



Product Catalogue

Alcast synergies Pvt. Ltd.

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About Us :

ALCAST stands as a titan among North India's aluminium extrusion manufacturers, boasting a formidable monthly production capacity of 750 tons. Our advanced manufacturing hub is equipped with state-of-the-art aluminium extrusion presses, capable of 750MT, 1000MT, 1100MT alongside a sophisticated billet casting setup (Hot Top casting) and a cutting-edge anodizing plant. Our facility also houses a contemporary tool shop, outfitted with the latest in CNC and EDM wire cut technology, along with a suite of ancillary equipment. We embrace the newest technological advancements in our foundry to ensure that our aluminium profiles not only feature an exceptional surface finish but also maintain robust chemical and mechanical properties that align with global standards. Utilizing 'Spectro Analysis' via a world-class spectrometer, we meticulously monitor every phase of our casting process. This rigorous analysis allows us to adhere to both standard and custom specifications with unwavering precision in chemical properties. Our in-house tool shop further guarantees the excellence of our dies, empowering us to craft intricate and customized designs that meet our clients' diverse needs.

At **ALCAST**, we exclusively source high-quality virgin ingots from industry leaders like HINDALCO and NALCO, ensuring our products are of unmatched quality with a luxurious finish and high-temper durability. Our press is enhanced with an advanced Automatic Gauge Control (AGC) system, precisely maintaining the thickness of the output to meet the exact specifications demanded by our clients. Our capabilities extend beyond mere production; we are adept at designing, extruding, and finishing aluminum sections tailored to the specific requirements of our customers. ALCAST is committed to excellence, evidenced by our comprehensive testing facilities and meticulous process validation at every step, guaranteeing the highest standards of quality and customer satisfaction.

Our vision

ALCAST is dedicated to spearheading innovation and providing economical solutions to meet the evolving and competitive needs of the Aluminium Extrusions market. Our focus is on embracing new innovations that address the Industry's challenges, propelling us forward in a dynamic market landscape.

State-of-the-Art Manufacturing Process

Extruder Press

Our facility is equipped with fully automatic 750 and 1000 UST Extrusion Presses, enhanced with Programmable Logic Control (PLC) to minimize any quality discrepancies and ensure the utmost precision in profile and alloy parameters. Our commitment to excellence is further demonstrated through the minimization of manual handling. We employ advanced Thermo Belt Handlers for the material handling process throughout the manufacturing cycle of our products, ensuring the surface finish of our products remains impeccable. The superior temper of our products is a testament to our rigorous alloying parameters and the efficiency of our High-Efficient Aging Ovens. This meticulous approach to every step of the manufacturing process guarantees that our products not only meet but exceed industry standards, ensuring that our customers receive only the best.

Beyond product excellence, **ALCAST** is committed to integrity, ethical practices, and positive community impact. Our dedication to continuous improvement and ethical business conduct underpins every aspect of our operations, reinforcing our pledge to meet and exceed stakeholder expectations. Through our cutting-edge processes and core values, **ALCAST** continues to lead in delivering high-quality, aesthetically pleasing aluminium finishes while fostering trust and advancing industry standards.

In house custom die formations | Can be better

In our Die Workshop, we boast an extensive array of commercial dies and cutting-edge machinery, featuring the latest imported High Precision Milling machines. This enables us to specialize in custom die correction and maintenance, ensuring each project meets our clients' unique specifications. Our team of die workshop engineers ranks among the most seasoned professionals in the industry. Their expertise and capability in handling custom requirements guarantee that we can tailor our services to meet the exact needs of our clients, reflecting our commitment to precision and quality in every aspect of our operations.

Over 60% of the world's Aluminium products are crafted through this esteemed process, celebrated not only for its superior quality outcomes but also for its economic efficiency. Recognized universally as the premier method for Aluminium production, this technique stands unmatched in its ability to deliver exceptional products in a cost-effective manner.

Why ALCAST

Quality Control Excellence

At **ALCAST**, we embody a philosophy where quality is ingrained in every step of our manufacturing process, ensuring a commitment to a 'ZERO DEFECT' outcome through stringent quality control measures at all stages of production. Our adherence to rigorous standards starts with the precise control over raw materials, employing a computerized spectrometer to analyze and adjust the chemical composition of Aluminium and its alloys. This meticulous attention guarantees that each batch aligns with our high standards. Central to our extrusion process are the dies, crafted with precision in our own facilities. Using the latest in computerized CNC Milling, Wire Cut, and Spark-Erosion-cum-Electrical Discharge machinery, we create dies that are not only precise but also ensure a superior finish for our extruded profiles and sections. Each die is then polished to perfection, achieving unmatched dimensional accuracy and smoothness.

Commitment to Flawless Delivery

ALCAST's commitment to quality extends beyond our production lines. We implement detailed quality control protocols, including the deployment of advanced technology and expert inspectors to monitor every aspect of our products. Our objective is not just to identify but also to preemptively address any potential defects, ensuring that every item we deliver meets our stringent criteria for perfection. Recognizing the critical importance of meeting client expectations, ALCAST offers tailored solutions and packaging options, meticulously designed to fulfill the specific requirements of our clients. This holistic approach not only ensures the delivery of impeccable products but also enhances the overall client experience, cementing our position as a leader in the industry.

A Legacy of Trust and Innovation

Our relentless pursuit of quality, perfection, and innovation has set new industry benchmarks. By enforcing strict quality controls and leveraging our state-of-the-art facilities, we produce technologically superior products that are durable and aesthetically pleasing, courtesy of our advanced processes. Our company's culture of continuous improvement, integrity, and positive societal impact guides our operations, driving us towards excellence. Our commitment to these principles has earned us the trust and confidence of clients and stakeholders alike, reinforcing our reputation as a frontrunner in the Aluminium extrusion industry.

Product Specifications and Ordering Information Length and Weight

Length: Our extrusions are available in a standard length of 3.66 meters, but we are flexible and can accommodate lengths beyond this or as per specific customer requirements.

Weight: The weight per meter for our products, as listed in this catalogue, represents the nominal weight and should serve as a guide. Please note that the actual weight of the products may vary by $\pm 10\%$ from the catalogue weight, reflecting the inherent variations in the manufacturing process.

Dimensions & Tolerances

Our sections are delivered adhering to our standard dimensional tolerances, aligned with IS (Indian Standard) specifications. While dimensions are presented in millimeters (MM) within our catalogue, we highly recommend confirming the full dimensions and tolerances to guarantee the accuracy of your order.

Shipping Tolerances

We are committed to fulfilling your order with precision. The material will be supplied in accordance with the ordered quantity, subject to shipping tolerances of $\pm 10\%$. This approach ensures that you receive the correct amount of material, accounting for any minor variations that may occur during the preparation and shipping process.

Order Requirements

For selections featured in this catalogue, we welcome orders starting at a minimum of 300 kg per specification. When it comes to inquiries for new sections, we require a minimum order of 300 kg. The term "specification" encompasses the section number, cut length, alloy and temper, packing details, and more, ensuring that each order is precisely tailored to meet your needs.

Placing Your Order

To ensure the swift and accurate processing of your orders, providing complete details about the specifications and intended use of the materials is essential. When placing your order, please make sure to include the following information:

1. **Section No.:** Specify the section number from the catalogue.
2. **Alloy & Temper:** Indicate the specific alloy and temper you require.
3. **Cut Length:** Mention the desired length of the sections in millimeters (mm).
4. **Quantity:** Specify the quantity needed in kilograms (kg) or pieces.
5. **Surface Finish & Exposed Surface:** Detail the required surface finish and any surfaces that will be exposed.
6. **End-use:** Describe the intended use of the material.
7. **Mode of Packing:** Indicate your preferred packing method.
8. **Conductivity:** If conductivity is a requirement, please specify.

The information provided in the following pages on various wrought Aluminium alloys serves as a general guide and may not reflect current availability. This guidance is intended to assist you in making informed decisions about your Aluminium needs, ensuring you receive the right material for your project.

TABLE - 1

Wrought alloys : Near equivalent designations

INDIA NEW I.S.	INDIA OLD I.S.	U.S.A. (A.A.)	BRITAIN (B.S.)	CANADA	GERMANY (DIN)	RUSSIA	I.S.O.	FRENCH ND
19501	1E	1050(E.C.)	1E	C 1S	E-Al 99.5	-	-	-
19500	1B	1050	1B	1S	A-99.5	-	Al-99.5	1050A
19600	-	1060	-	-	-	-	-	-
19700	-	1070	-	-	Al-99.7	-	Al-99.7	-
19800	1A	1080	1A	-	-	-	Al-99.8	-
19000	1C	1100	1C	2S	Al-99.0	AD	Al-99.0	1200
-	-	2011	FC1	28S	Al-Cu-Bi-Pb	-	Al-Cu-6 Bi Pb	2011
24345	H15	2014	H15	B26S	Al-Cu-Si	AK	-	-
24534	H14	2017	H14	17S/16S	-	D1	Al-Cu-4Mg Si	-
-	-	2024	-	24S	Al-Cu-Mg.2	-	Al-Cu-4Mg 1	2024
31000	N3	3003	N3	3S	Al-Mn	A-Mn	Al-Mn 1	3003
43000	N21	4043	N21	33S	Al-Si-5	AK	Al-Si5	4043
46000	N2	4047	N2	35S	-	-	-	-
51000	-	5005	-	B57S	-	-	Al-Mg-1	-
52000	N4	5052	N4	M57S	Al-Mg.2	A-Mg	Al-Mg-2.5	5051
53000	N5	5086	N5	54S	-	A.Mg-3	Al-Mg-4	-
54300	N8	5083	N8	D54S	Al-Mg-4.5 Mn	-	Al-Mg-4.5 Mn	5083
55000	N6	5056	N6	A56S	Al-Mg.5	-	Al-Mg.5	5356
65032	H20	6061	H20	65S	Al-Mg-Si Cu	-	Al-Mg-1Si Cu	-
63400	H9	6063	H9	50S	Al-Mg-Si 0.5	-	Al-Mg-Si	-
64430	H30	6351	H30	B51S	Al-Mg-Si 1	AV	Al-Si-1 Mg	6081
64423	H11	6066	H11	C62S	-	-	-	-
62400	-	6005	-	C51S	-	-	-	-
63401	91E	6101	91E	D50S	E.Al.Mg.Si 0.5	-	-	-
64401	-	6201	-	-	-	-	-	-
74530	-	7039	-	D74S	Al-Zn-Mg. 1	-	-	3004
-	-	7075	DTD	75S	Al-Zn-Mg Cu 1.5 -	-	Al-Zn 6 Mg Cu	7075
			5124					

