Specialty Multimode Graded-Index Fiber

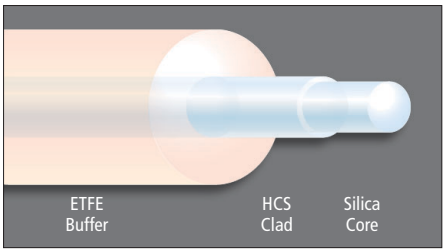
Leading Optical Innovations

MM Graded-Index Fibers

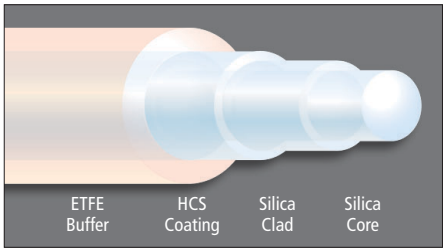
Fiber Name	Core/Clad/Buffer Diameter	Attenuation @ 850/1300	Buffer Type	Operating Temperature	NA	Short/Long-Term Bend Radius	Part Number
50/125 PYROCOAT	50/125/155 µm	≤3.2/1.2 dB/km	PYROCOAT	-65 to +300°C	0.20	≥10/17	BF04433
62.5 PYROCOAT	62.5/125/155 µm	≤3.5/1.5 dB/km	PYROCOAT	-65 to +300°C	0.275	≥10/17	BF04434
50/125 Hermetic PYROCOAT	50/125/155 µm	≤4.0/2.0 dB/km	Hermetic/PYROCOAT	-65 to +300°C	0.20	≥10/17	BF05781
50/125 Acrylate	50/125/250 µm	≤2.4/0.7 dB/km	Dual UV Acrylate	-40 to +85°C	0.20	≥10/17	BF04430-01
100/140 Acrylate	100/140/250 µm	≤4.0/1.5 dB/km	Dual UV Acrylate	-40 to +85°C	0.29	≥11/19	BF04432-01
100/140 High-Temp	100/140/170 µm	≤5.0/3.0 dB/km	PYROCOAT	-65 to +300°C	0.29	≥11/19	BF04436
100/140 Dual Acrylate	100/140/500 µm	≤4.0/1.5 dB/km	Dual UV Acrylate	-40 to +85°C	0.29	≥11/19	BF04432-02
100/140 Unbuffered FlightGuide	100/140/171.5 µm	≤5.0/3.0 dB/km	Hermetic/PYROCOAT	-65 to +300°C	0.29	≥5/6	BF05202
100/140 Buffered FlightGuide	100/140/171.5/450/900 µm	≤5.0/3.0 dB/km	Hermetic/PYROCOAT/ Silicone/ETFE	-55 to +165°C	0.29	≥5/6	BF04673
Geo50	50/125/155 µm	≤4.0/2.0 dB/km	Hermetic/PYROCOAT	-65 to +300°C	0.20	≥10/17	F13469

PLEASE NOTE:
All drawings are not to scale. Additional configurations available upon request. Please contact OFS to discuss your requirements.

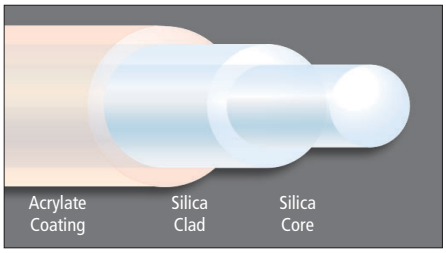
Standard HCS Fiber



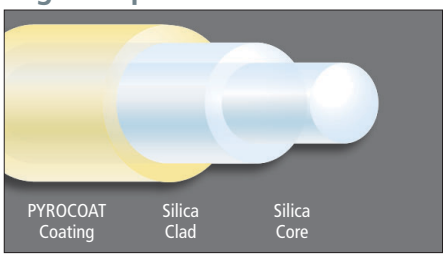
All Silica Fiber



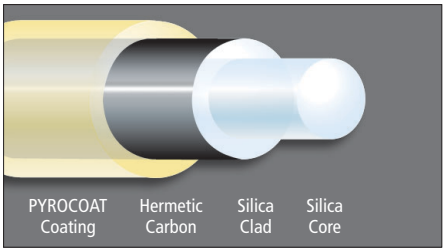
Dual Acrylate Buffer Fiber



High Temperature Fiber



High-Temperature Hermetic



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55 Darling Drive, Avon, CT 06001
25 Schoolhouse Road, Somerset, NJ 08873
Priorparken 680 DK-2605 Broendby, Denmark

