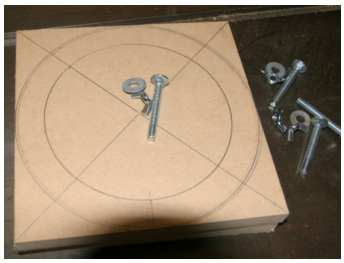
BUILDING A STRAKA CHUCK

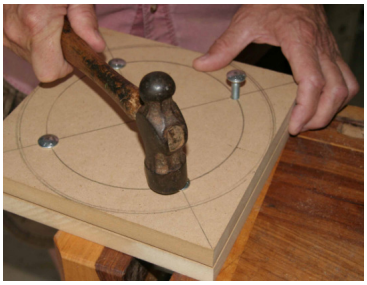
I was introduced to this chuck by Bob Marshall in the mid 1990's. Alan Lacer wrote an article on it and named it the Straka Chuck, see AAW Journal article "The Straka Chuck," 23.1:50–53. I have limited patience for cutting and assembling accurate parts. The method I describe below will make an accurate chuck if I drill 5 straight holes. The lathe does the rest. This chuck is useful for turning the bottoms of bowls or working on spheres.



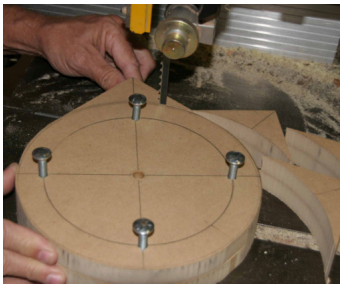
Cut two squares of MDF. Shown are 9" squares with center lines and 7" circle and a 9" circle. This will hold spheres from 2 ¾ to 6" diameter. You can vary the dimensions to suit your needs. Short bolts make the assembly quicker for making the chuck. The long bolts may hit the head stock of your lathe when making the chuck as they will stick out further without work in them.

Drill bolt holes where the 7" circle crosses the perpendicular center lines. Hold the two squares together and drill the first hole. Use scrap MDF as a back block to drill into for a clean exit hole. Insert a bolt in each drilled hole to keep the drilled holes aligned while drilling the next hole. I use 5/16 " carriage bolts.

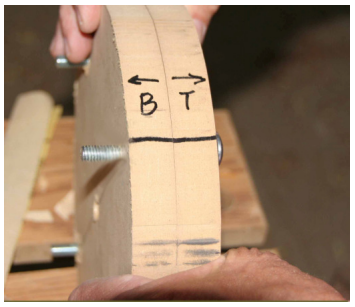
Drill a hole in the center to match a screw center. The worm screw in my chuck uses a 10mm bit. This hole must go through both pieces. We'll use the hole in the bottom piece.



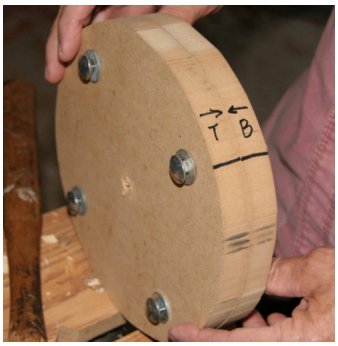
Tap the carriage bolts into the top surface to seat the square portion.



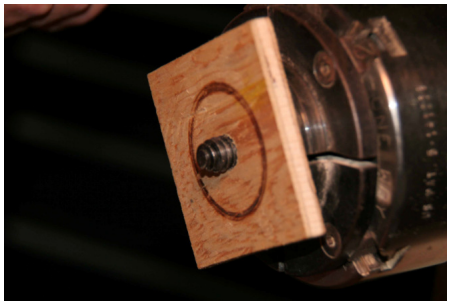
Cut the two discs round on the band saw. If the bolts are loose and slip through they will catch in the miter track. A turn of masking tape will keep them from slipping through.



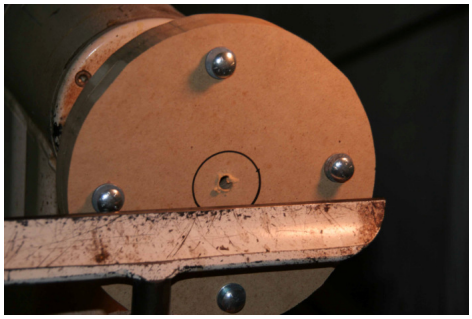
Make a witness mark for aligning the chuck. I don't rely on my holes being in a prefect square. The mark enables me to align the holes as they were drilled. Mark the bottom and top pieces. Put arrows to point to the top and bottom faces. The side you set the bolt head into is the top.



Assemble the pieces so that the top and bottom surfaces face each other. The arrows now point to the center. I put a washer on the bolt head side to prevent it from pulling into the underside of the chuck top.



Put the worm screw in the 4 jaw chuck. The screw should only hold the bottom piece. My screw is too long so I use a plywood spacer.

