From the Centre With Steve Bader

The dirt on wood dust

Wood dust. It's the unwanted byproduct of manufacturing wood to meet our needs. Everyone has it in their shop, but nobody wants it there. And ever since 2002, when wood dust was classified as a human carcinogen by those who classify such things, controlling or eliminating wood dust should have become a top priority for everyone associated with the wood industry. Although illnesses don't readily occur until many years later, some steps can be taken immediately to help remedy the dust situation.

If the top half of your dust collector, sprinkler or other pipes are a different colour than the bottom half, you may have a wood dust problem. This airborne dust can cause a variety of health-related problems, including dermatitis, allergic respiratory effects such as asthma, hypersensitivity pneumonitis and chronic bronchitis, and cancer of the nasal cavity. Specifically, the risk of adenocarcinoma is the highest, but other types of nasal cancer, or cancer of the nasopharynx and larynx, as well as Hodgkin's disease have also been associated with wood dust exposure in several, but not all, epidemiologic studies.

The long and short of it, for us woodworkers, is that this list of illnesses sounds scary!

It should be noted as well, that in these studies it didn't seem to matter whether it was softwood or hardwood being processed. Wood dust is wood dust.

Fortunately, there are remedies that we can use to protect ourselves. Perhaps the most obvious is to inspect your dust collector system to see that it is working properly. Check that the filter bags are in good condition, and replace any that are ripped or torn. Also, consider installing blast gates on machines that are infrequently used.

After that, the approach to tackling dust is twofold.

First is the use of a dust mask or other breathing apparatus. The limitations of masks, however, include comfort and fit. They must be carefully fitted to avoid leaks. The white-coloured fabric and elastic strap-type of nose and mouth masks, the ones that are widely available, are often ineffective. The best ones to obtain have a National Institute for Occupational Safety and Health (NIOSH) approval.

The second part of tackling the dust issue is called an engineering solution, where the dust is sucked away before it enters the air. The trick to an effective engineered control is, according to NIOSH, local exhaust ventilation (LEV) that captures and removes dust at or near its source. Since wood dust is generated by rapidly spinning cutters, it is thrown around at very high speeds, and hence, is hard to grab.

Table saws, shapers, routers and sanders are the worst culprits for generating dust, and according to NIOSH, traditional means for exhausting this dust are not very effective. The institute does offer suggestions for LEV systems for these particular machines though, as well as many others on their website: www.cdc.gov/niosh/hc5.html.

Sometimes even a simple thing, such as the location or angle of the exhaust hood, can have a tremendous impact on the efficiency of dust removal.

So, the information on the health effects of wood dust is out there, as are possible remedies to clear the air. It's encouraging to see the industry is reacting to this problem, as evidenced by a six-year, multimillion-dollar "Respiratory Health Study of Woodworkers," conducted by Tulane University Medical Center. The study, which is funded by 19 industry trade associations in the United States, will have its findings presented at IWF 2006 in August.

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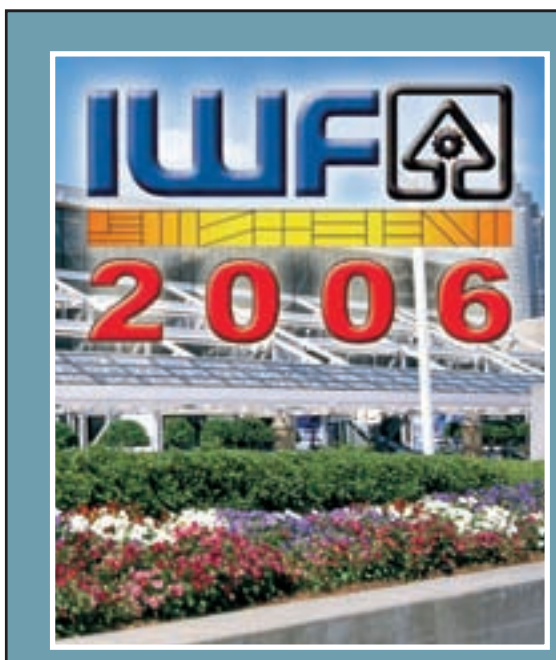


