

SEALING A COLOSSUS

Many of collectors have heard the horror stories of Colossus exploding from expansion and higher than normal operating temperatures.

The problem lies in the fact the rubber expansion plug is usually deteriorated and leaves the fluid nowhere to go but put unnecessary pressure onto the glass globe, resulting in an explosion.

When I decided to change my master fluid and discovered a deteriorated rubber insert, I came up with a Engineered solution so I will NEVER crack a valuable un-replaceable Colossus globe.

Material list

- **1/16" x 6"x6" sheet of Silicone rubber (SHORE 40)**
- **1/4" x 6" x 6" sheet of Neoprene rubber (SHORE 90)**
- **tube of RTV silicone –clear**
- **(2") PVC heat Shrink (145mm flat measure)**
- **Acetone**
- **Various sized drill bits**
- **Heat gun (Hair Dryer)**
Sharp Knife
- **Patience**

For those of you that want to save time, I may have a few "KITS" made up for sale. Contact me @ lampaddict@GMX.com

First,..a little background and education on the types of rubber, their usage, and it's SHORE
(Also known as DURO) ratings

Silicone Rubber

This material has excellent heat resistance, low temperature flexibility. Excellent resistance to compression.

It has resistance to ozone, aging, sunlight and many common fuels, oils and chemicals. .
Temperature range -80 F to 425 F.

Neoprene rubber

Versatile—typical applications include belting, coated fabrics, cable jackets, seals, gaiters, sound-proofing and vibration-reducing. Gives tight rubber-metal bonds

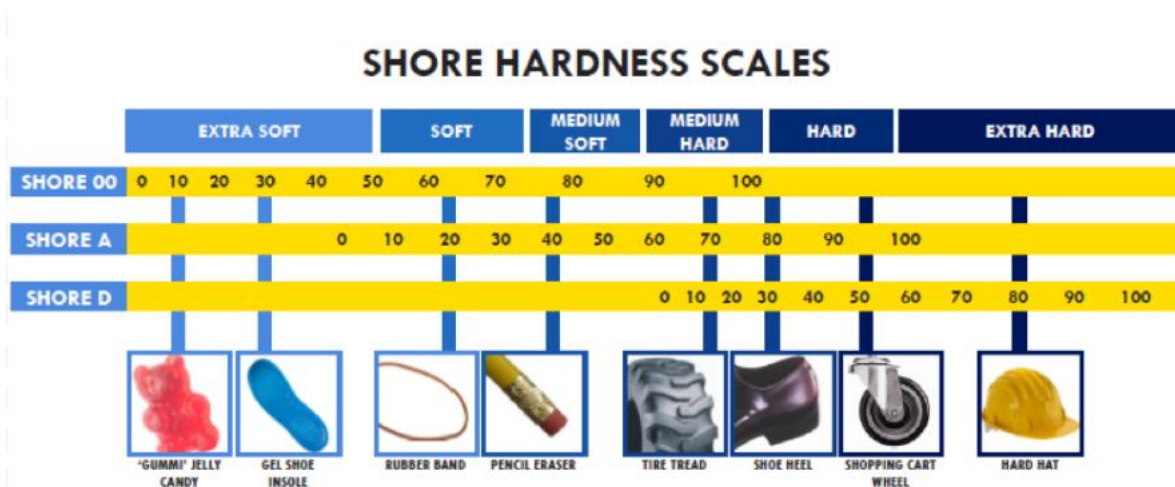
Withstands weathering from UV, ozone, and oxygen and resists flex cracking. Flame resistant, and is usable in temperatures ranging from -40 to 200 Deg. F. **DO NOT use sponge or foam**—just pure solid rubber.

Strong and flexible—525 PSI with 200% elongation capacity. Stays flexible over wide temperature range. Excellent for long-term gas and liquid storage—neoprene seals, gaskets, and linings maintain a gas- and liquid-tight seal, preventing leaks and damage for extended periods.

SHORE Ratings

Below you will see the various hardness of rubber that is available.

