

ADASC1 - April 29, 2024

Item # ADASC1 was discontinued on April 29, 2024. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

FIBER OPTIC MATING SLEEVES AND BULKHEAD ADAPTERS

- ▶ FC/PC, FC/APC, SMA, ST[®]/PC, LC[®]/PC, SC/PC, and Ferrule Mating Sleeves
- ▶ Precision Mating Sleeves for PM Fiber
- ▶ FC/PC, SMA, and ST/PC Bulkhead Adapters
- ▶ Protective Metal Caps

Application Idea

Panel-Mounted Mating Sleeves



ADALC1
LC[®]/PC Mating Sleeve

ADAFC3
FC/APC Mating Sleeve

ADAFC1
FC/PC to SMA Mating Sleeve

CAPT1
ST[®]/PC Cap

ADAF1
Ø2.5 mm Ferrule Mating Sleeve

HAFC
FC/PC Bulkhead Adapter

ADABD1
L-Bracket for D-Hole FC Mating Sleeve

ADASMAV
Vacuum-Compatible SMA Mating Sleeve

OVERVIEW

Features

- Mating Sleeves to Align Terminated Fiber Cables
- Mating Sleeves for Ø2.5 mm or Ø1.25 mm Ferrules
- Bulkhead Adapters for OEM or Custom Applications
- Vacuum-Compatible SMA-SMA Mating Sleeve Available
- Protective Metal Caps Available for Select Adapters
- Empty L-Brackets Available for FC Mating Sleeves

Mating Sleeves

Our mating sleeves connect any fiber cable terminated with industry-standard FC/PC, FC/APC, SMA, LC®/PC, SC/PC, and ST®*/PC connectors. All our mating sleeves properly align the cores of each terminated fiber end and minimize back reflections by bringing them into physical contact, with the exception of our SMA mating sleeves, which are air-spaced. Thorlabs also provides a selection of the mating sleeves sold on this page premounted in an L-bracket that provides mechanical compatibility with standard 1/4"-20 (M6) optomechanics.

Bulkhead Adapters

Thorlabs' FC/PC, SMA, and ST/PC Bulkhead Adapters contain one connector for applications that require the projection of light into free space (the ST/PC adapters are also available in packs of ten). Their compact size and mounting threads make them ideal for OEM or custom applications. Our FC/PC and SMA bulkhead adapters boast a one-piece construction that integrates easily with a custom application, while a compatible 3/8"-24 lock nut is sold separately for the ST/PC bulkhead adapter for OEM applications. The design of the adapters aligns the front face of the connector ferrule with the rear surface of the adapter. This allows the fiber to be placed in near-physical contact with any optics or instruments that are placed after the adapter.

Care and Proper Use

It is important that the fiber tips be clean to minimize connection losses and avoid damage to the connector. Except for our SMA mating sleeves, the fiber tips will be in physical contact within all of our mating sleeves. The use of our G608N3 Index Matching Gel (sold below) can also help to reduce losses at the fiber connection. Thorlabs offers a complete selection of inspection tools and cleaning supplies for optical fiber. For terminated fiber, our reusable fiber-to-fiber splicing products are useful for creating temporary connections. Fiber caps are also available for protecting the end face of the fiber.

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Mating Sleeves Selection Guide^a Connector 2

	FC/PC	FC/APC	SMA	LC®/PC	SC/PC	ST®/PC	Ø1.25 mm Ferrule	Ø2.5 mm Ferrule
Connector 1	FC/PC	ADAF1 ^b ADAF2 ^b ADAFCPM1 ^b ADAFCPM2 ^b ADAFCPM3 ADAF1 ^c ADAF4-5		ADAFCSMA1 ^b		ADAFCSMA1 ADAF1 ^c ADAF4-5	ADAFCSMA1 ADAF1 ^c	ADAF1 ^c ADAF4-5
	FC/APC		ADAFCSMA1 ^b					
	SMA		ADAFCSMA1 ^b					
	LC®/PC				ADALC1 ADAL1 ^c ADAL4-5			ADAL1 ^c ADAL4-5
	SC/PC	ADAFCSMA1 ADAF1 ^c ADAF4-5				ADASC1 ADAF1 ^c ADAF4-5	ADAF1 ^c	ADAF1 ^c ADAF4-5
	ST®/PC	ADAFCSMA1 ADAF1 ^c				ADAF1 ^c	ADAST ^b ADAF1 ^c	ADAF1 ^c
	Ø1.25 mm Ferrule				ADAL1 ^c ADAL4-5			ADAL1 ^c ADAL4-5 ADAL3 ^f
Ø2.5 mm Ferrule	ADAF1 ^c ADAF4-5				ADAF1 ^c ADAF4-5	ADAF1 ^c	ADAF1 ^c ADAF4-5 ADAF2 ^f	


- Bulkhead Adapters that have one connector for projecting light into free space are also available below.
- These mating sleeves are available in a mounted version.
- These mating sleeves are available in 5 packs.
- This mating sleeve is available in a mounted version and in a 10 pack.
- This mating sleeve is vacuum-compatible.
- These interconnects are designed to adapt optogenetic patch cables and fiber optic cannulae and are not intended for use with patch cables terminated with standard connectors.

