. Building a self-driven 3" vacuum sander

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I had often seen and wondered about having a self-driven sander and then on the www.woodessence.com site I saw that Mirka had Abranet 3" Sanding disks and backing pads with 6 hole pattern. This got me to thinking that I could build a vacuum version of a self-driven sander…. The starting materials are shown in Figure 1.
3" abranet disk, 3" soft foam backing pad, 3" sanding disk, 3" pad saver disk, 2"x1" aluminum blank, 37mm x 25mm x 7mm bearings, 3/4" brass plumbing sleeve and a copper 45° 3/4" pipe fitting.

Figure 1

The first thing was to modify the 3" sanding disk to having 6 vent ports… this was accomplished by attaching the ported Mirka saver pad onto the sanding disk to act as a drilling template. An 8mm brass pen sleeve was sharpened with a small conical grinding stone and then used in an electric drill to core the sanding disk foam down to the internal phenolic disk at a slight angle so the exit holes on the back of the sanding disk were within the depressed area of the disk. (One may have to detach the cored foam with small needle nose pliers). There is a phenolic disk embedded in the pad which had to be drilled out using a regular drill bit on the drill press. First the centre holes were located by using a 1mm drill in the hand drill approximating the center of the angled holes through the foam through the phenolic disk… then these were enlarged using an 8mm drill bit from the back side of the disk with a drill press.

The next operation was to make the bearing retainer/sanding disk connecting hub from the aluminum blank on the Taig lathe.

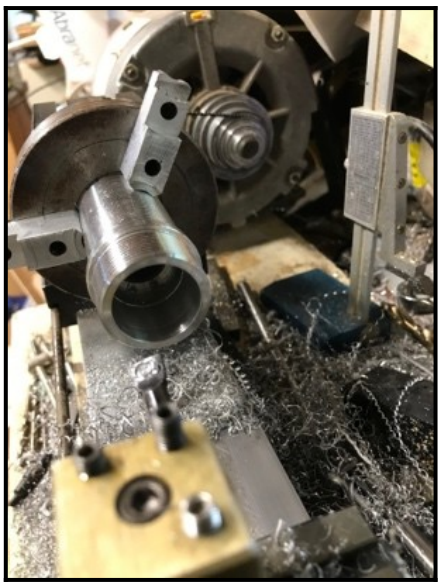
The block was mounted in a 3 jaw chuck on the lathe and a center drill used to mark out the center of the disk. Next a 5mm hole was drilled through the block so it could be taped for M6 to accommodate the M6 stud on the sanding disk. This was then taped on the lathe turning the chuck by hand so that the threading operation would be center aligned.

Then a recess was created so that the edge of the hub would just meet the foam backing ridge on the sanding disk when it was threaded into the hole (left). The hub was then reversed in the chuck and the bearing retaining hole machined in (center) This was accomplished using a carbide insert 1/4" tool bit in the tool bit carrier, resulting in a bearing retaining pocket 37mm x 14mm. The bearings would just barely slide into the holder (right).



Then six 8mm ports were drilled on a 3/4" radius on the drill press to give you the pattern seen above, with the bearings in place and the sanding disk threaded in place. The next operation was to place the head back in the lathe and taper the upper half of the holder to make it less heavy and more streamlined.

The inner brass sleeve was turned down to 25mm so that it would fit inside the bearing and a small shoulder created so it wouldn't bottom out in the housing. The bearings were fixed into the housing using LocTITE 609 bearing retaining compound, as well as the inner brass sleeve. The 45° copper fitting was epoxied into the inner brass sleeve. Thus the rotating sanding head was created.



The handle was made of carbon fibre with an aluminum bolster epoxied in it that was bored out to hold the copper fitting. The bolster was hollowed out back on the Taig lathe.

Back on the wood lathe, a piece of 1 1/2" PVC pipe was held in a chuck and turned down to 32mm to accommodate the flex hose in a friction fit. The PVC was then reversed in the chuck and turned down to 35mm and a groove cut in it for an O-ring to friction fit it to the carbon fibre handle. When it is all put together you have the completed 3" self-driven vacuum sander seen below.

Happy bowl sanding….

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The Nova Woodturners' Guild is a group of interested in the art and craft of woodturning. Our skills range from beginner to professional. Many members are also active in the Nova Scotia arts and crafts community and are members of the Nova Scotia Design Committee.