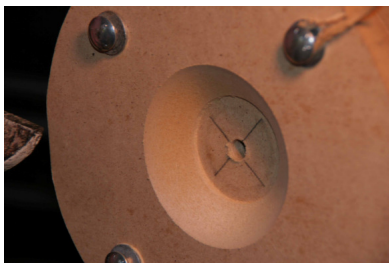


Mount the bolted pieces on the screw center. Snug it up tight. Don't over do it! You can strip the threads in the MDF if you over tighten. Mark the diameter of the opening in the top of the chuck. here 2" is used here. This allows you to work on about 1 ¾ " of the object held in the chuck. You may wish to make this opening larger or smaller.

Part straight in on the marked diameter. Make relief cuts. I like using a small square end scraper since the upper left corner will ride straight in on my diameter leaving a clean hole. A skew flat on its side used as a scraper would work too.

When you have cut through the center waste will fall free. Throw it in the trash so that you Don't trip on it.

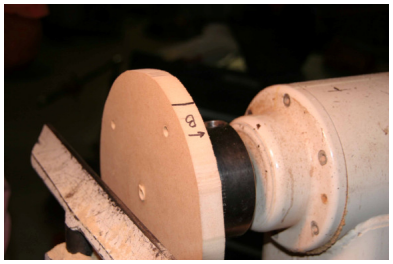
Starting at the edge of the hole make a series of parting cuts at a 45 degree angle.



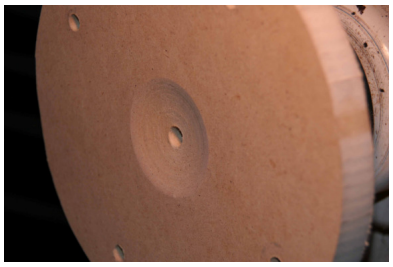
The last cut should end at the inside edge of the bottom of the hole.

Remove the bolts and the top section. Mark the diameter for the expansion grip of your chuck jaws. Use a small square end scraper to make a flat bottomed groove in the MDF. (A small skew on its side will work.) The groove should have a straight outside wall parallel to the ways of the lathe and a flat bottom about 3/8" deep.

A ¼" to a ½" larger than closed is a good choice for easy on off and a solid grip. *** DO NOT GRIP a TENON with MDF. It will twist off! ****

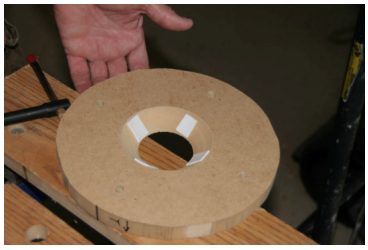


Remove the screw and mount the bottom part on the chuck using the groove you just made.
Note that the arrow points to the bottom face which is now mounted in the chuck.



Use a bowl gouge to turn a shallow rounded depression. This is like a very shallow bowl. This will help center a ball placed into the chuck. The depression is less than ¼" deep.

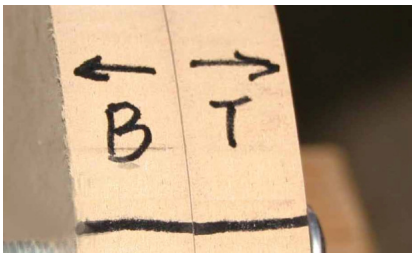
I use Fun Foam on my chuck. Fun Foam is sold at most craft stores. I use the adhesive backed sheets that are great for use with vacuum chucks and any sort of chuck that requires padding.

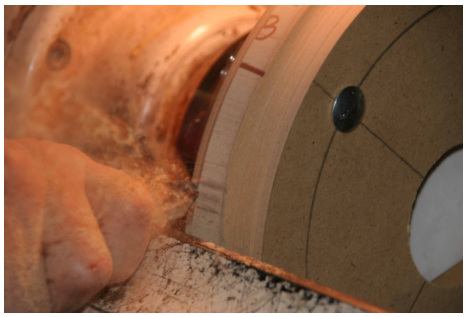


I put 4 small squares of the foam on the inside of the top piece. This works better for me than a solid piece for centering the work and for installing the foam.

On the bottom piece I cover the depression with a square of Fun Foam. The Fun Foam will stretch and adhere to the surface of the shallow depression.

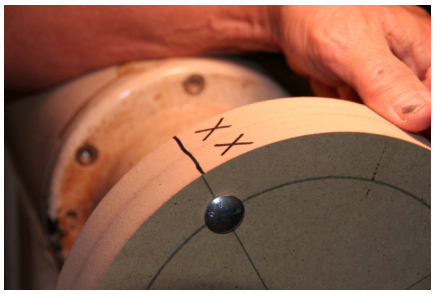
Bolt the two chuck parts together with the bottom and top surfaces facing outward.





Trim the edge with a bowl gouge. It will produce nasty dust. Wear a dust mask! Ride the bevel toward the center from each end. Cutting will give a much nicer surface than scraping.

Make a witness line for reassembly. I add a unique letter or symbol on both chuck parts so I will know which pieces belong to the same chuck. Put in the 7" bolts and it is ready to use.



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