FC/PC to FC/PC Wide-Key-Slot Mating Sleeves



- ▶ 2.2 mm Wide-Key-Slot Mating Sleeves
- ▶ Designed for All FC/PC-Terminated Fibers
- ▶ <0.5 dB Insertion Loss* (Measured at 635 nm with FC/PC-Terminated SM600 Fibers)

Thorlabs' ADAFC2 Wide-Key-Slot Mating Sleeve has a square flange with through holes for custom assemblies or our blank connection panels. The ADAFC1 Wide-Key-Slot Mating Sleeve is designed for the D-hole of a standard rack-mount panel, such as

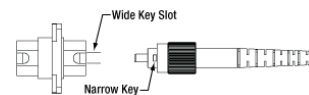
our fiber connection panels. To view a drawing with the recommended mounting hole pattern, click the Docs icon () below. These mating sleeves are compatible with either our square-flange or D-hole L-brackets sold below. The ADAFC2 is also available premounted in an L-bracket.

Flat FC/PC connectors are significantly less alignment sensitive than their angled FC/APC counterparts, making these wide-key-slot mating sleeves acceptable for narrow and wide key FC/PC connectors. Although these mating sleeves are mechanically compatible with narrow key FC/APC connectors, the wide-key slot makes it difficult to properly align the angled, narrow key FC/APC connector. For FC/APC applications, we therefore recommend the narrow-key-slot mating sleeves shown immediately below. All FC/PC and FC/APC patch cables manufactured by Thorlabs use narrow key connectors.

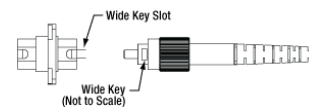
Each mating sleeve includes two protective caps that shield the connectors from dust and other contaminants. These caps should be removed before use. Please note that the size of these caps may vary from lot to lot. The CAPF1 metal cap is also available for use when these mating sleeves are mounted into our L-Brackets, sold below.

***Please Note:** When PM fiber is used, the insertion loss will increase to >1.0 dB. For mating PM fiber, we recommend using our PM fiber mating sleeves sold below.

Part Number	Description	Price	Availability
ADAFC2	FC/PC to FC/PC Mating Sleeve, Wide Key (2.2 mm), Square Flange	\$13.08	Today
ADAFC1	FC/PC to FC/PC Mating Sleeve, Wide Key (2.2 mm), D-Hole	\$11.65	Today



Click to Enlarge
Wide-Key-Slot Mating Sleeve and Narrow Key Connector:
Recommended for Narrow Key FC/PC Connectors
Not Recommended for Narrow Key FC/APC Connectors




Click to Enlarge
Wide-Key-Slot Mating Sleeve and Wide Key Connector:
Recommended for All Wide Key Connectors

FC/APC to FC/APC Narrow-Key-Slot Mating Sleeves



- ▶ 2.0 mm Narrow-Key-Slot Mating Sleeves
- ▶ Designed for FC/PC- or FC/APC-Terminated Fibers with 2.0 mm Narrow Keys
- ▶ <0.5 dB Insertion Loss* (Measured at 635 nm with FC-Terminated SM600 Fibers)

Thorlabs' ADAFC3 Narrow-Key-Slot Mating Sleeve has a square flange with through holes for custom assemblies or our blank connection panels. The ADAFC4 Narrow-Key-Slot Mating Sleeve is designed for the D-hole of a standard rack-mount panel,

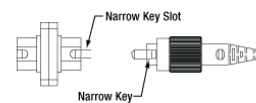
such as our fiber connection panels. To view a drawing with the recommended mounting hole pattern, click the Docs icon () below. These mating sleeves are compatible with either our square-flange or D-hole L-brackets sold below. The ADAFC3 is also available premounted in an L-bracket.

