

Aluminum Extrusion Types and Parts Selection

Aluminum Extrusion Tolerance Data

Aluminum Extrusion Types and Characteristics

	HFS Series	HFSL Series	EFS Series	NFS (NEFS, NFSL) Series	GFS Series	SLF Series
Photo						
Material	A6N01SS-T5	A6N01SS-T5	A6N01SS-T5	A6063S-T5	A6061SS-T6 Equivalent	A6063SS-T5
Features	Standard cross section shape.	Lightweight and economical extrusions. Suitable for use when light weight and economical price are given priority over strength.	Have rigidity equivalent to HFS Series yet lighter and more economical.	Material change to A6063S-T5 led to significant price reduction. The Cross Section Shape and Cross Sectional Moment of Inertia are the same as those of HFS, HFSL and EFS Series. Stress and tensile strength decrease due to material change. The color may vary slightly.*	These thick extrusions offer high rigidity and are suitable for use in high load.	Has 4 slotless flat enclosures. Excels in sanitary control since dust is not collected in slots. Various accessories for aluminum extrusions can be utilized by combining with Slot Type (SLFT6-4040, etc.)
Surface Treatment	Clear Anodize (HFS) Black Anodize (HFSB) Clear Coating (CAF) Baked Paint (Yellow) (HFSY)	Clear Anodize Black Anodize	Clear Anodize (EFS) Black Anodize (EFSB)	Clear Anodize Black Anodize	Clear Anodize	Clear Anodize
Representative Product	HFS8-4040	HFSL8-4040	EFS8-4040	NFS5-2020 (Different Material of HFS5-2020) NFS8-4040 (Different Material of EFS8-4040) NFSL6-3030 (Different Material of HFSL6-3030)	GFS8-100100	SLF6-4040 (No Slot Type) SLFC6-4040 (1 Slot Type)

* Aluminum extrusion colors may slightly vary depending on the materials.

Aluminum Extrusions Connection Method

Connection Method	Bracket Connection	Blind Joint Connection	Blind Brackets Connection	Screw Connection	SLF Series Connection
Connection Examples					
Features	The standard and economical connection method. Cover plates can be mounted by adding taps on the brackets.	A connection method that produces clean corners. Suitable for sections where equipment is loaded and unloaded or doors are to be mounted. Note that alterations are required to the extrusions, and available for limited extrusion models only. For applicable extrusions, see each product page. P551, 601, 659, 705	Brackets are hidden inside of slots producing clean corners. Alterations are not required. However, allowable load is smaller than that of bracket connections.	Connections only with screws can be achieved by applying tapping and counterbore alterations on the extrusions.	• Connection with dedicated joints • Screw Connection See "Features of SLF Series" for details. P725
Representative Product	HBLFNS6, HBLTS6, etc.	HCJ6, HMJ6, etc.	HBLBS6, HABLBS6, etc.	-	-

Selection of Related Parts

Numbers of applicable related parts are decided at the time of selecting aluminum extrusions. When selecting related parts, see No. as reference.

(Ex.) When assembling with HFS6-3030 aluminum extrusions of 6 series

Brackets HBLFNS6 HBLTS6 or Others	Blind Brackets Blind Joint HBLBS6 HSJ6 or Others	Nut HNTT6-Tapped Hole Dia. HNTAT6-Tapped Hole Dia. or Others
Extrusion End Caps and Covers HFC6-3030-Color HSCA6-Color or Others	Casters and Leveling Mounts HAJPS6 HCFT6-60 or Others	Door Parts HHPSN6 HMGN6 or Others
	Other Accessories HFCC6 LCSA6-Shaft Hole Dia. or Others	

Many products can be used for both 8 series and 8-45 series.

Pre-Assembly Insertion Nut HNTT8-8

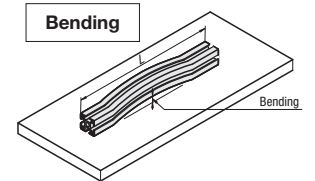
- It can be used with 8 series.
- It can be used with 8-45 series.

Various related parts can be installed to the aluminum extrusion structure according to the usage.

