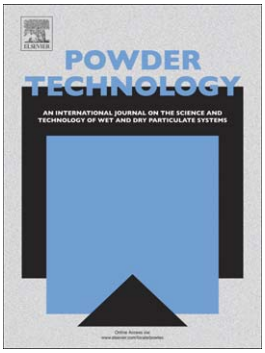

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CFD investigation of gas-solids flow in a new fluidized catalyst cooler

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Abstract: In our previous work, a new concept of annular catalyst cooler (ACC) was proposed and validated experimentally, which showed that an internal circulation of solids could be formed by using two gas distributors and both hydrodynamics and heat transfer could be largely improved. The current work simulated detailed hydrodynamics of gas-solids flow to advance our understanding of the ACC by using the two-fluid model. The influences of effective particle diameter d_p^* and specularity coefficient φ were examined and compared with experimental data. Optimum values of d_p^*=170 μm and φ=0.3 were determined and used in the simulations. Detailed hydrodynamics of gas-solids flow were then obtained, and the influential parameters were examined. The results showed that the proper selection of the ratio of gas