These narrow-key-slot mating sleeves allow for proper alignment of angled, narrow key FC/APC connectors. These sleeves are also mechanically compatible with narrow key FC/PC connectors, but the flat FC/PC connector is significantly less alignment sensitive, which makes the wide-key-slot mating sleeves shown immediately above an acceptable alternative. All FC/PC and FC/APC patch cables manufactured by Thorlabs use narrow key connectors.

Each mating sleeve includes two protective caps that shield the connectors from dust and other contaminants. These caps should be removed before use. Please note that the size of these caps may vary from lot to lot. The CAPF1 metal cap is also available for use when these mating sleeves are mounted into our L-Brackets, sold below.

***Please Note:** When PM fiber is used, the insertion loss will increase to >1.0 dB. For mating PM fiber, we recommend using our PM fiber mating sleeves sold below.

Part Number	Description	Price	Availability
ADAFC3	FC/APC to FC/APC Mating Sleeve, Narrow Key (2.0 mm), Square Flange	\$25.31	Today
ADAFC4	Customer Inspired! FC/APC to FC/APC Mating Sleeve, Narrow Key (2.0 mm), D-Hole	\$17.35	Today



Click to Enlarge
Narrow-Key-Slot Mating Sleeve and Narrow Key Connector:
Recommended for All Narrow Key Connectors

PM Fiber Mating Sleeves



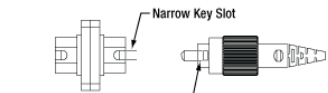
- ▶ Best Possible Matching of Polarization Axes in PM Fibers
- ▶ 2.0 mm Narrow Precision Key or 2.2 mm Wide Precision Key FC Connectors
- ▶ <1.0 dB Insertion Loss* (Measured at 635 nm with FC/PC- and FC/APC-Terminated PM630-HP Fibers)

Thorlabs' PM Fiber Mating Sleeves have housings made from a single piece of metal, as opposed to the typical two-piece design. This precision construction provides the best possible matching of polarization axes, making them ideal for FC/PC- or FC/APC-terminated PM fibers. To ensure the best performance, choose the mating sleeve that matches your key width. All FC/PC and FC/APC patch cables manufactured by Thorlabs use narrow key connectors.

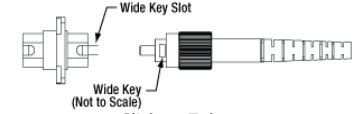
The ADAFCPM1 and ADAFCPM2 mating sleeves have square flanges with through holes for compatibility for custom assemblies, our blank connection panels, or our square-flange L-brackets (sold below). The ADAFCPM3 Narrow-Key-Slot Mating Sleeve is designed for the D-hole of a standard rack-mount panel, such as our fiber connection panels, and D-hole mounting L-brackets available below. To view a drawing with the recommended mounting hole pattern for each PM mating sleeve, click the Docs icon (📄) next to the Item # below. We also offer ADAFCPM1 and ADAFCPM2 mating sleeves premounted in an L-bracket.

Each mating sleeve includes two protective caps that shield the connectors from dust and other contaminants. These caps should be removed before use. The CAPF1 metal cap is also available for use when these mating sleeves are mounted into our L-Brackets, sold below.

*Please Note: If using a non-PM fiber this insertion loss will typically be less than 0.5 dB, due to higher tolerancing than our non-PM mating sleeves sold above.



Click to Enlarge
Narrow-Precision-Key-Slot Mating Sleeve and Narrow Key Connector:
Recommended for Narrow Key PM Fiber Connectors



Click to Enlarge
Wide-Precision-Key-Slot Mating Sleeve and Wide Key Connector:
Recommended for Wide Key PM Fiber Connectors
Not Recommended for Narrow Key PM Fiber Connectors

Part Number	Description	Price	Availability
ADAFCPM1	FC/PC to FC/PC or FC/APC to FC/APC Mating Sleeve, Wide Precision Key (2.2 mm), Square Flange	\$58.21	Today
ADAFCPM2	FC/PC to FC/PC or FC/APC to FC/APC Mating Sleeve, Narrow Precision Key (2.0 mm), Square Flange	\$58.21	Today
ADAFCPM3	Customer Inspired! FC/PC to FC/PC or FC/APC to FC/APC Mating Sleeve, Narrow Precision Key (2.0 mm), D-Hole	\$58.21	Lead Time

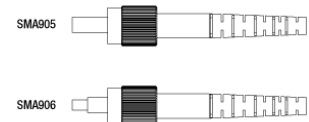
SMA to SMA Mating Sleeve



- ▶ Designed for SMA-Terminated Fibers
- ▶ <1.5 dB Insertion Loss (Typical Loss for a Pair of Ø200 µm Core Multimode Fibers)
- ▶ Sold Individually or in Packs of 10
- ▶ Vacuum-Compatible SMA to SMA Mating Sleeve Sold Below

