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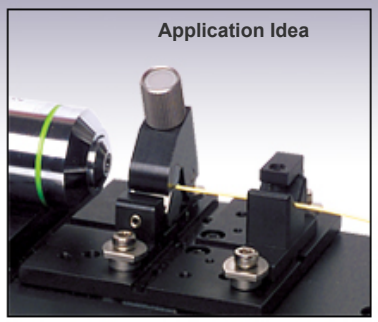
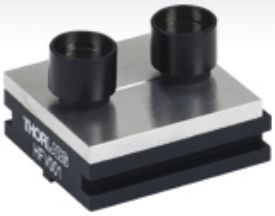
HFB005 - OCT 31, 2019

Item # HFB005 was discontinued on OCT 31, 2019. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

FIBER HOLDERS AND FORCE SENSORS FOR MULTI-AXIS FLEXURE STAGES

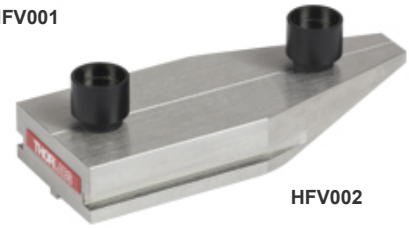
- ► Adjustable, Magnetic, & Simplified Fiber Clamps
- ► Fiber Array, Connectorized, & V-Groove Holders
- ► FC/PC-Connectorized Axial Force Sensor & Cable Strain Relief




HFV001

HFS001


HFF001


HFV002

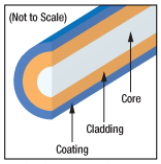
HFA001

HFB004

OVERVIEW

This page contains our selection of accessories for multi-axis flexure fiber stages. These include fiber clamps, fiber holders, and axial force sensors. We also manufacture magnetic clamps that hold fibers in our V-groove fiber holders. We also offer bare fiber chucks and a rotator for Fiber Launch platforms, as well as other Fiber Optomechanics.

Other Bare Fiber Mounts			
Post Mountable or SM Threaded	**Flexure Stage Compatible**		
V-Mounts	Clamps	Chucks	Rotator



Click to Enlarge
Basic Structure of a
Typical Optical Fiber

The V-groove fiber holders on this page are typically used to clamp fibers with the coating intact. The diagram to the right shows the structure of a typical fiber, which consists of a core, a cladding, and a coating (note that the diagram is not to scale). The coating serves to protect the cladding of glass fibers from particulates that may land on the surface of the fiber, causing it to become brittle. Although this layer may also have optical properties that allow it to double as a second cladding, it is still referred to as the coating layer due to the protective properties. The term “buffer” is often used instead of “coating” when the layer surrounding the cladding is composed of Tefzel, as this material bonds differently to the glass cladding than other common coating materials such as acrylate or TECS. Some fibers may also have an additional jacket, or buffer applied on top of the coating layer. To determine whether one of the clamps available below is compatible with the fiber used in your application, you must know the diameter of the outer layer (coating, additional jacket, or buffer layer). This value needs to be within the range of specified fiber diameters for the clamp.

Multi-Axis Stage Accessories											
											
Fiber Mounts	Fiber Rotators	Waveguide Mounts	Diode Mounts	Fixed Mounts	Kinematic Mounts	Top Plates	Extension Platforms	Fiber Chucks	Slide Holders	Kinematic Platforms	Adapter Plates

Flexure Stage Accessories: Connectorized Fiber Holder

- Holders for Connectorized Fibers:
  - HFB001: SMA-Connectorized Fibers
  - HFB004: FC/PC-Connectorized Fibers, Wide Key Slot (2.2 mm)
  - HFB005: FC/APC-Connectorized Fibers, Wide Key Slot (2.2 mm)
- 12.5 mm Optical Axis Height

These connectorized fiber holders are compatible with the mounting platforms of our multi-axis flexure stages. Each holder is designed to securely hold the center of the connector 12.5 mm (0.49") above the flexure stage platform. The design virtually eliminates fiber tip motion when the fiber cable is moved and significantly improves the repeatability of the positioning of the fiber tip.

