



Flow Data

This table may be used to determine the pressure loss in hose connected to rock drills and pneumatic tools. It is correct for hose with smooth inside lin-

ing. Hose with rough inside lining may have a friction loss of as much as 50% greater than the figures given in the table.

Air Flow Pressure Loss

		PULSATING FLOW													
		Cubic feet free air per minute passing through 50 foot lengths of hose													
Size of Hose	Gauge pressure	20	30	40	50	60	70	80	90	100	110	120	130	140	150
		Loss of pressure in pounds per square inch – 50 foot hose length													
1/2 in with couplings at each end	50	1.8	5.0	10.1	18.1										
	60	1.3	4.0	8.4	14.8	23.4									
	70	1.0	3.4	7.0	12.4	20.0	28.4								
	80	.9	2.8	6.0	10.8	17.4	25.2	34.6							
	90	.8	2.4	5.4	9.5	14.8	22.0	30.5	41.0						
	100	.7	2.3	4.8	8.4	13.3	19.3	27.2	36.6						
3/4 in with couplings at each end	110	.6	2.0	4.3	7.6	12.0	17.6	24.6	33.3	44.5					
	50	.4	.8	1.5	2.4	3.5	4.4	6.5	8.5	11.4	14.2				
	60	.3	.6	1.2	1.9	2.8	3.8	5.2	6.8	8.6	11.2				
	70	.2	.5	.9	1.5	2.3	3.2	4.2	5.5	7.0	8.8	11.0			
	80	.2	.5	.8	1.3	1.9	2.8	3.6	4.7	5.8	7.2	8.8	10.6		
	90	.2	.4	.7	1.1	1.6	2.3	3.1	4.0	5.0	6.2	7.5	9.0		
1 in with couplings at each end	100	.2	.4	.6	1.0	1.4	2.0	2.7	3.5	4.4	5.4	6.6	7.9	9.4	11.1
	110	.1	.3	.5	.9	1.3	1.8	2.4	3.1	3.9	4.9	5.9	7.1	8.4	9.9
	50	.1	.2	.3	.5	.8	1.1	1.5	2.0	2.6	3.5	4.8	7.0		
	60	.1	.2	.3	.4	.6	.8	1.2	1.5	2.0	2.6	3.3	4.2	5.5	7.2
	70		.1	.2	.4	.5	.7	1.0	1.3	1.6	2.0	2.5	3.1	3.8	4.7
	80		.1	.2	.3	.5	.7	.8	1.1	1.4	1.7	2.0	2.4	2.7	3.5
1 1/4 in with couplings at each end	90		.1	.2	.3	.4	.6	.7	.9	1.2	1.4	1.7	2.0	2.4	2.8
	100		.1	.2	.2	.4	.5	.6	.8	1.0	1.2	1.5	1.8	2.1	2.4
	110		.1	.2	.2	.3	.4	.6	.7	.9	1.1	1.3	1.5	1.8	2.1
	50			.1	.2	.2	.3	.4	.5	.7	1.1				
	60			.1	.2	.2	.3	.3	.5	.6	.8	1.0	1.2	1.5	
	70			.1	.2	.2	.3	.3	.4	.4	.5	.7	.8	1.0	1.3
1 1/2 in with couplings at each end	80				.1	.2	.2	.3	.3	.4	.5	.6	.7	.8	1.0
	90					.1	.2	.2	.3	.3	.4	.5	.6	.7	.8
	100					.1	.2	.2	.3	.3	.4	.4	.5	.6	.7
	110					.1	.2	.2	.3	.3	.3	.4	.5	.5	.6
	50						.1	.2	.2	.2	.3	.3	.4	.5	.6
	60							.1	.2	.2	.2	.3	.3	.4	.5
1 3/4 in with couplings at each end	70							.1	.2	.2	.2	.3	.3	.4	.5
	80								.1	.2	.2	.2	.2	.3	.4
	90									.1	.2	.2	.2	.2	.3
	100										.1	.2	.2	.2	.2
	110											.1	.2	.2	.2
	50												.1	.2	.2

For longer or shorter lengths of hose, the friction loss is proportional to the length, e.g., for 25 ft., half of the above; for 150 ft., three times the above, etc.



Water Flow Pressure Loss (PSI Per 100 Feet Of Hose)