I purchased the red 1/16" silicone rubber sheet in SHORE 40 (Flexible)



Below you will see the examples of the various rubbers I used below



The Design

The Design concept is to install and seal a flexible 1/16 silicone rubber sheet silicone sealed to the hot globe at full fluid expansion. When cooled and depressed into the globe due to the contraction of the fluid/air. I sealed the stiffer harder ¼ Neoprene rubber sheet with an air vent created between the sheet of rubber to create an expansion void/chamber between the two sheets of rubber. This will allow expansion of the silicone rubber sheet and vent the air chamber that is created between the two pieces of rubber material when heated.

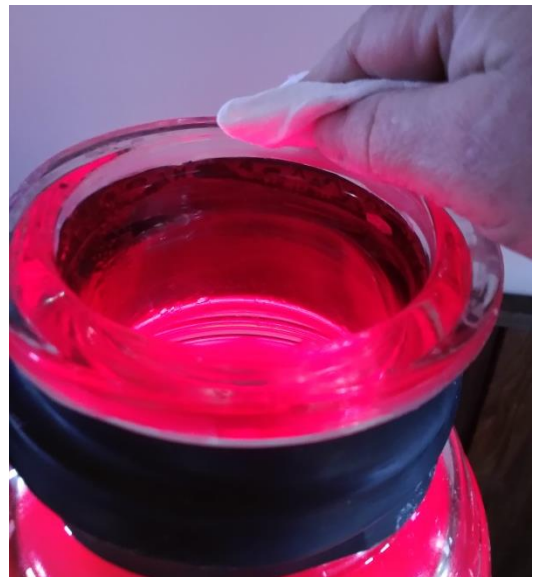
STEP 1

Carefully remove the cap, this can be accomplished with a small flat blade screwdriver and/or nail remover by working your way around the circumference several times until the cap can be removed. **DO NOT DISCARD** the metal cap. You are reusing it. Carefully remove the old rubber seal and toss. If you are changing the master fluid or lava, there is not much concern about fragments falling into the globe. However, if you are simply replacing the seal, be very careful to not let pieces of the old seal drop into the fluid.



STEP 2

Take some Acetone (pure nail polish remover) and clean the top of the rim and inside of your cap (notice I left the old heat shrink seal on for protection)



STEP 3

Cover the opening with something secure and non-porous

Heat up your lamp to operating temperature (4/6hrs)

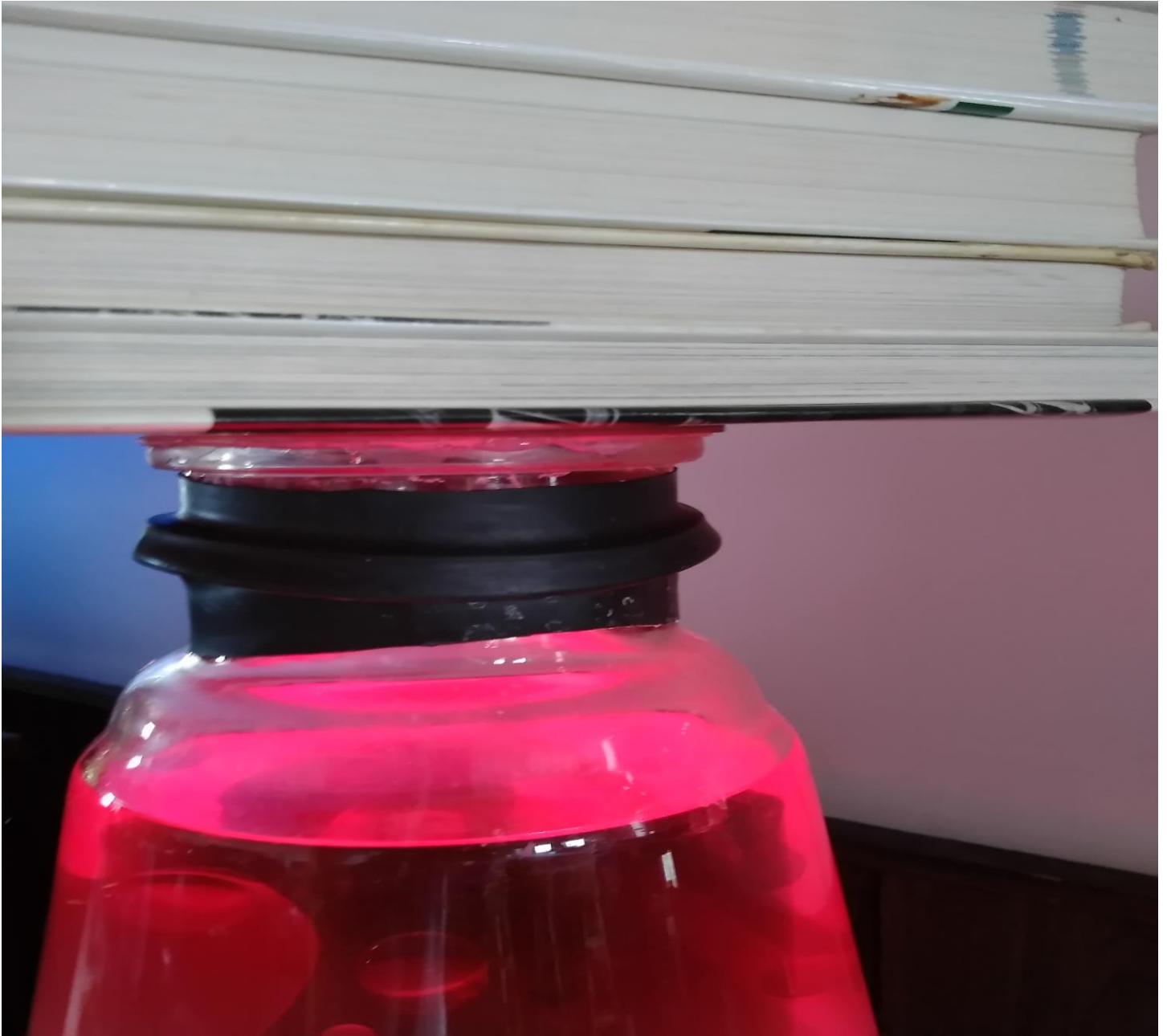
Take your Silicone (red) rubber sheet and put it in some boiling water for a few minutes.

