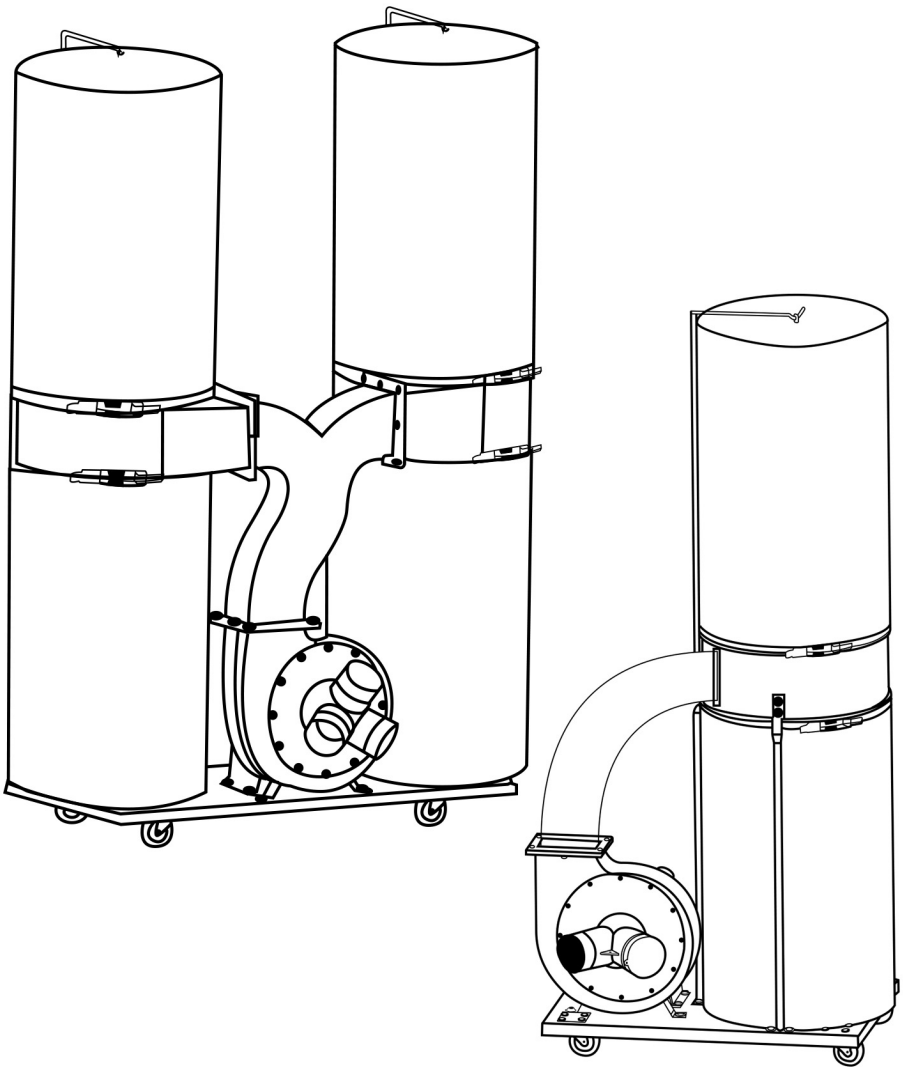
BigHorn Corp.
Quality Tools And Accessories

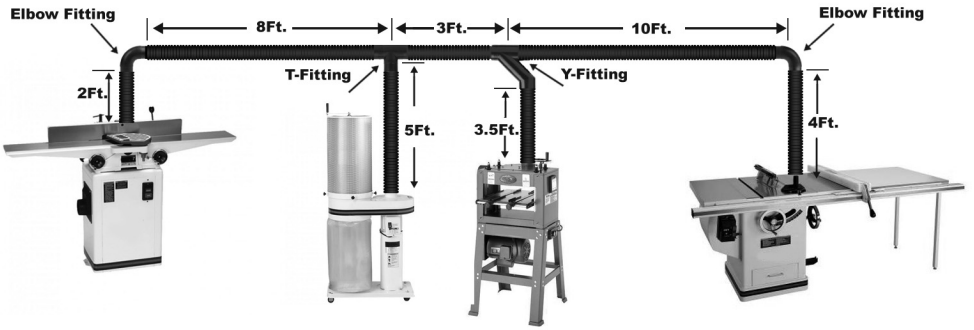
DUST COLLECTION IN THE WOODSHOP

DESIGNING AND INSTALLING AN EFFECTIVE SYSTEM



Before you buy a dust collector, you first need to come up with a framework, decide what number of and what sort of power tools will be associated with the framework, and where they will be in connection to the dust collection system. Once you have designed your framework, with a couple of basic estimations you can figure out what size dust collector best suits your requirements taking CFM (Cubic Feet per Minute of air flow) and Static Pressure Loss into account.

STEP-1 HOW TO LAYOUT YOUR SHOP



The case above illustrates a basic 3 machine format. In laying out your shop, ensure you follow these fundamental rules:

- Place machines requiring the highest CFM nearest to the dust collector (see chart below)
- Attempt to keep tool runs as short as possible
- Attempt to keep all ventilation work at the same height as the dust ports on the machines
- Try to limit the use of directional change fittings (T's and Y's and Elbows) as much as possible

MACHINE	CFM REQUIRED
12″ Planer	350
13″ + Planer	400
Shoper	400
Bandsaw	400
Radial Arm Saw	350
Table Saw	350
Disc Sander	300
Belt Sander	300
Floor Sweep	350
Jointer	350
Drill Press	300
Scroll Saw	300

NOTE: We prescribe introducing a blast gate for each tool/machine to direct the majority of the air current to the tool being utilized.