Thorlabs' ADASMA Mating Sleeve is an air-spaced mating sleeve for connecting two SMA-terminated fiber optic cables. It is directly compatible with SMA905-style connectors, and one ceramic alignment sleeve is included for mating an SMA905-style connector to an SMA906-style connector. The ADASMA is not intended for mating an SMA906-style connector to another SMA906-style connector. A washer and nut are included for panel mounting, as well as two dust caps for protecting the exposed ends of the mating sleeve. Our CAPN1 Metal Cap, sold separately, also protects the mating sleeve ends and can clip on to our L-bracket mounts.

These mating sleeves can be purchased individually or in packs of ten (Item # ADASMA-10) at a significant savings over the individual price. Each 10-pack includes ten mating sleeves, ten washers, ten nuts, ten alignment sleeves, and twenty dust caps to protect the exposed ends of the mating sleeves. The ADASMA is also available premounted in an L-bracket.



Click to Enlarge
The SMA906-style connector's ferrule has a step, which requires a ceramic alignment sleeve when mating it with an SMA905-style connector.

Part Number	Description	Price	Availability
ADASMA	SMA to SMA Mating Sleeve	\$19.00	Today
ADASMA-10	SMA to SMA Mating Sleeve, 10 Pack	\$152.30	Today
CAPN1	Customer Inspired! Metal Cap for SMA Bulkheads and Mating Sleeves	\$6.00	Today

Vacuum-Compatible SMA to SMA Mating Sleeve



- ▶ Air-Spaced SMA to SMA Mating Sleeve for Ultra-High-Vacuum Applications
- ▶ Constructed from 304 Stainless Steel
- ▶ <1.5 dB Insertion Loss (Typical Loss for a Pair of Ø200 µm Core Multimode Fibers)
- ▶ Double-Bagged for Cleanroom Environments
- ▶ Compatible with Thorlabs' Vacuum-Compatible Multimode Fiber Optic Patch Cables



Click to Enlarge
The ADASMAV has a Ø0.063" (Ø1.6 mm) vent hole.

Vacuum Compatibility Specifications	
Vacuum Compatibility as Packaged ^a	10 ⁻¹⁰ Torr
Materials	304 Stainless Steel
Preparation and Packaging	Chemically Cleaned and Double Vacuum Bagged
Stainless Steel Outgassing Rate at 20 °C	1.8 x 10 ⁻⁸ Torr-Liters/s/cm ²

Thorlabs' ADASMAV Mating Sleeve is a vacuum-compatible version of the ADASMA SMA to SMA Mating Sleeve. Constructed using 304 stainless steel, this adapter is designed to be used within ultra-high vacuum systems (>10⁻¹⁰ Torr) and features a Ø0.063" (Ø1.6 mm) vent hole in the side to allow trapped gases to escape (see image to the right). Unlike the standard version, the ADASMAV is only compatible with SMA905-style connectors. A 304 stainless steel washer and nut are included for custom mounting.

- a. Prior to placing any components in a vacuum system, we recommend using an appropriate cleaning procedure, which will be dependent on the application, as well as a pre-baking in a bake-out oven to remove moisture and surface volatiles.

Vacuum Compatibility Information

Our vacuum-compatible adapter is chemically cleaned and prepared for vacuum applications before packaging. It is compatible directly out of the packaging with vacuum environments down

to 10⁻¹⁰ Torr. With additional cleaning and processing, it can be used at even lower pressures, only limited by the outgassing rate of the stainless steel (see the table above). The material properties of the stainless steel and the cleaning methods completed by the end user should be used to determine the appropriateness of these products and materials in a specific vacuum system. Please note that using caps or panels not rated for vacuum applications with the ADASMAV is not recommended.

We also offer other vacuum-compatible components which may be used in vacuum applications.

Additional Vacuum-Compatible Components

Many of our patch cables can be special ordered for vacuum use. Contact Tech Support for details.

Part Number	Description	Price	Availability
ADASMAV	Vacuum-Compatible SMA to SMA Mating Sleeve	\$31.77	Today

ST[®]/PC to ST/PC Mating Sleeve



- ▶ Designed for ST[®]/PC-Terminated Fibers
- ▶ 3/8"-24 UNF-2A Thread

Thorlabs' ADAST Mating Sleeve connects two ST/PC-terminated fiber optic cables. A washer and 3/8"-24 UNF-2A threaded nut are included for panel mounting. Our CAPT1 Metal Cap, sold separately, protects the exposed end of the mating sleeve.

