



From The Shop



The newsletter of the Lehigh Valley Woodworker's Guild

Issue 12.2006

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Upcoming Meeting Information

Next Meeting: December 19th, 2006 (3rd Tuesday!)

Location: Lehigh Co. Senior Center
1633 Elm Street
Allentown, PA

Speakers and topics:

- Christmas party!
- Take 10 – 10 minute Q&A

November's Featured speakers:

Allen Powell of LVWG and **Curt Corum** of Air Handling Systems On Dust Collection

Allen Powell and Curt Corum combined to provide as much information on dust collection in the home shop as one could desire. Allen's background is in material handling on an industrial scale, so, while he downsized his work experience for our purposes, he brought the theory he uses in his field to our meeting. The first information source Allen mentioned was the often praised book by Sandor Nagyszalanczy (Allen deferred to Art Silva for the proper pronunciation of "Shawndoor"'s name – Art seems to revel in pronouncing it! James Earl Jones would be jealous!) - Woodshop Dust Control: A Complete Guide to Setting Up Your Own System. Allen also acknowledged WOODCENTRAL and contributor there, Bill Pentz. If

you have not visited that site, you are missing the foremost collection of woodworking expertise on the web. But you have already heard that.

Allen first acknowledged that sawdust and woodworking have an almost romantic connection. It is expected. It smells good. It looks traditional. It will kill you as fast as a pack of Marlboro a day – maybe faster depending on the wood. Even smaller traces can aggravate allergies, especially if you have your shop in any area connected to the house, and particularly if you have forced air heating. Woods like spalted maple get their figure from mold. One person noted that the very fine sawdust, sucked into an oil burner, can cause an explosion. That way, you will not have to worry about the allergies or long term effects of sawdust, and you can light that Marlboro...



A typical dust collector used in a home shop.

Allen started talking microns. Little stuff. 50 micron particles cannot be seen. Bill Pentz, in an article he found in Wood Central's Articles & Reviews section, states that a friend and pulmonary specialist advised him that particles less than 30µ (microns) (1/3 the size of human hair) pose the worst health hazard. Particles this size and smaller go right through most of the filter media used in dust collection systems and will slip right by our bodies natural defenses and penetrate into our body tissues. Once it gets in, it generally stays there for a long time and do all sorts of nasty damage of an unpredictable nature. Hobbyists do not have OSHA to police their shops. They have to police themselves. While tools are built with better dust collection in mind, most home shop tools are NOT built to the standard of industrial tools with regard to dust collection because

they are not policed or subject to lawsuits. In addition to messing up your body, it will mess up your tools. It will get into areas where one adjusting stop meets another to set accuracy. I am sure motor life is also impacted by excess amounts of sawdust left to fester in them as opposed to being carried away by collection devices that are properly engineered. Air filtration is designed to get debris carrying air away from you. Even a box fan in a basement window can help. Not much, but it can help.



This device collects airborne particles very effectively. Home made versions can be crafted easily.

Safe air filtration, according to the statistic Allen had, filters the air 60 times an hour. So figure out how many cubic feet your shop has, multiply by 60, and you can get to where an air filtration box (like the ones that hang off the ceiling) need to be. Of course, the more debris you pull out of the work process itself, by direct dust collection with proper filtration, the less of a burden is placed on the ceiling mounted type devices.

Allen also pointed out that there is airborne dust in the shop after you turn out the lights, so he has his ceiling mounted device on a timer that runs to clean the air after he leaves the shop to clean the residual particles in the air.

Again, first you capture the debris at the source – the machines. Most machines have some dust collection bags on them. They help, but are not enough by themselves. You can hook a shop vac up to them, but they are usually noisier than the tools (an exception are units like the FESTOOL and Fein devices which are quiet and also turn on and off with the tool). On the subject of noise, I'd like to interject the problem of NOISE pollution in the shop. Wear hearing protection or you WILL end up like me – hearing aids in both ears, or tinnitus or both. My ears have been ringing since I built a storage shed in 1988. Plus, shop vacs have very small capacity and will fill up in no time when used with jointers and planers, even if they CAN keep up with them.

