1 a pipe, vis-10.16 shows than at secminor loss

(10.42)

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etup shown lated using ge in piezo-

(10.43)

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w is develind in fully Fig. 10.17, nverge and coefficient for the abrupt inlet is $K_e = 0.5$. This value is found in Table 10.5 using the row labeled "pipe entrance" and the criteria of r/d = 0.0. Other values of head loss are summarized in Table 10.5.

TABLE 10.5 Loss Coefficients for Various Transitions and Fittings

Description	Sketch	### Additional Data ### 0.0 0.1 >0.2		K K _e 0.50 0.12 0.03	Source (10) [†]
Pipe entrance $h_L = K_e V^2 / 2g$	$\frac{1}{\sqrt{\frac{V}{V}}}$				
Contraction $h_L = K_C V_2^2 / 2g$	D_2 V_2 D_1 θ	D_2/D_1 0.00 0.20 0.40 0.60 0.80 0.90	K_C $\theta = 60^{\circ}$ 0.08 0.08 0.07 0.06 0.06	K_C $\theta = 180^{\circ}$ 0.50 0.49 0.42 0.27 0.20 0.10	(10)
Expansion $h_L = K_E V_1^2 / 2g$	V_1 V_1 V_2 V_1 V_2 V_3 V_4 V_4 V_5 V_5 V_5 V_5 V_5 V_7 V_8	D_1/D_2 0.00 0.20 0.40 0.60 0.80	K_E $\theta = 20^{\circ}$ 0.30 0.25 0.15 0.10	K_E $\theta = 180^{\circ}$ 1.00 0.87 0.70 0.41 0.15	(9)
90° miter bend	Vanes	Without vanes	$K_b = 1.1$		(15)
90° smooth bend		With vanes r/d 1 2 4 6 8 10	$K_b = 0.35$ 0.19 0.16 0.21 0.28 0.32	= 0.2	(15) (16) and (9)
Threaded pipe fittings	Globe valve—wide open Angle valve—wide open Gate valve—wide open Gate valve—half open Return bend Tee	Loekinoo sa in	j esca npa es a S	$K_{\nu} = 10.0$ $K_{\nu} = 5.0$ $K_{\nu} = 0.2$ $K_{\nu} = 5.6$ $K_{b} = 2.2$	(15)
in verfacuniume del desirate alle est ribed del the description	Straight-through flow Side-outlet flow 90° elbow 45° elbow	anta may ga minima atawa garana Kadi	et List (f. 1997) m List (f. 1997) firm Call only in pur limit	$K_t = 0.4$ $K_t = 1.8$ $K_b = 0.9$ $K_b = 0.4$	

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