The ADAST is also available premounted in an L-bracket.

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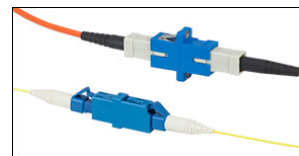
Part Number	Description	Price	Availability
ADAST	ST/PC to ST/PC Mating Sleeve	\$7.19	Today
CAPT1	Customer Inspired! Metal Cap for ST Bulkheads and Mating Sleeves	\$5.16	Today

LC/PC and SC/PC Mating Sleeves



- ▶ Options for SC/PC-Terminated or LC/PC-Terminated Fibers

Thorlabs' ADASC1 Mating Sleeve connects two SC/PC-terminated fiber optic cables, while our ADALC1 Mating Sleeve connects two LC/PC-terminated fiber optic cables. Both sleeves incorporate two tabs that snap into place when inserted into a panel.



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Part Number	Description	Price	Availability
ADASC1	SC/PC to SC/PC Mating Sleeve	\$21.39	Lead Time
ADALC1	LC/PC to LC/PC Mating Sleeve	\$21.39	Today

Ferrule Mating Sleeves



- ▶ Mate Any Fiber with $\varnothing 1.25$ mm or $\varnothing 2.5$ mm Ferrules
- ▶ Sold Individually or in Packs of 5

Thorlabs Ferrule Mating Sleeves are designed for use with any terminated fiber with a $\varnothing 2.5$ mm ferrule, such as FC/PC, ST[®]/PC, or SC/PC connectors, or with a $\varnothing 1.25$ mm ferrule, such as LC/PC or MU/PC connectors. These split sleeves can be used to create a temporary, quick-release connection between two cables, as shown in the photo to the right. They are compatible with both ceramic and stainless steel ferrule connectors. They are also compatible with our optogenetics fiber optic cannulae, optogenetics patch cables, and empty ceramic ferrules.



[Click to Enlarge](#)
ADAF1 Mating Sleeve Connecting Two Fiber Patch Cables

They are compatible with both ceramic and stainless steel ferrule connectors. They are also compatible with our optogenetics fiber optic cannulae, optogenetics patch cables, and empty ceramic ferrules.

Ceramic mating sleeves are available individually or in packages of five. Phosphor bronze mating sleeves are also available in packs of five. Ceramic can be easily cleaned in an autoclave, while phosphor bronze is slightly malleable and can be disconnected with less force as shown in the graphs below.

Item # Prefix	Compatible Ferrule Size	Insertion Loss	Length	Disconnect Force	Comparison Graphs	Material
ADAL1	1.25 mm Outer Diameter	<0.5 dB Typical (SM) ^a	6.8 mm	14.5 N (3.3 lbf) Typical ^c		Ceramic (Zirconia)
ADAL4		<1.0 dB Typical (MM) ^b		7.1 N (1.6 lbf) Typical ^c		Phosphor Bronze
ADAF1	2.5 mm Outer Diameter	<0.2 dB Typical (SM) ^d	11.4 mm	15.8 N (3.5 lbf) Typical ^f		Ceramic (Zirconia)
ADAF4		<1.0 dB Typical (MM) ^e		14.4 N (3.2 lbf) Typical ^f		Phosphor Bronze

- Tested using SM600 fiber at 635 nm with LC/PC connectors.
- Tested using $\varnothing 200$ μ m core, 0.39 NA multimode fiber with LC/PC connectors and an LED source at 617 nm.
- Tested using an LC/PC-type ferrule.
- Tested using SMF28 fiber at 1550 nm with FC/PC connectors.
- Tested using $\varnothing 200$ μ m core, 0.39 NA multimode fiber with FC/PC connectors and an LED source at 617 nm.
- Tested using an FC/PC-type ferrule.

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Part Number	Description	Price	Availability
ADAL1	Ceramic Split Mating Sleeve for $\varnothing 1.25$ mm (LC/PC) Ferrules	\$5.44	Today
ADAL1-5	Ceramic Split Mating Sleeves for $\varnothing 1.25$ mm (LC/PC) Ferrules, 5 Pack	\$21.82	Today
ADAL4-5	Customer Inspired! Phosphor Bronze Split Mating Sleeves for $\varnothing 1.25$ mm (LC/PC) Ferrules, 5 Pack	\$14.28	Today
ADAF1	Ceramic Split Mating Sleeve for $\varnothing 2.5$ mm (FC/PC, ST/PC, or SC/PC) Ferrules	\$6.06	Today
ADAF1-5	Ceramic Split Mating Sleeves for $\varnothing 2.5$ mm (FC/PC, ST/PC, or SC/PC) Ferrules, 5 Pack	\$24.23	Today
ADAF4-5	Customer Inspired! Phosphor Bronze Split Mating Sleeves for $\varnothing 2.5$ mm (FC/PC, ST/PC, or SC/PC) Ferrules, 5 Pack	\$12.08	Today

