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FBP-C-SMA - June 27, 2018

Item # FBP-C-SMA was discontinued on June 27, 2018. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

FIBER-TO-FIBER U-BENCHES

- **Fixed or Adjustable Coupling for a Variety of Applications**
- **Thermally and Mechanically Stable**
- **Compatible with a Wide Range of FiberBench Accessories**

FBP-A-SMA
Adjustable U-Bench
with SMA905 Connectors

FBC-1550PM-APC
Fixed U-Bench with PM Fiber
and FC/APC Connectors

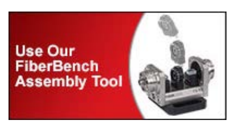
Application Idea
U-Benches Allow the Construction of Complex Optical Assemblies, Such as our PC-FFB-1550 Polarization Controller

Hide Overview

OVERVIEW

Features

- Fixed U-Benches Available with SM or PM Fiber
- Adjustable U-Benches Compatible with FC/PC, FC/APC, or SMA905 Connectors
- Thermally and Mechanically Stable
- Compatible with Thorlabs' Complete Line of FiberBench Components
- Beam Height is 14.3 mm Measured from the Deck
- 303 Non-Magnetic Stainless Steel
- Please Contact Tech Support for Special Wavelengths or Custom-Aligned Kits



Click to Enlarge
Each U-Bench Includes a Removable Plastic Dust Cover

Thorlabs' fixed and adjustable fiber-to-fiber U-Benches consist of a FiberBench base combined with either two built-in patch cables or two FiberPorts, respectively. The fixed U-Benches feature factory aligned input and output FC/PC or FC/APC patch cables with a narrowband antireflection coating to minimize insertion and return losses. In contrast, the adjustable U-Benches feature a FiberPort on either end that incorporates an AR-coated aspheric lens for one of three wavelength ranges: 350 - 700 nm (-A coating), 600 - 1050 nm (-B coating), and 1050 - 1620 nm (-C coating). Please see the *Specs* tab for more details.

The U-Benches allow for easy access to the optical beam and are ideal for fiber-to-fiber applications that incorporate multiple components and require the utmost in stability. While inserting thick optical components into the beam path, lateral offset can occur leading to additional insertion loss. The XY Tweaker Module can be used to compensate for up to 500 µm of beam displacement.

FiberBench Accessories			
FiberPorts	Optic Mounts	Alignment Tools	Polarizers

Beamsplitter Modules	Mirror Modules	Rotating Wave Plates	FiberBenches

Hide Specs

SPECS

Fixed U-Benches with Single Mode Fiber

Item #	Connectors	Design Wavelength	Bandwidth	Fiber	Beam Diameter ($1/e^2$, Typical)	Insertion Loss[a]	Return Loss[a]
FBC-780-FC	FC/PC	780 nm	±15 nm	780HP	0.40 mm	0.85 ± 0.3 dB	>50 dB
FBC-780-APC	FC/APC						
FBC-1064-FC	FC/PC	1064 nm		HI1060	0.32 mm		
FBC-1064-APC	FC/APC						
FBC-1310-FC	FC/PC	1310 nm		SMF-28 Ultra	0.43 mm	0.6 ± 0.3 dB	
FBC-1310-APC	FC/APC						
FBC-1550-FC	FC/PC	1550 nm			0.38 mm		
FBC-1550-APC	FC/APC						

- These specifications apply to the U-Bench before additional components are installed.

Fixed U-Benches with Polarization-Maintaining Fiber

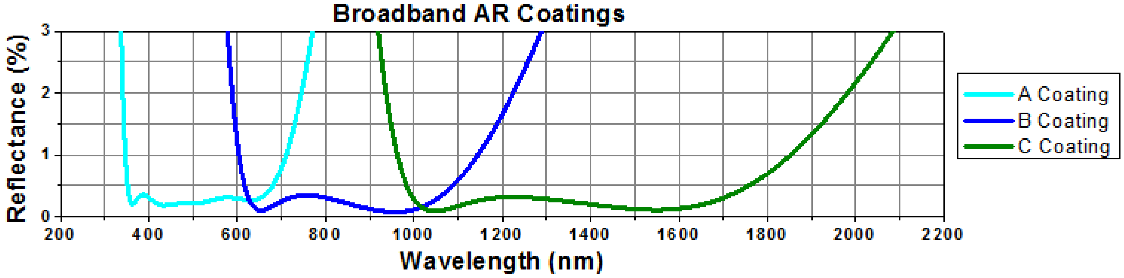
Item #	Connectors	Design Wavelength	Bandwidth	Fiber	Beam Diameter ($1/e^2$, Typical)	Extinction Ratio	Insertion Loss[a]	Return Loss[a]
FBC-1550PM-FC	FC/PC	1550 nm	±20 nm	PM1550-XP	0.4 mm	≥18 dB	0.6 ± 0.3 dB	≥50 dB
FBC-1550PM-APC	FC/APC							