Part Number	Description	Price	Availability
HFB001	**SMA-Connectorized Fiber Holder for Multi-Axis Stages**	**$65.78**	**Today**
HFB004	**FC/PC-Connectorized Fiber Holder for Multi-Axis Stages**	**$51.40**	**Today**
HFB005	**Customer Inspired! FC/APC-Connectorized Fiber Holder for Multi-Axis Stages**	**$62.76**	**Lead Time**

Flexure Stage Accessories: Quick-Release, Adjustable Fiber Clamp

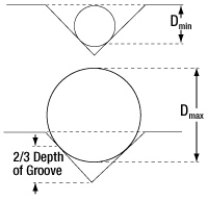
- Multi-Purpose V-Groove Insert Features 5 Different V-Grooves and 1 Flat Surface
- Accommodates Fibers or Cylindrical Optical Elements with Diameters from 125 µm to 2.66 mm
- Fiber Clamping Arm with Adjustable Knob Provides 0.25 - 2.0 N (0.06 - 0.45 lb) of Holding Force

This quick-release, adjustable-force fiber clamp has many features that make it our most versatile fiber clamp. The top knob is used to adjust the force that the clamping arm exerts on the fiber. This feature is useful when working with specialty fibers, such as highly birefringent fibers, photonic crystal fibers, or exotic glass fibers containing fluoride or tellurite.

The fiber holder features a grooved central ferrule with six mounting surfaces, which together accept fibers or other cylindrical objects that have an outer diameter between 125 µm to 2.66 mm. Simply rotate the ferrule to align the correct mounting groove with the clamping arm and secure with the included M4 setscrew. It has been designed to allow rapid mounting and dismounting of a variety of photonic components, including bare optical fibers, optical fibers mounted in ceramic ferrules, and multi-channel waveguides.

Accepted Diameters[a]		
Hexagon Flat	**D_{min}**	**D_{max}**
1	0.125 mm	0.240 mm
2	0.147 mm	0.333 mm
3	0.3 mm	0.666 mm
4	0.6 mm	1.333 mm
5	1.2 mm	2.66 mm

- These values are typical and do not take manufacturing tolerances into account.



To determine whether this clamp is suitable for your application, you must know the diameter of the cylindrical object that you wish to secure in the clamp, such as the outer layer (coating or additional jacket or buffer layer) of your fiber or the size of your ferrule. The table to the right specifies the minimum and maximum diameters a cylindrical object can have in order to be securely held by each groove in the HFF001.

For a simpler clamp for coated fiber, please consider the HFF003 Quick-Release Fiber Clamp listed below.

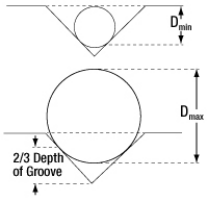
Part Number	Description	Price	Availability
HFF001	**Quick-Release Cylindrical Device Mount for Multi-Axis Stages**	**$360.71**	**Today**

Flexure Stage Accessories: V-Groove Fiber Holder

- Precision V-Groove Designed to Hold Ø150 µm to Ø341 µm Fibers
- Stainless Steel Construction Provides Robust, Wear-Resistant Surface
- HFM001 Magnetic Clamps Feature a Soft Elastomer Pad to Protect Fiber Cladding from Damage

Accepted Diameters[a]	
D_{min}	D_{max}
150 µm	341 µm

- These values are typical and do not take manufacturing tolerances into account.



For ease of mounting and experimental flexibility, the HFV001 Standard V-Groove Fiber Holder is an ideal solution for securing bare (coating intact), single mode fibers. The fiber is held in the precision V-groove by two magnetic clamps. The clamps have a special elastomer pad that locally distorts around the fiber to provide a secure but delicate grip. The base of the holder is made of anodized aluminum, and the top plate is made of magnetic stainless steel.

