

Workholding aids & chucking – part 8

In the next part of his workholding series, Kurt Hertzog looks at the subject of jam chucking in detail and ways to maximise its benefits

We'll get ourselves diverted if we begin our discussion with 'is it jam or jamb chucking?' You may see it written either way. A review of the definition of both words will allow proper usage depending on your point of view. We also might confuse things if we suggest that jam chucking is nothing more than using a very stubby mandrel or interference fit friction drive. Let's leave all of those semantic issues aside and explore the incredible potential of the jam chuck method of workholding.

In essence, jam chucking acts like a form of both mandrel and friction drive mounting. This workholding method combines the benefits of both. It couples those benefits with the immediate and custom creation when needed. Using a jam chuck has many benefits but the most attractive is the near zero cost of implementation. Jam chucking allows you to use small bits of wood that usually would be destined for the burn pile in a very

productive manner.

In this article, I will go on to explain what jam chucking is: as well as some of the ways to use it; key features to employ it; easy ways to create your own jam chuck; and some ways to maximise the benefits of this useful workholding method.

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WHAT IS JAM CHUCKING?

Jam chucking can be explained as simply as either an internal or external 'tuned to need' clamp usually made of wood. It usually is created from the leftover material still being held on the lathe from the project you are currently working on. The use of a jam chuck is most often planned from the beginning. Allowing a small bit of extra material allows a jam chuck to be created for completion of the other side. Technically, an inside jam chuck is a very shallow mandrel.

A jam chuck can be as simple as a scrap of wood that is cut to reverse mount your turning. This cutaway shows an outside bearing jam chuck without even clearing the dome

INSIDE OR OUTSIDE BEARING?

When planning to use a jam chuck, your first decision is whether it is inside or outside bearing on the turning. Depending on your mounting needs, you can use either method but the inside bearing jam chuck does present a few more complications. The two most important are your turnings wall strength, usually determined by thickness and species, and the wall contour. Either of these can present added difficulties for inside bearing. They are much less of a concern when using an outside bearing jam chuck.

Regardless of the grain orientation of your turning, using an inside bearing jam chuck needs enough wall strength to allow your jam fit to exert adequate gripping force without splitting the wall. With enough wall thickness, you can consider this method provided that your wall geometry allows it. Ideally the bearing surface between the jam chuck and the turning needs to be flush and perpendicular to the axis of rotation. Tapers, either inward or outward, present problems for the inside bearing jam chuck and its ability to provide grip. The tailcentre can assist but it is usually removed partway through the process.

Good practice for inside bearing jam chucking is to have walls that are perpendicular to the turning axis for sufficient length for the jam fit to position and secure the turning. Obviously, if you only need to clean the nubbin from the bottom of the turning and do some light sanding, your bearing surface doesn't require much length or a lot of clamp force to be applied. As usual, leave the tailcentre in play until you need to remove it. It will assist in the clamping and also provide the safest failure mode should something go awry.

For the most part, outside bearing jam chucking is easier to accomplish with less

opportunity to stress and damage your turning. It also offers the design flexibility to have walls that are not perpendicular to the turning axis. The outside bearing jam chuck shortcoming is that the jam chuck bearing area of the turning is inaccessible. That area of the turning needs to be completed prior to engagement in jam chucking. The engaged area needs to be handled gingerly by the jam fit to prevent damage to that surface.



Whether a shallow inside contact or a deeper inside contact, the cutaway show the importance of the flat registration surface and perpendicular wall

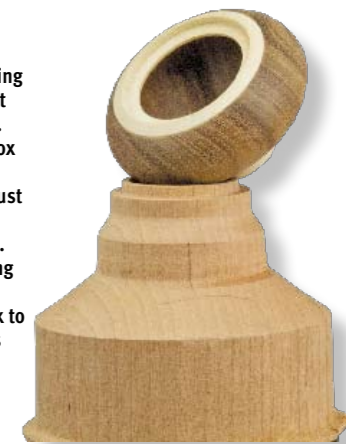


The cutaways show a shallow and a deep engagement with outside bearing jam chuck is far less dependent on wall thickness and strength. The turnings' outside circumference is incredibly strong



The cutaway shows the different cuts and the perils of those other than flat bottomed and perpendicular to the axis of rotation. The angled do have limited special uses

On occasion, delicate bearing surfaces must be dealt with. This lidded box has a fragile insert that must be used for jam chucking. See the mating shoulders on the jam chuck to deal with this



There is sufficient friction on both inner diameters and registration on the flat in the bottom of the lidded box insert to allow for mounting and additional work on the bottom



