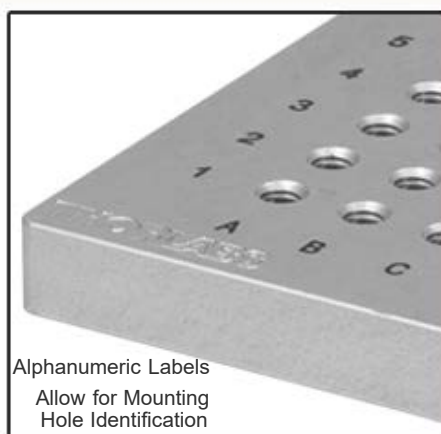


CMMP1818 - Sept. 30, 2020

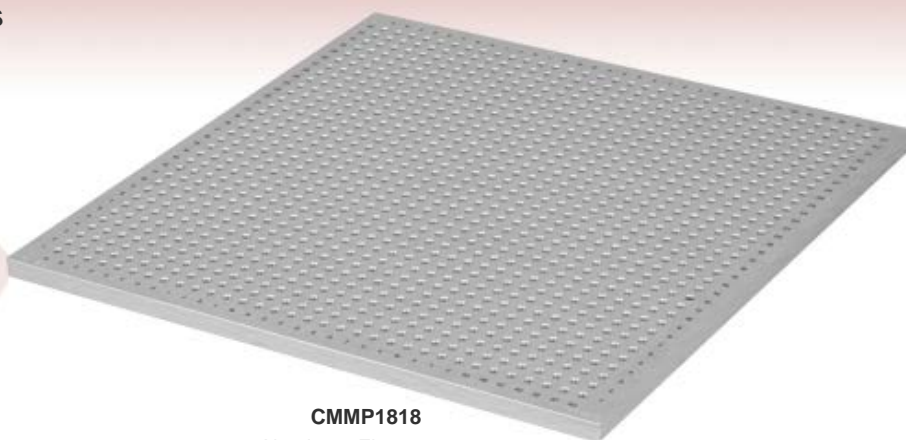
Item # CMMP1818 was discontinued on Sept. 30, 2020. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

CMM FIXTURE PLATES, ALUMINUM

- ▶ **Hard-Coat Anodized for Increased Durability**
- ▶ **1/4"-20 Tapped Through Holes for Mounting**
- ▶ **Ideal for CMM Metrology Applications**



Alphanumeric Labels
 Allow for Mounting
 Hole Identification



CMMP1818
 Aluminum Fixture
 Plate / Breadboard

OVERVIEW

Features

- Hard-Coat Anodized Aluminum Fixture Plate
- 18" x 18" (457.2 mm x 457.2 mm)
- On-Axis Alphanumeric Labels Indicate Mounting Hole Locations
- 1/4"-20 Through Tapped Holes on 0.50" (12.7 mm) Centers
- Highly Durable and Resistant to Wear and Abrasions
- Ideal for Modular Fixturing and Coordinate Measuring Machine (CMM) Metrology



Click to Enlarge
 These fixture plates provide the ideal platform for constructing modular fixture systems for use in CMM Metrology. See the *Application Idea* tab for details.

This solid aluminum, nonmagnetic fixture plate, also known as a breadboard, has been hard-coat anodized for increased abrasion resistance and durability. It provides the ideal platform for modular CMM fixturing (see *Application Idea* tab for details), prototyping optical assemblies, conducting experiments, and mounting smaller subsystems.

Each CMMP1818 fixture plate features a pattern of 1/4"-20 tapped through holes, spaced 0.5" (12.7 mm) apart, that is offset by 1.0" (25.4 mm) from the edges

Specifications

Specifications	
Size	18" x 18" (457.2 mm x 457.2 mm)
Material	Aluminum
Finish	Hard-Coat Anodized
Thickness	0.50" (12.7 mm)
Flatness	±0.006" (±0.15 mm) over 1 ft ²
Hole Size and Spacing	1/4"-20 Tapped Holes on 0.5" Centers
Number of Mounting Holes	1089
Distance from Edge to First Hole	1.0" on All Sides

of the board. This allows for an increased number of mounting options for components when compared to breadboards that have a standard 1" or 25.0 mm hole pattern or an offset double-density 0.5" or 12.5 mm hole pattern. The holes are threaded completely through these plates, allowing components to be mounted on both sides at once. Within the 1.0" wide, untapped region on each side are on-axis alphanumeric labels for identifying specific rows, columns, or mounting holes and allowing for repeatable experimental setups or modular fixturing.

