Fiberoptic Light Guides
Fiberoptic Light Guides

Shine a flashlight into one end of either a flexible plastic or glass fiberoptic light guide and you will see light coming out of the other end. This ability to guide light from one place to another provides many advantages when applied to industrial photoelectric sensing.

Fiberoptic Light Guides are flexible and small enough to fit into difficult sensing sites. This allows the sensor to be located in a more convenient, remote location — out of harm’s way. Fibers are resistant to high temperatures, vibration, condensation, and corrosion.

One of the main advantages of glass fiberoptic light guides is that they can be sized and shaped to provide optical advantages. When fiberoptic light guides are utilized, they become the optics of the sensing system.

At the sensing site, the size and shape of the fiberoptic bundle carrying the light controls the size and shape of the transmitted light beam. The size and shape of the fiberoptic bundle receiving the light beam controls the effective viewing area of the sensing system.

Lenses are available to provide additional control of the transmitted and received light beams. Both Beam Break and Beam Make sensing modes are adaptable to fiberoptic sensing.
Hints & Tips

1. USING STRAIGHT LIGHT GUIDES

Straight light guides are a bundle of glass fibers, with the same number of glass fibers on both ends.

• Thru-Beam/Opposed Mode Sensing

Straight light guides are used in pairs. One light guide is used to transmit the light from the sensor's light source to the sensing site. Here the light beam is focused, or directed across the area the target is to be passing. The receiving light guide is located on the opposite side, aligned in position to receive the light beam. Then this light guide transmits the received light back to the sensor's photo detector. When a target or object passes through the light beam, the sensor responds to the absence of light and switches its output accordingly. This is called Beam Break, or thru-beam sensing. (Refer to illustrations)

• Convergent "V" Axis Mode

At times thru-beam and proximity sensing won't work for a particular application. By using a pair of straight fibers directed at an object in a "V" configuration, a certain part of the object can be detected. (Refer to illustrations)

2. USING BIFURCATED LIGHT GUIDES

Bifurcated light guides start out as one bundle of glass fibers. This single bundle is then split into two separate bundles of fibers at the sensor end, and left as one randomly mixed bundle at the sensing end.

• Beam Break Sensing or Retroreflective Mode

The sensing tip of the fiber is placed on one side of the detection path with a reflector on the other. The object passes between the fiber and the reflector, breaking the beam and switching the output of the sensor. (Refer to illustrations)

• Beam Make Sensing or Proximity Mode

One half of the fiber transmits the light to the sensing site. The other half transmits the reflecting or diffusing light off the surface of the target back to the sensor's photodetector. This “proximity mode” sensing is used to sense nearby objects.

3. EXPLOSIVE ENVIRONMENTS WARNING

While fiberoptics are considered to be intrinsically safe, the sheathing is a hollow tube that could conceivably provide a flame path. Additionally, the photoelectric sensor must be placed into an approved enclosure.

4. LONG FIBERS

Glass fibers absorb 10% of the remaining light for each foot of glass the light travels; 15-foot fibers have brighter beams than 20-foot fibers, etc. Fibers can be ordered in longer lengths in 12-inch increments up to 30 feet.

5. ROUTING/BEND RADIUS

Avoid sharp bends when routing light guides around machines. A good minimum bend radius is approximately 10 times the jacket diameter.

6. WATERPROOF

Liquid inside the fiber's protective jacket will lower transmission. Use PVC monocoil jackets in wet locations.

7. REPAIRS

Fiberoptics must never be cut or broken. Never pull on a fiberoptic's protective jacket. They cannot be repaired or spliced. The tips cannot be bent unless specifically noted. They are filled with epoxy, and will break. Abrasion can scratch the face of the fiberoptic bundle and lower its performance.

8. CLEANING

Avoid dirt build-up on the bundle face. Clean with filtered air, soap and water, glass cleaners, toothbrushes, etc. Avoid abrasives.

9. FIBEROPTIC LIGHT GUIDES TEMPERATURE RATINGS

GLASS FIBERS (Type 304 stainless steel)

Standard Fibers

Excess heat above the rated temperature damages the epoxy in the tips, or melts the PVC monocoil jacket.

- Flexible Stainless Steel Jacketing
  Operating temperatures from -50°F to +525°F (-45°C to +275°C)

- PVC Monocoil Jacketing
  Operating temperatures from -40°F to +220°F (-40°C to +105°C)

High Temperature Fibers

On various tests our high temperature fiberoptics were subjected to temperatures above 500°C for ten hours, and they held their bonding elements without failure.