FC/PC to SMA Mating Sleeve



- ▶ Mate an FC/PC-Terminated Fiber to an SMA-Terminated Fiber
 - a. 2.2 mm Wide-Key-Slot FC/PC Connector
 - b. SMA905-Style SMA Connector

Thorlabs' ADAFCSMA1 Mating Sleeve mates an FC/PC-terminated single mode (SM) or multimode (MM) fiber to an SMA-terminated MM fiber by bringing the tips into physical contact. Our CAPF1 and CAPN1 Metal Caps are designed to protect the FC and SMA ends of the mating sleeve, respectively. Please note that this mating sleeve is only compatible with SMA905-style connectors.

The typical insertion loss for mating an FC/PC-terminated SM fiber to an SMA-terminated MM fiber is less than 0.2 dB^a, while the typical insertion loss for mating an FC/PC-terminated MM fiber to an SMA-terminated MM fiber is less than 1.4 dB^b.

The ADAFCSMA1 is also available premounted in an L-bracket.

- a. Measured at 633 nm by mating an FC/PC-terminated SM fiber with a 0.12 NA to an SMA-terminated MM fiber with a Ø50 µm core.
- b. Measured at 633 nm by mating an FC/PC-terminated MM fiber to an SMA-terminated MM fiber; both fibers had Ø50 µm cores.

Part Number	Description	Price	Availability
ADAFCSMA1	FC/PC to SMA Fiber Optic Mating Sleeve	\$52.28	Today
CAPF1	Customer Inspired! Metal Cap for FC/PC and FC/APC Bulkheads and Mating Sleeves	\$8.79	Today
CAPN1	Customer Inspired! Metal Cap for SMA Bulkheads and Mating Sleeves	\$6.00	Today

FC/PC to ST[®]/PC Mating Sleeve



- ▶ Mate an FC/PC-Terminated Fiber to an ST[®]/PC-Terminated Fiber
- ▶ <0.28 dB Insertion Loss (Typical Loss for a Pair of SM Fibers)

Thorlabs' ADAFCST1 Mating Sleeve mates an FC/PC-terminated single mode (SM) or multimode (MM) fiber to an ST/PC-terminated SM or MM fiber by bringing the tips into physical contact. It features a 2.2 mm wide-key-slot FC/PC connector and can be mounted in custom assemblies, our blank connection panels, or our square-flange L-brackets (sold below) for compatibility with 1/4"-20 (M6) mechanical assemblies. To view a drawing with the recommended mounting hole pattern, click the Docs icon

(📄) below.

Our CAPF1 and CAPT1 Metal Caps, sold separately, are designed to protect the FC/PC and ST/PC ends of the mating sleeve, respectively.

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Part Number	Description	Price	Availability
ADAFCST1	FC/PC to ST/PC Fiber Optic Mating Sleeve	\$14.62	Today
CAPF1	Customer Inspired! Metal Cap for FC/PC and FC/APC Bulkheads and Mating Sleeves	\$8.79	Today
CAPT1	Customer Inspired! Metal Cap for ST Bulkheads and Mating Sleeves	\$5.16	Today

FC/PC to SC/PC Mating Sleeve



- ▶ Mate an FC/PC-Terminated Fiber to an SC/PC-Terminated Fiber
- ▶ <0.11 dB Insertion Loss (Typical Loss for a Pair of SM Fibers)

Thorlabs' ADAFCSC1 Mating Sleeve mates an FC/PC-terminated single mode (SM) or multimode (MM) fiber to an SC/PC-terminated SM or MM fiber by bringing the tips into physical contact. It features a 2.2 mm wide-key-slot FC/PC connector and has a square flange with through holes compatible with our blank connection panels or square-flange L-brackets (sold below). To view a drawing with the recommended mounting hole pattern, click the Docs icon (📄) below.

Our CAPF1 Metal Cap, sold separately, protects the exposed FC/PC end of the mating sleeve.

