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THORLABS

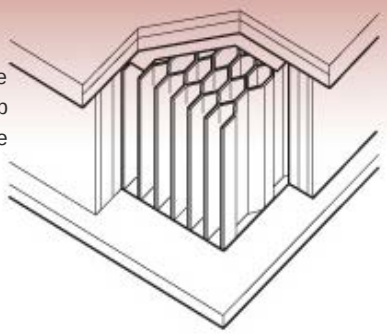
PBG12117 - September 21, 2021

Item # PBG12117 was discontinued on September 21, 2021 For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

ALUMINUM BREADBOARDS: ENHANCED STIFFNESS, 55 MM (2.2") THICK

- **All-Aluminum Construction Minimizes Thermal Instabilities**
- **High Strength-to-Weight Ratio**
- **Useful for Applications Demanding a Totally Nonmagnetic Structure**

Cutaway Showing the Internal Honeycomb Structure



PBG12118
18" x 24" UltraLight™ Optical Breadboard

OVERVIEW

Features

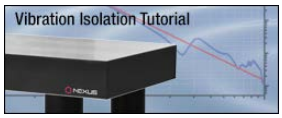
- Thickness: 55 mm (2.2")
- All-Aluminum Construction for Matching CTE to Reduce Thermal Effects
- Large Range of Sizes (W x L):
  - Imperial: 1' x 2' to 4' x 6'
  - Metric: 300 mm x 600 mm to 1250mm x 1800 mm
- Higher Rigidity than 0.5" Thick Solid Aluminum Breadboards (See *Construction* Tab for Details)
- Black Matte Painted Surface Reduces Reflectivity and Backscatter
- High-Density Honeycomb Core Provides Static and Dynamic Rigidity
- Custom Sizes Available; Contact Tech Support for Details

Key Specifications[a]		
Construction		
Breadboard Thickness	55 mm (2.2")	
Top Skin Flatness	±0.15 mm (±0.006") Over Any 0.3 m^2	
Construction	Double-Plate, Single-Honeycomb Core, Athermalized Aluminum Design	
Mounting Holes	**Imperial**	**Metric**
Threads and Spacing	1/4"-20 Tapped Holes on 1" Centers	M6 Tapped Holes on 25 mm Centers
Distance from Edge to First Holes	1.0" from Table Edge on all Sides	25.0 mm from Table Edge on all Sides
Maximum Screw Depth	6 mm (0.24") from Top Surface	

- a. For complete specifications that include specific breadboard dimensions and weights, see the *Specs* tab.

UltraLight™ Honeycomb Breadboards offer a high strength-to-weight ratio and an all-aluminum construction. Using aluminum throughout means that the breadboard will have similar coefficients of thermal expansion (CTE), which will minimize thermal instabilities. These breadboards are ideal for optical setups where portability and dynamic rigidity are important. They are typically used as replacements for aluminum, steel, or granite surface plates, as well as for applications demanding a totally nonmagnetic surface.

Choosing an Optical Breadboard



When choosing an aluminum optical breadboard, stiffness is a major consideration. For aluminum optical breadboards, Thorlabs offers two levels of stiffness: high and enhanced. Although most people associate deflection under load with thickness, it is actually the stiffness of a board that determines the deflection.

The higher the stiffness, the better the breadboard's ability to resist bending when a load or force is applied to it. Therefore, when a heavy load is placed in the center of a breadboard with high stiffness, the board will deflect more than it would if the same load were placed on an enhanced stiffness breadboard. This deflection can create misalignment between two components on opposite ends of the breadboard. This is especially important, for example, when conducting experiments that require sliding optical setups across the breadboard while maintaining a straight optical axis.

We also offer a broad selection of Nexus® Steel Honeycomb Breadboards, which provide greater stiffness and vibration damping. For a quick comparison of our different breadboard options, please see the *BB Selection Guide* tab.

Frame and Isolation Options

We offer a number of support options for breadboards. Our standard breadboard frames are available with rigid supports, or with passive or self-leveling active vibration isolation. We also offer passive and electronic isolator feet for mounting a breadboard on top of a table.