- These specifications apply to the U-Bench before additional components are installed.

Adjustable U-Benches

Item #[a]	Compatible Connectors	EFL[b]	Input MFD[c,d]	Output $1/e^2$ Waist Diameter[c]	Max Waist Distance[c,e]	Divergence[c]	Insertion Loss[c,f]	Return Loss[c,f]	Lens Characteristics			
									CA[g]	NA	AR Range[h]	Material
FBP-A-FC	FC/PC or FC/APC	2.0 mm	3.5 µm	0.33 mm	96 mm	1.75 mrad	1.5 dB	>50 dB	2.0 mm	0.50	350 - 700 nm	ECO-550
FBP-A-SMA	SMA905											
FBP-B-FC	FC/PC or FC/APC	2.0 mm	4.3 µm	0.43 mm	89 mm	2.20 mrad	0.85 dB	>50 dB	2.0 mm	0.50	600 - 1050 nm	ECO-550
FBP-B-SMA	SMA905											
FBP-C-FC	FC/PC or FC/APC	2.0 mm	10.4 µm	0.38 mm	38 mm	5.20 mrad	0.6 dB	>50 dB	2.0 mm	0.50	1050 - 1620 nm	ECO-550
FBP-C-SMA	SMA905											

- FiberPorts with an effective focal length of 7.5 mm or less can be used with both FC/PC and FC/APC connectors, as the 5-axis adjustment combined with the short focal length leads to a negligible off-axis output.
- Effective Focal Length
- These values are calculated using the following equipment: -A: 460HP at 450 nm, -B: 780HP at 850 nm, -C: SMF-28e+ at 1550 nm.
- Input Mode Field Diameter
- Maximum Waist Distance is defined as the maximum distance from the lens a Gaussian beam's waist can be placed.
- These specifications apply to the U-Bench before additional components are installed.
- Clear Aperture
- Wavelength range of the antireflection coating.



Hide Damage Threshold

DAMAGE THRESHOLD

Laser-Induced Damage in Silica Optical Fibers

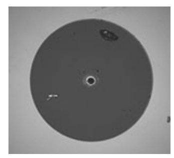
Quick Links
Damage at the Air / Glass Interface
Intrinsic Damage Threshold
Preparation and Handling of Optical Fibers

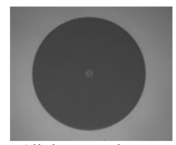
The following tutorial details damage mechanisms relevant to unterminated (bare) fiber, terminated optical fiber, and other fiber components from laser light sources. These mechanisms include damage that occurs at the air / glass interface (when free-space coupling or when using connectors) and in the optical fiber itself. A fiber component, such as a bare fiber, patch cable, or fused coupler, may have multiple potential avenues for damage (e.g., connectors, fiber end faces, and the device itself). The maximum power that a fiber can handle will always be limited by the lowest limit of any of these damage mechanisms.

While the damage threshold can be estimated using scaling relations and general rules, absolute damage thresholds in optical fibers are very application dependent and user specific. Users can use this guide to estimate a safe power level that minimizes the risk of damage. Following all appropriate preparation and handling guidelines, users should be able to operate a fiber component up to the specified maximum power level; if no maximum is specified for a component, users should abide by the "practical safe level" described below for safe operation of the component. Factors that can reduce power handling and cause damage to a fiber component include, but are not limited to, misalignment during fiber coupling, contamination of the fiber end face, or imperfections in the fiber itself. For further discussion about an optical fiber's power handling abilities for a specific application, please contact Thorlabs' Tech Support.