Other Breadboard Options

Thorlabs offers black-anodized solid aluminum breadboards with a 1" hole spacing and double hole density aluminum breadboards with 1/2" offset hole spacing. These are offered in various sizes ranging from 4" x 6" to 30" x 30" (100 mm x 150 mm to 750 mm x 750 mm) with thicknesses of 0.5" (12.7 mm), making their slim profile ideal for compact work areas. Circular breadboards are also available with an offset double-density hole pattern.

For vacuum applications, we recommend using our selection of Unanodized Circular or Rectangular Solid Aluminum Breadboards. For limited space applications, Thorlabs offers the MS12B and MS12B/M Mini-Series Breadboards. These breadboards feature increased tapped hole density and thinner breadboard thickness.

APPLICATION IDEA

CMM Modular Fixturing

Thorlabs' CMMP1818 fixture plate provides the ideal platform for constructing modular fixture systems for use in CMM Metrology. Fixturing is the process of securing an object prior to scanning with a CMM. Modular fixturing is where off-the-shelf components are used to secure these objects without the need for custom machining. Compared to permanent custom fixturing, it is a cost effective method to secure prototypes, small or last-minute production runs, or one-time projects. Modular systems also allow for repeatable, accurate, and fast fixturing setups to be created at any time to hold any object that needs to be scanned. Thorlabs' solid aluminum CMM plates feature a durable hard-coat finish, 1089 1/4"-20 mounting taps, and on-axis alphanumeric labels to help simplify the creation of these custom fixtures.

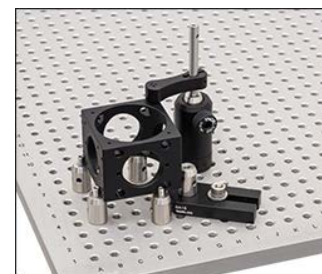
Material and Finish

Crafted from solid aluminum, our fixture plates are able to support larger components while still being lightweight for easy repositioning or movement on the work floor. Each board is hard-coat anodized for increased scratch, wear, and corrosion resistance. This coating also provides a smoother and harder surface ideal for metrology applications.

Fixture Mounting

This plate is 18" x 18", providing a large staging area capable of securing multiple objects using modular fixtures. Each has a pattern of 1/4"-20 tapped through holes, spaced 0.5" (12.7 mm) apart, that is offset by 1.0" (25.4 mm) from the edges of the board. Engraved on every side of the plate are on-axis alphanumeric labels which aid in creating reference points by identifying specific rows, columns, or mounting holes. This greatly reduces setup times and increases the repeatability between different operators.

A simple modular fixturing setup constructed on our CMMP1818 fixture plate is shown to the right. In this application a 30 mm cage cube is being fixed in place using Thorlabs' Ø1/2" post assemblies. Four TR075 0.75" Long Posts are used to create a corner base for repeatable positioning, while a fifth one is mounted on a BA1S Base to create an adjustable fifth point of contact that applies pressure on the cube, holding it in place. Finally, a post holder and metric post are combined with a PM3/M Clamping Arm to clamp the cube in place from above. Please note that our imperial Ø1/2" posts have 8-32 taps and are incompatible with the imperial PM3 clamping arms, which contain 6-32 mounting studs.



Click to Enlarge
30 mm Cage Cube Fixed in Place Using
Ø1/2" Posts, a Post Holder, a Base, a
PM3/M Clamping Arm, and Setscrews

ANODIZATION CLASSES & NBSP ;

The anodizing of aluminum is a widely utilized conversion coating technique applied to a wide range of materials and employed in various decorative and engineering applications. In the simplest of terms, anodizing is an electrochemical process that modifies the parent material's surface hardness, reflectivity, lubricity, adhesion, light suppression, and electrical /thermal insulating properties. While the anodizing process can be performed on a variety of electrically conductive materials, it is predominantly used to plate aluminum, thereby improving the component's surface properties.

Within the anodizing process, there are three alternative processes that, while similar, produce slightly different end properties: Type-I (Chromic Acid Anodize), Type-II (Sulfuric Acid Anodize), and Type-III (Hard Anodize). An explanation of each process is provided



Click to Enlarge

below. The main purpose of these three processes is to control the oxidation reaction that occurs naturally when raw aluminum is exposed to oxygen in the atmosphere.

