Optran® MIR
Silver halide fiber

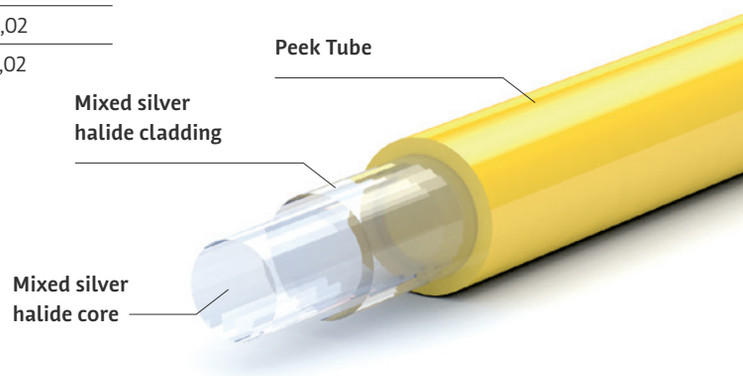
This unique fiber, which comprises a photosensitive compound (AgCl, AgBr), offers extremely low attenuation values in the mid-infrared (MIR) range.

Wavelength

Optran® MIR	4–18 µm

Numerical aperture (NA)

Low	0,13 ± 0,02
Standard	0,25 ± 0,02
High	0,35 ± 0,02



Advantages

- Optimised for CO- and CO_2-laser
- Low attenuation in the MIR range
- Robust and flexible
- Non-hygroscopic material
- Highly reliable connectors available
- Available in core / cladding or pure core versions

Technical data

Wavelength / spectral range	Optran® MIR: 4–18 µm
Numerical aperture (NA)	0,13 ± 0,02 | 0,25 ± 0,02 | 0,35 ± 0,02
Operating temperature	-60 to +110 °C
Standard diameter	Core / cladding (µm) 400 / 500 µm | 600 / 700 µm | 860 / 1000 µm
Calculation index (core)	2,1
Reflective losses @ 10.6 µm	25 %
Minimum bending radius	100 × cladding diameter
Highest power	30 Watt

Your advantages

- Over 500 Optran® UV and Optran® WF fibers in stock
- Non-standard diameters and NA values available
- Option of fully customised fiber production
- A complete solution for all your performance needs
- ISO 9001 compliant manufacturing environment
- CE mark

Headquarter

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Production sites

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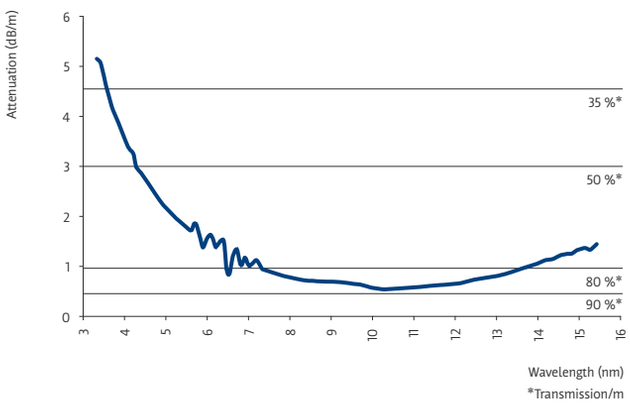
Attenuation values

The following diagram provides an overview of attenuation values relative to the wavelengths:

Optran® MIR



Applications

First choice for applications including CO_2-laser guides, FTIR spectroscopy, laser surface treatments and many more.

Instructions for using Optran® MIR fibers

Silver halide fibers are a very specific type of fibers that require special handling.

Avoid touching the bare core / cladding or allowing it to come into contact with damp / oily objects. Use dry, soft polymer or paper instead. Never touch the surfaces at the ends of the fibres! These must remain extremely clean if laser damage is to be prevented.
Avoid exposing MIR fibres to visible radiation or, above all, UV radiation, including luminescent light, as silver halides are photosensitive crystals that darken irreversibly if they are exposed to radiation. The optical properties of the fibre are best maintained by storing it in a dry, dark environment (e.g. in a loose, black polymer tube).
Cover the fibre tips with opaque caps to protect them against contamination and UV and visible radiation. Remove these caps only just before use, ideally in red light. Ensure that the fibre does not come into contact with metal in order to prevent any chemical reaction. Contact with any other materials, including polymers, dielectrics and the metals Au, Ti, Nb, Ta, Pt, is safe, though. The minimum bending radius for MIR fibres is 100 times their diameter. A smaller radius will cause the fibre to deform.

When connecting the fibre to a laser beam, be careful not to start at the highest intensity. First check the spot size of the focused laser beam at low intensity before connecting the fibre: the spot size should be less than 0.6 times the fibre diameter. Do not increase the laser power until a fibre transmission of 50–70 % has been reached. The fibre should not be too close to the irradiated area while intense radiation is being transmitted. Combustion and evaporation products can contaminate the surfaces at the fibre endfaces and thus cause the fibres to overheat. Where cables are used for laser cutting or drilling, a cooling gas stream or a protective focusing optic should be used to prevent the fibre tips from melting (melting point: approx. 412 °C).
Use the sharpened edge of a knife, scalpel or diamond knife (preferable from a dielectric material) to smooth the fibre tip. The use of a microtome is recommended for optimum results. The thin part of the fibre should be cut slowly after the first cut.

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