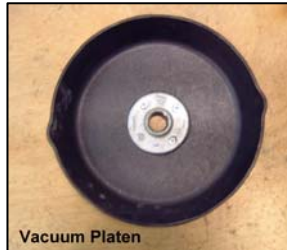


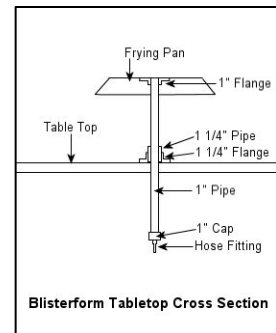
Low Cost Shop Equipment

Expensive does not always mean better. Ed Patterson, who works at Velocity Labs, was cleaning the dishes one night and noticed that a frying pan and a vacuum pulling platen had the same shape. Most people either make their own platens out of wood or buy the expensive aluminum ones. The cast iron frying pan has longer sloped sides, is extremely durable and if the threads ever get cross threaded it is less expensive to replace a \$3.00 1" flange.



Wal-Mart has several sizes to choose from, and they are all inexpensive. To make the platen, cut off the handle of the frying pan and smooth it off. Drill a 1" hole in the center of the pan and place a 1" pipe flange centered on the hole and mark the holes in the flange on the pan. Drill and tap the holes with 1/4-20 threads. Place duct seal in a ring around the flange, bolt the flange to the frying pan and grind down the bolts flush with the surface of the pan.

The vacuum pulling stations that we have are all made from parts purchased from the local hardware store, Wal-Mart, and McMaster-Carr. The vacuum forming stations, four in all, are all mounted on a table that is about 30" tall and 4x8 feet. The top and legs are made from doubled 3/4" plywood and varnished. Each station has the platen with a 20" section of 1" pipe connected to it and an end cap. The end cap is drilled and taped for a hose fitting that goes to a McMaster-Carr valve. The valve is mounted on a 8x10" section of plywood which makes for a great \$20 foot pedal and then is attached to a bunch of brass "T" hose fittings that



connect to the vacuum pump. The 20" section of pipe that is connected to the platen slides through a 5" long section of 1 1/4" pipe and a 1 1/4" flange that is bolted to the table top. The 1 1/4" pipe is drilled and taped on the front and side for two screws that tighten in on the 1" pipe and allow the platen to have some height adjustment. The aluminum 16x16" frames for the plastic were welded at a local shop for \$75 and all we had to add were the bolts and wing nuts.

The table has four vacuum pulling stations for blister molding and 2 stations for drape molding. The drape molding stations are made from 1" pipe 15" long with an end cap that is drilled and taped for a hose fitting at the end. We had a local welding shop weld the pipe to a section of 3/8" steel upright that was 4x6" and then weld that piece of steel perpendicular to the base. A 3/8" nut was welded to the top of the pipe over a hole to allow a knob to hold the plaster cast in the pipe. Total cost for welding and steel was \$50 each. Each drape molding station is connected to a simple gate valve that is mounted underneath the table at the front edge for easy access.





The lamination stands are also simple to make. A 20x20" 3/16" thick section of steel is the base, with a 2" pipe flange bolted to the center sealed with duct seal. Screwed into the flange is a 40" section of 2" pipe with a 3/8" pipe screwed into the side of it about 20" up. The 3/8" pipe has a gate valve attached and is connected to a vacuum source. At the top of the 2" to 1" pipe is a reducer that is drilled and taped with for two 3/8" allen cap screws. The screws tighten on the cast to hold it in place during lamination. In the top of the reducer is a 3" section of 1" pipe that stabilizes the cast. Bolted in one corner of the base is a 1/2" pipe flange with a 8 foot section of 1/2" pipe. Connected to the 1/2" pipe is a 90 degree elbow with another 12" section of 1/2" pipe that holds a clip over the center of the stand to hold the PVA bag or funnel during lamination. This stand allows the user to walk around the entire lamination. Attaching the bag clip to a weight and pulley allows the user to keep an even pull on the bag and adjust for different height laminations.

By removing the reducer, shortening the 2" pipe, removing the 1/2" pipe assembly from the lamination stand and adding the foot pedal in place of the gate valve you can turn the lamination stand into a great stand alone blister forming station.

Supplies list

Blister forming station table version

- 1 frying pan – you choose the size
- 1 1" pipe flange
- 1 20" long section of 1" pipe
- 1 1" pipe cap
- 1 barb hose fitting
- 1 1 1/4" pipe flange
- 1 5" long section of 1 1/4" pipe
- 1 McMaster-Carr valve (4625K61 squeeze lever - \$27.00)

Drape molding station

- 1 15" long section of 1" pipe
- 2 6x6" 3/8" thick steal plates
- 1 1" pipe cap
- 1 gate valve
- 1 3/8" nut
- 1 3/8" knob

Lamination Station

- 1 20x20" 3/16" thick steel
- 1 2" pipe flange
- 1 40" long section of 2" pipe
- 1 2" to 1" reducer
- 1 3" long section of 1" pipe
- 1 8 foot long section of 1/2" pipe
- 1 12" long section of 1/2" pipe
- 1 1/2" 90 degree elbow
- 1 1 1/4" long section of 3/8" pipe
- 1 gate valve

Blister forming station stand alone version

- 1 frying pan – you choose the size
- 1 20x20" 3/16" thick steel
- 1 40" long section of 2" pipe
- 1 2" pipe flange
- 1 2" to 1" reducer
- 1 3" long section of 1" pipe
- 1 barb hose fitting
- 1 McMaster-Carr valve (4625K61 squeeze lever)

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