Avoid Dust Collector Misapplications in High School Woodworking Shops

When industry experts from the dust collection field met with high school wood shop teachers at the 2015 AWFS Fair in Las Vegas, they were dismayed to learn that many did not have a functioning dust collection system for their school shop. The reason was not that the funds weren't available or spent, it was that the wrong dust collector and piping was purchased.

Per the National Fire Protection Association (NFPA) code 664, Chapter 4, General Requirements 4.5, Designer and Installer Qualifications, it is stated, "Systems that handle combustible wood particulates shall be designed by and installed under the supervision of qualified engineers who are knowledgeable of these systems and their associated hazards." It was highly apparent that for some of the school shops, this was not the case.

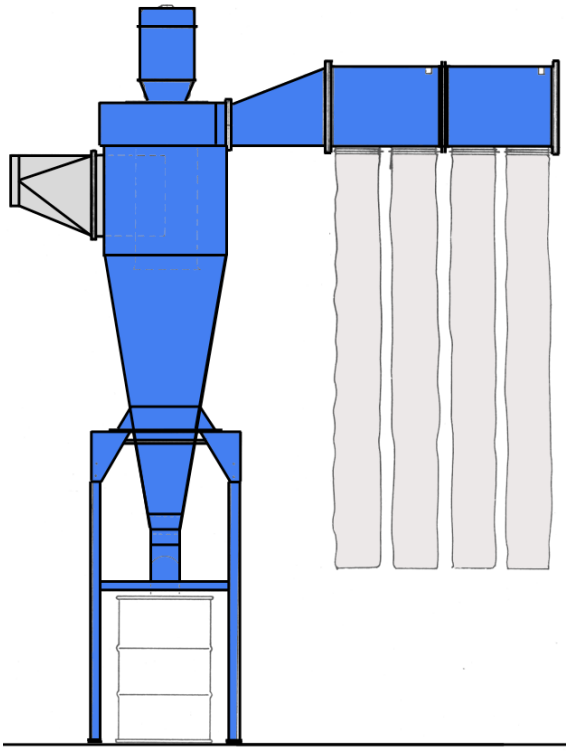
The following guidelines can be considered by education facilities when purchasing a dust collector:

For safety, longevity, and functional purposes, a pull through cyclone separator with after filter is the proper equipment. (Some of the dust collectors mentioned by teachers were cartridge type as well as envelope style cabinet collectors, neither of which are appropriate for a typical wood shop.) The after filter bags that come with a cyclone package will last for several years. Cartridge filters must be replaced on a regular basis. Cost per cartridge filter can range from $275.00 - $375.00 each. Even a small unit can have at least 6 cartridge filters, others as many as 12. Cartridge dust collectors and cabinet collectors are designed for fine particulate. The pull through cyclone separates up to 98% by weight of wood dust, chips, and shavings. The purchase price for a pull through cyclone arrangement with after filter is much less than the misapplied equipment, never mind the replacement cartridge filter cost.

Industry recommendation to administrators or districts bidding on equipment:
When going out for bid on a system, request in conjunction with the proposal, a blueprint with the engineer's seal that shows pipe sizing and equipment specifications. Then, prior to signing off on the purchase, request at least three recent references, make site visits, and interview the shop teacher. It is unfortunate that dust collectors are being sold by individuals with little or no knowledge of the equipment they are selling. The same situation occurs in the woodworking industry as well. Education dollars are precious, they do not need to be misused for inadequate, unsafe or unnecessarily costly systems. Remember, the proper three are the key, dust collector, hooding, and piping.

Two-Stage Dust Collectors

Since most woodworking dust contains coarse-sized and fine-sized particles, a two-stage dust collection system is generally recommended. A two-stage dust collector consists of a first stage cyclone, a blower and a second stage after filter.
A cyclone separator is a cone-shaped vessel into which the dust-laden air enters. The dust particles' inertia causes them to move toward the separator's outer wall. As the dust particles



proceed toward the outer wall, the coarse-sized particles lose momentum. When velocity drops on the coarse-sized particles, gravity causes them to settle into the container below. The remaining fine dust exits through a central outlet at the top and into the blower. The blower then relays the fine dust to the after filter.

The longer the cyclone body and cone, the better the dust separation. One major reason for using a separator is so the blower unit will only convey fine dust. Coarse wood dust particles and other debris hitting the blower impeller most likely will result in blower unbalance. This condition will ruin the blower very quickly. Also, a separator is used so that the after filter does not receive 100% of the dust-laden air. Cyclone with blower and after filter in weather proof enclosure can be located outside. Filtered air is normally returned back into the shop. A fire damper or abort gate will most likely be required at return air wall penetration.

AIR HANDLING SYSTEMS

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