



## GLASS SOLDER PREFORMS

### Features:

- Compatible with singlemode, multimode, or polarization maintaining fibers
- Alternative to costly gold plating methods for hermetic sealing
- Available in circular or oval configurations
- Fatigue and corrosion resistant
- No flux required for use
- Low melting temperature
- High fluidity when molten
- Large volume manufacturing capacity
- Designed to meet Telcordia specifications

### Applications:

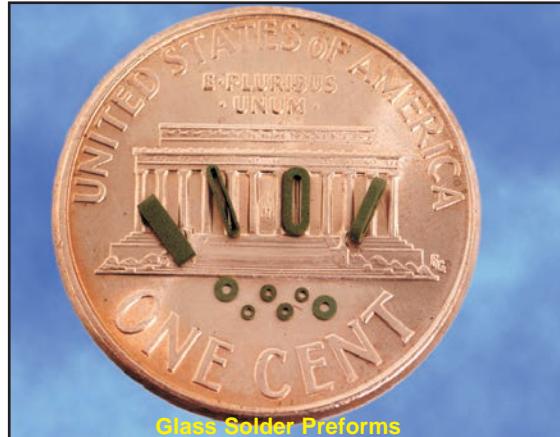
- Fiber to metal hermetic sealing
- Laser diode packaging
- Integrated optics packaging
- Vacuum feed through assemblies

### Product Description:

OZ Optics Glass Solder Preforms are designed specifically for hermetic sealing of optical fibers in optoelectronic and all optical packaging. The Glass Solder Preforms bond directly to the glass and metal surfaces. This enables hermetic sealing of optical fibers to metal packages without costly metalization, thus reducing the cost and lead time of the whole packaging process. After processing, assemblies sealed with glass solder can easily meet the stringent humidity resistance, hermeticity, and strength demanded for component packaging. Custom configurations can be designed for specific applications.

OZ Optics Glass Solder Preforms are compatible with Single Mode, Multimode or Polarization Maintaining (PM) fibers in single fiber and ribbon constructions. PM fibers offer a means to control polarization of optical signals throughout the system thus controlling Polarization Dependant Losses (PDL) and Polarization Mode Dispersion (PMD). This control is crucial in developing high speed, 10 Gbs, 40 Gbs, and faster systems.

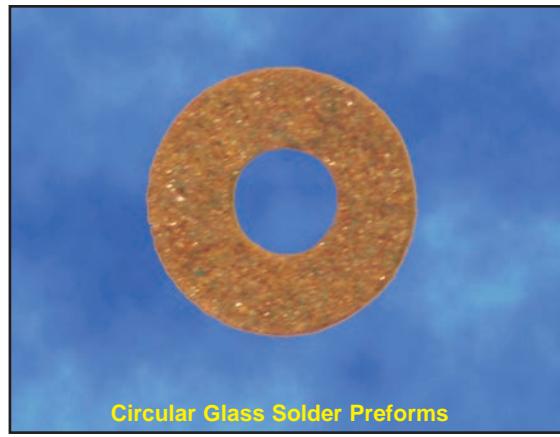
To help use the glass solder preforms, OZ Optics can supply a basic resistive or inductive soldering station to solder preforms onto metal ferrules and fibers. Please see the standard parts offered on the opposite page or call OZ Optics to select a design to fit your needs.



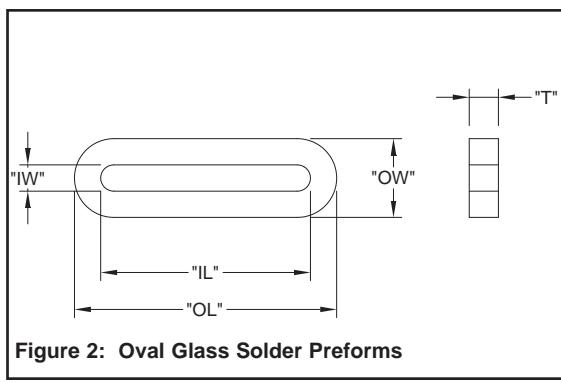
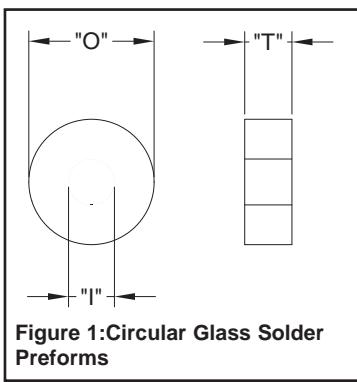
Glass Solder Preforms



Oval Glass Solder Preforms



Circular Glass Solder Preforms



## Ordering Examples for Standard Parts:

### Circular Glass Solder Preforms

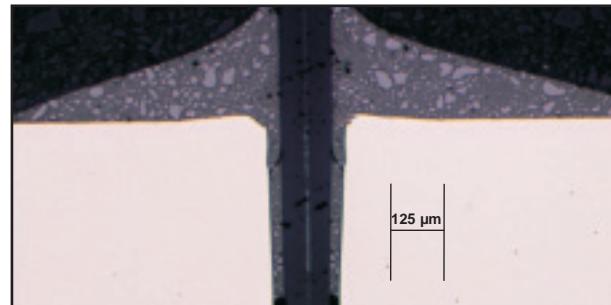
Bar Code	Part Number	ID (microns)	OD (microns)	Thickness (microns)	Recommended for
12540	GSP-C-279-762-254	279	762	254	Single fibers with 125 micron cladding diameters
12543	GSP-C-305-610-203	305	610	203	Single fibers with 125 micron cladding diameters
10412	GSP-C-381-1054-254	381	1054	254	Single fibers with 125 micron cladding diameters
34912	GSP-C-559-1194-203	559	1194	203	Single fibers with 125 micron cladding diameters

