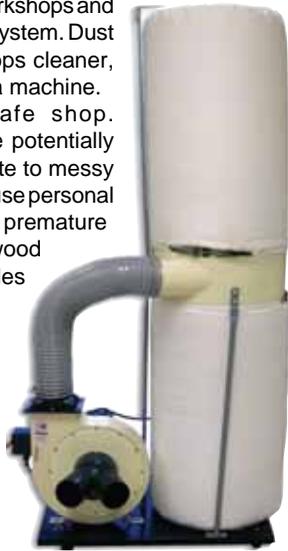


The Dust Collection System

An important addition to workshops and machines is a dust collection system. Dust collection systems make shops cleaner, safer, and extend the life of a machine.

A clean shop is a safe shop. Uncontrolled dust can cause potentially serious health risks, contribute to messy work environment that can cause personal injury, and be the cause of premature machine failures. Sawdust, wood chips, and any other particles generated by cutting the wood, particle board, plywood, etc., become hazardous if they are inhaled. These products are created with the use of resins, alkaloids, silica, tannins, toxic organic and inorganic elements. Not to mention the insecticides, formaldehydes, and other toxins that come in contact with the tree in nature. Exposure to dust containing any of these can cause respiratory ailments, allergic reactions, skin problems, and liver, kidney, or blood diseases. Keep in mind, the finer dust particles can be easily inhaled and ultimately end up within the bloodstream. These are the realities as pertaining to proper dust collection in the modern workshop.



DESIGNING THE PROPER DUST COLLECTION SYSTEM FOR YOUR SHOP

In order to design a cost-effective and efficient dust collection system, the ducting must be carefully planned. The simpler the system, the cheaper and more efficient it will be. Before getting started, there are many variables which should be considered, such as: type of dust collector, type of ducting material, location, layout, and the budget for your system.

Dust Collectors

There are basically two types of dust collectors: single-stage, and two-stage. A single-stage unit is an inherently cheaper system which consists of an inline impeller which passes debris through the impeller and deposits the dust and debris into a filter bag. As dust and debris collects in the bag or drum, the system becomes increasingly less efficient. Precautions need to be taken with single-stage systems to prevent large objects, or any objects that can

cause sparks when passing through the impeller. Objects that are too large can cause damage to the impeller, thus resulting in impaired performance. Objects that cause sparking exponentially increase the chance of a fire or dust explosion. A good dust separator should be installed so that it will trap metal objects before they reach the impeller. **If you suspect a spark was generated, the unit should be shut down immediately and the bag emptied into a safe airtight container.**

Two-stage units draw dust and debris into the system, but deposit the majority of the debris in the first stage collection container before entering the impeller. At this point, only fine dust passes through the impeller. As this fine dust passes through the impeller, the second stage consists of a fine micron filter element which filters the fine dust as the air is exhausted from the dust collector back into the shop.

Choosing Piping

There are two types of piping to choose from: metal or plastic. There are several different types of metal ducting such as stove, heat, and ventilation piping, as well as piping designed specifically for dust collection systems. Metal piping is generally more expensive, but has many advantages over plastic piping. One advantage of using metal piping is the fact that it is a conductor and does not contribute to static electrical charge build-up. Although suspended dust within the ducting still generates a static electrical charge, metal piping is a conductor that can be easily grounded, dissipating the charge. If metal piping is to be used for the system, it should be of 26 gauge material or heavier so that the ducting will not collapse from the vacuum. The ideal ducting is piping that is specifically designed for dust collection purposes because it is the most efficient; however, this is the most expensive. The use of metal piping does make installation more difficult, and may not be airtight if it is not specifically designed for dust collection. All leaks should be sealed for optimum performance.

Plastic piping, such as PVC or ABS, is the least expensive, readily available and easily assembled, but it has many inherent problems. Plastic piping is an insulator; thus static electricity is generated as dust particles travel through the ducting. It is very important to ground a plastic ducting system in order to dissipate the static electrical charge. This can be accomplished by running bare 16 AWG copper grounding wire, which should be stranded, braided and run inside the entire ducting system (braided antenna wire works well too). At any joints, the wire should be soldered