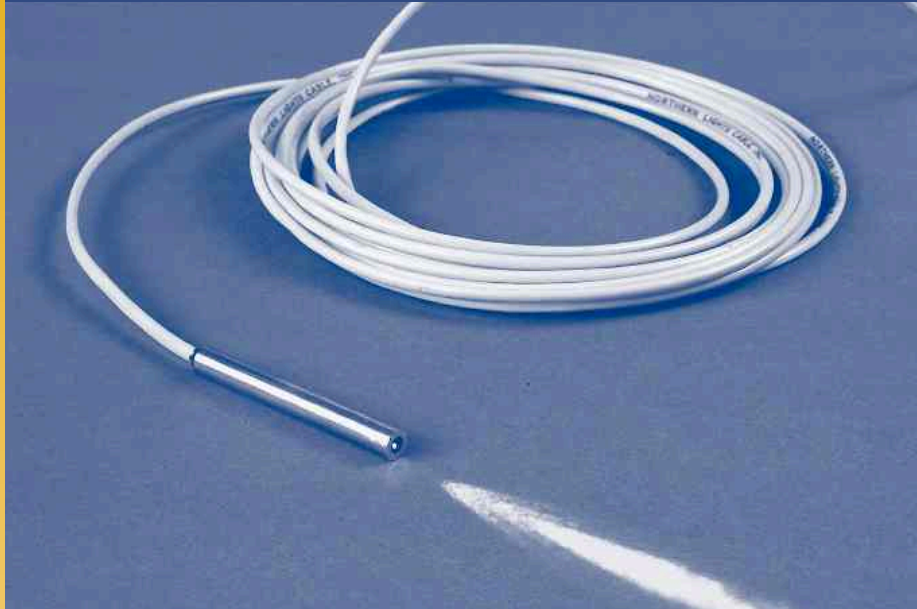


Tapered Optical Waveguides



APPLICATIONS

- Laser Ignition
- High power laser coupling
- Laser diode coupling
- Laser calibration systems
- LIDAR and other low divergence, low energy, detection systems
- Diffuse signal collection in sensing systems such as bio-fluorescence
- High pressure optical feedthroughs

DESCRIPTION

This product line incorporates a fiberoptic taper which is a dielectric waveguide that has a radius that varies with length. They can be used as high power laser input devices and as such would have an input core diameter that is larger than the output core diameter. However they can also be used in the opposite direction either as output devices to lower the emerging NA or fabricated as an "up" taper on a standard fiberoptic to increase the accepting NA which is useful in Laser Diode and sensing applications.

Power Capabilities: It has been shown that fused silica taper assemblies such as this can achieve 109 Watts/cm² of pulsed power at the output

end of a 600µm core fiber (15ns pulses). At any power level, successful laser coupling depends upon paying attention to the cleanliness of the optics and end faces involved. Even at low powers, attention to the epoxies is critical. As powers exceed 103 Watts/cm² modified high power connectors should be used which removes epoxies from the end of the connector. As powers get above 105 Watts/cm² true well type high power connectors can be used. This connector deepens the "well" which moves the epoxy further back from end face and also surrounds the end of the fiber completely in air protecting against ablation and decomposition caused

FEATURES

- Lower surface energy density reduces surface damage.
- Reduces dielectric breakdown of the air.
- Folded focal point reduces the potential of self-focusing.
- Allows for simpler input optics and easier alignment.
- Increase or decrease NA.
- Optimum shape for high pressure optical feedthroughs.

by over filling or misalignment. At 106 Watts/cm² a glass tube type ferrule should be used and at 107 Watts/cm² tapers are a requirement.

Tapered Optical Waveguides

ORDERING/SPECIFYING INFORMATION

- Tapers need to be specified with regard to their sizes, lengths, fiber type, and end terminations.
- The input size is the core diameter of the taper input.
- The output size is the core diameter of the taper output. If the taper is part of a fiber-optic cable the output size will be the fiber core size.
- The fiber type is the same as the material type for the taper (fused silica)
- The end terminations will be a 3/8" or 1/4" diameter ferrule or any of the standard fiberoptic connectors that are available.
- Tapers are available in input to output core ratios of 10:1 or 1:10 depending on whether it is a "down" or "up" taper.

NOTES

- Tapers can be custom fabricated for a variety of environmental or dimensional requirements. If you have a unique application do not hesitate to make your inquiry specific to your needs.
- Significant losses will occur unless the product of the output aperture and the NA at that aperture is less than or equal to the product of the input aperture and the NA at that aperture.

A Fiber Type

- 1) Silica/Silica (UV/VIS)
- 2) Silica/Silica Low Solarization (UV)
- 3) Silica/Silica (VIS/NIR)
- 4) Polymer Clad Silica(UV/VIS High NA)
- 5) Polymer Clad Silica(VIS/NIR High NA)
- 6) Other _____

B Fiber Size

1) 50µm	6) 500µm
2) 100µm	7) 600µm
3) 200µm	8) 800µm
4) 300µm	9) 1,000µm
5) 400µm	10) Other _____

C Termination

- 1) SMA-905
- 2) O-ring SMA
- 3) Std. Ferrule
- 4) FC
- 5) ST
- 6) Biconic
- 7) Ø0.250" Ferrule
- 8) Ø10mm Ferrule
- 9) Other _____

D Jacketing

- 1) PVC Tubing
- 2) PVC/Kevlar Furcation Tubing
- 3) PVC Monocoil
- 4) Stainless Steel BX
- 5) Braided SSTL/PTFE Hose
- 6) Teflon Tubing
- 7) Other _____

E Taper End Face Diameter
Specify _____

Temperature Requirements: _____

Other Requirements: _____

Specifying Method

T - A B C / C D X X X X (OAL-cm)

Example : T-164/73 0125

T - 1 6 4 / 7 3 0 1 2 5 (cm)

UV/Vis, 600µm core, FC connector, 1/4" ferrule, Monocoil, 125 CM Long.

Please contact RoMack regarding high temperature, chemical, vacuum, or any other environmental concerns.

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