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THORLABS

V2L6S - Feb 18, 2020

Item # V2L6S was discontinued on Feb 18, 2020. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

- ▶ CF Flange Fiber Feedthrough for Ultra-High Vacuum
- ▶ SMA Terminated on Both Sides
- ▶ Available for Wavelength Ranges from the UV to Near-IR



OVERVIEW

Features

- Construction Enables use at Vacuum Levels Down to 1×10^{-10} Torr
- Mates to $\text{\O}2.75$ " (DN40) CF Flanges
- Feedthroughs Available with $\text{\O}100 \mu\text{m}$, $\text{\O}200 \mu\text{m}$, $\text{\O}400 \mu\text{m}$, or $\text{\O}600 \mu\text{m}$ Core Multimode Fiber
- Low-OH and High-OH Offerings for Different Spectral Ranges
- Compatible with Thorlabs' Vacuum-Compatible Multimode Fiber Optic Patch Cables
- Bake-Out can be Conducted at Temperatures up to $250 \text{ }^\circ\text{C}$
- Flange Mounting Hardware Pack and Copper Gaskets Sold Below

Thorlabs' Ultra-High-Vacuum-Compatible $\text{\O}2.75$ " (DN40) Fiber Feedthrough CF Flanges allow for optical coupling into Ultra-High-Vacuum (UHV) systems down to 10^{-10} Torr from the outside environment using SMA905-terminated cables. When using fiber patch cables in a vacuum environment, ensure that the cables are vacuum compatible. Four wavelength ranges from the UV to the Near-IR are available. These fiber feedthroughs incorporate a multimode step index optical fiber, available with either a $\text{\O}100 \mu\text{m}$, $\text{\O}200 \mu\text{m}$, $\text{\O}400 \mu\text{m}$, or $\text{\O}600 \mu\text{m}$ core, that has a low insertion loss of $\leq 2.3 \text{ dB}$ and can handle optical powers up to 1 W.

Designed for use at UHV pressures, each of Thorlabs' fiber feedthrough CF flange utilizes a hermetically sealed fiber in a stainless steel shell. The CF-style flange utilizes a knife-edge mechanism to create an airtight seal between mating pieces. To create the seal, a copper gasket (sold below) is most often employed. As the bolts of the mating pair are tightened, the knife edge "bites" into the copper gasket, deforming it. The compressed copper fills all the machining marks and surface defects, which yields a leak-tight seal. Please note that the copper gasket is not included.

The fiber feedthrough features a male SMA905 connector on both ends; mating sleeves may be used to connect fiber patch cables to the feedthrough. Thorlabs offers the ADASMAV for mating vacuum-compatible patch cables inside a vacuum environment, such as mating to the UHV fiber feedthrough CF flanges. This 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 $\text{\O}0.063$ " ($\text{\O}1.6 \text{ mm}$) hole through the body to serve as a vent, allowing trapped gas to escape.


Copper gasket and mounting hardware sets for $\text{\O}2.75$ " CF flanges are also available below. Thorlabs also sells CF flange viewports for $\text{\O}1$ " windows, $\text{\O}1.5$ " flat windows, and $\text{\O}1.5$ " wedged windows as well as an extended line of vacuum-compatible parts.

Ø100 µm Ultra-High-Vacuum Feedthrough

- ▶ Ø2.75" (DN40), Male SMA905 Terminated Fiber Feedthrough CF Flanges
- ▶ Multimode Step Index Optical Fiber with Ø100 µm Core
- ▶ Double-Bagged for Cleanroom Environments

Thorlabs' Ø2.75" (DN40) Fiber Feedthrough CF Flanges are fixed (non-rotating) flanges with male SMA905 fiber connectors on both sides. The fibers are held in place by a glass-ceramic hermetic seal, creating an airtight feedthrough that is suitable for use with chambers operating at pressures down to 10^{-10} Torr. Mating sleeves may be used to connect fiber patch cables to the feedthrough; we recommend the ADASMAV (sold below) when mating a patch cable to the CF flange on the vacuum side. These flanges have six 1/4" (M6) through holes for bolting onto any standard DN40 CF flange.

Note: Mounting hardware and CF flange copper gasket seals are not included.