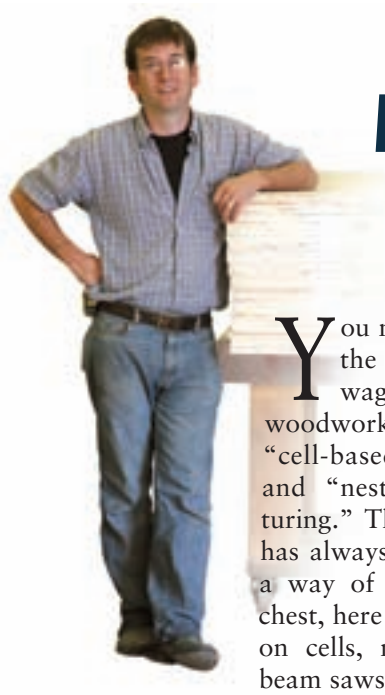
Don't miss the International Woodworking Machinery and Furniture Supply Fair (IWF) 2006, at the Georgia World Congress Center in Atlanta in August!

For more details about the show and all it has to offer, be sure to pick up the June/July edition of *Woodworking* magazine for a preview and guide.

"IWF is the one show where you can see it all, all in one place, and all in one show."

— PATRICK LAFRAMBOISE, IWF PRESIDENT AND CEO

The CNC Shop With Tom Morin



Making sense of "Cell versus Nest"

You may have read about the epic battle being waged in the nation's woodworking shops between "cell-based manufacturing" and "nested-based manufacturing." This confusing jargon has always annoyed me. So as a way of getting this off my chest, here is some background on cells, nesting routers and beam saws.

When machinery manufacturers use the term cell-based manufacturing, they usually mean this: You cut your parts on a beam saw, then machine them one-by-one on a point-to-point or CNC machining centre. This has been the main method of automated cabinet manufacturing since CNC's first appeared. I prefer to call this method "saw/point-to-point" (saw/ptp). Confusion arises because saw/ptp is not necessarily "cell" based.

Cell-based manufacturing is actually a lean manufacturing concept. Cell manufacturing is about breaking your product down into processing steps. If you can arrange your machines and workbenches to perform these steps in quick succession, you'll build your product faster and with less waste.

A work cell is a cluster of machines, arranged to complete a manufacturing process. Pre-lean thinking would have arranged individual machines based on their capacity. For example, a single cut-to-length station would cut solid wood parts for drawers, doors, mouldings and whatever else came along. In a cell-based shop, the "drawer-making cell" would have its own dedicated cut-to-length station. And that machine would be placed as close as possible to the dovetailer which would, in turn, be right beside the dedicated clamping area.

Cell manufacturing stresses small batches that travel quickly through the shop with minimal handling in order to minimize work-in-progress and increase throughput.

A manufacturer who uses the saw/ptp method may or may not have adopted a cell approach to building their product.

Nested-based manufacturing (or just nesting), by contrast, is to cut and machine parts on a CNC router instead of a saw. Optimizing software is used to lay out or "nest" the parts on a sheet of material along with its associated drilling, then it turns that layout into a program for the router. A nesting router has a flat table (not pods) and a powerful vacuum to hold parts in place while the router cuts them out. A porous spoilboard – placed between the material and the machine bed – protects the machine bed from being cut into. Typically, only face machining can be done while nesting, so parts must go to a horizontal boring machine if dowel or confirmat edge holes are needed.

For small- and medium-sized custom shops that are keen on automation, there is an increasing trend to nesting. In general, nesting takes up less capital, less space and less manpower than saw/ptp. However, for higher production shops, the balance will often tip in favour of saw/ptp.

In my next column, I'll go into detail about the pros and cons of each method.

Tom Morin is the owner of Morinwood Manufacturing Inc. Send comments or questions to tom@morinwood.ca.