For a longer holder optimized for fiber coupling to smaller devices, please consider the HFV002 Tapered V-Groove Fiber Holder sold below. The HFM001 Magnetic Clamps are also available separately below.

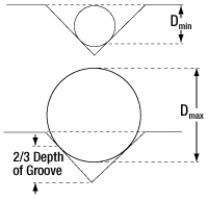
Part Number	Description	Price	Availability
HFV001	**Standard V-Groove Fiber Holder for Multi-Axis Stages**	**$147.17**	**Today**

Flexure Stage Accessories: Tapered V-Groove Fiber Holder

- Precision V-Groove Designed for Ø150 µm to Ø341 µm Fibers
- Stainless Steel Construction Provides Robust, Wear-Resistant Surface
- Tapered End Maximizes Access to Fiber in Industrial Coupling Applications

Accepted Diameters[a]	
D_{min}	D_{max}
150 µm	341 µm

- These values are typical and do not take manufacturing tolerances into account.



The HFV002 Tapered V-Groove Fiber Holder, which is longer than our HFV001 Fiber Holder sold above, is designed to allow access to smaller devices. When butt-coupling fibers to small waveguide devices (particularly when the device is mounted on a waveguide manipulator), it is often difficult to support and position the end of the fibers close enough to the input ports of the waveguide with standard V-groove holders. The tapered top plate of this mount improves the user's ability to visually observe the fiber-waveguide interface.

The fiber is secured with the two provided HFM001 Magnetic Clamps. These clamps are also available separately below.

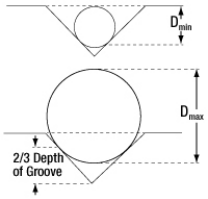
Part Number	Description	Price	Availability
HFV002	**Tapered V-Groove Fiber Holder for Multi-Axis Stages**	**$151.49**	**Today**

Flexure Stage Accessories: Simplified Fiber Clamp

- Precision V-Groove Designed to Hold Ø150 µm to Ø341 µm Fibers
- Magnet Holds Clamping Arm in Place
- Simplified Mechanical Design

Accepted Diameters[a]	
D_{min}	D_{max}
150 µm	341 µm

- These values are typical and do not take manufacturing tolerances into account.



This fiber clamp is intended for applications that do not require the extra features offered by the HFF001 Fast-Release Fiber Clamp listed above. The clamping arm is designed to swing approximately 120° from the clamping surface to allow easy loading of the fiber into the V-groove. A rare earth magnet is used to hold the clamping arm in place once it is lowered onto the fiber. A M4 (1.5 mm hex) magnetic setscrew is also embedded in the arm to provide a simple means of adjusting the clamping force.

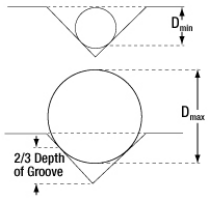
Part Number	Description	Price	Availability
HFF003	**Quick-Release Ø150 µm to Ø341 µm Fiber V-Groove for Multi-Axis Stages**	**$125.53**	**Today**

Flexure Stage Accessories: Cable Strain Relief

- Secures 900 µm or 3 mm Diameter Cables
- Mounts Directly on the Deck of Our Popular Multi-Axis Stages
- Prevents Accidental Misalignment

Accepted Diameters[a]	
D_{min}	D_{max}
0.663 mm	5.93 mm

- These values are typical and do not take manufacturing tolerances into account.



This strain relief accessory ensures that disturbances to the fiber cable are not translated into unwanted movement of the fiber end face, saving time while setting up and running experiments. It is especially useful for large-diameter fibers. A M2.5 (2 mm hex) setscrew allows for vertical adjustment of the clamping arm, and a M2 (1.6 mm hex) clamp setscrew secures the cable in the clamp's V-groove.

To determine whether this clamp is suitable for your application, the diameter of the outer layer (coating or additional jacket or buffer layer) of the fiber must be known. The table above specifies the minimum and maximum diameters that can be held securely. For an brief summary of fiber terminology, please see the *Overview* tab above.