For single tool use, the smaller 1.5 hp dust collectors on wheels work fine. The problems with these are the hoses, which always seem to be in the way, creating a hazard of their own. And wheeling them around can be

a pain from a power cord and space perspective. For systems where duct work will be used, the added burden of the duct system and fittings reduces efficiency and that makes higher powered machines almost always needed.

Here is where Allen's eyes began to glaze over and he took on a glow – started talking about cubic feet per minute, static pressure, air velocity, inches of water, black holes, quasars... my god, he loves it so! But the purpose of this exercise, while immersed in math of the most horrible kind, is to drive home the need to SIZE THE SYSTEM, which does not have to be difficult. If you are going to do it, the difference of a few dollars at the outset can mean the difference between a system that does the job and one that almost does the job, meaning you are almost protecting your health and that of those you care about – or at least the folks who live with you, whichever comes first.



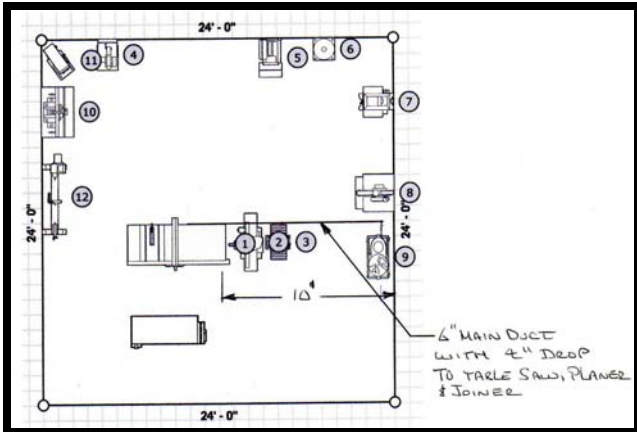
Allen Powell delivers some very detailed data, but kept the important stuff simple in his presentation.

Some definitions you need to know, made easy:

- CFM – Air volume in cubic feet per minute.
- FPM – Air velocity in feet per minute
- SP – Static Pressure expressed in inches of water gauge/ 100' of duct. This is a measure of the resistance to air flow in a duct.
- VP – Velocity Pressure; expressed in inches of water this is a measure of the pressure required to get air to flow at a given velocity.
- TP – Total pressure is the sum of
- Branch – the line connecting to the machine.
- Main Duct – the line connecting branches to the dust collector.

I can cite a bunch of numbers here that Allen knows in detail, but the numbers used by American Air Filter, and a chart cited by Allen, advised of the dust collection needs of common shop tools makes it almost mandatory to have a dust collector of at least 800

Cubic Feet per minute (CFM) at a velocity of 4000 feet per minute. This will allow you some extra air movement power for resistance of pipes, fittings, hoses, but not much. Actual recommendations for a shop with even minor duct work is far more than that.



PLAN your shop around your dust collection and workflow needs. Include dust collection in your plan up front.

OK, woodworkers then think that, once they have all the FUN machines, they will add their duct collector. One problem – your shop, and tool location, needs to factor proximity to duct work or room for a roll around dust collector. You will look to keep duct runs and fittings to a minimum, and have your largest debris generating machines closer to the dust collector where loss of pressure will be least. You need to know, without getting too scientific, the requirements of each machine, the total resistance of your system, the resistance of the filter media, the loss of a bulk chip collector (such as a cyclone or a garbage pail with lid). Please – not to a gnat’s eyebrow, but you need to do a little simple math. The numbers are easily available on the internet or at your local woodworking store if they are decent. Woodcraft folks can help here.



Here is an integrated cyclone system (motor on top) with collection canister for large debris at bottom and high quality filter. Oneida. Not cheap. Just good.



