

LB5C - Sept. 19, 2016

Item # LB5C was discontinued on Sept. 19, 2016. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

60 MM CAGE CUBES AND ACCESSORIES

► **Build 2D and 3D Cage Systems with Cage Cubes**

► **Mount 2" Optics Inside Cage Cubes**

Application Idea

LC6W Cage Cube with Optic and SM2 Lens Tube in 60 mm Cage System Assembly



LC6W
60 mm Cage Cube

LB3C
Mounting Platform



LB6C
Cube or Prism Clamp



LB1C
Blank Cover Plate



LB5C1
Ø2" Optic Mount



LB4C
Kinematic Platform
(Bottom View)



LFFM1
Rectangular Filter Mount

OVERVIEW

Features

- Cage Cube for Holding Optic Mounts in 60 mm Cage Systems
- Mounts for Ø2" Mirrors or Rectangular Optics from 30 to 53 mm Long
- Clamp Available for Beamsplitter Cubes and Prisms
- Optic Mounting and Kinematic Mounting Platforms Available

The LC6W cage cube offers four internally SM2-threaded ports and 60 mm cage compatibility. Two faces are machined with Ø6 mm through holes for cage rods, while the other four faces feature 4-40 tapped holes for securing cage rods to the cube. The through holes allows the cube to be translated along the cage rods, then locked in place with the included setscrews.

We also offer accessories for this cube including blank and SM2-threaded cover plates (for the top and bottom of the cube), rigid and kinematic platforms for prisms and beamsplitters, and rectangular and Ø2" optic mounts. These accessories are particularly useful when working with beamsplitters in a 60 mm cage system.

Alternative Size Options

| |
|----------------------------|
| 16 mm Cage Cubes |
| 2" Wide 30 mm Cage Cubes |
| 1.5" Wide 30 mm Cage Cubes |
| 60 mm Cage Cubes |

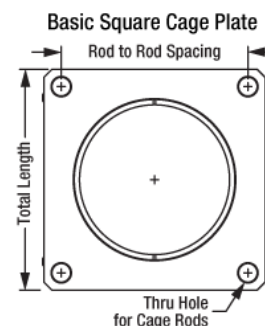
CAGE OVERVIEW

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 $\text{Ø}1/2$ ", $\text{Ø}1$ ", and $\text{Ø}2$ " 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.

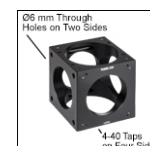
| Standard Cage System Measurements | | | |
|-----------------------------------|---------------|---------------|----------------|
| Cage System | 16 mm | 30 mm | 60 mm |
| Thread Series | SM05 | SM1 | SM2 |
| Rod to Rod Spacing | 16 mm (0.63") | 30 mm (1.18") | 60 mm (2.36") |
| Total Length | 25 mm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

60 mm Cage Cube

- ▶ Four Internally SM2-Threaded (2.035"-40) Ports
- ▶ 4-40 Tapped Holes on Four Faces for Securing $\text{Ø}6$ mm Cage Rods
- ▶ $\text{Ø}6$ mm Through Holes for $\text{Ø}6$ mm Cage Rods

The LC6W is a 60 mm cage cube designed for building 2D and 3D cage systems while providing a means to mount optics such as beamsplitters inside. Two opposing faces offer $\text{Ø}6$ mm through holes, while the other four faces have 4-40 tapped holes to accept cage rods. The through holes allow for 1D translation of a section in a cage assembly. There are four 8-32 tapped holes (see photo to the right)



Click to Enlarge Cage Rod Mounting Options

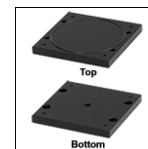
on the top and bottom of the cube for connecting various accessories, such as cover plates or platforms, which can be found below. The 8-32 cap screws needed for mounting these accessories are included with the individual accessory and not the LC6W Cage Cube.

Eight 4-40 setscrews are included to secure the cube to the cage rods that pass through the through holes of the cage cube.

| Part Number | Description | Price | Availability |
|-------------|-----------------|----------|--------------|
| LC6W | 60 mm Cage Cube | \$132.00 | Today |

60 mm Cage Cube Cover Plates

- ▶ LB1C(/M): Blank Cube Cover Plate; 1/4"-20 (M6 x 1.0) Tapped Hole for Post Mounting
- ▶ LB2C: SM2-Threaded Cube Cover Plate for Attaching SM2 Lens Tubes and Accessories
- ▶ Compatible with LC6W Cage Cube
- ▶ 4-40 Tapped Holes for 60 mm Cage Systems



Click to Enlarge
LB1C Light-Tight
Blank Plate

Two cover plates are offered for the LC6W cube. The LB1C(/M) is a blank cover plate that is designed to provide a light-tight environment within the cube via a rubber o-ring. The opposite side of this plate features one centered 1/4"-20 (M6) tapped hole for mounting purposes.