- Stainless Steel Jacketing (Type 304)
  Operating temperatures from -50°F to +900°F (-45°C to +480°C)

PLASTIC FIBERS

<table>
<thead>
<tr>
<th>PLASTIC FIBER OPTIC SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
</tr>
<tr>
<td>-40° to 80° C (-40° to 176° F)</td>
</tr>
<tr>
<td>Sensing Range</td>
</tr>
<tr>
<td>Dependent on Fiber &amp; Sensor Comb.</td>
</tr>
<tr>
<td>Optical Fiber: Acrylic Monofilament</td>
</tr>
<tr>
<td>Protective Jacket: Black Polyethylene</td>
</tr>
<tr>
<td>Construction</td>
</tr>
<tr>
<td>Threaded End Tips &amp; Hardware: Nickel Plated Brass</td>
</tr>
<tr>
<td>Probe End Tips: SUS Stainless Steel</td>
</tr>
<tr>
<td>Minimum Bend Radius</td>
</tr>
<tr>
<td>.47&quot; (12 mm) for .020&quot; (0.5 mm) Fibers</td>
</tr>
<tr>
<td>.98&quot; (25 mm) for .040&quot; (1.0 mm) Fibers</td>
</tr>
<tr>
<td>Chemical Resistance</td>
</tr>
<tr>
<td>Core is made of acrylic. Avoid exposing core to acids and aggressive bases as well as solvents. Jacket of fiber will provide a degree of protection from most chemical environments.</td>
</tr>
</tbody>
</table>
Fiberoptic Light Guides

1. Select mode of sensing best suited to your application, e.g., "straight light guide" for Beam Break/opposed mode sensing, or "bifurcated light guide" for Beam Make/proximity sensing.

2. Determine whether the standard size or the miniature fibers will work best.

3. Select "stainless steel armored cable" for most applications, including high temperatures, or "PVC jacketed monocoil" for wet applications.

4. Select fiberoptic bundle size and shape that optimize the viewing area and provide the greatest amount of contrast deviation as displayed on the CONTRAST INDICATOR.

5. Select the tip configuration that best fits the sensing needs, such as, right angle, straight, stainless or brass threaded (both 1.5" and .625" lengths), or side view.

6. Use the Glass Fiberoptic Model Number Matrix below to create the model number that matches your selected sensing mode, jacketing, fiberoptic bundle, size, and tip configuration.

Plastic Fiberoptic Light Guides

Model numbers for plastic fibers do not fit this matrix. If you have a need for a plastic fiber, look through this section and determine the tip configuration and fiber you require. See drawings for plastic fiber bundle sizes.

This section lists only the most popular fiberoptic light guides. Many more configurations are also available directly from stock. Consult your local sales representative or the factory with your requirements.
Fiberoptic Light Guides

JACKETING FOR FIBEROPTIC LIGHT GUIDES

**Glass Fiber – Flexible Stainless Steel Armored Cables**

Stainless steel armored cables (Type 304 Stainless) provide maximum protection against shock and abrasion. The interlocked metal hose is both flexible and strong. However, it is not waterproof, oil tight, or vapor proof. Standard operating temperatures from -50°F to 525°F (-45°C to 275°C). High temperature from -50°F to +900°F (-45°C to +480°C).

**Glass Fiber – PVC Jacketed Monocoil**

PVC jacketed monocoil provides ample protection for most industrial applications. It is a flat-wound steel spring, forming a crush-proof flexible tube around the glass. PVC monocoil fibers are waterproof, oil tight, crush resistant, and very flexible. Operating temperatures from -40°F to 220°F (-40°C to 105°C). Not available in High Temperature. PVC Jacketed Monocoil (add Suffix “P” to Model Numbers).

**Miniature Glass Fiber – PVC and Stainless Steel Cables**

Smaller O.D, smaller tip configurations, with the same flexibility and durability as our standard fiber optic light guides. Smaller tips and diameter allow these fiber optics to fit into smaller spaces for mechanic constraint issues, and still provide a robust and chemical resistant solution for difficult sensing tasks in harsh environments.

**Plastic Fiber – Fluorinated Polymer Jacket**

Core – Polymethyl Methacrylate (ultra grade) with an allowable bending radius of >17mm. Operating temperatures from -40°F to +185°F (-40°C to +85°C). Note: Due to their light transmission properties, plastic fiberoptic light guides are recommended for use only with visible light sensors.

