The Casting of the Down Feed, Clapper Box, Cross Slide Support, and Cross Slide

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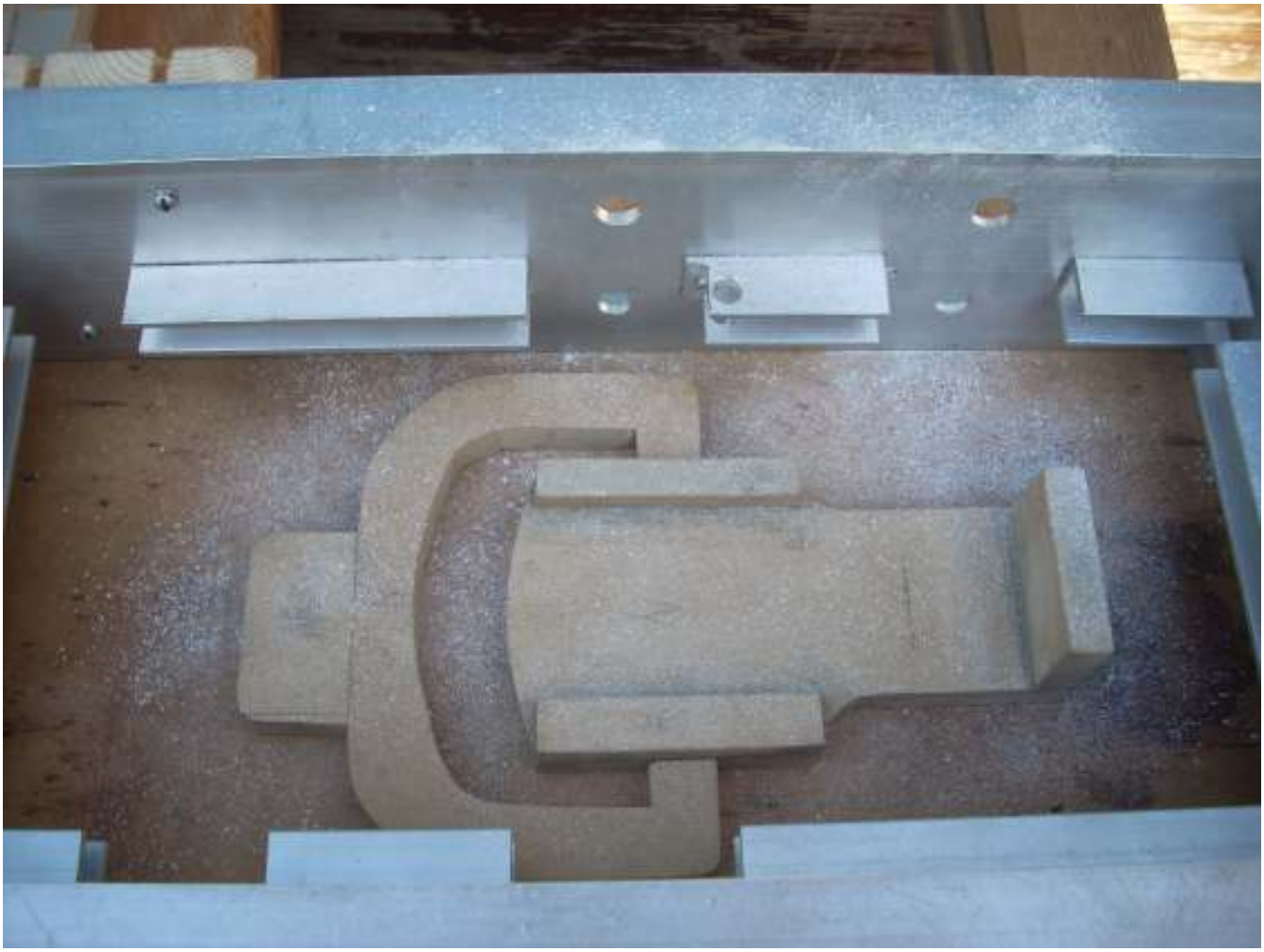
This casting session occurred over a two day period. I cast the down feed and clapper box but failed to successfully mold the cross slide support. Eventually it became evident that my problem was with my worn our Petrobond. I had tried to recondition it but the oil did not get into the clay enough. I contacted my local foundry supply house 10 minutes before they closed. So the next morning I went up there, bought 100 pounds of fresh Petrobond and 50 pounds of parting dust. By 10:30 AM I was home trying out the new materials. This Petrobond is like modeling clay. It rams up beautifully and, as you will see, it has very high green strength so the castings came out nice and crisp.