Damage at the Air / Glass Interface

There are several potential damage mechanisms that can occur at the air / glass interface. Light is incident on this interface when free-space coupling or when two fibers are mated using optical connectors. High-intensity light can damage the end face leading to reduced power handling and permanent damage to the fiber. For fibers terminated with optical connectors where the connectors are fixed to the fiber ends using epoxy, the heat generated by high-intensity light can burn the epoxy and leave residues on the fiber facet directly in the beam path.


Click to Enlarge
Damaged Fiber End


Click to Enlarge
Undamaged Fiber End

Damage Mechanisms on the Bare Fiber End Face

Damage mechanisms on a fiber end face can be modeled similarly to bulk optics, and industry-standard damage thresholds for UV Fused Silica substrates can be applied to silica-based fiber. However, unlike bulk optics, the relevant surface areas and beam diameters involved at the air / glass interface of an optical fiber are very small, particularly for coupling into single mode (SM) fiber. therefore, for a given power density, the power incident on the fiber needs to be lower for a smaller beam diameter.

The table to the right lists two thresholds for optical power densities: a theoretical damage threshold and a "practical safe level". In general, the theoretical damage threshold represents the estimated maximum power density that can be incident on the fiber end face without risking damage with very good fiber end face and coupling conditions. The "practical safe level" power density represents minimal risk of fiber damage. Operating a fiber or component beyond the practical safe level is possible, but users must follow the appropriate handling instructions and verify performance at low powers prior to use.

Estimated Optical Power Densities on Air / Glass Interface[a]

Type	Theoretical Damage Threshold[b]	Practical Safe Level[c]
CW (Average Power)	~1 MW/cm^2	~250 kW/cm^2
10 ns Pulsed (Peak Power)	~5 GW/cm^2	~1 GW/cm^2

- All values are specified for unterminated (bare) silica fiber and apply for free space coupling into a clean fiber end face.
- This is an estimated maximum power density that can be incident on a fiber end face without risking damage. Verification of the performance and reliability of fiber components in the system before operating at high power must be done by the user, as it is highly system dependent.
- This is the estimated safe optical power density that can be incident on a fiber end face without damaging the fiber under most operating conditions.

Calculating the Effective Area for Single Mode and Multimode Fibers

The effective area for single mode (SM) fiber is defined by the mode field diameter (MFD), which is the cross-sectional area through which light propagates in the fiber; this area includes the fiber core and also a portion of the cladding. To achieve good efficiency when coupling into a single mode fiber, the diameter of the input beam must match the MFD of the fiber.

As an example, SM400 single mode fiber has a mode field diameter (MFD) of ~Ø3 µm operating at 400 nm, while the MFD for SMF-28 Ultra single mode fiber operating at 1550 nm is Ø10.5 µm. The effective area for these fibers can be calculated as follows:

SM400 Fiber: Area = Pi x $(MFD/2)^2$ = Pi x $(1.5\ \mu m)^2$ = 7.07 μm^2 = 7.07 x 10^{-8} cm^2

SMF-28 Ultra Fiber: Area = Pi x $(MFD/2)^2$ = Pi x $(5.25\ \mu m)^2$ = 86.6 μm^2 = 8.66 x 10^{-7} cm^2

To estimate the power level that a fiber facet can handle, the power density is multiplied by the effective area. Please note that this calculation assumes a uniform intensity profile, but most laser beams exhibit a Gaussian-like shape within single mode fiber, resulting in a higher power density at the center of the beam compared to the edges. Therefore, these calculations will slightly overestimate the power corresponding to the damage threshold or the practical safe level. Using the estimated power densities assuming a CW light source, we can determine the corresponding power levels as:

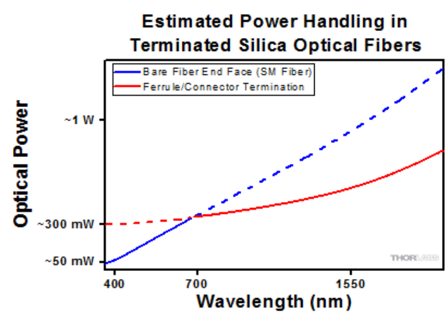
SM400 Fiber: 7.07 x 10^{-8} cm^2 x 1 MW/cm^2 = 7.1 x 10^{-8} MW = 71 mW (Theoretical Damage Threshold)
7.07 x 10^{-8} cm^2 x 250 kW/cm^2 = 1.8 x 10^{-5} kW = 18 mW (Practical Safe Level)

