

Ductwork Installation And Product Guide

For Dust Collection Systems

- Installation And Design Guide
- Product And Price List
- Order Form

*This guide is limited to
Penn State Industries' line of
metal ductwork. A complete line of
dust collection equipment is
available in our full catalog.*



Penn State
Industries

Your complete dust collection supplier

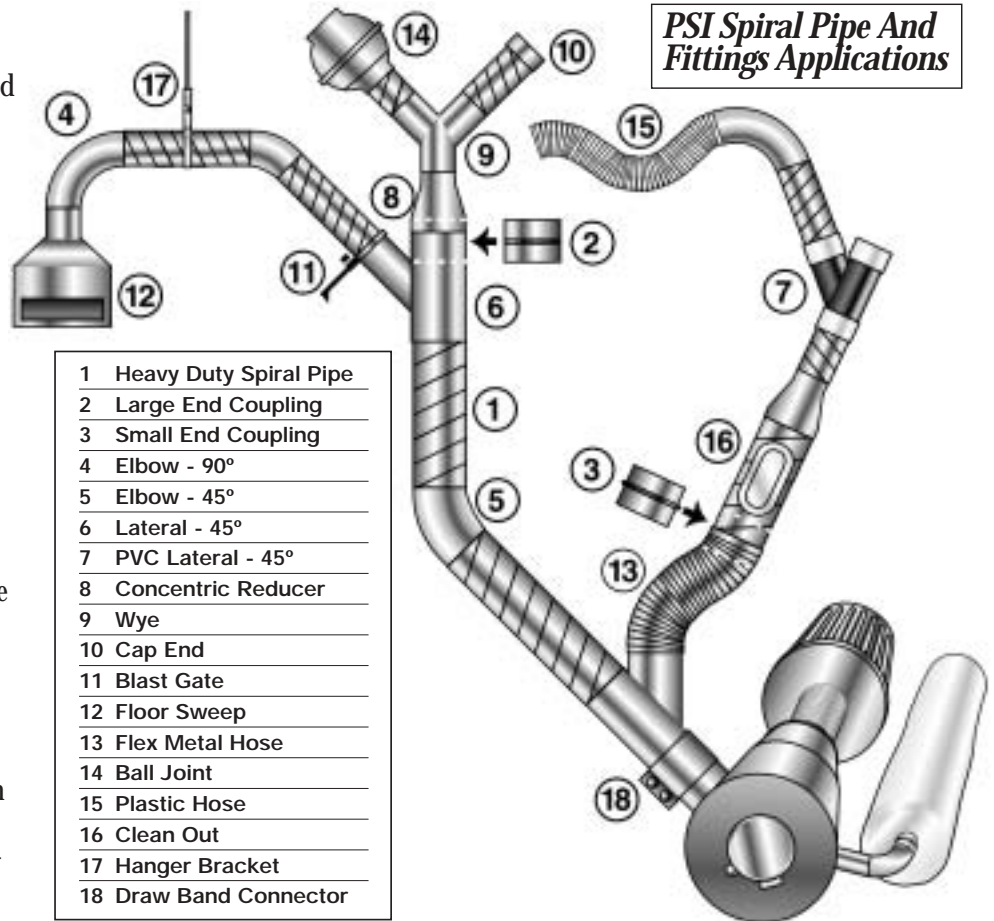
1-800-377-7297 • e-store: www.dustcollecting.com

Penn State Industries spiral metal ductwork is safe, efficient, and easy to install.

Creating a cleaner, safer shop may be easier than you think. PSI's spiral metal ductwork is easily assembled, and we supply all of the pipe, fittings, and accessories you need to make a dust free shop a reality.

Why use metal duct? PSI spiral metal ductwork is available in 4", 5" and 6" diameters (#N-BC). Less expensive (plastic) duct is generally not available above 4". Our metal fittings are designed for woodworking applications; they carry dust efficiently, provide superior airflow and allow convenient connections to most machines. Metal ductwork is safer: it is self-grounding, thereby avoiding static discharge and shock. Metal pipe is smoother inside than corrugated metal or flexible hose. It is much more efficient at the wye, elbow, and branch fittings. Smooth transitions result in less air turbulence and friction. Metal pipe is less expensive than PVC in diameters over 4" and has a much larger variety of adapters available. Metal ductwork is robust and rigid – it will withstand any level of stress and high vacuum.

