

EXTERNAL FORCE MODEL: VISCOUS FLUID

This model is used to predict influence of gas/fluid phase on particle motion.

$$Re = \frac{2R_p v_p}{\nu_f}$$

$$C_D = \begin{cases} \frac{17}{Re^{0.6}}, & 10.1 < Re \\ \frac{27}{Re^{0.8}}, & 0.5 < Re < 10.1 \\ \frac{24}{Re}, & Re < 0.5 \end{cases}$$

$$F_D = v_p^2 \cdot \pi \cdot R_p^2 \cdot \frac{\rho_g}{2} \cdot C_D$$

The drag force F_D acting into opposite direction of particle velocity v_p .

Symbol	Description
Re	Reynolds number [-]
ρ_f	Fluid density [kg/m ³]
R_p	Particle radius [m]
v_p	Particle velocity [m]
ν_f	Dynamic viscosity of fluid [m ² /s]