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0505

SPECIALTY MULTIMODE GRADED-INDEX FIBER

Specification Sheet

50/125 and 62.5/125 Fibers

Leading Optical Innovations

Product Description

Graded-index fibers, in general, have more bandwidth than their step-index counterparts. These are available in a variety of core sizes and coating options to meet application needs for bandwidth, high temperature, hermeticity, or other specifications.

Typical Applications

- Local-area networks
- Industrial data communications
- Extreme-temperature environments
- Distributed temperature sensing

Features and Benefits

- Operates optimally with low modal dispersion at both 850 nm and 1300 nm
- Less-expensive interconnections, single-mode fiber
- Smaller core allows for higher bandwidth than 100/140 fiber
- With PYROCOAT coating, withstands temperature ranges from -65 to +300°C and up to 400°C for short durations

Related Products & Capabilities

- MM Graded-Index 100/140 Fibers
- MM Geo50 Fiber
- MM Step-Index Fibers and Cables
- Custom Cabling — OFS does not recommend the application of fluorinated polymers directly over the PYROCOAT coatings

Ask us about options available for these fibers:

- ☑ **Cabling**
- ☑ **Connectorization**
- ☑ **Metalization**
- ☑ **Additional Buffers**
- ☑ **Larger Buffer Sizes**
- ☑ **Other Upgrades**

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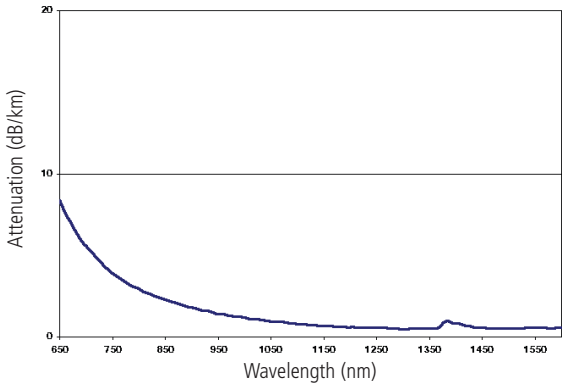
Typical Spectral Attenuation*

