



## Tm, Ho and Tm/Ho Doped Fibers

### For fiber lasers from 1.9 to 2.2μm

High power laser @ 2 microns needs reliable Thulium doped fiber.

iXblue carries a full range of Thulium and Holmium doped optical fibers for amplifiers and fiber lasers. iXblue's Thulium doped fiber products have been developed for core pumped fiber lasers and amplifiers.

Single clad Holmium doped fiber can be pumped by a Thulium doped fiber laser with direct core pumping.

Double clad Holmium doped fiber is available for high efficiency multi-mode pump coupling.

### Key Features

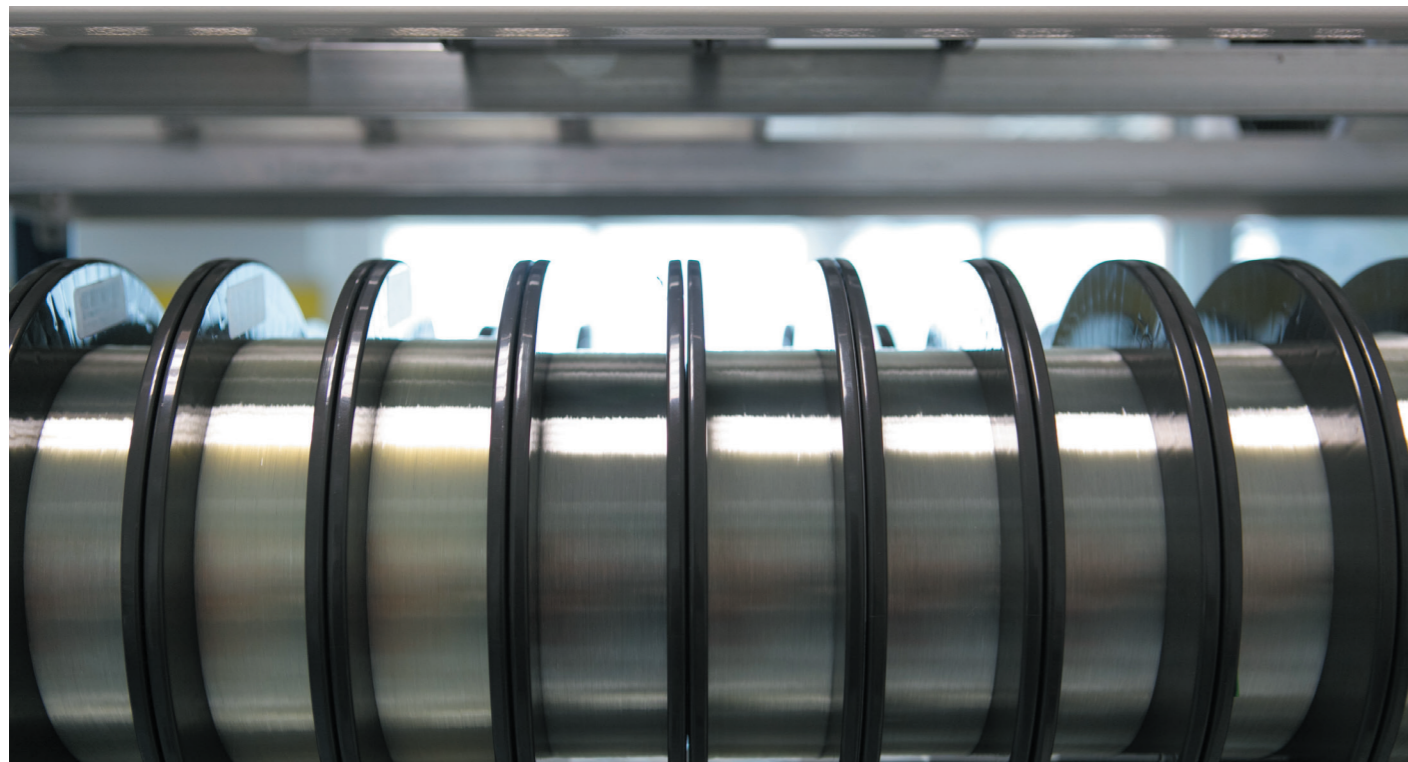
- CW and pulsed fiber lasers @ 2 μm
- High pump and consistent absorption
- Low M<sup>2</sup>
- Large mode area
- High efficiency
- High Tm O concentration

