

## LCFW5 - February 3, 2025

Item # LCFW5 was discontinued on February 3, 2025. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

### CAGE SYSTEM FILTER WHEELS

- ▶ Available for 16 mm, 30 mm, and 60 mm Cages
- ▶ Wheels Index to Each Filter
- ▶ Lens Tube Compatible Entry and Exit Ports



**LCFW5**  
60 mm Cage  
Compatible



**SCFW6**  
16 mm Cage  
Compatible



**CFW6**  
30 mm Cage  
Compatible

#### Application Idea



LCFW5 shown with Ø2" absorptive ND filters and six cage rods installed. Note that only the bottom two cage rods pass through the mount. On the top, two

## OVERVIEW

### Features

- Quickly Rotate Wheel to Change Filters
- Available for Ø1/2" (Ø12.5 mm), Ø1" (Ø25 mm), Ø2" (Ø50 mm) Filters
- SM-Threaded Through Port for Lens Tube Compatibility
- Filter Wheel Slots are SM05, SM1, or SM2 Threaded
- Retaining Rings Included
- Post Mountable with Bottom Taps

Thorlabs offers cage filter wheels for its 16 mm, 30 mm, and 60 mm cage systems that are SM threaded to accept Ø1/2" (Ø12.5 mm), Ø1" (Ø25 mm), Ø2" (Ø50 mm) filters, respectively. Unmounted filters can be secured in the six filter slots using the provided retaining rings. Thorlabs offers spanner wrenches for tightening the retaining rings. On each rotation of the filter wheel, a spring-loaded detent mechanism locks a filter into alignment with the bore that is centered along the cage system's mechanical axis. The centered bore is also SM-threaded on both input and output ports to allow lens tubes and mounted or unmounted filters to be connected to the main body. In addition, the bottoms of the filter wheels feature tapped holes that make them post mountable.

The 30 mm and 60 mm filter wheel designs allow the two bottom cage rods to pass through the entire mount. The upper two cage rods terminate just before the filter wheel to allow the filter wheel to rotate unimpeded. The 16 mm cage filter wheel requires that all cage rods terminate at the mount to ensure unimpeded rotation of the filter wheel. The maximum thickness of the filters accepted by each wheel is given below.

## CAGE OVERVIEW

Cage System Overview

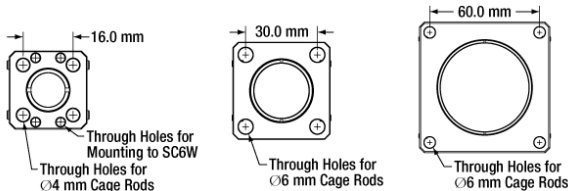
The Cage Assembly System provides a convenient way to construct large optomechanical systems with an established line of precision-machined building blocks designed for high flexibility and accurate alignment.

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 below). 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.

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.



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

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 (2.80")

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	
Replacement Setscrews		Replacement setscrews are offered for our 16 mm (SS4B013, SS4B025, and SS4B038) and 30 mm (SS4MS5 and SS4MS4) cage systems products.
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.

16 mm Cage Filter Wheel for Ø1/2" (Ø12.5 mm) Filters



- ▶ Wheel Holds up to Six Unmounted Ø1/2" (Ø12.5 mm) Filters
- ▶ Maximum Filter Thickness: 0.19" (4.7 mm)
- ▶ SM05-Threaded (0.535"-40) Through Ports on Main Body
- ▶ Includes Six SM05RR Retaining Rings
- ▶ Bottom Taps for Post Mounting

The SCFW6 is designed for our 16 mm cage system and has six SM05-threaded filter holders for Ø1/2" (Ø12.5 mm) optics. The spring-loaded wheel features indents that click into place, centering the filter in the cage. The stationary input and output ports of the main body are also SM05-threaded for compatibility with our Ø1/2" lens tubes. Each cage rod through hole is accompanied by a side-located locking 4-40 setscrew, which can be secured using a 0.05" (1.3 mm) hex key. For compatibility with standard optomechanics, the bottom contains an 8-32 and an M4 tapped hole, as well as two 4-40 and two M3 x 0.5 tapped holes.

The filter wheel rotates around a 5/32" hex shoulder screw. The filter wheel can be removed by unscrewing the shoulder screw while gently holding the filter wheel. Lift out the filter wheel to easily add or remove filters, or to switch out for another 16 mm cage system filter wheel. To replace the filter wheel back into the main body, gently hold the wheel in place while reinserting and tightening the shoulder screw. To purchase additional filter wheels without the main body, please contact Tech Support.