A device familiar to all the men in the room. A garbage pail, used to collect larger chips and debris. Smaller stuff goes on to the collector filter. Easier to empty, other advantages. See the text.

Duct sizes and material are critical in minimizing resistance. Using a larger main duct helps to reduce resistance, as does using short lengths of flexible duct work, which adds large amounts of resistance (aka loss of static pressure) to your system. Shapes of fittings can cause great problems. A 4” tee fitting is a terrible solution to creating a branch, whereas a wye fitting is proper as it facilitates smooth flow of air as opposed to collision. Rather than use 4” duct on your main run, use 6” for less loss.



This is the shape of a good lateral, not a “T” fitting.

Duct material is also a hot topic. PVC – cheap and easy. Arcing and sparking! Perhaps not the spontaneous combustion we have heard about, but from the static electricity that build up in them. There is likely more danger of a fire from an external spark igniting flammables than from an internal fire, although one can occur if a piece of metal hits an impeller and causes a spark to settle in sawdust in the bag. Makes a good case for a 2 stage setup.



Allen uses large main ducts running off of his collector to reduce loss in his system

So – a collector for large debris, like a cyclone or garbage pail collector will trap these metal particles and other large chips in a collector while only allowing finer stuff to get on to the impeller and filter media. Easier to empty, safer, longer life for machinery, just a good idea. These create what is known as a two stage system Sort of like a septic system only handling different inputs. Think of the septic holding tank and the drain field. Better yet, let's skip that thought.

You can buy cyclone systems if you do not have a collector now, buy a cyclone separator to put on your existing system, or build a cyclone from widely available plans from all sorts of sources, including Woodcentral. They WILL reduce your system efficiency from a resistance perspective, so a collector needs to be sized for inclusion of one of these devices. A typical 1.5 hp collector will not have enough juice for a cyclone.



Some guild members enjoy a chat during the break at the November meeting.

Allen backed up all of his talk with math and graphs that looked like they moved by themselves if you stared at them long enough. One member remarked that if you looked at one of them long enough, the

image turned into a picture of Rosie O'Donnell. He left early...

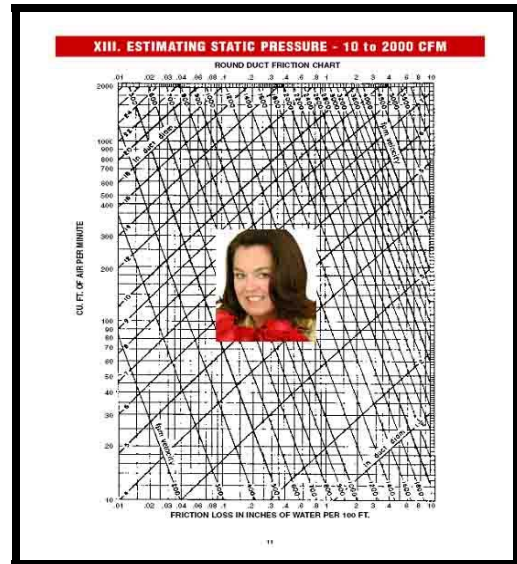


Chart Allen provided for calculating changes in static pressure for air movement changes. Some members saw an optical illusion when they stared at it long enough.



Curt Corum of Air Handling systems gave a great presentation after a 5 hour drive to get here!

Following Allen, Curt Corum of Air Handling Systems gave a very interesting presentation on duct and fitting materials and techniques. This had virtually NO sales pitch in it, but useful brochures from Air Handling systems were available which also made good references – a GOOD handout! With respect to ducting, metal is better than PVC for a number of reasons. Primarily, PVC will allow static buildup which will shock the dinner out of you. PVC will also scuff inside and lose efficiency over time. Just for your information, the NFPA, an industry standards group like OSHA, does not allow PVC to be used for dust collection ducts in industrial settings. You will not see it

in commercial cabinet making shops. If you have it and you like it, fine. PVC fittings typically, are not offered with sweeping radii needed for max efficiency. With regard to smooth pipe bends and how air moves, Curt alluded to running bases. It is a heck of a lot easier to ROUND first and ROUND second than it is to make right angles. Try it. I did just to test his theory. Running full blast, I hit first, make a right angle turn, then... The paramedics woke me up and said I'd be getting knee surgery right after Donovan McNabb. (My lawyer will be contacting you, Curt). Metal fittings are MADE for this application, or you can just pay more for a larger collector and still have inefficiency. With PVC, you are better off using 2- 45 degree fittings to make the curve than one 90 degree piece.

