

B5C - Sept. 19, 2016

Item # B5C was discontinued on Sept. 16, 2016. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

OPTIC MOUNTS FOR 30 MM CAGE CUBES

- ▶ Integrate Dichroic Filters, Prisms, Beamsplitting Cubes, or Ø1" Optics into 30 mm Cage Systems
- ▶ Compatible with 30 mm Cage Cube Platforms and Rotating Platforms

Application Idea



B6C
Cube or Prism Clamp



B5C1
Ø1" Optic Holder



FFM1
Dichroic Filter Holder



B6C Holding a Right-Angle Prism and FFM1 Mounting a Dichroic Mirror in 30 mm Cage Cubes

OVERVIEW

Features

- Optic Mounts for 30 mm Cage Cubes
- Mount on 30 mm Cage Platforms and Rotating Platforms

These 30 mm-Cage-Cube-Compatible Optic Mounts are ideal for integrating prisms, beamsplitters, dichroic filters, and Ø1" optics into a 30 mm cage cube system. They are compatible with our selection of 30 mm Cage Cube Accessories. See the *Application Ideas* tab for an example of how to use our cage cubes and accessories to construct a beam combiner with a dichroic mirror as well as a variable attenuation beamsplitter with a polarizing beamsplitting cube.

The FFM1 rectangular filter holder, Ø1" optic mounts, and PM3 clamping arm are designed to mount directly to any of our 30 mm cage cube platforms. The B6C cage cube clamp mounts directly to the top of a C4W or C6W 30 mm cage cube. This clamp works in conjunction with either a platform or B1C Blank Cover Plate mounted to the bottom of the cage cube.

We also offer a dichroic cage cube with a built-in FFM1 mount.

| 30 mm Cage Cubes and Accessories | | | | |
|----------------------------------|--------------|-----------|--------------------|--------------|
| | | | | |
| Cage Cubes | Optic Mounts | Platforms | Rotating Platforms | Cover Plates |

APPLICATION IDEAS

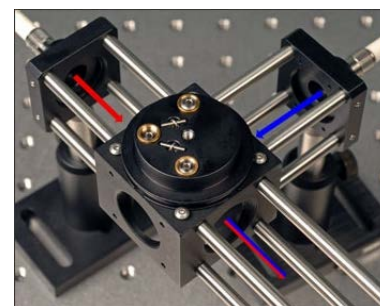
Combining Two Beams

Our cage system can be used to build an easily adjustable beam combiner. This setup is based on the use of an appropriate dichroic mirror for the wavelengths that need to be combined. One beam needs to be in the transmission band of the dichroic mirror, while the other needs to be in the reflection band. For this application the reflection band laser is 405 nm and the transmission band laser is 635 nm. The DMLP567 is an appropriate dichroic mirror for the two selected wavelengths.

The dichroic mirror is mounted in a B5CT1 threaded $\varnothing 1$ " optic mount and attached to a B4C kinematic platform. The kinematic platform allows for positioning of the beam that is within the reflection band of the dichroic mirror. This assembly is placed within a C4W cage cube with ER cage rods attached to two adjacent faces. One set of cage rods holds a collimator for the reflection band's fiber coupled laser, while the other set of cage rods holds a collimator for the transmission band's fiber coupled laser.

A more complex setup can be built to combine more than two beams by using multiple dichroic mirrors together.

[APPLIST] [APPLIST]



Variable Attenuation Beamsplitter

In normal operation, the variable beamsplitter/attenuator utilizes a half-wave plate to rotate the polarization of a previously linearly polarized beam of light. At the beamsplitter interface, p-polarized light will be transmitted, while s-polarized light will be reflected. By choosing the correct orientation with the half-wave plate, one can determine the amount of p-polarized and s-polarized light incident upon the interface (as shown in Figure 1 below).