**CUSTOM FIBERS**

Custom Fiberoptics are a TRI-TRONICS® specialty. In most cases, we can meet your “special requirements” for customized tip configurations, fiber bundle sizes, and cable lengths, all with quick delivery. All requests for custom fiberoptic light guides must include a detailed drawing showing the critical tolerances before a quotation can be provided, to ensure construction requirements and tolerances are within TRI-TRONICS® capabilities.

Important: Custom fiberoptic light guides are non-refundable and non-returnable. Suitability for purpose is not guaranteed. Custom length fibers are +/- .5 inches per foot.

**EXAMPLES:**
Glass Single Light Guides

### Straight Barrel Tip
**Stainless Steel Jacket**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
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<tbody>
<tr>
<td>F-A-36</td>
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<tr>
<td>F-B-36A</td>
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<tr>
<td>F-E-36A</td>
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**PVC Monocoil Jacket**

<table>
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<tbody>
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### Right Angle Tip
**Stainless Steel Jacket**

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**PVC Monocoil Jacket**

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### Right Angle Tip, then Threaded
**Stainless Steel Jacket**

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**PVC Monocoil Jacket**

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<td>F-E-36RTP</td>
<td>.046&quot;</td>
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Glass Single Light Guides

Straight Threaded Tip Stainless Steel Jacket
- MODEL: F-A-36T .125"
- MODEL: F-B-36T .062"
- MODEL: F-E-36T .046"
- MODEL: F-K-36T .020" x .15"

PVC Monocoil Jacket
- MODEL: F-A-36TP .125"
- MODEL: F-B-36TP .062"
- MODEL: F-E-36TP .046"
- MODEL: F-K-36TP .020" x .15"

Threaded Tip, then Right Angle Stainless Steel Jacket
- MODEL: F-A-36TR .125"
- MODEL: F-B-36TR .062"
- MODEL: F-E-36TR .046"

PVC Monocoil Jacket
- MODEL: F-A-36RSP .093"

Side View, Right Angle Tip Stainless Steel Jacket
- MODEL: F-A-36RS .093"

PVC Monocoil Jacket
- MODEL: F-A-36RSTP .093"

Drawing available at ttco.com
Glass Single Light Guides

Straight Needle Tip
Stainless Steel Jacket
MODEL    BUNDLE SIZE
F-B-36    .062"

PVC Monocoil Jacket
MODEL    BUNDLE SIZE
F-B-36P   .062"

Right Angle Needle Tip
Stainless Steel Jacket
MODEL    BUNDLE SIZE
F-B-36R   .062"

PVC Monocoil Jacket
MODEL    BUNDLE SIZE
F-B-36RP  .062"

Straight Needle Tip
Stainless Steel Jacket
MODEL    BUNDLE SIZE
F-E-36    .046"

PVC Monocoil Jacket
MODEL    BUNDLE SIZE
F-E-36P   .046"

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Right Angle Needle Tip Stainless Steel Jacket
MODEL F-E-36R
BUNDLE SIZE .046"

PVC Monocoil Jacket
MODEL F-E-36RP
BUNDLE SIZE .046"

Straight Needle Tip Stainless Steel Jacket
MODEL F-H-36
BUNDLE SIZE .015"

PVC Monocoil Jacket
MODEL F-H-36P
BUNDLE SIZE .015"

Right Angle Needle Tip Stainless Steel Jacket
MODEL F-H-36R
BUNDLE SIZE .015"

PVC Monocoil Jacket
MODEL F-H-36RP
BUNDLE SIZE .015"

Drawing available at ttco.com
Glass Single Light Guides

**Straight Needle Tip Stainless Steel Jacket**

<table>
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<td>F-J-36</td>
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**PVC Monocoil Jacket**

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<td>F-J-36P</td>
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**Right Angle Needle Tip Stainless Steel Jacket**

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**PVC Monocoil Jacket**

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<tr>
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**Rectangular Flat Housing Stainless Steel Jacket**

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<th>MODEL</th>
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<tbody>
<tr>
<td>F-C-36</td>
<td>.032&quot; x .38&quot;</td>
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**PVC Monocoil Jacket**

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Glass Single Light Guides

Rectangular Bundle Barrel Tip Stainless Steel Jacket

- **MODEL**: F-K-36
- **BUNDLE SIZE**: 0.20” x 0.15”