TABLE-2

Wrought alloys : Guide to selection

Alloy	Temper	Resistance to Corrosion	Workability (Cold)	Machinability	Brazeability	Weldability	Commonly available forms	Indications of use
EC/1050, 1060 (1B) (19501) (19500) (19600)	F,O	A	A	D	A	A	Flats, Rods, Tubes & other sections	Electrical conductors, cable sheathings, impact- extruded products, pressing utilities of anodizing quality, pen caps, piping etc.
1100 (1C) (19000)	F,O	A	A	D	A	A	Flats, Rods, Tubes & other sections	Packaging lightly stresses and decorative assemblies in architecture and transport, equipment for chemical, food and brewing industries.
2014 (H 15) (24345)	T4 T6	C C	C D	B B	D D	C C	Rods & Bars Rods & Bars	Highly stressed component of all types in aircraft, ordnance and general engineering.
2017 (H 14) (24534)	T4	C	C	B	D	C	Rods & Bars	Highly stressed parts in aircraft and other structures, screw machine products.
4043 (N 21) (43000)	F, O	A	A	D	A	A	Rods & other sections	Welding wire, architectural applications.
5005 (51000A)	F,O	A	A	D	B	A	Flats, Rods & other sections	Consumer durable with attractive anodised finish, architectural, electrical conductors etc.
5052 (N 4) (52000)	O, F	A	A	D	C	A	Flats, Rods, Tubes & other sections	Structures exposed to marine atmosphere, aircraft parts, wire rope ferrules, rivet stock.
5086 (N 5) (53000)	O, F	A	A	D	D	A	Flats, Rods & other sections	Ship building and other marine applications, rivets, coinage etc.
5056 (N 6) (55000)	O, F	A	A	D	D	A	Rods	Zips, Welding Rods and Rivets.
6061 (H 20) (65032)	O, F T4 T6	A A A	A C D	D C C	A A A	A A A	Rods, Flats, Tubes & other sections	Heavy duty structures, building hardware, sections for bus body, truck and rail coach, furniture, rivets etc.
6063 (H9)	O,F T4 T6 T5	A A A A	A B C C	D C C C	A A A A	A A A A	Rods, Flats, Tubes & other sections	Building hardware, architectural sections with good surface finish, medium strength furniture and anodized sections.
6066 (22450)	O,F T4 T6	B B B	B C C	D B B	A A A	A A A	Rods and other solid sections	For welded structures, textile parts, heavy duty machine parts.

TABLE-2

Wrought alloys : Guide to selection

Alloy	Temper	Resistance to Corrosion	Workability (Cold)	Machinability	Brazeability	Weldability	Commonly available forms	Indications of use
6101 (91 E) (63401)	T4 T6	A A	B B	C C	A A	A A	Rods, Flats, Tubes & other sections	High strength electrical busbar sections.
6201 (64401)	T4	A	A	C	A	A	Redraw Rod	Overhead conductors, ACAR and AAAC.
6351 (H 30) (64430)	O,F T4 T6	A A A	A C D	D C C	A A A	A A A	Rods, Flats, Tubes & other sections	Structural and general engineering items such as rail & road transport vehicles, bridges, cranes, roof trusses, rivets etc.
7039 (D74S) (74530)	O,F T4 T6	A A A	A C D	D C C	A A A	A A A	Flats, Tubes, Rods & other sections	Defence structures like mobile bridges etc. Tread and chequered plates. Excellent welding property with no loss of strength in welded zone.
7075 (DTD5124)	O,F T4 T6	A A A	A A D	A A A	A A A	A A A	Rods	Highly stressed structural applications.

Notes:

- Relative ratings for corrosion, workability and machinability in decreasing order of merit A, B, C and D.
- Weldability & brazeability ratings A, B, C and D are relative ratings defined as follows:
 - Generally weldable by the commercial procedure & methods.
 - Weldable with special technique.
 - Limited weldability due to crack sensitivity or loss in corrosion resistance and mechanical properties.
 - Generally not weldable.
- Availability of other forms subject to special enquiries and methods.

TABLE-3

Wrought alloys : Chemical composition limits (per cent)

Alloy (ISS)	Equivalent alloy (AA)	Copper	Magnesium		Silicon		Iron		Manganese		* Others (Total) Max	Remarks	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.			
1 C	19000	1100	-	0.10	-	-	-	0.5	0.6	-	0.1	0.1	Aluminium 99.0% Min
		1200	-	0.05	-	-	Si+Fe 1.0			-	0.05	0.1	Aluminium 99.0% Min
1 B	19500	1050	-	0.05	-	-	-	0.25	0.4	-	0.05	0.1	Aluminium 99.5% Min
1 E	19501	-	-	0.04	-	-	-	0.15	0.35	-	0.03	0.1	Aluminium 99.5% Min
		1350	-	0.05	-	-	-	0.10	0.40	-	0.01	0.1	Aluminium 99.5% Min
-	19600	1060	-	0.05	-	-	-	0.25	0.35	-	0.03	0.1	Aluminium 99.6% Min
-	19700	1070	-	0.03	-	-	-	0.2	0.25	-	0.03	0.1	Aluminium 99.7% Min
H 15	24345	2014	3.8	5.0	0.2	0.8	0.5	1.2	0.7	0.3	1.2	0.5	-
H 14	24534	2017	3.5	4.7	0.4	1.2	0.2	0.7	0.7	0.4	1.2	0.5	-
N3	31000	3003	-	0.1	-	0.1	-	0.6	0.7	1.0	1.5	0.4	-
N21	43000	4043	-	0.1	-	0.2	4.5	6.0	0.6	-	0.5	0.2	-
N2	46000	4047	-	0.1	-	0.2	10.0	13.0	0.6	-	0.5	0.2	-
N4	52000	5052	-	0.1	1.7	2.6	-	0.6	0.5	-	0.5	0.4	Cr + Mn = 0.5
N5	53000	5086	-	0.1	2.8	4.0	-	0.6	0.5	-	0.5	0.4	Cr + Mn = 0.5
N6	55000	5056	-	0.1	4.5	5.6	-	0.6	0.7	-	0.5	0.4	Chromium upto 0.25
N8	54300	5083	-	0.1	4.0	4.9	-	0.4	0.7	0.5	1.0	0.4	Chromium upto 0.25
H 20	65032	-	0.15	0.4	0.7	1.2	0.4	0.8	0.7	0.2	0.8	0.4	**Cr =0.15-0.35
		%											
-	-	6061	0.15	0.4	0.8	1.2	0.4	0.8	0.7	-	0.15	0.4	Chromium 0.04 to 0.35
H 9	63400	6063	-	0.1	0.4	0.9	0.3	0.7	0.6	-	0.3	0.4	-
-	-	6066	0.7	1.2	0.8	1.4	0.9	1.8	0.7	0.6	1.1	0.4	-
-	64423	-	0.5	1.0	0.5	1.3	0.7	1.3	0.8	-	1.0	-	-
91E	63401	6101	-	0.05	0.4	0.9	0.3	0.7	0.5	-	0.03	0.1	-
-	64401	6201	-	0.1	0.6	0.9	0.5	0.9	0.5	-	0.03	0.1	-
H 30	64430	6351	-	0.1	0.4	1.2	0.6	1.3	0.6	0.4	1.0	0.3	-
		6082	-	0.1	0.6	1.2	0.7	1.3	0.5	0.4	1.0	0.3	Chromium upto 0.25
-	74530	7039	-	0.2	1.0	1.5	-	0.4	0.7	0.2	0.7	0.4	Zinc 4.0 - 5.0 %
-	-	7075	1.2	2.0	2.1	2.9	-	0.5	0.5	-	0.3	0.2	Zinc (5.1 -6.1)% & Chromium(0.18-0.28) %

* Titanium and/or other grain refining elements

**Either Mn or Cr shall be present

TABLE-4
Wrought alloys : Mechanical properties

Non - Heat Treatable Alloys					
Alloy AA Old (ISS) New (ISS)	Temper	Ultimate Tensile Strength Kg/mm ²		0.2% Proof Stress Kg/mm ²	Elongation On 50 mm GL
		Min.	Max.		
1100[1C][19000]	O	-	11.0	-	25
1050[1B][19500]	O	-	10.0	-	25
1060[19600]	O	-	9.5	-	25
1070[19700]	O	-	9.5	-	25
4043[N21][43000]	O	-	13.0	-	18
4047[N2] [46000]	O	-	15.0	-	12
5052[N4] [52000]	O	-	24.5	-	18
5086[N5] [53000]	O	-	26.5	-	16
5056[N6] [55000]	O	-	34.5	-	15
5083[N8] [54300]	O	-	35.5	-	13

Heat Treatable Alloys					
2014 [H15] [24345]	T4[W]	39	-	24.0	10
	T6 [WP]	49	-	43.0	6
2017 [H14] [24534]	T4[W]	39	-	24.0	10
6063 [H9] [63400]	T4[W]	14	-	8.0	14
	T6 [WP]	19	-	15.5	7
6061 [H20] [65032]	M or O	-	15.0	-	16
	T4[W]	19	-	11.5	14
	T6 [WP]	28.5	-	24.0	7
6351[H30] [64430]	M or O	-	15	-	16
	T4[W]	19	-	12.0	14
	T6 [WP]	31.5	-	27.5	7
6066	O	-	20.5	-	16
	T4[W]	28	-	17.5	14
	T6 [WP]	35	-	31.5	7
6101[91E] [63401]	T4[W]	14	-	8.0	12
	T6 [WP]	20.5	-	17.0	10
6201 [64401]	T4[W]	16	-	7.0	14
	T8 [WDP]	32	-	-	3
7039 [74530]	T4[W]	28	-	23.5	9
	T6 [WP]	31.5	-	26.5	7
7075	T6 [WP]	54	-	46.5	6

Properties indicated herein are typical properties and are given for information only. However properties of all the profiles in specific alloy shall be as per I.S. Specification.

