

General Handling

Careful consideration should be given to the general handling of capillary tubing and optical fiber. A few key guidelines are discussed below.

Storage of capillary tubing and optical fiber can be critical, depending on the application.

- Most Polymicro products are packaged with a protective diaper wrapped around the outside layer of product. The product is then shipped in a sealed plastic baggie. Efforts to reduce exposure to moisture will prolong lifetime, therefore keep the shipping baggie sealed until the product is ready to be used. Purchasing in spool lengths that appropriately match consumption is recommended. To minimize collection of debris and dust onto stored material, replace the protective diaper after removing product from the spool.
- If exposure of capillary tubing internal surfaces to the atmosphere is of concern, make sure to reseal the ends after removing product. This can be done by thermal fusing or by placing a septa or similar material over the end of the capillary tubing.
- When purchasing large diameter tubing or fiber, be sure to store the product so it is setting on the flange edges. This will avoid cascading and subsequent entanglement during product removal.

Cleanliness of any surface that comes into contact with the tubing or fiber is critical.

- Debris on work surfaces, such as glass particles from previous cleaving operations, can lead to breakage and is often perceived as apparent brittleness. Especially troublesome, are small particles that become embedded in the polyimide, and lead to breakage during further processing or use. Consider placing butcher paper on your workbench and change it regularly to provide a clean work area. If this is not possible, clean the work surface frequently.
- If capillary is placed onto, or routed through, a manufacturing device, consider all surfaces or features that could contact the capillary and make sure these are routinely cleaned of any debris, especially after any breakage. Surfaces should be smooth and free of manufacturing defects such as burrs or sharp edges; keep this in mind during fixture design and manufacture.

Bending stress is a key handling issues that should be given careful consideration.

- Capillary tubing and optical fiber are often exposed to bending during manufacturing processes and subsequent use. Bending these products produces localized tension, often referred to as bending stress. The smaller the bending radius, the greater the imparted bending stress. The acceptable bending radius for a given application should always be taken into account. For further discussion on bending stress refer to Fiber Optics & Optical Fiber and Flexible Fused Capillary Tubing chapters of this handbook.
- Note that product lifetime is directly proportional to the bend radius. The smaller the bending radius either during handling, or in the final product design, the shorter the lifetime of the product.
- A common handling oversight is the incorporation of rollers or guides that expose the tubing or fiber to excessively high stresses. It is recommended that the applied stress be calculated for each component of the system. Related equations and tables are found in Fiber Optics & Optical Fiber and Flexible Fused Capillary Tubing chapters of this handbook.