Layout your dust collection system
 Planning your duct layout on paper is the first step. Proper planning will assure a top performing dust collection system, and changes on paper are always easier on you and your wallet. First, draw the locations of your woodworking machines, doors, windows, cabinets and other fixtures that may obstruct your ductwork. Certain machines should be located closer to your dust collectors (we'll discuss this later). Designing a layout for larger or smaller shops will follow the same general principles.



PSI Spiral Pipe And Fittings Applications

- 1 Heavy Duty Spiral Pipe
- 2 Large End Coupling
- 3 Small End Coupling
- 4 Elbow - 90°
- 5 Elbow - 45°
- 6 Lateral - 45°
- 7 PVC Lateral - 45°
- 8 Concentric Reducer
- 9 Wye
- 10 Cap End
- 11 Blast Gate
- 12 Floor Sweep
- 13 Flex Metal Hose
- 14 Ball Joint
- 15 Plastic Hose
- 16 Clean Out
- 17 Hanger Bracket
- 18 Draw Band Connector

The location of the dust collector:
 Variables that play a role in where to place the dust collector include: Noise level of the collector, footprint and height, the overall length of your duct, obstructions at the ceiling and wall levels, level (e.g. heating and plumbing obstructions), direction of joists (for running pipe), electrical service, locations of doors and windows.

Keep the length of runs to a minimum:
 Your system will perform best with shorter runs. It

will be less expensive to equip, and easier to build and maintain.

Placement of woodworking machines:
 Certain machines like planers and router tables put out more debris than others.

TOOL	CFM
15" Planer	500
Radial-Arm Saw	450
Drum Sander	450
6" Jointer	450
12" Planer	350
Tablesaw	350
Bandsaw	350
Drill Press	350
Floor Sweep	350
Disc Sander	350

CHART 1

These machines require more CFM and should be placed closest to your dust collector – resulting in better airflow and chip collection (see chart 1). Your least demanding machines may be placed at the end of a run. Placement of a floor sweep (#N-FSW) should be used near machines where dust collection is inefficient or impractical.

Placement of 45° laterals and wyes: (#N-LAT or #N-WYE). All of the laterals and wyes available from PSI are made with an exact 45° angle off the centerline. To determine the placement of a wye on the main duct branch, draw a line from the machine to the main duct meeting it at 45°. The intersection will determine the placement of the wye (see figure 1). In the case of an obstruction, a combination of 45° elbows (#N-45E) or a length of flexible metal pipe (#N-FH) can be used to circumvent the obstruction.

Figures 1, 2, and 3 show three alternatives for laying out ductwork in a typical shop, in order of preference. Figure 1 is a “diagonal run”, Figure 2 is a “central run”, and Figure 3 is a “perimeter run”. Any one of these runs may best suit your shop depending on the placement of your collector, machines and obstructions.

The Diagonal Run: With this design, you can locate your dust collector in the corner of your shop, away from high activity, usually in dead space. This design also results in using less ductwork.

The Central Run: This design locates the collector centrally on a wall with a short run of main pipe running down the center of the shop. The advantage of this design is that your dust collector will generally be located closer to all of your machines and may require less overall length of pipe. This design allows you to run your pipe along your joists.

The Perimeter Run: This design requires a long main run around the walls of the shop. The advantage of this plan is that it is the best design for avoiding obstructions at the ceiling level that would eliminate one of the other plans. Drops from your main to machines will tend to be out of the way. With this design the pipe can be run at ceiling, wall or even floor level. The drawback of this plan is that it requires more main ductwork and fittings.

