



# *Fiber Optics*



# Banner's Fiber Offering

## Experience

Banner has over 30 years of expertise working with fiber optics to help suit your application needs. With an extensive variety, our fiber optics support a wide range of applications.

Why choose our fibers?

- We offer the single largest volume of glass and plastic models, offering customizable fiber solutions for a variety of applications
- With a team of fiber specialists, we can create specials and custom designs in a quick turnaround time
- With Banner, you can expect a knowledgeable, supportive fiber specialist team that will help you meet your unique application needs no matter how challenging your application
- We have a global presence and distribution network for mass, rapid customization anywhere in the world
- With years of fiber optic experience, our team of design specialists understands a wide range of applications and will work closely with you to create custom solutions

Visit [Bannerengineering.com/selectionguide](http://Bannerengineering.com/selectionguide) to easily find a fiber that meets your application needs with our online fiber selection guide. If you do not see what you are looking for, remember to contact one of Banner's Application Engineers and learn about our rapid customization. Banner has several fiber models in stock to get you what you need and can make modifications quickly.

## Fiber Optic Uses

Fiber optic systems are typically used in harsh conditions, including high vibration, extreme heat, and noisy, wet, corrosive or explosive environments. Fibers are also used in confined areas since many models can be bent to fit precisely where needed.

## Glass or Plastic Fibers?

Glass fibers are mostly used in challenging environments, such as applications with high temperatures, corrosive materials or moisture.

Plastic fibers are typically used for more general purpose applications where they can tolerate extreme bending and be cut to length to fit in limited space setups.

## Sample Applications

- Punch presses
- Vibratory feeders
- Conveyors
- Web control
- Tablet counting
- Ovens
- Semiconductor processing equipment
- Liquid level

# Fiber Selection Guide

All Categories
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## Plastic Fiber Selection Guide Learn More

Select the attributes to find the fibers best suited for your application. Selected attributes are marked with an orange icon; click again to deselect. Results will dynamically update below.

Undo   Redo   Clear All

**Step 1** ?

**Step 2** ?

**Step 3** ?

Type	Sensing End Assembly	Sheathing Material	Length (m)	Core ø (mm)	Sensing End Size
<input type="checkbox"/> Diffuse Reflective <input type="checkbox"/> Opposed Mode <input type="checkbox"/> Retroreflective <input type="checkbox"/> Convergent <input type="checkbox"/> Bulk Cable <input type="checkbox"/> Liquid Level	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Segment 1</b>  <input type="checkbox"/> Angle  <input type="checkbox"/> Array  <input type="checkbox"/> Coaxial  <input type="checkbox"/> Dual  <input type="checkbox"/> Encapsulated  <input type="checkbox"/> Ferrule  <input type="checkbox"/> Lens  <input type="checkbox"/> Probe                 </div> <div style="width: 45%;"> <input type="checkbox"/> Rectangle  <input type="checkbox"/> Slot  <input type="checkbox"/> Thread  <input type="checkbox"/> Trifurcated  <input type="checkbox"/> Unterminated                 </div> </div> <div style="margin-top: 10px;"> <b>Segment 2</b>  <input type="checkbox"/> Angle  <input type="checkbox"/> Coaxial  <input type="checkbox"/> Ferrule  <input type="checkbox"/> Lens  <input type="checkbox"/> Miniature  <input type="checkbox"/> Probe  <input type="checkbox"/> Rectangle  <input type="checkbox"/> Sideview  <input type="checkbox"/> Slot  <input type="checkbox"/> Thread  <input type="checkbox"/> Unterminated                 </div>	<input type="checkbox"/> Polyethylene <input type="checkbox"/> STEELSKIN <input type="checkbox"/> DURA-BEND <input type="checkbox"/> High Flex <input type="checkbox"/> Chemical Resistant <input type="checkbox"/> PVC	<input type="checkbox"/> < 2 <input type="checkbox"/> 2 <input type="checkbox"/> >2 <=5 <input type="checkbox"/> >5 <=10 <input type="checkbox"/> > 10	<input type="checkbox"/> 0.25 <input type="checkbox"/> 0.50 <input type="checkbox"/> 1 <input type="checkbox"/> 1.5 <input type="checkbox"/> Others	<input type="checkbox"/> 12 <input type="checkbox"/> 3x3 <input type="checkbox"/> Array <input type="checkbox"/> M3 <input type="checkbox"/> M4 & M2.5 <input type="checkbox"/> M4 & M2.6 <input type="checkbox"/> M6 <input type="checkbox"/> M8 <input type="checkbox"/> Others

The Plastic Fiber Selection Guide at [Bannerengineering.com/selectionguide](http://Bannerengineering.com/selectionguide) is a tool that allows you to quickly and easily refine a search from hundreds of models by selecting key fiber criteria. Relevant model results will be displayed dynamically as you choose different criteria from the selection tool. The online Plastic Fiber Selection Guide is available in multiple languages for convenient use to help you find the right fiber that meets your needs. If you cannot find what you are looking for, contact a Banner Application Engineer at 1-888-3-SENSOR to find out more about our custom fibers.

# Plastic Fiber Optic Information

## Model Key



### PLASTIC FIBER FAMILY designator

Same for all plastic fibers

### ASSEMBLY STYLE designator

I = Individual fiber\*  
 DI = Dual Individual fiber\*  
 B = Bifurcated fiber

### SENSING END designator

A = 90° Angle  
 AT = 90° Angle/Thread  
 CF = Coaxial Ferrule  
 CT = Coaxial Thread  
 E = Encapsulated  
 EFP = Extended Ferrule Probe  
 F = Ferrule  
 FM = Ferrule Miniature  
 FMP = Ferrule Miniature Probe  
 L = Lensed  
 P = Probe  
 PF = Probe Ferrule  
 PMSB = Probe Miniature Side-view Bendable  
 PS = Probe Side-view  
 PSB = Probe Side-view Bendable  
 PSM = Probe Side-view Miniature  
 R = Rectangular  
 RS = Rectangular Side-view  
 T = Thread  
 TA = Thread/90° Angle  
 TP = Thread/Probe

### MODIFICATIONS designator†

MFR = Flex relief  
 MSW = Slot width  
 MTA = Tight angle  
 MTL = Thread length  
 MAL = Array length  
 MPL = Probe length  
 MFL = Ferrule length

### CONTROL END designator

U = Underminated straight cable\*\*  
 UC = Underminated Coiled cable  
 UHF = Underminated DURA-BEND™ multi-core cable  
 T5 = Terminated  
 TMB5 = STEELSKIN™ braiding over monocoil reinforcement

### FIBER LENGTH designator

3 = 1 m (1000 mm)  
 6 = 2 m (2000 mm)  
 15 = 5 m (5000 mm)  
 30 = 10 m (10,000 mm)  
 100 = 30 m (30,480 mm)

### FIBER CORE DIAMETER designator

1 = 0.25 mm  
 2 = 0.50 mm  
 3 = 0.75 mm  
 4 = 1.00 mm  
 6 = 1.50 mm  
 1x4 = 4 x 0.25 mm  
 1x16 = 16 x 0.265 mm  
 1x32 = 32 x 0.265 mm

## Fiber Specifications (unless otherwise noted)

Cable Length	2 meters
Amplifier (control) End	Free cut
Min. Bend Radius	8 mm for 0.25 mm core 12 mm for 0.5 mm core 25 mm for 1.0 mm core 38 mm for 1.5 mm core
Operating Temperature	-30 - +70° C

## Fiber Core Diameter Comparison

		N/A
PIT16U	PBT16U	
PIT26U	PBT26U	PBCT26U
PIT46U	PBT46U	PBCT46U
		N/A
PIT66U	PBT66U	

\* All individual plastic fiber optics are sold and used in pairs. Bifurcated fibers are two-way fibers with a single sensing end that both emits and receives light and with dual-control sensor ends that attach separately to the sensor's LED and photodetector.

\*\* Plastic fibers with "U" in the suffix of the model numbers have unterminated control ends; cut them to the required length using the supplied cutter.

† Not all modifications can be applied to all fiber assemblies. Please consult factory for verification of modifications.



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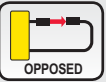
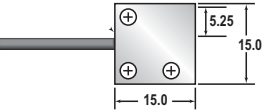