Please note that while the two bottom cage rods may pass through the mount, they will prevent the filter wheel from rotating freely. The two top cage rods cannot pass through, due to obstruction by the filter wheel.

Part Number	Description	Price	Availability
SCFW6	16 mm Cage Filter Wheel for Six Ø1/2" (Ø12.5 mm) Filters	\$131.87	Today

### 30 mm Cage Filter Wheel for Ø1" (Ø25 mm) Filters



- ▶ Holds up to Six Ø1" (Ø25.4 mm) Filters
- ▶ Maximum Filter Thickness: 0.25" (6.4 mm)
- ▶ SM1-Threaded (1.035"-40) Through Ports on Main Body
- ▶ Includes Six SM1RR Retaining Rings
- ▶ Bottoms Taps for Post Mounting

The CFW6/(M) is designed for our 30 mm cage system and has six SM1-threaded filter holders for Ø1" (Ø25 mm) optics. The spring-loaded wheel features indents that click into place, centering the filter in the cage. The stationary input and output ports of the main body are also SM1-threaded for compatibility with our Ø1" lens tubes. Each cage rod through hole is accompanied by a side-located locking 8-32 setscrew, which can be secured using a 5/64" (2.0 mm) hex key. For compatibility with standard optomechanics, the bottom of the imperial version has two 1/4"-20 and four 8-32 mounting holes, while the bottom of the metric version has two M6 and four M4 mounting holes.

The filter wheel rotates around a 3/16" hex shoulder screw that is locked in place by a nylon-tipped 5/64" hex setscrew located on the rear top of the main body. The filter wheel can be removed by first loosening the setscrew, and then removing the shoulder screw while gently holding the filter wheel. Lift out the filter wheel to easily add or remove filters, or to switch out for another 30 mm cage system filter wheel. To replace the filter wheel back into the main body, gently hold the wheel in place while reinserting the shoulder screw. Tighten the shoulder screw, and then retighten the 5/64" setscrew. To purchase additional filter wheels without the main body, please contact Tech Support.

Please note that while the two bottom cage rods may pass through the mount, the two top cage rods cannot, due to obstruction by the filter wheel.

Part Number	Description	Price	Availability
CFW6/M	30 mm Cage Filter Wheel for Six Ø1" (Ø25 mm) Filters, M6 and M4 Taps	\$175.81	Today
CFW6	30 mm Cage Filter Wheel for Six Ø1" (Ø25 mm) Filters, 1/4"-20 and 8-32 Taps	\$175.81	Today

### 60 mm Cage Filter Wheel for Ø2" (Ø50 mm) Filters

- ▶ Holds up to Five Ø2" (Ø50.8 mm) Filters
- ▶ Maximum Filter Thickness: 0.24" (6.0 mm)
- ▶ SM2-Threaded (2.035"-40) Through Ports on Main Body
- ▶ Includes Five SM2RR Retaining Rings
- ▶ Bottom Taps for Post Mounting



The LCFW5 is designed for our 60 mm cage system and has five SM2-threaded filter holders for Ø2" (Ø50 mm) optics. The spring-loaded wheel features indents that click into place, centering the filter in the cage. The stationary input and output ports of the main body are also SM2-threaded for compatibility with our Ø2" lens tubes. Each cage rod through hole is accompanied by a side-located locking 4-40 setscrew, which can be secured using a 0.05" (1.3 mm) hex key. For compatibility with standard optomechanics, the bottom contains a 1/4"-20 and an M6 tapped hole, as well as two 8-32 and two M4 tapped holes.

The filter wheel rotates around a 3/16" hex shoulder screw. The filter wheel can be removed by unscrewing the shoulder screw while gently holding the filter wheel. Lift out the filter wheel to easily add or remove filters, or to switch out for another 60 mm cage system filter wheel. To replace the filter wheel back into the main body, gently hold the wheel in place while reinserting and tightening the shoulder screw. To purchase additional filter wheels without the main body, please contact Tech Support.

Please note that while the two bottom cage rods may pass through the mount, the two top cage rods cannot, due to obstruction by the filter wheel.

Part Number	Description	Price	Availability
LCFW5	60 mm Cage Filter Wheel for Five Ø2" (Ø50 mm) Filters	\$228.08	Today