Design elements of your dust collection system

Start your ductwork design at the dust collector itself: To achieve maximum airflow you should always use the

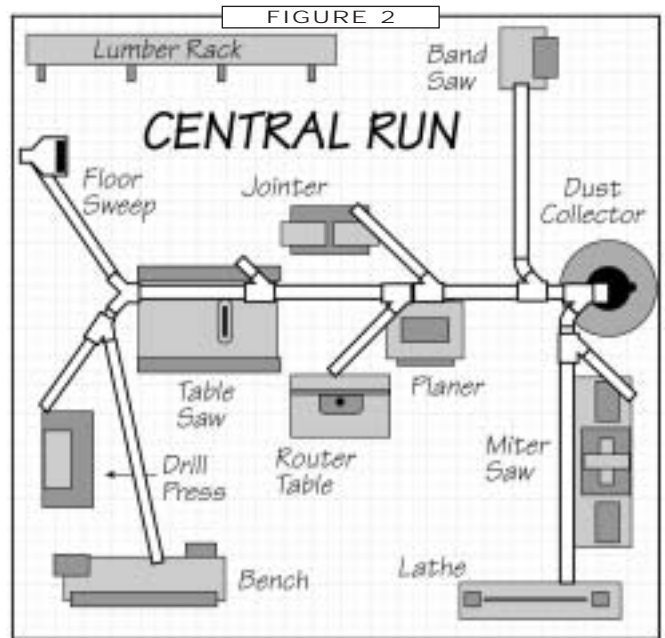
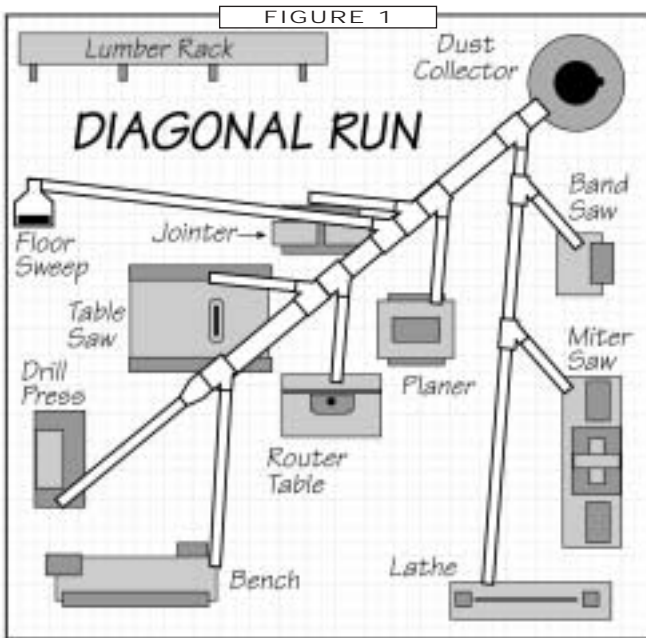
largest diameter possible when connecting pipe to your blower, and up to the connection at your machine. This will be your “main duct”. The diameter of your main duct normally will be determined by the diameter of the intake port of your dust collection system (see chart 2). Remove any wye adapters before measuring this opening (cyclone units typically will not have this adapter). A smaller diameter may result in higher airspeed but less suction. Avoid runs of ducting and machine ports smaller than 4" dia. Your first piece of ductwork (usually a long radius 90° elbow) should be secured to the blower unit intake.

1. Straight pipe sections (#N-BC) may be connected to each other with couplers (figure 4).

2. Couplers (#N-SEC) insert into the pipe, creating a very smooth transition from one section to another. Fittings like elbows, reducers, laterals and wyes do not require couplers when connected to pipe, since the ends of the fittings take the place of a coupler.

Penn State Models	Main Port Size
DC1BXL Collector	5"
DC2-5 DC-250 DC-250SE Collectors	6"
All PSI Cyclone Collectors	5"

CHART 2



Note: If your shop is under construction, you can run your ductwork under the floor.