PVC Monocoil Jacket

- **MODEL**: F-K-36P
- **BUNDLE SIZE**: 0.20” x 0.15”

Rectangular 2” Flat Housing Stainless Steel Jacket

- **MODEL**: F-P-36
- **BUNDLE SIZE**: 0.01” x 1.50”

PVC Monocoil Jacket

- **MODEL**: F-P-36P
- **BUNDLE SIZE**: 0.01” x 1.50”

3” Long Bendable Tip Stainless Steel Jacket

- **MODEL**: F-L-36B
- **BUNDLE SIZE**: 0.57”

PVC Monocoil Jacket

- **MODEL**: F-L-36BP
- **BUNDLE SIZE**: 0.57”

Drawing available at ttco.com
Glass Bifurcated Light Guides

**Straight Barrel Tip**
- Stainless Steel Jacket

<table>
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**PVC Monocoil Jacket**

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**Right Angle Tip**
- Stainless Steel Jacket

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**PVC Monocoil Jacket**

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**Right Angle Tip, then Threaded**
- Stainless Steel Jacket

<table>
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Straight Threaded Tip
Stainless Steel Jacket

<table>
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<tr>
<td>*BF-K-36T</td>
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PVC Monocoil Jacket

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Straight Threaded Tip
Stainless Steel Jacket
Micro Polished for Superior Performance and Range

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<tbody>
<tr>
<td>BF-U-36TUV</td>
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Threaded Tip, then Right Angle
Stainless Steel Jacket

<table>
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<th>MODEL</th>
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Drawing available at ttco.com
## Glass Bifurcated Light Guides

### Side View, Right Angle Tip
**Stainless Steel Jacket**

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<thead>
<tr>
<th>MODEL</th>
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**PVC Monocoil Jacket**

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### Side View, Right Angle
**Threaded, Stainless Steel Jacket**

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### Straight Needle Tip
**Stainless Steel Jacket**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF-B-36</td>
<td>.062&quot;</td>
</tr>
</tbody>
</table>

**PVC Monocoil Jacket**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF-B-36P</td>
<td>.062&quot;</td>
</tr>
</tbody>
</table>

### Right Angle Needle Tip
**Stainless Steel Jacket**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF-B-36R</td>
<td>.062&quot;</td>
</tr>
</tbody>
</table>

**PVC Monocoil Jacket**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF-B-36RP</td>
<td>.062&quot;</td>
</tr>
</tbody>
</table>
Glass Bifurcated Light Guides

Straight Needle Tip
Stainless Steel Jacket
MODEL: BF-E-36
BUNDLE SIZE: .046"

PVC Monocoil Jacket
MODEL: BF-E-36P
BUNDLE SIZE: .046"

Right Angle Needle Tip
Stainless Steel Jacket
MODEL: BF-E-36R
BUNDLE SIZE: .046"

PVC Monocoil Jacket
MODEL: BF-E-36RP
BUNDLE SIZE: .046"

Straight Needle Tip
Stainless Steel Jacket
MODEL: BF-J-36
BUNDLE SIZE: .027"

PVC Monocoil Jacket
MODEL: BF-J-36P
BUNDLE SIZE: .027"

Drawing available at ttco.com
Glass Bifurcated Light Guides

Right Angle Needle Tip
Stainless Steel Jacket

**MODEL** BF-J-36R
**BUNDLE SIZE** .027"

PVC Monocoil Jacket

**MODEL** BF-J-36RP
**BUNDLE SIZE** .027"

Rectangular Flat Housing
Stainless Steel Jacket

**MODEL** BF-C-36
**BUNDLE SIZE** .032" x .38"

PVC Monocoil Jacket

**MODEL** BF-C-36P
**BUNDLE SIZE** .032" x .38"

Rectangular Bundle Barrel Tip
Stainless Steel Jacket

**MODEL** BF-K-36
**BUNDLE SIZE** .020" x .15"

PVC Monocoil Jacket

**MODEL** BF-K-36P
**BUNDLE SIZE** .020" x .15"

---

800-237-0946 • ttco.com
Glass Bifurcated Light Guides

Rectangular, 2" Flat Housing
Stainless Steel Jacket

MODEL: BF-P-36
BUNDLE SIZE: .010" x 1.50"

