

CP09/M - November 23, 2020

Item # CP09/M was discontinued on November 23, 2020. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

30 MM REMOVABLE SEGMENT CAGE PLATES

▶ Insert or Remove Cage Segments while Maintaining Rigidity of Existing Cage System

▶ Flexure Cam Lock Design

▶ 0.35" and 0.50" Thick Versions

Construction Idea

(See the Overview Tab for Details)



CP45
0.35" Thick Cage Plate



CP09T
0.50" Thick Cage Plate



[Hide Overview](#)

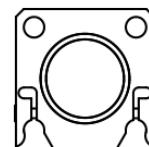
OVERVIEW

Features

- Build Removable Cage Segments for 30 mm Cage Systems
- Accepts Ø6 mm Cage Rods
- Flexure Cam Lock Design Allows Cage Segment Removal
- SM1 (1.035"-40) Internal Thread
- Two SM1RR Retaining Rings Included
- Available in 0.35" and 0.50" Thick Versions

Alternative Size Options

16 mm Removable Segment Cage Plates
30 mm Removable Segment Cage Plates
60 mm Removable Segment Cage Plates



Click for Details
 Schematic of
 Removable Segment
 Cage Plate (Flexure
 Cam Locks on Bottom)

Thorlabs' 30 mm Removable Cage Segment Plates provide the means to extract a portion of a cage system and replace it with another pre-aligned cage segment, as illustrated in the animation and images below. Unlike standard cage plates which require the cage rod to be threaded through the cage plate, these plates allow a segment of a cage system to be removed without disturbing other components in the cage system. The flexure cam locks used in these plates (shown in the schematic to the right) allow the removal of the cage plate in a direction perpendicular to the cage axis, and also securely hold the cage rods prior to locking the segment in place. These cage plates may also be mounted on our Ø1/2" Posts via an 8-32 (M4) threaded mounting hole in the bottom of the parts; the CP45, CP09T, and CP45T/M have an additional 8-32 (M4) threaded mounting hole on their top face.

Thorlabs offers 16 mm, 30 mm and 60 mm cage systems designed for Ø1/2", Ø1" and Ø2" optical components (respectively). The parts on this page are compatible with our 30 mm cage system and utilize Ø6 mm ER cage rods.

Assembling a Removable Cage Segment

Step-by-step instructions for assembling and using a removable cage segment are shown below and is also illustrated in the animation to the right.

1. Use a CP09T or CP45T/M (0.50" thick) cage plate to create an interface for a removable cage segment. Pass two cage rods completely through the through holes in the cage plate and secure them via the side-located setscrews. The CP09T uses a 0.050" hex; the CP45T/M has a 2 mm hex. The remaining cage rods are passed halfway through the flexure cam locks of the fixed CP09T or CP45T/M cage plates. Do not tighten the flexure cam locks at this point.
2. The removable cage segment can be constructed using the cage plates sold below. Slide the cage rods through the holes in each cage plate and tighten the side-located setscrews with a 5/64" (2 mm) hex key (CP45 or CP45T/M) or 0.050" (1.3 mm) hex key (CP09T or CP09/M). Please note that the cage rods in the removable segment need to be long enough so that they fit into the flexure clamp of the fixed CP09T or CP45T/M cage plates.
3. To lock the removable cage segment once it is in position, tighten all of the flexure mechanisms by tightening the cap head screws with the appropriate hex key. The CP45 cap head screws use a 5/64" hex size, while the CP09T cap head screws use a 3/32" hex size. For the metric cage plates, the CP09/M requires a 1.5 mm hex key, and the CP45T/M needs a 2.5 mm hex key. To remove the segment, loosen the screws on the flexure mechanisms and gently lift the removable segment. An example showing a completed cage system with a removable segment is shown below.



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[Hide Cage Overview](#)

CAGE OVERVIEW

Cage System Overview

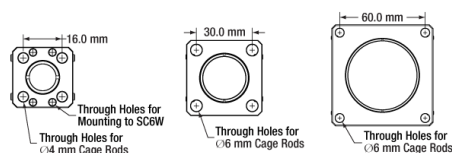
The Cage Assembly System provides a convenient way to construct large optomechanical systems with an established line of precision-machined building blocks designed for high flexibility and accurate alignment.

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 (2.8")

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	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
	30 mm	

Plates	60 mm	our FiberPorts.
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.

[Hide 30 mm Removable Segment Cage Plate](#)

30 mm Removable Segment Cage Plate

Part Number	Description	Price	Availability
CP09/M	Customer Inspired! 30 mm Removable Segment Cage Plate, 0.35" Thick, Metric	\$27.87	Lead Time
CP45T/M	30 mm Removable Segment Cage Plate, 0.50" Thick, Metric	\$29.23	Today
CP45	30 mm Removable Segment Cage Plate, 0.35" Thick	\$27.87	5-8 Days
CP09T	Customer Inspired! 30 mm Removable Segment Cage Plate, 0.50" Thick	\$29.23	Today