CONNECTING COMPONENTS TOGETHER

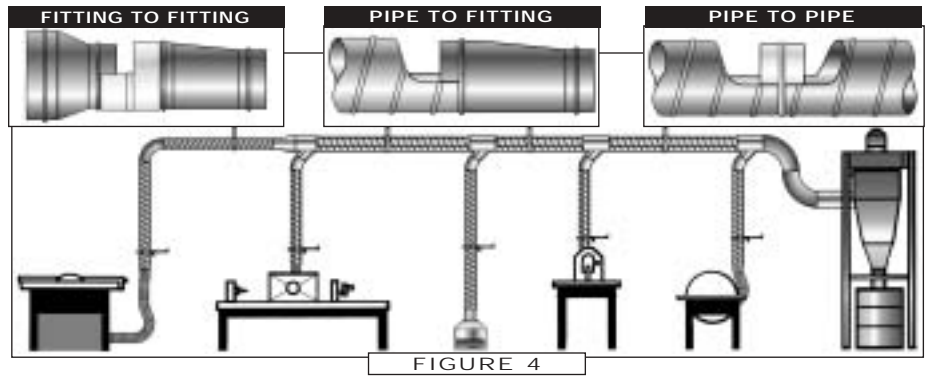


FIGURE 4

Connecting two fittings together can be easily accomplished by using a short piece of pipe about six inches long. A large end coupling (#N-LEC) may also be used for this purpose.

3. Elbow Radius (#N-90E or #N-45E)- Air going through ductwork will tend to move through bends more easily if the bends are smooth and gradual. Gradual turns are also necessary to avoid blockage from wood dust and chips. The use of PSI's long radius elbows will avoid backpressure and will maximize airflow.

4. Wye (#N-WYE) fittings should be used in place of "T" fittings for the smoothest, uninterrupted airflow through your system.

5. Blast Gates (#N-BGA) are necessary at every machine to shut off airflow in unused branches since open ducting will divert the airflow from where is most necessary. Blast gates should also be used to shut off larger branches that are not in use.

6. Caulk (#SYSCAULK) should be applied at each connection to avoid loss of vacuum due to leakage. This also strengthens the connection.

Dust collection system installation

Drops to your machines: Typical drops are shown in figure 4. If your machine has a 4" port, a length of 4" flex hose (#N-CVD or #N-J13) will run from the port to a blast gate. For convenience the gate should be about 4' off the ground and positioned horizontally (to avoid blockage). In figure 4, the gate connects to the main via a lateral, a 45° elbow and length of 4" pipe. At the drop at the end of a run, a 90° elbow off the branch is used.

Start the main run off the dust collector:

As shown in Figure 4, a 90° elbow (the same diameter as the opening) connects to the intake port of your dust collector (Penn State Industries collector ports are shown in Chart 2). Use a draw band connector (#N-DBC) for most flexibility – it will act as a "quick disconnect" in case you want to disconnect the dust collector from your piping system. You'll need to determine the distance from the end of the elbow to the ceiling. Use another elbow to connect the vertical pipe to the main on the ceiling.

Connect your pipe to the ceiling or wall:

Use Ceiling Brackets (#N- HB), or for wall suspension, special Wall Brackets (# N-WB) should be used every six feet of main pipe. Brackets and hangers should be at least four inches from any pipe couplers or other joints.

Once your drawing is complete – indicate what components are needed throughout the system and make a list of components (bill of materials).

Installation suggestions

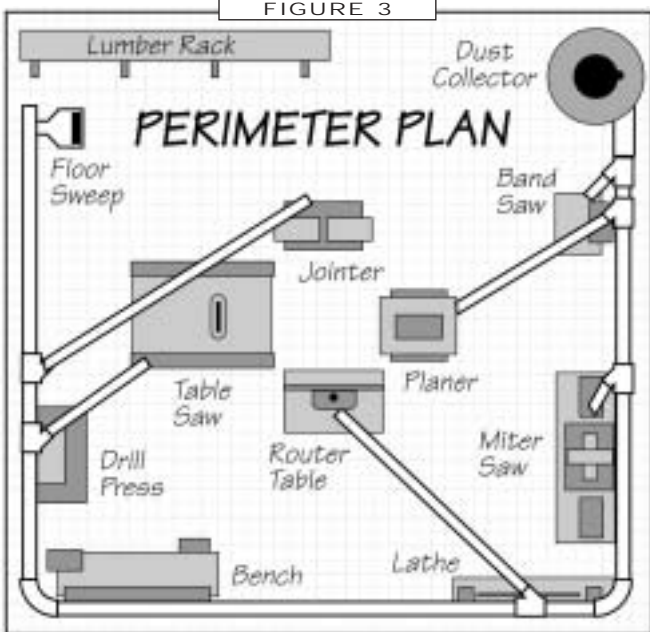
For safety, always use work gloves and goggles when assembling your system.