TABLE-5
Wrought Alloys : Typical tensile properties at various temperatures (Kg/mm²)

Alloy & Temper	Tensile Strength	Temp. °C									
		Below zero			Above Zero						
		-200	-80	-25	25	100	150	200	250	300	350
1100 O (19000)	Ultimate	17.5	10.5	10.0	9.0	7.0	5.5	4.0	3.0	2.0	1.5
	Yield	4.2	3.9	3.5	3.5	3.2	3.0	2.5	2.0	1.4	1.1
2014 T6* (24345)	Ultimate	59.0	52.0	50.5	49	44.0	28.0	11.0	6.5	4.5	3.0
	Yield	50.0	45.5	43.5	42	40.0	24.5	9.0	5.0	3.5	2.5
2017 T4 (24534)	Ultimate	56.0	45.5	45.0	43.5	40.0	28.0	11.0	6.5	4.0	3.0
	Yield	37.0	29.5	29.0	28.0	27.5	21.0	9.0	5.0	3.5	2.5
3003 O (31000)	Ultimate	23.0	14.0	12.0	11.0	9.0	7.5	6.0	4.0	3.0	2.0
	Yield	6.0	5.0	4.5	4.0	4.0	3.5	3.0	2.5	1.7	1.3
5052 O (52000)	Ultimate	31.0	20.5	19.5	19.5	19.0	16.0	12.0	8.5	5.0	3.5
	Yield	11.0	9.0	9.0	9.0	9.0	9.0	7.5	5.0	4.0	2.0
5086 O (53000)	Ultimate	38.5	27.5	26.5	26.5	26.5	20.5	15.5	12.0	7.5	4.0
	Yield	17.0	15.0	15.0	15.0	15.0	13.5	12.0	7.5	5.0	3.0
6061 T4 (65032)	Ultimate	35.0	26.5	25.0	24.5	-	21.0	13.5	5.0	3.0	2.0
	Yield	19.5	15.5	15.5	14.5	-	14.5	10.5	3.8	1.8	1.5
6061 T6	Ultimate	49.0	34.5	33.0	31.5	29.5	24.0	13.5	5.0	3.2	2.1
	Yield	33.0	29.5	28.5	28.0	26.5	21.5	10.5	3.5	1.9	1.3
6063 T4 (63400)	Ultimate	26.0	20.5	19.5	15.5	-	15.5	6.5	3.5	2.1	1.8
	Yield	12.0	12.0	10.5	9.0	-	9.0	4.5	2.8	1.8	1.4
6063T6	Ultimate	33.0	26.5	25.0	24.5	21.5	14.5	6.5	3.0	2.5	1.6
	Yield	25.0	23.0	22.5	21.5	19.5	14.0	4.5	2.5	1.8	1.4

* Subject to special enquiry

TABLE-6
Wrought Aluminium & Aluminium Alloys:- Mechanical and Electrical Properties

Alloy	Temper Designation	Tensile Strength Min.	0.2 Percent Proof Stress Min.	Percent Elongation on 5.65 Sa Min.	Electrical Conductivity at 20° C, Min	Maximum Electrical Resistivity at 20° C	Thickness	Inside bend radius Min.	Coeff. Of thermal expansion	Thermal Conductivity
AA IS		Mpa	Mpa		% IACS	ohm mm/mm ²	mm		per°C at 20°C typical	CGS at 25°C typical
1050 19501	M	60	-	25	60.00	0.02874	upto 12	1x thickness	23.8 x 10 ⁻⁶	0.56
6101 63401	W	140	80	12	-	-	-	-	- 23.4	-
6101 63401	WP (range 1)	170	135	12	56.50	0.030	3.00 to 9.50	1x thickness	x 10 ⁻⁶	0.52
6101 63401	1)	200	170	10	55.00	52	3.00 to 9.50	thickness	23.4 x 10 ⁻⁶	0.52
6201 -	WP (range 2) T81	-	-	-	52.50	0.03135	-	2x thickness	23.5 x 10 ⁻⁶	0.50
						0.03283		thickness		

NOTE

1MPa=1N/mm² = 0.102 kg/mm²

Properties in M temper are only typical values and are given for information only.

If required the cross-section shall be calculated from the mass and length of a straight test piece taking density 2.705 for grade 19501 and 2.700 for grade 63401

TABLE 7
Wrought alloys : Welding properties

Alloy & Temper	Gas	Arc with Inert Gas	Arc With Flux	Relatively Suitable for Joining (*)			Soldering		Filler Metal †
				Resist. Welding	Pressure Welding	Brazing	Low Temp.	High Temp. (3)	
1050 O	A	A	A	B	A	A	A	A	1260
1100 O	A	A	A	B	A	A	A	A	1100
2014 O	D	C	C	B	C	D	D	D	4145
2017 T4	D	C	C	B	D	D	D	D	4145
T6	D	C	C	B	D	D	D	D	4145
3003 O	A	A	A	B	A	A	A	A	1100
5005 O	A	A	A	B	A	B	B	A	4043
5052 O	A	A	A	B	B	C	C	C	5356
5086 O	C	A	A	B	C	D	D	D	5356
6061 O	A	A	A	B	A	A	B	A	4043
T4	A	A	A	A	B	A	B	A	4043
T6	A	A	A	A	B	A	B	A	4043
6063 T6	A	A	A	A	B	A	B	A	4043
6101 T6	A	A	A	A	B	A	B	A	4043
6201 T81	A	A	A	A	B	A	B	A	4043
7039 T6	D	C	C	A	C	D	C	C	7039

1. For general purpose only. For specialised applications, e.g. pressure vessels anodised item etc., special process should be used.
2. * Joining ratings A, B, C & D are relative ratings in order of merit.
 A – Readily weldable.
 B – Special techniques and close control of procedure are required.
 C – Limited weldability due to crack sensitivity, loss in strength and or loss in resistance to corrosion.
 D - Not recommended.
- 3.† Filler metals for general purpose only. For specialised applications requiring high strength ductility, colour match after anodising etc., special filler metals are recommended.

TABLE 8

Wrought Alloys : Surface Finishing (Suitability)

Alloy	Suitable for				
	Protective Anodising	Anodising & Dyeing	Bright Anodising	Plating	Vitreousa Immelgin
1050/1070	E	E	V	V	G
1100	V	V	G	V	G
2014/2017	M	M(D)	U	V	U
3003	G	G	M	G	V
4043	G	G(D)	U	O	G
5005	V	V	V	O	U
5052	V	V	G-V	O	U
5086/5056	V	V	G	O	U
6061	G	G	M	O	O
6063	V	V	G-V	O	O
6066	M	M(D)	U	V	U
6101	V	V	G-V	O	O
6351	G	G	M	O	O

- E** Excellent
- V** very good
- G** Good
- M** Moderate
- U** Unsuitable
- D** Only Suitably for dark colours
- O** Modified technique is essential and some initial difficulties may occur.

Standard Manufacturing Tolerances

The Standard manufacturing tolerance given here are applicable to the average shape. Wider tolerance may be required for some shapes, and closer tolerances may be possible for others. For 5052, 5056, 5083, 5086 and other high magnesium alloys, special (wider) tolerances will be applicable.

Tolerances stricter than standard shall be subjected to special enquiry.

TABLE : 9
Round Bars/Rods : Diameter Tolerance

Specified Diameter mm	Tolerance (mm)		
	Class A +	-	Class B ±
Upto 12.0	0.03	0.07	0.20
Over 12.0 Upto 25.0	0.05	0.10	0.25
Over 25.0 Upto 40.0	0.07	0.13	0.30
Over 40.0 Upto 50.0	0.13	0.13	0.38
Over 50.0 Upto 56.0	0.15	0.15	0.46
Over 56.0 Upto 71.0	0.20	0.20	0.53
Over 71.0 Upto 80.0	0.25	0.25	0.61
Over 80.0	0.5%	0.5%	1%

Notes:

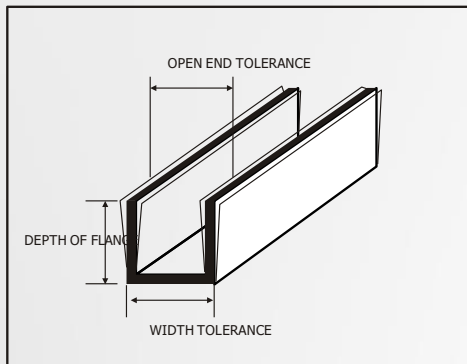
1. Class 'A' is for drawn rods.
2. Class 'B' is normal tolerance for extruded rods.

TABLE : 10
Solid Sections : Width Tolerance (at closed ends)

Specified width or Width across flats mm	Tolerance mm ±
4	0.18
5	0.20
6	0.20
8	0.23
10	0.23
12	0.25
16	0.28
20	0.30
25	0.30
32	0.38
40	0.46
50	0.46
60	0.53
80	0.69
100	0.69
120	0.76
160	1.02
200	1.14
250	1.40

Notes:

1. For intermediate size, take tolerance for the next higher value.
2. Width tolerances on open ends of Solid Sections such as Channels, I-Beams, etc. are given separately in Table-11.

TABLE - 11
Solid Sections : Width Tolerance (at open ends)


Displacement of any one leg to be controlled independently by tolerance on angle

Tolerance on open ends of channels and I-beams

Specified Width mm	Depth of flange or leg (mm)			
	6.5 to 16.0	16.1 to 32.0	32.1 to 64.0	64.1 to 150.0
Width Tolerance mm ±				
Upto 6.0	0.30	-	-	-
6.1 to 12.0	0.35	0.40	0.45	-
12.1 to 20.0	0.40	0.45	0.50	-
20.1 to 25.0	0.45	0.50	0.55	0.65
25.1 to 38.0	0.50	0.55	0.65	0.75
38.1 to 50.0	0.60	0.70	0.80	0.90
50.1 to 100.0	0.80	0.90	1.20	1.50
100.1 to 150.0	1.10	1.30	1.70	2.00
150.1 to 200.0	1.50	1.60	2.10	2.50
200.1 to 250.0	1.70	1.90	2.70	3.00

Notes:

1. Tolerance on either internal or external gap (between flanges or legs) can be guaranteed depending on requirements.
2. Width tolerance at closed ends are given in Table – 10.
3. These tolerances are applicable to channels, I-Beam and other such sections where there are both opened and closed ends.

TABLE 12
Solid sections : Thickness tolerance

Specified** Thickness mm	Width of Section (mm)															
	12	16	20	25	32	40	50	63	80	100	125	160	200	250	320	
1.2	0.20	0.20	0.20	0.20	0.20	*	*	*	*	*	*	*	*	*	*	
1.6	0.18	0.20	0.20	0.20	0.20	*	*	*	*	*	*	*	*	*	*	
2.0	0.18	0.20	0.20	0.20	0.20	0.23	0.25	0.28	0.30	0.33	0.36	0.38	0.41	0.46	*	
2.5	0.18	0.20	0.20	0.20	0.20	0.23	0.25	0.28	0.30	0.33	0.36	0.38	0.41	0.43	0.46	*
3.2	0.18	0.20	0.20	0.20	0.23	0.25	0.28	0.30	0.33	0.36	0.38	0.41	0.43	0.48	*	
4.0	0.20	0.23	0.23	0.23	0.25	0.28	0.30	0.33	0.36	0.38	0.43	0.43	0.46	0.51	*	
5.0	0.20	0.23	0.23	0.23	0.25	0.28	0.30	0.33	0.36	0.38	0.41	0.43	0.46	0.51	*	
6.0	0.20	0.23	0.23	0.23	0.25	0.28	0.30	0.33	0.36	0.41	0.46	0.51	0.56	0.66	*	
8.0	0.23	0.25	0.25	0.25	0.28	0.30	0.33	0.36	0.38	0.43	0.48	0.53	0.58	0.71	*	
10.0	0.23	0.25	0.25	0.25	0.28	0.30	0.33	0.36	0.38	0.43	0.48	0.53	0.58	0.71	*	
12.0	0.25	0.28	0.28	0.28	0.30	0.33	0.36	0.38	0.41	0.46	0.48	0.53	0.58	0.74	0.97	
16.0	0.28	0.30	0.30	0.30	0.33	0.36	0.38	0.41	0.43	0.48	0.51	0.56	0.61	0.76	1.02	
20.0	-	0.30	0.30	0.30	0.36	0.38	0.41	0.43	0.46	0.51	0.53	0.61	0.69	0.79	1.04	
25.0	-	0.30	0.30	0.30	0.36	0.38	0.41	0.43	0.46	0.51	0.53	0.61	0.69	0.79	1.04	
32.0	-	-	-	-	0.38	0.41	0.43	0.46	0.48	0.53	0.56	0.66	0.74	-	-	
40.0	-	-	-	-	-	0.46	0.48	0.51	0.53	0.56	0.61	0.71	0.79	-	-	
50.0	-	-	-	-	-	-	0.53	0.56	0.58	0.61	0.66	0.76	0.84	-	-	
63.0	-	-	-	-	-	-	-	0.61	0.64	0.66	0.71	0.81	0.89	-	-	
80.0	-	-	-	-	-	-	-	-	0.69	0.71	0.74	0.86	0.94	-	-	
100.0	-	-	-	-	-	-	-	-	-	0.76	0.79	0.91	0.99	-	-	
125.0	-	-	-	-	-	-	-	-	-	-	0.89	0.97	1.04	-	-	

* To be regarded as special sections.