This is to make it more flexible.

While it is in the water, Remove the temporary cover and lay a bead of silicone on the rim of the globe.

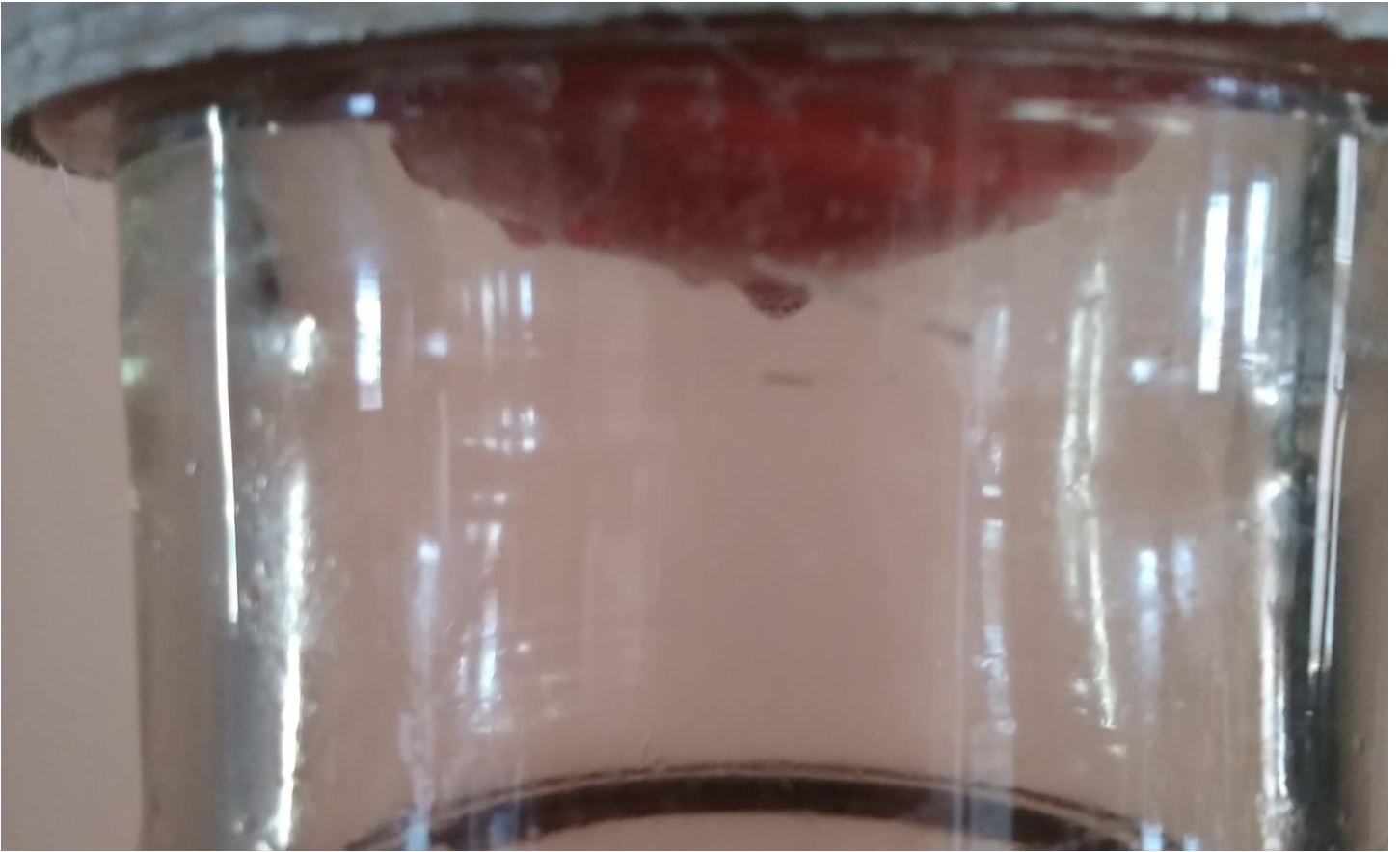


Remove the Red silicone rubber from the boiling water and pat dry thoroughly. Carefully place it onto the fresh silicone and then put a flat compress on top of it (I used a stack of heavy books)
Let the lamp run a few more hours to let the silicone set a bit then shut it off for the night and walk away.



STEP 4

The next day you should see this:



The contraction of the air and water inside the lamp will draw down the red silicone sheet as it creates a vacuum. This is now your new expansion chamber.

Step 5

Take your stiff $\frac{1}{4}$ rubber sheet and cut to fit inside the cap. Now drill a small $\frac{1}{8}$ hole through the cap AND the black rubber



Step 6

Remove the black rubber $\frac{1}{4}$ " seal and use a step drill to drill a bigger hole into the metal cap so there is no chance of misalignment when you re-insert the cap onto the rubber seal. (I don't care how good you can measure, you will probably never get dead center of the cap and have the rubber seal align when reinserted or shifted)

Please make sure you deburr the shavings from the hole with file or sandpaper



STEP 7

