



## Verrillon® VHM7000 Series Fibers

AFL's Verrillon VHM7000 Series graded-index, bend-insensitive multimode fiber is suitable for mid-range temperatures where the carbon coating is a true barrier against hydrogen diffusion that causes undesirable optical absorption in the operating spectral region of most optical sensors. It has the added benefit of low bend loss for use in tight bend applications.

With their optimized optical design, VHM7000 fibers are engineered to operate under extremely small bend radii down to 7.5 mm. The low bend loss provided by VHM7000 Series fiber makes it the fiber to use in tight bend applications.

VHM7000 is available with polyimide, silicone-PFA, silicone-MTA, MTDA and carbon coatings which allow it to withstand high temperatures and hydrogen-containing atmospheres. Carbon coating can be applied to provide hermeticity against water and hydrogen in downhole applications and for fatigue resistance in long-term deployments.

VHM7000 is available at proof test levels of 100 kpsi and 200 kpsi.

### Features

- 50/125 μm graded-index multimode fiber
- Suitable for use in low/mid-temperature, no/low hydrogen environments
- Bend insensitive
- Carbon coating provides exceptional resistance to H<sub>2</sub> and moisture ingress
- Wide range of protective coatings available, depending on application requirements

### Specifications

PART NO.	MMF-50-7-CMTDA-125-2	MMF-50-7-CMTDA-125-7
Description	50/125/245 μm Carbon/Mid-Temp Dual Acrylate Bend Insensitive, Multimode Fiber, 200 kpsi	50/125/245 μm Carbon/Mid-Temp Dual Acrylate Bend Insensitive, Multimode Fiber, 100 kpsi
PARAMETER	VALUE	VALUE
<b>Material</b>		
Hermetic Coating	Carbon	Carbon
Coating	Mid-Temp Dual Acrylate	Mid-Temp Dual Acrylate
<b>Geometry</b>		
Core Diameter (μm)	50 ± 2.5	50 ± 2.5
Clad Diameter (μm)	125 ± 2	125 ± 2
Core Non-Circularity (%)	≤ 5	≤ 5
Clad Non-Circularity (%)	≤ 1	≤ 1
Core/Clad Offset (μm)	≤ 1.5	≤ 1.5
Coating Diameter (μm)	245 ± 10	245 ± 10
<b>Optical</b>		
NA (nominal)	0.20	0.20
Attenuation <sup>1</sup> @ 850 nm (dB/km), @ 1300 nm (dB/km)	≤ 2.5, ≤ 0.7	≤ 2.5, ≤ 0.7
Bandwidth @ 850 nm (MHz-km), @ 1300 nm (MHz-km)	≥ 500, ≥ 500	≥ 500, ≥ 500
Bend Loss <sup>2</sup> @ 850 nm (dB), @ 1300 nm (dB)	≤ 0.2, ≤ 0.5	≤ 0.2, ≤ 0.5
<b>Mechanical</b>		
Proof Test (kpsi)	≥ 200	≥ 100
Operating Temperature (°C)	-40 to +150	-40 to +150

<sup>1</sup> Measured on loose coil

<sup>2</sup> Two turns on 7.5 mm radius mandrel

# Verrillon® VHM7000 Series Fibers

## Specifications

PART NO.	MMF-50-7-P-125-7	MMF-50-7-CP-125-7
Description	50/125/155 μm Polyimide coated Bend Insensitive, Multimode Fiber	50/125/155 μm Carbon/Polyimide coated Bend Insensitive, Multimode Fiber
PARAMETER	VALUE	
<b>Material</b>		
Hermetic Coating	—	Carbon
Coating	Polyimide	Polyimide
<b>Geometry</b>		
Core Diameter (μm)	50 ± 2.5	50 ± 2.5
Clad Diameter (μm)	125 ± 2	125 ± 2
Core Non-Circularity (%)	≤ 5	≤ 5
Clad Non-Circularity (%)	≤ 1	≤ 1
Core/Clad Offset (μm)	≤ 1.5	≤ 1.5
Coating Diameter (μm)	155 ± 5	155 ± 5
Polyimide Coating Concentricity <sup>1</sup> (%)	≥ 80	≥ 80
<b>Optical</b>		
NA (nominal)	0.20	0.20
Attenuation <sup>2</sup> @ 850 nm (dB/km), @ 1300 nm (dB/km)	≤ 3.0, ≤ 1.2	≤ 3.0, ≤ 1.2
Bandwidth @ 850 nm (MHz-km), @ 1300 nm (MHz-km)	≥ 500, ≥ 500	≥ 500, ≥ 500
Bend Loss <sup>3</sup> @ 850 nm (dB), @ 1300 nm (dB)	≤ 0.2, ≤ 0.5	≤ 0.2, ≤ 0.5
<b>Mechanical</b>		
Proof Test (kpsi)	≥ 100	≥ 100
Operating Temperature (°C)	-65 to +300	-65 to +300

<sup>1</sup> Measured as (Min Wall/Max Wall) x 100

<sup>2</sup> Measured on loose coil

<sup>3</sup> Two turns on 7.5 mm radius mandrel

# Verrillon®

## VHM7000 Series Fibers

### Specifications

<b>PART NO.</b>	<b>MMF-50-7-MTDA-125-7</b>
Description	50/125/245 μm Mid-Temp Dual Acrylate coated Bend Insensitive, Multimode Fiber
<b>PARAMETER</b>	<b>VALUE</b>
<b>Material</b>	
Coating	Mid-Temp Dual Acrylate
<b>Geometry</b>	
Core Diameter (μm)	50 ± 2.5
Clad Diameter (μm)	125 ± 2
Core Non-Circularity (%)	≤ 5
Clad Non-Circularity (%)	≤ 1
Core/Clad Offset (μm)	≤ 1.5
Coating Diameter (μm)	245 ± 10
<b>Optical</b>	
NA (nominal)	0.20
Attenuation <sup>1</sup> @ 850 nm (dB/km), @ 1300 nm (dB/km)	≤ 2.5, ≤ 0.7
Bandwidth @ 850 nm (MHz-km), @ 1300 nm (MHz-km)	≥ 500, ≥ 500
Bend Loss <sup>2</sup> @ @ 850 nm (dB), @ 1300 nm (dB)	≤ 0.2, ≤ 0.5
<b>Mechanical</b>	
Proof Test (kpsi)	≥ 100
Operating Temperature (°C)	-40 to +150

<sup>1</sup> Measured on loose coil

<sup>2</sup> Two turns on 7.5 mm radius mandrel