** For intermediate size, take tolerance for the next higher value.

TABLE - 13
Round Tubes : Wall Thickness Tolerance

Specified Wall Thickness (mm)	Tolerance (mm)	
	Class 1 ±	Class 2 ±
Upto 1.2	0.30	-
1.60	0.30	-
1.80	0.30	-
2.00	0.30	-
2.24	0.30	-
2.50	0.33	-
2.80	0.36	-
3.15	0.40	0.90
3.55	0.43	0.94
4.00	0.48	0.97
4.50	0.51	1.02
5.00	0.56	1.07
5.50	0.61	1.12
6.30	0.67	1.18
7.10	0.76	1.27
8.00	0.97	1.47
9.00	1.10	1.60
10.00	1.22	1.73
11.20	1.28	1.79
12.50	1.35	1.85

Notes :

1. Tubes with wall thickness intermediate between standard sizes will have the tolerance of the next higher wall thickness.
2. Tolerance on standard wall thickness above 12.50 mm may be as agreed to between the purchaser and the supplier.
3. For Al-Zn-Mg, Al-Mg and Al-Cu alloys, class 2 tolerances shall apply.
4. For Al, Al-Mn and Al-Mg-Si alloys, class 1 tolerances

TABLE - 14
Round Tubes :
Diameter Tolerance



Specified Diameter Outside or Inside mm	Allowable Deviation of Mean Diameter 1/2 (AA+BB) from Specified Diameter (Dia. Tolerance) mm ±	Allowable Deviation of Diameter at any point From Specified Diameter (Ovalness Tolerance) mm ±
From 9 upto 18	0.25	0.50
Over 18 upto 30	0.30	0.60
Over 30 upto 40	0.36	0.80
Over 40 upto 50	0.45	0.90
Over 50 upto 60	0.54	1.00
Over 60 upto 80	0.60	1.30
Over 80	1% of dia	2.5% of dia

Notes :

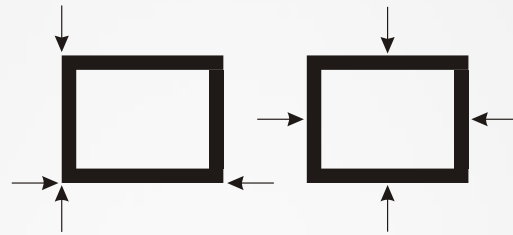
- When outside diameter, inside diameter and wall thickness are all specified, standard tolerances are applicable to any two of these dimensions, but not to all three.
- Mean diameter is the average of two diameter measurement taken at right angles to each other at any point along the length. In other words, mean diameter is 1/2 (AA + BB).
- Ovalness tolerance is not applicable for annealed temper or if the wall thickness is less than 2.5% of the outside diameter.

TABLE 15
Hollow Sections: Wall Thickness Tolerance

Wall Thickness mm	Width or overall dimensions (mm)														
	Over 10.0	20.0	30.0	40.0	50.0	60.0	80.0	100.0	120.0	140.0	160.0	180.0	200.0	225.0	250.0
Class B															
Over	Upto														
1.0	1.5	0.28	0.28	0.28	0.30	-	-	-	-	-	-	-	-	-	-
1.5	2.0	0.30	0.33	0.33	0.36	-	-	-	-	-	-	-	-	-	-
2.0	2.5	0.33	0.33	0.36	0.38	0.43	0.46	-	-	-	-	-	-	-	-
2.5	3.0	0.41	0.43	0.46	0.48	0.51	0.53	0.56	-	-	-	-	-	-	-
3.0	4.0	0.53	0.56	0.58	0.61	0.64	0.66	0.69	0.71	0.74	-	-	-	-	-
4.0	5.0	-	0.71	0.74	0.76	0.79	0.81	0.84	0.86	0.89	0.91	0.94	1.02	-	-
5.0	6.0	-	-	0.97	0.99	1.02	1.04	1.07	1.09	1.12	1.14	1.17	1.19	1.22	1.24
6.0	8.0	-	-	-	1.22	1.24	1.27	1.30	1.32	1.35	1.37	1.40	1.42	1.45	1.47
8.0	10.0	-	-	-	-	1.47	1.50	1.52	1.55	1.57	1.60	1.63	1.65	1.68	1.70
10.0	12.0	-	-	-	-	1.73	1.75	1.78	1.8	1.83	1.85	1.88	1.90	1.93	1.96
12.0	16.0	-	-	-	-	-	1.98	2.00	2.03	2.06	2.08	2.11	2.13	2.16	2.18
16.0	20.0	-	-	-	-	-	-	2.24	2.26	2.29	2.31	2.34	2.36	2.39	2.41
20.0	25.0	-	-	-	-	-	-	2.49	2.51	2.54	2.57	2.59	2.62	2.64	2.67
Class A															
1.5	2.0	0.28	0.30	0.30	0.33	-	-	-	-	-	-	-	-	-	-
2.0	2.5	0.30	0.30	0.33	0.36	0.41	0.43	-	-	-	-	-	-	-	-
2.5	3.0	0.30	0.30	0.36	0.38	0.43	0.46	0.51	-	-	-	-	-	-	-
3.0	4.0	0.33	0.36	0.38	0.41	0.46	0.51	0.56	0.61	0.69	-	-	-	-	-
4.0	5.0	-	0.41	0.43	0.46	0.51	0.56	0.61	0.69	0.76	0.84	0.91	0.99	-	-
5.0	6.0	-	-	0.46	0.51	0.56	0.61	0.69	0.76	0.84	0.91	0.99	1.07	-	-
6.0	8.0	-	-	-	0.56	0.61	0.69	0.76	0.84	0.91	0.99	1.07	1.14	-	-
8.0	10.0	-	-	-	-	0.69	0.76	0.84	0.91	0.99	1.07	1.14	1.22	-	-
10.0	12.0	-	-	-	-	0.76	0.84	0.91	0.99	1.07	1.14	1.22	1.30	-	-
12.0	16.0	-	-	-	-	-	0.91	0.99	1.07	1.14	1.22	1.30	1.37	-	-
16.0	20.0	-	-	-	-	-	-	1.07	1.14	1.22	1.30	1.37	1.45	-	-

Notes:

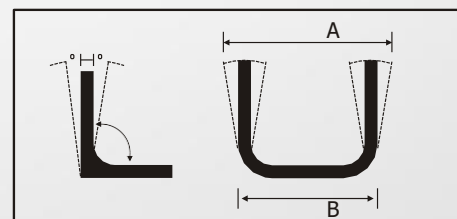
- These tolerances are applicable to hollow sections other than round tubes.
- For non-heat-treatable alloys, these tolerances are applicable when wall thickness of the section is at least 1.5 mm or 1/32 of overall width, whichever is greater. For heat-treated alloys, these tolerances are applicable when wall thickness is at least 1.5 mm or 1/24 of overall width, whichever is greater.
- Unless otherwise specified, class B tolerances will be applicable.
- For high-magnesium non-heat-treatable alloys (5052, 5056, 5083, 5086), an extra tolerance of 50% shall be allowed.

TABLE 16
Hollow Sections: Width Tolerance


Specified Width or Width across flats (mm)		Width tolerance \pm when measured	
		at corners	at centre
Over	Upto		
10.0	20.0	0.30	0.46
20.0	30.0	0.38	0.55
30.0	40.0	0.45	0.65
40.0	50.0	0.52	0.80
50.0	60.0	0.60	1.00
60.0	80.0	0.70	1.20
80.0	100.0	0.80	1.40
100.0	120.0	0.89	1.65
120.0	140.0	1.02	1.90
140.0	160.0	1.14	2.20
160.0	180.0	1.27	2.45
180.0	200.0	1.40	2.70

Notes:

1. These tolerances are applicable to hollow sections other than round tubes.
2. For non-heat-treatable alloys, these tolerances are applicable when wall thickness of the section is at least 1.5 mm or 1/32 of overall width, whichever is greater. For heat-treated alloys, these tolerances are applicable when wall thickness is at least 1.5 mm or 1/24 of overall width, whichever is greater.
3. For high-magnesium non-heat-treatable alloys (5052, 5056, 5083, 5086), an extra tolerance of 50% shall be allowed.

TABLE 17
Solid & Hollow Sections: Angularity Tolerance


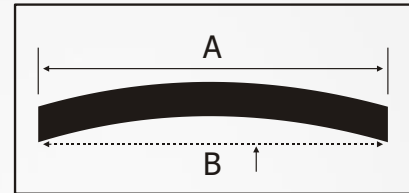
Displacement of any one leg to be controlled independently by angular tolerances

Specified thickness of thinnest leg mm	Allowable deviation from specified angle degree \pm
Upto 5.0	2.0
Over 5.0 upto 19.0	1.5
Over 19.0	1.0

Notes :

Angles should be measured at the extremities of the section. If the cases of the sections are convex, the angle should be measured by balancing the arms of the protractor at the middle of the section.

TABLE 18
Solid & Hollow Sections: Flatness Tolerance



Width of section (mm) A		Tolerance B
Over	Upto & including	±mm
-	25	0.18
25	38	0.25
38	50	0.30
50	-	0.30 plus 0.13 mm for every 25 mm of width (see ex. below)

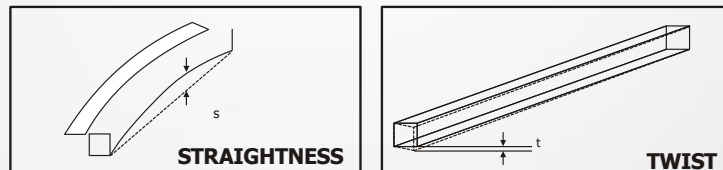
Example : The tolerances for a solid section of 150 mm width shall be as follows:

$$\pm(0.30 + 0.13 \times \frac{150}{25}) = (0.30 \pm 0.13 \times 6) = \pm 1.08 \text{ mm}$$

Notes :

1. Flatness tolerance is measure of concavity or convexity.
2. While measuring convexity, the straight edge shall be balanced at the middle of the section.

