

# Glass Cylinder Mounting and Sealing Techniques

## Hatch Legend



Borosilicate Glass Cylinder



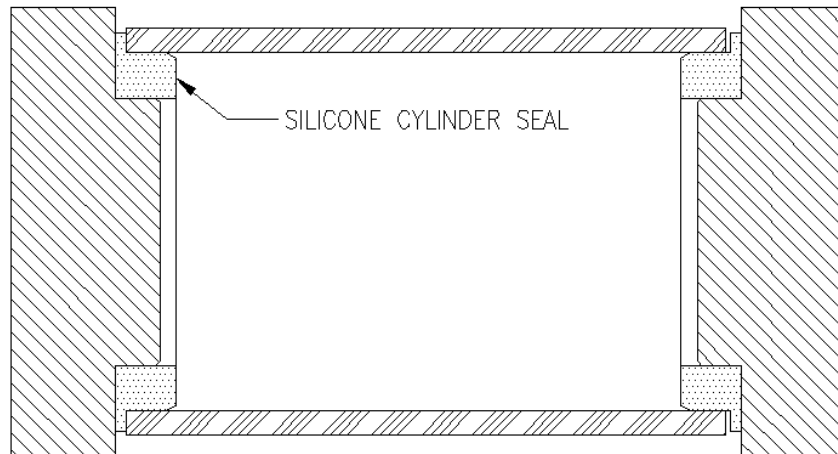
Mating Material (See Material Selection Table)



Silicone Rubber

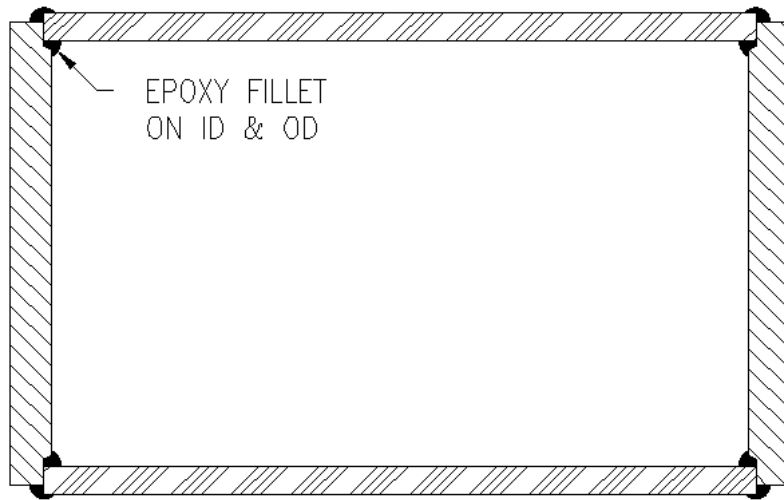
### 1. Use Airpot Cylinder Seals.

These molded, silicone rubber parts seal on the ID of the cylinder and have a flange to protect the cylinder from axial shocks. A pilot on the mating part is required to energize the seal.



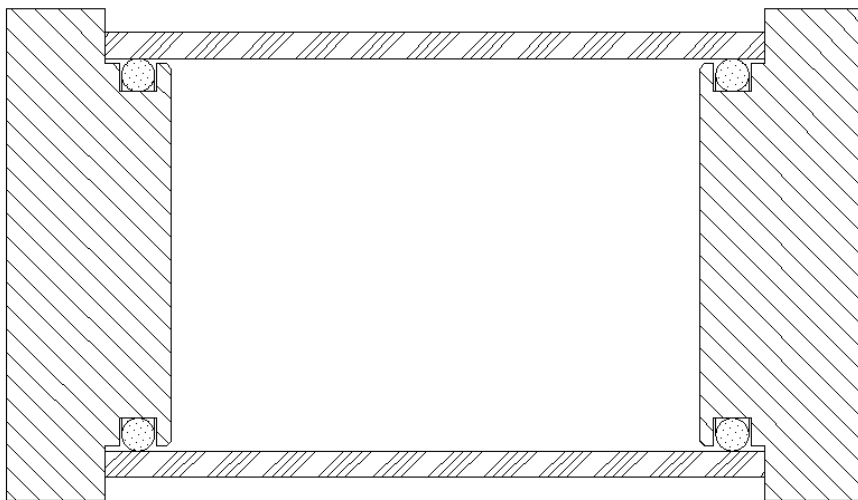
### 2. Bond Directly to Another Part

The major problem here is the thermal expansion mismatch between the borosilicate glass that has ultra-low expansion and the mating part (See Material Selection Guide) that normally has high expansion. Use an epoxy that is “toughened” (not too hard), do not use cyanoacrylate (super glue).

