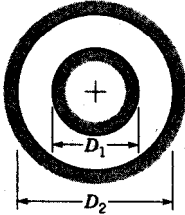
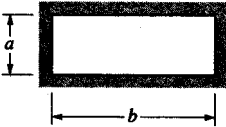


■ TABLE 8.3

Friction Factors for Laminar Flow in Noncircular Ducts (Data from Ref. 18)

Shape	Parameter	$C = fRe_h$
I. Concentric Annulus $D_h = D_2 - D_1$ 	D_1/D_2	
	0.0001	71.8
	0.01	80.1
	0.1	89.4
	0.6	95.6
	1.00	96.0
II. Rectangle $D_h = \frac{2ab}{a + b}$ 	a/b	
	0	96.0
	0.05	89.9
	0.10	84.7
	0.25	72.9
	0.50	62.2
	0.75	57.9
1.00	56.9	

*** Table is for Laminar Flow Only ***