Now take a bead of silicone and lay it on top of the red rubber seal and place the black seal on top of it. Spin it slightly to ensure the silicon is distributed evenly. Place the Flat compress (Stack of hardcover books) and let is set at least 12 hrs. You may carefully remove any excess silicone that may have ozzed out with your finger before it sets.



Your seal should look something like this:

Notice the impression of the silicone sheet



STEP 8

Install your cap.(DO NOT SILICONE IT TO THE RUBBER) To re-crimp the seal, I find it is best to either leave on the old heat shrink around the neck or use layers of masking tape to protect the neck of the globe while tapping down the edge of the cap. I use a small hobby jewelry hammer to tap the rim of the cap back in place.



Since my colossus will probably never be shipped by conventional courier ever again (or turned on its side). The second time I did this I decided to NOT hammer the cap back down but let the heat shrink do its job to keep the cap in place. This way, if I ever decide to change the master fluid color, add magnesium sulfate, etc, it will be easier to do so.

I use two kinds of heat shrink. One is clear and intentionally made to seal liquid and medical bottles, *(that annoying crap for the arthritically insane that is on practically every bottle you buy now)*

The Second is a PVC vinyl and usually used to create battery packs. Both are 145MM and available on eBay.

Here is the clear seal:



Here is the Black PVC seal
(step one - seal with heat gun)



Finished Product