### Oval Glass Solder Preforms

Bar Code	Part Number	ID Length (microns)	ID Width (microns)	OD Length (microns)	OD width (microns)	Thickness (microns)	Recommended for
24351	GSP-V-1200-400-2000-1200-550	1200	400	2000	1200	550	4 Fiber Ribbon
12439	GSP-V-2200-406-3000-1200-550	2200	406	3000	1200	550	8 Fiber Ribbon
32977	GSP-V-3200-400-4000-1200-400-500	3200	400	4000	1200	500	12 Fiber Ribbon
32941	GSP-V-4400-380-5400-1380-760	4400	380	5400	1380	760	16 Fiber Ribbon

### Standard Product Specifications:

Density of Glass Powder: 7.6 g/cc  
 Glass Transition (Tg): 215 °C  
 Average Thermal Expansion Coefficient (room to 150C): 7.7 ppm/C  
 Modulus of Elasticity:  $6.33 \times 10^5$  kg/cm<sup>2</sup>  
 Sealing Temperature: 340 °C - 440 °C



Cross section of the hermetic seal created by using glass solder

### Ordering Examples For Standard Parts:

A customer needs a Glass Solder Perform to hermetically seal a standard singlemode fiber into a hermetic seal tube with a 150 micron fiber hole and a 2.5mm outside diameter. No specific dimensions are given, however the customer would like to ensure that a good seal can be created.

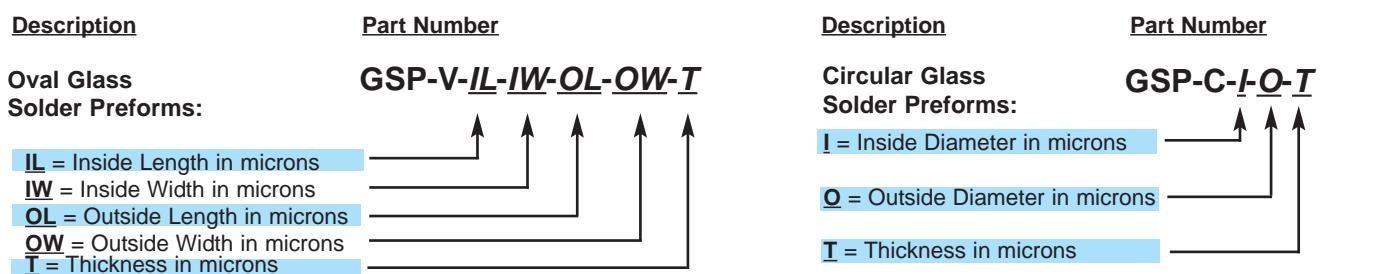
Bar Code	Part Number	Description
12540	GSP-C-279-762-254	Circular Glass solder perform, inside diameter of 279 microns, outside diameter of 762 microns with a thickness of 254 microns

## Ordering Information for Custom Parts:

OZ Optics welcomes the opportunity to provide custom designed products to meet your application needs. As with most manufacturers, customized products do take additional effort so please expect some differences in the pricing compared to our standard parts list. In particular, we will need additional time to prepare a comprehensive quotation, and lead times will be longer than normal. In most cases non-recurring engineering (NRE) charges, lot charges, and a 500 piece minimum order will be necessary. These points will be carefully explained in your quotation, so your decision will be as well informed as possible. We strongly recommend buying our standard products.

## Questionnaire For Custom Parts:

1. What size fiber are you intending on using the glass solder pre-form with?
2. Will this be used for a single fiber, ribbon fiber or group of fibers?
3. What is the fiber seal tube inside diameter that you intend to solder the fiber into?
4. What is the outside diameter of the seal tube?
5. What is the material of the solder tube?
6. Is there any plating or coating on the seal tube?
7. Do you need circular or oval preforms?
8. Do you know what dimensions you want?



## Ordering Examples For Custom Parts:

A customer needs a Glass Solder Perform to hermetically seal a custom ribbon fiber array. The customer has specified that they require an oval perform with the inside length to be 5.0mm, the inside width to be 300µm, the outside length to be 7 mm and the outside width to be 900µm with a thickness of 1mm

Bar Code	Part Number	Description
NA	GSP-V-5000-300-7000-900-1000	Oval Glass solder perform, inside dimension of 5000 µm x 300 µm, outside dimension of 7000 µm x 900 µm, thickness is 1 mm.

## Frequently Asked Questions:

**Q:** Should I use flux in the glass soldering process?

**A:** No, flux may contaminate the glass melting process creating a poor hermeticity seal.

**Q:** What temperature should I use to melt the glass solder preform onto the fiber?

**A:** The recommended processing temperature is between 340 °C and 440 °C.

**Q:** If I use a separate seal tube to seal the fiber, how do I put this into my final package?

**A:** The seal tube should be sealed into the package using standard metal soldering or laser welding procedures. Since the metal solders use a lower melting temperature, there will be no chance of compromising the glass seal.

**Q:** Can I use the glass solder directly on my final package?

**A:** Yes, if the components within the package can withstand the processing temperatures. For most applications it is recommended that a separate seal tube be used.

**Q:** How long does it take to seal a fiber with the glass solder preform?

**A:** Depending on the method used to heat the glass solder ring, a good seal can be accomplished in as little as 3 seconds.

**Q:** What material should be used for my seal tube?

**A:** The glass solder will adhere to many metal or glass materials. Care should be taken in selecting materials to minimize stresses over the expected temperature range so the seal of fibers are not compromised. A Kovar material with a nickel and gold overcoat is typically recommended because it most closely matches the coefficient of thermal expansion of the fiber and the glass solder material and it can later be metal soldered into the final package.