PVC Monocoil Jacket

MODEL: BF-P-36P
BUNDLE SIZE: .010" x 1.50"

3" Long Bendable Tip
Stainless Steel Jacket

MODEL: BF-L-36B
BUNDLE SIZE: .057"

PVC Monocoil Jacket

MODEL: BF-L-36BP
BUNDLE SIZE: .057"

Sensor Adaptor
Bendable 3" Tip
For use with
F1 Optical Block

MODEL: BF-L-3B
BUNDLE SIZE: .057"

Drawing available at ttco.com
Miniature Glass Single Light Guides

Our MINIATURE GLASS FIBEROPTIC LIGHT GUIDES utilize the high performance and protection of glass fibers with the space saving flexibility of plastic fibers, plus a tighter bend radius. Now there is nowhere we can’t take you.

Stainless Steel Jacket
MODEL MF-A-36T BUNDLE SIZE .090”

PVC Monocoil Jacket
MODEL MF-B-36TP BUNDLE SIZE .062”

Stainless Steel Jacket
MODEL MF-B-36RT BUNDLE SIZE .062”

PVC Monocoil Jacket
MODEL MF-B-36RTP BUNDLE SIZE .062”

Stainless Steel Jacket
MODEL MF-B-36TR BUNDLE SIZE .062”

PVC Monocoil Jacket
MODEL MF-B-36TRP BUNDLE SIZE .062”

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Miniature Glass Single Light Guides

Stainless Steel Jacket
MODEL MF-A-36TM6
BUNDLE SIZE .050"

PVC Monocoil Jacket
MODEL MF-B-36TM6P
BUNDLE SIZE .062"

Stainless Steel Jacket
MODEL MF-B-36
BUNDLE SIZE .062"

PVC Monocoil Jacket
MODEL MF-B-36P
BUNDLE SIZE .062"

Stainless Steel Jacket
MODEL MF-B-36TM4
BUNDLE SIZE .062"

PVC Monocoil Jacket
MODEL MF-B-36TM4P
BUNDLE SIZE .062"

Drawing available at ttco.com
Miniature Glass Single Light Guides

Side View, Right Angle, Threaded, Stainless Steel Jacket
MODEL: MF-B-36RS
BUNDLE SIZE: 0.062" 

PVC Monocoil Jacket
MODEL: MF-B-36RSP
BUNDLE SIZE: 0.062"

Rectangular Flat Housing Stainless Steel Jacket
MODEL: MF-C-36
BUNDLE SIZE: 0.250" X 0.025"

Stainless Steel Jacket
MODEL: MF-E-36
BUNDLE SIZE: 0.046"

PVC Monocoil Jacket
MODEL: MF-E-36P
BUNDLE SIZE: 0.046"

Stainless Steel Jacket
MODEL: MF-J-36
BUNDLE SIZE: 0.027"

PVC Monocoil Jacket
MODEL: MF-J-36P
BUNDLE SIZE: 0.027"
FINALLY... BIFURCATED FIBEROPTIC LIGHT GUIDES
in a small package with the performance of glass

Stainless Steel Jacket
MODEL BUNDLE SIZE
MBF-A-36T .090"
MBF-B-36T .062"

Stainless Steel Jacket
MODEL BUNDLE SIZE
MBF-B-36RT .062"

PVC Monocoil Jacket
MODEL BUNDLE SIZE
MBF-B-36RTP .062"

Stainless Steel Jacket
MODEL BUNDLE SIZE
MBF-B-36TR .062"

PVC Monocoil Jacket
MODEL BUNDLE SIZE
MBF-B-36TRP .062"

Drawing available at ttco.com
Miniature Glass Bifurcated Light Guides

**Stainless Steel Jacket**
- **MODEL** MBF-A-36TM6
- **BUNDLE SIZE** .090”

**PVC Monocoil Jacket**
- **MODEL** MBF-B-36TM6P
- **BUNDLE SIZE** .062”

**Stainless Steel Jacket**
- **MODEL** MBF-B-36
- **BUNDLE SIZE** .062”

**PVC Monocoil Jacket**
- **MODEL** MBF-B-36P
- **BUNDLE SIZE** .062”

**Stainless Steel Jacket**
- **MODEL** MBF-B-36TM4
- **BUNDLE SIZE** .062”

**PVC Monocoil Jacket**
- **MODEL** MBF-B-36TM4P
- **BUNDLE SIZE** .062”

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Miniature Glass Bifurcated Light Guides