Part Number	Description	Price	Availability
ADAFCSC1	FC/PC to SC/PC Fiber Optic Mating Sleeve	\$14.62	Today
CAPF1	Customer Inspired! Metal Cap for FC/PC and FC/APC Bulkheads and Mating Sleeves	\$8.79	Today

Bulkhead Adapters



- ▶ Ideal for OEM or Custom Applications
- ▶ 2.0 mm Narrow-Key-Slot FC/PC Bulkhead Adapter
- ▶ 2.2 mm Wide-Key-Slot FC/PC Bulkhead Adapter
- ▶ SMA905- or SMA906-Style Bulkhead Adapter
- ▶ ST/PC Bulkhead Adapter and Compatible 3/8"-24 Lock Nut
- ▶ Useful for Fiber-to-Free-Space Interfaces



Click to Enlarge
LN3824 Lock Nut
Secured to the HAST
ST/PC Adapter

Thorlabs Bulkhead Adapters each accept a fiber connector on one side and have threads that can be used to mount the adapter into an OEM or custom system. They are useful for applications that require light to be launched from a fiber into a free-space setup. The design aligns the front face of the connector ferrule with the rear surface of the adapter, as shown in the photo to the right, and allows the fiber to be placed in near-physical contact with any optics or instruments that are placed after the adapter.

For compatibility with FC/PC-terminated patch cables, we offer two bulkhead adapters: the HAF2C with a 2.0 mm narrow-key slot and the HAF2C with a 2.2 mm wide-key slot. Both adapters have 3.2 mm long, 3/8"-24 external mounting threads on the side opposite the FC/PC connector. To create 3/8"-24 taps in custom assemblies, Thorlabs offers the TAP3824 tap.

Our HASMA adapter is 0.38" (9.65 mm) long, with a 1/4"-36 threaded barrel for use with SMA905- and SMA906-style terminated fiber optic patch cables. The threaded barrel can also be used with the lock nut for mounting within OEM or custom systems.



Click to Enlarge
HASMA Adapter Attached to an SMA-Terminated Fiber
Patch Cable

The HAST adapter is a 0.58" (14.8 mm) long adapter for use with ST/PC terminated fiber optic patch cables. It has 0.18" (4.6 mm) of external 3/8"-24 external threads. The LN3824 Lock Nut, which has internal 3/8"-24 threads, may be purchased separately for mounting within OEM or custom systems. Both the HAST adapter and LN3824 are also available in packs of ten.

The uncommon mounting threads in these adapters will require the use of custom mounting solutions. The HAF2C, HAF2C, and HASMA adapters may directly screw into an adapter plate. In order to mount the HAST adapter, the LN3824 lock nut must first be threaded onto the adapter (see the photo above). Once the lock nut is secure, the assembly may be threaded onto an adapter plate with a thread depth of at least 0.10" (2.54 mm). Please note that the HAST adapter and LN3824 lock nut are machined so that the maximum amount of torque needed to secure them into the adapter plate should not exceed 121.6 oz-lbs (0.86 N•m).

We recommend engaging at least two threads for stability when using a custom mount, with thread locker (Loctite) as an option for permanent solutions. If tapping a hole is not an option, the adapters can also be epoxied in place.

If a custom or OEM solution is not desired, the adapters are also available mounted within unthreaded and SM-threaded disks (sold above) for compatibility with our lens tube systems. Fiber and bulkhead caps are also available for preventing damage to the terminated fiber when it is not in use. For OEM inquiries, please contact techsales@thorlabs.com.

Part Number	Description	Price	Availability
HAF2C	FC/PC Bulkhead Adapter, Narrow Key (2.0 mm)	\$20.68	Today
HAF2C	FC/PC Bulkhead Adapter, Wide Key (2.2 mm)	\$20.68	Today
HASMA	SMA Bulkhead Adapter with Lock Nut	\$9.38	Today
HAST	ST/PC Bulkhead Adapter	\$8.42	Today
HAST-P10	ST/PC Bulkhead Adapter, 10 Pack	\$81.60	Today
LN3824	3/8"-24 Lock Nut	\$3.57	Today
LN3824-P10	3/8"-24 Lock Nut, 10 Pack	\$34.68	Today

Empty L-Brackets for FC Mating Sleeves



- ▶ Compatible with Either Square Flange or D-Hole FC Mating Sleeves (See Table to the Right)
- ▶ Single, Dual, and Quadruple Brackets Available
- ▶ Single and Dual Brackets Include One or Two CAPF1 Metal Caps

Thorlabs' Empty L-Brackets are provided for customers who purchase our unmounted FC mating sleeves separately. They allow the construction of L-bracket mating sleeves not offered from stock; for example, a narrow key connector and a wide key connector can be placed into one L-bracket.