Aluminum Extrusion JIS Standards

Bend Tolerance (Special Grade)

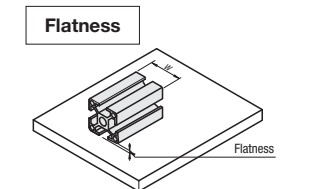
Diameter of Circumscribed Circle mm	Unit: mm		
	Minimum Thickness mm	Per Arbitrary Section of 300mm Length	per Full Length (L) mm
38 or less	2.4 or less	1.3 or less	$1.3 \times \frac{L}{300}$ or Less
	Over 2.4	0.3 or less	$0.3 \times \frac{L}{300}$ or Less
Over 38 to 300 or less	-	0.3 or less	$0.3 \times \frac{L}{300}$ or Less
Over 300	-	0.5 or less	$0.5 \times \frac{L}{300}$ or Less



Note: * Given values are for extrusions placed on flat surfaces with minimized bends by own weight.
* When the overall length is not an integral multiple of 300mm, determine the tolerance by rounding up the remainder length to 300mm.

Flatness Tolerance

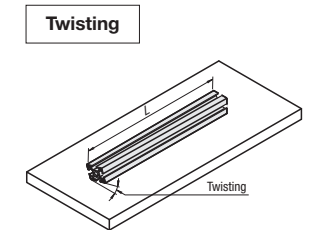
Shape Type	Unit: mm		
	General Shape	Hollow Shape	
Minimum Thickness of Measurement Point Width	-	4.7mm or Less	Over 4.7mm
25mm or Less	0.10 or less	0.15 or less	0.10 or less
Over 25mm	0.004xW or Less	0.006xW or Less	0.004xW or Less
Per Arbitrary Section of 25mm Width	0.10 or less	0.15 or less	0.10 or less



Note: Not Applicable to the plane including open section.

Twist Tolerance

Diameter of Circumscribed Circle mm	Unit: degree	
	Per Arbitrary Section of 300mm Length	per Full Length (L) mm
38 or less	1 or less	$1 \times \frac{L}{300}$ or Less; However, Max. Value is 7
Over 38 to 76 or less	1/2 or less	$\frac{1}{2} \times \frac{L}{300}$ or Less; However, Max. Value 5
Over 76	1/4 or less	$\frac{1}{4} \times \frac{L}{300}$ or Less; However, Max. Value 3



Reference: Tolerance of Outer Dimension (JIS)

Outer Dimension Tolerance (JIS)	Unit: mm		
	A Dimension	A Dimension	B Dimension
HFS5-2020	±0.41	±0.41	±0.54
HFS5-4040	±0.54	±0.54	±0.86
HFS6-3060	±0.86	±0.60	±0.86
HFS6-6060	±0.54	±0.60	
HFS8-4040	±0.86		
HFS8-8080	±0.60		
HFS8-4545	±0.86		
HFS8-9090			

*MISUMI Aluminum Extrusions are within JIS dimension tolerance above.

Mechanical Properties of Aluminum Extrusions

Series	JIS Standard (Reference)		Actual Measurement	JIS Standard (Reference)
	HFS Series	GFS Series		
Material (JIS Symbol)	A6N01SS-T5	A6061SS-T6 Equivalent		A6063S-T5
Tensile Strength (N/mm ²)	245 or more	265 or more	278	155 or more
Proof Stress (N/mm ²)	205 or more	245 or more	247	110 or more
Longitudinal Elastic Modulus (N/mm ²)	69972	69972		69972
Brinell Hardness (HB)	88	88		88
Surface Treatment	Anodize 9µm or more	Anodize 9µm or more		Anodize 9µm or more

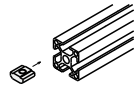
Nuts for Aluminum Extrusions - Overview

For 6 Series (Slot Width 8mm)

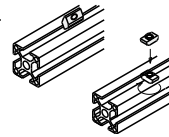
Nuts for Aluminum Extrusions - Overview

MISUMI offers variety of Pre-Assembly or Post-Assembly Insertion Nuts for Aluminum Extrusions. Select an applicable type specific to your application.