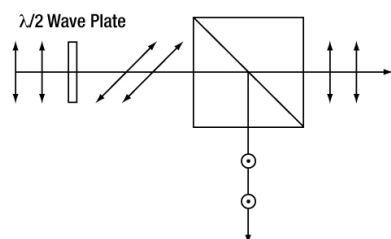
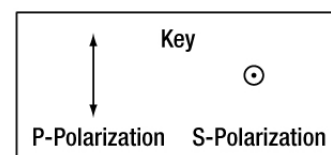


Figure 1. Normal Variable Beamsplitter Operation

This assembly is mounted within a C6W 30 mm cage cube with ER cage rods attached to hold a half-wave plate and rotation mount. The rotation mount is a CRM1P which is designed for integration into a 30 mm cage system. The precision control over the rotation is particularly useful when attempting to maximize or minimize a beam throughput. The zero-order mounted half-wave plate threads directly onto this rotation mount.

APPLIST] [APPLIST]



The variable attenuation beamsplitter is a common component in many large optical systems and can serve as the basic building block for various applications just as; beam sampling, beam combining, beam splitting, power balance, and reflection isolation. Due to the modular design of the 30 mm cage cube system, this device can be easily integrated into a larger cage cube system. A variable attenuation beamsplitter can function at any wavelength supported by the optics of the system. For this application the optics were chosen for a 670 nm variable beamsplitter.

The polarization beamsplitting cube sits upon a B4CRP precision rotation platform and is held in place with a B6C cage cube clamp. The precision rotation platform allows for precise alignment of the polarization beamsplitting cube relative to the incident laser beam and also yields control over



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CAGE OVERVIEW

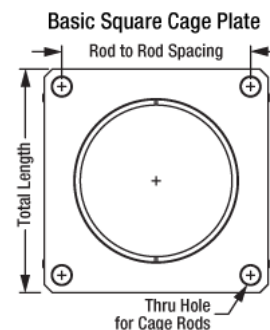
Cage System Overview

The Cage Assembly System provides a convenient way to construct large optomechanical systems with an established line of precision-machined building blocks designed for high flexibility and accurate alignment.

16 mm, 30 mm, and 60 mm Cage System Standards

Thorlabs offers three standards defined by the center-to-center spacing of the cage assembly rods (see image to

right). The 16 mm cage, 30 mm cage, and 60 mm cage standards are designed to accommodate Ø1/2", Ø1", and Ø2" optics, respectively. Specialized cage plates that allow smaller optics to be directly inserted into our larger cage systems are also available. All locking setscrews used in these cage plates are standard 4-40 setscrews, which use a 0.05" hex key.



An example of the standard cage plate measurements determining cage system compatibility.

Standard Threads

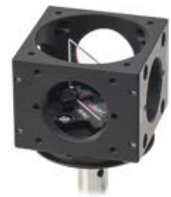
The flexibility of our Cage Assembly System stems from well-defined mounting and thread standards designed to directly interface with a wide range of specialized products. The three most prevalent thread standards are our SM05 Series (0.535"-40 thread), SM1 Series (1.035"-40 thread), and SM2 Series (2.035"-40 thread), all of which were defined to house the industry's most common optic sizes. Essential building blocks, such as our popular lens tubes, directly interface to these standards.

| Standard Cage System Measurements | | | |
|-----------------------------------|---------------|---------------|----------------|
| Cage System | 16 mm | 30 mm | 60 mm |
| Thread Series | SM05 | SM1 | SM2 |
| Rod to Rod Spacing | 16 mm (0.63") | 30 mm (1.18") | 60 mm (2.36") |
| Total Length | 25 mm (0.98") | 41 mm (1.60") | 71.1 mm (2.8") |