Part Number	Description	Price	Availability
HFS001	**Strain Relief Clamp for Fiber Optic Cables for Multi-Axis Stages**	**$51.40**	**Today**

Flexure Stage Accessories: Magnetic Clamps

- Soft Elastomer on Bottom Surface Protects Exposed Fiber Cladding
- Sold in Packages of Six

These magnet assemblies are used to securely hold fibers to our V-groove style fiber holders. Please note that two of these fiber clamps are included with each V-groove style fiber holder. We offer these magnetic clamps as replacement parts. They are also useful for customers building customized fiber optic assemblies.

Part Number	Description	Price	Availability
HFM001	**Pack of 6 Magnetic Clamps for Multi-Axis Stages**	**$27.06**	**Today**

Flexure Stage Accessories: Fiber Array Holder

- Accepts Rectangular Fiber Arrays up to 12 mm Wide
- Actuator Knob Controls Clamping Mechanism and Allows Easy Loading
- Angled Contact Pads Ensure that the Optical Element Sits Flat on the Support Surface
- Also Useful for Mounting Rectangular Optics

The HFA001 Fiber Array Holder uses a single actuator knob to simultaneously move both sides of the clamping mechanism. This two-sided mechanism ensures the device being mounted is centered on the support surface. Three angled clamping surfaces provide a slight downward pressure and stable, three-point contact. The third clamping point is located at the end of a spring-loaded flexure rod that allows the holder to adapt to differently sized optical elements.

Part Number	Description	Price	Availability
HFA001	**Standard Adjustable fiber array holder for Multi-Axis Stages**	**$443.67**	**Today**

Multi-Axis Flexure Stage Accessories: Axial Force/Touch Sensor Platform

- Load Capacity: 30 N (6.7 lb)
- Sensitivity: 0.03 N (0.0067 lb)
- 62.5 mm Deck Height with AMA034 Support Post
- 112.5 mm Deck Height with AMA035 Support Post

Click To Enlarge
The FSC103 secured onto the AMA034 has the same deck height as our 3-axis platforms.

The FSC103 Axial Force Sensor is a force-sensing cell that can be used to position an optical fiber with respect to another device in the direction of the optical axis. When the fiber makes contact with the device, a force arises that is detected by a strain gauge. This generates an electrical signal that is available for the actuator controller to indicate that the desired position has been reached. The FSC103 comes with two mounting cleats that are used to secure components to the platform.

These cells mount in the groove of our AMA034 and AMA035 Post Assemblies. The AMA034 delivers a deck height of 62.5 mm (optical height of 75 mm), which is the same as our 3-axis NanoMax, RollerBlock, and MicroBlock platforms. It includes two mounting cleats to hold the FSC103. The AMA035 delivers a 112.5 mm deck height (optical height of 125 mm), which matches our NanoMax 600 6-axis stages.

The FSC103 sensor is compatible with the other flexure stage accessories sold on this page. The KSG101 K-Cube™ Strain Gauge Reader is ideal for monitoring the output of the stage's sensor. A PAA622 cable is included with the force sensor for connection to the strain gauge reader.

Part Number	Description	Price	Availability
FSC103/M	**Axial Force Sensor with Grooved Platform for Multi-Axis Stages, Metric**	**$767.23**	**5-8 Days**
AMA034	**Post for FSC103 Axial Force Sensor, 75 mm Optical Height**	**$141.45**	**Today**
AMA035	**Post for FSC103 Axial Force Sensor, 125 mm Optical Height**	**$193.70**	**Today**
FSC103	**Axial Force Sensor with Grooved Platform for Multi-Axis Stages**	**$767.23**	**Today**

Flexure Stage Accessories: V-Groove Axial Force Sensor Fiber Holder

- Load Capacity: 30 N (6.7 lb)
- Sensitivity: 0.03 N (0.0067 lb)
- Two Magnetic HFM001 Fiber Clamps Included

Compatible Controllers
KSG101 K-Cube™ Strain Gauge Reader
BPC301 1-Channel Benchtop Piezo Controller
BPC301 3-Channel Benchtop Piezo Controller

This force-sensing cell uses the same principle as the FSC103 Axial Force Sensor sold above, but is used to position a bare optical fiber with respect to another device. When the fiber makes contact with the device, a force arises that is detected by a strain gauge. This generates an electrical signal that is available for the actuator controller to indicate that the desired position has been reached.

