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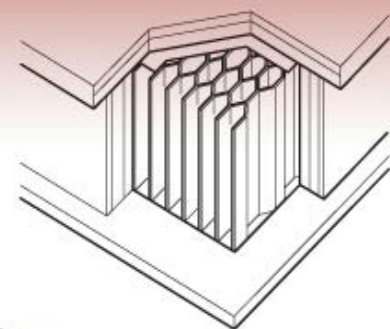


## PBG12104 - May 21, 2015

Item # PBG12104 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: ENHANCED STIFFNESS, 55 MM (2.2") 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

- 55 mm (2.2") Thick
- 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.



Optical  
Tables  
Capabilities

##### 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](#)

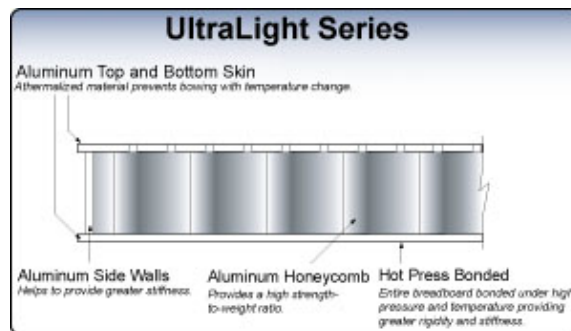
## S P E C S

Finish & Construction	
Breadboard Thickness	55 mm (2.2")
Flatness	$\pm 0.15$ mm ( $\pm 0.006$ " ) over any 0.3 m <sup>2</sup>
Construction	Double-Plate, Single-Honeycomb Core, Athermalized Design
Top and Bottom Plate Design	Matched Materials for Athermalized Design. Top 6 mm Thick, Bottom 3 mm Thick
Material	Aluminium
Core	High-Density Plated Aluminum Honeycomb
Sides	Black Laminated Aluminum Sides, Slightly Inset
Finish	Matte Black
Mounting	Imperial Tables: 1/4"-20 Tapped Holes not Sealed, on 1" Centers Metric Tables: M6 Tapped Holes not Sealed, on 25 mm Centers
Distance from Edge to First Holes	Imperial Tables: 1.0" on all Sides Metric Tables: 25 mm on all Sides
Maximum Screw Depth	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.



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### 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 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.


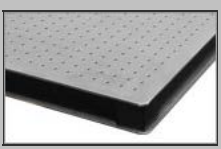
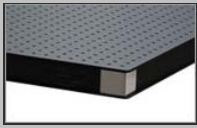



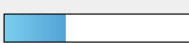






[Hide Weights & Dims](#)

**WEIGHTS & DIMS**

Imperial Part #	Dimensions (L X W X H)	Unpackaged Mass (kg)	Unpackaged Weight (lbs)	Packaged Mass (kg)*	Packaged Weight (lbs)*
PBG12102	2' x 1' x 2.2"	6.00	13.00	12.00	26.40
PBG12103	3' x 1' x 2.2"	8.00	18.00	17.00	37.40
PBG12104	4' x 1' x 2.2"	12.00	26.45	21.05	46.30
PBG12118	2' x 1.5' x 2.2"	8.00	17.64	14.32	31.50
PBG12105	2' x 2' x 2.2"	12.00	27.00	20.96	46.21
PBG12106	3' x 2' x 2.2"	16.00	35.00	29.00	63.80
PBG12108	5' x 2' x 2.2"	26.00	57.00		
PBG12109	2.5' x 2.5' x 2.2"	17.00	38.00	31.00	68.20
PBG12110	3' x 2.5' x 2.2"	20.00	44.00		
PBG12111	4' x 2.5' x 2.2"	27.00	60.00	46.00	101.20
PBG12112	3' x 3' x 2.2"	26.00	57.00		
PBG12113	4' x 3' x 2.2"	32.00	71.00	54.00	118.80
PBG12114	5' x 3' x 2.2"	39.00	86.00		
PBG12115	4' x 4' x 2.2"	42.00	93.00		
PBG12117	6' x 4' x 2.2"	64.00	141.0		
Metric Part #					
PBG52502	600 x 300 x 55 mm	6.00	13.00	12.00	26.40
PBG52503	900 x 300 x 55 mm	8.00	18.00	16.00	35.20
PBG52504	1200 x 300 x 55 mm	11.00	24.25	20.00	44.00
PBG52522	600 x 450 x 55 mm	8.20	18.00	15.34	33.75
PBG52505	600 x 600 x 55 mm	11.00	24.00	20.00	44.00
PBG52506	900 x 600 x 55 mm	16.00	35.00	28.00	61.60
PBG52507	1200 x 600 x 55 mm	21.00	46.30	21.95	48.40
PBG52508	1500 x 600 x 55 mm	27.00	60.00	27.00	59.40
PBG52510	900 x 750 x 55 mm	20.00	44.00	20.00	44.00
PBG52511	1200 x 750 x 55 mm	26.00	57.00	44.00	96.80
PBG52513	1200 x 900 x 55 mm	27.00	59.00	51.00	112.20
PBG52514	1500 x 900 x 55 mm	30.00	66.00	40.00	88.00
PBG52512	900 x 900 x 55 mm	24.00	53.00	37.00	81.40
PBG52520	1500 x 1250 x 55 mm	47.00	103.61	81.00	178.20
PBG52521	1800 x 1250 x 55 mm	66.00	145.00	95.00	209.00

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

**BB SELECTION GUIDE**

Breadboards					
	Nexus, Optimized Damping	Intrinsically Damped	Aluminum Honeycomb	Solid Aluminum	
<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				N/A	
Stiffness	60 mm (2.4") Thick			25 mm (0.98") Thick	
	110 mm (4.3") Thick			55 mm (2.2") Thick	

<sup>a</sup> The damping and stiffness performance shown here is qualitative and does not reflect exact specifications of each breadboard.