KEYS TO SUCCESSFUL APPLICATION

A jam chuck performs the same two key features of any workholding mount. It provides orientation and mounting security. The orientation is provided by having a cut surface that the turning will be in contact with that is not only accurately positioned perpendicular to the axis of rotation but also repeatable. Usually this is a flat cut on the jam chuck that bears on a feature on the turning. While a corner referencing on the turning can be used, a flat on the jam chuck is suggested. The interference fit provides the friction for drive and the gripping to prevent detachment. You can perform heavier handed work with a jam chuck while the tailcentre is engaged. Once

the tailcentre is removed, only light touch and sharp tools are in order. The same goes for sanding. Once the tailcentre is removed, only the friction of the jam fit is securing things so slower speeds and lighter touch is required for all activities.

It is a wise practice to keep the tailcentre engaged whenever possible. It allows for heavier work to be done and provides a graceful failure mode



Once the tailcentre needs to be removed to provide access, lighter touches are in order whether cutting or sanding. Notice the backup support for the sanding reducing strain on the jam fit

◀ CREATING YOUR JAM CHUCK

Marking the size for your jam chuck can be as simple as a pencil tracing of your turning or a divider marking. Regardless if an inside or outside fit jam chuck, cutting it is a single sided adjustment. You cut short of the final position and then 'tune' the fit for the desired gripping force. Depending on whether you will be reusing the jam chuck or it is a single use may impact your design of the interference fit. That is, do you want to pop the turning off the jam fit or are you willing to cut it off. A one-time use, cut it off type fit will allow for much more clamp force but does require a bit of forethought. This design requires simple access to the area needing to be cut away. Poor planning will require far more effort on your part to cut and release the turning. Inside jam chucks are rarely a cutaway fit not only because of the geometry but also the much lower interference forces that can be used.

There are a variety of turning tools that you can use to cut your jam chuck to fit but the easiest to use is a parting tool. It offers an easy way to make 90° cuts and straight parallel wall cuts. Other tools can be pressed into service so use what you find the easiest to control. Depending on your method of marking your material being used for your jam chuck, you'll want to creep up on the proper fit. You can cut quickly to the close point and then use a cut and test fit method to tune the final fit. While seemingly tedious, it does go quickly and with practice it only requires a couple of test fits. As you test the fit, you'll be able to achieve the tightness desired based on your subsequent process needs. This is a one sided adjustment so go slowly. Remember that the amount of your cut takes off twice that amount of material.

If you've accidentally gotten the fit a bit too loose for your needs, you have two options. You can re-cut the jam chuck. Leave the original error for reference to let you get close on the next try without going too far. Another option is to tighten the fit. There are a few ways to do this if the looseness isn't too dramatic. You can use a sheet or two of facial tissue, kitchen paper, or similar material. Place it between your workpiece and the jam chuck. The space taken by the tissue will often tighten the fit sufficiently for you to proceed. Another way to tighten things is with moisture. Wetting the jam chuck and then quickly installing the turning often works. The jam chuck wood will swell and expand tightening the fit. Remember, as the wood dries it will loosen again so plan accordingly.



Transferring the size to ballpark the jam chuck cut can be measured but is far easier to roughly position the work and pencil mark the outside dimension



No need to clear the material outside of the immediate area of the turning. A quick and simple, cut to fit inside bearing jam chuck. Effective even with thin walls since only light sanding is planned



The tool of choice for cutting jam chucks is an 3mm parting tool. Ground straight across it works well for flat bottoms and walls that are perpendicular to the axis of rotation



Trial and error method is used to zero in on the proper fit. Even with light cutting planned, a jam chuck with outside engagement allowing a tighter fit is used



If you make a mistake and over cut, leave the mistake there. It will help you when making your next attempt. If you do need to remove it for access, do so after you have achieved the proper fit



Minor over cutting can be corrected with a fold or two of paper towel or other compressible 'wood' product. If it requires too much filler, a safer alternative is to re-cut the jam chuck



Wetting the jam chuck wood will swell it slightly tightening the fit. This temporary fix will often allow you to proceed. Notice the use of the screw mount to hold the scrap wood for the jam chuck

CONCLUSION

Seeing jam chuck versatility? With planning, it can be taper, chuck, faceplate mounted, and re-useable. Perhaps some truing needed but re-usable. Depending on your needs, you might have a permanent jam chuck and cut your work to fit the jam chuck each time rather than vice versa. Jam chucks are low cost, easy to use, applicable regardless of size, with clamping force cut to order. What's not to like about a jam chuck?

One time use jam chucks are fine but don't lose sight of multiple uses either for repetitive projects or just full utilisation of the scraps prior to the burn bin. Accurate repositioning will help