| Cage Components | | |
|---|---|---|
| Cage Rods | 16 mm | These rods are used to connect cage plates, optic mounts, and other components in the cage system. The SR Series Cage Rods are compatible with our 16 mm cage systems, while the 30 mm and 60 mm cage systems use ER Series Cage Rods. |
| | 30 mm | |
| | 60 mm | |
| Cage Plates | 16 mm | These serve as the basic building blocks for a cage system. They may have SM-threaded central bores, smooth bores sized for industry standard optics or to accommodate the outer profile of our SM Series Lens Tubes, or specialized bores for other components such as our FiberPorts. |
| | 30 mm | |
| | 60 mm | |
| Optic Mounts | 16 mm | Thorlabs offers fixed, kinematic, rotation, and translation mounts specifically designed for our Cage Systems. |
| | 30 mm | |
| | 60 mm | |
| Cage Cubes | 16 mm | These cubes are useful for housing larger optical components, such as prisms or mirrors, or optics that need to sit at an angle to the beam path, such as beamsplitters. Our cage cubes are available empty or with pre-mounted optics. |
| | 30 mm | |
| | 60 mm | |
| Post and Breadboard Mounts and Adapters | Mounting options for cage systems can be found on our Cage System Construction pages. Cage Systems can be mounted either parallel or perpendicular to the table surface. | |
| Size Adapters | Cage System Size Adapters can be used to integrate components from different cage system and threading standards. | |
| Specialized Components | Thorlabs also produces specialized cage components, such as Filter Wheels, a HeNe Laser Mount, and a FiberPort Cage Plate Adapter, allowing a wide range of our products to be integrated into cage-mounted optical systems. Explore our Cage Systems Visual Navigation Guide to see the full range of Thorlabs' cage components. | |

Cage-Compatible Rectangular Filter Holder

- ▶ Holds Dichroic and Other Filters from 26 - 43 mm Long
- ▶ Mounts Filters Up to 3.0 mm Thick
- ▶ Can Accommodate Filters Up to:
 - 1.26" (32 mm) Tall Inside a C4W Cage Cube
 - 0.98" (25 mm) Tall Inside a C6W Cage Cube
- ▶ Two Spring-Loaded Clamping Mechanisms Secure Optic's Position



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[APPLIST]
[APPLIST]

FFM1 Dichroic Filter Holder shown mounted to a B3C Cube Platform mounted in a C6W Cube.

The FFM1 Cage-Compatible Rectangular Filter Holder is specifically designed to hold the rectangular filters. The two included 4-40 (M3) cap screws can be used to secure the holder to Thorlabs' 30 mm Cage Cube Platforms or Rotating Platforms.

If used with a C4W Cage Cube, the mount enables the filter to be placed at a 45° angle with respect to the cube's face and provides a Ø1" clear aperture, which maximizes the usable area of the filter for this configuration. If used with the C6W Cage Cube, you will only be able to use the top ER rod clearance holes (the bottom ones will be blocked by the platform) and the maximum filter height that can be accommodated is 0.98" (25 mm). Note that the FFM1 Holder is not compatible with our C6WA Platform Adapter.

Rectangular filters up to 3 mm thick can be held using two spring-loaded clamping arms designed to avoid scratching of a filter's interference coating; simply apply a horizontal force to the spring-loaded clamps, seat the optic into the channel created, and release the clamps, which leaves the optic wedged between a stop and a clamp at each end.

If desired, the FFM1 can be mounted directly to a Mini-Series Post using the included cap screws. To mount the filter holder to our Ø1/2" Posts, which feature 8-32 (M4) threading, you'll need an MSA8 thread adapter (MSA4/M for metric Ø1/2" posts).