**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

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

**Imperial Aluminum Ultralight Series II Breadboards (Stocked in the USA)**

Part Number	Description	Price	Availability
PBG12118	UltraLight Series II Breadboard, 2' x 1.5' x 2.2", 1/4"-20 Taps	\$674.00	Lead Time
PBG12105	UltraLight Series II Breadboard, 2' x 2' x 2.2", 1/4"-20 Taps	\$833.00	Today
PBG12106	UltraLight Series II Breadboard, 3' x 2' x 2.2", 1/4"-20 Taps	\$1,050.00	Today
PBG12110	UltraLight Series II Breadboard, 3' x 2.5' x 2.2", 1/4"-20 Taps	\$1,220.00	Lead Time
PBG12111	UltraLight Series II Breadboard, 4' x 2.5' x 2.2", 1/4"-20 Taps	\$1,490.00	Today
PBG12113	UltraLight Series II Breadboard, 4' x 3' x 2.2", 1/4"-20 Taps	\$1,710.00	Today
PBG12114	UltraLight Series II Breadboard, 5' x 3' x 2.2", 1/4"-20 Taps	\$2,030.00	Today

[Hide Imperial Aluminum Ultralight Series II Breadboards \(Custom Order\)](#)

**Imperial Aluminum Ultralight Series II Breadboards (Custom Order)**

Part Number	Description	Price	Availability
PBG12102	UltraLight Series II Breadboard, 2' x 1' x 2.2" , 1/4"-20 Taps	\$676.00	Lead Time
PBG12109	UltraLight Series II Breadboard, 2.5' x 2.5' x 2.2", 1/4"-20 Taps	\$1,170.00	Lead Time
PBG12103	UltraLight Series II Breadboard, 3' x 1' x 2.2", 1/4"-20 Taps	\$787.00	Lead Time
PBG12112	UltraLight Series II Breadboard, 3' x 3' x 2.2", 1/4"-20 Taps	\$1,490.00	Lead Time
PBG12104	UltraLight Series II Breadboard, 4' x 1' x 2.2", 1/4"-20 Taps	\$902.00	Lead Time
PBG12115	UltraLight Series II Breadboard, 4' x 4' x 2.2", 1/4"-20 Taps	\$2,310.00	Lead Time
PBG12108	UltraLight Series II Breadboard, 5' x 2' x 2.2", 1/4"-20 Taps	\$1,600.00	Lead Time
PBG12117	UltraLight Series II Breadboard, 6' x 4' x 2.2", 1/4"-20 Taps	\$3,330.00	Lead Time

[Hide Metric Aluminum Ultralight Series II Breadboards \(Stocked in the UK\)](#)

**Metric Aluminum Ultralight Series II Breadboards (Stocked in the UK)**

Part Number	Description	Price	Availability
PBG52502	UltraLight Series II Breadboard, 600 x 300 x 55 mm, M6 Taps	\$557.00	2 Weeks
PBG52522	UltraLight Series II Breadboard, 600 x 450 x 55 mm, M6 Taps	\$664.00	2 Weeks
PBG52505	UltraLight Series II Breadboard, 600 x 600 x 55 mm, M6 Taps	\$804.00	2 Weeks
PBG52506	UltraLight Series II Breadboard, 900 x 600 x 55 mm, M6 Taps	\$1,030.00	2 Weeks
PBG52510	UltraLight Series II Breadboard, 900 x 750 x 55 mm, M6 Taps	\$1,190.00	2 Weeks
PBG52511	UltraLight Series II Breadboard, 1200 x 750 x 55 mm, M6 Taps	\$1,460.00	2 Weeks
PBG52513	UltraLight Series II Breadboard, 1200 x 900 x 55 mm, M6 Taps	\$1,670.00	2 Weeks
PBG52508	UltraLight Series II Breadboard, 1500 x 600 x 55 mm, M6 Taps	\$1,460.00	Today
PBG52514	UltraLight Series II Breadboard, 1500 x 900 x 55 mm, M6 Taps	\$1,980.00	2 Weeks
PBG52521	UltraLight Series II Breadboard, 1800 x 1250 x 55 mm, M6 Taps	\$3,280.00	Lead Time

[Hide Metric Aluminum Ultralight Series II Breadboards \(Custom Order\)](#)

### Metric Aluminum Ultralight Series II Breadboards (Custom Order)

Part Number	Description	Price	Availability
PBG52503	UltraLight Series II Breadboard, 900 x 300 x 55 mm, M6 Taps	\$776.00	Lead Time
PBG52512	UltraLight Series II Breadboard, 900 x 900 x 55 mm, M6 Taps	\$1,460.00	Lead Time
PBG52504	UltraLight Series II Breadboard, 1200 x 300 x 55 mm, M6 Taps	\$888.00	Lead Time
PBG52520	UltraLight Series II Breadboard, 1500 x 1250 x 55 mm, M6 Taps	\$2,840.00	Lead Time

Visit the *Aluminum Breadboards: Enhanced Stiffness, 55 mm (2.2") Thick* page for pricing and availability information:  
[http://www.thorlabs.com/newgrouppage9.cfm?objectgroup\\_id=1877](http://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=1877)