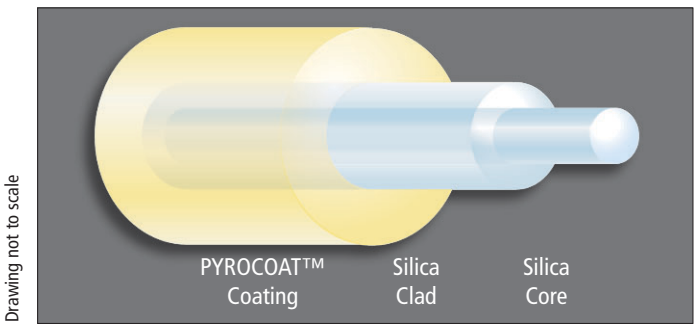


*Graph represents data for fiber part number BF04434

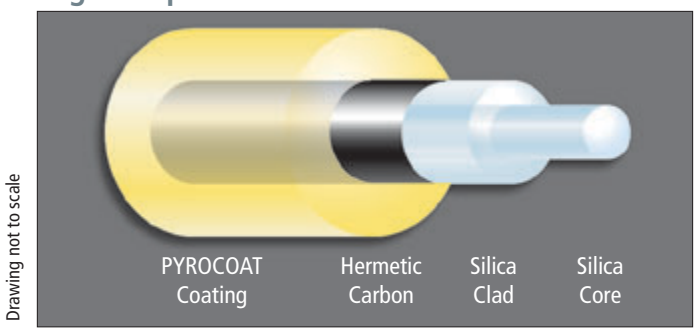
Fiber Specifications

Optical Properties	50/125 PYROCOAT	62.5 PYROCOAT	50/125 Hermetic PYROCOAT	50/125 Acrylate
Numerical aperture	0.20	0.275	0.20	0.20
Bandwidth @ 850 nm	≥400 MHz/km	≥160 MHz/km	≥400 MHz/km (typical)	≥600 MHz/km
Bandwidth @ 1300 nm	≥400 MHz/km	≥300 MHz/km	≥400 MHz/km (typical)	≥600 MHz/km
Attenuation @ 850 nm	≤3.2 dB/km	≤3.5 dB/km	≤4 dB/km	≤2.4 dB/km
Attenuation @ 1300 nm	≤1.2 dB/km	≤1.5 dB/km	≤2 dB/km	≤0.7 dB/km
Zero dispersion wavelength (nominal)	1306.5 nm	1342.5 nm	1306.5 nm	1306.5 nm
Zero dispersion slope (typical) (ps/[nm^2-km])	≤0.101	≤0.097	≤0.101	≤0.101
Dimensions/Geometric Properties				
Core diameter	50 ± 3 µm	62.5 ± 3 µm	50 ± 3 µm	50 ± 2.5 µm
Cladding diameter	125 ± 2 µm	125 ± 2 µm	125 ± 2 µm	125 ± 1 µm
Coating diameter	155 ± 5 µm	155 ± 5 µm	155 ± 5 µm	250 ± 10 µm
Core/clad offset	≤3 µm	≤3 µm	≤3 µm	≤1.5 µm
Core non-circularity	≤5%	≤5%	≤5%	≤5%
Clad non-circularity	≤2%	≤2%	≤2%	≤1%
Buffer/Coating Descriptions				
Coating material	PYROCOAT	PYROCOAT	Hermetic/PYROCOAT	Acrylate
Operating temperature	-65 to +300°C	-65 to +300°C	-65 to +300°C	-40 to +85°C
Mechanical and Testing Data				
Short-term bend radius	≥10 mm	≥10 mm	≥8 mm	≥10 mm
Long-term bend radius	≥17 mm	≥17 mm	≥8 mm	≥17 mm
Proof test level	≥100 kpsi (0.689 GPa)	≥100 kpsi (0.689 GPa)	≥100 kpsi (0.689 GPa)	≥100 kpsi (0.689 GPa)
Product Description Code	**TCU-ME050H**	**TCU-MD062H**	**TCU-ME050J**	**ACU-ME050C**
Order by Part Number	**BF04433**	**BF04434**	**BF05781**	**BF04430 01**

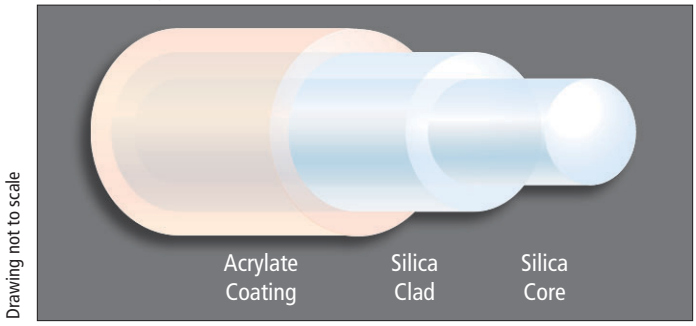
High-Temperature Fiber



High-Temperature Hermetic Fiber



Dual Acrylate Buffer



SPECIALTY MULTIMODE GRADED-INDEX FIBER

Specification Sheet

100/140 Fibers

Leading Optical Innovations

Product Description

Graded-index fibers, in general, have more bandwidth than their step-index counterparts. These are available in a variety of core sizes and coating options to meet application needs for bandwidth, high temperature, hermeticity, or other specifications.

