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Diy woodshop dust collection system

1/9 FAMILY HANDYMAN You don't have to deal with that irritating layer of sawdust that seems to settle throughout the store, garage or basement every time you cut and sand a few lengths of upholstery. You don't even have to shell out big money for a central dust collection system. You can capture the most annoying dust in a standard store vacuum and several accessories. We'll show you how to assemble simple, cheap dust collectors that suck up most of that sawdust before it gets to everything. Read this story to learn how to keep things from getting too dusty at work. 2/9 FAMILY HANDYMAN If you're lucky, you can plug a vacuum hose directly into the dust hole of your tool. But this does not happen often, because the size of the dust ports for power hand tools varies. The best strategy for compiling a dust collector system is to buy a universal adapter. Simply cut the soft rubber with a utility knife to fit in the tool dust hole and vacuum hose for the wood dust collection system. (For most hand held power tools, we recommend a 1-1/4 inch hose.) However, keep duct tape on hand for completely sealing odd-size dust ports. 3/9 FAMILY HANDYMAN Buy 6-foot (or longer) length 1-1/4 inch hose to connect directly to hand held power tools. Then connect the 1-1/4 inch hose to the standard 2-1/2 inch vacuum hose with plastic friction. The smaller hose is light and flexible compared to the larger hose. No pulling, no kinks. You will hardly notice a 1-1/4 inch hose as you move a saw, fender or other tool through a round piece. Most grinders have dust ports, but relatively few circular saws and routers have dust collection systems. 4/9 FAMILY HANDYMAN Althen days, most bench-top saws and planers have dust ports, and they make a huge difference in dust control, even with the store vacuum. You won't get it all, but even an 80 percent reduction will help a lot. Connections are usually easy. In most cases, ports are standard 2-1/2 inches, so you can simply push the 2-1/2 inch vacuum hose directly into the port as we show here. It works best with larger capacity vacuum cleaners because sawdust and chips from a table saw or planer build up quickly! 5/9 FAMILY HANDYMAN Ideally, tool manufacturers should standardize dust ports so you could quickly move the hose from one tool to another. But that's not the case yet. In the meantime, save time and frustration by installing the adapter permanently on heavily used tools such as shrink saws. Then you can simply plug in the hose. 6/9 FAMILY HANDYMAN Higher-priced shop vacuum cleaners often come with a special switch that turns on the vacuum automatically when the tool starts. (Fein is one brand.) This is a great feature because you don't have to walk into a vacuum store to turn it on every time you want to make the cut. This problem you can also solve in three three Ways: 7/9 FAMILY HANDYMAN You have noticed a cloud of fine dust that blows out of the exhaust when you turn on most shop vacuum cleaners. Small dust particles flow directly

through the store's standard vacuum dust filters. To stop this fine dust, buy a high-quality HEPA filter from any store that sells your vacuum brand. They are well worth the price because they last a long time and can be rinsed clean. 8/9 FAMILY HANDYMANDust collection hoses add to the mess in a small store. But if you tend to work in one area, you can remove some tangle and keep the tool from getting hung loosely by hanging the vacuum hose from the overhead hook. If you want to go all out, add a few in the areas where you work most often. 9/9 FAMILY HANDYMANMany power tools do not have dust ports. But if you are doing a lot of cutting and drilling, you can easily place a portable dust collector nearby. Depending on the system, you may need to tink with adapters and metal pipes (from home centers) in order to transition to a vacuum hose. You can also rumming down the HVAC aisle at your local home center and put together a cheaper system with portions of stock and duct tape. Originally published as December 04, 2020 Like many people, after retirement I built a woodworking shop. I looked at commercial dust collection systems, and didn't like the look of 4 hoses laying all over the store. I also didn't think I needed the ability to operate several machines at once because it's just a hobby shop. I decided to look at the possibility of using a smaller diameter wall pipe system using PVC. My logic here was that a smaller diameter with adequate CFM led to higher speeds, hopefully resulting in similar performance using one machine at a time. I also wanted to use my existing shop-vac, knowing from experience that the 5.0 (top) HP unit was more than adequate for the machines I have, as I have used on any, hand changing hose. The last requirement was that had to turn on automatically, I was tired of aw crap, forgot to start shop-vac first! With all of the above, the photos pretty much explain where I went from there. 