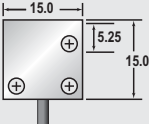

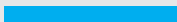


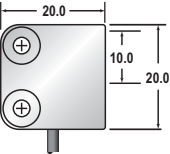






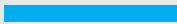


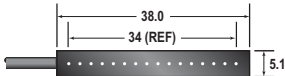




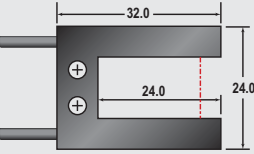




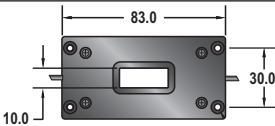




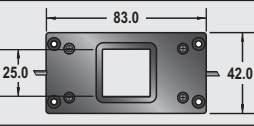




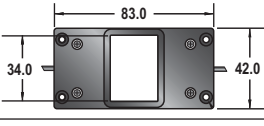




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# Array & Slot Fibers



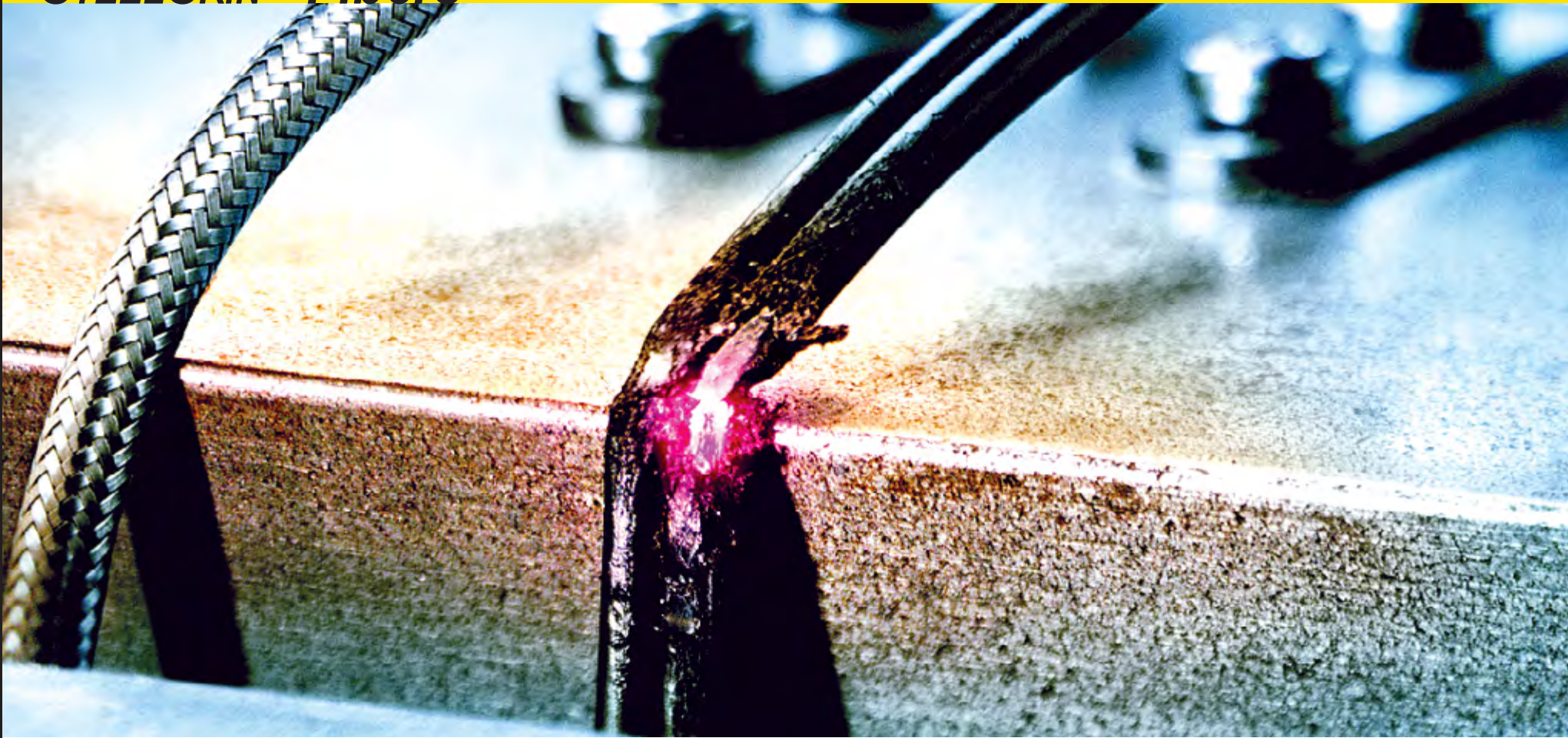
Array and slot fibers are customizable for a simple setup and provide an optimal solution for small part counting applications. Array fibers are ideal for broad spectrum detection and slot fibers are pre-aligned and easy to install.

- Quick and easy setup and alignment
- Small part counting applications
- Multiple beams can be customized for different array lengths
- Wide area detection
- Ideal for tracking applications, profiling parts, edge guiding, finding the edge of objects

Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		<ul style="list-style-type: none"> <li>Ultra-compact head</li> <li>5.25 mm straight exit</li> <li>Aluminium</li> </ul>	DF-G1 640  D10D 840  D10B 300  D10A 260 	PIR1X166U
		<ul style="list-style-type: none"> <li>Ultra-compact head</li> <li>5.25 mm side exit</li> <li>Aluminium</li> </ul>	DF-G1 640  D10D 840  D10B 300  D10A 260 	PIRS1X166U
		<ul style="list-style-type: none"> <li>Compact head</li> <li>10 mm side exit</li> <li>Aluminium</li> </ul>	DF-G1 760  D10D 860  D10B 300  D10A 260 	PIRS1X166UM.4
		<ul style="list-style-type: none"> <li>19 mm side exit</li> </ul>	DF-G1 770  D10D 880  D10B 340  D10A 270 	PIRS1X166UMP.75
		<ul style="list-style-type: none"> <li>34 mm side exit</li> </ul>	DF-G1 680  D10D 1000  D10B 300  D10A 260 	PIRS1X166UMPMAL
		<ul style="list-style-type: none"> <li>Easy mount "fork" head</li> </ul>	DF-G1 12  D10D 12  D10B 12  D10A 12 	PDIS46UM12
		<ul style="list-style-type: none"> <li>10 x 25 mm coverage</li> <li>Side or end exit</li> <li>Min. object detection of 1.5 mm<sup>†</sup></li> </ul>	DF-G1 25  D10D 25  D10B 25  D10A 25 	PFCVA-10X25-S PFCVA-10X25-E
		<ul style="list-style-type: none"> <li>25 x 25 mm coverage</li> <li>Side or end exit</li> <li>Min. object detection of 3 mm<sup>†</sup></li> </ul>	DF-G1 25  D10D 25  D10B 25  D10A 25 	PFCVA-25X25-S PFCVA-25X25-E
		<ul style="list-style-type: none"> <li>34 x 25 mm coverage</li> <li>Side or end exit</li> <li>Min. object detection of 4 mm<sup>†</sup></li> </ul>	DF-G1 34  D10D 34  D10B 34  D10A 34 	PFCVA-34X25-S PFCVA-34X25-E

<sup>†</sup> Based on 2% threshold offset on the D10DPCFP Model Fiber Amplifier. See datasheet for detail.

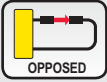
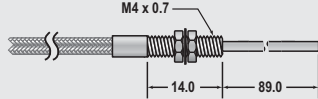
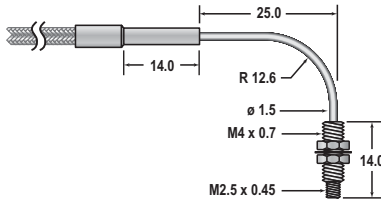
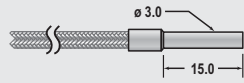
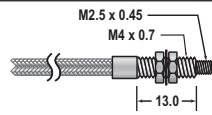
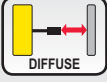
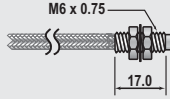
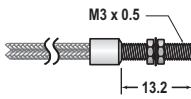
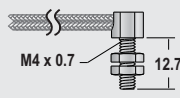
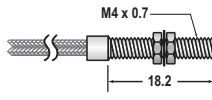
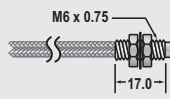
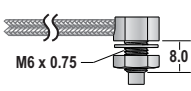
# STEELSKIN™ Fibers



STEELSKIN™ rugged fiber models resist kinking, cutting and snagging and have a low profile to easily embed in machines. With a strong, solid sheathing, they are great for mechanical protection in applications where standard plastic fibers would not hold up. Ideal for busy assembly stations, embedded in stations, part presence or places where equipment is constantly moved on and off a production line.

- Abrasion resistant while maintaining flexibility
- Bend to tighter radius and thinner than standard plastic fiber optics
- Solid, smooth and sturdy sheathing
- Superior resistance to wear, chemicals and other environmental conditions
- Assembly stations, part presence, busy assembly cells



Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		<ul style="list-style-type: none"> <li>Individual</li> <li>Bendable tip</li> </ul>	DF-G1 740 D10D 1000 D10B 380 D10A 350	PITP43TMB5
		<ul style="list-style-type: none"> <li>Individual</li> <li>90° angle thread</li> </ul>	DF-G1 740 D10D 1000 D10B 380 D10A 350	PIAT43TMB5
		<ul style="list-style-type: none"> <li>Individual</li> <li>Ferrule</li> </ul>	DF-G1 740 D10D 1000 D10B 380 D10A 350	PIF43TMB5
		<ul style="list-style-type: none"> <li>Individual</li> </ul>	DF-G1 740 D10D 1000 D10B 380 D10A 350	PIT43TMB5
		<ul style="list-style-type: none"> <li>Bifurcated</li> </ul>	DF-G1 230 D10D 250 D10B 90 D10A 80	PBT43TMB5
		<ul style="list-style-type: none"> <li>Coaxial</li> <li>Thread</li> </ul>	DF-G1 110 D10D 180 D10B 52 D10A 40	PBCT23TMB5
		<ul style="list-style-type: none"> <li>Coaxial</li> <li>Miniature thread</li> </ul>	DF-G1 80 D10D 135 D10B 40 D10A 30	PBCT23TMB5MTA
		<ul style="list-style-type: none"> <li>Coaxial</li> <li>Thread</li> </ul>	DF-G1 110 D10D 180 D10B 52 D10A 40	PBCT23TMB5M4
		<ul style="list-style-type: none"> <li>Bifurcated</li> <li>Bendable tip</li> </ul>	DF-G1 740 D10D 250 D10B 94 D10A 85	PBTP43TMB5
		<ul style="list-style-type: none"> <li>Bifurcated</li> <li>Thread right angle</li> <li>Stainless steel</li> </ul>	DF-G1 210 D10D 305 D10B 90 D10A 80	PBAT43TMB5MTA



# DURA-BEND™ Fibers

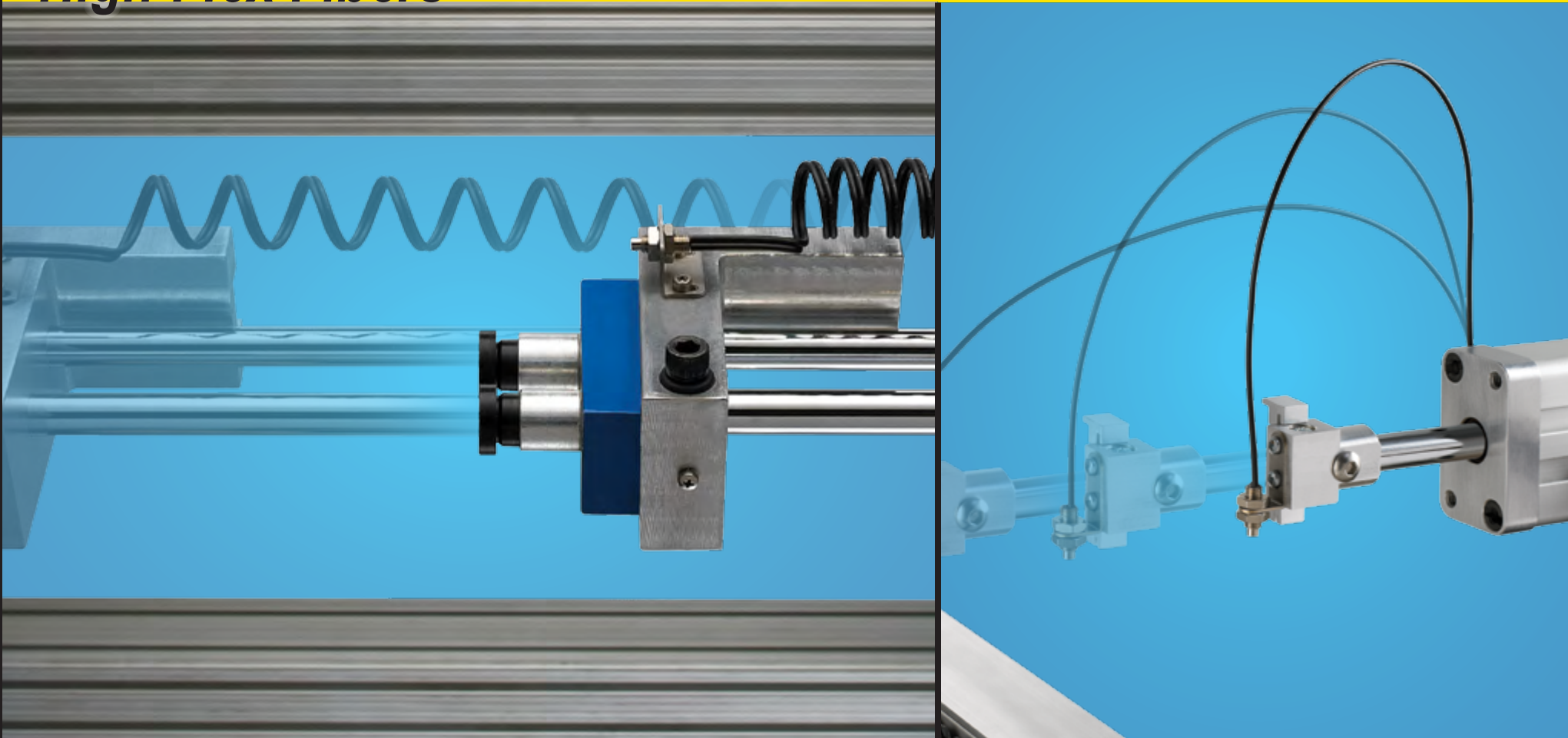


DURA-BEND™ fiber models provide improved flexibility for limited space setups and difficult-to-access locations. These fibers are best for use when fibers need to be integrated into a small fixture where a great deal of bending in tight spaces is needed.