We also offer the CM1-DCH, which is a dichroic filter mount in our compact 1.5" CM1 cage cube.

| Part Number | Description | Price | Availability |
|-------------|--|---------|--------------|
| FFM1 | Customer Inspired!30-mm-Cage-Compatible Rectangular Filter Mount | \$56.10 | Today |

Cage Cube Optic Mount with Nylon Retaining Screws

- ▶ Holds Ø1" (25.4 mm) Optics from 0.04" to 0.24" (1.0 mm to 6.0 mm) Thick
- ▶ Compatible with 30 mm Cage Cube Platforms and Rotating Platforms

The B5C Optic Mount uses nylon retaining screws to hold Ø1" optics on our 30 mm Cage Cube Platforms and Rotatable Platforms. When used in a C4W or C6W cage cube, the mount can center the optic within the cube. This is particularly important when mounting a mirror in the cube.



Click to Enlarge
B5C Mount Being Placed into a C6W Cage Cube

| Part Number | Description | Price | Availability |
|-------------|---|---------|--------------|
| B5C | Ø1" Optic Mount for 30 mm Cage Cube with Nylon Retaining Screws | \$30.50 | Lead Time |

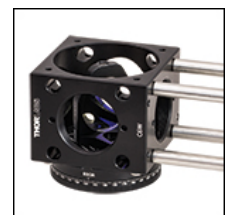
Cage Cube Optic Mount with Nylon-Tipped Setscrew

- ▶ Holds Ø1" (25.4 mm) Optics Thicker than 0.12" (3.0 mm)
- ▶ Compatible with 30 mm Cage Cube Platforms and Rotating Platforms

The B5C1 Optic Mount uses a setscrew to hold Ø1" optics on our 30 mm Cage Cube Platforms and Rotatable Platforms. The nylon-tipped setscrew that holds the optic in place has a 5/64" (2.0 mm) hex. The mount is attached to imperial cage cube platforms using a 4-40 button head screw (1/16" hex) and washer and to metric cage cube platforms using an M3 screw (2 mm hex) and washer (all mounting hardware included).



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Coated Side of Optics Aligns to Engraved Witness Lines



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[APPLIST]
[APPLIST]
B5C1 Mount with Ø1" Optic Mounted on B3CR Platform in a C6W Cage Cube

When used in a C4W or C6W cage cube, the mount can center the optic within the cube. This is particularly important when mounting a mirror in the cube. Witness lines are engraved on the sides of the mount for aid in alignment. These witness lines mark the position of the optic's front surface when inserted into the mount with the front face directed towards the screw's mounting

slot.

| Part Number | Description | Price | Availability |
|-------------|---|---------|--------------|
| B5C1 | Customer Inspired!Ø1" Optic Mount for 30 mm Cage Cube with Setscrew Optic Retention | \$30.00 | Today |

- ▶ B5CT1 Holds Ø1" (25.4 mm) Optics up to 0.13" (3.4 mm) Thick
- ▶ B5CT2 Holds Ø1" (25.4 mm) Optics up to 0.25" (6.3 mm) Thick
- ▶ SM1-Threaded with Included SM1RR Retaining Ring
- ▶ Compatible with 30 mm Cage Cube Platforms and Rotating Platforms



Click to Enlarge
Coated Side of Optics
Aligns to Engraved
Witness Lines



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[APPLIST]
[APPLIST]
B5CT2 Mount with Ø1" Optic
Mounted on B4CRP Platform in
a C6W Cage Cube

The B5CT1 and B5CT2 SM1-threaded Optic Mounts hold Ø1" optics on our 30 mm Cage Cube Platforms and Rotatable Platforms. The B5CT1 and B5CT2 Mounts hold optics up to 0.13" (3.4 mm) or 0.25" (6.3 mm) thick, respectively, using an SM1RR retaining ring (included). The deeper design of the LB5CT2 mount reduces the clear aperture when used with transmissive optics such as beamsplitters, making it ideal for mounting mirrors. Each mount is attached to imperial cage cube platforms using a 4-40 button head screw (1/16" hex) and washer and to metric cage cube platforms using an M3 screw (2 mm) and washer (all mounting hardware included).