Tees are no good, as stated, and 45 degree branches are much better. Also, offset / stagger your branches – using an opposed wye fitting with 45's on either side is not good.

Even hoses need to be thought out. Rubber hose is best for table saws, shapers and jointers. Neoprene for sanders. Use a foot or two – only what you need – between duct and machine. Hoses also are made with exterior wear strips or coating if they are to lay on the floor or be subject to other wear. Also, there are nicely made quick release disconnects that are well worth the money.



If you are using PVC, two 45's are better than one 90 degree fitting as shown here.

Blast gates are another area for errors. The half gates which are cheap are not very effective. There is also a self cleaning gate that works quite well. Adjustable gates allow for multi use machines so that pressures can be adjusted and maintained at proper levels. So what kind of metal? Well, stainless is nice but very pricey. Galvanized steel is just fine, and pop rivets together easily. It is made to assemble almost as easily as PVC and is much more forgiving if you have to take it apart. It is naturally grounding and will not be subject to sparking if installed properly.



High quality blast gates are an essential part of your system.



A floor sweep addition is handy if you have a 2 stage system. See text.

Odds and ends – dust collection hoods on machines are usually designed as an afterthought. These should be neither too long and narrow or too short. They should allow dust to flow smoothly into the round opening of the hose to the duct. I have a planer that has one of these short wide hoods and dust is always gathering in the sides. You can make your own out of sheet metal, making a cardboard mock up first. Table saws do best dust collection when designed with the collection hood surrounding the bottom of the blade. Radial Arm Saw needs a two collection point approach, one at the traditional collection point and one behind the blade. Band saws benefit from dual collection points as well. Floor sweep attachments are great but ONLY with a two stage system to avoid damage to impellers and potential sparks.

About Air Handling Systems...

Curt Corum drove 5 hours to make this presentation, so a little biography on this company is in order. Thanks, Curt and Air Handling Systems!

Air Handling Systems, located in Woodbridge, Connecticut, is known as a leader in the dust and fume collection industry as well as for industrial air handling. Having designed dust collection systems for Norm

Abram's New Yankee Workshop, This Old House restoration in Milton Mass., and thousands of woodworkers, Air Handling Systems is known nationally in the dust collection industry and for industrial air handling. But that's just the start. We are also known in the HVAC, aerospace, pharmaceutical, chemical, powder and many other industries for both dust and fume collection. Air Handling was one of the first companies in the spring of 1995 to offer products on-line via the Internet. Today we continue to update and improve our site and are constantly working to make it more helpful and useful.

Each year we ship our air handling systems to every one of our country's fifty states. We also ship to Canada, Mexico and many countries located in the Caribbean, Central, and South America. Through the years of shipping to all corners of the Americas, we have developed an expertise on the best packaging methods and most cost effective shipping procedures. Our ability has reduced delivery cost and transportation time to our many thousands of satisfied customers. The company is a true family business. David Scott is President, Patty Scott is Financial Vice President, Jamison Scott is Marketing Manager, Mary (Scott) Hughes is a Sales Representative, Dave's nephew Curt Corum is Sales Manager, and his nephew Scott Hughes is in the Accounting Department.

As was the case in 1950, when our family first started in the sheet metal business over fifty years ago, we were and still are an American Owned company and are Proud to produce air handling systems with American Labor and American Material.