Typical Applications

- Extreme-temperature environments
- Space and avionics

Features and Benefits

- Operates optimally with low modal dispersion at both 850 nm and 1300 nm
- High numerical aperture
- Large core diameter
- Efficient power coupling
- Less-expensive interconnections
- With PYROCOAT coating, withstands temperature ranges from -65 to +300°C and up to 400°C for short durations

Related Products & Capabilities

- MM Graded-Index 50/125 and 62.5/125 Fibers
- MM Geo50 Fiber
- MM Step-Index Fibers and Cables
- Custom Cabling — OFS does not recommend the application of fluorinated polymers directly over the PYROCOAT coatings

Ask us about options available for these fibers:

- ☑ **Cabling**
- ☑ **Connectorization**
- ☑ **Metalization**
- ☑ **Additional Buffers**
- ☑ **Other Upgrades**

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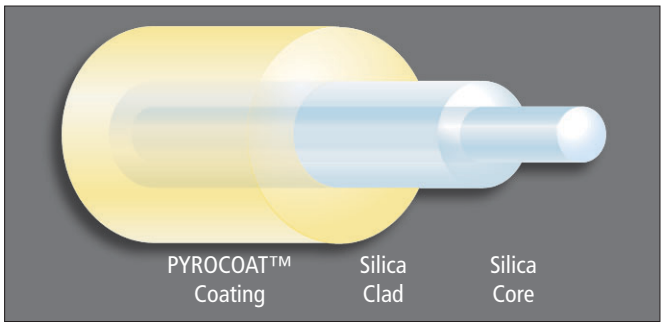
Fiber Specifications

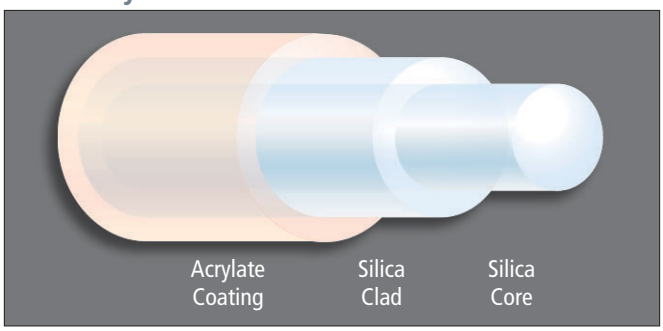
Optical Properties	100/140 ACRYLATE REDUCED OD	100/140 HIGH-TEMP	100/140 ACRYLATE
Numerical aperture	0.29	0.29	0.29
Bandwidth @ 850 nm	≥100 MHz/km	≥100 MHz/km	≥100 MHz/km
Bandwidth @ 1300 nm	≥100 MHz/km	≥100 MHz/km	≥100 MHz/km
Attenuation @ 850 nm	≤4.0 dB/km	≤5.0 dB/km	≤4.0 dB/km
Attenuation @ 1300 nm	≤1.5 dB/km	≤3.0 dB/km	≤1.5 dB/km
Zero dispersion wavelength (nominal)	1345 nm	1345 nm	1345 nm
Zero dispersion slope (typical) (ps/[nm^2-km])	≤0.097	≤0.097	≤0.097
Dimensions/Geometric Properties			
Core diameter	100 ± 4 µm	100 ± 4 µm	100 ± 4 µm
Cladding diameter	140 ± 3 µm	140 ± 3 µm	140 ± 3 µm
Coating diameter	250 ± 15 µm	170 ± 5 µm	500 ± 25 µm
Core/clad offset	≤3 µm	≤3 µm	≤3 µm
Core non-circularity	≤5%	≤5%	≤5%
Clad non-circularity	≤2%	≤2%	≤2%
Buffer/Coating Descriptions			
Coating material	Dual UV Acrylate	PYROCOAT	Dual UV Acrylate
Operating temperature	-40 to +85°C	-65 to +300°C	-40 to +85°C
Mechanical and Testing Data			
Short-term bend radius	≥11 mm	≥11 mm	≥11 mm
Long-term bend radius	≥19 mm	≥19 mm	≥19 mm
Proof test level	≥100 kpsi (0.689 GPa)	≥100 kpsi (0.689 GPa)	≥100 kpsi (0.689 GPa)
Product Description Code	**ACU-MC100C**	**TCU-MC100H**	**ACU-MC100D**
Order by Part Number	**BF04432 01**	**BF04436**	**BF04432 02**

High-Temperature Fiber



Drawing not to scale

Dual Acrylate Buffer



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FlightGuide

Military and Avionic Applications

Leading Optical Innovations

Product Description

The FlightGuide family of aerospace fibers provides high-temperature and strength capabilities for 100/140 µm graded-index fibers. Proven success on F/A-22 aircraft has been extended; FlightGuide cables have been specially selected to be used in the Joint Strike Fighter program.

