SELECTION GUIDE

Central Vacuum System Sizing and Selection Guide

The following tables have been developed to assist in sizing and selection of vacuum systems to meet your needs. To use them, you need to know the number and size of the various stations to be served by the system, the usage factor (i.e. how many are in use at any time as a percent of the total), and the vacuum level required. The examples below show how this data is used to select the proper size system for your application. Note that the third example initially yields an extremely oversized answer and that additional application understanding is required to determine the correct result.

Table 1–CFM Per Station

(1) Vacuum Level			(2) Service Factor									
inHgVac	inHgAbs	Torr	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0.00	29.92	760.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	1.5
5.00	24.92	633.0	0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	1.8
10.00	19.92	506.0	0.2	0.5	0.7	0.9	1.1	1.4	1.6	1.8	2.0	2.3
15.00	14.92	379.0	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0
20.00	9.92	252.0	0.5	0.9	1.4	1.8	2.3	2.7	3.2	3.6	4.1	4.5
25.00	4.92	125.0	0.9	1.8	2.7	3.6	4.6	5.5	6.4	7.3	8.2	9.1
27.50	2.42	61.5	1.9	3.7	5.6	7.4	9.3	11.1	13.0	14.8	16.7	18.5
28.00	1.92	48.8	2.3	4.7	7.0	9.3	11.7	14.0	16.4	18.7	21.0	23.4
29.00	0.92	23.4	4.9	9.8	14.6	19.5	24.4	29.3	34.1	39.0	43.9	48.8
29.50	0.42	10.7	10.7	21.4	32.1	42.7	53.4	64.1	74.8	85.5	96.2	106.9
29.70	0.22	5.6	20.4	40.8	61.2	81.6	102.0	122.4	142.8	163.2	183.6	204.0
29.88	0.04	1.0	122.2	224.4	336.6	448.8	561.0	673.2	785.4	897.6	1,010.0	1,122.0
29.90	0.02	0.5	224.4	448.8	673.2	897.6	1,122.0	1,346.0	1,571.0	1,795.0	2,020.0	2,244.0

Table 2–Fixture Inlet Factor

CONNECTION SIZE	1/8	3/16	1/4	5/16	3/8	7/16	1/2	3/4	7/8	1
FIXTURE INLET FACTOR	0.3	0.6	1.0	2.0	2.3	3.1	4.0	9.0	12.3	16.0

EXAMPLES:

1. Laboratory has 24 vacuum stations, each with a 1/4" connection, and wants 25 inHgVac. Service factor is 50%. Enter Table 1 at (1) Vacuum Level and go down to the row for 25 inHgVac and then across to the (2) Service Factor column for 50%. The CFM required is 4.6 per station. From Table 2, the Fixture Inlet Factor for 1/4" fittings is 1.0. Therefore, the system requirements are:

   24 stations x 4.6 CFM/station x 1.0 factor = 110.4 CFM

2. School has eighteen 3/8" outlets with 70% service needs 27.5 inHgVac.

   18 stations x 13.0 CFM/station x 2.3 factor = 538.2 CFM

3. Meat packer has 4 double chamber machines with 1" connections operating continuously at 1 Torr:

   4 stations x 1,122 CFM/station x 16.0 factor = 71,808 CFM

   This number is extremely large and is wrong. To use the tables, more application understanding must be used. Double chamber machines use vacuum about 80% of the time; the remaining time is spent loading and unloading the chambers. Also, they see 1 Torr at the end of their cycle and atmospheric pressure at the start; the average vacuum is about 15 inHgVac. Therefore, we have:

   4 stations x 2.4 CFM/station x 16.0 factor = 153.6 CFM