TABLE 19
Solid & Hollow Section: Twist & Straightness Tolerance



Diameter of circumscribing circle mm	Allowable deviation from straightness mm per metre or length
Upto & including 25.0	2.1
Over 25.0	1.7

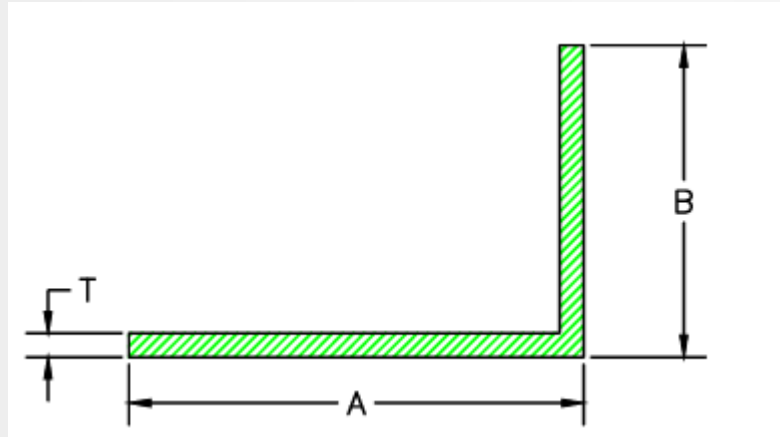
Notes :

1. Tolerance values are same for straightness and twist.
2. Twist is normally measured by placing the extruded section on a flat surface and measuring the maximum distance at any point along its length between the bottom surface of the section and the flat surface. From this measurement, the deviation from true straightness of the section is subtracted. The remainder is the twist. To convert the standard twist tolerance to an equivalent inner value, the tangent of the standard tolerance is multiplied by the width of the surface of the section that is one of the flat surface.

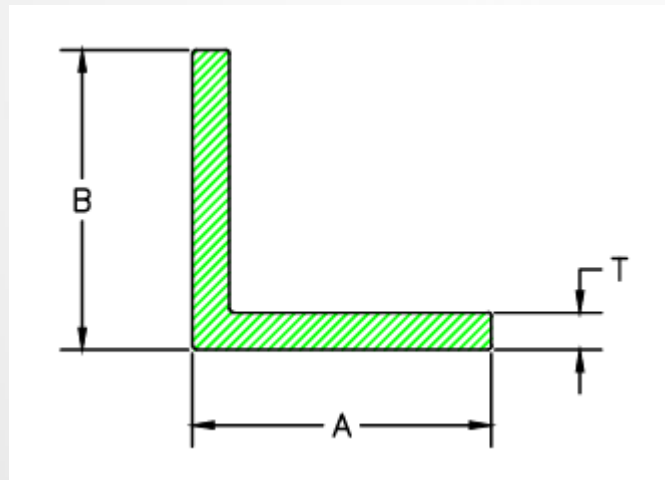
TABLE 20
Solid & Hollow Section: Cut Length Tolerance

Width or diameter mm	Length tolerance mm ±
Upto 50.0	6
50.1 to 100.0	8
100.1 to 150.0	10
150.1 and above	12

ANGLE

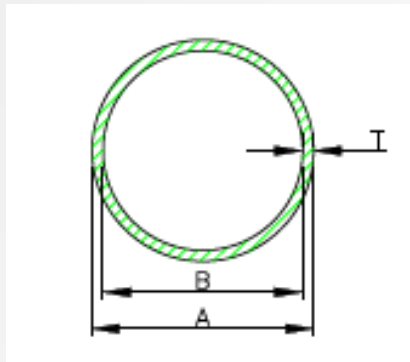


<u>SECTION NO</u>	<u>A</u>	<u>B</u>	<u>T</u>	<u>WT/12FT</u>
551	38	25	2.65	1.30-1.60
552	38	25	3.20	1.80-2.00



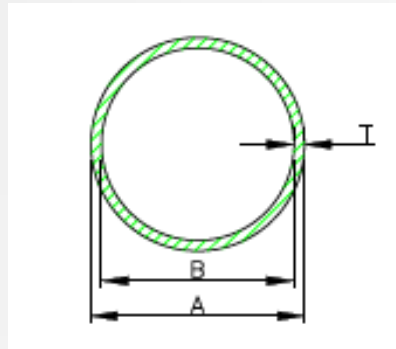
<u>SECTION NO</u>	<u>A</u>	<u>B</u>	<u>T</u>	<u>WT/12FT</u>
501	25	25	1.50	0.75
502	38	38	2.50	1.85
503	38	38	3.95	2.90
504	50	50	3.05	3.00
505	50	50	4.30	4.25

ROUND PIPE

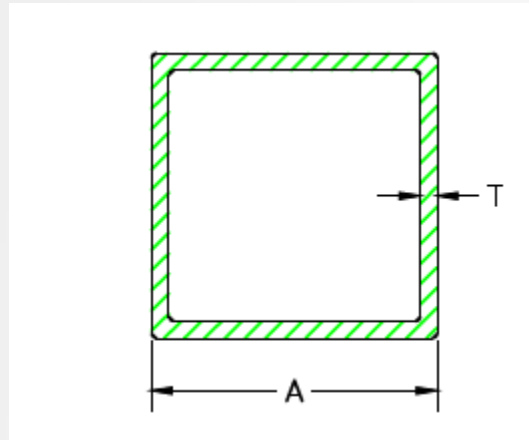


<u>SECTION NO</u>	<u>OD</u>	<u>ID</u>	<u>THICKNESS</u>	<u>WT / 12FT</u>
RP-601	9.00	8.00	0.50	0.130
RP-602	9.40	7.80	0.80	0.210
RP-603	10.00	6.50	1.75	0.450
RP-604	11.00	10.00	0.50	0.160
RP-605	11.20	10.00	0.60	0.200
RP-606	15.00	1.50	6.75	1.700
RP-607	16.00	13.00	1.50	0.650
RP-608	16.00	13.00	1.50	0.650
RP-609	16.00	11.00	2.50	1.000
RP-610	17.00	6.40	5.30	1.900
RP-611	17.00	11.00	3.00	1.300
RP-612	19.00	18.00	0.50	0.300
RP-613	19.00	6.20	6.40	2.800
RP-614	19.30	16.30	1.50	0.850
RP-615	20.30	18.30	1.00	0.600
RP-616	20.50	18.50	1.00	0.600
RP-617	25.00	23.20	0.90	0.700
RP-618	25.00	22.00	1.50	1.100
RP-619	25.00	23.00	1.00	0.750
RP-620	25.20	22.70	1.25	0.900

ROUND PIPE



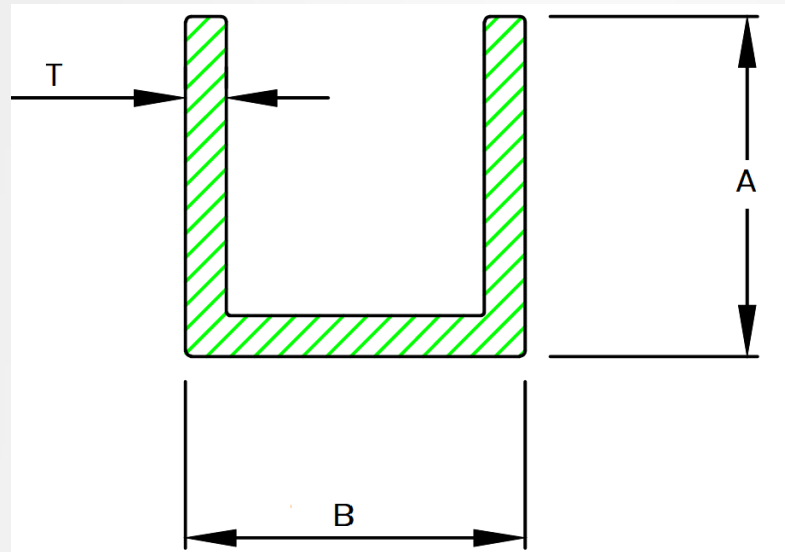
<u>SECTION NO</u>	<u>OD</u>	<u>ID</u>	<u>THICKNESS</u>	<u>WT / 12FT</u>
RP-621	25.50	22.50	1.50	1.100
RP-622	28.00	22.40	2.80	2.200
RP-623	28.80	27.00	0.90	0.800
RP-624	29.00	28.00	0.50	0.450
RP-625	30.00	27.70	1.15	1.000
RP-626	30.00	28.50	0.75	0.700
RP-627	30.00	29.00	0.50	0.450
RP-628	30.00	28.30	0.85	0.780
RP-629	30.00	28.50	0.75	0.700
RP-630	30.20	29.50	0.35	0.300
RP-631	30.50	29.50	0.50	0.500
RP-632	32.00	27.00	2.50	2.300
RP-633	32.50	28.10	2.20	2.000
RP-634	32.60	28.90	1.85	1.800
RP-635	38.30	35.30	1.50	1.700



SQUARE TUBE

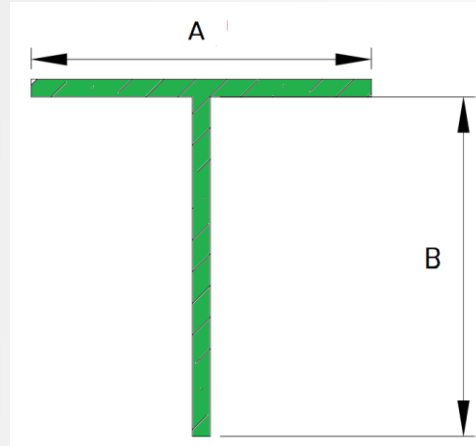
<u>SECTION NO</u>	<u>A (MM)</u>	<u>A (INCHES)</u>	<u>THICKNESS</u>	<u>WT/12FT</u>
701	19	3/4"	0.80	0.800-1.100
710	25	1"	0.70	0.800-1.100
720	38	1.5"	0.90	1.80-2.20
721	38	1.5"	1.10	2.40-2.60
722	38	1.5"	1.50	2.80-3.20
723	38	1.5"	1.80	3.80-4.20
731	50	2"	1.00	2.50-2.80
732	50	2"	1.20	2.80-3.10
733	50	2"	1.50	3.50-3.80