### Applications

- 2 μm CW & pulsed lasers
- 2 μm amplifiers

### Related Products

- Associated fiber bragg mirrors
- Matching passive fiber



### Main Specifications for single clad fibers

Product Name	Core diameter (μm)	Core NA	Core absorption (dB/m)	Core absorption(dB/m)	Cladding diameter (μm)	Coating diameter (μm)
IXF-TDF-4-125	4 +/- 1	0.27	> 150 @ 793 nm *	> 35 @ 1180 nm	125 +/- 2	245 +/- 15
IXF-TDF-5-125	5 +/- 1	0.25	> 300 @ 793 nm*	> 20 @ 1180 nm	125 +/- 2	245 +/- 15
IXF-TDF-5-125-HD	5 +/- 1	0.17	> 300 @ 793 nm*	> 70 @ 1180 nm	125 +/- 2	245 +/- 15
IXF-HDF-8-125	8 +/- 1	0.16	> 2.5 @ 890 nm **	> 15 @ 1150 nm > 45 @ 1950 nm* > 10 @ 2050 nm*	125 +/- 2	245 +/- 15

### Polarization Maintaining Fibers:

IXF-TDF-PM-5-125	4.5 +/- 1	0.25	> 120 @ 793 nm *	> 30 @ 1180 nm	125 +/- 2	245 +/- 15
IXF-HDF-PM-8-125	8 +/- 1	0.16	> 2.5 @ 890 nm **	> 15 @ 1150 nm > 45 @ 1950 nm* > 10 @ 2050 nm*	125 +/- 2	245 +/- 15
IXF-HDF-PM-20-250	20 +/- 2	0.08	> 4 @ 890 nm **	> 24 @ 1150 nm > 72 @ 1950 nm* > 16 @ 2050 nm*	250 +/- 2	340 +/- 20

\* calculated from 1180 nm absorption value  
\*\* calculated from 1150 nm absorption value

### Common specifications

- OH concentration: < 0.01 ppm
- Relative OH absorption @ 1380 nm: < 0.6 dB/km
- Custom specifications on request

### Main Specifications for double clad fibers

Product Name	Core diameter (μm)	Core NA	Clad absorption around @789 nm (dB/m) *	Clad absorption @1180 nm (dB/m)	Cladding diameter (μm)	Coating diameter (μm)
IXF-2CF-Tm-O-6-130	6 +/- 0.5	0.22	> 3.3	> 0.6	125 +/- 3	245 +/- 15
IXF-2CF-Tm-O-10-130	10 +/- 1	0.14	> 6.5	> 1.2	125 +/- 3	245 +/- 15
IXF-2CF-Tm-O-12-130	12 +/- 1	0.14	> 5.0	> 1.0	125 +/- 3	245 +/- 15
IXF-2CF-Tm-O-20-250	20 +/- 1	0.09	> 3.3	> 0.6	250 +/- 5	340 +/- 20
IXF-2CF-Tm-O-25-250	25 +/- 1	0.08	> 7.0	> 1.2	250 +/- 5	360 +/- 20
IXF-2CF-TmHo-O-6-130	6 +/- 0.5	0.22	> 3.3	> 0.6	125 +/- 3	245 +/- 15
IXF-2CF-TmHo-O-25-300	25 +/- 1	0.09	> 3.0	> 0.7	300 +/- 10	460 +/- 20

### Polarization Maintaining Fibers:

IXF-2CF-Tm-PM-6-130	6 +/- 0.5	0.22	> 3.3	> 0.6	125 +/- 3	245 +/- 15
IXF-2CF-Tm-PM-10-130	10 +/- 1	0.14	> 6.5	> 1.2	125 +/- 3	245 +/- 15
IXF-2CF-Tm-PM-20-300	20 +/- 1	0.08	> 2.7	> 0.5	300 +/- 10	460 +/- 20
IXF-2CF-TmHo-PM-6-130	6 +/- 0.5	0.22	> 3.3	> 0.6	125 +/- 3	245 +/- 15
IXF-2CF-TmHo-PM-25-300	25 +/- 1	0.09	> 5.6	> 1.0	300 +/- 10	460 +/- 20

\* calculated from 1180 nm absorption value

### Common specifications

- MM background (dB/km): < 50
- Cladding NA: ≥ 0.46
- Cladding shape: octagonal / round (PM) fiber
- Proof test level (kpsi): 100

- Low OH water content : < 0.1 ppm
- Tm/Ho atomic ratio = 10
- Birefringence: > 2.10<sup>-4</sup> typ / Panda type
- Custom specifications on request

### Main Specifications for triple clad fibers

Product Name	Core diameter (μm)	Core NA	Inner clad diameter (μm)	Coating diameter (μm)	Inner clad NA	Outer clad NA	Proof test level (kpsi)
IXF-3CF-Ho-O-20-250-300	20 +/- 1	0.08	250 +/- 3	450 +/- 15	0.22	> 0.46	> 78
IXF-3CF-TmHo-PM-18-270-300	18 +/- 2	0.09	270 +/- 3	490 +/- 25	0.22	> 0.46	> 50