Putting ArtMolds' New Affordable Vacuum Chamber to the Test

By David E. Parvin, A.L.I.

A while back, I wrote a series of four articles for this publication on vacuuming and pressuring as they pertain to sculpting. The first discussed the advantages of using them. The second and third described step by step how to construct a vacuum and a pressure chamber. The fourth explained in detail how to put both the vacuum and pressure chambers to practical use. The fact is that while it is relatively simple to construct a pressure chamber, a vacuum chamber is more difficult. But at that time, I was not aware of an inexpensive alternative. So when recently I found out that ArtMolds claims to have a functioning vacuum chamber for less money one would spend to construct his/her own, I just had to try it.

To really put it to the test, I decided to let one of my studio assistants, Stevie, do the assembly. In photograph #1, it is obvious that Stevie was just as excited as I was to see what was in the box. Don't let the Denver University sweatshirt which Stevie is wearing make you wonder if I brought in a ringer such as a fourth year college mechanical engineering student just to make the assembly look easy. At the time, Stevie was an almost seventeen year old high school junior. So if you think you are as smart and capable as a seventeen year old, keep reading.

In photo #2, Stevie had removed the contents of the box which consisted of:

1. Vacuum chamber body
2. Two rubber gaskets
3. Two acrylic plastic lids
4. A vacuum gauge
5. An exhaust valve body assembly
6. A yard of plastic tubing
7. Manual

The manual is only three pages besides the cover sheet and the nine step assembly instructions take less than a page. I found this encouraging because it seems that nowadays even the simplest devices often are accompanied with a manual size of a major city's phone book. ArtMolds must consider its customers to have more than the general population's common sense because there are no condescendingly insulting warnings such as, "Do not feed to small children or pets," or "Do not operate in the middle of a frozen lake during spring thaw."

The only two things required for assembly which are not supplied are an adjustable wrench and a dab of petroleum jelly. I substituted 13 mm and 14 mm open end wrenches which worked perfectly. Pliers would have sufficed as well.

Stevie had no problem following each of the nine simple assembly steps with no guidance from me except for the last one which I will explain.

Photograph #1

Photograph #2

Photograph #3: Attaching the vacuum gauge to the copper valve using a #13 metric open end wrench

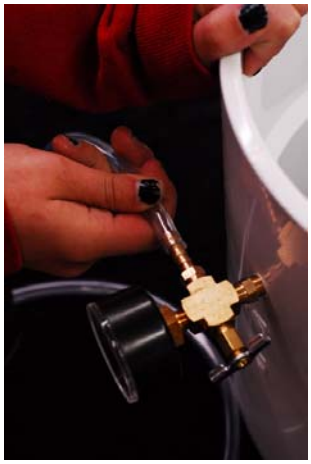
Photograph #4: Attaching the copper valve to the pre-threaded hole in the vacuum chamber

Photograph #5: A little petroliun jelly to make sliding on the tubing easier

Step 1: In photo #3, Stevie was attaching the vacuum gauge to the brass fitting.

Step 2: The attached gauge and the fitting were then connected to the vacuum chamber in photo #4.

Step 3: Stevie then lubricated the hose barb fitting with a bit of petroleum jelly and pressed the plastic tubing onto the hose barb, photos #5 and #6.



Photograph #6: The tubing slides on effortlessly

Photograph #7: Pealing off the protective paper from the acrylic sheets

Photograph #8: Positioning the bottom gasket

Photograph #9: Setting the vacuum chamber on the bottom gasket

Step 4: Stevie removed the protective paper from the acrylic lids. The directions said to remove the paper from both sides of both lids. It is essential that one be able to view what is happening to the materials being de-aired, hence the clear lids. However, since the bottom lid would come into contact with some surface, such as a counter top, and there is no reason to look through the bottom lid, my suggestion is that one leaves the paper on the bottom side in order to prevent scratching of the lid surface, photo #7.

Step 5: One of the two rubber gaskets was centered on the bottom lid, photo #8.

Step 6: Stevie then placed the vacuum chamber in the center of the bottom gasket, making sure that the entire perimeter of the chamber was sitting evenly on the gasket, photo #9.

Step 7: Stevie next centered the second gasket evenly on the top rim of the chamber, photo #10.