U CHANNEL

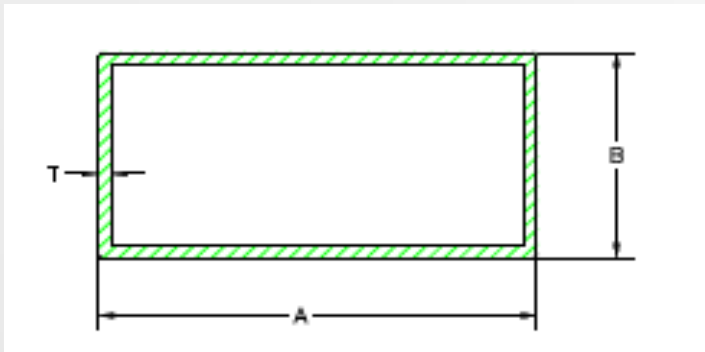


<u>SECTION NO</u>	<u>A</u>	<u>B</u>	<u>T</u>	<u>WT/14FT</u>
801	12	12	0.70	0.280-0.320
802	9	9	0.70	0.180-0.240

T SECTION

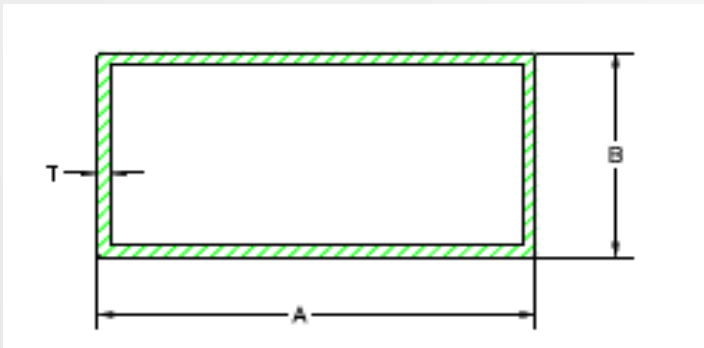


<u>SECTION NO</u>	<u>A</u>	<u>B</u>	<u>T</u>	<u>WT/14FT</u>
851	19	19	0.70	0.280-0.320
852	25	25	0.70	0.280-0.320



RECTANGULAR TUBE

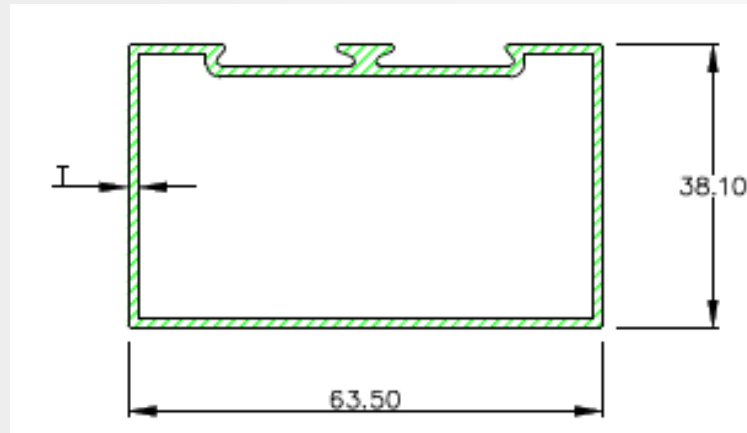
<u>SECTION NO</u>	<u>A X B INCHES</u>	<u>A X B MM</u>	<u>WT RANGE/15FT</u>
900	1.5 X 1	36 X 24	0.60-.900
901	1.5 X 1	36 X 24	1.00-1.30
902	1.5 X 1	38 X 25	1.40-1.70
903	1.5 X 1	38 X 25	1.80-2.00
904	1.5 X 1	38 X 25	2.20-2.50
910	2 X 1	50 X 25	0.90-1.00
911	2 X 1	50 X 25	1.10-1.30
912	2 X 1	50 X 25	1.50-1.70
913	2 X 1	50 X 25	1.80-2.00
914	2 X 1	50 X 25	2.20-2.50



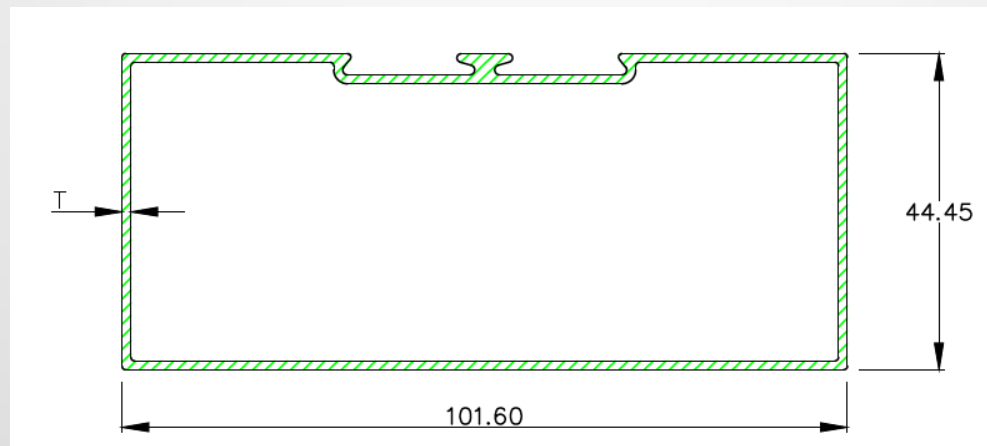
RECTANGULAR TUBE

<u>SECTION NO</u>	<u>A X B INCHES</u>	<u>A X B MM</u>	<u>WT RANGE/15FT</u>
930	2.5 X 1.5	63 X 38	1.70-2.00
931	2.5 X 1.5	63 X 38	2.20-2.50
932	2.5 X 1.5	63 X 38	2.80-3.00
933	2.5 X 1.5	63 X 38	3.50-3.80
940	3 X 1	75 X 25	2.70-3.00
941	3 X 1	75 X 25	3.20-3.50
942	3 X 1	75 X 25	4.20-4.50
950	4 X 2	100 X 50	4.70-5.00
951	4 X 2	100 X 50	6.70-7.00
952	4 X 2	100 X 50	9.70-10.00

SINGLE PARTITION

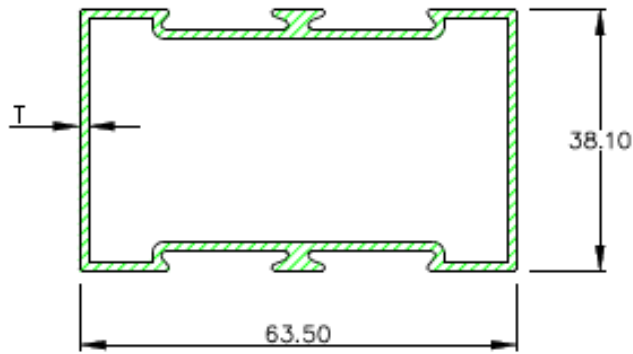


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1001	0.95	2.50-2.70
1002	1.10	2.70-3.00
1003	1.50	3.70-4.00
1004	1.80	4.70-5.00

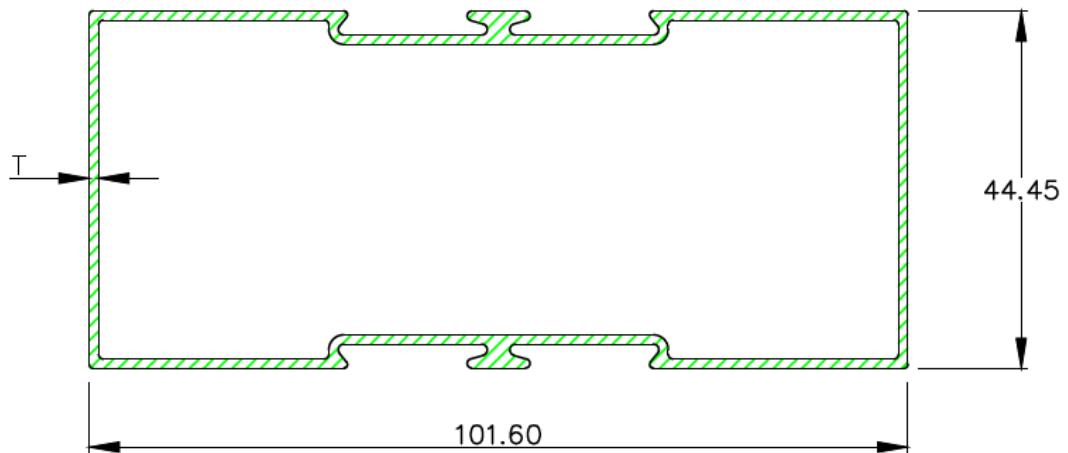


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1007	1.20	4.70-5.00
1008	1.70	6.70-7.00
1009	2.20	9.70-10.00

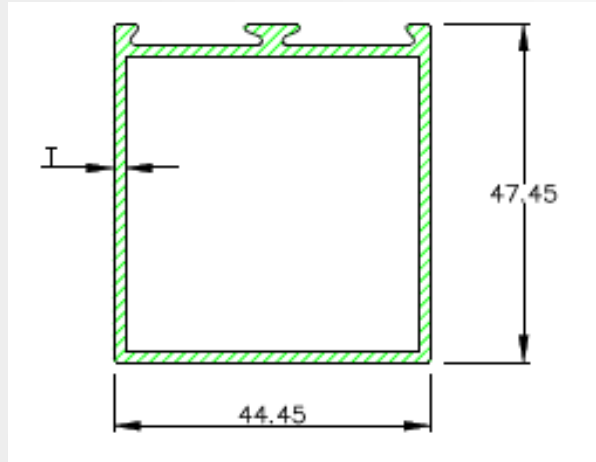
DOUBLE PARTITION



<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1050	0.95	2.50-2.70
1051	1.10	2.70-3.00
1052	1.50	3.70-4.00
1053	1.80	4.70-5.00



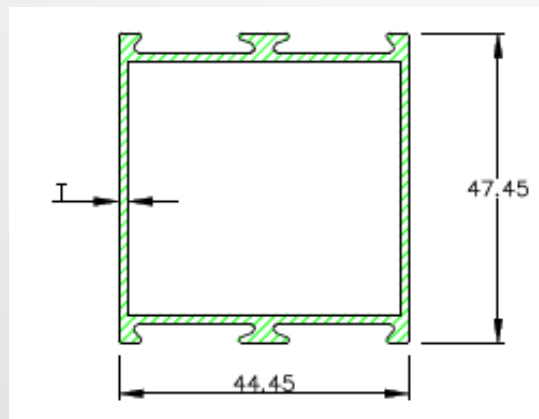
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1054	1.20	4.70-5.00
1055	1.70	6.70-7.00
1056	2.20	9.70-10.00



DOOR SINGLE (DMS)

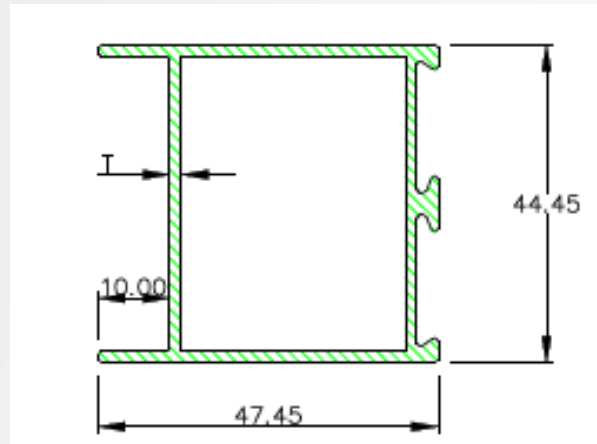
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1100	1.00	2.50-2.70
1101	1.10	2.70-3.00
1102	1.60	3.70-4.00
1103	2.00	4.70-5.00