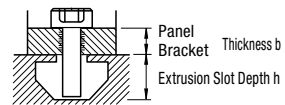
Pre-Assembly Insertion: Insert from the slot ends before assembly. Large width causes less plays in the slots, making screw tightening easy.



Post-Assembly: Mountable from slots after assembly.



Type	Photo	Features	Pre-Assembly				Post-Assembly			
			Material		Page		Material		Page	
			Steel	Stainless Steel	Single Item	Package	Steel	Stainless Steel	Single Item	Package
Standard		Most standard and economical products. Can be connected temporarily in combination with optional stoppers.	○	○	P619	P618	○	○	P622	P618
Temporary Holding (Ball Spring)		Can be moved in the extrusions smoothly. Temporary holding is repeatedly possible.	○	○	P620	P618	○	○	P623	P618
Temporary Holding (Leaf Spring)		Secure temporary holding with springs on both sides.	-	-	-	-	○	○	P623	P624
Temporary Holding (Resin Stopper)		Resin stopper on outer circumference prevents aluminum extrusions from being scratched when mounting temporarily.	○	○	P620	-	-	-	-	-
Post-Assembly Rotational		Insert the nut into the extrusion and turn it in the slot. Large nut width prevents plays.	-	-	-	-	○	○	P622	-
With Lock		Included set screw enables nut fixing. Convenient where panes and covers are removed frequently.	○	-	P621	-	○	○	P624	-
Thread Locking Adhesive Type		Reduces loosening due to vibrations caused by transfer or equipment moves. One-time use and repeated use types are available.	○	-	P619-620	-	○	-	P622-624	-
Compact (Short Nuts)		Usable with narrow pitch when multiple nuts are lined in the slots. (Approx. 40% shorter than the standard width)	○	-	P621	P621	○	-	P624	P624
Square Nuts		Sheet metal type: more economical than standard nuts.	○	○	-	P621	-	-	-	-
Screw Integrated		Requires less time for screw tightening.	-	○	P625	-	-	○	P625	-
Long Nut		Workpieces such as Linear Guides are mountable with desired pitches.	○	○	P626	-	○	○	P626	-
Offset Nut (Other than 5 Series)		When connecting the extrusions at corners with Pre-Assembly Insertion Double Joint (refer to P611), the nut does not protrude from the extrusion.	-	○	P621	-	-	-	-	-
Conductive Washers (Other than 5 Series)		Electrical conductivity between extrusions is achieved by combining with Toothed Washer (P625).	-	○	P625	-	-	-	-	-



Aluminum Extrusions and Applicable Screws to Mount Panes/Brackets (Size M - L Dim.)

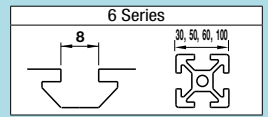
Slot Width	Extrusion Square	Depth h	Panels/Brackets Thickness b (mm) to be mounted on extrusions															
			0.8	1	1.2	1.5	2	3	4	4.5	5	6	8.2	9	10	12	14	
8	30	9	6-3	M3-8	M3-10	M3-12	M3-15	M3-18	M3-20									
			6-4	M4-8	M4-10	M4-12	M4-15	M4-18	M4-20									
			6-5	M5-8	M5-10	M5-12	M5-15	M5-18	M5-20	M5-22								
			6-6	x	M6-10	M6-12	M6-15	M6-20	M6-22									

⊗ "x" means there is no applicable screw. Use one size smaller tapped products.

Note that, for some of the types shown here, order might be unable to be received by the MISUMI Malaysia, Indonesia, and/or India offices.

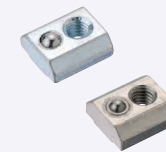
Nuts for Aluminum Extrusions - Bulk Packages

For 6 Series (Slot Width 8mm)

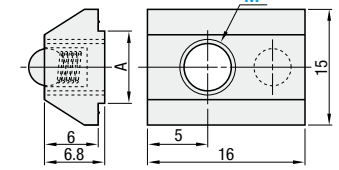


Features: Bulk packages are cost effective for in-house stock or large quantity uses.