Flow of water in U.S. gal. per min.	Flow of water in cu. feet per sec.	Actual Internal Diameter, Inches								
		½	¾	1	1¼	1½	2	2½	3	
0.5	.001	0.4								
1.5	.003	3.02	1.01	0.42						
2.5	.005	7.75	2.58	1.08						
5	.011	27.8	9.27	3.86	0.95	0.32	0.13			
10	.022	99.5	33.2	13.8	3.38	1.14	0.47	0.12		
15	.033		71.0	29.6	7.25	2.45	1.01	0.25	0.08	
20	.044		121.0	50.3	12.4	4.15	1.71	0.42	0.14	
25	.055			76.5	18.7	6.34	2.60	0.64	0.22	
30	.066			108.0	26.5	8.96	3.68	0.90	0.30	0.13
35	.077			142.0	34.8	11.8	4.83	1.18	0.40	0.17
40	.088				44.7	15.1	6.20	1.52	0.51	0.21
45	.099				55.0	18.6	7.65	1.87	0.63	0.26
50	.110				67.5	22.8	9.35	2.28	0.78	0.32
60	.132				94.3	31.8	13.1	3.19	1.08	0.45
70	.154				126.0	42.5	17.5	4.25	1.44	0.60
80	.176					54.6	22.5	5.48	1.86	0.77
90	.198					67.5	27.8	6.80	2.30	0.95
100	.223					81.5	33.5	8.19	2.78	1.15
125	.278					124.0	50.6	12.4	4.20	1.73
150	.334						72.1	17.6	6.97	2.46
175	.390						94.5	23.1	7.83	3.23
200	.446						122.0	29.6	10.1	4.15
225	.501							36.8	12.5	5.15
250	.557							44.6	15.2	6.28
275	.613							53.3	18.1	7.45
300	.688							62.5	21.2	8.75
325	.724							72.5	24.6	10.2
350	.780							83.2	28.2	11.7
375	.836							94.5	32.1	13.3
400	.891							107.0	36.2	14.9
450	1.00								44.9	18.6
500	1.11								54.5	22.5
600	1.34								76.5	31.6
700	1.56								102.0	42.1
800	1.78								131.0	53.9
900	2.00									66.8
1000	2.23									81.4
1100	2.45									97.0
1200	2.67									114.0
1300	2.90									132.0
1400	3.12									
1500	3.34									
1600	3.56									
1800	4.01									
2000	4.45									

Note: The pressure loss experienced by a liquid flowing through a hose depends on the rate of flow, the viscosity of the liquid, the hose I.D., the smoothness of the tube, and the hose length. This chart shows the relationship

between rate of flow, I.D., and pressure loss for water at 68°F with a viscosity of one centipoise. The pressure is directly proportional to the length of the hose, therefore, the data shown can be easily extended by use of pro-



**Water Flow Pressure Loss (continued)
(PSI Per 100 Feet Of Hose)**

Flow of water in U.S. gal. per min.	Flow of water in cu. feet per sec.	Actual Internal Diameter, Inches						
		4	6	8	10	12	14	16
100	.223	.26						
125	.278	.40						
150	.334	.54						
175	.390	.70	.10					
200	.446	.90	.13					
225	.501	1.08	.16					
250	.557	1.34	.19					
275	.613	1.60	.24					
300	.668	1.84	.28					
325	.724	2.04	.33					
350	.780	2.30	.37					
375	.836	2.80	.44					
400	.891	3.10	.49					
425	.947	3.40	.54					
450	1.00	3.80	.60					
475	1.06	4.25	.70					
500	1.11	4.60	.78	.16				
550	1.22	5.60	.93	.18				
600	1.34	6.60	1.10	.23				
650	1.45	7.60	1.30	.27				
700	1.56	8.60	1.50	.30				
750	1.67	9.60	1.70	.34				
800	1.78	10.80	1.90	.39				
850	1.89	12.00	2.20	.44				
900	2.00		2.40	.49				
950	2.12		2.60	.54				
1000	2.23		2.80	.59	.19			
1100	2.45		3.20	.66	.23			
1200	2.67		3.70	.74	.27			
1300	2.90		4.50	.88	.31			
1400	3.12		5.30	1.10	.35	.15		
1500	3.34		6.20	1.25	.40	.17		
1600	3.56		7.00	1.40	.45	.19		
1800	4.01		8.80	1.80	.54	.24		
2000	4.45		16.50	2.20	.64	.29	.14	
2500	5.57			3.40	.98	.42	.21	
3000	6.68			4.50	1.40	.58	.29	.14
3500	7.80			6.20	1.90	.79	.39	.18
4000	8.91			8.20	2.40	1.00	.50	.23
4500	10.03			10.20	3.00	1.25	.62	.28
5000	11.14				3.80	1.50	.74	.34
6000	13.37				5.20	2.10	1.10	.46
7000	15.60				7.00	2.80	1.40	.62
8000	17.82				9.20	3.70	1.80	.80
9000	20.05				11.50	4.60	2.30	1.00
10000	22.28					5.70	2.80	1.25
12000	26.74					6.70	3.70	1.70
14000	31.19					10.00	5.00	2.40
16000	35.65					13.50	6.80	3.30
18000	40.10						8.80	4.40
20000	44.56						11.00	5.50



Open-End Discharge

The term “open-end discharge” refers to a hose which empties a fluid into the atmosphere. Even though one end is open, the pressure is not low throughout the hose.

The inlet end pressure is equal to that in the line to which the hose is connected unless the flow rate is so low that the hose is not completely filled. The pressure

along the hose length drops from a maximum at the inlet to zero at the outlet and the pressure at any given point along the length is nearly proportional to the distance from the hose inlet.