When used in a C4W or C6W cage cube, the mount can center the optic within the cube. This is particularly important when mounting a mirror in the cube. Witness lines are engraved on the sides of the mount for aid in alignment. These witness lines mark the position of the optic's front surface when inserted into the mount with the front face directed towards the screw's mounting slot.

| Part Number | Description | Price | Availability |
|-------------|--|---------|--------------|
| B5CT1 | Customer Inspired!Ø1" Optic Mount with SM1-Threaded Bore for 30 mm Cage Cube, Mounts Optics up to 3.4 mm Thick | \$32.50 | Today |
| B5CT2 | Customer Inspired!Ø1" Optic Mount with SM1-Threaded Bore for 30 mm Cage Cube, Mounts Optics up to 6.3 mm Thick | \$35.00 | Today |

Cage Cube Clamp

- ▶ Clamp Objects Within Cage Cubes
- ▶ 1/8" Hex Socket Adjuster Clamp with Delrin-Tipped Swivel Head

The B6C cage cube clamp, designed for use with our 30 mm cage cubes, features a 1/4"-20 clamp adjuster with a Delrin swivel tip that helps to protect the clamped optic from marring. The clamping mechanism is adjusted with a 1/8" hex socket and designed for use with rectangular objects and other objects with parallel top and bottom surfaces. The clamp of the B6C threads down from its top and pushes down on the object being clamped. Because of this top-down clamping system, the B6C must be used in conjunction with a B1C blank cover plate, platforms, or rotational platforms (see image to the right).

The table above lists the minimum and maximum object thickness that this clamp can hold. For systems that require light tightness, the B6C features an O-ring that, when used with the B1C blank Cover Plate and a 30 mm cage cube, forms a light-tight cage cube.



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[APPLIST]
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Beamsplitter Cube Mounted in
C4W Cage Cube with B3C Platform
and B6C Clamp



Click to Enlarge
Exploded view of a
cage system showing a
right-angle prism
clamped by the B6C.

| Item # | Min Thickness | Max Thickness |
|-----------------------------------|-----------------|-----------------|
| B6C with B1C | 0.58" (14.8 mm) | 1.28" (32.5 mm) |
| B6C with B3C, B3CR, B4C, or B4CRP | 0.45" (11.5 mm) | 1.15" (29.2 mm) |

| Part Number | Description | Price | Availability |
|-------------|-------------|-------|--------------|
|-------------|-------------|-------|--------------|

| | | | |
|------------|------------------------------|----------------|--------------|
| B6C | 30 mm Cage Cube Clamp | \$24.00 | Today |
|------------|------------------------------|----------------|--------------|

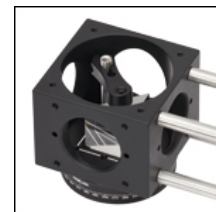
[Hide Cage Cube Clamping Arm](#)

Cage Cube Clamping Arm

- ▶ Provides Clamping Force for Our Cage Cube Platforms
- ▶ Ideal for Prisms and Beamsplitter Cubes
- ▶ Compatible with 30 mm Platforms and Rotating Platforms

Thorlabs' PM3(/M) arms feature a cap screw-activated flexure mechanism to secure the clamping arm to the post, while a nylon-tipped setscrew secures the optic. A $\varnothing 0.09$ " ($\varnothing 2.3$ mm) hole located near the top of the post allows for its initial tightening with a 5/64" (2 mm) balldriver or hex key. The PM3(/M) arm offers 0.97" (24.6 mm) of vertical travel.

The PM3/M metric clamping arm is compatible with the metric versions of both our 30 mm platforms and rotating platforms. The PM3 imperial clamping arm is compatible with the imperial versions of our 30 mm cage rotating platforms (see image to the right).



