Pipe Head Losses

Pipe friction, and the fittings too.

Civil Engineering

Head is lost along a pipe by wall friction, and at every fitting by local turbulence.

$$h_f = f\,(L/D)\,v^2/2g \cdot h_m = K\,v^2/2g$$

Double the velocity Both go with v^2.	**Losses rise 4 times**
Halve the diameter Same flow rate.	**Loss rises about 32×**
A 90° bend Per fitting.	**K around 0.3 to 1.0**

THE COMMON MISTAKE

× Counting friction loss only

✓ Add bends, valves and entries

On a short run with many fittings the minor losses can exceed the pipe friction loss, sometimes by a wide margin.

Educational reference. Friction factor depends on Reynolds number and roughness. Use Moody or Colebrook, not a guess.