SMF-28 Ultra Fiber: 8.66 x 10^{-7} cm^2 x 1 MW/cm^2 = 8.7 x 10^{-7} MW = 870 mW (Theoretical Damage Threshold)
8.66 x 10^{-7} cm^2 x 250 kW/cm^2 = 2.1 x 10^{-4} kW = 210 mW (Practical Safe Level)

The effective area of a multimode (MM) fiber is defined by the core diameter, which is typically far larger than the MFD of an SM fiber. For optimal coupling, Thorlabs recommends focusing a beam to a spot roughly 70 - 80% of the core diameter. The larger effective area of MM fibers lowers the power density on the fiber end face, allowing higher optical powers (typically on the order of kilowatts) to be coupled into multimode fiber without damage.

Damage Mechanisms Related to Ferrule / Connector Termination

Fibers terminated with optical connectors have additional power handling considerations. Fiber is typically terminated using epoxy to bond the fiber to a ceramic or steel ferrule. When light is coupled into the fiber through a connector, light that does not enter the core and propagate down the fiber is scattered into the outer layers of the fiber, into the ferrule, and the epoxy used to hold the fiber in the ferrule. If the light is intense enough, it can burn the epoxy, causing it to vaporize and deposit a residue on the face of the connector. This results in localized absorption sites on the fiber end face that reduce coupling efficiency and increase scattering, causing further damage.



Click to Enlarge

Plot showing approximate power handling levels for single mode silica optical fiber with a termination. Each line shows the estimated power level due to a specific damage mechanism. The maximum power handling is limited by the lowest power level from all relevant damage mechanisms (indicated by a solid line).

For several reasons, epoxy-related damage is dependent on the wavelength. In general, light scatters more strongly at short wavelengths than at longer wavelengths. Misalignment when coupling is also more likely due to the small MFD of short-wavelength SM fiber that also produces more scattered light.

To minimize the risk of burning the epoxy, fiber connectors can be constructed to have an epoxy-free air gap between the optical fiber and ferrule near the fiber end face. Our high-power multimode fiber patch cables use connectors with this design feature.

Determining Power Handling with Multiple Damage Mechanisms

When fiber cables or components have multiple avenues for damage (e.g., fiber patch cables), the maximum power handling is always limited by the lowest damage threshold that is relevant to the fiber component.

As an illustrative example, the graph to the right shows an estimate of the power handling limitations of a single mode fiber patch cable due to damage to the fiber end face and damage via an optical connector. The total power handling of a terminated fiber at a given wavelength is limited by the lower of the two limitations at any given wavelength (indicated by the solid lines). A single mode fiber operating at around 488 nm is primarily limited by damage to the fiber end face (blue solid line), but fibers operating at 1550 nm are limited by damage to the optical connector (red solid line).

In the case of a multimode fiber, the effective mode area is defined by the core diameter, which is larger than the effective mode area for SM fiber. This results in a lower power density on the fiber end face and allows higher optical powers (on the order of kilowatts) to be coupled into the fiber without damage (not shown in graph). However, the damage limit of the ferrule / connector termination remains unchanged and as a result, the maximum power handling for a multimode fiber is limited by the ferrule and connector termination.

Please note that these are rough estimates of power levels where damage is very unlikely with proper handling and alignment procedures. It is worth noting that optical fibers are frequently used at power levels above those described here. However, these applications typically require expert users and testing at lower powers first to minimize risk of damage. Even still, optical fiber components should be considered a consumable lab supply if used at high power levels.

Intrinsic Damage Threshold

In addition to damage mechanisms at the air / glass interface, optical fibers also display power handling limitations due to damage mechanisms within the optical fiber itself. These limitations will affect all fiber components as they are intrinsic to the fiber itself. Two categories of damage within the fiber are damage from bend losses and damage from photodarkening.

Bend Losses

Bend losses occur when a fiber is bent to a point where light traveling in the core is incident on the core/cladding interface at an angle higher than the critical angle, making total internal reflection impossible. Under these circumstances, light escapes the fiber, often in a localized area. The light escaping the fiber typically has a high power density, which burns the fiber coating as well as any surrounding furcation tubing.