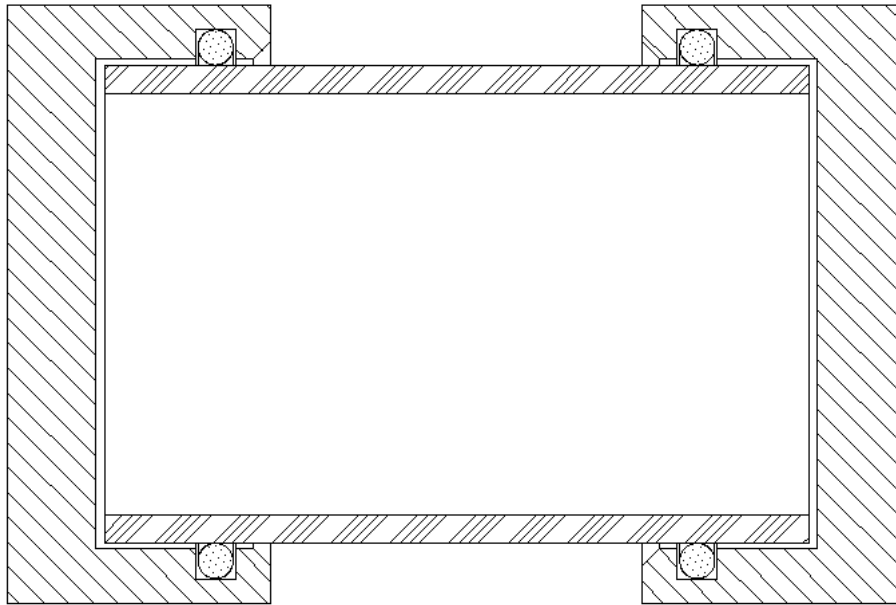


### 3. O-Rings

O-rings that pick up on the ID of the cylinder are best as the ID varies  $<.001''$  from piece to piece. Use P-80<sup>TM</sup> Rubber Lubricant to get temporary lubricity on the rubber O-ring.

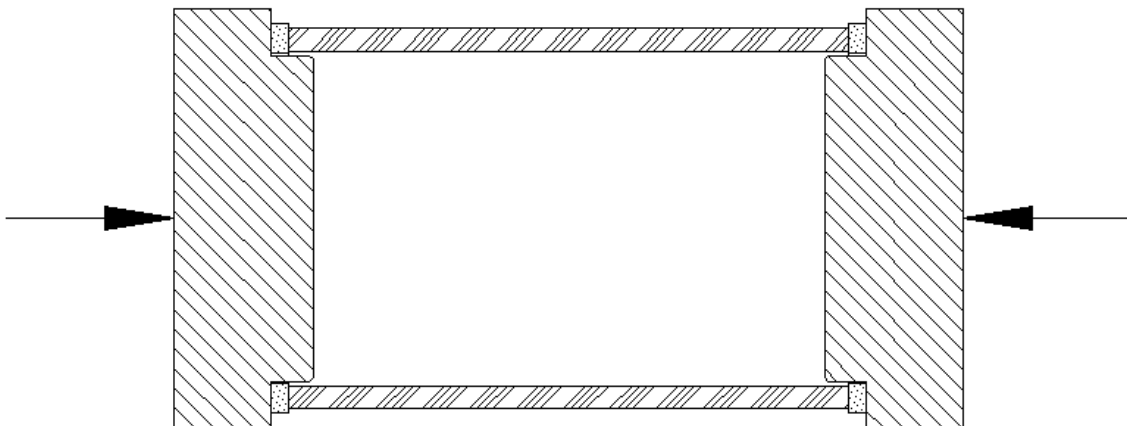


OD O-rings also work well but beware that the tolerance on the cylinder OD is large ( $\pm .010''$  typically). Also, the ID/OD concentricity of the cylinder can be several thousandths, which can be important if precise locating is needed. That said, OD O-rings work great for prototypes because the OD of the cylinder can be measured and then the gland for the O-ring could be made to fit. Again, use P-80<sup>TM</sup>.



#### **4. Axial Squeeze Against Rubber Washer**

Use pilots to locate the cylinder then squeeze against a rubber flat washer. Make sure that with the stiffness of your washer and squeeze force that the washer can properly seal if the cut end of the glass cylinder is  $\frac{1}{2}^\circ$  from square.



#### **5. Potting with RTV Silicone**

This is commonly done to mount the cylinder within an aluminum housing. The idea is to use a close fitting rod to fit inside the cylinder that is precision located to fix the position of the cylinder until the RTV cures. This method can work well for prototypes and production but expect to experiment with your technique of applying and curing the RTV.

### Material Selection Guide

<b>Material Class</b>	<b>Included Materials</b>
1	Plastics, Aluminum, Brass, 300 Series SS
2	400 Series SS, Steel
3	Invar, Kovar

<b>Mounting Method</b>	<b>Material Class</b>	<b>Cure Temp (°C)</b>	<b>Operating Temp (°C)</b>
Standard Silicone Cylinder Seals	1,2,3	NA	-20 to 150
Extreme Temperature Silicone Cylinder Seals	1,2,3	NA	-55 to 150
Epoxy Bond	1	25	25
	2	40 to 60	40 to 60
	3	<200	<200
Axial Squeeze (Standard Silicone)	1,2,3	NA	-20 to 150
Axial Squeeze (Extreme Temperature Silicone)	1,2,3	NA	-55 to 150
ID or OD O-Rings	1,2,3	NA	Depends on O-Ring Capability And O-Ring Groove Design