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Making a Vacuum Chuck

by Kurt Hertzog

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The faceplate used in this example is a homemade one made by welding a 1"-8 nut (for my particular lathe) to some mild steel and then turned round.

Obviously, the weld must be leak free or any leaks need to be plugged with caulking prior to use. Other than cost, a factory made steel or aluminum faceplate would have worked equally as well. I have made vacuum chucks with no faceplate by drilling and tapping the thread into a hardwood. I've used Maple and Walnut with success.

A hole is drilled in the center to couple the vacuum through as well as three holes drilled for fastening the faceplate to a wooden block. The vacuum hole need not be dead center. I drill all of the holes on a drill press. It's easier and cleaner to drill the steel there than on my lathe. Because this is for a very light duty vacuum chuck, I chose three holes for mounting. If you are planning a larger or heavy duty chuck, make sure you select enough mounting holes and the properly sized mounting hardware for safe operation.

I am using a piece of plywood that is thick enough so the mounting screws (3/4" #8s) won't protrude.

The circle is loosely cut on the bandsaw leaving extra for trimming on the lathe.



The faceplate is checked for fit and the best side of the plywood is used to seal to the faceplate.



Probably not necessary, but I use whatever caulking compound is around to seal the wood to the faceplate.



Not much is required. Just a ring that will seal around the center vacuum hole.



The faceplate is mounted to the wood block with the 3/4" #8 screws.



The worst side is out with the best side creating the seal to the faceplate with the assistance of the caulking.



The vacuum hole already in the faceplate is drilled through the wood block now while it is easy to do.



The faceplate is mounted on the lathe for truing and balancing.



With no reason to be at exactly the same diameter as the steel on the faceplate, the wood is only turned until round and close in diameter.



Rather than leave a sharp corner on the front, I roll that edge using a sweeping radius to the approximate edge of the tube. By breaking the sharp edges on the front and back the wood block becomes much operator friendly if you should brush against it.



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By trial and error, I open the id until it's close and tune the id as well.
mounted.



By trial and error, I open the id until it's close and tune the id as well.



Once it's a press fit, I open it to a slip fit and allow for a radius in the corners.



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