- Minimal transmission loss under extreme bend radius
- Maintains performance regardless of flexing
- Multicore assemblies available
- Can almost kink fiber without affecting performance
- Works well in constant flexing applications

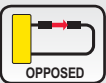
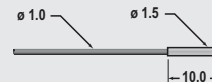
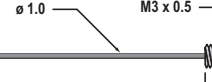
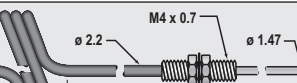
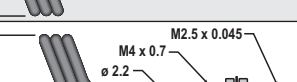
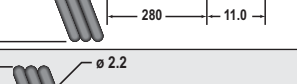
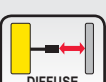
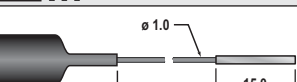
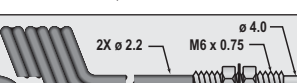
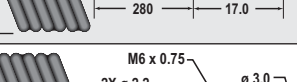
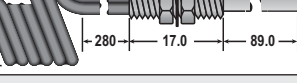
Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Min. bend radius 1 mm</li> </ul>	DF-G1 440 D10D 1000 D10B 330 D10A 230	PIT46UHF
		<ul style="list-style-type: none"> <li>• Smooth ferrule</li> <li>• Min. bend radius 1 mm</li> </ul>	DF-G1 440 D10D 1000 D10B 330 D10A 230	PIF46UHF
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Min. bend radius 1 mm</li> </ul>	DF-G1 120 D10D 260 D10B 80 D10A 65	PIT26UHF
		<ul style="list-style-type: none"> <li>• Smooth ferrule</li> <li>• Miniature tip</li> <li>• Min. bend radius 1 mm</li> </ul>	DF-G1 440 D10D 1000 D10B 330 D10A 230	PIFM46UHF
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Bendable tip</li> <li>• Min. bend radius 1 mm</li> </ul>	DF-G1 440 D10D 1000 D10B 330 D10A 230	PIP46UHF
		<ul style="list-style-type: none"> <li>• Right angle</li> <li>• Low profile</li> </ul>	DF-G1 400 D10D 900 D10B 300 D10A 200	PIA46UHFBMPMS
		<ul style="list-style-type: none"> <li>• Right angle</li> <li>• Threaded</li> <li>• Min. bend radius 1 mm</li> </ul>	DF-G1 440 D10D 1000 D10B 330 D10A 230	PIAT46UHFMFTA
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Min. bend radius 1 mm</li> </ul>	DF-G1 40 D10D 55 D10B 20 D10A 18	PBT26UHF
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Min. bend radius 1 mm</li> </ul>	DF-G1 140 D10D 250 D10B 80 D10A 70	PBT46UHF
		<ul style="list-style-type: none"> <li>• Right Angle</li> <li>• Threaded</li> <li>• Min. bend radius 1 mm</li> </ul>	DF-G1 120 D10D 225 D10B 80 D10A 70	PBAT46UHFMFTA

# High-Flex Fibers

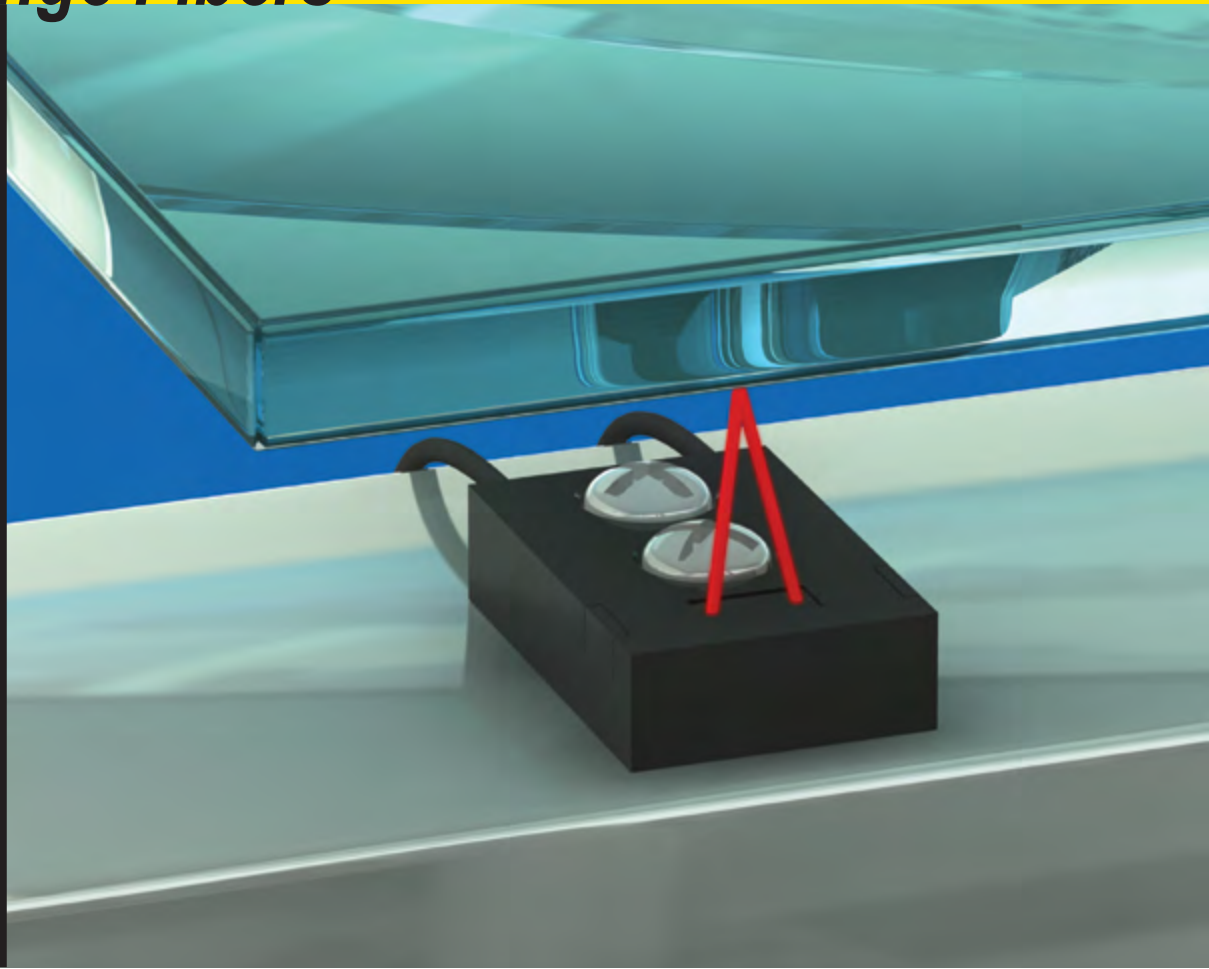
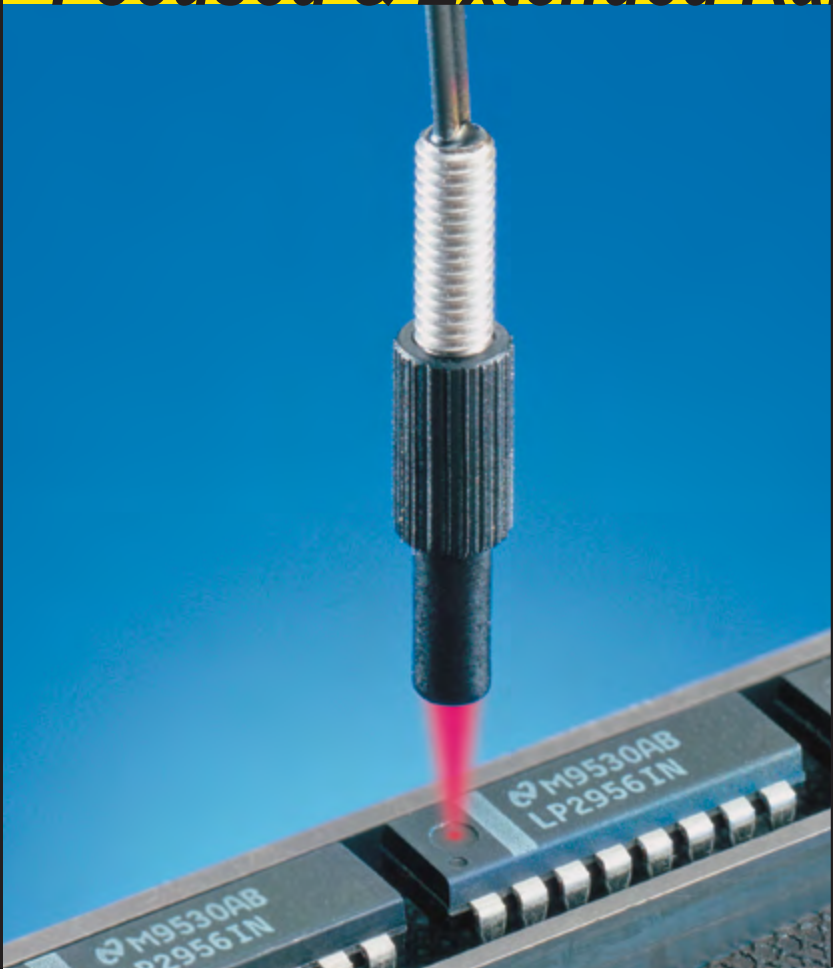


High-flex fibers are ideal for machines with reciprocating motions and when fibers need to be repeatedly bent. With a higher elasticity rating, high-flex fibers are best for use on moving machines, such as robotic arms.

