

56 Sparta Avenue • Newton, New Jersey 07860  
 (973) 300-3000 Sales • (973) 300-3600 Fax  
 www.thorlabs.com

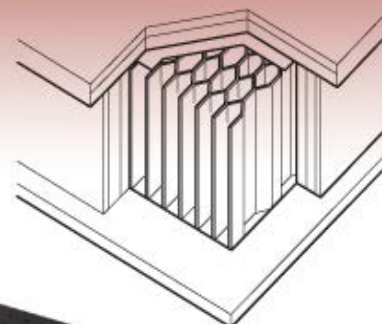


## PBG11115 - May 21, 2015

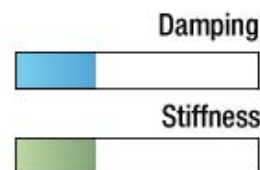
Item # PBG11115 was removed from our e-commerce site on May 21, 2015. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

### ALUMINUM BREADBOARDS: HIGH STIFFNESS, 25 MM (0.98") THICK

- ▶ All Aluminum Construction
- ▶ High Strength-to-Weight Ratio
- ▶ Excellent Thermal Stability
- ▶ Ideal for Optical Setups
- ▶ Used for Applications Demanding a Totally Nonmagnetic Structure



UltraLight™  
Optical Breadboards



[Hide Overview](#)

#### OVERVIEW

##### Features

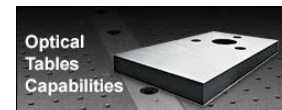
- 25 mm (0.98") Thickness
- UltraLight Breadboards are 20% Lighter than Equivalent Solid Aluminum Surface Plates
- All-Aluminum Construction Results in Excellent Thermal Stability
- Higher Rigidity than 0.5" Thick Solid Aluminum Breadboards (see *Construction Tab* for Details)
- Black Matte Painted Surface Reduces Reflectivity and Backscatter
- High Density Core Provides Static and Dynamic Rigidity

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. 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. 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 was placed on an enhanced stiffness breadboard. This deflection can create misalignment between two components on opposite ends of the breadboard. This feature is especially important, for example, when conducting experiments that require

Key Specifications	Imperial Breadboards	Metric Breadboards
<b>Flatness</b>	±0.15 mm (±0.006") Over Any 0.3 m <sup>2</sup>	
<b>Mounting Holes</b>	1/4"-20 Tapped Holes on 1" Centers	M6 Tapped Holes on 25 mm Centers
<b>Distance From Edge to First Holes</b>	1.0" on All Sides	25 mm on All Sides



sliding optical setups across the breadboard while maintaining a straight optical axis.

[Hide Specs](#)

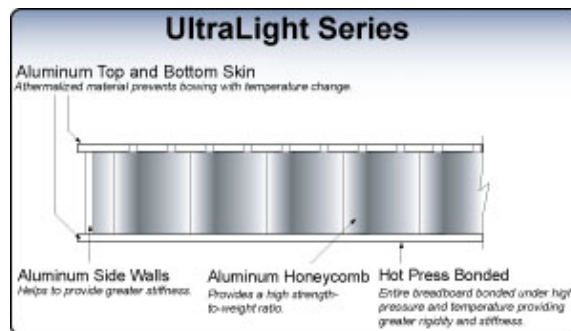
**S P E C S**

Finish and Construction	
<b>Breadboard Thickness</b>	25 mm (0.98")
<b>Flatness</b>	±0.15 mm (±0.006") over any 0.3 m <sup>2</sup>
<b>Construction</b>	Double-Plate, Single-Honeycomb Core, Athermalized Design
<b>Top and Bottom Plates</b>	Matched materials for athermalized design. Top 6 mm thick, Bottom 3 mm thick
<b>Material</b>	Aluminium
<b>Core</b>	High-Density plated aluminum honeycomb
<b>Sides</b>	Black laminated-aluminum sides, slightly inset
<b>Finish</b>	Matte Black
<b>Mounting Holes</b>	Metric Tables: M6 tapped holes not sealed, on 25 mm centers Imperial Tables: 1/4"-20 tapped holes not sealed, on 1" centers
<b>Distance from Edge to First Hole</b>	Metric Tables: 25 mm on all sides Imperial Tables: 1.0" on all sides
<b>Maximum Screw Depth</b>	6 mm from Top Surface

[Hide Construction](#)

**C O N S T R U C T I O N**

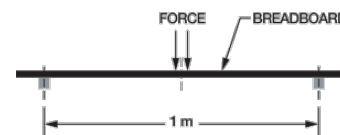
Thorlabs UltraLight™ optical breadboards offer high strength-to-weight ratio and excellent thermal stability. These breadboards are ideal for optical setups where portability and dynamic rigidity are important.