Hide Specs

SPECS

Specifications		
Construction		
Breadboard Thickness	55 mm (2.2")	
Top Skin Flatness	±0.15 mm (± 0.006") Over Any 0.3 m^2	
Construction	Double-Plate, Single-Honeycomb Core, Athermalized Aluminum Design	
Top Plate	6 mm Thick Aluminum	
Bottom Plate	3 mm Thick Aluminum	
Core	High-Density Plated Aluminum Honeycomb	
Sides	Black Laminated Aluminum Sides, Slightly Inset	
Finish	Matte Black	
Mounting Holes	**Imperial**	**Metric**
Threads and Spacing	1/4"-20 Tapped Holes, Not Sealed, on 1" Centers	M6 Tapped Holes, Not Sealed, on 25 mm Centers
Distance from Edge to First Holes	1.0" on all Sides	25.0 mm on all Sides
Maximum Screw Depth	6 mm from Top Surface	

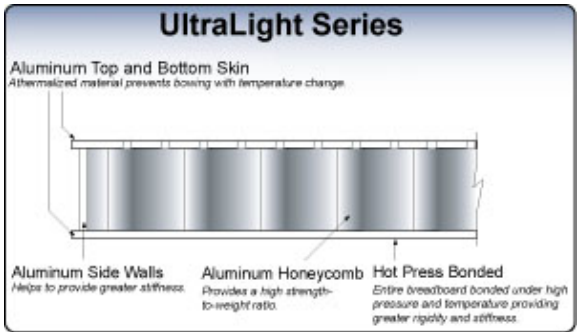
Imperial Breadboard Dimensions and Weights						Metric Breadboard Dimensions and Weights					
Item #	**Dimensions (L x W x H)**	**Unpackaged Mass**	**Unpackaged Weight**	**Packaged Shipping Mass[a]**	**Packaged Shipping Weight**	**Item #**	**Dimensions (L x W x H)**	**Unpackaged Mass**	**Unpackaged Weight**	**Packaged Shipping Mass[a]**	**Packaged Shipping Weight[a]**
PBG12102	12" x 24" x 2.2"	6.00 kg	13.00 lbs	12.00 kg	26.40 lb	PBG52502	300 x 600 x 55 mm	6.00 kg	13.00 lbs	12.00 kg	26.40 lbs
PBG12103	12" x 36" x 2.2"	8.00 kg	18.00 lbs	17.00 kg	37.40 lb	PBG52503	300 x 900 x 55 mm	8.00 kg	18.00 lbs	16.00 kg	35.20 lbs
PBG12118	18" x 24" x 2.2"	8.00 kg	17.64 lbs	14.32 kg	31.50 lb	PBG52522	450 x 600 x 55 mm	8.20 kg	18.00 lbs	15.34 kg	33.75 lbs
PBG12105	24"' x 24" x 2.2"	12.00 kg	27.00 lbs	20.96 kg	51.41 lb	PBG52505	600 x 600 x 55 mm	11.00 kg	24.00 lbs	20.00 kg	44.00 lbs

PBG12106	24" x 36" x 2.2"	16.00 kg	35.00 lbs	29.00 kg	63.80 lb	PBG52506	600 x 900 x 55 mm	16.00 kg	35.00 lbs	28.00 kg	60.00 lbs
PBG12108	24" x 60" x 2.2"	26.00 kg	57.00 lbs	43.00 kg	94.60 lb	PBG52508	600 x 1500 x 55 mm	27.00 kg	60.00 lbs	44.00 kg	94.60 lbs
PBG12110	30" x 36" x 2.2"	21.00 kg	46.30 lbs	35.00 kg	68.39 lb	PBG52510	750 x 900 x 55 mm	20.00 kg	44.00 lbs	36.00 kg	79.37 lbs
PBG12111	30" x 48" x 2.2"	27.00 kg	60.00 lbs	46.00 kg	96.80 lb	PBG52511	750 x 1200 x 55 mm	26.50 kg	58.42 lbs	43.00 kg	103.62 lbs
PBG12113	36" x 48" x 2.2"	32.00 kg	71.00 lbs	54.00 kg	118.80 l	PBG52513	900 x 1200 x 55 mm	27.00 kg	59.00 lbs	51.00 kg	112.20 lbs
PBG12114	36" x 60" x 2.2"	39.00 kg	86.00 lbs	64.00 kg	140.80 l	PBG52514	900 x 1500 x 55 mm	39.50 kg	87.08 lbs	63.00 kg	140.80 lbs
PBG12117	48" x 72" x 2.2"	64.00 kg	141.0 lbs	134.00 kg	293.38 l	PBG52521	1250 x 1800 x 55 mm	66.00 kg	145.00 lbs	95.00 kg	352.00 lbs