The anodizing process starts by mounting the substrate/parts to be anodized onto a conductive rack/jig (usually constructed from titanium or aluminum); these racks are then immersed into an electrolyte solution, which has a composition that is similar to battery acid. A DC power supply is then added to the entire cell/anodizing system; this promotes electrolysis of water within the electrolyte via electron transfer and separation of water molecules, which in turn promotes oxygen evolution at the anode (hence the term anodizing).

This reaction forms a tightly packed hexagonal structured layer on the exposed surfaces of the aluminum components. Once hydrated/sealed (in most cases), the resulting item has improved corrosion resistance and is electrically insulated. The density, thickness, and sometimes color of the resultant anodic film can be precisely controlled through the use of various electrolyte solutions, concentrations, temperatures, and current densities. After this initial conversion coating has taken place, various different chemical species (i.e., PTFE, metallic species, or colored pigments) can be adsorbed / deposited into the oxidized film, which can further enhance the Anodic film's performance or aesthetics.

Unanodized Aluminum Post Holder



Click to Enlarge Type-II Anodized Aluminum Post Holder

Type-I Anodization

Type-I (Chromic Acid Anodizing) Oxidation is generally utilized for aerospace applications (soon to be replaced by Tartaric Anodizing) or general bonding applications. The standard film thickness is between 0.5 μm to 18 μm, making it too thin for external use. This type of plating provides a moderate improvement in corrosion resistance and electrical insulation as well as excellent adhesive bonding properties due to the film structure.



Click to Enlarge Type-III Anodized Aluminum Post

Type-II Anodization

Type-II (Sulfuric Acid Anodizing) Oxidation is widely used for architectural and decorative purposes due to its film structure and performance capabilities. Typical film thicknesses can range between 5 μm and 25 μm. The increased film thickness and differences in film structure compared to Type-I provide an increase in the film's abrasion resistance and electrical insulation. Films such as Type I and Type II can be machined post anodizing; however, due to the increase in hardness introduced by the anodic film tool, the lifetime of the cutting tool will be diminished.

Type-III Anodization

Type-III (Hard Anodizing/Hard-Coat) Oxidation is the thickest, densest, and most robust type of anodizing available and is predominantly used exclusively for engineering purposes. It has a typical thickness between 25 μm to 150 μm and is often referred to as 'Hard Anodizing' or 'Hard Coat Anodizing'. The increased thickness and film density produced by this type of anodizing make an extremely hard and very rugged coating with a greatly reduced wear-and-tear characteristic. This Anodic process exhibits all of the benefits offered by Type-II, but provides a lower co-efficient of friction, better corrosion resistance, and maximum surface hardness. However, due to the increased thickness and hardness of this type of anodizing, components anodized in this way cannot be easily machined post processing without specialist tooling.

Most Thorlabs components feature a Type-II matte-black anodized finish to promote light-absorption and provide improved wear resistance, while maintaining the ability to be machined with common tooling. In certain Thorlabs designs, Type-III or "Hard Coat Anodizing" has been chosen to offer maximum surface-hardness and wear resistance due to the requirements presented by the product's intended application, such as our TRA series non-magnetic, low-reflectivity aluminum posts.

BB SELECTION GUIDE

	 Nexus, Optimized Damping	 Intrinsically Damped	 Aluminum Honeycomb	 Stainless Steel	 Solid Aluminum
Construction					
Breadboard Thickness	60 mm (2.4") 110 mm (4.3")	58 mm (2.28")	25 mm (0.98") 55 mm (2.2")	12.7 mm (0.5")	7.0 mm (0.28") 9.5 mm (0.375") 12.7 mm (0.5") 19.05 mm (0.75")
Working Surface	430 Grade Stainless Steel or 304L Grade Nonmagnetic Steel Top	430 Grade Stainless Steel Top Plate	Aluminum	416 Grade Stainless Steel	Solid Aluminum Anodized or Unanodized