[Click to Enlarge](#)

**Stiffness Comparison: PBG Series (Honeycomb Aluminum Breadboard) vs. MB Series (Solid Aluminum Breadboard)**

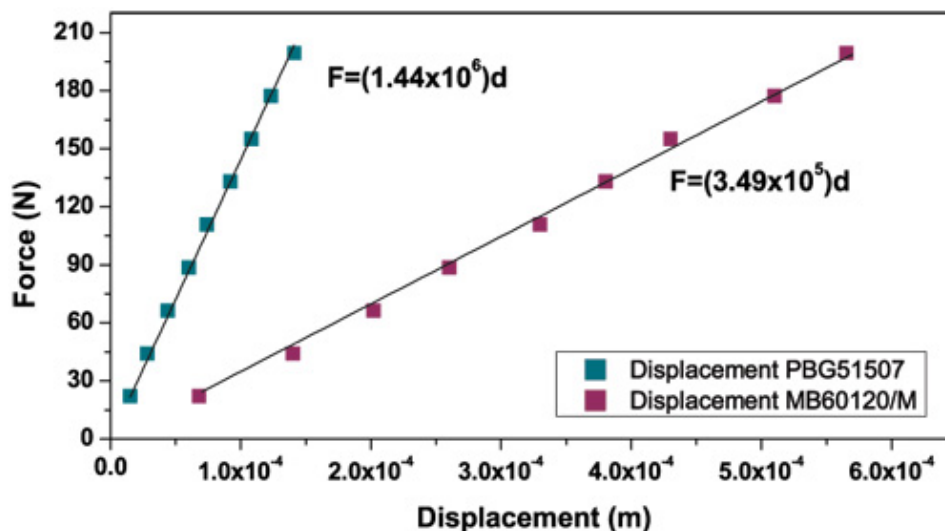
Deflection data was acquired for a 1" thick PBG51507 honeycomb aluminum breadboard and a 0.5" thick MB60120/M solid aluminum breadboard. The UltraLight PBG51507 breadboard measured 600 mm x 1200 mm x 25 mm with an unpackaged mass of 19.5 kg, while the MB60120/M breadboard measured 600 mm x 1200 mm x 12.5 mm with an unpackaged mass of 23 kg. As shown in the schematic to the right, each table was supported by fulcrum points that were spaced 1 m apart. Then, various loads were applied uniformly across the center of the breadboard and the amount of deflection was measured. From the data collected, a plot of Load vs. Deflection was created as shown below; from the plot, it is clear that the UltraLight PBG series of honeycomb aluminum breadboards are lighter and stiffer than our 0.5" thick MB-series of solid aluminum breadboards.



The data yields two important results:

- The PBG51507 honeycomb aluminum breadboard, which is 15% lighter than the MB60120/M solid aluminum breadboard, is 4.3 times stiffer
- For a given weight, the UltraLight breadboard is effectively 5.1 times stiffer than the solid aluminum breadboard

Therefore, our UltraLight series of breadboards is an excellent choice if you are looking for a light-weight breadboard with extremely good rigidity.



#### 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 6mm aluminum top plate. The second layer adds the main aluminum honeycomb structure and the 3mm 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.

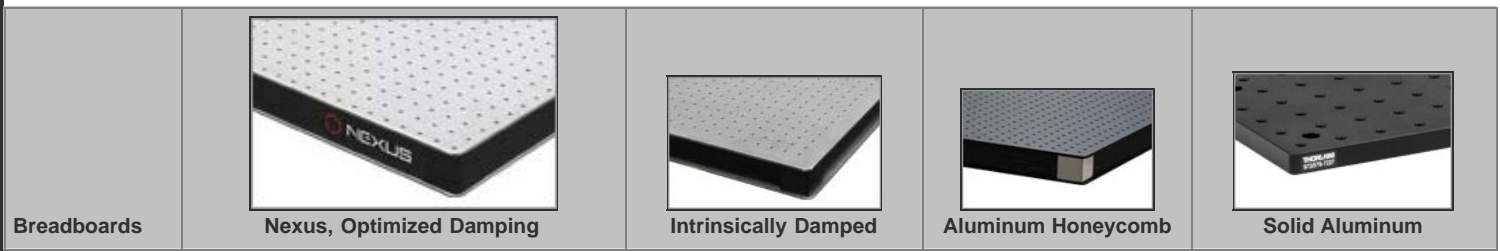
[Hide Weights & Dims](#)

