

# System design

## Sizing pipes



It is possible to calculate an approximate pipe size for a given flow rate using the following formula:

$$d_i = 35.7 \sqrt{\frac{Q}{v}}$$

where

v = Flow velocity (m/s)

d<sub>i</sub> = Pipe inside diameter (mm)

Q = Flow rate (l/s)

It is quite common for the flow velocity to be unknown at this stage. The following values are regarded as acceptable liquid velocities for plastic systems:

Suction = 0.5 - 1.0 m/s

Delivery = 1.0 - 3.0 m/s

Example:

What will be a suitable size for a pipe carrying water at a flow rate of 100 litres per second with a flow velocity of 1.5 metres per second?

$$d_i = 35.7 \sqrt{\frac{100}{1.5}}$$

$$d_i = 291 \text{ mm}$$

Therefore the optimum internal diameter should be 291 mm (minimum). Selecting a pipe with an internal diameter smaller than the optimum size will create increased pressure drop.