Item #	Wavelength Range	Fiber Core Diameter	Attenuation Range (Click to Enlarge)	NA	Vacuum Level	Insertion Loss	Max Optical Power	Max Temperature
VC2H1S	200 - 1200 nm	100 µm		0.22 ± 0.02	1 × 10 ⁻¹⁰ Torr	≤2.3 dB	1 W	250 °C
VC2L1S	400 - 2400 nm							


Part Number	Description	Price	Availability
VC2H1S	NEW! Customer Inspired! Fiber Feedthrough for Ø2.75" CF Flange, High-OH, Ø100 µm Core, 200 - 1200 nm, SMA	\$412.00	Today
VC2L1S	NEW! Customer Inspired! Fiber Feedthrough for Ø2.75" CF Flange, Low-OH, Ø100 µm Core, 400 - 2400 nm, SMA	\$412.00	Today

Ø200 µm Ultra-High-Vacuum Feedthrough

- ▶ Ø2.75" (DN40), Male SMA905 Terminated Fiber Feedthrough CF Flanges
- ▶ Multimode Step Index Optical Fiber with Ø200 µm Core
- ▶ Double-Bagged for Cleanroom Environments

Thorlabs' Ø2.75" (DN40) Fiber Feedthrough CF Flanges are fixed (non-rotating) flanges with male SMA905 fiber connectors on both sides. The fibers are held in place by a glass-ceramic hermetic seal, creating an airtight feedthrough that is suitable for use with chambers operating at pressures down to 10^{-10} Torr. Mating sleeves may be used to connect fiber patch cables to the feedthrough; we recommend the ADASMAV (sold below) when mating a patch cable to the CF flange on the vacuum side. These flanges have six 1/4" (M6) through holes for bolting onto any standard DN40 CF flange.

Note: Mounting hardware and CF flange copper gasket seals are not included.

Item #	Wavelength Range	Fiber Core Diameter	Attenuation Range (Click to Enlarge)	NA	Vacuum Level	Insertion Loss	Max Optical Power	Max Temperature
VC2H2S	200 - 1200 nm	200 µm		0.22 ± 0.02	1 × 10 ⁻¹⁰ Torr	≤2.3 dB	1 W	250 °C
VC2L2S	400 - 2400 nm							


Part Number	Description	Price	Availability
VC2H2S	Fiber Feedthrough for Ø2.75" CF Flange, High-OH, Ø200 µm Core, 200 - 1200 nm, SMA	\$412.00	Today
VC2L2S	Fiber Feedthrough for Ø2.75" CF Flange, Low-OH, Ø200 µm Core, 400 - 2400 nm, SMA	\$412.00	Today

Ø400 µm Ultra-High-Vacuum Fiber Feedthrough

- ▶ Ø2.75" (DN40), Male SMA905 Terminated Fiber Feedthrough CF Flanges
- ▶ Multimode Step Index Optical Fiber with Ø400 µm Core
- ▶ Double-Bagged for Cleanroom Environments

Thorlabs' Ø2.75" (DN40) Fiber Feedthrough CF Flanges are fixed (non-rotating) flanges with male SMA905 fiber connectors on both sides. The fibers are held in place by a glass-ceramic hermetic seal, creating an airtight feedthrough that is suitable for use with chambers operating at pressures down to 10^{-10} Torr. Mating sleeves may be used to connect fiber patch cables to the feedthrough; we recommend the ADASMAV (sold below) when mating a patch cable to the CF flange on the vacuum side. These flanges have six 1/4" (M6) through holes for bolting onto any standard DN40 CF flange.

Note: Mounting hardware and CF flange copper gasket seals are not included.

Item #	Wavelength Range	Fiber Core Diameter	Attenuation Range (Click to Enlarge)	NA	Vacuum Level	Insertion Loss	Max Optical Power	Max Temperature
VC2H4S	200 - 1200 nm	400 µm		0.22 ± 0.02	1 × 10 ⁻¹⁰ Torr	≤2.3 dB	1 W	250 °C
VC2L4S	400 - 2400 nm							


Part Number	Description	Price	Availability
VC2H4S	NEW! Customer Inspired! Fiber Feedthrough for Ø2.75" CF Flange, High-OH, Ø400 µm Core, 200 - 1200 nm, SMA	\$412.00	Today
VC2L4S	NEW! Customer Inspired! Fiber Feedthrough for Ø2.75" CF Flange, Low-OH, Ø400 µm Core, 400 - 2400 nm, SMA	\$412.00	Today