The main duct may be assembled on the ground in manageable sections. If you work on top of scrap plywood you can layout the position of angled branches, making it easier to determine the length of straight pipes that extend between them. If you have to cut a piece of pipe, it can be easily done using a saber saw and a metal cutting blade. Wrap tape around the pipe at the position of the cut, drill a pilot hole and cut using the edge of the tape as a guide.

Apply caulk at the connections and force fit the components together. Secure with pop rivets. Note that sheet metal screws may cause obstruction by snagging wood chips.

The assembled ductwork sections may now be positioned and fastened securely to the ceiling using appropriate hangers.

FIGURE 3



Spiral Pipe & Fittings Price List

Heavy Duty Spiral Pipe - 24 GAUGE

The ideal ducting for your dust collection system. The inside of the pipe is very smooth while the continuous outside seam provides superior support and strength. Large ends adapts to small end coupling and fittings. Available in 5' lengths only.



Item #	Style (dia)	Price for 5' length	
		1-4 qty.	5+ qty.
N-BC04/5	4"	\$9.95	\$8.95
N-BC05/5	5"	\$11.95	\$10.95
N-BC06/5	6"	\$13.95	\$12.95

Small End Coupling

Small end couplings slide precisely inside of our spiral pipe for connecting two pieces of pipe together. They can also be used to connect flex hose, large ends of fittings or to connect flex hose to flex hose



Item #	Size (dia)	1-4 qty.	5+ qty.
N-SEC04	4"	\$3.95	\$3.50
N-SEC05	5"	\$4.25	\$3.75
N-SEC06	6"	\$4.50	\$4.00

Large End Coupling

Large end couplings connect small ends to small end - primarily used to connect fittings to fittings.



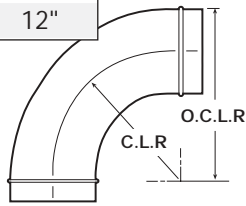
Item #	Size (dia)	1-4 qty.	5+ qty.
N-LEC04	4"	\$3.95	\$3.50
N-LEC05	5"	\$4.25	\$3.75
N-LEC06	6"	\$4.50	\$4.00

Standard Series Elbows - 20 GAUGE

One piece stamped elbows are very strong, a very smooth for efficient air flow. Has two small ends.

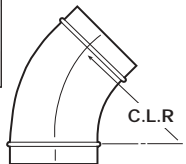
90° Standard Series Elbows

Item #	Size (dia)	Price	C.L.R.	O.C.L.R.
N-90E04	4"	\$14.95	6"	8"
N-90E05	5"	\$15.95	7.5"	10"
N-90E06	6"	\$16.95	9"	12"



45° Standard Series Elbows

Item #	Size (dia)	Price	C.L.R.
N-45E04	4"	\$12.95	6"
N-45E05	5"	\$13.95	7.5"
N-45E06	6"	\$14.95	9"



45° Laterals - 20 GAUGE

The most efficient way to branch from a main line. Has all small ends that fit conveniently into spiral pipe.

Item #	Size A - B - C	Price
N-LAT444	4" - 4" - 4"	\$45.00
N-LAT554	5" - 5" - 4"	\$45.00
N-LAT555	5" - 5" - 5"	\$45.00
N-LAT664	6" - 6" - 4"	\$45.00
N-LAT665	6" - 6" - 5"	\$45.00
N-LAT666	6" - 6" - 6"	\$45.00
N-LAT654	6" - 5" - 4"	\$52.95
N-LAT544	5" - 4" - 4"	\$52.95
N-LAT655	6" - 5" - 5"	\$52.95



45° PVC Plastic Lateral

Includes adapters that fit 4" spiral pipe.

Item #	Size A - B - C	Price
N-D4YX	4" - 4" - 4"	\$9.95

Long Taper Concentric Reducers

20 GAUGE - One piece reducers with small ends fit precisely into spiral pipe.

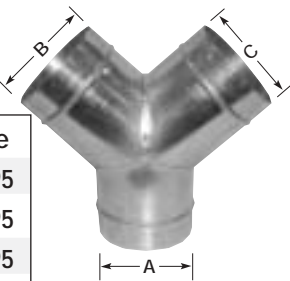
Item #	Size (dia)	Price
N-RED54	5" - 4"	\$14.55
N-RED64	6" - 4"	\$14.55
N-RED65	6" - 5"	\$14.55



Wyes

Efficiently split a main into 2 branches. Has all small ends to fit into spiral pipe.