- a. These masses/weights are approximate and are subject to change. The information is only to be used as a guideline.

CONSTRUCTION

Thorlabs UltraLight™ optical breadboards offer high strength-to-weight ratio and excellent thermal stability. These breadboards are ideal for optical setups where portability and dynamic rigidity are important.



Click to Enlarge

Minimum Relative Breadboard Motion

The UltraLight™ range incorporates a double-plate, single-honeycomb design, providing excellent stiffness and dynamic rigidity. The top layer consists of a 6 mm aluminum top plate. The second layer adds the main aluminum honeycomb structure and the 3 mm aluminum bottom plate. The main honeycomb core is fabricated from strips of precision-formed plated aluminum, which is bonded together with a high-tensile-strength epoxy adhesive.

Excellent Surface Flatness

Breadboard flatness is critically important during many experimental setups. Lack of local flatness requires readjustment of components for height variations across the breadboard and can cause component “wobble”. Thorlabs breadboards offer unsurpassed flatness due to the high-precision aluminum plates, which are specially handled to maintain superior flatness throughout the manufacturing process. A unique thermal bonding process ensures that stress is not induced during manufacture, thereby retaining the flatness of the top plate.

Athermalized Design

Thorlabs breadboards have matched aluminum for both the top and bottom plates. This unique athermalized design eliminates thermal bowing effects caused by temperature variations.

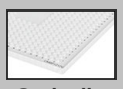
TUTORIAL

Optical Tables Tutorial

1. The Need For Optical Tables
2. Sources Of Vibration
3. Theory Of Tabletop Vibration
4. Tabletop Design
5. Theory Of Vibration Isolation
6. Table Isolator Design
7. Conclusion

[click for tutorial]

BB SELECTION GUIDE

Breadboards	 Nexus, Optimized Damping	 Intrinsically Damped	 Aluminum Honeycomb	 Stainless Steel	 Solid Aluminum	 Optically Clear Acrylic
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")	12.7 mm (0.5")
Working Surface	430 Grade Stainless Steel or 304L Grade Nonmagnetic Steel Top Plate	430 Grade Stainless Steel Top Plate	Aluminum	416 Grade Stainless Steel	Solid Aluminum Anodized or Unanodized	Acrylic
Top Skin	5 mm (0.20")	5 mm (0.20")	6 mm (0.24")	N/A	N/A	N/A
Bottom Skin	5 mm (0.20")	3 mm (0.12")	3 mm (0.12")	N/A	N/A	N/A
Core Design	High-Density Plated Steel Honeycomb, 0.26 mm Thick		High-Density Plated Aluminum Honeycomb	N/A	N/A	N/A
Side Panels	Rigid Steel Box Section	Unplasticized Polyvinyl Chloride (uPVC)	Black Laminated Aluminum Sides	N/A	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	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	1/4-20" 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	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	1.0" (25.4 mm) on all Sides
Performance[a]						
Damping				N/A	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")	7.0 mm (0.28") Thick	12.7 mm (0.5") Thick

	 110 mm (4.3") Thick		 55 mm (2.2") Thick	Thick	 19.05 mm (0.75") Thick	

- a. 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 More [+]

Width	Length	Honeycomb					Stainless Steel	Solid Aluminum[a]			Acrylic, Transparent
		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	

- a. 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 without an anodized coating (item #s ending with U).
- b. 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
- c. Tapped Hole Pattern Aligned at 45°
- d. Build-to-Order
- e. Includes a T-Slot in Side Panels for Compatibility with 25 mm Rail Accessories
- f. This product has an access aperture.

