

# Building Your Fume Hood Exhaust System

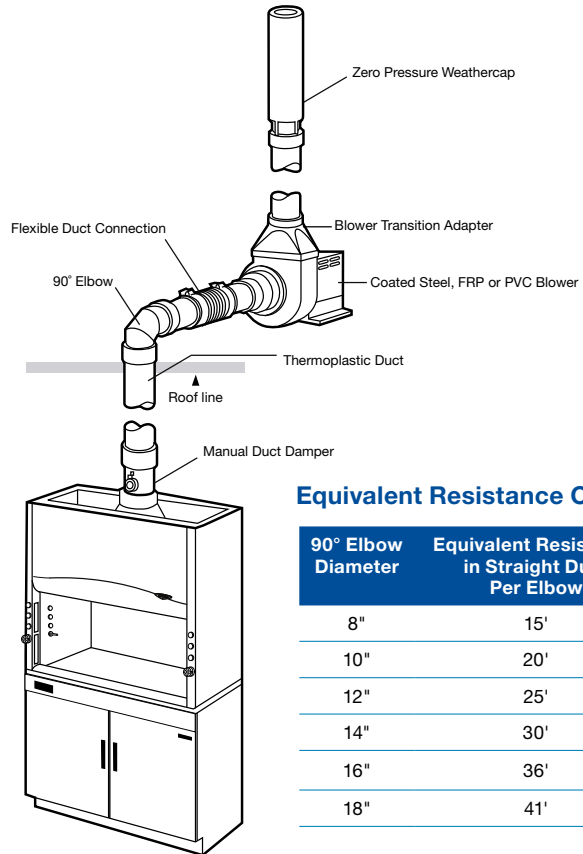
## Size Your Blower

### Option 1: Size on your own

#### How to Size a Fume Hood Exhaust Fan

Use this guide for sizing blowers for Fume Hoods. Enter your information for step-by-step guidance on proper blower sizing.

- Find the required airflow (CFM) and static pressure (inches of water) from the appropriate table in your fume hood's brochure.  
 Hood airflow (CFM) \_\_\_\_\_  
 Hood Static Pressure (inches of water) \_\_\_\_\_
- Add up the total straight lengths of duct in linear feet going from the top of the hood to the termination of the exhaust. Include all vertical and horizontal runs.  
 Total Straight Duct (feet) \_\_\_\_\_
- Determine the number of 90° and 45° elbows in the duct run.  
 Total 90° Elbows \_\_\_\_\_ ; Total 45° Elbows \_\_\_\_\_
- Multiply the number of elbows from step 3 by the equivalent resistance found in the Equivalent Resistance Chart (right). For a 45° elbow, the equivalent resistance is half of the 90° elbow of the same size.  
 90° Elbow (eq. feet) \_\_\_\_\_ + 45° Elbow (eq. feet) \_\_\_\_\_  
 = \_\_\_\_\_ Total Elbow (eq. ft)
- Add the total feet from step 2 to the total feet from step 4 to determine the total equivalent straight length of duct for the system. Be sure to add 5' for the zero pressure weathercap.  
 Total Equivalent Length of duct (feet) \_\_\_\_\_
- Use the Static Pressure Losses for Ductwork table (right) to identify the static pressure loss per foot. (ie. 1000 CFM and 12" duct = 0.0018 inches of water per foot) (You may have to round the CFM from step 1).  
 Static Pressure Loss  
 (inches of water per foot of duct) = \_\_\_\_\_
- Multiply total equivalent length of duct from step 5 by the static pressure loss per foot from step 6 for total duct static pressure.  
 Total Duct Static Pressure (inches of water) = \_\_\_\_\_
- Calculate total system static pressure by adding hood static pressure from step 1 and duct static pressure from step 7.  
 Total system static pressure (inches of water) = \_\_\_\_\_
- Using the total system static pressure from step 8 and the hood CFM from step 1, use the fan curves on pages 10 and 11 to validate blower operation with your system. Hint: The x-axis is the CFM and the y-axis is the static pressure. Be sure the point that your CFM and Static Pressure intersect is within the blower performance range.



#### Equivalent Resistance Chart\*

90° Elbow Diameter	Equivalent Resistance in Straight Duct Per Elbow
8"	15'
10"	20'
12"	25'
14"	30'
16"	36'
18"	41'

#### Static Pressure Losses for Ductwork

Nominal Diameter	6"	8"	10"	12"	16"
	Airflow (CFM)				
Airflow (CFM)	Static Pressure Loss (inches of water per foot of duct)				
250	0.0039	0.0011	0.0003	—	—
500	0.0147	0.0037	0.0013	—	—
750	0.0321	0.0079	0.0026	0.0011	—
1000	0.0557	0.0140	0.0043	0.0018	0.0005
1250	0.0855	0.0210	0.0066	0.0027	0.0008
1500	—	0.0300	0.0095	0.0039	0.0012
1750	—	0.0380	0.0130	0.0053	0.0016
2000	—	—	0.0155	0.0067	0.0020
2500	—	—	0.0245	0.0109	0.0031
3000	—	—	—	0.0145	0.0042
4000	—	—	—	0.0240	0.0074
5000	—	—	—	—	0.0120

### Option 2: Contact Labconco for assistance in sizing your blower.

\* The equivalent resistance chart values are based on elbows with a turning radius of 1.5 times the duct diameter. Elbows with a smaller turning radius should not be used as they incorporate a higher static pressure. Find the equivalent straight feet of the elbows by multiplying the number of elbows by the appropriate value in the equivalent resistance chart.