



Verrillon® VHM4000 Series Harsh Environment Fibers

Verrillon® VHM4000 product is a multimode step-index with a pure silica core for high resistance to hydrogen darkening. This product is available in both 50/125 and 62.5/125 versions. This design is available in a variety of coatings including Polyimide, high temperature acrylates, Silicone-PFA and hermetic Carbon. Typically, these fibers are used in down-hole distributed sensing and imaging applications where the temperature and hydrogen partial pressures are extreme. Due to its step index design, the VHM4000 product is suitable for short distance applications where the spatial resolution requirements are not extreme.

Features

- Step-index multimode fiber with pure silica core
- Suitable for applications in hydrogen-rich environments
- Wide range of protective coatings available, depending on application requirements
- Excellent for deployment in shallow wells where extremely short spatial resolution is not required

Specifications

PART NO.	MMF-50-5-P-125-5	MMF-62.5-5-P-125-5
Description	50/125/155 µm Polyimide coated, Step Index, Multimode Fiber	62.5/125/155 µm Polyimide coated, Step Index, Multimode Fiber
PARAMETER	VALUE	
Material		
Coating	Polyimide	Polyimide
Geometry		
Core Diameter (µm)	50 ± 3.0	62.5 ± 3.0
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 ¹	≥ 80	≥ 80
Optical		
NA (nominal)	0.20	0.22
Attenuation ² @ 850 nm (dB/km)	≤ 3.0	≤ 3.0
Attenuation ² @ 1060 nm (dB/km)	≤ 1.3	≤ 1.3
Attenuation ² @ 1300 nm (dB/km)	≤ 1.0	≤ 1.0
Mechanical		
Proof Test (kpsi)	≥ 100	≥ 100
Operating Temperature (°C)	-65 to +300	-65 to +300

¹ Measured as (Min. Wall/Max. Wall) x 100

² Measured on loose coil

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Specifications

PART NO.	MMF-50-5-CP-125-5
Description	50/125/155 µm Carbon/Polyimide coated, Step Index, Multimode Fiber
PARAMETER	VALUE
Material	
Hermetic	Carbon
Coating	Polyimide
Geometry	
Core Diameter (µm)	50 ± 3.0
Clad Diameter (µm)	125 ± 2
Core Non-Circularity (%)	≤ 5
Clad Non-Circularity (%)	≤ 1
Core/Clad Offset (µm)	≤ 1.5
Coating Diameter (µm)	155 ± 5
Polyimide Coating Concentricity ¹ (%)	≥ 80
Optical	
NA (nominal)	0.20
Attenuation ² @ 850 nm (dB/km)	≤ 3.0
Attenuation ² @ 1060 nm (dB/km)	≤ 1.3
Attenuation ² @ 1300 nm (dB/km)	≤ 1.0
Mechanical	
Proof Test (kpsi)	≥ 100
Operating Temperature (°C)	-65 to +300

¹ Measured as (Min. Wall/Max. Wall) x 100

² Measured on loose coil

Specifications

PART NO.	MMF-50-5-CMTDA-125-5
Description	50/125/245 µm Carbon/Mid-Temp Dual Acrylate, Step Index, Multimode Fiber
PARAMETER	VALUE
Material	
Hermetic Coating	Carbon
Primary Coating	Mid-Temp Dual Acrylate
Secondary Coating	Mid-Temp Dual Acrylate
Geometry	
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 ± 5
Optical	
NA (nominal)	0.20
Attenuation ¹ @ 850 nm (dB/km)	≤ 3.0
Attenuation ¹ @ 1300 nm (dB/km)	≤ 1.0
Mechanical	
Proof Test (kpsi)	≥ 100
Operating Temperature (°C)	-40 to +150

¹ Measured on loose coil

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VHM4000 Series Harsh Environment Fibers

Specifications

PART NO.	MMF-105-1-P-125-150-2	MMF-110-1-P-121-140-1
Description	105/125/150 μm Polyimide coated, Low OH, Step Index, Multimode Fiber, 0.15 NA	110/121/140 μm Polyimide coated, Low OH, Step Index, Multimode Fiber, 0.22 NA
PARAMETER	VALUE	
Material		
Coating	Polyimide	Polyimide
Geometry		
Core Diameter (μm)	105 ± 5	110 ± 7
Clad Diameter (μm)	125 ± 3	121 ± 5
Core/Clad Offset (μm)	≤ 3.0	≤ 3.0
Coating Diameter (μm)	150 ± 5	140 ± 5
Optical		
NA (nominal)	0.15	0.22
Attenuation ¹ @ 808 nm (dB/km)	≤ 15	≤ 15
Mechanical		
Proof Test (kpsi)	≥ 100	≥ 100
Operating Temperature (°C)	-65 to +300	-65 to +300

¹ Measured on loose coil

Specifications

PART NO.	MMF-105-5-CA-125-250-22	MMF-105-5-CA-125-250-15
Description	105/125/250 μm Carbon/Acrylate coated, Low OH, Silica Core, Step Index, Multimode Fiber, 0.22 NA	105/125/250 μm Carbon/Acrylate coated, Low OH, Silica Core, Step Index, Multimode Fiber, 0.15 NA
PARAMETER	VALUE	
Material		
Hermetic Coating	Carbon	Carbon
Coating	Dual UV Acrylate	Dual UV Acrylate
Geometry		
Core Diameter (μm)	105 ± 5	105 ± 5
Clad Diameter (μm)	125 ± 3	125 ± 3
Core/Clad Offset (μm)	≤ 3.0	≤ 3.0
Coating Diameter (μm)	250 ± 10	250 ± 10
Optical		
NA (nominal)	0.22	0.15
Attenuation ¹ @ 808 nm (dB/km)	≤ 20	≤ 20
Mechanical		
Proof Test (kpsi)	≥ 100	≥ 100
Operating Temperature (°C)	-40 to +85	-40 to +85

¹ Measured on loose coil



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VHM4000 Series Harsh Environment Fibers

Specifications

PART NO.	MMF-200-1-A-240-400-1
Description	200/240/400 Acrylate coated, Low OH, Silica Core, Step Index Multimode Fiber, 0.22 NA, 100 kpsi Proof Test
PARAMETER	VALUE
Material	
Hermetic Coating	UV Acrylate
Coating	UV Acrylate
Geometry	
Core Diameter (µm)	200 ± 8
Clad Diameter (µm)	240 ± 6
Core/Clad Offset (µm)	≤ 3.0
Combined Coating Diameter (µm)	400 ± 25
Optical	
NA (nominal)	0.22
Attenuation @ 850 nm (dB/km)	≤ 10
Mechanical	
Proof Test (kpsi)	≥ 100
Operating Temperature (°C)	-40 to +85