Metric Optical Breadboard Size Options More [+]

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

- a. 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).
- b. 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
- c. Tapped Hole Pattern Aligned at 45°
- d. Build-to-Order
- e. Includes a T-Slot in Side Panels for Compatibility with 25 mm Rail Accessories
- f. This product has an access aperture.

Imperial Breadboards, Stocked in USA

Part Number	Description	Price	Availability
PBG12118	UltraLight Series II Breadboard, 18" x 24" x 2.2", 1/4"-20 Taps	$733.68	Today
PBG12105	UltraLight Series II Breadboard, 24" x 24" x 2.2", 1/4"-20 Taps	$888.42	Today
PBG12106	UltraLight Series II Breadboard, 24" x 36" x 2.2", 1/4"-20 Taps	$1,140.55	Today
PBG12110	UltraLight Series II Breadboard, 30" x 36" x 2.2", 1/4"-20 Taps	$1,316.94	Today
PBG12111	UltraLight Series II Breadboard, 30" x 48" x 2.2", 1/4"-20 Taps	$1,615.61	Today
PBG12113	UltraLight Series II Breadboard, 36" x 48" x 2.2", 1/4"-20 Taps	$1,848.25	Today
PBG12114	UltraLight Series II Breadboard, 36" x 60" x 2.2", 1/4"-20 Taps	$2,191.29	Lead Time

Imperial Breadboards, Custom Order

Part Number	Description	Price	Availability
PBG12102	UltraLight Series II Breadboard, 12" x 24" x 2.2", 1/4"-20 Taps	$615.72	Lead Time
PBG12103	UltraLight Series II Breadboard, 12" x 36" x 2.2", 1/4"-20 Taps	$733.68	Lead Time
PBG12108	UltraLight Series II Breadboard, 24" x 60" x 2.2", 1/4"-20 Taps	$1,615.61	Today
PBG12117	UltraLight Series II Breadboard, 48" x 72" x 2.2", 1/4"-20 Taps	$3,306.95	Lead Time

Metric Breadboards, Stocked in UK

Part Number	Description	Price	Availability
PBG52511	UltraLight Series II Breadboard, 750 x 1200 x 55 mm, M6 Taps	$1,615.61	Today
PBG52513	UltraLight Series II Breadboard, 900 x 1200 x 55 mm, M6 Taps	$1,848.25	Lead Time
PBG52514	UltraLight Series II Breadboard, 900 x 1500 x 55 mm, M6 Taps	$2,191.29	3-4 Weeks
PBG52505	UltraLight Series II Breadboard, 600 x 600 x 55 mm, M6 Taps	$888.42	Lead Time
PBG52506	UltraLight Series II Breadboard, 600 x 900 x 55 mm, M6 Taps	$1,140.55	Lead Time
PBG52508	UltraLight Series II Breadboard, 600 x 1500 x 55 mm, M6 Taps	$1,615.61	Lead Time
PBG52510	UltraLight Series II Breadboard, 750 x 900 x 55 mm, M6 Taps	$1,316.94	Lead Time
PBG52521	UltraLight Series II Breadboard, 1250 x 1800 x 55 mm, M6 Taps	$3,306.95	3-4 Weeks
PBG52522	UltraLight Series II Breadboard, 450 x 600 x 55 mm, M6 Taps	$733.68	Today

Metric Breadboards, Custom Order

Part Number	Description	Price	Availability
PBG52502	UltraLight Series II Breadboard, 300 x 600 x 55 mm, M6 Taps	$615.72	Lead Time
PBG52503	UltraLight Series II Breadboard, 300 x 900 x 55 mm, M6 Taps	$733.68	Lead Time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