A special category of optical fiber, called double-clad fiber, can reduce the risk of bend-loss damage by allowing the fiber's cladding (2nd layer) to also function as a waveguide in addition to the core. By making the critical angle of the cladding/coating interface higher than the critical angle of the core/clad interface, light that escapes the core is loosely confined within the cladding. It will then leak out over a distance of centimeters or meters instead of at one localized spot within the fiber, minimizing the risk of damage. Thorlabs manufactures and sells 0.22 NA double-clad multimode fiber, which boasts very high, megawatt range power handling.

Photodarkening

A second damage mechanism, called photodarkening or solarization, can occur in fibers used with ultraviolet or short-wavelength visible light, particularly those with germanium-doped cores. Fibers used at these wavelengths will experience increased attenuation over time. The mechanism that causes photodarkening is largely unknown, but several fiber designs have been developed to mitigate it. For example, fibers with a very low hydroxyl ion (OH) content have been found to resist photodarkening and using other dopants, such as fluorine, can also reduce photodarkening.

Even with the above strategies in place, all fibers eventually experience photodarkening when used with UV or short-wavelength light, and thus, fibers used at these wavelengths should be considered consumables.

Preparation and Handling of Optical Fibers

General Cleaning and Operation Guidelines

These general cleaning and operation guidelines are recommended for all fiber optic products. Users should still follow specific guidelines for an individual product as outlined in the support documentation or manual. Damage threshold calculations only apply when all appropriate cleaning and handling procedures are followed.

1. All light sources should be turned off prior to installing or integrating optical fibers (terminated or bare). This ensures that focused beams of light are not incident on fragile parts of the connector or fiber, which can possibly cause damage.

2. The power-handling capability of an optical fiber is directly linked to the quality of the fiber/connector end face. Always inspect the fiber end prior to connecting the fiber to an optical system. The fiber end face should be clean and clear of dirt and other contaminants that can cause scattering of coupled light. Bare fiber should be cleaved prior to use and users should inspect the fiber end to ensure a good quality cleave is achieved.

3. If an optical fiber is to be spliced into the optical system, users should first verify that the splice is of good quality at a low optical power prior to high-power use. Poor splice quality may increase light scattering at the splice interface, which can be a source of fiber damage.

4. Users should use low power when aligning the system and optimizing coupling; this minimizes exposure of other parts of the fiber (other than the core) to light. Damage from scattered light can occur if a high power beam is focused on the cladding, coating, or connector.

Tips for Using Fiber at Higher Optical Power

Optical fibers and fiber components should generally be operated within safe power level limits, but under ideal conditions (very good optical alignment and very clean optical end faces), the power handling of a fiber component may be increased. Users must verify the performance and stability of a fiber component within their system prior to increasing input or output power and follow all necessary safety and operation instructions. The tips below are useful suggestions when considering increasing optical power in an optical fiber or component.

1. Splicing a fiber component into a system using a fiber splicer can increase power handling as it minimizes possibility of air/fiber interface damage.

Users should follow all appropriate guidelines to prepare and make a high-quality fiber splice. Poor splices can lead to scattering or regions of highly localized heat at the splice interface that can damage the fiber.

2. After connecting the fiber or component, the system should be tested and aligned using a light source at low power. The system power can be ramped up slowly to the desired output power while periodically verifying all components are properly aligned and that coupling efficiency is not changing with respect to optical launch power.
3. Bend losses that result from sharply bending a fiber can cause light to leak from the fiber in the stressed area. When operating at high power, the localized heating that can occur when a large amount of light escapes a small localized area (the stressed region) can damage the fiber. Avoid disturbing or accidently bending fibers during operation to minimize bend losses.
4. Users should always choose the appropriate optical fiber for a given application. For example, large-mode-area fibers are a good alternative to standard single mode fibers in high-power applications as they provide good beam quality with a larger MFD, decreasing the power density on the air/fiber interface.
5. Step-index silica single mode fibers are normally not used for ultraviolet light or high-peak-power pulsed applications due to the high spatial power densities associated with these applications.

Hide Fixed U-Benches with Single Mode Fiber

Fixed U-Benches with Single Mode Fiber

- Aligned at 780 nm, 1064 nm, 1310 nm, or 1550 nm
- Bandwidth: ±15 nm
- FC/PC or FC/APC Connectors (2.0 mm Narrow Key)

Thorlabs' Fixed Fiber-to-Fiber U-Benches allow easy access to the optical beam in a fiber-based application. They facilitate optical chopping and the insertion of plano-plano optical elements such as filters, polarizers, and attenuators, and they are fully compatible with the wide offering of FiberBench components.