DOOR MIDDLE DOUBLE (DMD)



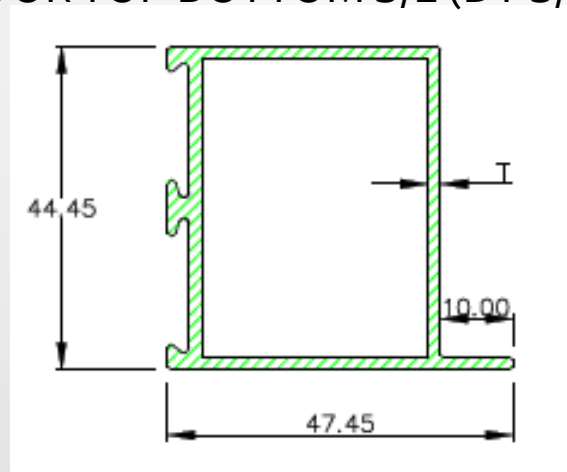
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1150	1.00	2.50-2.70
1151	1.10	2.70-3.00
1152	1.60	3.70-4.00
1153	2.00	4.70-5.00

DOOR TOP BOTTOM (DT)



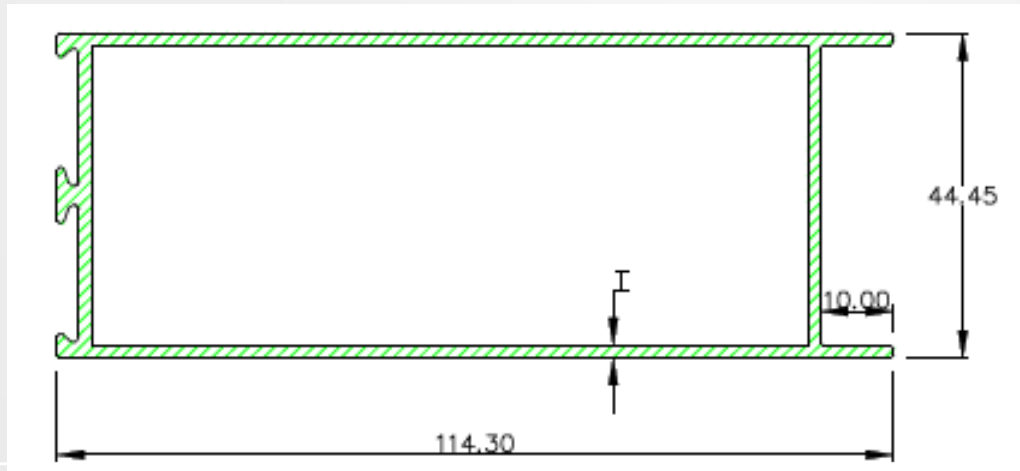
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1160	1.00	2.50-2.70
1161	1.10	2.70-3.00
1162	1.60	3.70-4.00
1163	2.00	4.70-5.00

DOOR TOP BOTTOM S/L (DT S/L)

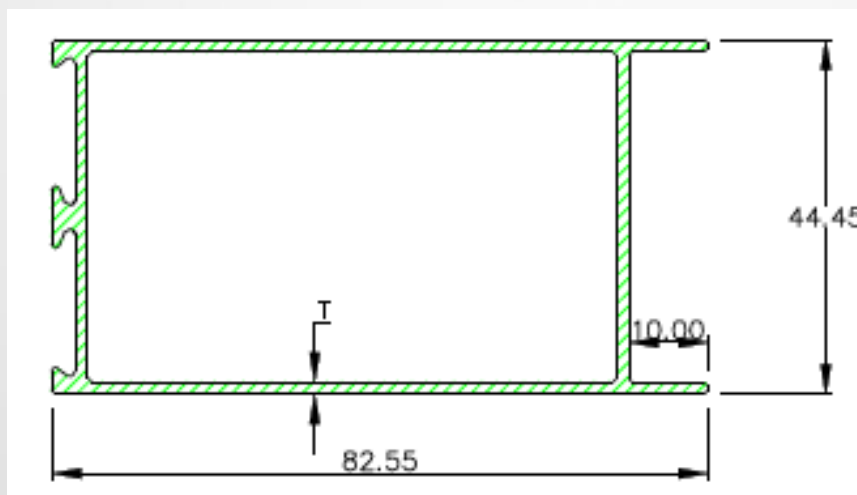


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1170	1.00	2.50-2.70
1171	1.10	2.70-3.00
1172	1.60	3.70-4.00
1173	2.00	4.70-5.00

DOOR TOP BOTTOM (DT)

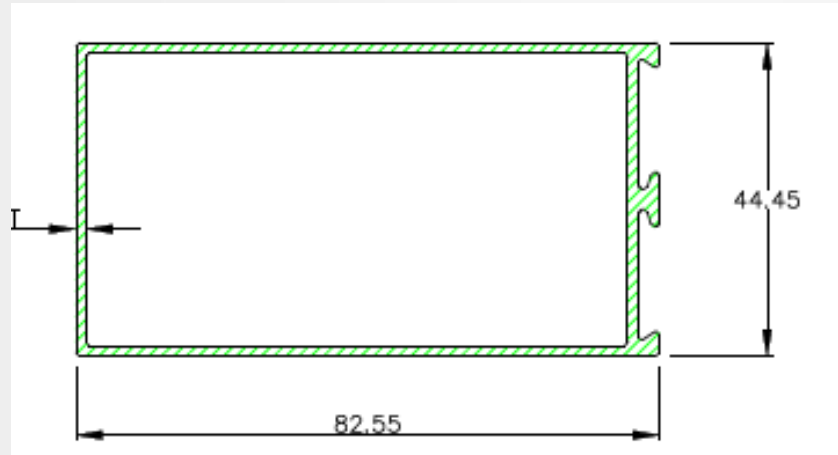


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1180	1.15	4.70-5.00
1181	1.70	6.70-7.00
1182	2.30	9.70-10.00



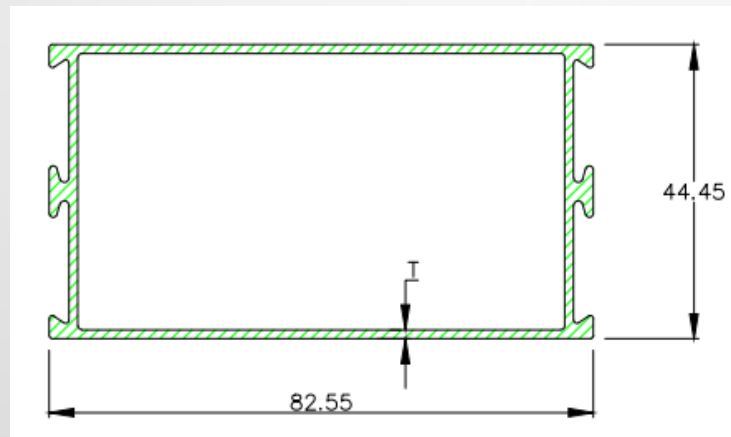
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1190	1.30	4.70-5.00
1191	1.90	6.70-7.00
1192	2.50	9.70-10.00

DOOR SINGLE (DMS)



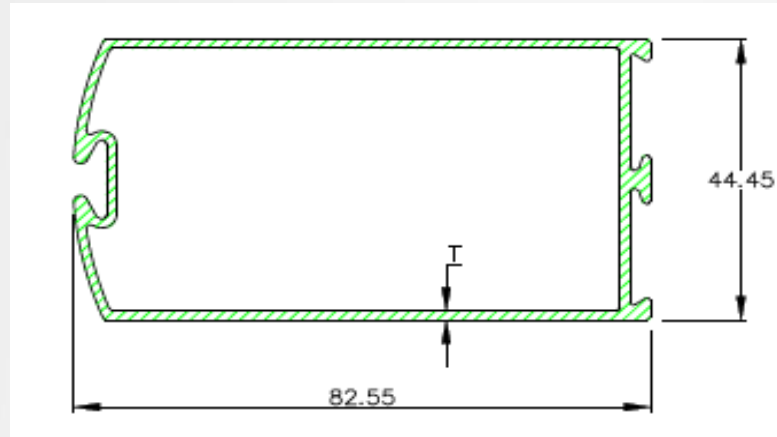
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1200	1.30	4.70-5.00
1201	1.90	6.70-7.00
1202	2.50	9.70-10.00

DOOR MIDDLE DOUBLE (DMD)

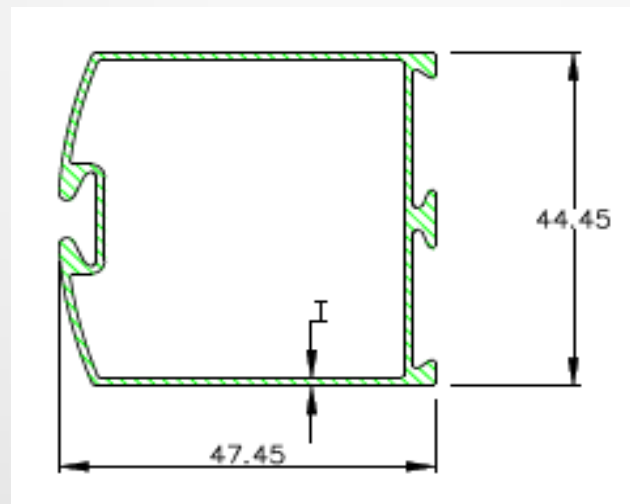


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1210	1.30	4.70-5.00
1211	1.90	6.70-7.00
1212	2.50	9.70-10.00

DOOR VERTICAL

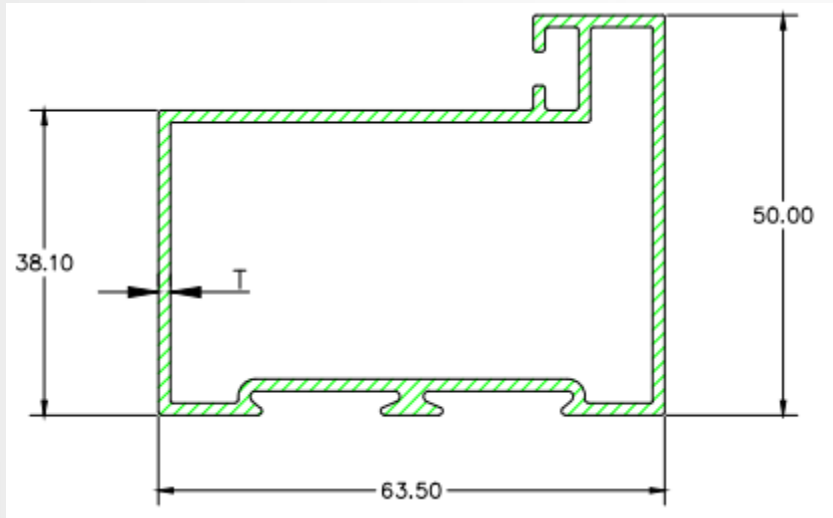


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1220	1.30	4.70-5.00
1221	1.90	6.70-7.00
1222	2.50	9.70-10.00