FlightGuide optical fiber is coated with a carbon layer for hermeticity and a PYROCOAT polyimide layer for additional protection in harsh environments. The buffered version of this fiber also includes a protective layer of silicone and a 900 µm ETFE buffer.

Typical Applications

- Aircraft communications
- Military and space applications

Features and Benefits

- Excellent resistance to chemicals and oil
- Dual window operation at 850 nm and 1300 nm
- Wide fiber operating temperature ranges -55 to +165°C or -65 to +300°C, depending on construction

Related Products & Capabilities

- Fully cabled versions of this fiber are also available — see pages 190-191
- Custom Cabling — OFS does not recommend the application of fluorinated polymers directly over the PYROCOAT coatings

Ask us about options available for these fibers:

- ☑ **Cabling**
- ☑ **Connectorization**
- ☑ **Metalization**
- ☑ **Additional Coatings**
- ☑ **Other Upgrades**

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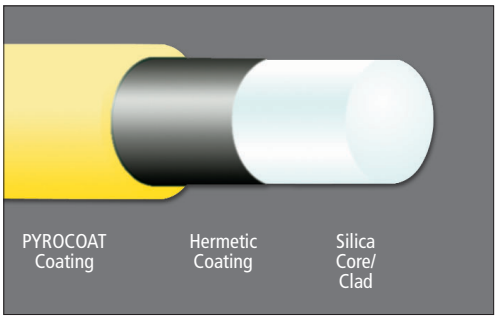
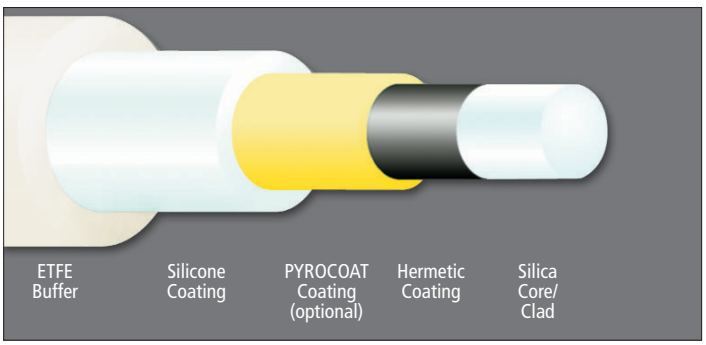
Unbuffered FlightGuide



Drawing not to scale

Buffered FlightGuide

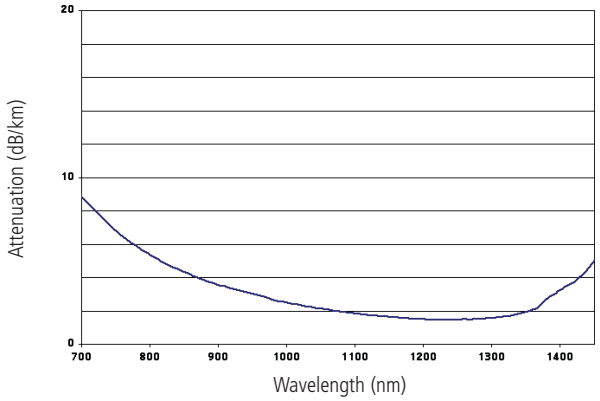


Drawing not to scale

Fiber Specifications

Optical Properties	100/140 Unbuffered FlightGuide	100/140 Buffered FlightGuide
Numerical aperture	0.29	0.29
Bandwidth @ 850 nm	≥200 MHz-km	≥200 MHz-km
Bandwidth @ 1300 nm	≥200 MHz-km	≥200 MHz-km
Attenuation @ 850 nm	≤5.0 dB/km	≤5.0 dB/km
Attenuation @ 1300 nm	≤3.0 dB/km	≤3.0 dB/km
Dimensions/Geometric Properties		
Core diameter	100 ± 3 µm	100 ± 3 µm
Cladding diameter	140 ± 2 µm	140 ± 2 µm
Coating diameter	171.5 ± 1 µm	171.5 ± 1 µm
Silicone buffer diameter	none	450 ± 25 µm
Jacket diameter	none	900 ± 50 µm
Coating concentricity	≥85%	≥85%
Core/clad offset	≤2 µm	≤2 µm
Core non-circularity	≤2%	≤2%
Clad-non-circularity	≤2%	≤2%
Buffer/Coating Descriptions		
Coating material	Hermetic/PYROCOAT	Hermetic/PYROCOAT
Buffer material	none	Silicone
Jacket material	none	ETFE
Operating temperature	-65 to +300°C	-55 to +165°C
Mechanical and Testing Data		
Short-term bend radius	≥5 mm	≥5 mm
Long-term bend radius	≥6 mm	≥6 mm
Proof test level	≥200 kpsi (1.378 GPa)	≥200 kpsi (1.378 GPa)
Order by Part Number	**BF05202**	**BF04673**