Ø600 µm Ultra-High-Vacuum Fiber Feedthrough

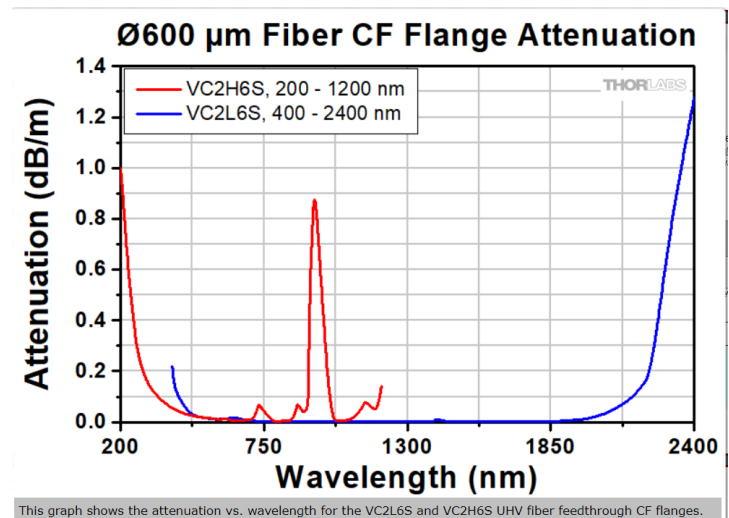
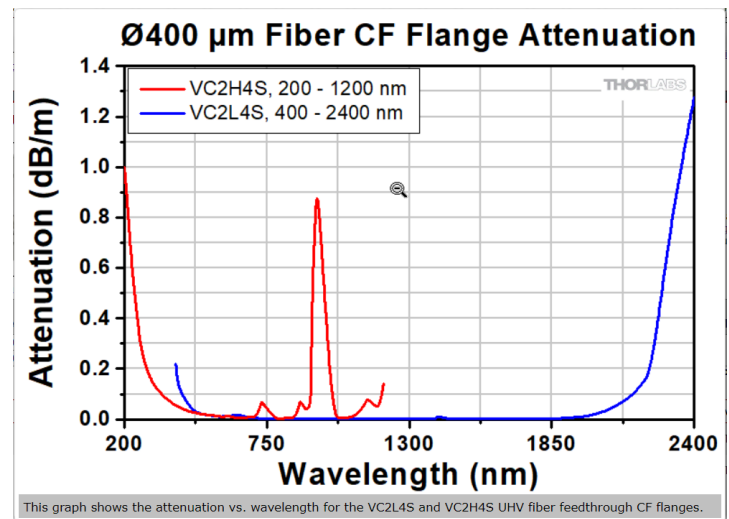
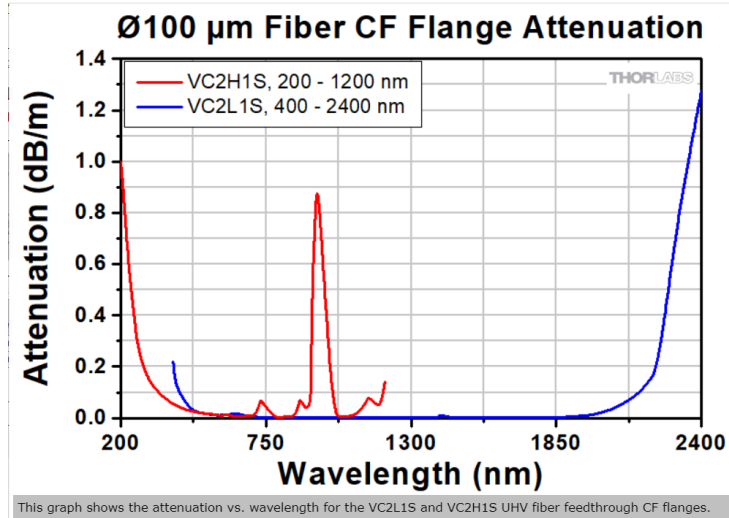
- ▶ Ø2.75" (DN40), Male SMA905 Terminated Fiber Feedthrough CF Flanges
- ▶ Multimode Step Index Optical Fiber with Ø600 µm Core
- ▶ Double-Bagged for Cleanroom Environments

Thorlabs' Ø2.75" (DN40) Fiber Feedthrough CF Flanges are fixed (non-rotating) flanges with male SMA905 fiber connectors on both sides. The fibers are held in place by a glass-ceramic hermetic seal, creating an airtight feedthrough that is suitable for use with chambers operating at pressures down to 10^{-10} Torr. Mating sleeves may be used to connect fiber patch cables to the feedthrough; we recommend the ADASMAV (sold below) when mating a patch cable to the CF flange on the vacuum side. These flanges have six 1/4" (M6) through holes for bolting onto any standard DN40 CF flange.

