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NOMENCLATURE

- \ddot{a} particle's acceleration
 c_p specific heat, J/kg K
 d_H hydraulic diameter, m
 h convective heat transfer, W/m²K
 h_k sensible enthalpy, kJ/kg
 k thermal conductivity, W/mK
 L tube length, m
 q heat flux
 Re Reynolds number
 p pressure, Pa
 T temperature, K
 v velocity, m/s
 v_{dr} drift velocity, m/s

Greek symbols

- ϕ volume fraction
 μ dynamics viscosity, kg/ms
 ρ density, kg/m³
 η kinematic viscosity, m²/s

Subscripts

- bf base fluid
 eff effective
 f base fluid
 p particle
 $vol\%$ volume percentage