## WEIGHTS &amp; DIMS



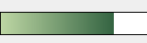






Part Number	Dimensions (L X W X H)	Unpackaged Mass (kg)	Unpackaged Weight (lbs)	Packaged Mass (kg)*	Packaged Weight (lbs)*
PBG11101	1' x 1' x 0.98"	3.17	7.00	7.00	15.40
PBG11102	2' x 1' x 0.98"	5.00	11.02	11.00	24.20
PBG11103	3' x 1' x 0.98"	9.07	20.00	15.03	33.07
PBG11104	4' x 1' x 0.98"	10.00	22.05	20.00	44.09
PBG11118	2' x 1.5' x 0.98"	7.71	17.00	16.00	35.20
PBG11105	2' x 2' x 0.98"	9.07	20.00	20.00	44.00
PBG11106	3' x 2' x 0.98"	13.15	29.00	27.94	61.60
PBG11107	4' x 2' x 0.98"	20.41	45.00	33.93	74.80
PBG11108	5' x 2' x 0.98"	24.00	52.91	37.92	83.60
PBG11110	3' x 2.5' x 0.98"	15.90	35.00	32.93	72.60
PBG11111	4' x 2.5' x 0.98"	25.00	55.00	41.91	92.40
PBG11112	3' x 3' x 0.98"	21.00	46.30	38.91	85.80
PBG11113	4' x 3' x 0.98"	30.94	68.20	50.90	112.20
PBG11114	5' x 3' x 0.98"	40.92	90.20	62.90	138.60
PBG11115	4' x 4' x 0.98"	37.00	81.57	67.86	149.60
<b>Metric</b>					
PBG51501	300 mm x 300 mm x 25 mm	3.17	7.00	6.99	15.40
PBG51502	600 mm x 300 mm x 25 mm	5.00	11.00	11.00	24.20
PBG51503	900 mm x 300 mm x 25 mm	14.06	31.00	15.03	33.00
PBG51504	1200 mm x 300 mm x 25 mm	9.00	19.84	17.72	39.60
PBG51522	600 mm x 450 mm x 25 mm	8.16	18.00	15.31	33.75
PBG51505	600 mm x 600 mm x 25 mm	10.43	23.00	20.00	44.00
PBG51506	900 mm x 600 mm x 25 mm	15.00	33.00	25.90	57.00
PBG51507	1200 mm x 600 mm x 25 mm	16.78	37.00	33.93	74.80
PBG51508	1500 mm x 600 mm x 25 mm	21.00	46.20	20.95	46.20
PBG51509	750 mm x 750 mm x 25 mm	14.00	30.86	26.00	57.20
PBG51510	900 mm x 750 mm x 25 mm	18.14	40.00	31.93	70.40
PBG51511	1200 mm x 750 mm x 25 mm	25.00	55.00	39.92	88.00
PBG51512	900 mm x 900 mm x 25 mm	23.13	51.00	36.92	81.40
PBG51513	1200 mm x 900 mm x 25 mm	29.94	66.00	50.90	112.20
PBG51514	1500 mm x 900 mm x 25 mm	39.92	88.00	56.88	125.40

\*These weights are approximate and are subject to change. The information is only to be used as a guideline

**BB SELECTION GUIDE**



<b>Construction</b>				
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")
Working Surface	430 Grade Stainless Steel Top Plate		Aluminum	Solid Aluminum Anodized or Unanodized
Top Skin	5 mm (0.20")	5 mm (0.20")	6 mm (0.24")	N/A
Bottom Skin	5 mm (0.20")	3 mm (0.12")	3 mm (0.12")	N/A
Core Design	High-Density Plated Steel Honeycomb, 0.26 mm Thick		High-Density Plated Aluminum Honeycomb	N/A
Side Panels	Rigid Steel Box Section	Moisture-Resistant Medium Density Fiberboard (MDF)	Black Laminated Aluminum Sides	N/A
Ferromagnetism	Magnetic or Non-Magnetic Options	Magnetic	Non-Magnetic	
Sealed Holes	Sealed (25 mm Depth) or Non-Sealed Options	Non-Sealed		N/A
Threads and Spacing	1/4"-20 (M6) Tapped Holes on 1" (25 mm) Centers or Untapped Top Plate	1/4"-20 (M6) Tapped Holes on 1" (25 mm) Centers		
Distance from Edge to First Holes	0.5" (12.5 mm) on all Sides	1.5" (37.5 mm) on all Sides	1.0" (25 mm) on all Sides	0.5" (12.5 mm) on all Sides

<b>Performance<sup>a</sup></b>				
Damping				
Stiffness	60 mm (2.4") Thick			N/A
	110 mm (4.3") Thick			
	25 mm (0.98") Thick			
	55 mm (2.2") Thick			

• The damping and stiffness performance shown here is qualitative and does not reflect exact specifications of each breadboard.