Item #	Size A-B-C	Price
N-WYE444	4" - 4" - 4"	\$49.95
N-WYE544	5" - 4" - 4"	\$49.95
N-WYE555	5" - 5" - 5"	\$49.95
N-WYE666	6" - 6" - 6"	\$49.95



Plugs / Caps - (PF)

Caps off the end of a pipe run

Item #	Size (dia) of pipe	Price
N-CAP104	4"	\$7.95
N-CAP105	5"	\$8.95
N-CAP106	6"	\$9.95



Floor Sweep

These sturdy metal fixtures should be installed near machinery or areas that are not serviced by the dust collector system. Ideal for general cleanup. Requires a blast gate. Economy style is plastic.

Item #	Style	Size (dia)	Price
N-FSW04	Premium	4"	\$85.00
N-FSW05	Premium	5"	\$85.00
N-FSW06	Premium	6"	\$85.00
DFS	Economy	4"	\$8.95



Pipe not included

Ball Joints

Galvanized joints provide smooth airflow with flexibility for positioning many adapters that are normally fixed.

Item #	Size (dia)	Price
N-BJ04	4"	\$79
N-BJ05	5"	\$89
N-BJ06	6"	\$99



Infinite rotation and positioning.

Aluminum Blast Gates

Premium styles easily disassemble for cleaning

Item #	Style	Size (dia)	Price	
			1-2	3+
N-BGA04	Premium	4"	\$15.95	\$14.95
DB4A	Economy	4"	\$7.95	\$6.95
N-BGA05	Premium	5"	\$18.95	\$17.95
N-BGA06	Premium	6"	\$22.95	\$21.95



ECOGATE™ Automatic Dust Collector and Blast Gate Switch

Saves you time, energy and money! The ECOGATE™ system opens your blast gate and turns on your dust collector when you turn on your woodworking machine, then shuts the gate and turns off the dust collector when the machine is switched off. This hi-tech computerized system includes these components:

greenBOX™

This electronic control unit can activate up to eight gates, receive signals from eight sensors and turns on 110V or 220V dust collectors.



Sensors

These devices are easily attached to your machine and signal the control unit.

Electronic Blast gates

Patented, automatic, motorized 4" metal blast gates are self cleaning.

STARTER SET SPECIAL: Includes the "greenBOX®" control unit (for up to 8 gates), four 4" motorized blast gates, four sensors, and wire to connect the system together.

#ECOGATE4 Starter system REG. \$699**\$599.00** (UPS \$7)

#ECOGATEX Extra 4" gate & sensor REG. \$99only **\$79.00/ea**

Draw Band Connectors

The ideal flexible connection to attach pipe, elbows or fitting to a dust collector. The bands can be tightened individually to allow for diameter differences. Allows for a "quick disconnect" to remove your dust collector from your piping system.

Item #	Size (dia)	Price
N-DB04	4"	\$12.95
N-DB05	5"	\$12.95
N-DB06	6"	\$12.95



Air tight seal.

Hose Clamps - Priced in paks of 5

Item #	Size (dia)	Price/5 pack
DBC4	4"	\$4.95
DBC5X	5"	\$5.50
DBC6X	6"	\$5.95



Flex Metal Hose

Premium metal hose is ideal for hookups from the main piping system to the machine. Sold in increments of 5ft. lengths.

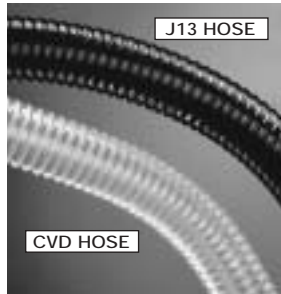
Item #	Size (dia)	Price
N-FH04	4" x 5 ft.	\$39.95
N-FH05	5" x 5 ft.	\$49.95
N-FH06	6" x 5 ft.	\$59.95



J13 Black Plastic Hose

An economical and durable all plastic hose that retains its shape and resists permanent crushing. Allows uninhibited passage of dust without clogging.