Each U-bench includes two 1 meter long FC/PC- or FC/APC-terminated patch cables pre-aligned at each wall plate. For custom versions, please contact Tech Support.

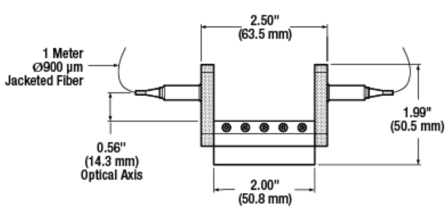


Diagram of Fixed U-Bench (Side View)

Item #[a]	Connectors	Fiber	Fiber Type	Alignment Wavelength	Insertion Loss
FBC-780-FC	FC/PC	780HP	SM[b]	780 nm	0.85 ± 0.3 dB
FBC-780-APC	FC/APC				
FBC-1064-FC	FC/PC	HI1060		1064 nm	
FBC-1064-APC	FC/APC				
FBC-1310-FC	FC/PC	SMF-28 Ultra		1310 nm	0.6 ± 0.3 dB
FBC-1310-APC	FC/APC				
FBC-1550-FC	FC/PC			1550 nm	
FBC-1550-APC	FC/APC				

- For full specifications, please refer to the *Specs* tab.
- Single Mode Fiber

Part Number	Description	Price	Availability

FBC-780-FC	**Fixed Fiber-to-Fiber Coupler, 780 nm, 780HP Fiber, FC/PC**	**$709.92**	**Today**
FBC-780-APC	**Fixed Fiber-to-Fiber Coupler, 780 nm, 780HP Fiber, FC/APC**	**$732.36**	**Today**
FBC-1064-FC	**Fixed Fiber-to-Fiber Coupler, 1064 nm, HI1060 Fiber, FC/PC**	**$684.42**	**Today**
FBC-1064-APC	**Fixed Fiber-to-Fiber Coupler, 1064 nm, HI1060 Fiber, FC/APC**	**$704.82**	**Today**
FBC-1310-FC	**Fixed Fiber-to-Fiber Coupler, 1310 nm, SMF-28 Ultra Fiber, FC/PC**	**$684.42**	**Today**
FBC-1310-APC	**Fixed Fiber-to-Fiber Coupler, 1310 nm, SMF-28 Ultra Fiber, FC/APC**	**$704.82**	**Today**
FBC-1550-FC	**Fixed Fiber-to-Fiber Coupler, 1550 nm, SMF-28 Ultra Fiber, FC/PC**	**$684.42**	**3-5 Days**
FBC-1550-APC	**Fixed Fiber-to-Fiber Coupler, 1550 nm, SMF-28 Ultra Fiber, FC/APC**	**$704.82**	**Today**

Hide Fixed U-Benches with Polarization-Maintaining Fiber

Fixed U-Benches with Polarization-Maintaining Fiber

- Polarization-Maintaining Fiber U-Benches Aligned at 1550 nm
- Bandwidth: ±20 nm
- FC/PC or FC/APC Connectors (2.0 mm Narrow Key)


Click to Enlarge
A slow axis indicator is engraved on each wall plate.

Thorlabs' Fixed Fiber-to-Fiber U-Benches allow easy access to the optical beam in a fiber-based application. They facilitate optical chopping and the insertion of plano-plano optical elements such as filters, polarizers, and attenuators, and they are fully compatible with the wide offering of FiberBench components.

Each U-bench includes two 1 meter long FC/PC- or FC/APC-terminated patch cables pre-aligned at each wall plate. The patch cable connector keys are aligned to the slow axis. A slow axis indicator for the collimated free-space beam within the U-Bench is engraved in each wall plate, as shown in the photo to the right. For custom versions of our U-benches, please contact Tech Support.

