SHERLINE PRODUCTS
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TIP 102 — Machining a Chuck Platform for Turning Thin Parts/Jack Pantry

Jack Pantry wrote us asking what others do to hold very thin parts in their lathe chucks. He first tried reversing the chuck jaws but found his part too thin to be held by the first step and yet too small of a diameter to be held in the second step.* Before we answered him, he came up with a solution of his own that he had seen on larger lathes.

He machined a platform that holds the thin part away from the chuck face and is held by the jaws in their standard position. Following is Jack's explanation and design of his chuck platform (see Figure 1).

"The 3-legged platform is placed against the face of the 3-jaw chuck, to hold an item square with the chuck, while holding it out away from the face of the chuck. The thickness of the platform, much like a pair of parallels, is selected according to the thickness of the item you want to hold in the chuck. This is only when I have an item that is relatively thin, thinner than the jaws are deep. Or even if it is slightly thicker than the jaws are deep, I want to increase the amount by which it extends beyond the jaws. I couldn't do that in this case because the item was too thin to use the first step, and too small OD to use the second step."

Jack mentioned that he had seen some of these 3-legged platforms commercially, for much larger lathes. He added that the commercial platforms had a magnet in each leg, so that you didn't have to hold it in place while you were attempting to clamp the item in the chuck.

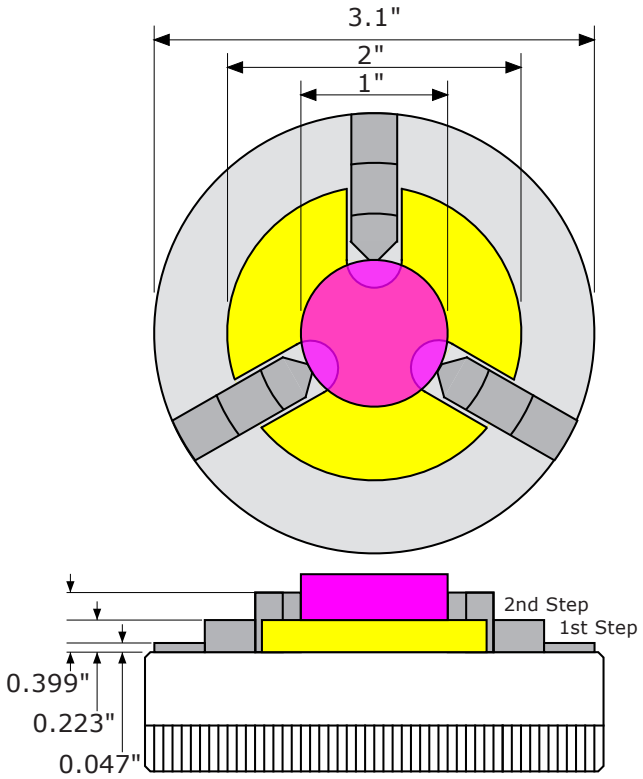
Jack went through a few design phases for his platform part, and he has shared his final design with us. He said to mill the notches for the jaws of the chuck, he reversed the jaws of that chuck to hold the disc while milling those notches. It doesn't matter where you begin milling those jaw notches, as long as they are 120º apart. As drawn, a part as small as 5/8" diameter could be used, but by making the notches deeper, a part as small as 1/2" diameter could be used. He suggessts not pushing it much below 1/2".

Jack went on to say, "I'll probably make one or two for the next time I have this problem trying to clamp an item with the jaws reversed. I'll probably use 12L14 and a fly cutter to establish the thickness I want, and a 3/8" end mill to make the three notches."

Thank you,
Jack Pantry

Dimensional Drawing

Platform: Shown in yellow
Item to be machined: Shown in magenta



The dimensions of the jaw heights shown are Sherline specs.
Your jaw height may vary slightly do manufacturing tolerances.

FIGURE 1—If the OD of the item to be machined is too small to be clamped by the 2nd step with the jaws reversed, yet too thin to be clamped by the 1st step with the jaws reversed, then some means must be used to hold the item parallel with the face of the chuck while clamped by the jaws in their normal orientation.

"In this case, I chose the thickness of the platform to be the same height as the 2nd step. In actuality, a person might need more than one platform of different thicknesses. I also simplified the design so that each notch for the jaws is 3/8" wide, to be easily machined, yet wider than the jaws."

***NOTE:** While Jack was trying to work with the jaws in the reverse position, he noted that the approximate minimum diameter for the 1st Step is 7/8", and for the 2nd Step is 1-9/16".*

Sherline 3-Jaw Chuck Jaw Opening Ranges

The 2.5" 3-Jaw Chuck (P/N 1041)
Jaws in normal position: 3/32" (2mm) to 1-3/16" (30 mm)
Jaws in reverse position: 1/4" (6mm) to 2-1/4" (56 mm)
3.125" 3-Jaw Chucks (P/N 1040, 1040C, and 1042)
Jaws in normal position: 3/32" (2mm) - 1-1/2" (38mm)
Jaws in reverse position: 1/4" (6mm) - 2-3/4" (70mm)

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