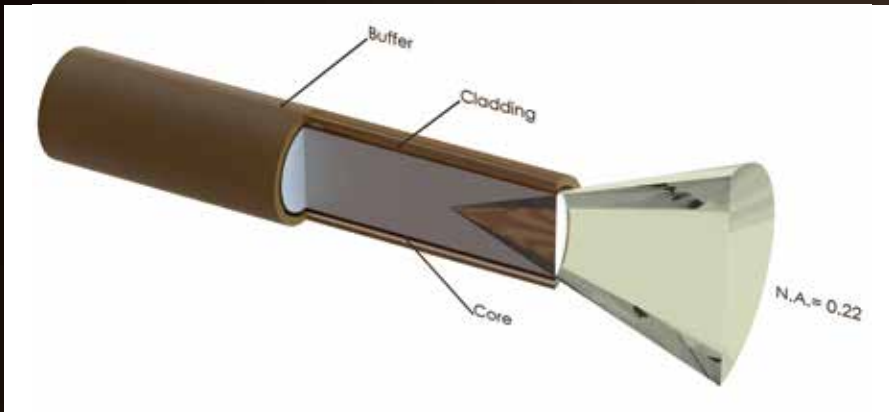


# FIBER-OPTIC DESIGN



## Core

For spectroscopic applications, generally, multi-mode step index silica fibers are used. These range in core thickness from 50 to 1000 microns. The core is made out of pure silica. Other fiber cores with much higher absorption are made out of certain glass types or plastics. These are not offered in this catalog.

First a distinction is made between silica with high or low OH content. Silica fibers with high OH (600-1000 PPM) are used in the UV/VIS wavelength range because of the low absorption in the UV. They are referred to as UV/VIS fibers. For Deep-UV applications (below 230 nm) special solar-

ization resistant fibers can be used.

The water content causes strong absorption peaks in the NIR wavelength range. In order to get good fibers for the NIR range, the "water" is removed from the silica. This results in low OH fibers (<2 PPM) with low absorption in the NIR. They are referred to as VIS/NIR fibers.

New in this catalog are the so-called broadband fibers, which can be used for the UV-NIR range (250-2500 nm), the product code for these fibers is UVIR.

## Cladding

In order to get the light guiding effect the core is cladded with a lower index of refraction material. For the highest quality fibers with the lowest absorption this is a fluorine-doped silica, the so-called silica-silica or all-silica fibers with a numerical aperture (NA) of 0.22.

## Buffers

Without further protection fibers would easily break, because of small scratches or other irregularities on the surface. Therefore a next layer, the buffer, is added. This buffer also determines under what circumstances the fiber can be used. Temperature range, radiation, vacuum, chemical environment and bending are factors to be considered.

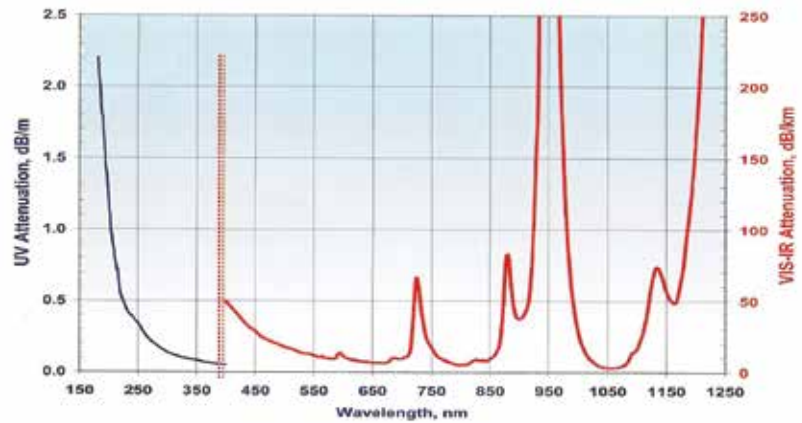
Polyimide buffers offer a wide temperature range (-100 to 400°C) and superior solvent resistance. Also, this material is non-flammable. Drawbacks are sensitivity to micro bending and the difficulty to remove it.

For extreme temperatures (-270 to 700°C) metal buffers are used. Metal buffers can withstand a continuous high temperature up to 500 °C and intermittent even up to 700°C. Low outgassing makes them also excellent for use in UHV environments.

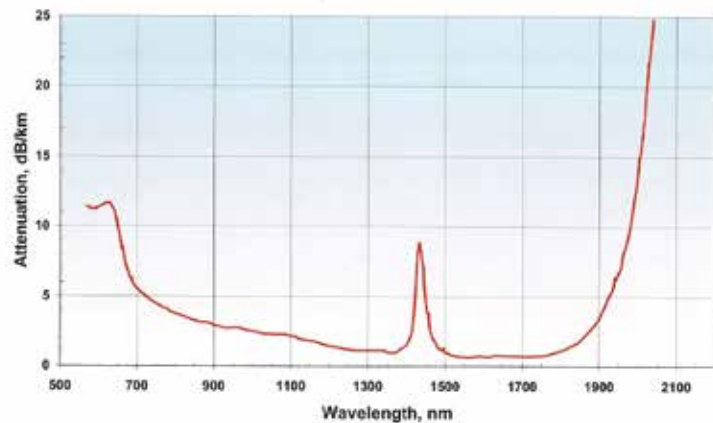


## Technical Data

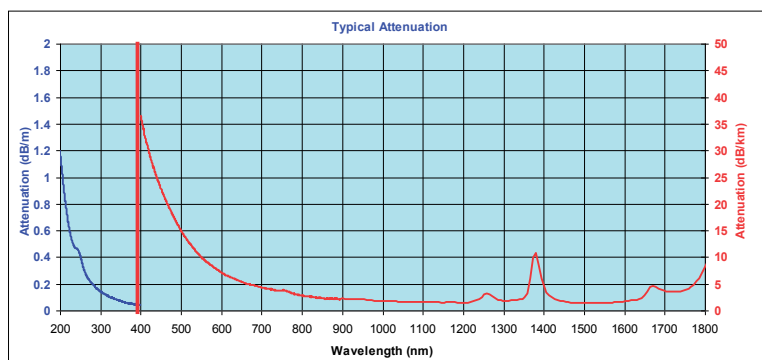
<b>Fiber Material</b>	Standard
<b>Temperature Range</b>	-190 °C to +400°C
<b>Fiber type</b>	Step index Multimode
<b>Core Numerical Aperture</b>	0.22 ± 0.02
<b>Buffer</b>	Polyimide
<b>Available Diameters</b>	50/100/200/400/600/800/1000 μm
<b>Laser damage resistant core</b>	1,3 kW/mm <sup>2</sup> CW at 1060 nm, up to 10 J, pulsed
<b>Bend radius</b>	momentary 100 x clad radius long term 600 x clad radius



Transmission UV/VIS fibers



Transmission VIS/NIR fibers



Transmission UV/VIS/NIR broadband