For Public Release

Read BEFORE handling fiber optic cables and assemblies.

Handling Note for Fiber Assemblies and Impact on Warranty

Scope: This note states the recommended handling practices for fiber optic cables and assemblies manufactured by X Specialty Optical Fibers Inc. and comments on important warranty issues related to handling. This note relates to ALL fiber cable assemblies but is specifically targeted at larger core cables (>200μm core).

Section 1 – Handling Guidelines

A) Strength and Proof Testing:

Do not proof test!

Strength, or "proof" testing, is done by the fiber manufacturer. It is a carefully controlled process. It has been found that the more one stresses fiber near its strength limit, the more overall lifetime expectation to continue to resist failures is reduced. Therefore, it is specifically recommended that NO fiber be proof tested, or strength tested except perhaps for sample testing of large lots in order to gather nominal strength statistics. But, ANY proof or strength testing is done at the risk of damaging the fiber. Specifically, proof testing a fiber at or below its bend radius minimum or in any way uncontrolled or unapproved by us will void the warranty.

B) Bend Radius:

Do not bend the fiber past the minimum bend radius (MBR)!

The rule of thumb regarding bend radius is that the MINIMUM bending radius for a particular fiber is 300X the cladding diameter (assuming the cladding is also glass). Using this rule of thumb the stress on s silica fiber is nominally 32KPSI. To aid in this the following minimum bending chart is provided:

Fiber	Minimum Bend RADIUS	Minimum Bend Diameter
100/110/125	1.7cm (0.65")	3.3cm (1.30")
200/220/245	3.3cm (1.30")	6.6cm (2.60")
400/440/480	6.6cm (2.60")	13.2cm (5.20")

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600/660/710	9.9cm (3.90″)	19.8cm (7.80″)
1000/1050/XXX	15.8cm (6.2″)	31.5cm (12.4″)

NOTE: Fiber manufacturer will typically store and ship fiber on spools nominally twice the values above. They do that for the very reasons stated here. The longer and higher a fiber is stressed the more likely it is to break!

If your application requires a smaller MBR than listed here, please call us to discuss the best ways to minimize risks and maximize the likelihood of a successful outcome and long use without damage.

CABLE CONSTRUCTION DOES NOT LIMIT BENDING TO THE MINIMUM RADIUS, ONLY PROPER HANDLING AND CARE CAN DO THAT!

C) Twisting:

Do not coil or twist the cable when spooling, un-spooling, coiling or uncoiling.

Cables must be handled in a "hand over hand" fashion at all times.

Fiber Cables are NOT rope or wire and cannot be handled as such. Twisting while coiling or uncoiling is a very common cause of fiber cable damage.

Fiber cables should not be handled like rope and coiled or uncoiled by twisting or untwisting one loop at a time. Fiber should always be handled in a "hand over hand" fashion making coils or unrolling coils by moving the fiber in a circle, one hand over the other. To do otherwise is to induce a twisting stress in the cable and hence in the fiber within the cable. This type of improper handling can also cause end terminations to fail. Very high stresses can be achieved if a cable is uncoiled incorrectly and damage or weakening can be the result, and this type of handling will void the warranty.

D) Pulling:

Do not pull fiber cables by their end fittings! And, be careful of pulling in general, unless your specific cable has been rated to withstand this stress.

Fibers are usually very strong in direct tension, relative to their cross section, but when the fibers are small it is very easy to break them. Unfortunately, each cable construction will have its own limits, and it is difficult to give any rules of thumb in this regard. If you anticipate pulling your fiber cables in any way, please consult with us for help in determining the maximum tensions allowed and to avoid problems or inappropriate expectations.

E) Other Handling Comments:

Optical fiber is not wire or rope and can't be handled as such.

Any fiber optic cable, constructed with quality techniques and materials, should survive the installation and use they have been designed for as long as care is taken when handling it. The most

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risk in a fiber cable's life typically occurs during inspection, testing and installation. It is very easy to exceed the bend radius guideline, especially when working with the large core cables and performing these tasks.

The main thing is to remember that smaller core fibers and the associated cables are very robust and can lull you into thinking that the recommended handling practices are "flexible." That is an incorrect assumption. Fiber is glass. While optical fiber represents an incredible achievement in materials processing, you cannot lose sight of the fact that it is still glass and glass can break.

XSOF makes some of the most robust large core fiber assemblies. This note is an attempt to raise the level of awareness regarding these cables in order to ensure the maximum number of successful applications. If you have ANY questions about this, please feel free to call us for a specific discussion of your application and product.

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