The Down Feed

This was the first time I got to use my new variable volume flask.

I configured the cope and drag to be rectangular. For some crazy reason, I kept thinking they were only good as squares.



The molding board is down and the pattern with gate system dusted. It is a bit snug on the sides but since this is aluminum and not wood, it can take a lot more heat. The sprue will fit in a hole near the center of the block at the center of the gate system.

With a flask this heavy, I use a ratchet strap to hold the boards to the flask before trying to turn it over. A few clicks of the ratchet and nothing slides.

After rolling the drag, you can see the pattern and gate system. Note that very little sand is on the aluminum frame of the flask. This demonstrates that the flask was squarely down on the molding board and should therefore be a good tight fit to the cope.

Here is where I started to figure out that the Petrobond was very weak. Some edges are clean but there is a lot of breakout. This is a small part so there was still plenty of sand left to prevent drop out.

The sprue was cut with my home made sprue cutter. Works great.

The flask was then closed and moved over to the casting area.

You can clearly see every place that looked bad in the mold. Yet this can be cleaned up with machining.

Not too bad from the side.

And the back look fine. The two divots are my holes for drawing the pattern.

The Clapper Box

I used the same gate system but you can see that the pattern is not as wide as the last one. No problem, I just had to cut some sand.

I chose to pull the gate system first and do my cuts with the clapper box pattern still in place.

The weak Petrobond broke a little. This is not so bad but will require some machining of the casting to clean up. You can also see the corner in the upper center area cracked. Otherwise, it is not a terrible imprint.

Not my best work but with a bit of machining, it will do.

From the side it doesn't look half bad.

The top side looks the best.

The Cross Slide Support

Now I'm in the second day and about to use my new Petrobond. The difference is like night and day. One hit with my ramming tool and the stuff is solid. Subsequent hits have no effect. You can see the cope imprint here. There is a small amount of break out but look at all of those crisp lines!

The drag imprint came out even better.

You may be able to see a slice in the casting in the upper left quadrant. This was damage to the pattern when I used my belt sander to increase the draft. Otherwise, sure looks pretty to me.

I lost some wood in the pattern when I increased the draft but there should still be enough metal there. Nice clean lines in the mold means nice clean lines in the casting.

With a little bandsaw work followed with time on my mill/drill, and this should work just fine.

The Cross Slide

Nothing special about molding this pattern so here is just the result using the new Petrobond.

You can see a little bit of roughness, probably due to either roughness in the pattern hanging onto the sand or not enough relief near the wide face of the pattern. Nothing that can't be cleaned up. The gate is shown in the foreground. I cut it by hand before pulling the pattern.

You can see the sprue on the left which was cut into a funnel so is rather rough. On the right is my riser which was formed from a smooth wooden dowel. On the face of the casting you can again see the two holes used to draw the pattern.

Clearly my work looks a lot better with my new Petrobond. Sure is a good feeling.

I now have four rough castings so get to spend time in my air conditioned shop rather than out in that blazing Arizona sun and high humidity.

As I was putting away my furnace the following morning, some refractory fell out of the cover. I have had trouble with the cover since it fused to the body of the furnace during the Heat-up Sequence used to dry and cure the refractory. The mechanical shock of breaking it loose greatly weakened it. The base is made from the same refractory and is about as thick as the cover. Yet it has held up fine.

I may have to break out all of the old refractory and pour a new cover. A closer inspection should help me decide my best course of action. I'd rather be casting or machining.

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