Typical Spectral Attenuation*



* Graph represents data for fiber part # BF05202.

GeoFiber

GEO50

Leading Optical Innovations

Product Description

Geo50 fiber is a hydrogen resistant graded-index optical fiber specialized for performance in Distributed Temperature Sensing (DTS) applications. The fiber core and cladding are silica glass drawn from preforms made with extraordinary process control. Carbon maximizes resistance to hydrogen ingression and the glass composition minimizes attenuation due to hydrogen absorption in the extreme DTS environments they are designed to encounter.

Primary Coating. Years of highly specialized experience and research have gone into designing this optical fiber and applying the customized coating combination that enables its use in harsh environments. The first line of defense is a very thin primary coating of carbon that chemically bonds with the glass to provide a hermetic seal against moisture at all temperatures. Carbon dramatically extends the lifetime of the fiber by stopping fiber "fatigue" (crack growth activated by water vapor). Carbon has the additional feature of providing a barrier against H_2 ingression at temperatures up to 130°C.

Secondary Coating. OFS recommends a secondary coating of PYROCOAT polyimide, a high-temperature material that allows fiber to perform in environments ranging up to 300°C. It is extruded in a thin, continuous coating during the draw process and gives the fiber an outer diameter (OD) of only 155 µm.

Typical Applications

- Distributed temperature sensing
- High-temperature DTS

Features and Benefits

- Tough glass for harsh environments
- Industry-standard, 50 µm graded-index fiber
- Hydrogen resistant glass to minimize H_2 ingression
- Carbon for hermeticity and H_2 resistance
- Abrasion resistant
- Long lengths up to 14 km
- Temperature performance to 300°C

Related Products & Capabilities

- GeoFibers in single-mode construction
- Custom cabling, OFS does not recommend the application of fluorinated polymers directly over the PYROCOAT coatings

Ask us about options available for these fibers:

- ☑ **Cabling**
- ☑ **Connectorization**
- ☑ **Metalization**
- ☑ **Additional Coatings**
- ☑ **Other Upgrades**

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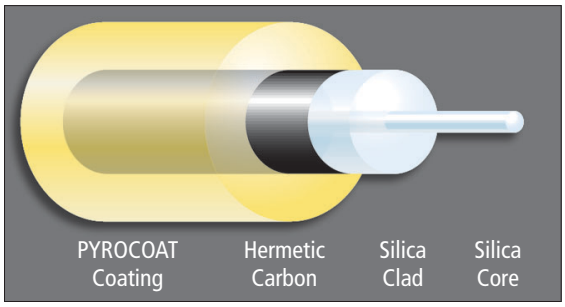

Drawing not to scale

Fiber Specifications

Optical Properties	GEO50
Numerical aperture	0.20
Attenuation @ 850 nm	≤4.0 dB/km
Attenuation @ 1300 nm	≤2.0 dB/km
Dimensions/Geometric Properties	
Core diameter	50 ± 3 µm
Clad diameter	125 ± 2 µm
Coating diameter	155 ± 5 µm
Clad non-circularity	≤2.0%
Core non-circularity	≤5%
Core/clad offset	≤3 µm
Coating/Buffer Descriptions	
Coating material	Hermetic Carbon/PYROCOAT
Operating temperature	-65 to +300°C
Mechanical and Testing Data	
Short-term bend radius	≥10 mm
Long-term bend radius	≥17 mm
Proof test level	≥100 kpsi (0.689 GPa)
Order by Part Number	**F13469**