1-1/2 PVC water pipes with 1-1/2 electric wall brackets pipe facilitates adjustment. I opted for ball valves instead of blast gates, mainly because it would take more work to match the forework for the blast gate. The standard 2-1/2 vacuum hose didn't quite match up to the outdoor pvc diamater, but as always, the handyman's secret weapon with duct tape provided the solution. I wrapped the adhesive tape on the PVC pipe end up to a size where I could use a hair dryer to extend the vacuum hose and slide the hose through the adhesive tape. When the hose cooled, it fit perfectly. I decided to soon use the dust representative of the cyclone and capture most of the dust and chips as they shop-vac so that I should not clean so often. Another drivers was that it allowed me to put a shop-vac over the ceiling. More floor space and less noise. The unit is easy to mount on the drum lid with six 1/4 metal screws (not included). I have to say that at \$40 I bought a little pig-in-a-poke, but it really works as an advert. I have half filled a 30 gallon drum with sawdust and still empty the shop-vac or clean the filter. I decided to anchor the PVC pipe going through the ceiling using a floor flange for the electric pipe and drilling a free hole for PVC, then sticking PVC in place. I also used tubular clamps above the ceiling for PVC. I looked at a few commercial current sensing products to automatically turn on the shop-vac when I started one of the machines, but the price was about \$50 per machine for remote nodes, plus the controller itself. I, fortunately, have all 5 machines that I use shop-vac on, on one circuit, which simplified the automation requirements as I just had to follow one point. I settled on a design that didn't limit the current in case I tried to run multiple machines, using the Aprilaire 51 current sensing relay, which is commonly used for humidifier circuits running from the motor fan engine stream. This is only rated for 50 watts, so I used to drive the relay. When I first prototyped the circuit, the relay was energizing immediately. After replacing the current sensor gave the same result, I began experimenting with loading, and found that although the specs said 50 watt max, it should also have said 10 watt minimum load. Specifically the relay I used only draws 10ma and measures 5k ohms resistance load, so I added 2k ohm 20 watt wirewound resistance parallel to the relay coil to increase the load and keep the relay from a false start. The system has been running for for about a month, and is working to my expectations, with more than enough vacuum and speed. One gotcha in my system is my paper barrel. I closed all valves with shop-vac on and it imploded. Nice ad for shop-vac I guess. I'm not good at writing conclusions or writing at all for that matter, so I end up here I guess. I am happy to answer any questions. Thanks, Steve Update – 10/30/2012 I was still having trouble after 3 months with occasional fake triggers from my garage door opener. I modified the circuit by replacing the original relay with a single contact relay and replaced the 2000 ohm resistance with a 40 watt bulb. It has run well ever since, with no fake triggers, but I have a questionable update to this site. I also added a wall switch directly through the current Aprilaire sensor to help clean the store. The switch energises the relay to run the vacuum directly so I can connect a 20ft hose to clean the floor. Steve Update - 10/24/2014 I added a 25 foot hose to clean the store floor. Looking around the one that worked best was the pool skimmer. I added another valve and elbow, and this hose fit inside the elbow with duct tape where 2 1/2 went to the outside of the pipe. Live on the right I think. The hose reaches everywhere in the store, even the cobwebs in the corners, and the standard attachments all fit. Thanks, Steve Update - 12/4/2014 Replaced a small dedicated vacuum system on my mitre saw with extension ran through the ceiling. The \$20 vac never quite managed the airflow generated by the saw. I left the valve on the other side of the room, true that it's not that smart, but I can achieve it easy this way, and it allows me to put flexible vacuum hoses high on the wall for the swivel way of the saw. I also ran specialized wall sockets for a saw from a sensed perimeter all over the room for other tools on the vacuum system. Again, since I only use it for one tool at a time, there is a lot of capacity as an electrical and vacuum system. Thanks, Steve Months ago I shared a tour of the OPC workshop, and I clearly remember William calling BS because the store looked so clean. What can I say? I like clean trade. I also remember Tim R. encouraging me to get dust collection resolved for health and safety reasons. With