

Appendix 2.1

Leak Rates from Holes of Known Sizes

Area of leak square inches	Gallons per minute (gpm)					
	Pressure pounds per square inch (psi)					
	10	20	40	60	80	100
0.005	0.5	0.8	1.1	1.3	1.5	1.7
0.010	1.1	1.5	2.2	2.6	3.1	3.4
0.025	2.7	3.8	5.4	6.6	7.6	8.5
0.050	5.4	7.6	11	13	15	17
0.075	8.1	11	16	20	23	26
0.100	11	15	22	26	31	34
0.200	22	31	43	53	61	68
0.300	32	46	65	79	92	102
0.400	43	61	86	106	122	136
0.500	54	76	108	132	153	171
0.600	65	92	129	159	183	205
0.700	76	107	151	185	214	239
0.800	86	122	173	211	244	273
0.900	97	137	194	238	275	307
1.000	108	153	216	264	305	341
1.100	119	168	237	291	336	375
1.200	129	183	259	317	366	409
1.300	140	198	280	343	397	443
1.400	151	214	302	370	427	478
1.500	162	229	324	396	458	512
1.600	173	244	345	423	488	546
1.700	183	259	367	449	519	580
1.800	194	275	388	476	549	614
1.900	205	290	410	502	580	648
2.000	216	305	431	528	610	682
2.500	270	381	539	661	763	853
3.000	324	458	647	793	915	1,023
4.000	431	610	863	1,057	1,220	1,364

The above table is based on the following formula:

Flow = 2.8 x Area x Square Root of (148 x Pressure)

Flow – gallons per minute (gpm), Area – square inches, Pressure – pounds per square inch (psi)

Example use of Appendix 2.1:

A hole 1/8 inch by 1¼ inch in size at 50 pounds per square inch

First calculate the area:

1/8 inch = 0.125 inches, 1¼ inch = 1.25 inches, Area = 0.125 x 1.25 = 0.156 square inch

From the table, the size that is closest is 0.1 and 0.2 square inches, and the pressure is between 40 and 60 pounds per square inch. The flow rate is going to be about 36 gallons per minute.