Vacuum Systems & Vacuum Chucks

by Mike Heneghan

First, I would like to discuss safety issues when using a vacuum system. A vacuum system for your lathe can be an excellent tool and addition to your workshop. However, just like any tool in your shop, it can hurt you and cause injury. Keep a clear mind! Don't use anything in your shop if you are tired, don't feel well or under any medication. Always keep an eye on your vacuum gauge in case you have a drop in vacuum pressure due to leaks or voids on your working piece. I would not turn a foot if I couldn't get at least a reading of 15 on the gauge. And just as important, make sure you are using freshly sharpened tool. I personally feel that a vac system and chuck is only usable safely when turning the foot on a bowl, platter or small pot or vase.. ***Although I have seen a someone turn a bowl from scratch using the vac system, I do not recommend it.***

One of the requirements for a Vacuum system is a through head-stock. If you don't have this, there are companies (Vicmarc & Oneway) who sell a rotorary adapter that attaches on the inboard side of the head-stock, with a spindle adapter for the vacuum chuck. The disadavantage to this is the extra expense, and the horizontal extension of your work piece. Oneway also sells the adapter for the outside of the headstock, allowing you to keep your wheel. I think they are around $99. A cheaper alternative is the Holdfast Universal Adapter Kit for $60.00 at WoodCraft.

I have used my vacuum system for about four years now, and it is really handy for turning that special looking foot on a bowl or platter. The system enables you to achieve the smallest detailing without anything in the way, plus no sanding or carving off that last bump in the middle. However, if you buy a vac system say from Craft Supplies you will end of spending at least $800 for a vac pump, gauge, tubing & fittings, chuck & seals, faceplate chuck and rotary adapter. But, with a little research you can cut that cost down to about $200 or less. Some of the items needed may already be in your workshop Take a look at my website for more information: www.mikeswoodturning.net

The first step would be to find a vacuum pump. Your pump will need to pull at least 2.5 CFM (cubic feet of mecury). If you can find one at 3.0 CFM, that's even better. I use the Gast is 3.5CFM and bought it from the Supply Center in Lincoln NE at $89.95. However, they now have a different model at a little over $200. A great vac pump compared to $389 at Craft Supplies. There are two types of pumps; oiless vane, and oiled. With an oiled pump you have to keep the oil resovior full but it is a little less noisy. The oiless vane pump is a little noiser but heavy duty and will probably last longer. The big plus is that you dobn't have to worry about the oil. See the links on the last page for a good vac pump. You may even find a used pump used in refrigeration industry.

Next, you need to acquire vacuum tubing and fittings. Most pump fittings are 1/4 inch. But you can use gas fittings and neck them down to 1/4 inch. You'll need a vacuum gauge and filter. I used a compressor air filter from Harbor Freight ($19.95), the just reversed the hook up for vacuum instead of compressed air. However, I did notice that some Vacuum Pumps come equipped with both a gauge and filter. So, that is another option. A friend had some 1/4 inch pressure fittings and 6mm vacuum tubing, so I lucked out. You will also need some type of shut off valve or on/off switch for the pump. On my pump I use about 8 feet of propane tubing connect to the exhaust port. this helps to reduce pump noise.

Vacuum Chucks & Faceplates: This is really a broad subject, because there are so many ways to make a usable vac chuck or faceplate. A faceplate is just a nice thing to have for a larger bowl or platter. You can easily get along with just the chuck. A chuck can be made from round plastic in different sizes & tapped for your lathe. (Ref my 3 March 2012 demo) You can also make a chuck from laminated marine plywood then sealed or hardwood then sealed and painted. I know of turners using 4 inch waste pipe with a toilet pan seal, using a plywood backing plate & attaching a 3 inch faceplate. There are a few options to mount your chuck on the lathe. You can sacrifice a faceplate on a wood or plastic chuck; drill a hole to glue in a large nut to thread on your spindle; or acquire some round plastic then tap one side to your spindle size.

Vacuum Chuck Seals: There are several types of material you can use for seals. You can buy them from WoodCraft or Craft Supplies USA. The cheaper way is to look around and experiment with different materials. The main requirement is that the seal must be of a ***closed cell*** material (air cannot pass through it) They say that and old scuba wet suit is great for seals. When you buy a new electronic device, TV, DVD etc, keep that shinny plastic it's wrapped in. It makes an excellent seal for chucks.

Hook up is really simple. Tubing connects to vacuum side of the pump, through the filter & gauge to the release valve and then on to the rotary adapter. I connect about 10 feet of rubber gas hose to the exhaust side of the vac pump to reduce the noise. I put everything on a wooden panel which is bolted to the wall.

If you have any questions please send me an email or give me a call.

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