The fiber is secured with the two provided HFM001 Magnetic Clamps. These clamps are also available separately above.

Part Number	Description	Price	Availability
FSC102	**V-Grooved Fiber Holder Axial Force Sensor for Multi-Axis Stages**	**$780.20**	**Today**

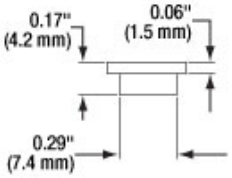
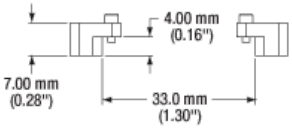
Accessory Lockdown Clamps

Click for Details
Accessories mounted in close proximity using the AMA110 Mounting Block.

- Secures Components to NanoMax, MicroBlock, or RollerBlock Stages
- Cleats for Mounting Single Components
- Mounting Blocks and Clamps for Close Proximity Mounting of Multiple Components

To lock an accessory in place, rotate the AMA010 cleat so that the flat is facing the stage's groove. Place the accessory into the groove between the cleats, rotate the cleat so that the rounded edge covers the edge of the mount, and lock down the cap screw.

The AMA010(/M) Cleats have a flat milled along one side. To lock an accessory along the center alignment groove, rotate the cleat so that the flat is facing the groove. Place the accessory into the groove between the cleats, rotate the cleat so that the rounded edge covers the edge of the mount, and lock down the 6-32 (M3) locking screw and washer. The cleats can be rotated without needing to remove the locking screws. See the animation to the right for details. The included screws are 5/16" (8 mm) long and are used with a 3/32" (2.5 mm) hex key.

Lockdown Clamps					
Item #	**AMA010**	**AMA010/M**	**AMA110**	**AMA110/M**	**AMA111**
Included Hardware	6-32 Cap Screw (x15) M3.5 Washer (x15)	M3 Cap Screw (x15) M3 Washer (x15)	6-32 Nylon Tip Setscrew (x12) 6-32 Cap Screw (x4)	M3 Nylon Tip Setscrew (x12) M3 Cap Screw (x4)	6-32 Cap Screw (x2) M3 Cap Screw (x2) M3.5 Washer (x2) M3 Washer (x2) 7/64" Hex Key 2.5 mm Hex Key
Mechanical Diagram (Click for Details)					

Click to Enlarge
Close proximity mounting using the AMA010 Cleat and AMA111 Clamp.

For mounting multiple components in close proximity, we offer the AMA110 mounting blocks. These mounting blocks feature a line of nylon-tipped setscrews to secure components, and allow for easy repositioning and very close mounting. The blocks are secured via two holes and are supplied with either 6-32 or M3 cap screws.

The AMA111 Narrow Device Mounting Clamps offer an alternative solution when devices need to be mounted close together. They are secured using an M3.5 or M3 washer and a 6-32 or M3 cap screw, compatible with a 7/64" or 2.5 mm hex key, respectively.

Part Number	Description	Price	Availability
AMA010/M	**Cleats with M3 Locking Screws, Qty. 15**	**$40.58**	**Today**
AMA110/M	**Optic Mounting Block, Qty. 2, Metric**	**$45.72**	**Today**
AMA111	**Narrow Device Mounting Clamps, Qty. 2**	**$28.68**	**Today**
AMA010	**Cleats with 6-32 Locking Screws, Qty. 15**	**$40.58**	**Today**
AMA110	**Optic Mounting Block, Qty. 2**	**$45.72**	**Today**

Visit the *Fiber Holders and Force Sensors for Multi-Axis Flexure Stages* page for pricing and availability information:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=1173