- Highly durable for thousands of cycles of reciprocated motion
- Higher elasticity rating
- Repeated flexing and bending
- Provides additional resistance to prevent fiber damage
- Ideal for robotic arm applications and use on moving machines

Fiber Mode	End Tip	Features	Typical Range (mm)	Model
 <p>OPPOSED</p>		<ul style="list-style-type: none"> <li>Best for repetitive flexing (1,000s of cycles)</li> </ul>	DF-G1 250 <span style="color:red">■</span> D10D 350 <span style="color:blue">■</span> D10B 84 <span style="color:green">■</span> D10A 72 <span style="color:orange">■</span>	PIFM1X46U
		<ul style="list-style-type: none"> <li>Best for repetitive flexing (1,000s of cycles)</li> </ul>	DF-G1 250 <span style="color:red">■</span> D10D 350 <span style="color:blue">■</span> D10B 84 <span style="color:green">■</span> D10A 72 <span style="color:orange">■</span>	PIT1X46U
		<ul style="list-style-type: none"> <li>For applications involving reciprocating motion</li> </ul>	DF-G1 540 <span style="color:red">■</span> D10D 780 <span style="color:blue">■</span> D10B 320 <span style="color:green">■</span> D10A 260 <span style="color:orange">■</span>	PIP46UC
		<ul style="list-style-type: none"> <li>For applications involving reciprocating motion</li> </ul>	DF-G1 540 <span style="color:red">■</span> D10D 780 <span style="color:blue">■</span> D10B 320 <span style="color:green">■</span> D10A 280 <span style="color:orange">■</span>	PIT46UC
		<ul style="list-style-type: none"> <li>Ferrule</li> </ul>	DF-G1 540 <span style="color:red">■</span> D10D 780 <span style="color:blue">■</span> D10B 320 <span style="color:green">■</span> D10A 280 <span style="color:orange">■</span>	PIF46UC
 <p>DIFFUSE</p>		<ul style="list-style-type: none"> <li>Best for repetitive flexing (1,000s of cycles)</li> </ul>	DF-G1 35 <span style="color:red">■</span> D10D 50 <span style="color:blue">■</span> D10B 18 <span style="color:green">■</span> D10A 15 <span style="color:orange">■</span>	PBFM1X43T5
		<ul style="list-style-type: none"> <li>For applications involving reciprocating motion</li> </ul>	DF-G1 75 <span style="color:red">■</span> D10D 110 <span style="color:blue">■</span> D10B 40 <span style="color:green">■</span> D10A 32 <span style="color:orange">■</span>	PBT46UC
		<ul style="list-style-type: none"> <li>For applications involving reciprocating motion</li> </ul>	DF-G1 75 <span style="color:red">■</span> D10D 110 <span style="color:blue">■</span> D10B 40 <span style="color:green">■</span> D10A 32 <span style="color:orange">■</span>	PBP46UC
		<ul style="list-style-type: none"> <li>For applications involving reciprocating motion</li> </ul>	DF-G1 75 <span style="color:red">■</span> D10D 110 <span style="color:blue">■</span> D10B 40 <span style="color:green">■</span> D10A 32 <span style="color:orange">■</span>	PBT46UC

# Focused & Extended Range Fibers



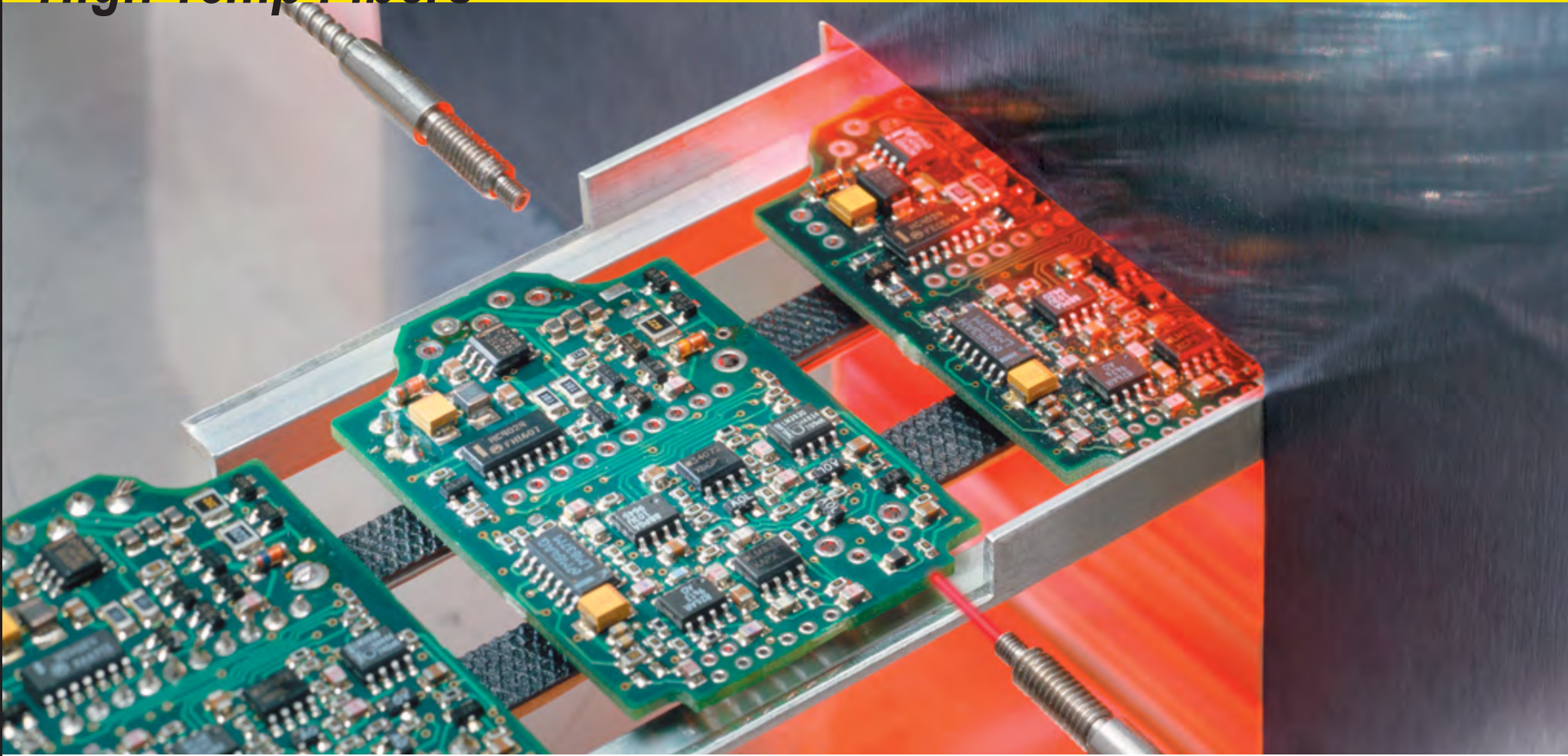
Lensed fiber models work well in confined areas, providing increased performance and reliability. They are also ideal for longer range applications, such as sensing in an intrinsically safe area, or applications requiring a focused beam for small features or objects.

- Range extension
- Fixed or adjustable lengths
- Small part counting and intrinsically safe area applications
- Longer range with opposed mode and shorter range with convergent mode
- Fiber and lens models available

Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		<ul style="list-style-type: none"> <li>Ultra-long range</li> </ul>	DF-G1 4000 D10D 4000 D10B 4000 D10A 4000	PIL46U
		<ul style="list-style-type: none"> <li>Low beam divergence angle of <math>\pm 2^\circ</math></li> <li>Ideal for wafer mapping</li> </ul>	DF-G1 2090 D10D 1500 D10B 860 D10A 800	PLIS-1
		<ul style="list-style-type: none"> <li>Range-extending lens</li> <li>M2.5 thread</li> </ul>	DF-G1 4000 D10D 4000 D10B 4000 D10A 4000	L2 w/PIL46U
		<ul style="list-style-type: none"> <li>Anodized Aluminium tip</li> <li>Beam spot <math>\varnothing</math> 0.5-3.2 mm</li> <li>Glass lens</li> </ul>	DF-G1 32 D10D 32 D10B 32 D10A 32	PLI-A10
		<ul style="list-style-type: none"> <li>Straight exit</li> <li>DURA-BEND fiber</li> </ul>	DF-G1 D10D Straight side exit with lenses; D10B 3 mm focal distance D10A	P22-C1
		<ul style="list-style-type: none"> <li>Side exit</li> <li>DURA-BEND fiber</li> </ul>	DF-G1 D10D Straight side exit with lenses; D10B 3 mm focal distance D10A	P12-C1
		<ul style="list-style-type: none"> <li>Flat mount</li> </ul>	DF-G1 D10D Flat mount 6 mm focal distance, D10B lenses convergent optics D10A	P32-C6
		<ul style="list-style-type: none"> <li>Anodized Aluminium</li> <li>Beam spot <math>\varnothing</math> 0.25 mm @ 6 mm</li> <li>Fixed focus</li> </ul>	DF-G1 6 D10D 6 D10B 6 D10A 6	L4C6 w/PBCT26U
		<ul style="list-style-type: none"> <li>Anodized Aluminium</li> <li>Beam spot <math>\varnothing</math> 4 mm @ 20 mm</li> <li>Fixed focus</li> </ul>	DF-G1 20 D10D 20 D10B 20 D10A 20	L4C20 w/PBCT26U
		<ul style="list-style-type: none"> <li>Anodized Aluminium</li> <li>Beam spot <math>\varnothing</math> 0.5 - 3.2 mm</li> <li>Adjustable focus</li> </ul>	DF-G1 32 D10D 32 D10B 32 D10A 32	LZ3C8 w/PBCT26UM3



# High Temp Fibers

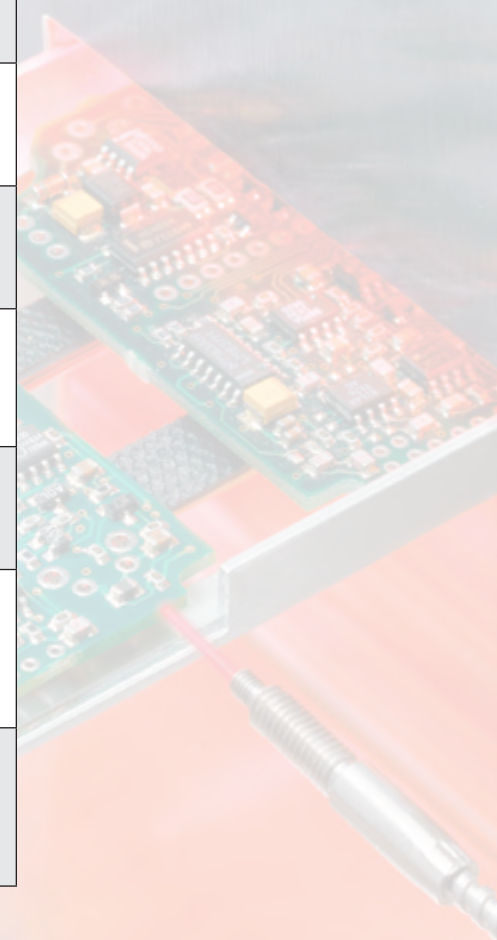


High temp fiber optics are used in situations where the temperature is above a certain limit for most plastic fibers. These are usually used in thermal process applications and Banner offers the widest selection of plastic and glass fibers for high temperature situations.