The LB2C is an internally SM2-threaded cage cube plate, which allows SM2-threaded components to mate to the top or bottom faces of the LC6W cube.

Four 8-32 cap screws are included for attachment to the LC6W Cage Cube sold above.

| Part Number | Description | Price | Availability |
|-------------|--|---------|--------------|
| LB1C/M | Light-Tight Blank Cover Plate for 60 mm Cage Cube, M6 Tap | \$28.80 | Today |
| LB2C | SM2-Threaded Cover Plate for 60 mm Cage Cube | \$28.80 | Today |
| LB1C | Light-Tight Blank Cover Plate for 60 mm Cage Cube, 1/4"-20 Tap | \$28.80 | Today |

Rotatable Cage Cube Platforms

- ▶ Mounting Platform Fits into the Top or Bottom of LC6W Cage Cube
- ▶ LB3C(/M) Features Sixteen 6-32 (M4) Tapped Holes
- ▶ LB4C(/M) Offers $\pm 3^\circ$ Pitch, $\pm 3^\circ$ Yaw, and 0.25" (6.35 mm) Z Translation and Eight 6-32 (M4) Tapped Holes
- ▶ Ideal for Mounting Beamsplitter Cubes, Prisms, or 2" Optics (Mounts Sold Separately Below)
- ▶ Bottom-Located 8-32 (M4) Tapped Hole for Mounting to $\varnothing 1/2$ " Posts

The LB3C(/M) and LB4C(/M) platforms mount into the top or bottom of our LC6W cage cubes. Four cutouts in the platforms enable them to be secured to the LC6W via the four included 8-32 locking screws. The LB3C platform features sixteen 6-32 (M4) tapped holes, while the LB4C has eight 6-32 (M4) tapped holes, which can be used to mount the optic mounts sold separately below. These tapped holes may also be used with a PM3(/M) or PM4(/M) clamping arm to hold prisms.

The LB3C platform is rigid and allows coarse manual rotational positioning, while the LB4C platform has three adjusters to provide pitch, yaw, and 0.25" (6.35 mm) Z translation in addition to manual rotational positioning. The LB4C's kinematic adjustment comes from three 1/4"-80 adjusters which have a 5/64" (2 mm) hex. The bottom of each platform has an 8-32 (M4) tapped hole, allowing it to be mounted onto a $\varnothing 1/2$ " Post.

| Part Number | Description | Price | Availability |
|-------------|---|----------|--------------|
| LB3C/M | Mounting Platform for 60 mm Cage Cube, Metric Taps | \$45.50 | Today |
| LB4C/M | Kinematic Prism Platform for 60 mm Cage Cube, Metric Taps | \$130.00 | Today |
| LB3C | Mounting Platform for 60 mm Cage Cube, Imperial Taps | \$45.50 | Today |
| LB4C | Kinematic Prism Platform for 60 mm Cage Cube, Imperial Taps | \$130.00 | Lead Time |

Cage Cube Clamp

- ▶ Clamp Objects Within LC6W Cage Cube
- ▶ 5/32" (4 mm) Hex Socket on Screw Clamp
- ▶ Delrin Swivel Head Clamp

| | Min Thickness | Max Thickness |
|--------------------|-----------------|-----------------|
| LB6C with LB1C(/M) | 1.23" (31.3 mm) | 2.63" (66.8 mm) |
| LB6C with LB3C(/M) | 1.10" (28 mm) | 2.50" (63.5 mm) |

The LB6C cage cube clamp is compatible with the LC6W 60 mm cage cube. The clamping mechanism comes from a 5/16"-18 screw with a Delrin swivel tip to help avoid marring the clamped object. This adjuster features a 5/32" (4 mm) hex socket to loosen or tighten the clamp. The cube clamp plate features an O-ring, which can be used to form a light tight cage cube when used with the LB1C blank plates and C4W cube. Please note that a blank cover plate (LB1C) or cage cube platform (LB3C, LB4C) must be used in conjunction with the clamp. This clamp is best suited for use with rectangular objects and other objects with parallel top and bottom surfaces. The maximum and minimum object thicknesses are listed in the table to the right.