STEP-2 DETERMINING THE DUCT DIAMETER NEEDED

Identify the power tools you will utilize that require the most CFM from the outline above. On the off chance that you will run more than one tool at once, add the CFM quantities of those tools together. Using the chart given below, decide the duct diameter that will be required for your framework. We don't suggest utilizing pipe smaller than 4″ in distance across.

- 250 - 400 CFM 4″ Duct
- 400 - 650 CFM 5″ Duct
- 650 - 800 CFM 6″ Duct

If you decide that your framework will require higher than 800 CFM, you can ascertain the proper conduit diameter across using the equation given below:

$$\text{Duct Dia.} = \sqrt{\frac{(\text{CFM} \times 183)}{350}}$$

STEP-3 DETERMINING STATIC PRESSURE LOSS

Decide the length of straight ventilation work in your format from the dust collector to every tool. Tally the quantity of every sort of directional change fittings to every tool: Y-fittings, T-fittings, and Elbow Fittings. Every kind of fitting is proportional to a particular length of straight conduit in the measure of Status Pressure Loss it causes. Allude to the accompanying chart for reference:

PRODUCT DIA.	90° ELBOW	30° Y	30° T
4″	6 Feet	3 Feet	7 Feet
5″	9 Feet	4 Feet	10 Feet
6″	12 Feet	5 Feet	13 Feet
7″	13 Feet	6 Feet	14 Feet

Decide and include the proportionate number of duct feet for the all of the directional change fittings for every tool. Add this number to the aggregate length of straight line duct from the dust collector to every tool. When you have decided the aggregate length of pipe to every tool, (straight line channel in addition to fittings), you can then compute the Static Pressure Loss for every tool/machine taking into account the outline below.
(Static Pressure Loss is measured in inches)

DUCT DIA.	STATIC PRESSURE LOSS PER FT. OF DUCT
4″ Duct	0.055 In./Ft.
5″ Duct	0.042 In./Ft.
6″ Duct	0.035 In./Ft.
7″ Duct	0.026 In./Ft.
8″ Duct	0.022 In./Ft.

Illustration:
In our example format, the framework comprises of 3 tools: a jointer, a planer and a table saw. The computations for this framework are as follows:

	JOINTER	PLANER	TABLESAW
4″ Dia. Duct	15 Ft.	11.5 Ft.	22 Ft.
90° Elbow	1 = 6 Ft.	0	1 = 6 Ft.
30° Y-Elbow	0	1 = 3 Ft.	0
90° T-Elbow	1 = 7 Ft.	1 = 7 Ft.	1 = 7 Ft.
Total Feet	28 Ft.	21.5 Ft.	28 Ft.

To decide the Static Pressure Loss for every tool, multiply your aggregate feet by 0.055″ (4″ diameter duct)

Static Pressure Loss	JOINTER	PLANER	TABLESAW
	1.54	1.182	1.925

We suggest including 1″ of Static Pressure Loss to make up for a grimy filter bag. The highest Static Pressure Loss for this framework would be 1.925″ for the table saw in addition to 1″ for a dirty filter bag bringing about an aggregate Static Pressure loss of 2.925″.

STEP-4 DETERMINING WHICH DUCT COLLECTOR IS NEEDED

Utilize the tool/machine with the highest Static Pressure Loss and the device requiring the highest CFM to identify the measure of dust collector you require for your framework. On the off chance that you will run more than one tools at once, you should include the CFM's and Static Pressure Loss of these tools. In our case, the device with the highest Static Pressure Loss is the table saw with 2.925″. The tool requiring the highest CFM is the planer at 400 CFM. In this way, we should buy a dust collector with a Static Pressure Loss rating of 2.21″ or more and a CFM rating of 400 or more utilizing only one tool/machine at once. The JET DC650 with a Static Pressure Loss rating of 8.5″ and a CFM rating of 650 would carry out the job well. It would be savvy in this situation to consider a larger Dust Collector, for example, the JET DC1200. This would permit you to add more tools to the framework later on.

STEP-5 PREVENTING STATIC ELECTRICITY BUILD-UP

The threat of electricity produced via friction developing in the pipe framework and bringing on a blast of flame is always prevalent. To be on a safe side, run ground wires through both within and around the outside of all the piping. Use stranded aluminum or copper or strong copper wire for within and aluminum antenna guy wire for the outside. The JET Dust Collection Grounding Kit contains all of the crucial components to securely ground your framework.

At directional change fittings, you can weld the wires within the fitting. Wires in Y-Joint fittings must be patched confronting far from the air stream, or you can penetrate a little opening in every branch of the fitting—bring the wires out of the fitting and join them with a wire nut. You should do this for all Blast Gates so you can totally close the entryway. Seal the gaps with caulk after the framework is assembled to prevent air leak.

Wrap a wire around the outside of the hose and fittings to expel any friction based electricity that may develop on the outside of the ducts. Ground both within and outside wires to a metal part on every woodworking machine—including the Dust Collector. You may need to utilize a screw or fastener with a lock washer to guarantee a good ground connection.