

Reynolds Number

Mechanical Engineering

The ratio that decides whether flow is laminar, turbulent or neither.

$Re = \rho V D \div \mu$ compares inertia with viscosity. The length scale matters.

Case	Laminar	Turbulent
Pipe flow, diameter D	Below about 2300	Above about 4000
Flat plate, distance x	Below 5×10^5	Above 5×10^5
Sphere, diameter D	Below about 1	Above about 1000
Pipe friction factor	$f = 64 \div Re$	Moody chart or Colebrook
Pipe velocity profile	Parabolic	Flat, thin wall layer

Between 2300 and 4000 pipe flow is transitional and will not settle.
Design out of that band.