Their web site has hints and tips and a lot of ideas can be gained from looking over their online catalog.

www.airhand.com

Other resources:

General woodworking with search facility:

<http://www.woodcentral.com/>

Pentz article on Woodcentral

http://www.woodcentral.com/articles/shop/articles_190_shtm

There are also detailed plans on building a cyclone collector at Woodcentral.

Closed Door Sale at Woodcraft! Our favorite toy store!

Closed Door Sale at Woodcraft! Our favorite toy store!

December 16th, 6:00 - 8:00 PM.

OK Folks. Here it is! Woodworkers, get your significant other to buy your gift on December 16th.

A guild member sale event and more.

10% off SALE (excludes power tools, Festool and Leigh Jig).

Special markdowns on selected tools of all kinds.

Closeout specials of all kinds.

We will raffle off many items including hats, Tee shirts and other items including a Freud Raised Panel door set.

Food and drinks provided!

As with guild meetings, immediate family members are welcome.

This should be a fun night to get together and pick out your Christmas (or holiday of your choice!) gift! Let's face it, better than getting another box of socks!

Q&A – Take 10!

Well, your sometimes alert newsletter writer was trying to prepare the computer for Allen's slides and I missed it! Sorry! It was probably Allen's fault anyway.

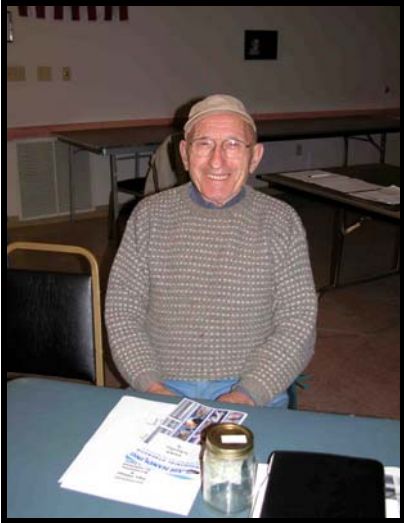
And the Woodcraft winner is...



John Truskowski is the WOODCRAFT gift certificate winner for November!

Masters award from October to Adolph Schneider

Adolph has been a faithful attendee of our guild and sometime presenter for many years. Anyone who has spoken to him knows he is a true gentleman and, for one as talented as he is, a very humble man. He will share his knowledge with anyone who asks him for it. His work is impeccable. Immaculate. You saw it in October. His skill is so far above that of even experienced woodworkers, it would have been unfair for the judges to include his work in a contest with even seasoned craftspeople. Hence, Adolph was rightfully awarded the Masters Award. Congratulations!



**Adolph Schneider – Masters Award Winner!
And always a class gentleman.**

Blocks – Good News, disappointing news..

The steering committee met at Woodcraft on December 5th to pack up the blocks in bags for delivery to the US Marines. The good news is that a few members (Like the Marines? A few good men – or women?) made some very nice blocks that kids will enjoy. The bad news is that, with many paid members in our guild who have a table saw and a sander, we had less than half what we delivered last year – a total of 32 bags of blocks. Thanks to those who understand that this is a GUILD. A guild has a lot of definitions, but the one this guild was founded on is that of an experienced artisan who passes on the techniques and values of his craft and passion to journeymen to carry on a tradition. Giving something enduring. Like blocks. I know that my stepson has wooden blocks in our home from when he was 3 years old. These are far nicer than the red, yellow, green and blue ones in Toys R Us, and may be a valued thing to a child to keep and pass on as well. Part of the gift of blocks is not only to give kids things that will last a lifetime – it is giving them a gift of wood from people who enjoy working wood. The wood was free for members who are willing to MAKE SOME BLOCKS.

I guess the purpose of this section is to thank those who gave of their skill and time and to share with those

who could have helped out and did not the disappointment we had in the rather sparse showing. Speaking for myself and the steering committee, I feel bad for Lou Supina who will be delivering these 32 bags to the Marines. Let's hope they were not expecting too much. No jokes in this section. I am off my soap box now.



Here is the 2006 production of our guild.