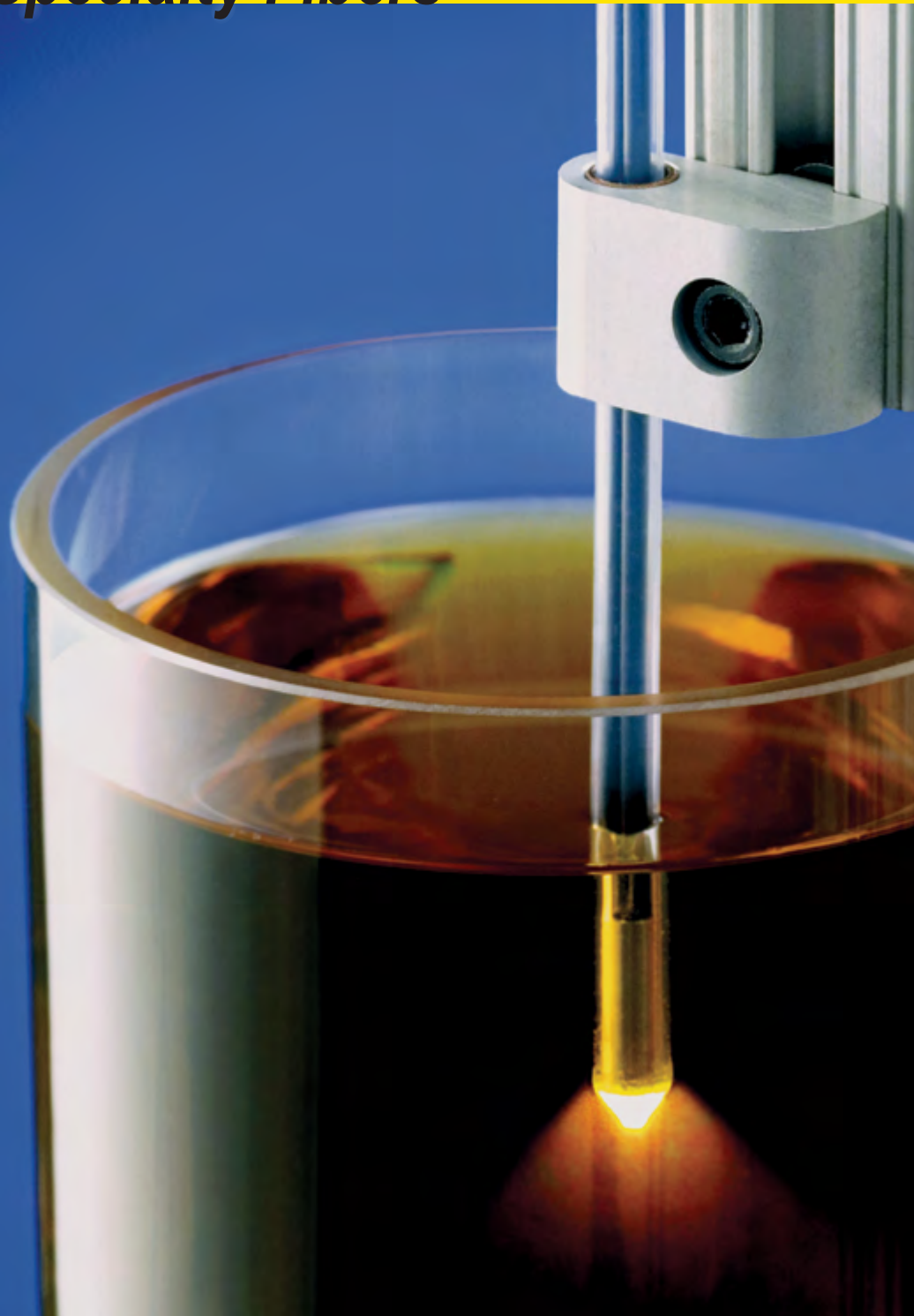
- For high temp applications above 100° C
- Thermal process applications
- For sensing near manufacturing ovens
- Manufacturing of solar panels, colored glass and ceramics
- Widest selection of plastic and glass fibers for high temp applications



Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		<ul style="list-style-type: none"> <li>Miniature thread</li> <li>End tip withstands 315° C</li> </ul>	DF-G1 774 D10D 1767 D10B 400 D10A 325	IMT.756.6S-HT
		<ul style="list-style-type: none"> <li>Smooth ferrule</li> <li>Side exit</li> <li>Stainless steel</li> </ul>	DF-G1 170 D10D 305 D10B 72 D10A 53	IA.31.7ST5ETA
		<ul style="list-style-type: none"> <li>Smooth ferrule</li> <li>90° angle</li> <li>Stainless steel</li> </ul>	DF-G1 810 D10D 1200 D10B 430 D10A 312	IA.82.5PT5
		<ul style="list-style-type: none"> <li>Smooth ferrule</li> <li>Side exit</li> <li>Stainless steel</li> </ul>	DF-G1 810 D10D 1200 D10B 410 D10A 300	IA.83.3ST5ETA
		<ul style="list-style-type: none"> <li>Thread; withstands 105° C</li> </ul>	DF-G1 600 D10D 850 D10B 270 D10A 210	PIT46UHT1
		<ul style="list-style-type: none"> <li>Miniature thread</li> <li>End tip withstands 315° C</li> </ul>	DF-G1 50 D10D 67 D10B 19 D10A 15	BMT16.6S-HT
		<ul style="list-style-type: none"> <li>Threaded</li> <li>Stainless steel</li> </ul>	DF-G1 240 D10D NA D10B NA D10A NA	BT13.5ST5
		<ul style="list-style-type: none"> <li>Thread right angle</li> <li>Stainless steel</li> </ul>	DF-G1 270 D10D NA D10B NA D10A NA	BAT16.6ST5MTA
		<ul style="list-style-type: none"> <li>Thread; withstands 105° C</li> </ul>	DF-G1 52 D10D 60 D10B 22 D10A 18	PBT26UHT2

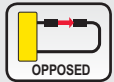
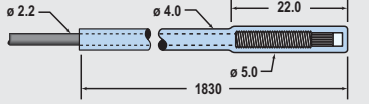




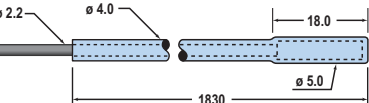




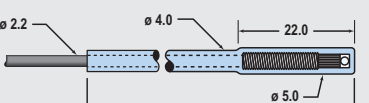




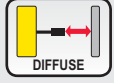
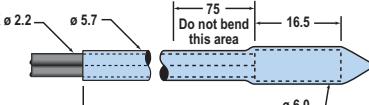
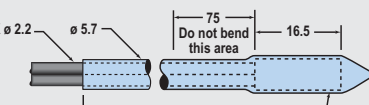
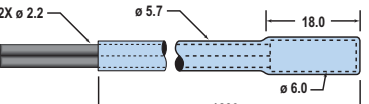






# Specialty Fibers



Specialty and custom fibers are designed for specific sensing applications. Many of the standard fibers can be customized and ready for use in days, not weeks. Banner excels in customization and will work with you to find the right solution.

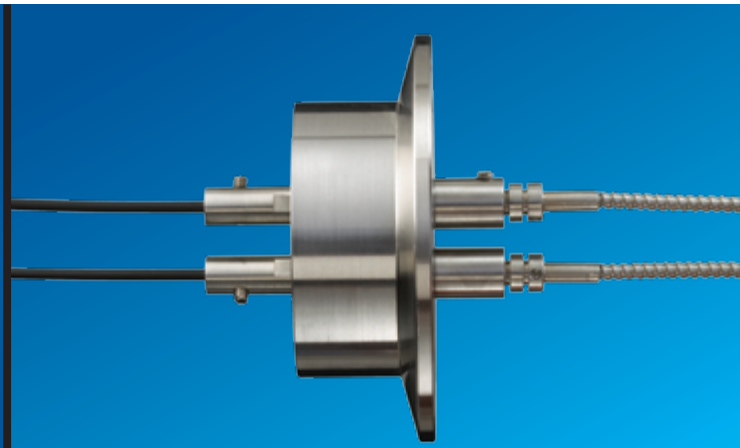
- Custom design
- Chemical resistance
- Extreme environments
- Liquid level detection
- Customize bifurcations, material, lengths and other fiber features

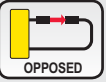
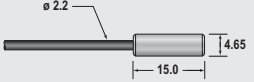




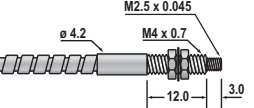
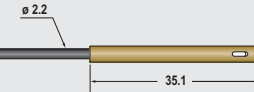




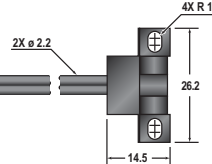
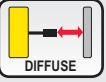
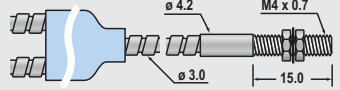
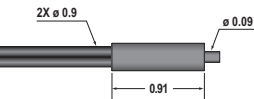




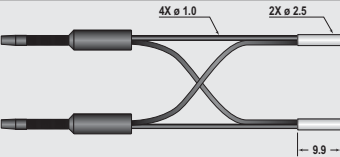




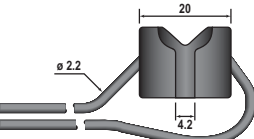
Fiber Mode	End Tip	Features	Typical Range (mm)	Model
 <p>OPPOSED</p>		<ul style="list-style-type: none"> <li>Fluoropolymer encapsulated; lens</li> </ul>	DF-G1 1900  D10D 2700  D10B 2000  D10A 1600 	PIE46UT
		<ul style="list-style-type: none"> <li>Fluoropolymer encapsulated; lens</li> </ul>	DF-G1 950  D10D 1400  D10B 440  D10A 300 	PIE66UTMNL
		<ul style="list-style-type: none"> <li>Fluoropolymer encapsulated; side-view prism</li> </ul>	DF-G1 400  D10D 575  D10B 300  D10A 280 	PIE546UT
 <p>DIFFUSE</p>		<ul style="list-style-type: none"> <li>Fluoropolymer encapsulated</li> <li>Sensor switches when tip of fiber is immersed in liquid</li> </ul>	DF-G1 D10D D10B D10A N/A	PBE46UTMLLP
		<ul style="list-style-type: none"> <li>Fluoropolymer encapsulated</li> <li>Sensor switches when tip of fiber is immersed in liquid</li> <li>End tip withstands 105° C</li> </ul>	DF-G1 D10D D10B D10A N/A	PBE46UTMLLPHT1
		<ul style="list-style-type: none"> <li>Fluoropolymer encapsulated; tip</li> </ul>	DF-G1 220  D10D 360  D10B 75  D10A 12 	PBE46UTMNL