Item #	Size (dia)	Price
N-J13-0415	4" x 15 ft.	\$29.95
N-J13-0425	4" x 25 ft.	\$39.95
N-J13-0515	5" x 15 ft.	\$49.95
N-J13-0525	5" x 25 ft.	\$59.95



CVD Clear Plastic Hose

This clear premium hose is constructed of PVC and reinforced with a thick wire helix. CVD is an economical alternative to metal ducting.

Item #	Size (dia)	Price
N-CVD-0415	4" x 15 ft.	\$59.95
N-CVD-0425	4" x 25 ft.	\$89.95
N-CVD-0515	5" x 15 ft.	\$69.95
N-CVD-0525	5" x 25 ft.	\$99.95
N-CVD-0615	6" x 15 ft.	\$79.95
N-CVD-0625	6" x 25 ft.	\$109.95



Flexible Hose

Reinforced with heavy duty wire .050" thick, this extremely flexible, durable hose will not collapse, even under heavy suction. Just ground the wire at either end of the hose to ground your collection system.

#D08 8 ft. of 4" I.D. hose..... \$12 for 8 ft. length
 #D50 50 ft. of 4" I.D. hose..... \$40 for 50 ft. length

Joint Sealing Silicone Caulk

Seal all of your system's metal connections
 #SYSCAULK 10 oz tube\$4.95/tube



Clean Outs

Install on the outside of pipe and provide easy access to the inside of ductwork.

Item #	Size (dia)	Price
N-CO4	4"	\$19.95
N-CO5	5"	\$19.95
N-CO6	6"	\$19.95



Hanger Brackets

Our specially designed hangers will conveniently attach to a ceiling or wall. One band is required to support every 5'-10' section of main duct. At least one should be used on every branch.

SHORT HANGER BRACKETS
 For ceiling installation.

Item #	Size (dia)	Price/5 pack
N-HB04	4" x 12"	\$7.95
N-HB05	5" x 12"	\$8.95
N-HB06	6" x 12"	\$9.95

LONG HANGER BRACKETS
 For hanging spiral pipe from ceiling along walls.

Item #	Size (dia)	Price/5 pack
N-WB04	4" x 36"	\$14.95
N-WB05	5" x 36"	\$16.95
N-WB06	6" x 36"	\$18.95



Rivet Gun

Used for securing all of your system's metal connections. Includes a large assortment of rivets.

#N-RIVET.....\$15.95



Table Saw Dust Hoods

ABS plastic - sized to fit most 8" to 12" contractor type table saws. 4" outlet.

#DT2 12" x 12" x 2-1/2"\$8.95/ea
 #DT4 14" x 14" x 2-1/2"\$9.95/ea



Jointer Dust Hoods

ABS plastic - Sizes for both 6" and 8" jointers with cabinet stands. 4" outlet.

Fits over a 6-1/2" x 6-1/2" chute
 #DJ6.....\$4.95/ea
 Fits over a 7" x 8-1/2" chute
 #DJ8.....\$5.95/ea



Universal Dust Hood

Versatile and sturdy ABS hood attaches directly to almost any machine cabinet. Fits over opening 6-1/4" x 6-1/4".

#DU6\$4.95/ea



Penn State Industries Ductwork Order Form

Name _____
 Address _____
 City _____ State _____ Zip _____
 Phone (day) _____ (Evening) _____

Payment by: Check (enclosed) Credit Card
 Type of Card: MasterCard Visa Discover American Express
 Card Number _____
 Signature: _____ Exp. Date _____