Note: Mounting hardware and CF flange copper gasket seals are not included.

Item #	Wavelength Range	Fiber Core Diameter	Attenuation Range (Click to Enlarge)	NA	Vacuum Level	Insertion Loss	Max Optical Power	Max Temperature
V2H6S	200 - 800 nm	600 µm		0.22 ± 0.02	1 × 10 ⁻¹⁰ Torr	≤2.3 dB	1 W	250 °C
V2L6S	400 - 2200 nm							

Part Number	Description	Price	Availability
V2H6S	Customer Inspired! Fiber Feedthrough for Ø2.75" CF Flange, Ø600 µm Core, 200 - 800 nm, SMA	\$514.01	5-8 Days
V2L6S	Customer Inspired! Fiber Feedthrough for Ø2.75" CF Flange, Ø600 µm Core, 400 - 2200 nm, SMA	\$514.01	5-8 Days



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.

- 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	\$28.95	Today

CF Flange Copper Gaskets and Mounting Hardware

- ▶ VMH6 Stainless Steel (18-8) Mounting Hardware Set Includes:
 - ▶ Six Bolts (Silver-Plated, 1/4"-28 x 1.50", 12-Point Heads)
 - ▶ Six Nuts and Twelve Washers
- ▶ Single-Use Copper Gaskets for Forming a Seal Between Ø2.75" CF Flanges
 - ▶ 101 Copper Alloy (99.99% Pure), OFHC (Oxygen-Free High Conductivity)
 - ▶ VGC10: 1/4-Hard Copper Gaskets
 - ▶ VGA10: Annealed Copper Gaskets



Click to Enlarge
VGA10 Copper Gasket
Installed on VPCHW42-C
Viewport

Thorlabs offers mounting hardware and single-use copper gaskets for mating Ø2.75" CF flanges. These flanges utilize a knife-edge mechanism to create an airtight seal between mating pieces. To create the seal, a copper gasket is most often employed. As the bolts of the mating pair are tightened, the knife edge "bites" into the copper gasket, deforming it. The extruded metal fills all the machining marks and surface defects, which yields a leak-tight seal.

1/4-hard and annealed copper gaskets are sold in sets of 10. We recommend using the softer annealed copper gaskets with viewports to lower the chance of deformation in the optic due to stress in the flange. The set of stainless steel mounting hardware includes six silver-plated bolts, six nuts, and twelve washers. The silver plating on the bolts acts as a lubricant to prevent galling between the stainless steel surfaces of the bolt and the nut.

Instructions

First ensure the knife-edge mating surfaces of the CF flanges are free from debris or scratches. Then choose the desired bolt hole orientation and insert the gasket, aligning leak-test grooves on the flanges if present. Slide a washer onto the bolt, insert the bolt through the flanges, and add another washer before screwing on the nut. Hand tighten each bolt, then use two wrenches to hold the bolt head and turn the nut. Tighten the nuts gradually in 1/8 to 1/4 turn increments in an alternating crisscross ("star") pattern until the desired tightness is reached. Following these steps will result in a reliable seal with even gasket compression and deformation.

Part Number	Description	Price	Availability
VMH6	Mounting Hardware for CF Flanges: 6 Silver-Plated Bolts, 6 Nuts, 12 Washers	\$17.51	Today
VGC10	1/4-Hard OFHC 99.99% Pure Copper Gaskets for Ø2.75" CF Flange, 10 Pack	\$41.20	Today
VGA10	Annealed OFHC 99.99% Pure Copper Gaskets for Ø2.75" CF Flange, 10 Pack	\$92.70	Today

Visit the *Ultra-High-Vacuum Fiber Feedthrough CF Flanges* page for pricing and availability information:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=8396