

$$(p_2 - p_1) = (p_2 - p_1)|_{\text{friction}} + (p_2 - p_1)|_{\text{momentum}}$$

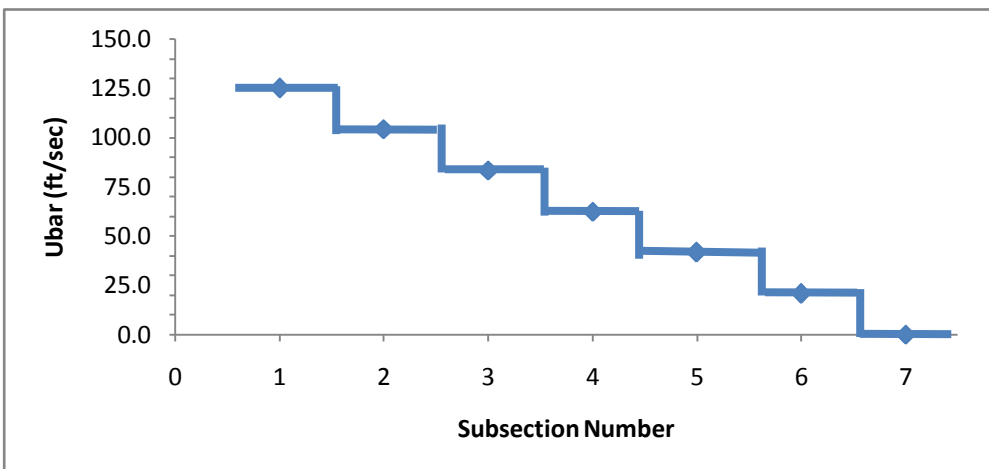
The largest value of $(p_2 - p_1)$ is when $(p_2 - p_1)|_{\text{friction}}$ is neglected

$$\text{Therefore, } (p_2 - p_1)|_{\text{max}} = (p_2 - p_1)|_{\text{momentum}} = (\rho/2)(V_1)^2$$

V1	125 ft/sec	
rho	0.073 lbm/ft^3	4.22454E-05
mu	0.0000123 lbm/ft-sec	0.000001025
1	32.17 lbm-ft/lbf-sec^2	
1 atm	2116.8 lbf/ft^2	
1 atm	408 inH2O	
1 atm	101,325 Pa	

[p2-p1]max	17.7 lbf/ft^2	570.3125
	3.42 inH2O	
	848.6 Pa	

V1	125 ft/sec
rho	0.073 lbm/ft^3
mu	0.0000123 lbm/ft-sec
A pipe	0.0218166 ft^2
A exit	0.0003409 in^2
m* initial	0.1990766 lbm/sec



$$[(p_2 - p_1)_{\text{friction}}] = [(L/D)(1/2)(\rho)(V^{*2})]f$$

$$(1/f) = \{1.8 \log[\text{Re}/(6.9)]\}^{*2}$$

$$\text{Re} = (\rho)VD/(\mu)$$

$$P_2 - P_1 = -(C/A') \left[\int_{x_1}^{x_2} \tau \cdot dx \right] - \frac{\rho}{2} (V_2^2 - V_1^2)$$

Subsection	Begins at	Ends at	Median	Mass Flow	m* (lbm/sec)	Ubar (ft/sec)
1	0	1	0.5	m*	0.199	125.0
2	1	9	5	(5/6)m*	0.166	104.2
3	9	17	13	(4/6)m*	0.133	83.3
4	17	25	21	(3/6)m*	0.100	62.5
5	25	33	29	(2/6)m*	0.066	41.7
6	33	41	37	(1/6)m*	0.033	20.8
7	41	42	41.5	0	0.000	0.0

$$(Ubar)_{\text{subsection}} = [(m^*)_{\text{subsection}}]/[(\rho)(A)]$$

Re	f	P drop (psf)	inH2O	Pa	lbm/ft-sec^2	lbm/in-sec^2
123645	0.0171	0.151	0.029	7.24	4.86	0.40541425
103037.5	0.0177	0.872	0.168	41.76	28.06	2.33856167
82429.99	0.0186	0.585	0.113	28.01	18.82	1.56867282
61822.49	0.0198	0.350	0.068	16.77	11.27	0.93904714
41215	0.0216	0.171	0.033	8.16	5.49	0.45718579
20607.5	0.0256	0.050	0.010	2.41	1.62	0.13495546
0	0	0	0	0	0.00	0

2.18 0.420 104.3 70.1 5.8

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