Packing up the blocks at Woodcraft.



The US Marines unloading our delivery of blocks. Looks like they were about done in this photo.

Drag and Brag

We had two very nice projects in November – one from a professional who never fails to amaze us and one from a fellow woodworker who just created something of beauty that rivals work of professionals.

Ken Burton brought in a clock that was unusual for folks who do not know his work, but, for those who have seen his work, is another meticulous piece of artistry with his signature style and fascinating choice of materials. (I guess you can tell I did not like it much!)



No big deal here. Just another fabulous Ken Burton piece.



You had to see this one in person - by Tom Biello. Built from some wood handed down by his wife's family.

Representing the Non-professionals, Tom Biello made a beautiful tea box from wood that belonged to, I believe, his father in law. (forgive me for not getting that perfect – it was a hectic evening..). Spalted maple and walnut that impressed even the pickiest perfectionist. Very nice work and selection of materials.

Steering Committee Meeting Notes

Andy Anderson gave a treasury read out which was accepted by the Steering committee. Of major expense was the Lehigh County Senior Center for year 2007. The guild treasury also acted as a waypoint for the Taunton Books money – we wrote the check and deposited your funds.

We discussed the speakers for 2007 and are still looking for folks. HELP US OUT! GIVE US LEADS!

The rest of the meeting time was spent packing blocks and discussing the logistics of the Woodcraft sale.

Business Opportunities for Members

Just a reminder..... If someone wants to start this as a spinoff team....

If there are members who are interested in selling their wares at local venues, and you want to use the forum of the guild to gather members who would like to sell their wares, we will bring this up as a topic of interest at the next meeting. If there is enough interest, someone should step up as a chair person to bring these people together. Once the team is started, you are more or less on your own with how you manage this activity. Of course, you can use our "opening remarks" and this newsletter as communication forum (Sort of like we market ANY vendor who is in our guild, we would like to know any events that a team of guild members may be working as FYI), but the business aspect of any sub team that would be formed is not guild business. Communication and organization activities of any such team would be done outside of normal guild time and scope. Think about it, and think about if you would like to chair something like this if there is interest.

VIRTUAL SHOP TOURS! AGAIN!

I guess we are all out of virtual shop tours. Maybe a presentation of your tool box or car trunk? I love it...

Wood Specials

SHADY LANE TREE FARM

Louise & Mike Peters
5220 Shimerville Road
Emmaus, PA
610 965-5612 Please call

FLEETWOOD LUMBER & FLOORING

BILL BURKERT
27 Rapp Rd.
Fleetwood, PA
610 944-8364 Please call

Member discount 5%

Bailey Wood Products, Inc.

441 Mountain Rd.
RD#2 Box 38
Kempton, PA
610 756-6827

Woodcraft

Pkwy Shopping Ctr.
1534 Lehigh St.
Allentown, Pa.,18103

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Web Site Administrator : Lou Supina	215-679-4234
Treasurer: Harold Andy Anderson	610-965-4828
Book / Purchase Coordinator Gerry Chiusano	610-730-3958
Guild Contact Person – E-mail Russ Reinhard	

Member's Mart – For Sale

- Andy got the aprons! \$20 per apron. Nice stuff!



From The Shop



The newsletter of the Lehigh Valley Woodworker's Guild
2006 Meeting Calendar:

Month	Topic	Speaker
December 19 th	Holiday Party	
January 16 th	Band Saw Boxes	Fred Matlack!
February 20 th		
March 20 th	Grumbine Turns!	Bill Grumbine!
April 17 th	Carving	Phil Alcock – NJ Professional Woodworkers Guild

NEXT MEETING – Tuesday, December 19th, Starting at 7:30, sharp. Allow time to arrive and be seated before start time.

Location: Lehigh Co. Senior Center

Topics:

- Holiday Celebration for the family!
- Take Ten – 10 minute Q&A problem solver session

Lehigh Valley Woodworkers' Guild
C/O Dan Manturi
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