

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	Door Parts HHPSN6 HMGN6 or Others	Other Accessories HFCC6 LCSA6-Shaft Hole Dia. or Others
Casters and Leveling Mounts HAJPS6 HCFT6-60 or Others		

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

Pre-Assembly Insertion Nut HNTT8-8

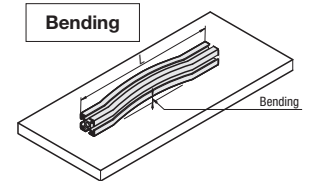
- It can be used with 8 series.
- It can be used with 8-45 series.

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

Aluminum Extrusion JIS Standards

Bend Tolerance (Special Grade)

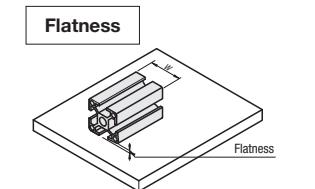
Diameter of Circumscribed Circle mm	Unit: mm		
	Minimum Thickness mm	Per Arbitrary Section of 300mm Length	per Full Length (L) mm
38 or less	2.4 or less	1.3 or less	$1.3 \times \frac{L}{300}$ or Less
	Over 2.4	0.3 or less	$0.3 \times \frac{L}{300}$ or Less
Over 38 to 300 or less	-	0.3 or less	$0.3 \times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

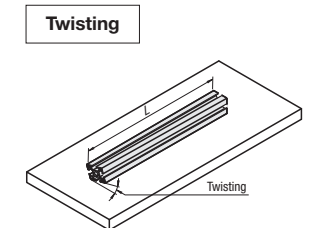
Shape Type	Unit: mm		
	General Shape	Hollow Shape	
Minimum Thickness of Measurement Point Width	-	4.7mm or Less	Over 4.7mm
25mm or Less	0.10 or less	0.15 or less	0.10 or less
Over 25mm	0.004xW or Less	0.006xW or Less	0.004xW or Less
Per Arbitrary Section of 25mm Width	0.10 or less	0.15 or less	0.10 or 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	±0.86		

*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

Alterations for Aluminum Extrusions - Overview / Labeling Service / Chamfering Alterations

(Applicable Extrusion: P.529 ~ P.690)

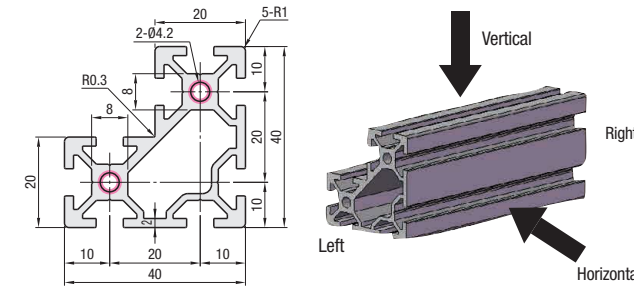
MISUMI Aluminum Extrusion products can be utilized for structure building with highly enhanced design flexibility when available alteration options are applied. Some alterations are not applicable depending on extrusion types and sizes. Check for the available alterations on each product page price lists. The hyphens (-) in the price lists denote the unavailable items.

Type	Alterations	Page	Alteration Codes	App. Example	Contents
End Tapping	End Tapping (Center Hole)	P.757	LTP/RTP/TPW LHP/RHP/HPW		Adds tapped holes on extrusion ends. Blind Joints which require this alteration • Screw Joints P.552, 603, 660, 706 • Simple Joints P.604
	End Tapping (4 Side Holes)	P.768	LSP/RSP/SPW		Adds tapped holes on extrusion corner ends.
Cutting Method Change	High Precision Cut	P.758	SC		Applies High Precision Cut with an overall length tolerance of (Standard=L±0.5)→L±0.2 * Only applicable to L≤1500
	45-Degree Cut	P.758	L□T45/R□T45		Cuts with 45-degree angle.
Drill Wrench Hole	Wrench Hole in Fixed Position	P.759	LWP/RWP		Wrench access hole(s) for Blind Joints are drilled. The hole location will be aligned with the mating extrusion's tapped hole location. Blind Joints which require this alteration • Screw Joints P.552, 603, 660, 706 • Single Joints P.609, 661, 707 • Tapping Joints P.552, 602, 660
	Hole Position Change for Extrusion End Cap Thickness	P.760	FL/FR		Offsets the wrench access hole for the thickness of Extrusion End Cap (3mm). The extrusion end cap will be flat with the adjacent extrusion surface.
	Wrench Hole in Specified Position	P.761	AH/BH/AV/BV		Adds a wrench hole in a desired position from the left end. Use for Blind Jointing in beam sections, etc.
Counterboring	Counterbores in Specified Position	P.763	Z6/XA100		Adds a counterbored hole in a desired position from the left end. Can be used for connecting extrusions or installing tables, etc.
Blind Joint Dedicated Holes	D Hole	P.764	LDH/RDH		Adds required holes for Single Joint connections. (Single Joints P.609, 661, 707)
	S Hole	P.765	LSH		Adds required holes for Pre-Assembly, Insertion Double Joint connections. (Pre-Assembly Insertion Double Joints P.611, 663, 709)
	M Hole	P.766	LMH		Adds required holes for Post-Assembly Insertion Double Joints, Center Joint connections. (Post-Assembly Insertion Double Joints P.554, 607, 664, 710)
	L Hole	P.767	JLP		Adds required holes for Parallel Joint connections. (Parallel Joints P.554, 613, 664)