Stainless Steel Jacket
MODEL       BUNDLE SIZE
MBF-B-36RS  .062"

PVC Monocoil Jacket
MODEL       BUNDLE SIZE
MBF-B-36RSP .062"

Rectangular Flat Housing Stainless Steel Jacket
MODEL       BUNDLE SIZE
MBF-C-36    0.250" X 0.025"

Stainless Steel Jacket
MODEL       BUNDLE SIZE
MBF-E-36    .046"

PVC Monocoil Jacket
MODEL       BUNDLE SIZE
MBF-E-36P   .046"

Stainless Steel Jacket
MODEL       BUNDLE SIZE
MBF-J-36    .027"

PVC Monocoil Jacket
MODEL       BUNDLE SIZE
MBF-J-36P   .027"

Drawing available at ttco.com
Plastic Single Light Guides

All Plastic Fibers are priced per package.
Plastic Single Light Guides have two per package.

### Straight Threaded Tip
- **Model**: PF-Z-78TL
- **Bundle Size**: 0.040" (1.0 mm)

![Straight Threaded Tip](image)

### Straight Threaded Tip
- **Model**: PF-Q-78T
- **Bundle Size**: 0.020" (0.5 mm)

![Straight Threaded Tip](image)

### Threaded Tip then Right Angle
- **Model**: PF-Z-78TRL
- **Bundle Size**: 0.040" (1.0 mm)

![Threaded Tip then Right Angle](image)

### Straight Threaded Needle Tip
- **Model**: PF-Z-78T70
- **Bundle Size**: 0.040" (1.0 mm)

![Straight Threaded Needle Tip](image)

### Straight Needle Tip with Threaded Mounting
- **Model**: PF-Q-78T70
- **Bundle Size**: 0.020" (0.5 mm)

![Straight Needle Tip with Threaded Mounting](image)
Plastic Single Light Guides

All Plastic Fibers are priced per package.
Plastic Single Light Guides have two per package.

---

Range Guidelines with Red LED

**PF-Z-78TL, PF-Z-78T70**

<table>
<thead>
<tr>
<th>Product</th>
<th>TINY-EYE</th>
<th>EZ-EYE™</th>
<th>MITY-EYE</th>
<th>OPTI-EYE</th>
<th>EZ-PRO™</th>
<th>MARK III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Range (mm)</td>
<td>0</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
</tr>
</tbody>
</table>

**PF-Q-78T, PF-Q-78T35, PF-Q-78T70**

<table>
<thead>
<tr>
<th>Product</th>
<th>TINY-EYE</th>
<th>EZ-EYE™</th>
<th>MITY-EYE</th>
<th>OPTI-EYE</th>
<th>EZ-PRO™</th>
<th>MARK III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Range (mm)</td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
</tbody>
</table>

**PF-Z-78TRL**

<table>
<thead>
<tr>
<th>Product</th>
<th>TINY-EYE</th>
<th>EZ-EYE™</th>
<th>MITY-EYE</th>
<th>OPTI-EYE</th>
<th>EZ-PRO™</th>
<th>MARK III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Range (mm)</td>
<td>0</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
</tr>
</tbody>
</table>

Drawing available at ttco.com
Plastic Single Light Guides

All Plastic Fibers are priced per package.
Plastic Single Light Guides have two per package.

Slip-on Barrel
Lens 1/4" x 1"

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
<th>LF-G-36</th>
<th>.040&quot;</th>
<th>36&quot; Cable Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LF-G-72</td>
<td>.040&quot;</td>
<td>72&quot; Cable Length</td>
</tr>
</tbody>
</table>

Slip-on Threaded Barrel
Lens 3/8" x 1"

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
<th>LF-H-36</th>
<th>.040&quot;</th>
<th>36&quot; Cable Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LF-H-72</td>
<td>.040&quot;</td>
<td>72&quot; Cable Length</td>
</tr>
</tbody>
</table>

Plastic Fibers
Right Angle

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
<th>F-S-72R</th>
<th>.040&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F-S-120R</td>
<td></td>
</tr>
</tbody>
</table>

Low cost, right angle plastic fiber optic light guides offer the most reliable sensing mode for opaque objects. Wide beam simplifies alignment. 72" or 120" long cut-to-length fibers.

