

Hazen-Williams Equation

ROUGHNESS COEFFICIENT C VALUES FOR HAZEN-WILLIAMS EQUATION

VALUES OF C TYPE OF PIPE	RANGE	NEW PIPE	DESIGN C
PVC	160 - 145	150	150
Polyethylene	150 - 130	140	140
Asbestos-Cement	160 - 140	150	140
Cement-Lined Steel	160 - 140	150	140
Welded Steel	150 - 80	140	100
Riveted Steel	140 - 90	110	100
Concrete	150 - 85	120	100
Cast Iron	150 - 80	130	100
Copper, Brass	150 - 120	140	130
Wood Stave	145 - 110	120	110
Vitrified Clay		110	100
Corrugated Steel		60	60

Above values of C for use with Hazen-Williams Equation, friction head losses in feet per foot of pipe length for fresh water at 50 degrees Fahrenheit.

$$H_f = \frac{4.55}{C^{1.852}} \times \frac{Q^{1.852}}{D^{4.871}} \times L$$

- Where H_f = Friction Head Loss in psi
- C = Roughness Coefficient
- Q = Flow Rate (gpm)
- L = Pipe Length (ft)
- D = Pipe Inner Diameter (inches)