Type	Alterations	Page	Alteration Codes	App. Example	Contents
Special Extrusions End Plates Mounting	GFS Series End Tapping	P.768	LTS/RTS/TSW		Adds tapped holes on extrusion ends. Blind Joints which require this alteration • Screw Joints P.552, 603, 660, 706 • Simple Joints P.604
	HFSR End Tapping	P.768	LTS/RTS/TSW		Necessary alteration to use Ends Protection Plates for HFSR series on P.555, 568, 615, 628.
Chamfering	End Face C Chamfering	See Below	CW		Adds C Chamfering on extrusion ends.
Labeling	Labeling	See Below	ZZZ		Adds a sticker with catalog No. etc. on the aluminum extrusions. Although number of characters are limited, customer's own serial number or unit number can be labeled.

Standard of Extrusion Position and Indications

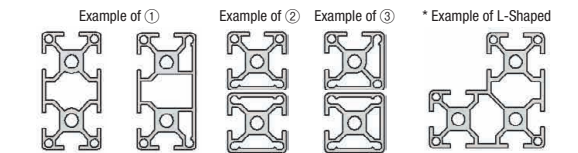
For some hole alterations, specifying "Which end (L or R) to apply the alterations" and "Which direction (horizontal or vertical) to apply the alterations" will be required. Using our standard specifying method for orientation, then L/R and H/V are determined as shown below.



Standard of Extrusion Position

Placing method of the extrusion, which is a basis to determine right and left is shown as follows.

- On the vertical length
- Flat side down
- One flat side down and another flat side right



* When the extrusion is on the vertical length and also has a flat side, ① has the priority.

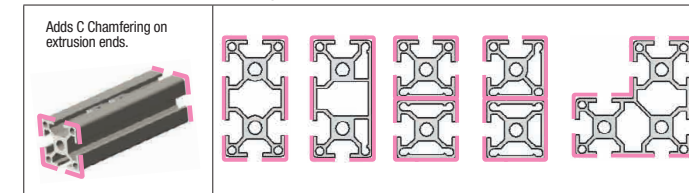
LR (Left and Right of Extrusions):

Place extrusions properly, then determine the right and left. Since most extrusion cross sections are symmetrical and can be used in any orientation. However, please specify the L/R parameters in your orders for administrative purposes. Extrusions ① with different alterations applied on left and right ends, and ② with non-symmetrical cross sections are not reversible therefore the L/R specifications will become critically important.

HVP (Horizontal / Vertical / Cross):

Specify the hole alterations with the extrusion properly oriented, and according to the connection method with the mating extrusion.

End Face C Chamfering



* Not applicable to Aluminum Extrusions with Parallel Surfacing, Aluminum Extrusions 15mm Square

Alteration	Code	Spec.
End Face C Chamfering	CW	Adds C Chamfering on both extrusion ends. (Thread Chamfering C0.2 ~ 0.3)

Ordering Example: Part Number HFS6 - 3030 - 500 - CW

Labeling on Aluminum Extrusions

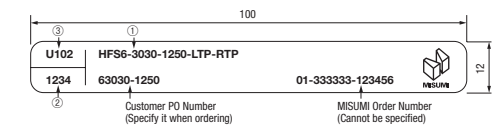
Adds a sticker with catalog No. etc. on the aluminum extrusion. (Free of Charge)

When placing an order, please add:

- a serial number of four digits beginning with -ZZZ
- Specify a unit number of 3 digits or less beginning with -U.

(Ex.) HFS6-3030-1250-LTP-RTP-ZZZ1234-U102

① Part Number ② Serial Number ③ Unit Number



Detailed Specs

Please specify the serial number by 1 digit or more. Make ③ blank if the unit number is not specified. If Part Number exceeds 41 digits, "... " follows from the 42nd digit. If Customer PO Number exceeds 21 digits, "... " follows from the 22nd digit.

