

PÉRDIDAS SINGULARES PARA REYNOLDS BAJOS

Para flujos con números de Reynolds bajos, Hooper (1992) propone utilizar un coeficiente de pérdida singular dado por

$$k = \frac{K_1}{Re} + \frac{K_\infty}{1 + 1/D}$$

Donde K_1 y K_∞ corresponden a coeficientes evaluados para $Re = 1$ y número de Reynolds muy grande, respectivamente. Sus valores se presentan en la tabla siguiente. El diámetro D de la tubería debe expresarse en pulgadas.

Fitting	Description	Type	K_1 at $Re = 1$	K_∞ at very high Re
Elbows	90°	Standard R/D = 1, screwed	800	0.40
		Standard R/D = 1, flanged/welded	800	0.25
		Long radius (R/D = 1.5), all types	800	0.20
		Mitered Elbow R/D = 1.5 1 weld 90°	1000	1.15
		2 welds 45°	800	0.35
		3 welds 30°	800	0.30
		4 welds 22.5°	800	0.27
		5 welds 18°	800	0.25
	45°	Standard (R/D = 1.0), all types	500	0.20
		Long radius (R/D = 1.5), all types	500	0.15
		Mitered, 1 weld, 45° angle	500	0.25
		Mitered, 2 welds, 22.5° angle	500	0.15
	180°	Standard R/D = 1, screwed	1000	0.60
		Standard R/D = 1, flanged/welded	1000	0.35
		Long radius (R/D = 1.5), all types	1000	0.30
Tees	Used as elbows	Standard, screwed	500	0.70
		Long radius, screwed	800	0.40
		standard, flanged/welded	800	0.80
	Run-through tee	Stub-in-type branch	1000	1.00
		Screwed	200	0.10
		Flanged or welded	150	0.05
Valves	Gate, ball, plug	Stub-in-type branch	100	0.00
		Full line size, $\beta = 1$	300	0.10
		Reduced trim, $\beta = 0.9$	500	0.15
		Reduced trim, $\beta = 0.85$	1000	0.25
	Globe	Standard	1500	4.00
	Globe	Angle or Y-type	1000	2.00
	Diaphragm	Dam type	1000	2.00
	Butterfly		800	0.25
	Check	Lift	2000	10.0
		Swing	1500	1.50
		Tilting check	1000	0.50

*Use R/D = 1.5 values for R/D = 5 pipe bends, 45° to 180°. Use appropriate tee values for flow-through crosses.