	Plate				
Top Skin	5 mm (0.20")	5 mm (0.20")	6 mm (0.24")	N/A	N/A
Bottom Skin	5 mm (0.20")	3 mm (0.12")	3 mm (0.12")	N/A	N/A
Core Design	High-Density Plated Steel Honeycomb, 0.26 mm Thick		High-Density Plated Aluminum Honeycomb	N/A	N/A
Side Panels	Rigid Steel Box Section	Unplasticized Polyvinyl Chloride (uPVC)	Black Laminated Aluminum Sides	N/A	N/A
Ferromagnetism	Magnetic or Non-Magnetic Options	Magnetic	Non-Magnetic	Magnetic	Non-Magnetic
Sealed Holes	Sealed (25 mm Depth) or Non-Sealed Options	Non-Sealed		N/A	N/A
Thread Options	1/4"-20 (M6) Tapped Holes	1/4"-20 (M6) Tapped Holes		1/4"-20 (M6) Tapped Holes	1/4"-20 (M6), 4-40 (M3), or 8-32 (M3) and 1/4"-20 (M6) Tapped Holes
Spacing	1" (25 mm) Centers	1" (25 mm) Centers		1" (25 mm) Centers	1" (25 mm) Centers or 0.5" (12.7 mm) Centers
Distance from Edge to First Holes	0.5" (12.5 mm) on all Sides		0.5" (12.5 mm) or 1.0" (25 mm) on all Sides	0.5" (12.5 mm) on all Sides	0.5" (12.5 mm) on all Sides
Performance^a					
Damping				N/A	N/A
Stiffness	60 mm (2.4") Thick 	58 mm (2.28") Thick 	25 mm (0.98") Thick 	12.7 mm (0.5") Thick 	7.0 mm (0.28") Thick
	110 mm (4.3") Thick 		55 mm (2.2") Thick 		19.05 mm (0.75") Thick

- The damping and stiffness performance shown here is qualitative and does not relate to exact specifications of each breadboard.

Optical Breadboard Selection Guides

The selection guides below list every size offered for our honeycomb, solid aluminum, and acrylic breadboards. Simply locate the specific width and length needed and then select the type of breadboard. Expand each table by clicking the *More [+]* button within the header.

Thorlabs also offers several unique breadboard solutions. For applications requiring temperature control, we offer anodized aluminum water cooled breadboards in several sizes, in addition to a temperature-controlled mini-series breadboard for small-scale operations. Our anodized aluminum large-area translation stages and rotating breadboards offer hand-operated positioning control, while our manual and motorized translating mounting platforms are ideal for use in microscopy applications.

Imperial Optical Breadboard Size Options										
Width	Length	Honeycomb					Stainless Steel	Solid Aluminum ^a		
		Nexus (60 mm Thick) ^b	Nexus (110 mm Thick) ^b	Intrinsically Damped (58 mm Thick)	Aluminum (25 mm Thick)	Aluminum (55 mm Thick)		Standard	Double Density	High Density

- Solid aluminum breadboards are offered with four different thicknesses: 0.5" (item # prefix MB), 0.75" (item # prefix MBH), 3/8" (item # prefix MS), or 0.28" (item # prefix MS). Select sizes are also available in hard-coat anodized aluminum (item # CMMP1818) or without an anodized coating (item #s ending with U).
- Item Number Suffix:
 - F, A, B, or G: Non-Sealed Mounting Holes
 - T, L, U, or N: Sealed Mounting Holes
 - FN or AN: Nonmagnetic Mounting Holes
 - Y or Z: No Mounting Holes
 - S: Stainless Steel
- Tapped Hole Pattern Aligned at 45°
- Build-to-Order
- Includes a T-Slot in Side Panels for Compatibility with 25 mm Rail Accessories
- This product has an access aperture.

Metric Optical Breadboard Size Options										
Width	Length	Honeycomb					Stainless Steel	Solid Aluminum ^a		
		Nexus (60 mm Thick) ^b	Nexus (110 mm Thick) ^b	Intrinsically Damped (58 mm Thick)	Aluminum (25 mm Thick)	Aluminum (55 mm Thick)		Standard	Double Density	High Density

- Solid aluminum breadboards are offered with four different thicknesses: 12.7 mm (item # prefix MB), 19.05 mm (item # prefix MBH), 9.5 mm (item # prefix MS), or 7.0 mm (item # prefix MS). Select sizes are also available without an anodized coating (item #s ending with U).
- Item Number Suffix:
 - F, A, B, or G: Non-Sealed Mounting Holes
 - T, L, U, or N: Sealed Mounting Holes
 - FN or AN: Nonmagnetic Mounting Holes
 - Y or Z: No Mounting Holes
 - S: Stainless Steel
- Tapped Hole Pattern Aligned at 45°
- Build-to-Order
- Includes a T-Slot in Side Panels for Compatibility with 25 mm Rail Accessories
- This product has an access aperture.

Part Number	Description	Price	Availability
CMMP1818	Fixture Plate for CMM Metrology, 18" x 18" x 1/2", 1/4"-20 Tapped Mounting Holes	\$883.01	Lead Time