■ Pre-Assembly Insertion Spring Nuts - Pack (100/Pkg.)



Type	Material			Surface Treatment
	Main Body	Ball	Spring	
PACK-HNTU	S10C Equivalent	SUS304	SWP-A	Trivalent Chromate
PACK-SHNTU	SUS304 Equivalent (Sintered)	SUS304	SUS304-WP8	-

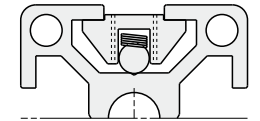


RoHS



Example

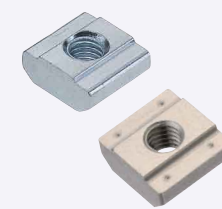
Does not fall even if the extrusion is placed vertically. Built-in spring prevents slips. Moves easily in the slot when pressed slightly by hand.



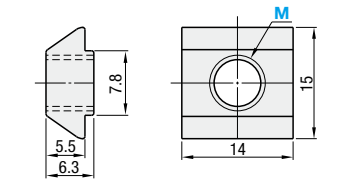
Part Number		M						Unit Price (1 ~ 10 packages)	
Type	No.							Package Price	Price per Pkg.
PACK-HNTU	6	3	4	5	6				
PACK-SHNTU									

100 pcs. per package

■ Pre-Assembly Insertion Spring Nuts - Pack (100/Pkg.)



Type	Material			Surface Treatment
	Main Body	Ball	Spring	
PACK-HNTT	S10C Equivalent	SUS304	SWP-A	Trivalent Chromate
PACK-HNTTSN	SUS316 Equivalent (Sintered)	SUS304	SUS304-WP8	-



RoHS



Example



Built-in spring prevents slips. Moves easily in the slot when pressed slightly by hand.

*Does not fall even if the extrusion is placed vertically.

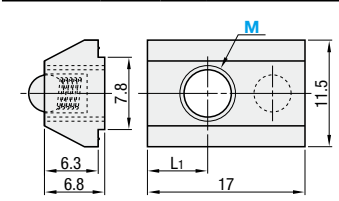
Part Number		M						Unit Price (1 ~ 10 packages)	
Type	No.							Package Price	Price per Pkg.
PACK-HNTT	6	3	4	5	6				
PACK-HNTTSN									

100 pcs. per package

■ Post-Assembly Insertion Spring Nuts - Pack (100/Pkg.)



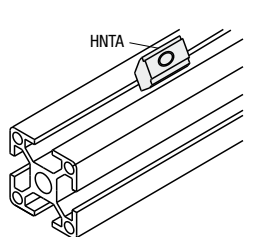
Type	Material			Surface Treatment
	Main Body	Ball	Spring	
PACK-HNTTP	S10C Equivalent	SUS304	SWP-A	Trivalent Chromate
PACK-SHNTTP	SUS304 Equivalent (Sintered)	SUS304	SUS304-WP8	-



RoHS



Example



⊗ Stoppers are sold separately. P622

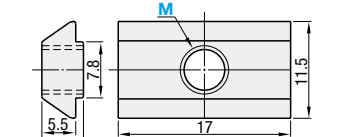
Part Number		M						Unit Price (1 ~ 10 packages)	
Type	No.							Package Price	Price per Pkg.
PACK-HNTTP	6	3	4	5	6	6	6.5		
PACK-SHNTTP									

100 pcs. per package

■ Post-Assembly Insertion Stopper Nuts / Pack (100/Pkg.)



Type	Material			Surface Treatment
	Main Body	Ball	Spring	
PACK-HNTA	S10C Equivalent	SUS304	SWP-A	Trivalent Chromate
PACK-HNTASN	SUS316 Equivalent (Sintered)	SUS304	SUS304-WP8	-



RoHS

⊗ 100 pcs. per package

Part Number		M						Unit Price (1 ~ 10 packages)	
Type	No.							Package Price	Price per Pkg.
PACK-HNTA	6	3	4	5	6				
PACK-HNTASN									

100 pcs. per package



Ordering Example: Part Number - M, PACK-HNTA6 - 6