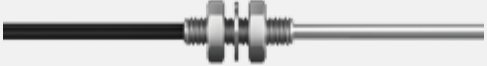








# Specialty Fibers

Fiber Mode	End Tip	Features	Typical Range (mm)	Model	
		<ul style="list-style-type: none"> <li>Stainless steel</li> <li>Vacuum feed through</li> </ul>	DF-G1 D10D D10B D10A	N/A Varies by fiber	VFT-M8MVS
		<ul style="list-style-type: none"> <li>Stainless steel</li> <li>Vacuum feed through</li> <li>For use with PIL45U or LO8FP</li> </ul>	DF-G1 D10D D10B D10A	N/A Varies by fiber	VFT-1.3MRWM8
		<ul style="list-style-type: none"> <li>Stainless steel</li> <li>Vacuum feed through</li> </ul>	DF-G1 D10D D10B D10A	N/A Varies by fiber	DVFT-2.ONWQ50
		<ul style="list-style-type: none"> <li>Aluminum</li> <li>Vacuum feed through</li> </ul>	DF-G1 D10D D10B D10A	N/A Varies by fiber	VFT-1.3MVSA
		<ul style="list-style-type: none"> <li>Stainless steel</li> <li>Vacuum feed through</li> </ul>	DF-G1 D10D D10B D10A	N/A Varies by fiber	HVFT-1.5NWQ40



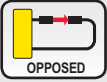
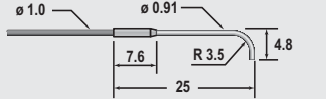
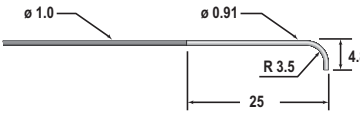
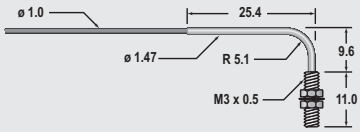
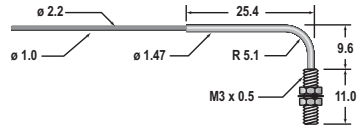
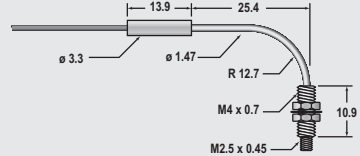
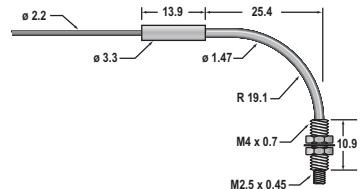
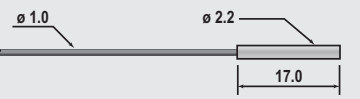
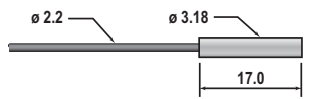
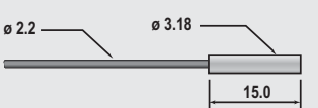
Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		<ul style="list-style-type: none"> <li>For use with Vacuum feed through on ambient side</li> </ul>	DF-G1 1320  D10D 2400  D10B 600  D10A 525 	PIF66UMVFA
		<ul style="list-style-type: none"> <li>Miniature thread</li> <li>Entire cable withstands 480° C</li> </ul>	DF-G1 Range dependent upon amplifier setting and feed through used. D10D D10B D10A	IMT.753SMVF
		<ul style="list-style-type: none"> <li>Flat sides for easy alignment</li> <li>Brass housing</li> </ul>	DF-G1 680  D10D 1000  D10B 440  D10A 350 	PIPS66UMSQMAP
		<ul style="list-style-type: none"> <li>Specialty slot sensor</li> <li>90° angle; compact "fork" head</li> </ul>	DF-G1 5   D10D 5   D10B 5   D10A 5	PDISM46UM5MA
		<ul style="list-style-type: none"> <li>Miniature thread</li> <li>Entire cable withstands 480° C</li> </ul>	DF-G1 Range dependent upon amplifier setting and feed through used. D10D D10B D10A	BMT13SMVF
		<ul style="list-style-type: none"> <li>Coaxial ferrule probe</li> <li>Non-metalic end tip</li> </ul>	DF-G1 220  D10D 345  D10B 145  D10A 120 	PBCFP46UMLR
		<ul style="list-style-type: none"> <li>Dual bifurcated</li> <li>Light "OR" or Dark "AND" logic</li> </ul>	DF-G1 50  D10D 100  D10B 35  D10A 25 	PDBF26T5
		<ul style="list-style-type: none"> <li>Clear tube mount</li> </ul>	DF-G1 Sensor switches when liquid meniscus reaches optical axis D10D D10B D10A	PDI46U-LLD

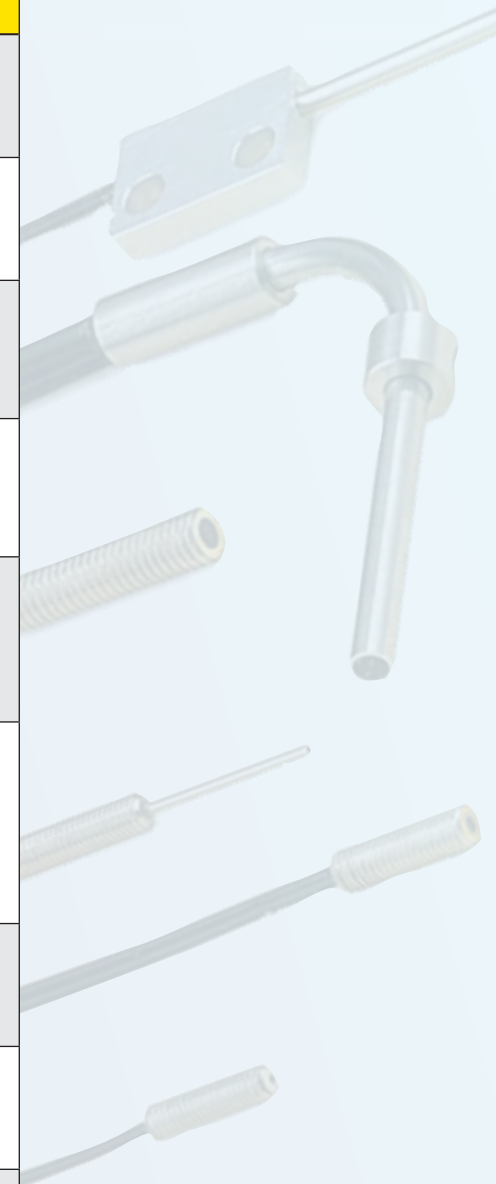
# Standard Fibers

Core Size	Thread	Ferrule	Probe
 0.25 mm			
 0.5 mm			
 1.0 mm			
 1.5 mm			

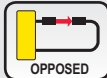
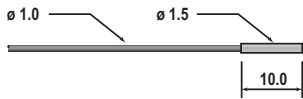




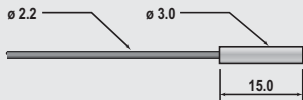
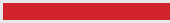
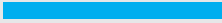


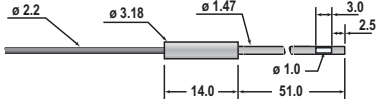




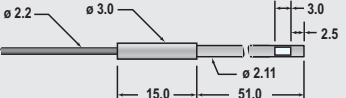

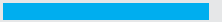


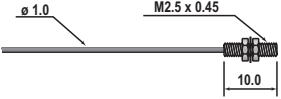









Standard fiber optics come in a variety of materials with standard fiber tips in various sizes. With the breadth of the product line, if a standard fiber does not meet your application requirements, modifications can be made to give you a customized solution.

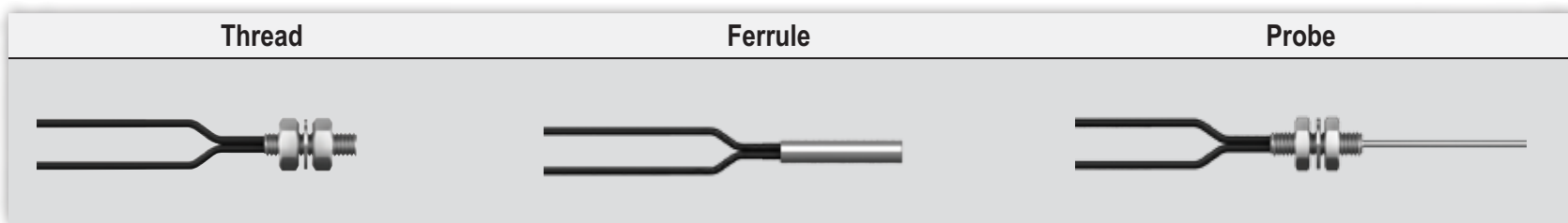
- Plastic individual fibers ideal for use in small, confined areas
- Available in side view/right angles
- Available in bifurcated models
- Various tip and fiber sizes depending on application
- Widest selection of plastic fibers

Fiber Mode	End Tip	Features	Typical Range (mm)		Model
		• 90° angle	DF-G1: 28 D10D: 40 D10B: 18 D10A: 15		PIA16U
		• 90° angle	DF-G1: 120 D10D: 180 D10B: 70 D10A: 50		PIA26U
		• 90° angle • Thread	DF-G1: 60 D10D: 90 D10B: 18 D10A: 12		PIAT16U
		• Thread • 90° angle	DF-G1: 200 D10D: 280 D10B: 100 D10A: 50		PIAT26U
		• 90° angle • Thread	DF-G1: 840 D10D: 1200 D10B: 320 D10A: 275		PIAT46U
		• 90° angle • Thread • Long range	DF-G1: 1280 D10D: 2400 D10B: 410 D10A: 350		PIAT66U
		• Smooth ferrule	DF-G1: 220 D10D: 400 D10B: 95 D10A: 75		PIF26U
		• Smooth ferrule	DF-G1: 820 D10D: 1200 D10B: 320 D10A: 300		PIF46U
		• Smooth ferrule • Long range	DF-G1: 1320 D10D: 2400 D10B: 600 D10A: 525		PIF66U

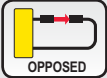
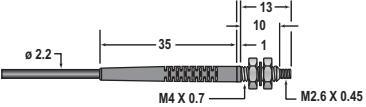
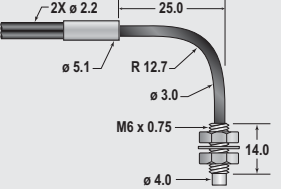
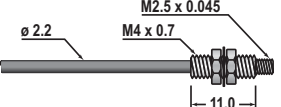
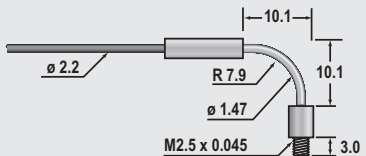
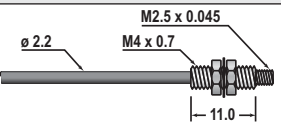
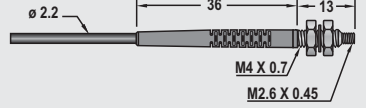
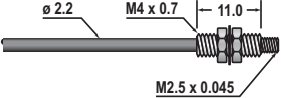
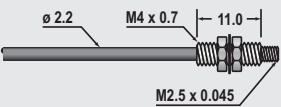


