

RadHard 50 µm BendBright™ Multimode Fibre



APPLICABLE STANDARDS

- IEC / EN 60793-2-10: type A1-OM2/OM3/OM4/OM5
- ISO / IEC 11801: Category OM2/OM3/OM4/OM5
- TIA / EIA 492 AAAF

Issue Date: September 2024  
Supersedes: December 2022

Prysmian Group's 50 µm RadHard MMF can be used in moderate irradiative environments (ex. Gamma rays, X-flash, Neutrons, and other high energy charged particles) . The bend-insensitive RadHard MMF has a Germanium-doped core and with its outstanding bending performance, the fibre provides improved fibre and cable performance. The 50 µm RadHard MMF can be used in all cable constructions, including loose tube, tight buffered, ribbon and central tube designs.

OPTICAL SPECIFICATIONS  
RADIATION INDUCED ATTENUATION (RIA)

| Test Conditions       | Units   | RIA at 1300 nm  |
|-----------------------|---------|-----------------|
| Dose = 10 kGy         | dB/100m | < 7.5 (typical) |
| Dose Rate = 1.67 Gy/s |         |                 |
| Temperature ≈ 28°C    |         |                 |
| Dose = 20 kGy         | dB/100m | < 8 (typical)   |
| Dose Rate = 2.5 Gy/s  |         |                 |
| Temperature ≈ 25°C    |         |                 |

ATTENUATION

| Attribute                          | Units | Specified Values |
|------------------------------------|-------|------------------|
| Attenuation coefficient at 850 nm  | dB/km | ≤ 2.4            |
| Attenuation coefficient at 1300 nm | dB/km | ≤ 0.6            |

BANDWIDTH (OFL)

| Attribute                             | Units  | OM2   | OM3    | OM4    | OM5    |
|---------------------------------------|--------|-------|--------|--------|--------|
| Overfilled Modal Bandwidth at 850 nm  | MHz·km | ≥ 500 | ≥ 1500 | ≥ 3500 | ≥ 3500 |
| Overfilled Modal Bandwidth at 1300 nm | MHz·km | ≥ 500 | ≥ 500  | ≥ 500  | ≥ 500  |
| Overfilled Modal Bandwidth at 953 nm  | MHz·km | -     | -      | -      | ≥ 1850 |

## BANDWIDTH (EMB)

| Attribute                            | Units  | OM3    | OM4    | OM5    |
|--------------------------------------|--------|--------|--------|--------|
| Effective Modal Bandwidth at 850 nm  | MHz·km | ≥ 2000 | ≥ 4700 | ≥ 4700 |
| Overfilled Modal Bandwidth at 953 nm | MHz·km | -      | -      | ≥ 2470 |

## Numerical Aperture

|                    |               |
|--------------------|---------------|
| Numerical aperture | 0.200 ± 0.015 |
|--------------------|---------------|

## MACROBENDING LOSS

| Conditions                          | Wavelength    | Units | Specified Values |
|-------------------------------------|---------------|-------|------------------|
| Mandrel Radius = 7.5 mm, 2 Turns    | 850 / 1300 nm | dB    | ≤ 0.2 / ≤ 0.5    |
| Mandrel Radius = 15 mm, 2 Turns     | 850 / 1300 nm | dB    | ≤ 0.1 / ≤ 0.3    |
| Mandrel Radius = 37.5 mm, 100 Turns | 850 / 1300 nm | dB    | ≤ 0.5 / ≤ 0.5    |

## CHROMATIC DISPERSION

| Attribute                               | Units | Specified Values          |
|-----------------------------------------|-------|---------------------------|
| Zero Dispersion Wavelength, $\lambda_0$ | nm    | 1297 ≤ $\lambda_0$ ≤ 1328 |

## BACKSCATTER CHARACTERISTICS <sup>1</sup>

| Attribute                        | Conditions      | Units     | Specified Values |
|----------------------------------|-----------------|-----------|------------------|
| Point Discontinuity <sup>2</sup> | 850 nm, 1300 nm | dB        | ≤ 0.1            |
| Irregularities over fibre length | 850 nm, 1300 nm | dB        | ≤ 0.1            |
| Reflections                      | -               | -         | Not allowed      |
| Group Index of Refraction        | 850 nm          | (Typical) | 1.482 (typical)  |
| Group Index of Refraction        | 1300 nm         | -         | 1.477 (typical)  |

<sup>1</sup> OTDR measurement with 0.5 μs pulse width.

