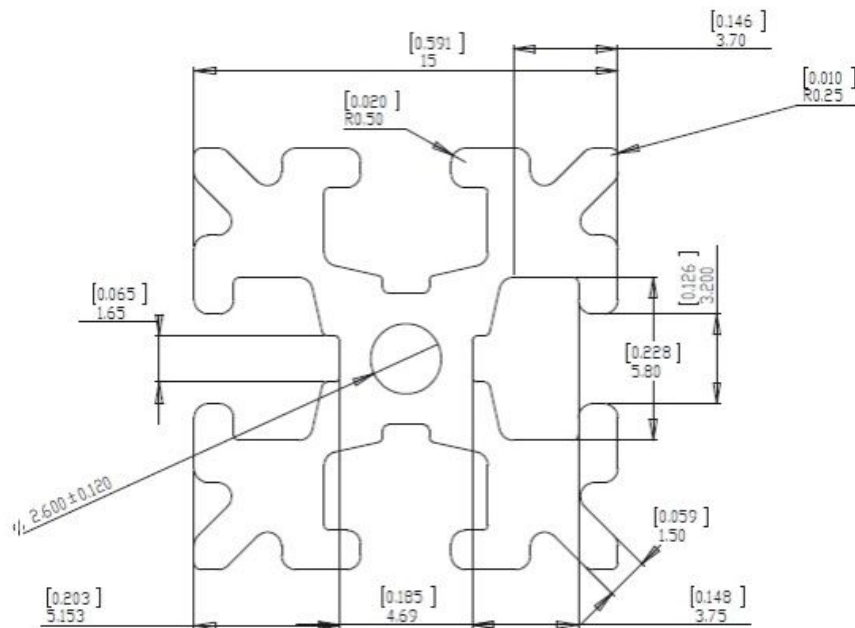


OpenBeam



Specifications

- dimensions: 15x15mm width and height, length is variable
- hollow core: the hole that runs down the extrusion is sized for an M3 sized tap.
- weight: 0,297 gram per mm
- material: aluminum , 6063-T5 black anodised
- size nuts and bolts: M3, each of the 4 slots are designed to capture a regular DIN934 M3 nut.
- stiffness area: 113,52mm²
- polar moment of inertia of the area, at the centroid = 4705,05mm⁴
- principal moments of inertia of the area, at the centroid
 - $I_x = 2352,52\text{mm}^4$
 - $I_y = 2352,52\text{mm}^4$

Notes

Lengths supplied in kit...

300, 210, 150, 120, 90, 60, 45, 30mm, 2 off of each length

The 223.5mm lengths are designed for the robot chassee, 9 supplied

You can obtain more of these lengths you just need to ask

Do **NOT** cut the lengths, you must use sizes supplied

If you must have a special length, you need to request it, it will be supplied from a separate collection of lengths.

6063 aluminium alloy

AA 6063 is an aluminium alloy, with magnesium and silicon as the alloying elements. The standard controlling its composition is maintained by [The Association of Aluminum Producers](#). It has generally good mechanical properties and is heat treatable and weldable. It is similar to the British aluminium alloy HE9.

6063 is the most common alloy used for aluminium extrusion. It allows complex shapes to be formed with very smooth surfaces fit for anodizing and so is popular for visible architectural applications such as window frames, door frames, roofs, and sign frames. Applications requiring higher strength typically use 6061 or 6082 instead.

Chemical composition

The alloy composition of 6063 is:

- Silicon minimum 0.2%, maximum 0.6% by weight
- Iron no minimum, maximum 0.35%
- Copper no minimum, maximum 0.10%
- Manganese no minimum, maximum 0.10%
- Magnesium minimum 0.45%, maximum 0.9%
- Chromium no minimum, maximum 0.10%
- Zinc no minimum, maximum 0.10%
- Titanium no minimum, maximum 0.10%
- Other elements no more than 0.05% each, 0.15% total
- Remainder Aluminium

Mechanical properties

The mechanical properties of 6063 depend greatly on the temper, or heat treatment, of the material.

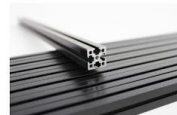
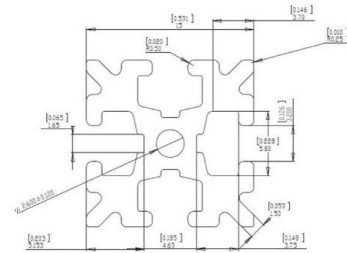
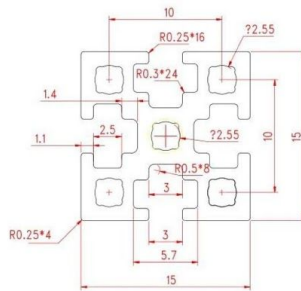
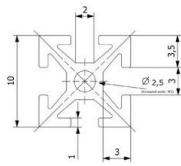
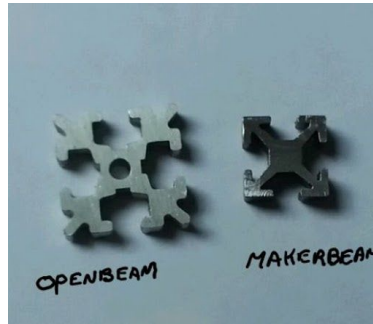
6063-T5

T5 temper 6063 has an ultimate tensile strength of at least 140 MPa (20,000 psi) in thicknesses up to 13 millimetres (0.5 in), and 130 MPa (19,000 psi) from 13 mm (0.5 in) thick, and yield strength of at least 97 MPa (14,000 psi) up to 13 millimetres (0.5 in) and 90 MPa (13,000 psi) from 13 to 25 mm (0.5 to 1 in). It has elongation of 8%.

Welding

6063 is highly weldable, using tungsten inert gas welding. Typically, after welding, the properties near the weld are those of 6063-O, a loss of strength of up to 30%. The material can be re-heat-treated to restore a higher temper for the whole piece.

Comparison to MakerBeam



Diameter	10mmx10mm	15mmx15mm	15mmx15mm
Type	T-slot, hollow core, threaded ends.	T-slot, hollow core, threaded ends.	T-slot, hollow core, sized for a M3 tap
Threaded ends	M3, 8mm deep	M3, 8mm deep	----
Weight	0,123 gram per mm	0.297 gram per mm	0,297 gram per mm
Material	Aluminum, 6063-T5	Aluminum, 6063-T5	Aluminum, 6063-T5
Finish	Anodised black or clear	Anodised black or clear	Anodised black or clear
Bolts	M3 square headed bolts for MakerBeam	M3 regular bolts	M3 regular bolts
Nuts	Regular M3 DIN934 nuts	M3 DIN934 nuts will slide into the beam	M3 DIN934 nuts will slide into the beam
Stiffness Area	48mm ²	113mm ²	113mm ²
Polar moment of inertia of the area, at the centroid:			
	982mm ⁴	4705mm ⁴	4705mm ⁴
Principal moments of inertia of the area, at the centroid:			
I _x	491mm ⁴	2352mm ⁴	2352mm ⁴
I _y	491mm ⁴	2352mm ⁴	2352mm ⁴