These L-brackets contain one or two 1/4" (M6) through holes for easy mounting to a post, optical table, or breadboard. All L-brackets feature 4-40 tap(s) to secure a CAPF1 Metal Cap, available for purchase separately. Single versions include one CAPF1 Metal Cap, while dual versions include two.

The ADABS1, ADABS2, and ADABS3 include screws with 2-56 threading for attaching the square flange mating sleeves. Replacement screws (Item # SH2S019) are available in packs of 50.

Item #	ADABS1	ADABS2	ADABS3	ADABD1	ADABD2	ADABD3
Sleeve Type	Square Flange			D-Hole		
L-Bracket Type	Single	Dual	Quadruple	Single	Dual	Quadruple
Compatible Sleeves	AD AFC2 AD AFC3 AD AFCPM1 AD AFCPM2 AD AFCST1 AD AFCSC1			AD AFC1 AD AFC4 AD AFCPM3		

Part Number	Description	Price	Availability
ADABS1	Customer Inspired! Single L-Bracket for Square Flange FC Mating Sleeves	\$27.92	Today
ADABS2	Customer Inspired! Dual L-Bracket for Square Flange FC Mating Sleeves	\$37.72	Today
ADABS3	Customer Inspired! Quadruple L-Bracket for Square Flange FC Mating Sleeves	\$58.24	Today
ADABD1	Customer Inspired! Single L-Bracket for D-Hole FC Mating Sleeves	\$27.92	Today
ADABD2	Customer Inspired! Dual L-Bracket for D-Hole FC Mating Sleeves	\$37.72	Today
ADABD3	Customer Inspired! Quadruple L-Bracket for D-Hole FC Mating Sleeves	\$58.24	Today

Index Matching Gel



Thorlabs' G608N3 Index Matching Gel is a crystal-clear optical coupling compound intended to reduce signal attenuation in wave guide assemblies at connections. The presence of air at the junction of two optical fibers causes significant signal refraction due to the large differential optical impedance that exists between air and the signal-carrying wave guides.

The optical coupling compound G608N3 has been formulated with the requisite optical properties of clarity, purity, and refractive index to minimize signal losses while allowing pliable mechanical connections between rigid parts. Unlike a rigid optical epoxy, this pliable gel is viscoelastic and can take up the differential thermal expansion of precision optical parts without inducing excessive stresses or delamination. Residue may be cleaned from fiber tips using methanol or isopropyl alcohol.

In many devices, these materials serve an additional function: they help seal out ambient dust or fluids from sensitive optical components. This gel is formulated to be ultraclean, non-yellowing, and unaffected by x-ray, ultraviolet or sunlight exposure. It has extremely low outgassing and volatility characteristics and is free from light-absorbing microscopic particulates. This optical product is a chemically stable, non-toxic, synthetic material with wide temperature serviceability and is suitable for designs with high reliability and long service life.

The table below gives data on the decrease in signal loss when using the gel. Each syringe comes with 3 cc of index matching gel. This index matching gel can also be used to refill our fiber-to-fiber splice kits.

Insertion Loss Improvement			
Connector Types	Loss Without Index Matching Gel G608N3	Loss With Index Matching Gel G608N3	Difference
SMA-to-SMA ^a	2.88 dB	1.25 dB	1.63 dB
FC/PC-to-FC/PC ^b	1.12 dB	0.59 dB	0.53 dB

- a. A 617 nm LED source was used to mate two multimode 0.22 NA, Ø50 µm core, Ø125 µm clad patch cords with and without index matching gel.
 b. A 780 nm fiber coupled laser source was used to mate two FC/PC-terminated 780HP fibers with and without index matching gel.

Specifications		
Refractive Index	402 nm	1.4995
	589.3 nm	1.4646
	980 nm	1.4462
	1550 nm	1.4378
Refractive Index Temperature Coefficient (25 °C to 60 °C)		-3.5×10^{-4} per °C
Refractive Index vs. Wavelength (Cauchy Fit) ^a		$1.4338 + 10520 \lambda^{-2}$
Optical Absorption (450 - 750 nm)		<0.003% per µm
Apparent Viscosity (25 °C)		10,600 poises
Oil Separation (24 hrs at 100 °C)		0.2%
Evaporation (24 hrs at 100 °C)		1.0%
Specific Gravity (25 °C)		1.06
Thermal Coefficient of Expansion		0.0006 cc/cc/°C
Microscopic Particulate Contamination	10 - 34 µm	<300 Particles/cc
	≥35 µm	0 Particles/cc
Absorption Spectrum		

a. Wavelength λ in nm

Part Number	Description	Price	Availability
G608N3	Index Matching Gel, 3 cc Syringe	\$48.41	Today