

A Compact Hold Down Clamp Support, Version 1.0

By R. G. Sparber

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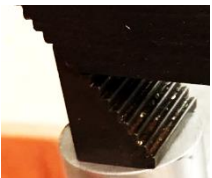
The stack of cylinders to the left of the hold-down clamp performs the same function as a pair of step blocks but in less space².



My tallest cylinder is 4 inches tall. Next to it is a 2-inch cylinder. And, finally, I have a 1-inch cylinder. All cylinders are drilled and tapped for 8-32 set screws.

I also have a 1/4-inch thick plate, drilled and tapped in three places.

This 1:2:4 height ratio, plus the plate and a small step block, gives me a continuous height range of 0 to 8 inches ($1 + 2 + 4 + \frac{1}{2} + \frac{1}{2}$).



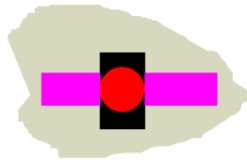
I chose a diameter of $1\frac{1}{4}$ inches so the small step block easily fits on top.

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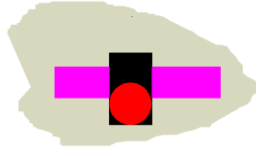
² This idea builds on spacer blocks which have a threaded center. I'm not concerned about absolute accuracy so would not risk my spacer blocks in this application.



I add the plate for stability when the cylinders must span a T-slot.



The center threaded hole lets me span the center of a T-slot.



One of the threaded holes off-center enables me to place the stack on the edge of a T-slot.

I added the third threaded hole as a storage place for my three connecting screws.

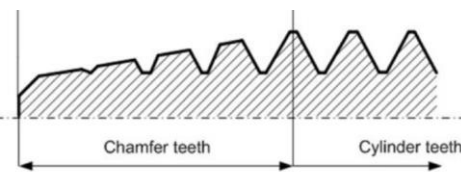


Alternatively, I can store the assembled cylinders and plate.

The connecting screws make the stack stable but do not take any force. I cut the threads for a 55% engagement for ease of assembly. It is then easy to spin the set screws into the threaded holes with my fingers.

I performed all the work on my bandsaw and lathe. The stock was cut about 30 thou oversize on my bandsaw and then squared up on my lathe. Length is not critical, but the ends must be square.

Using a 9/64th rather than the standard #29 tap drill proves the looser engagement. I then tapped each hole 8-32.



The tap leaves the thread partially cut at the bottom of the hole due to its chamfer teeth.

I installed a 3/16th inch long set screw into each hole until it binds up in the partial thread. This arrangement prevents my coupler screws from binding. Instead, the coupler screw cleanly hits the top of the small set screw and stops without jamming.



To assemble a stack of cylinders, I screw a coupler set screw into the bar or bottom cylinder until it hits the small set screw. Then I spin on the next cylinder.

For 0 to ½ inch, I use only the stepped block.



Here, you see my 1-inch cylinder supporting the step block, giving me a 1 to 1 ½ inches range.

If I put the ½ inch bar under the 1-inch cylinder, I can go from 1½ to 2 inches.



Using the 2-inch cylinder, I can clamp 2-inch stock without the stepped block. Add in the stepped block, and I can go from 2 inches up to 2 ½ inches.



By stacking the 4-inch, 2-inch, and 1-inch cylinders with the stepped block, I can clamp stock 7 to 7 ½ inches tall.

If I added the ½ inch bar, I could go from 7 ½ to 8 inches plus span the T-slot with added stability.

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