<sup>2</sup> Mean of bi-directional measurement

## GEOMETRICAL SPECIFICATIONS

### GLASS GEOMETRY

| Attribute                         | Units | Specified Values |
|-----------------------------------|-------|------------------|
| Core Diameter                     | μm    | 50 ± 2.5         |
| Core non-Circularity              | %     | ≤ 5              |
| Core-Cladding Concentricity Error | μm    | ≤ 1.5            |
| Cladding Diameter                 | μm    | 125.0 ± 1.0      |
| Cladding non-Circularity          | %     | ≤ 1              |

## COATING GEOMETRY

| Attribute                            | Units | Specified Values |
|--------------------------------------|-------|------------------|
| Coating Diameter                     | μm    | 242 ± 7          |
| Coating non-Circularity              | %     | ≤ 5              |
| Coating-Cladding Concentricity Error | μm    | ≤ 10             |

## MECHANICAL SPECIFICATIONS

### Proof Test <sup>3</sup>

The entire spool length is subjected to a tensile proof stress ≥ 0.7 GPa (100 kpsi) ; 1% strain equivalent

<sup>3</sup> Higher proof test available upon request

## COATING PERFORMANCE

| Attribute                                                 | Units | Typical Values |
|-----------------------------------------------------------|-------|----------------|
| Average Coating Strip Force, unaged and aged <sup>4</sup> | N     | 1 to 3         |
| Peak Coating Strip Force, unaged and aged <sup>4</sup>    | N     | 1.3 to 8.9     |

<sup>4</sup> Aging at 23°C, 30 days

## FIBRE STRENGTH

| Attribute                                                                       | Units | Specified Values        |
|---------------------------------------------------------------------------------|-------|-------------------------|
| Dynamic Tensile Strength (0.5 meter gauge length), unaged and aged <sup>5</sup> | GPa   | median > 3.8 (550 kpsi) |
| Dynamic Fatigue, unaged and aged <sup>5</sup>                                   | -     | n <sub>d</sub> ≥ 20     |

<sup>5</sup> Aging at 85°C, 85% RH, 30 days

## ENVIRONMENTAL SPECIFICATIONS

| Environmental test             | Test Conditions          | Induced attenuation at 850, 1300 nm (dB/km) |
|--------------------------------|--------------------------|---------------------------------------------|
| Temperature Cycling            | -60°C to +85°C           | ≤ 0.1                                       |
| Temperature - Humidity Cycling | -10°C to +85°C, 4-98% RH | ≤ 0.1                                       |
| Water Immersion                | 30 days ; 23°C           | ≤ 0.1                                       |
| Dry Heat                       | 30 days ; 85°C           | ≤ 0.1                                       |
| Damp Heat                      | 30 days; 85°C; 85% RH    | ≤ 0.1                                       |

## OTHERS

| Attribute | Specification                     |
|-----------|-----------------------------------|
| Length    | Multiples of 2.2 km per spool     |
| Coating   | Standard Acrylate Coating (Clear) |

All measurements in accordance with ITU-T G650 recommendations

© PRYSMIAN GROUP 2024, All Rights Reserved

All sizes and values without tolerances are reference values. Specifications are for product as supplied by Prysmian: any modification or alteration afterwards of product may give different result. The information contained within this document must not be copied, reprinted or reproduced in any form, either wholly or in part, without the written consent of Prysmian. The information is believed to be correct at the time of issue. Prysmian reserves the right to amend this specification without prior notice. This specification is not contractually valid unless specifically authorized by Prysmian.