Description	Size	Item #	Price	Qty.	Total
1-4 qty./ 5+ qty.					
Spiral pipe 5 ft. length	4"	N-BC04/5	\$9.95/8.95		
	5"	N-BC05/5	\$11.95/10.95		
	6"	N-BC06/5	\$13.95/12.95		
Small End Coupling	4"	N-SEC04	\$3.95/3.50		
	5"	N-SEC05	\$4.25/3.75		
	6"	N-SEC06	\$4.50/4.00		
Large End Coupling	4"	N-LEC04	\$3.95/3.50		
	5"	N-LEC05	\$4.25/3.75		
	6"	N-LEC06	\$4.50/4.00		
90° Elbow	4"	N-90E04	\$14.95		
	5"	N-90E05	\$15.95		
	6"	N-90E06	\$16.95		
45° Elbow	4"	N-45E04	\$12.95		
	5"	N-45E05	\$13.95		
	6"	N-45E06	\$14.95		
45° Laterals	4" 4" 4"	N-LAT444	\$45.00		
	4" 4" 4"	N-D4YX	\$9.95		
	5" 4" 4"	N-LAT544	\$52.95		
	5" 5" 4"	N-LAT554	\$45.00		
	5" 5" 5"	N-LAT555	\$45.00		
	6" 5" 4"	N-LAT654	\$52.95		
	6" 5" 5"	N-LAT655	\$52.95		
	6" 6" 4"	N-LAT664	\$45.00		
	6" 6" 5"	N-LAT665	\$45.00		
6" 6" 6"	N-LAT666	\$45.00			
Tapered Reducers	5" to 4"	N-RED54	\$14.55		
	6" to 4"	N-RED64	\$14.55		
	6" to 5"	N-RED65	\$14.55		
Wyes	4" 4" 4"	N-WYE444	\$49.95		
	5" 5" 5"	N-WYE555	\$49.95		
	5" 4" 4"	N-WYE544	\$49.95		
	6" 6" 6"	N-WYE666	\$49.95		
Caps	4"	N-CAP104	\$7.95		
	5"	N-CAP105	\$8.95		
	6"	N-CAP106	\$9.95		
Aluminum Blast Gates	4"	N-BGA04	\$15.95/14.95		
	4"	DB4A (economy)	\$7.95/6.95		
	5"	N-BGA05	\$18.95/17.95		
	6"	N-BGA06	\$22.95/21.95		
Ecogate™ Blast Gate	4"	ECOGATE4	\$599.00		
	4"	ECOGATEX	\$79.00		
Floor Sweeps	4"	N-FSW04	\$85.00		
	4"	DFS (economy)	\$8.95		
	5"	N-FSW05	\$85.00		
	6"	N-FSW06	\$85.00		

Description	Size	Item #	Price	Qty.	Total
Draw Band Connectors	5"	N-DB05	\$12.95		
	6"	N-DB06	\$12.95		
Metal Flex Hose 5 ft. length	4"	N-FH04	\$39.95		
	5"	N-FH05	\$49.95		
	6"	N-FH06	\$59.95		
Ball Joints	4"	N-BJ04	\$79.00		
	5"	N-BJ05	\$89.00		
	6"	N-BJ06	\$99.00		
Clean Outs	4"	N-C04	\$19.95		
	5"	N-C05	\$19.95		
	6"	N-C06	\$19.95		
J13 Hose	4"	N-J130-415	\$29.95		
	4"	N-J130-425	\$39.95		
	5"	N-J130-515	\$49.95		
	5"	N-J130-525	\$59.95		
CVD Hose	4"	N-CVD-0415	\$59.95		
	4"	N-CVD-0425	\$89.95		
	5"	N-CVD-0515	\$69.95		
	5"	N-CVD-0525	\$99.95		
	6"	N-CVD-0615	\$74.95		
	6"	N-CVD-0625	\$104.95		
Hose Clamps Pak of 5	4"	DBC4	\$4.95		
	5"	DBC5X	\$5.50		
	6"	DBC6X	\$5.95		
Short Hanger Brackets 5 pak	4"	N-HB04	\$7.95		
	5"	N-HB05	\$8.95		
	6"	N-HB06	\$9.95		
Long Hanger Brackets 5 pak	4"	N-WB04	\$14.95		
	5"	N-WB05	\$16.95		
	6"	N-WB06	\$18.95		
Caulk tube		N-CAULK	\$1.95		
Rivet Gun kit		N-RIVET	\$15.95		
Plastic Ports	4"	DT2	\$8.95		
	4"	DT4	\$9.95		
	4"	DJ6	\$4.95		
	4"	DJ8	\$5.95		
	4"	DU6	\$4.95		

Order subtotal	
PA residents add 7% tax	
Shipping: Your order will be shipped by UPS or Common Carrier at our option.	
Freight charges: Add 15% of the order total to all orders with a minimum \$9.95 shipping charge.	
ORDER TOTAL	

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