Four 8-32 cap screws are included for attachment to the LC6W Cage Cube sold above.

| Part Number | Description | Price | Availability |
|-------------|-----------------------|---------|--------------|
| LB6C | 60 mm Cage Cube Clamp | \$28.80 | Today |

Rectangular Filter Mount

- ▶ Holds Rectangular or Square Filters Up to 4.0 mm Thick
- ▶ Accommodates Filters up to 2.5" (63.5 mm) Tall and 30 - 53 mm Long Inside a LC6W Cage Cube
- ▶ Two Spring-Loaded Clamping Mechanisms Secure Optic's Position
- ▶ Compatible with LB3C(/M) and LB4C(/M) Platforms

The LFFM1 Cage-Compatible Filter Holder is specifically designed to hold rectangular or square filters up to 2.5" (63.5 mm) tall and 30 mm - 53 mm Long inside a LC6W cage cube (see photo to the right). When used with the LB3C or LB4C mounting platforms, this mount enables dichroic filters, colored filters, beamsplitters, or ND filters to be placed at any angle with respect to the incident light.

Rectangular filters up to 4.0 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.

The LFFM1 can be directly mounted to Ø1/2" posts via the #8 counterbore which accepts 8-32 (M4) cap screws. Two 6-32 cap screws and two M4 cap screws are included for securing the holder to the LB3C(/M) or LB4C(/M) mounting platforms. The outside and inside engraved witness lines help line up the LFFM1 with the mounting positions for the LB3C(/M) and LB4C(/M) platforms. The optic and filter mount should be installed onto a mounting platform before being inserted into the cage cube.



Click to Enlarge
[APPLIST]
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LFFM1
Rectangular Filter Holder shown mounted to a LB3C Cube Platform in a LC6W Cube.

| Part Number | Description | Price | Availability |
|-------------|---|---------|--------------|
| LFFM1 | NEW! Customer Inspired!60-mm-Cage-Compatible Rectangular Filter Mount | \$65.00 | Today |

Cage Cube Optic Mount with Nylon Retaining Screws

- ▶ Holds Ø2" Optics up to 0.47" (12 mm) Thick
- ▶ Compatible with LB3C(/M) and LB4C(/M) Platforms

The LB5C Optic Mount uses nylon retaining screws to hold Ø2" optics on our 60 mm Cage Cube Rotatable Platforms. When used in an LC6W 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
Ø2" Beamsplitter Mounted in LC6W Cage Cube with LB5C Mount and LB4C Platform

| Part Number | Description | Price | Availability |
|-------------|---|---------|--------------|
| LB5C | Ø2" Optic Mount for 60 mm Cage Cube with Nylon Retaining Screws | \$56.20 | Lead Time |

[Hide Cage Cube Optic Mount with Nylon-Tipped Setscrew](#)

Cage Cube Optic Mount with Nylon-Tipped Setscrew

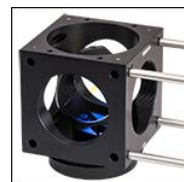
- ▶ Holds Ø2" (50.8 mm) Optics Thicker than 0.12" (3.0 mm)
- ▶ Compatible with LB3C(/M) and LB4C(/M) Platforms

The LB5C1 Optic Mount uses a setscrew to hold Ø2" optics on our 60 mm Cage Cube 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 6-32 button head screw (7/64" hex) and washer and to metric cage cube platforms using an M4 screw (3 mm hex) and washer (all mounting hardware included).

When used in an LC6W 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
Coated Side of Optics
Aligns to Engraved
Witness Lines



Click to Enlarge
LB5C1 Mount with Ø2"
Beamsplitter on LB4C
Platform in LC6W Cage
Cube

| Part Number | Description | Price | Availability |
|-------------|---|---------|--------------|
| LB5C1 | Customer Inspired!Ø2" Optic Mount for 60 mm Cage Cube with Setscrew Optic Retention | \$55.00 | Today |

Cage Cube Optic Mounts with SM2-Threaded Bore

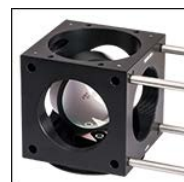
- ▶ LB5CT1 Holds Ø2" (50.8 mm) Optics up to 0.26" (6.6 mm) Thick
- ▶ LB5CT2 Holds Ø2" (50.8 mm) Optics up to 0.48" (12.3 mm) Thick
- ▶ SM2-Threaded with Included SM2RR Retaining Ring
- ▶ Compatible with LB3C(/M) and LB4C(/M) Platforms

The LB5CT1 and LB5CT2 SM2-threaded Optic Mounts hold Ø2" optics on our 60 mm Cage Cube Rotatable Platforms. The LB5CT1 and LB5CT2 Mounts hold optics up to 0.26" (6.6 mm) or 0.48" (12.3 mm) thick, respectively, using an SM2RR 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 6-32 button head screw (7/64" hex) and washer and to metric cage cube platforms using an M4 screw (3 mm hex) and washer (all mounting hardware included).