that in mind, I've been working on a dust management system in our store for the last couple of weeks, and it's finally complete (at least for now). Dust management (DM) is not something you want to jump into blindly. It is important to plan materials, port locations, find compatible products and more. Plus, it's especially difficult to interface flexible hoses with a fixed tube (a must for any dust management system). Read on to learn how I've dealt with these challenges so you can create a DM system of your own. Materials 6 PVC and fittings (see below) 4 PVC 6 Flexible hose (see below) 4 Flexible hose (see below) 6 Hose clamps 4 Hose clamps 6 Sheet fittings (see below) PVC cement 4 Blast gates (see below) Floor Sweep (see below) 4 – Reduction 2-1/2 (see below) Hanging strap Silicone sealant Aluminum tape Metal screws 6 PVC There are several different types of PVC out there such as sewerage & sewerage (S&S&D), sewerage, waste and vent (DWV), SDR35 and others, and each has different characteristics. I am convinced that only about any of them will be able to handle the requirements of the dust management system, so the factors you want to consider are size, weight, availability and price. I chose the 6 DWV, foam core PVC because it is the largest size my dust collector can handle, and the foam core means it is much lighter than the alternatives. Unfortunately, it's also more expensive, but that's what was readily available at my local plumbing supplier. Gates, floor sweep, reduction and flexible hoses These are all products (mostly) specific to dust management systems, and Amazon is the best source for finding them. Here are links to what I used: Sheet metal one of the difficulties in creating a dust management system is making all the connections, and I ended up using several 6 sheet metal fittings to overcome some demanding connections. I picked up the starter collar and curled dry out my local HD. Tools This project does not require too much in the way of tools. Here's what I used: Drill/Wire Dremel with Ring Cutter DeWalt 12v Rotary Reversible Saw Rubber Stick Dust Collector The heart of any dust management system is a dust collector, and Delta was kind enough to send me a Delta 50-786. This unit is equipped with HP 1-1/2 induction motor, 1 micron filtration and 1200 cubic ft. / min (CFM). It is possible to accommodate two 4 ports or one 6 port. The snap in the bag ring is really suitable for quick replacement in the new bag too. I've had this unit setup with my desk seen over the last couple of months, and I'm so impressed by how many sawdust it captures. If you own a workshop, you know how tiring it can be to sweep sawdust all the time, and that's why I'm excited to integrate the 786 with all my workshop tools. Check out the full review to come. It is a single-stage dust collector, which means that everything goes through the impeller and into the collection bag, and the top filter collects small particles. The two-stage collector is even better because it first separates heavier pieces, which increases efficiency, and has the added advantage of protecting the impeller from harmful impurities. As you might expect, two-stage dust collectors also have a higher price tag and have a larger footprint. The 1-1/2 HP is powerful, and I've actually suing things that I thought were out of reach! Even so, it's at the lower end for a dust management system, and a 2+ HP unit would be preferable. Dust collectors are loud, so ideally I would place this unit in an adjacent room. This is not possible for me, so I need to be satisfied with storing the dust collector in an out-of-the-way location. Although the owner's manual shows a convenient flange to connect 6 flexible hoses (instead of two 4 ports), my unit had nothing like that. This is one of the reasons I had to get creative and bought a sheet metal starting collar. Should I ground my dust management system? If you look around online, there is some discussion about using PVC or metal pipes for dust management system. If you ignore differences in price and availability, the argument boils down to safety. Flammable dust (like sawdust) creates the potential for a lightning fire and explosion, and the National Fire Protection Association (NFPA) reports that just under 420 there is cause for concern (see source here and read more here). In short, the dust cloud is quite flammable and only needs a source of ignition to cause problems, and this source can be anything from static shock to a hot engine. In addition, air and particles moving through PVC or pipes build static electricity. One solution is the grounding of the entire system, which is easily carried out with metal channels. However, PVC is an insulator, so grounding the pipe is out of the question. After everything I've read, here are my two cents. PVC is a good choice for a dust management system, and since it's