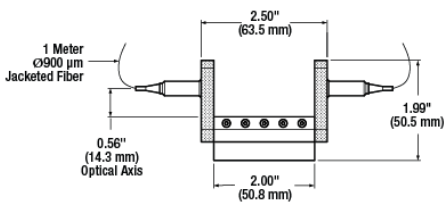


Diagram of Fixed U-Bench (Side View)

Item #[a]	Connectors	Fiber	Fiber Type	Alignment Wavelength	Insertion Loss
FBC-1550PM-FC	FC/PC	PM1550-XP	PM[b]	1550 nm	0.6 ± 0.3 dB
FBC-1550PM-APC	FC/APC				

- For full specifications, please refer to the *Specs* tab.
- Polarization-Maintaining Fiber

Part Number	Description	Price	Availability
FBC-1550PM-FC	**Customer Inspired! Fixed Fiber-to-Fiber Coupler, 1550 nm, PM1550-XP Fiber, FC/PC**	**$1,001.64**	**Today**
FBC-1550PM-APC	**Customer Inspired! Fixed Fiber-to-Fiber Coupler, 1550 nm, PM1550-XP Fiber, FC/APC**	**$1,022.04**	**Today**

Hide Adjustable U-Benches with FC/PC, FC/APC, or SMA905 Connectors

Adjustable U-Benches with FC/PC, FC/APC, or SMA905 Connectors

- AR Coated for 350 - 700 nm, 600 - 1050 nm, or 1050 - 1620 nm
- FC/PC-, FC/APC-, or SMA905-Compatible Versions Available
- Adjustable Collimation/Coupling for Applications Requiring Flexibility
- Five Degrees of Freedom Plus Rotational Adjustment on Each FiberPort

Item #[a]	Compatible Connectors	AR Coating Range[b]	Insertion Loss[c]
FBP-A-FC	FC/PC or FC/APC	350 - 700 nm (A Coating)	1.5 dB
FBP-A-SMA	SMA905		
FBP-B-FC	FC/PC or FC/APC	600 - 1050 nm (B Coating)	0.85 dB
FBP-B-SMA	SMA905		
FBP-C-FC	FC/PC or FC/APC	1050 - 1620 nm (C Coating)	0.6 dB
FBP-C-SMA	SMA905		

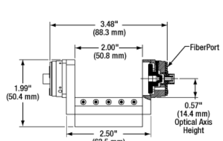


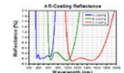
Diagram of Adjustable U-Bench

Thorlabs' Adjustable Fiber-to-Fiber U-Benches provide the same benefits as the Fixed U-Benches with the added flexibility of using any desired fiber patch cables with FC/PC, FC/APC, or

- For full specifications, please refer to the *Specs* tab.
- R_{avg}<0.5%; please refer to the graph to the lower right for sample reflectance values.
- These values are calculated using the following equipment: -A: 460HP at 450 nm, -

(Side View) SMA905 connectors. Each B: 780HP at 850 nm, -C: SMF-28e+ at 1550 nm.

Adjustable U-Bench includes two FiberPorts, the FC/PC- and FC/APC-compatible versions of which are compatible with 2.1 mm wide key and 2.0 mm narrow key patch cables. Based on the stable FiberBench platform, these devices are easily configured and aligned for any potential application.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For minimal insertion and return losses, use AR-coated SM, MM, or PM patch cables. For fiber with core size greater than Ø62.5 µm, there will be high insertion loss. At this point, the fiber no longer acts as a point source and the lens is imaging the core rather than creating a collimated beam. Please see the *Specs* tab for more details. For custom versions, please contact Tech Support.

Part Number	Description	Price	Availability
FBP-A-FC	**Adjustable Fiber-to-Fiber Coupler, 350 - 700 nm, FC/PC or FC/APC**	**$1,095.48**	**Today**
FBP-A-SMA	**Adjustable Fiber-to-Fiber Coupler, 350 - 700 nm, SMA905**	**$907.80**	**Lead Time**
FBP-B-FC	**Adjustable Fiber-to-Fiber Coupler, 600 - 1050 nm, FC/PC or FC/APC**	**$1,095.48**	**Lead Time**
FBP-B-SMA	**Adjustable Fiber-to-Fiber Coupler, 600 - 1050 nm, SMA905**	**$907.80**	**Today**
FBP-C-FC	**Adjustable Fiber-to-Fiber Coupler, 1050 - 1620 nm, FC/PC or FC/APC**	**$1,095.48**	**Lead Time**
FBP-C-SMA	**Adjustable Fiber-to-Fiber Coupler, 1050 - 1620 nm, SMA905**	**$907.80**	**Today**