When used in an LC6W 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.



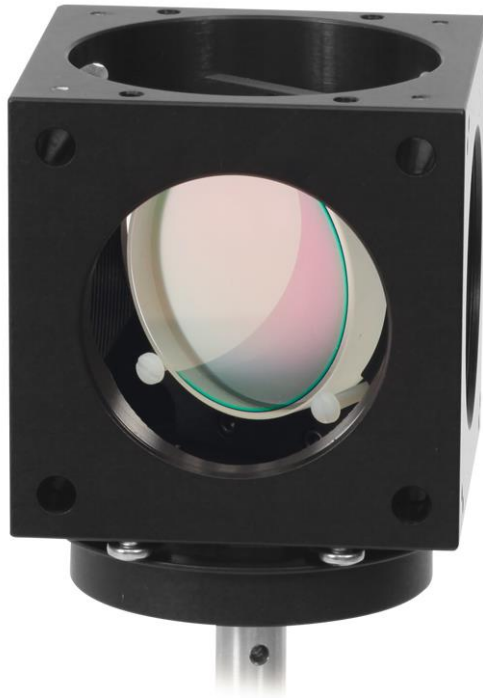
Click to Enlarge
Coated Side of Optics
Aligns to Engraved
Witness Lines



Click to Enlarge
Ø2" Mirror Mounted in
LC6W Cage Cube using
an LB5CT2 Mount and an
LB3C Platform

| Part Number | Description | Price | Availability |
|-------------|---|---------|--------------|
| LB5CT1 | Customer Inspired!Ø2" Optic Mount with SM2-Threaded Bore for 60 mm Cage Cube, Mounts Optics up to 6.6 mm Thick | \$57.50 | Today |
| LB5CT2 | Customer Inspired!Ø2" Optic Mount with SM2-Threaded Bore for 60 mm Cage Cube, Mounts Optics up to 12.3 mm Thick | \$60.00 | Today |

60 mm Cage Cubes and Accessories - Google Chrome
 Thorlabs, Inc. [US] | https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=3940&pn=LBSC



The LFFM1 Rectangular Filter Holder shown mounted to a LB3C Cube Platform in a LC6W Cube.
 m Newton, New Jersey

Available / Ships
 ✓ Today ✗

Unsaved Changes!
 ✗

Click to Enlarge
 [APPLIST]
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 LFFM1 Rectangular Filter Holder shown mounted to a LB3C Cube Platform in a LC6W Cube.
 m Newton, New Jersey

Available / Ships
 ✗ Lead Time

Cage Cube Optic Mount with Nylon-Tipped Setscrew

- ▶ Holds Ø2" (50.8 mm) Optics Thicker than 0.12" (3.0 mm)
- ▶ Compatible with LB3C(M) and LB4C(M) Platforms


The LBSC1 Optic Mount uses a setscrew to hold Ø2" optics on our 60 mm Cage Cube 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 6-32 button head screw (7/64" hex).

60 mm Cage Cubes and Accessories - Google Chrome
 Thorlabs, Inc. [US] | https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=3940&pn=LBSC

Two Spring-Loaded Clamping Mechanisms Secure Optic's Position
 ▶ Compatible with LB3C(M) and LB4C(M) Platforms

The LFFM1 Cage-Compatible Filter Holder is specifically designed to hold rectangular or square filters up to 2.5" (63.5 mm) tall and 36 mm wide.

The LFFM1 can be directly mounted to the LB3C(M) or LB4C(M) platforms.



Click to Enlarge
 [APPLIST]
 [APPLIST]
 LFFM1 Rectangular Filter Holder shown mounted to a LB3C Cube Platform in a LC6W Cube.
 m ship from Newton, New Jersey

Available / Ships
 \$5.00 ✓ Today ✗

Unsaved Changes!
 ✗

Click to Enlarge
 [APPLIST]
 [APPLIST]
 Ø2" Beamsplitter Mounted in LC6W Cage Cube with LBSC Mount and LB4C Platform.
 m ship from Newton, New Jersey

Part Number - Universal
 Price Available / Ships
 LBSC Ø2" Optic Mount for 60 mm Cage Cube with Nylon Retaining Screws \$55.20 ✗ Lead Time

Cage Cube Optic Mount with Nylon-Tipped Setscrew

- ▶ Holds Ø2" (50.8 mm) Optics Thicker than 0.12" (3.0 mm)
- ▶ Compatible with LB3C(M) and LB4C(M) Platforms

The LBSC1 Optic Mount uses a setscrew to hold Ø2" optics on our 60 mm Cage Cube 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 6-32 button head screw (7/64" hex).