The following table shows the flow in gallons per minute for various sizes of hoses in open-end discharge service.

Open-End Flow (GPM)

	Pressure at Inlet, psi	Hose Length, feet									Pressure at Inlet, psi	Hose Length, feet								
		25	50	75	100	125	150	200	300			25	50	75	100	125	150	200	300	
1/2" hose	30	10.4	6.2	5.6	4.8	4.3	3.8	3.3	2.6	1"	30	68.0	46.2	37.5	32.0	28.5	25.8	22.0	17.8	
	40	12.1	8.5	6.2	5.6	5.0	4.5	3.8	3.2		40	79.0	54.4	44.0	37.5	33.0	30.0	25.8	20.8	
	50	13.8	9.4	7.5	6.4	5.6	5.1	4.0	3.5		50	89.0	62.0	49.0	42.0	37.5	34.0	29.0	23.3	
	60	15.2	10.4	8.5	7.1	6.2	5.6	4.9	3.8		60	100.0	68.0	54.4	46.2	41.8	37.5	32.0	25.8	
	70	16.6	11.2	9.0	7.8	6.8	6.2	5.3	4.2		70	—	74.0	59.0	51.0	45.0	40.8	37.3	28.0	
	80	18.0	12.1	9.8	8.5	7.3	6.6	5.6	4.5		80	—	79.0	63.0	54.4	48.0	43.0	37.5	30.0	
	90	19.0	13.0	10.4	8.8	7.7	7.1	6.0	4.8		90	—	84.0	68.0	58.0	51.8	46.2	40.0	32.0	
	100	20.1	13.8	11.0	9.4	8.5	7.5	6.4	4.9		100	—	89.0	71.0	62.0	54.4	49.0	42.0	34.0	
	125	22.8	15.5	12.5	10.5	9.4	8.5	7.2	5.8	125	—	101.0	80.0	68.0	62.0	55.8	47.8	38.0		
58" hose	30	18.1	12.5	10.3	8.7	7.7	7.0	6.0	4.9	1 1/4" hose	50	—	110.0	85.0	72.0	56.0	58.0	50.0	42.0	
	40	21.4	14.8	12.5	10.3	9.0	8.3	7.0	5.7		75	—	130.0	110.0	90.0	80.0	73.0	64.0	52.0	
	50	23.9	16.5	13.2	11.4	10.3	9.2	7.9	6.3		100	—	150.0	125.0	110.0	92.0	85.0	73.0	58.0	
	60	26.5	18.1	14.8	12.5	11.2	10.3	8.7	7.0		150	—	—	150.0	130.0	120.0	110.0	90.0	67.0	
	70	27.5	20.0	16.0	13.7	12.0	11.0	10.0	7.6		1 3/8" hose	50	—	140.0	115.0	96.0	85.0	75.0	65.0	54.0
	80	30.6	21.4	16.8	14.8	13.0	11.8	10.3	8.3			75	—	170.0	140.0	125.0	110.0	96.0	84.0	67.0
	90	32.5	22.5	18.1	15.5	14.0	12.5	10.5	8.7			100	—	205.0	160.0	140.0	125.0	110.0	96.0	75.0
	100	34.5	23.9	19.0	16.6	14.8	13.2	11.4	9.2			150	—	—	205.0	170.0	155.0	140.0	125.0	97.0
	125	39.0	27.0	21.5	18.5	16.6	15.0	12.9	10.5											
34" hose	30	31.0	21.3	17.2	14.8	13.0	11.8	10.2	8.2	1 1/2" hose	50	—	180.0	150.0	130.0	120.0	105.0	90.0	74.0	
	40	36.0	25.0	20.0	17.2	15.2	13.8	11.8	9.4		75	—	230.0	180.0	160.0	145.0	130.0	120.0	90.0	
	50	41.0	28.0	22.5	19.2	17.2	15.5	13.2	10.7		100	—	260.0	220.0	180.0	170.0	150.0	130.0	105.0	
	60	45.5	31.0	25.0	21.3	19.0	17.2	14.8	11.8		150	—	—	260.0	230.0	205.0	180.0	160.0	130.0	
	70	49.5	34.0	27.2	23.5	21.0	18.8	17.1	12.8		2" hose	50	—	380.0	310.0	270.0	240.0	210.0	180.0	150.0
	80	53.0	36.0	29.1	25.0	22.0	20.0	17.2	13.8			75	—	480.0	380.0	330.0	290.0	270.0	230.0	180.0
	90	56.2	39.0	31.0	27.0	23.8	21.3	18.2	14.8			100	—	550.0	450.0	380.0	350.0	310.0	260.0	215.0
	100	60.0	41.0	33.0	28.0	25.0	22.6	19.2	15.5			125	—	—	550.0	480.0	425.0	380.0	330.0	265.0
	125	68.0	46.0	37.5	32.0	23.0	25.8	21.8	17.5											



Fluid Velocity vs. Flow Rate

The graph below illustrates the fluid velocity for flow rates up to 10,000 GPM for hose from 1" through 10" I.D.