an insulator, the chances of a spark occurring inside the pipe are minimal. The OPC shop is a small-scale operation, and I doubt I'll ever have a highly concentrated dust cloud that could actually explode. So the real threat is the source of ignition, which starts to burn in the garbage bin. For this reason, I regularly empty the basket. Finally, I plan on operating ground wire on the outside of the pipe because I want to avoid shocking myself should enough static charge build up. Pipe layout planning The purpose of any dust management system is to maintain suction on the tool and the correct direction of the pipe can make a big difference. Here are some tips: The closer the dust collector is to the end point, the better. That means plotting the route as far as possible. Bends and turns negatively impact performance, so keep those to a minimum. Use long sweep elbows or even two separate 45° forgings to create a large radius turn rather than short, fast turns. Opt for wye fittings rather than T to improve airflow. Keep as many pipes as possible. Flexible hosing creates about twice the resistance of a solid pipe, so it tries to minimize flexible hoses. For my setup, I created 6 run from my dust collector to the attic and down right next to my desk saw. I integrated several large ports on this one line so I can connect my desk saws, floor sweep and 2-1/2 port (rag saw, router, store vac, etc.) I also limited wye mounting in the attic for future expansion. Step 1: Cut out drywall To do all this, I started cutting circles in the ceiling for my PVC using a squat circle cutter. Step 2: Run PVC somehow I managed to finagle PVC in place, supports all pipes with metal hanging straps attached to roof beams. I decided to glue everything because I wanted to ensure an airtage fit and because it will help support the pipe. On the other hand, 6 PVC fits very cosily, and it's much easier to laugh at PVC, if the forays are not glued together. 6 PVC is hard to work with just for its sheer size. I quickly learned that forming doesn't change after a full session, so it was important that they were turned on in the right orientation. You also go through cement very quickly. Quickly. Look for running next to my saw table. It has two 6 x 4 wyes and a reducer at the bottom. I fit a short part of 4 PVC on each mount before installing my blast gate. Some of my cuts weren't very nice, so I hid them in forks and used factory edges when they were visible. Step 3: Install the Blast Gates Blast Gate direct airflow to the appropriate tool, and they have the added advantage of having fit an internal diameter of 4 PVC or flexible hoses so they actually act as a solder. Secured my gate explosion with two screws and sealed the edges with silicone. Step 4: Make final connection Here's a look at the blast gate and my 2-1/2 port. This will serve as a connection for the router, store vac and others. Here is a floor sweep, and it is very convenient to sweep dirt and dirt into it. I have secured a short part of 4 flexible hoses with hose clamps on both sides. I originally planned to use double-sided tape to ensure the floor sweep. It actually works just fine without I could nix that idea. For table saws, I connected 4 flexible hose hoses with hose clamps to the blast gate on one of the wyes. I don't have a great solution for my rememflation saw. To really capture the sawdust I would have to set up a hood, and I didn't figure out the best way to integrate that with my mobile mute saw the workstation. Step 5: Connect the dust collector as I mentioned Delta does not provide an easy way to connect 6 flexible hoses, so I bought a starter collar. It had adhesive and pre-drilled holes for screws. Just make sure the screws are short enough not to damage the impeller fins. In the picture you can also see that I fastened 6 flexible hoses to the wavy end. Next, I covered the whole thing in aluminum foil tape to remove air leakage. At the other end of the 6 flexible hose was 6 metal dry. Ideally, I would use 6 PVC joints. Unfortunately, I'm not sure if anyone makes connections that big. With a few screws hose clamp and bundle of foil tape I connected a flexible hose to pvc. Finished I fired into the dust collector and listened to all the knuckles for loss of air and found a couple of places that needed some silicone. Otherwise, it was very tight. Using a table saw was a real test, as I have become accustomed to minimal drinkers. I grabbed a scrap piece of plywood and made about 15 cuts, and I'm glad to report that almost all the sawdust has been vacuumed away. I feel really good about how it turned out, and I'm glad it's going to be easy to expand as I add new tools (like bandsaw one day). This DM will not have a place in the air filtration system. However, it's a big step forward in keeping my business clean and safe.

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