

Message ID: 2 Entry time: **Wed Jul 6 12:04:33 2005**

Author:	Greg Meade and Zach Noyes
Type:	Routine
Category:	General
Subject:	Silicone Cookies - Day 1

Starting at 10:00

We tried to find mold materials with little luck. In order to make effective cookies, we need flat glass or tin surfaces (from the Silicone Instructions). We found the following:

Metal lid

Wax Lid

Glass Petri Dish

Aluminum Foil (perhaps to wrap another material)

Created test silicone by measuring out roughly 20-30 grams of base and 2-3 grams of the other solution. We did have problems trying to pour the solutions (viscosity issues) and getting the right ratio of weight.

Another problem faced was bubbles forming in the mixed silicone solution. We were able to get out the larger bubbles by poking them with our stirrer. However the smaller bubbles remained.

Possible Solutions: Use Vacuum Pump, we do have the equipment but the procedure is complicated so we wanted to have a better idea of what we were up against.

Current Status: We poured the solution into our molds to set for tomorrow, when we will further evaluate our options. 🤖

Message ID: 4 Entry time: **Thu Jul 7 09:03:26 2005**

Author:	Zach Noyes and Greg Meade
Type:	Routine
Category:	General
Subject:	Silicone Cookies - Day 2

9:00 Distortions from the molding surface resulted in all four molds. The bubble issue was also present, but we cannot really be sure of how big their error is without further testing. The soap releasing agent worked perfectly. We did, however, acquire a new mold which has promise. The one problem of that mold is that it does not have very high walls. If we were to use a vacuum pump to rid the silicone of bubbles, this low wall would be a problem. Another idea for a new mold would be to see if the CIM guy could make us a perfect mold. We are now exploring that idea. We also found a metal punch that is almost exactly the correct size. We could make an entire sheet then punch out the desired number. Our final idea for a mold would be to use the actual coupling for the PMT that the cookie would be mounted on.

9:15 We noticed that the disks we already have are not that bad. To test the new disks we want to make, we first need to find the effect a normal disk would have. We have therefore asked the PMT testing team for use of their equipment to test one of the PMTs with and without a cookie attached. This would establish the correct change so we could be sure that our cookies were not hurting the detector.

9:54: We have decided our plan for today. We are going to use the new flat mold that Zach brought in with the black coupling attached. We will pour the silicone mix directly into that mold to form a nice cookie. We may still use the vacuum pump if we can get that running correctly.

Amount of mix needed to make one cookie

.46 grams of curing agent
4.23 grams of base agent
*the whole mold is 199.16 grams
Optimal Width: 2.2 mm
Optimal Diameter: 45 mm

10:21: We attempted our plan but in the pouring process some of the silicone leaked out. We are going to try retaping down the mold and then try again. One major plus was that we were able to successfully calculate and measure the silicone mix agents.

3:00 pm : We found that we can successfully make cookies and cut them out to a usable size with the punch acquired from the machine shop. Our first batch of cookies was not very transparent and picked up the impressions from the mold used. We found that trying to mold the cookies using the coupling resulted in leaking of the silicone under the ring. We reverted to making a large mold and then pressing them out with the punch. Cleanup will be a problem, since the silicone is not water soluble. I spoke to Connie about acquiring test tube brushes and some sort of degreaser from the chemical

storeroom. We'll evaluate the newest cookie from the new mold in the portable vacuum pump tomorrow.

Message ID: 6 Entry time: Fri Jul 8 09:21:41 2005

Author:	Greg Meade and Zach Noyes
Type:	Routine
Category:	General
Subject:	Silicone Cookies - Day 3

9:00: We found that our mold we created yesterday was not quite fully gelled. However the vacuum definitely worked to rid the mold of bubbles. We are now turning our focus to proper cleanup.

Things we might need:

- Exacto Knife
- Latex Gloves
- Test Tube Brush
- De-Greasing agent

10:15: We have found a wonderful sheet of glass with no visible imperfections at all. We also found some weird metal things that we are using as walls, with electrical tape holding it all together.

We are going to try making a large sheet of silicone and then punch it out with our metal punch. Because the glass sheet is too large to fit in our vacuum, we are going to prepare the solution in a beaker and then put it in the vacuum to remove the bubbles. Then we will pour that silicone solution back into our tray to set for tomorrow (we hope).

Dimensions of tray:

- Height - 1.0 cm
- Width - 25.7 cm
- Length - 25.5 cm

- Optimal Cookie height: .30 cm
- Specific Gravity of Base: 1.11
- Specific Gravity of curing agent: 1.03
- Ratio (by volume) of Base to curing agent: 9.28 to 1

Amounts used:

- 23.72 mL of Curing Agent
- 196.30 mL of Base

11:30: We aquired the neccesary cleaning equipment from the Hutchinson Hall Chemistry Store. The guy who helped us was a cool dude who was listening to reggae and had a hawaiian shirt and ponytail. We took our mold out of the vacuum and tried pouring it into our tray. We think we formed some bubbles but we cannot be quite sure if they will stay or not. We are currently just going to wait until tomorrow to see how it works.

Message ID: 10 Entry time: **Mon Jul 11 11:50:00 2005**

Author:	Zachary Noyes
Type:	Routine
Category:	General
Subject:	Silicone Cookies - Day 4

We have removed as many good silicone cookies as possible from the first of the square molds. Marks from the soap release agent remain on the cookies, rendering them apparently useless. Trials will tell whether they are useless. The solution to this problem may be to not use a release agent in the next trial. The cookies are about 2 mm thicker than the originals, so we are using about 190 mL of base and 20.5 ml of curing agent. Hopefully the next trial will yield more useful results.