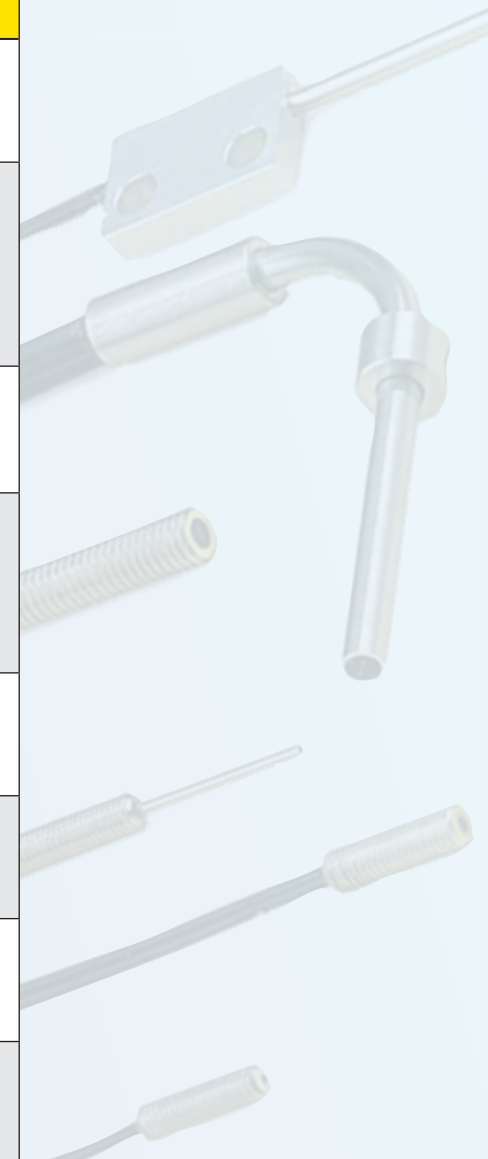
# Standard Fibers

Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		<ul style="list-style-type: none"> <li>Best for repetitive flexing (1,000s of cycles)</li> </ul>	DF-G1 250  D10D 350  D10B 84  D10A 72 	PIFM1X46U
		<ul style="list-style-type: none"> <li>Smooth ferrule</li> <li>Miniature tip</li> </ul>	DF-G1 820  D10D 1200  D10B 360  D10A 300 	PIFM46U
		<ul style="list-style-type: none"> <li>Smooth ferrule</li> <li>Non-bendable tip</li> </ul>	DF-G1 350  D10D 500  D10B 200  D10A 160 	PIPS46U
		<ul style="list-style-type: none"> <li>Smooth ferrule</li> <li>Non-bendable tip</li> </ul>	DF-G1 680  D10D 1000  D10B 440  D10A 350 	PIPS66U
		<ul style="list-style-type: none"> <li>Thread</li> </ul>	DF-G1 58  D10D 90  D10B 20  D10A 15 	PIT16U
		<ul style="list-style-type: none"> <li>Thread</li> </ul>	DF-G1 220  D10D 400  D10B 95  D10A 75 	PIT26U

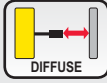
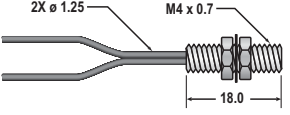
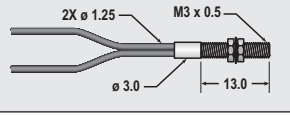
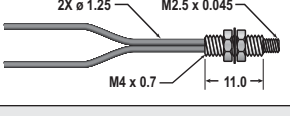
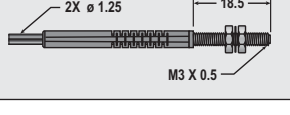
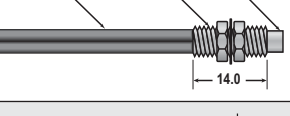
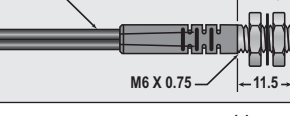

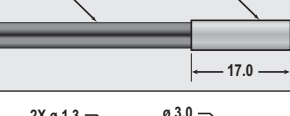
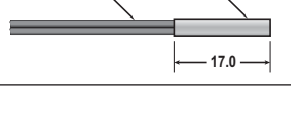




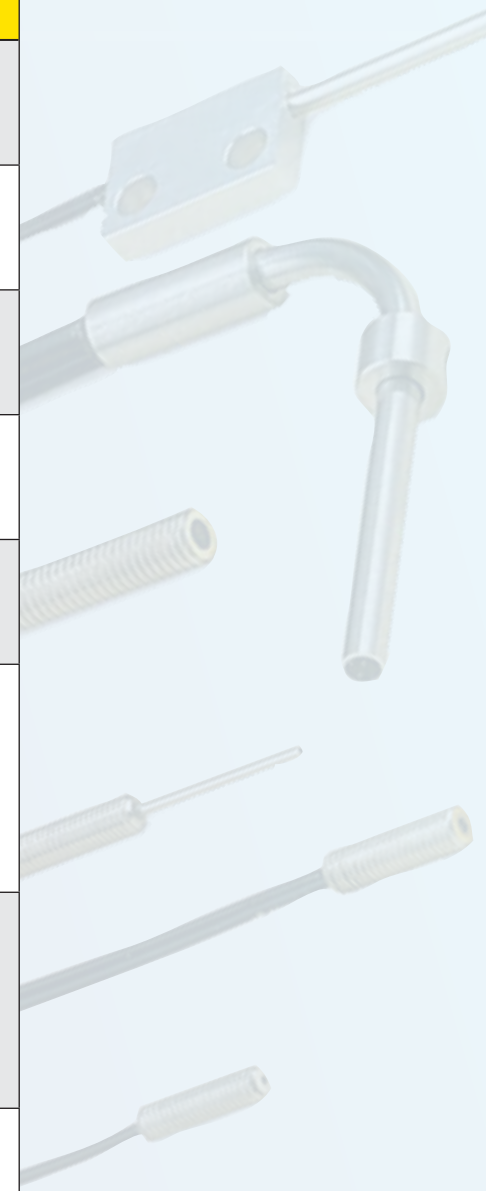
Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Overmolded flex relief</li> </ul>	DF-G1 220 D10D 400 D10B 95 D10A 75	PIT26UMFR
		<ul style="list-style-type: none"> <li>• 90° angle</li> <li>• Thread</li> </ul>	DF-G1 120 D10D 225 D10B 80 D10A 70	PBAT46U
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• 15' length</li> </ul>	DF-G1 690 D10D 1020 D10B 271 D10A 240	PIT415U
		<ul style="list-style-type: none"> <li>• 90° angle</li> <li>• Thread</li> </ul>	DF-G1 840 D10D 1200 D10B 320 D10A 220	PIAT46UM.4X.4MT
		<ul style="list-style-type: none"> <li>• Thread</li> </ul>	DF-G1 820 D10D 1200 D10B 320 D10A 300	PIT46U
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Overmolded flex relief</li> </ul>	DF-G1 840 D10D 1200 D10B 320 D10A 260	PIT46UMFR
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Long range</li> </ul>	DF-G1 1320 D10D 2400 D10B 600 D10A 525	PIT66U
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Long range</li> </ul>	DF-G1 1120 D10D 2040 D10B 510 D10A 450	PIT615U



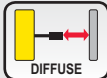
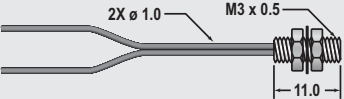
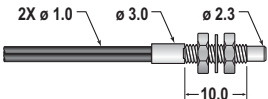
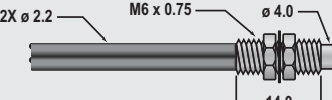
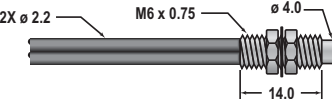
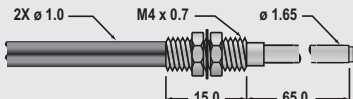
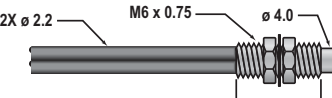
# Standard Fibers

Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		<ul style="list-style-type: none"> <li>• Coaxial</li> <li>• Thread</li> </ul>	DF-G1 90 <span style="color:red">■</span> D10D 180 <span style="color:blue">■</span> D10B 55 <span style="color:green">■</span> D10A 40 <span style="color:orange">■</span>	PBCT26U
		<ul style="list-style-type: none"> <li>• Coaxial</li> <li>• Miniature thread</li> </ul>	DF-G1 90 <span style="color:red">■</span> D10D 180 <span style="color:blue">■</span> D10B 55 <span style="color:green">■</span> D10A 40 <span style="color:orange">■</span>	PBCT26UM3
		<ul style="list-style-type: none"> <li>• Coaxial</li> <li>• Miniature thread</li> </ul>	DF-G1 90 <span style="color:red">■</span> D10D 180 <span style="color:blue">■</span> D10B 55 <span style="color:green">■</span> D10A 40 <span style="color:orange">■</span>	PBCT26UM4M2.5
		<ul style="list-style-type: none"> <li>• Coaxial</li> <li>• Thread</li> <li>• Overmolded flex relief</li> </ul>	DF-G1 80 <span style="color:red">■</span> D10D 160 <span style="color:blue">■</span> D10B 50 <span style="color:green">■</span> D10A 35 <span style="color:orange">■</span>	PBCT26UMFR
		<ul style="list-style-type: none"> <li>• Coaxial</li> <li>• Thread</li> </ul>	DF-G1 220 <span style="color:red">■</span> D10D 345 <span style="color:blue">■</span> D10B 145 <span style="color:green">■</span> D10A 120 <span style="color:orange">■</span>	PBCT46U
		<ul style="list-style-type: none"> <li>• Coaxial</li> <li>• Thread</li> <li>• Overmolded flex relief</li> </ul>	DF-G1 200 <span style="color:red">■</span> D10D 310 <span style="color:blue">■</span> D10B 130 <span style="color:green">■</span> D10A 110 <span style="color:orange">■</span>	PBCT46UMFR
		<ul style="list-style-type: none"> <li>• Smooth ferrule</li> </ul>	DF-G1 80 <span style="color:red">■</span> D10D 150 <span style="color:blue">■</span> D10B 38 <span style="color:green">■</span> D10A 25 <span style="color:orange">■</span>	PBF26U
		<ul style="list-style-type: none"> <li>• Smooth ferrule</li> </ul>	DF-G1 220 <span style="color:red">■</span> D10D 300 <span style="color:blue">■</span> D10B 100 <span style="color:green">■</span> D10A 85 <span style="color:orange">■</span>	PBF46U
		<ul style="list-style-type: none"> <li>• Smooth ferrule</li> <li>• Thin jacket (ø 1.3)</li> </ul>	DF-G1 220 <span style="color:red">■</span> D10D 300 <span style="color:blue">■</span> D10B 100 <span style="color:green">■</span> D10A 85 <span style="color:orange">■</span>	PBF46UM3MJ1.3





Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		<ul style="list-style-type: none"> <li>• Smooth ferrule</li> <li>• Long range</li> </ul>	DF-G1 310 D10D 475 D10B 200 D10A 170	PBF66U
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Bendable tip</li> </ul>	DF-G1 80 D10D 150 D10B 38 D10A 25	PBP26U
		<ul style="list-style-type: none"> <li>• Thread</li> <li>• Bendable tip</li> </ul>	DF-G1 220 D10D 300 D10B 100 D10A 85	PBP46U
		<ul style="list-style-type: none"> <li>• Smooth ferrule</li> <li>• Bendable tip</li> <li>• Side exit</li> </ul>	DF-G1 30 D10D 45 D10B 18 D10A 16	PBPS26U
		<ul style="list-style-type: none"> <li>• Smooth ferrule</li> <li>• Bendable tip</li> <li>• Side exit</li> </ul>	DF-G1 100 D10D 150 D10B 64 D10A 50	PBPS46U
		<ul style="list-style-type: none"> <li>• Rectangular tip</li> </ul>	DF-G1 200 D10D 300 D10B 80 D10A 65	PBR1X326U
		<ul style="list-style-type: none"> <li>• Rectangular tip</li> <li>• Side sensing</li> </ul>	DF-G1 200 D10D 300 D10B 80 D10A 65	PBRS1X326U
		<ul style="list-style-type: none"> <li>• Thread</li> </ul>	DF-G1 12 D10D 30 D10B 7 D10A 5	PBT16U


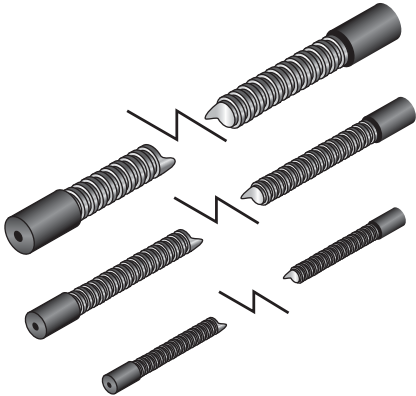
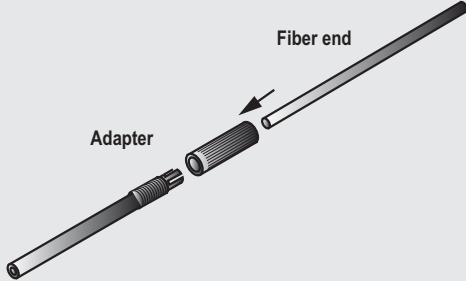


# Standard Fibers

Fiber Mode	End Tip	Features	Typical Range (mm)	Model
		• Thread	DF-G1 80 <span style="color:red">■</span> D10D 150 <span style="color:blue">■</span> D10B 38 <span style="color:green">■</span> D10A 25 <span style="color:orange">■</span>	PBT26U
		• Thread	DF-G1 80 <span style="color:red">■</span> D10D 150 <span style="color:blue">■</span> D10B 38 <span style="color:green">■</span> D10A 25 <span style="color:orange">■</span>	PBT26UMSSMFF
		• Thread	DF-G1 220 <span style="color:red">■</span> D10D 300 <span style="color:blue">■</span> D10B 100 <span style="color:green">■</span> D10A 85 <span style="color:orange">■</span>	PBT46U
		• Thread • Long range	DF-G1 310 <span style="color:red">■</span> D10D 475 <span style="color:blue">■</span> D10B 200 <span style="color:green">■</span> D10A 170 <span style="color:orange">■</span>	PBT66U
		• Probe ferrule • 15 foot length	DF-G1 68 <span style="color:red">■</span> D10D 120 <span style="color:blue">■</span> D10B 32 <span style="color:green">■</span> D10A 27 <span style="color:orange">■</span>	PBPF215U
		• Thread • 15 foot length	DF-G1 180 <span style="color:red">■</span> D10D 250 <span style="color:blue">■</span> D10B 85 <span style="color:green">■</span> D10A 72 <span style="color:orange">■</span>	PBT415U

## Brackets

			
<b>SMBFP3</b>	<b>SMBFP4</b>	<b>SMBFP4N</b>	<b>SMBFP6</b>
Plastic fiber with M4 tip	Plastic fiber with M4 tip	Plastic fiber with M4 tip	Plastic fiber with M6 tip

General Features		Model Specific Features	Image	Model Number
Fiber Cutters	<ul style="list-style-type: none"> <li>• These kits are used with unterminated plastic fiber cables</li> <li>• Each kit contains 40 bushings and 10 cutter assemblies (cutters can be purchased separately in packages of 25 - reference model PFC-2-25)</li> </ul>	<ul style="list-style-type: none"> <li>• 25 cutters(no bushings)</li> </ul>	 <p>NOTE: Bushings used with Q45, OMNI-BEAM™, ECONO-BEAM®, MAXI-BEAM® and VALU-BEAM® sensors only.</p>	PFC-3-25
		<ul style="list-style-type: none"> <li>• For use with 0.25 and 0.5 mm diameter cables</li> </ul>		PFK20
		<ul style="list-style-type: none"> <li>• For use with 1 and 1.5 mm diameter cables</li> </ul>		PFK40
Plastic Fiber Field-Installable Sheathing	<ul style="list-style-type: none"> <li>• Stainless steel sheathing with stainless steel end fittings (one end internally threaded to capture fiber end tips, other end non-threaded) is used in applications where protection is required for plastic fiber optic cables</li> <li>• All models listed are 1.8 m in length</li> <li>• Other lengths are available by contacting Banner Applications Department</li> </ul>	<ul style="list-style-type: none"> <li>• May be used with bifurcated fiber assemblies having M6 x 0.75 threaded end tips (e.g., PBCT46U, PBP46U, PBT46UHT1 and PBT66U)</li> </ul>		PFS69S6T
		<ul style="list-style-type: none"> <li>• May be used with individual or bifurcated fiber assemblies having M4 x 0.7 threaded end tips (e.g., PBCT26U, PBP26U, PIP46U, PIT46U and PIT66U)</li> </ul>		PFS53S6T
		<ul style="list-style-type: none"> <li>• May be used with individual fiber assemblies having M3 x 0.5 threaded end tips (e.g., PIP26U, PIT26U and PIT1X46U)</li> </ul>		PFS44S6T
Plastic Fiber Adapters	<ul style="list-style-type: none"> <li>• Compression fitting adapters are used with small-diameter unterminated plastic fiber cables</li> <li>• Use when interfacing small-diameter plastic fibers to D10, D11, D12, QM42, QS18, R55F, FI22 and MINI-BEAM plastic fiber sensor families</li> <li>• Each kit contains 100 pairs of adapters. One pair will interface either one bifurcated fiber optic cable or a pair of individual cables to a fiber optic amplifier</li> </ul>	<ul style="list-style-type: none"> <li>• Use to adapt plastic fiber optic cables with outside jacket diameter of 1.0 mm, such as PIT26U and PBP16U</li> </ul>	 <p>Adapter</p> <p>Fiber end</p>	UPFA-1-100
		<ul style="list-style-type: none"> <li>• Use to adapt plastic fiber optic cables with outside jacket diameter of 1.25 mm or 1.3 mm, such as PBCT26U and PBF46UM3MJ1.3</li> </ul>		UPFA-2-100

# Amplifiers

## DF-G1



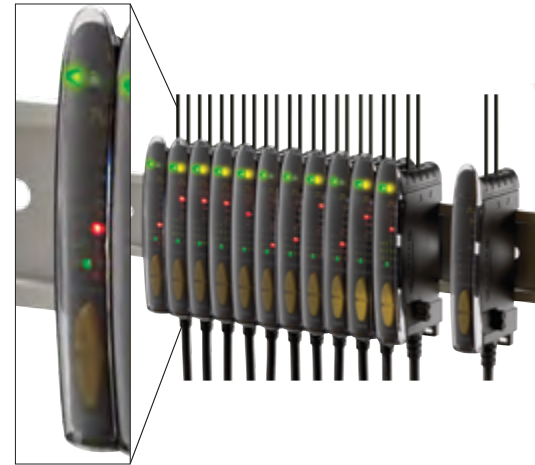
Intuitive user interface ensures easy sensor setup and programming via displays and switches/buttons, remote input teach wire, or IO-Link. A dual-display shows signal level and threshold simultaneously for simple operation and status monitoring.

## D10 Series



### D10D

Numeric display of signal strength and operating status with two discrete outputs in the same sensor or a discrete output and either a 4-20 mA current or a 0-10V dc voltage analog output in same sensor.



### D10B

Easy-to-read 8-segment light bar display indicator for TEACH and signal strength with push buttons for easy-to-set static, dynamic light set, dark set and window SET programming.



### D10A

12-turn manual sensitivity adjustment with a pulse rate indicator for signal strength and bipolar discrete outputs, one current sourcing (PNP) and one current sinking (NPN).

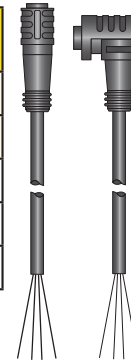


Other amplifiers available.  
Call a fiber expert for more info.  
1.888.373.6767

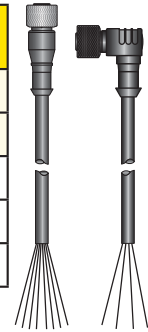
# Amplifier Accessories

## Cordsets

Pico QD						
Length	Snap-on 4-Pin		Threaded 4-Pin		Snap-on 6-Pin	
	Straight	Right-Angle	Straight	Right-Angle	Straight	Right-Angle
2.00 m	PKG4-2	PKW4Z-2	PKG4M-2	PKW4M-2	PKG6Z-2	PKW6Z-2
5.00 m	PKG4-5	PKW4Z-5	PKG4M-5	PKW4M-5	—	—
9.00 m	PKG4-9	—	PKG4M-9	PKW4M-9	PKG6Z-9	PKW6Z-9



Euro QD		
Length	Threaded 4-Pin	
	Straight	Right-Angle
1.83 m	MQDC-406	MQDC-406RA
4.57 m	MQDC-415	MQDC-415RA
9.14 m	MQDC-430	MQDC-430RA



## Brackets

DIN-35...	SMBR55F01	SMBR55FRA	SA-DIN-BRACKET

## Clamps

DF-G1
SA-DIN-CLAMP



Banner offers thousands of readily available alternative fiber models in stock for a quick turnaround time, ensuring you can find what you need for your application. If you did not find what you were looking for, call to speak to a fiber specialist at 1-888-3-SENSOR or go online to [Bannerengineering.com/selectionguide](http://Bannerengineering.com/selectionguide) to find fibers that meet your needs.

***Fiber selection guide***

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9714 Tenth Avenue North • Minneapolis, Minnesota 55441  
(763) 544-3164 • Fax: (763) 544-3213 • Toll-free: 888-373-6767  
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