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[APPLIST]

The B3CR has 6-32 taps for use with the PM3 to hold a right-angle prism.

| Part Number | Description | Price | Availability |
|-------------|---|---------|--------------|
| PM3/M | Small Adjustable Clamping Arm, M4 Threaded Post | \$18.00 | Today |
| PM3 | Small Adjustable Clamping Arm, 6-32 Threaded Post | \$18.00 | Today |

Optic Mounts for 30 mm Cage Cubes - Google Chrome

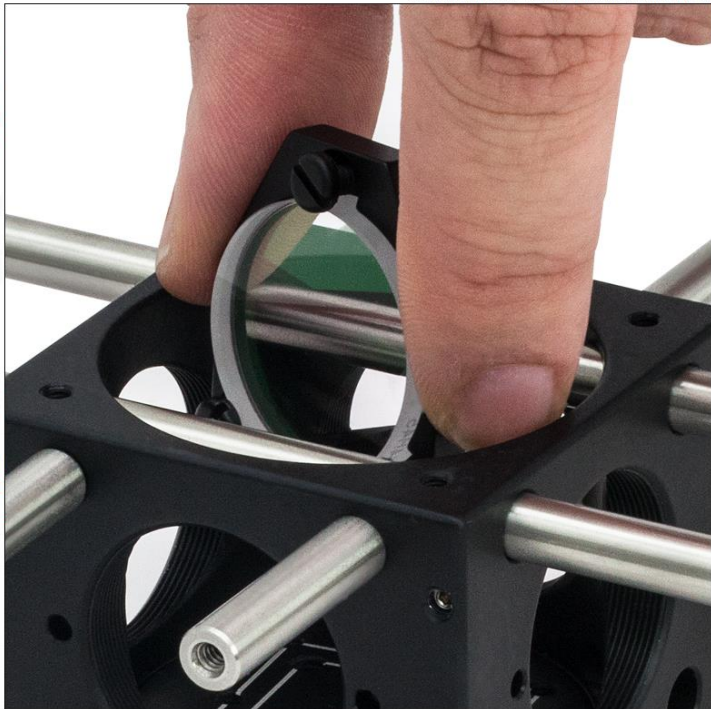
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We also offer the [CMI-DCI](#), which is a dichroic filter mount in our compact 1.5" CM1 cage cube.

Based on your currency / country selection, your order will ship from Newton, New Jersey

+1 Qty Docs Part Number - Universal Price Available / Ships

Cage



+1 Qty Docs Part Number - Universal Price Available / Ships

Cage

B5C1

The B5C with Ø1 inch optic placed into a C6W 30 mm cage cube. The B5C mount is screwed onto the platform (not shown) that is attached to the bottom of the cage cube.

Based on your currency / country selection, your order will ship from Newton, New Jersey

+1 Qty Docs Part Number - Universal Price Available / Ships

Available / Ships

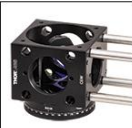
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B5C Mount Being Placed into a C6W Cage Cube from Newton, New Jersey

Available / Ships

Lead Time

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View Metric Product List
B5C1 Mount with Ø1" Optic Mounted on B3CR Platform in a C5W Cage Cube



Optic Mounts for 30 mm Cage Cubes - Google Chrome


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Cage Cube Optic M




[Zoom](#)

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Cage Cube Optic M



[Zoom](#)



B5C

When used in a C6W or C5W cage cube, the mount can center the optic within the cube. This is particularly important when mounting a mirror in the cube. Witness lines are engraved on the sides of the mount for aid in alignment. These witness lines mark the position of the optic's front surface when inserted into the mount with the front face directed towards the screw's mounting slot.

[Click to Enlarge](#)
Central Slot of Optics Aligns to Engraved Witness Lines

[Click to Enlarge](#)
View Imperial Product List
View Metric Product List
B5C1 Mount with Ø1" Optic Mounted on B3CR Platform in C5W Cage Cube from Newton, New Jersey

Based on your currency / country selection, your order will ship from Newton, New Jersey

+1 Qty Docs Part Number - Universal Price Available / Ships

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\$56.10 ✓ Today

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\$36.50 Lead Time