800-237-0946 • ttco.com
Plastic Diplex Light Guides

Threaded Tip
MODEL: PFD-Z-78M6
BUNDLE SIZE: .040"

Threaded Tip
MODEL: PFD-Z-78M6
BUNDLE SIZE: .040"

Coaxial Threaded Tip
MODEL: PFD-CZ-78T
Emitter: .040"
Receiver: .010"

Threaded Tip
MODEL: PFD-Q-78M4
BUNDLE SIZE: .020"

Threaded Tip
MODEL: PFD-Q-78M3
BUNDLE SIZE: .020"

Drawing available at ttco.com
### Plastic Diplex Light Guides

#### Straight Needle Tip, Threaded

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFD-Z-78T70</td>
<td>.040&quot;</td>
</tr>
</tbody>
</table>

#### Needle Tip with Threaded Mounting Diplex

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFD-Q-78T35</td>
<td>.020&quot;</td>
</tr>
</tbody>
</table>

#### Straight Needle Tip

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF-W-24PP</td>
<td>.040&quot;</td>
</tr>
</tbody>
</table>

#### Straight Needle Tip

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF-Y-72PPC</td>
<td>.040&quot;</td>
</tr>
</tbody>
</table>

#### Gap Probe Tip

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BUNDLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF-G-41</td>
<td>.40&quot;</td>
</tr>
</tbody>
</table>
Plastic Diplex Light Guides

INDIVIDUAL CUT-TO-LENGTH COMPONENTS

Plastic Fiber Cutter, model # PFC-1

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH-4001-25</td>
<td>25' of .040 Single Plastic Fiberoptic Cable</td>
</tr>
<tr>
<td>EH-4001-50</td>
<td>50' of .040 Single Plastic Fiberoptic Cable</td>
</tr>
<tr>
<td>EH-4001-100</td>
<td>100' of .040 Single Plastic Fiberoptic Cable</td>
</tr>
<tr>
<td>EH-4002-25</td>
<td>25' of 2-.040&quot; Diplex Plastic Fiberoptic Cable</td>
</tr>
<tr>
<td>EH-4002-50</td>
<td>50' of 2-.040&quot; Diplex Plastic Fiberoptic Cable</td>
</tr>
<tr>
<td>EH4002-100</td>
<td>100' of 2-.040&quot; Diplex Plastic Fiberoptic Cable</td>
</tr>
<tr>
<td>PFC-1</td>
<td>Plastic Fiber Cutter</td>
</tr>
<tr>
<td>NFA-50</td>
<td>.5&quot; Nylon Fiberoptic Adaptor, 50 pieces</td>
</tr>
<tr>
<td>NFA12-50</td>
<td>.25&quot; Nylon Fiberoptic Adaptor, 50 pieces</td>
</tr>
</tbody>
</table>

Drawing available at ttco.com
Examples of Custom Light Guides

Custom Fiberoptic tips and lengths BTO (built to order). Please consult factory.

Straight Barrel Tip
PVC Monocoil Jacket
Low Profile

MODEL
BF-A-36X31

BUNDLE SIZE
.125"

---

Side View Right
Angle Short Tip
PVC Monocoil Jacket

MODEL
BF-A-36X408

BUNDLE SIZE
.093"

---

Straight Threaded Tip
Stainless Steel Jacket
Light Pipe

MODEL
F-A-168X448

BUNDLE SIZE
.125"

---

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Examples of Custom Light Guides
Custom Fiberoptic tips and lengths BTO (built to order). Please consult factory.

Straight Threaded Tip
Light Pipe
Stainless Steel Jacket

MODEL
F-A-36X70

BUNDLE SIZE
.125"

Side View Right Angle
Dual Head Tip
Stainless Steel Jacket

MODEL
BF-A-36X107

BUNDLE SIZE
.093"

Dual Head Tip

45° Short Curved Tip
Stainless Steel Jacket

MODEL
BF-B-36X397

BUNDLE SIZE
.062"

Short Curved Tip

Drawing available at ttco.com
Examples of Custom Light Guides

Custom Fiberoptic tips and lengths BTO (built to order). Please consult factory.

Right Angle “C” Fiber
Stainless Steel Jacket

MODEL
BF-C-36X374

BUNDLE SIZE
0.38” X 0.032”

Jig Fit Fiber
Stainless Steel Jacket

MODEL
BF-E-36X92

BUNDLE SIZE
0.046”

Jig Fit Fiber
Stainless Steel Jacket

MODEL
F-A-36X505

BUNDLE SIZE
0.093”