[Hide Tutorial](#)

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

[\[click for tutorial\]](#)

[Hide Imperial Aluminum UltraLight Series I Breadboards \(Stocked in the USA\)](#)

**Imperial Aluminum UltraLight Series I Breadboards (Stocked in the USA)**

Part Number	Description	Price	Availability
PBG11102	UltraLight Series I Breadboard, 2' x 1' x 0.98", 1/4"-20 Taps	\$527.00	Today
PBG11118	UltraLight Series I Breadboard, 2' x 1.5' x 0.98", 1/4"-20 Taps	\$637.00	Today
PBG11105	UltraLight Series I Breadboard, 2' x 2' x 0.98", 1/4"-20 Taps	\$747.00	Today
PBG11103	UltraLight Series I Breadboard, 3' x 1' x 0.98", 1/4"-20 Taps	\$636.00	Lead Time
PBG11106	UltraLight Series I Breadboard, 3' x 2' x 0.98", 1/4"-20 Taps	\$964.00	Today
PBG11110	UltraLight Series I Breadboard, 3' x 2.5' x 0.98", 1/4"-20 Taps	\$1,130.00	Today
PBG11112	UltraLight Series I Breadboard, 3' x 3' x 0.98", 1/4"-20 Taps	\$1,290.00	Today
PBG11107	UltraLight Series I Breadboard, 4' x 2' x 0.98", 1/4"-20 Taps	\$1,180.00	Today
PBG11111	UltraLight Series I Breadboard, 4' x 2.5' x 0.98", 1/4"-20 Taps	\$1,400.00	Today
PBG11113	UltraLight Series I Breadboard, 4' x 3' x 0.98", 1/4"-20 Taps	\$1,620.00	Today

[Hide Imperial Aluminum UltraLight Series I Breadboards \(Custom Order\)](#)**Imperial Aluminum UltraLight Series I Breadboards (Custom Order)**

Part Number	Description	Price	Availability
PBG11101	UltraLight Series I Breadboard, 1' x 1' x 0.98", 1/4"-20 Taps	\$466.00	Lead Time
PBG11104	UltraLight Series I Breadboard, 4' x 1' x 0.98", 1/4"-20 Taps	\$815.00	Lead Time
PBG11115	UltraLight Series I Breadboard, 4' x 4' x 0.98", 1/4"-20 Taps	\$2,210.00	Lead Time
PBG11108	UltraLight Series I Breadboard, 5' x 2' x 0.98", 1/4"-20 Taps	\$1,510.00	Lead Time
PBG11114	UltraLight Series I Breadboard, 5' x 3' x 0.98", 1/4"-20 Taps	\$2,100.00	Lead Time

[Hide Metric Aluminum UltraLight Series I Breadboards \(Stocked in the UK\)](#)**Metric Aluminum UltraLight Series I Breadboards (Stocked in the UK)**

Part Number	Description	Price	Availability
PBG51501	UltraLight Series I Breadboard, 300 x 300 x 25 mm, M6 Taps	\$415.00	2 Weeks
PBG51502	UltraLight Series I Breadboard, 600 x 300 x 25 mm, M6 Taps	\$520.00	Lead Time
PBG51522	UltraLight Series I Breadboard, 600 x 450 x 25 mm, M6 Taps	\$627.00	Lead Time
PBG51505	UltraLight Series I Breadboard, 600 x 600 x 25 mm, M6 Taps	\$734.00	2 Weeks
PBG51503	UltraLight Series I Breadboard, 900 x 300 x 25 mm, M6 Taps	\$626.00	2 Weeks
PBG51506	UltraLight Series I Breadboard, 900 x 600 x 25 mm, M6 Taps	\$945.00	2 Weeks
PBG51510	UltraLight Series I Breadboard, 900 x 750 x 25 mm, M6 Taps	\$1,100.00	2 Weeks
PBG51512	UltraLight Series I Breadboard, 900 x 900 x 25 mm, M6 Taps	\$1,260.00	2 Weeks
PBG51507	UltraLight Series I Breadboard, 1200 x 600 x 25 mm, M6 Taps	\$1,160.00	2 Weeks
PBG51511	UltraLight Series I Breadboard, 1200 x 750 x 25 mm, M6 Taps	\$1,370.00	Lead Time
PBG51513	UltraLight Series I Breadboard, 1200 x 900 x 25 mm, M6 Taps	\$1,580.00	2 Weeks
PBG51514	UltraLight Series I Breadboard, 1500 x 900 x 25 mm, M6 Taps	\$1,890.00	2 Weeks

[Hide Metric Aluminum UltraLight Series I Breadboards \(Custom Order\)](#)**Metric Aluminum UltraLight Series I Breadboards (Custom Order)**

Part Number	Description	Price	Availability
PBG51509	UltraLight Series I Breadboard, 750 x 750 x 25 mm, M6 Taps	\$1,060.00	Today

Visit the *Aluminum Breadboards: High Stiffness, 25 mm (0.98") Thick* page for pricing and availability information:[http://www.thorlabs.com/newgrouppage9.cfm?objectgroup\\_id=1876](http://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=1876)