Step 8: The second acrylic lid was placed over the top gasket, sealing the vacuum chamber. The vacuum chamber was now completely assembled and ready for use, photo #11.

Step 9: says, “Connect your plastic tube to your vacuum source. You are ready to use the vacuum chamber.” Anyone with any experience with pneumatics will know how to do this. However, since Stevie had no exposure to air driven equipment, I had to help her with this step. I showed her three different ways of doing this. In the first, I had her attach the plastic line directly to the vacuum pump with another barbed connector, photo #12. The advantage to this method is that it is the simplest and will result in the least amount of loss of vacuum due to leakage. The main disadvantage is that the vacuum source has to be close to the pressure chamber.

A second method was to attach the barbed connector to the end of a hose which was attached to the vacuum source, photo #13. The advantage of this is that the vacuum source can be further away from the vacuum chamber depending on the length of the hose.

Photograph #10: Placing the top gasket in place

Photograph #11: Once the top acrylic sheet is in place, the chamber is complete

Photograph #12: Connecting the plastic tube directly to the vacuum pump

Photograph #13: Plastic tube connected to the vacuum hose with a barbed fitting

Photograph #14: The plastic tub can be attached to the vacuum line with a quick disconnect coupling

Photograph #15: Attach a vacuum source and you are in business

Photograph #16: The vacuum chamber can hold a ten quart bucket (7.25 liters)

If the vacuum source has other uses, connecting/disconnecting to the pressure chamber can be facilitated with a quick release coupling, photo #14.

Notice the obvious look of satisfaction on Stevie's face in photo #15 for a job well done when she observes what had been miscellaneous parts has become a functioning vacuum chamber!

Notice that the vacuum is large enough to contain a 2 1/2 gallon bucket as shown in photo #16. A bucket of that size is sufficient to hold a gallon of liquid and allow for expansion when evacuated. I have probably been using vacuums for at least twenty years in my studio and do not ever recall a need to evacuate more than a gallon of liquid at one time. So as we know, while size does matter, this ArtMolds vacuum chamber should be large enough for just about any purpose a sculptor might have.

At higher altitudes, one cannot pull the same 29 plus inches of mercury that one can achieve at sea level. The 25 inches that one should be able to get in Denver is still sufficient. However, for thicker liquids it may be necessary to rock the chamber back and forth to help bring the bubbles to the surface and allowing the gases can escape, photo #17. It is important that the chamber be light enough that it can be picked up for this purpose. The edges on the acrylic lid make perfectly good handles. Don't worry about the lid coming off, if you are strong enough to pull the lid loose from the chamber with an established vacuum, I suspect the US Olympic Committee would like to talk to you.

In summary, I am very impressed with this product and can not think of a single negative or disadvantage to it. Had it been available when I wrote the article on constructing a vacuum chamber, I would have just suggested ordering one of these and save oneself some money and a bunch of time. So how do you get one? Just go to: http://www.artmolds.com/category150.cfm.

Note. No doubt that most readers are more likely to have air compressors than vacuum pumps. After all, there are so many tools which use compressed air but very few require a vacuum source. Any tool supplier probably has a selection of air compressors but vacuum pumps are a little harder to find so here are some suggestions. ArtMolds has done the searching for you and offers an excellent professional grade one. However, there are two very low cost options which can allow one to experience just how beneficial a vacuum chamber can be. The first is a very inexpensive device called an Air Vacuum Pump made by Central Pneumatics which works by a venturi and is also available from ArtMolds. The third is to use a refrigerator compressor. For more information on vacuum sources, see articles #2 and #5 listed below.

Vacuum and pressure chambers have many advantages for sculptors in both mold making and casting. In fact, I am certain that there are things I could not have done as successfully and in some cases not at all without them. For more information, I would be glad to email my previous Sculpture Journal articles if you will contact me directly at: parvinstudio@comcast.net.

1. Using Vacuums and Pressure in Casting
2. Making a Vacuum Chamber, September
3. Making a Pressure Chamber
4. Putting Vacuum and Pressure Chambers to Practical Use
5. Another Source for Vacuum Pumps

Photograph #17: When evacuated, can be lifted by the lid