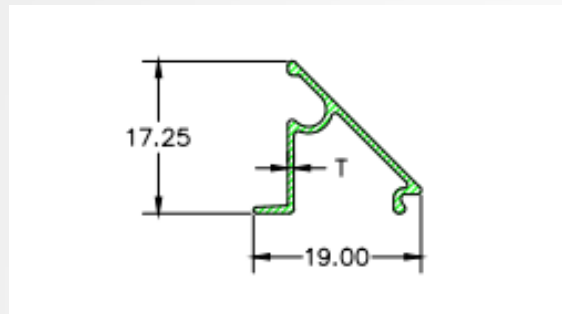
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1230	1.00	2.50-2.70
1231	1.10	2.70-3.00
1232	1.60	3.70-4.00
1233	2.00	4.70-5.00

PATTAM



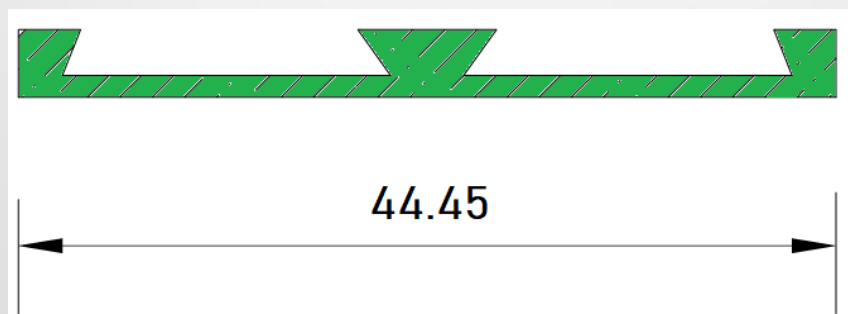
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1240	1.20	3.700-4.000
1241	0.45	4.800-5.200

GLAZING CLIP

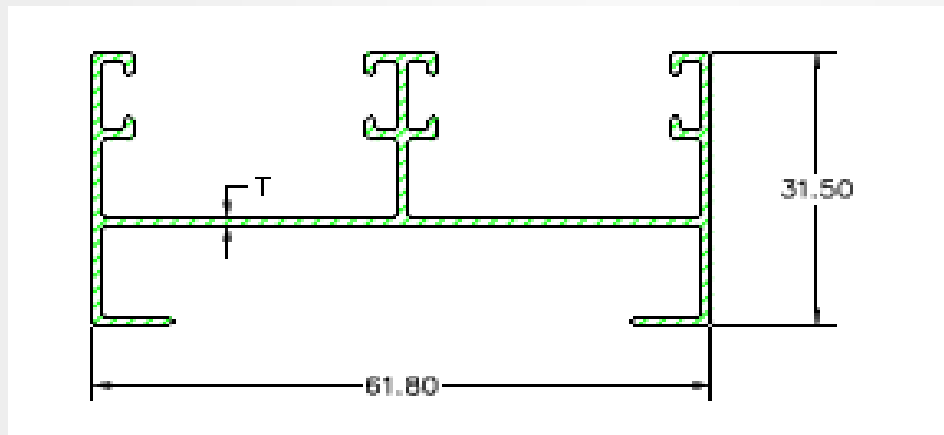


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 12 FT</u>
1250	0.40	0.180-0.200
1251	0.45	0.210-0.240
1252	0.50	0.240-0.270
1253	0.55	0.270-0.300

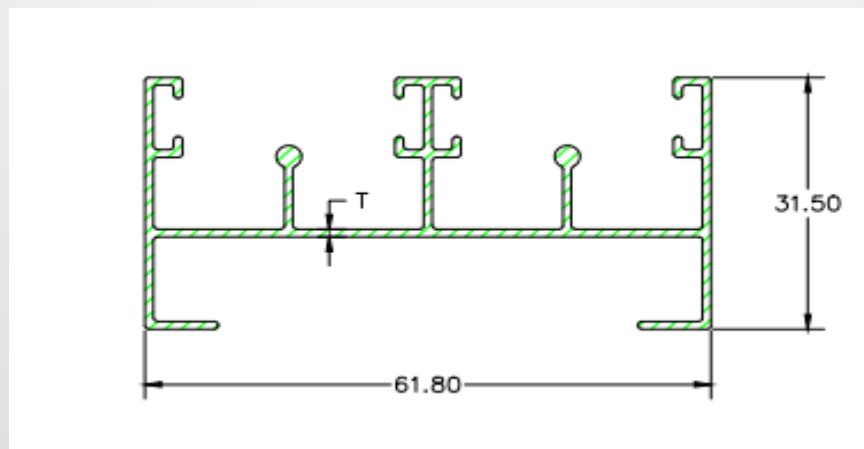
GLAZING PLATE



<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 12 FT</u>
1260	1.00	0.400-0.600

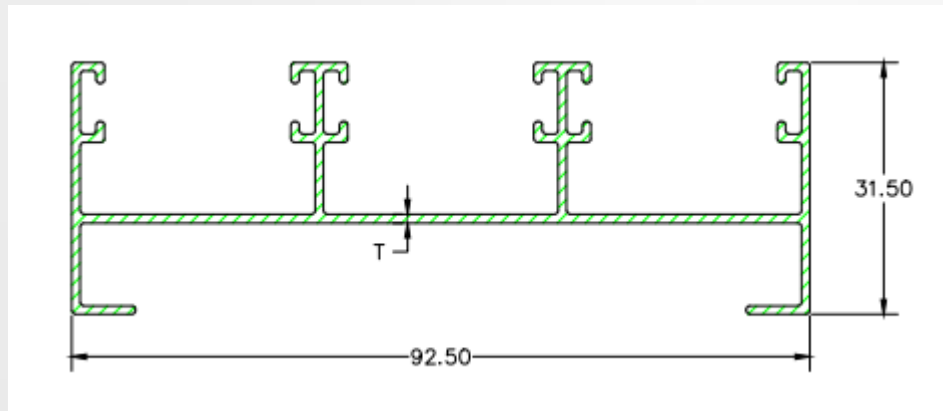
3/4" TWO TRACK TOP


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1301	0.95	1.60-1.80
1302	1.05	1.80-2.00
1303	1.15	2.00-2.30
1304	1.30	2.60-2.90

3/4" TWO TRACK BOTTOM


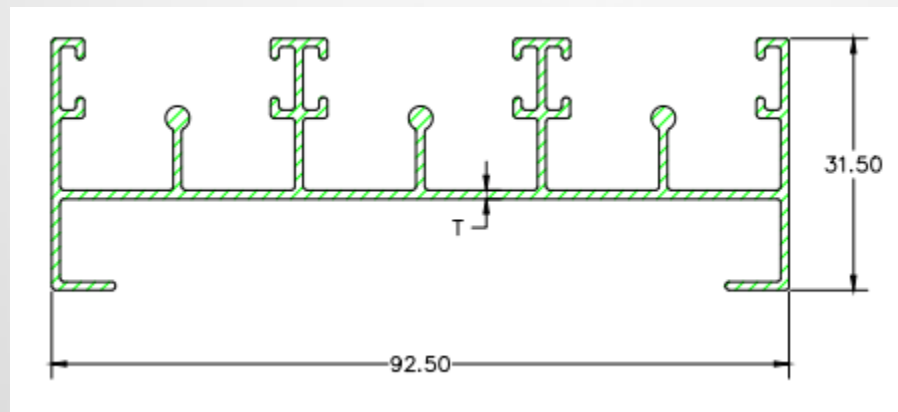
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1311	0.95	1.60-1.80
1312	1.05	1.80-2.00
1313	1.15	2.00-2.30
1314	1.30	2.60-2.90

3/4" THREE TRACK TOP

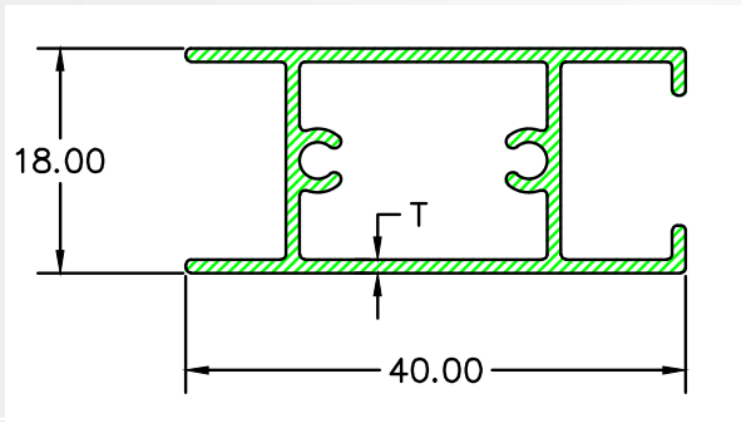


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1321	0.95	2.80-3.10
1322	1.05	3.80-4.10

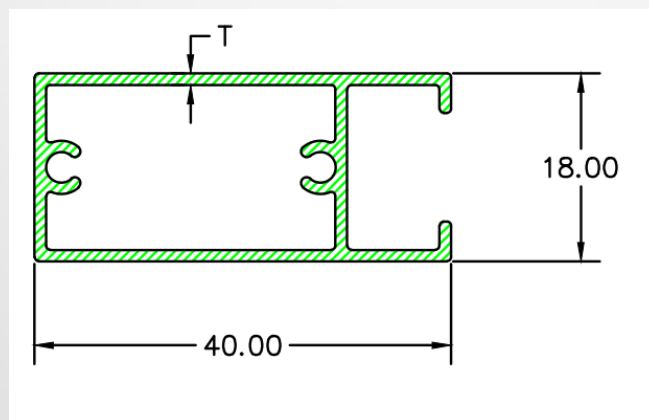
3/4" THREE TRACK BOTTOM



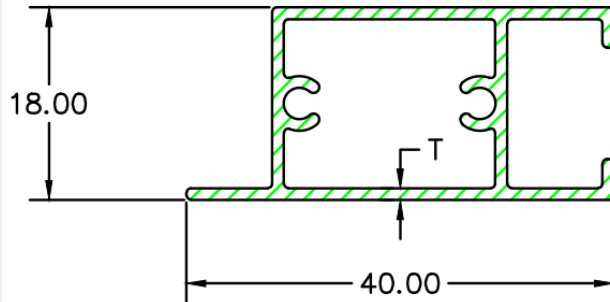
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1331	0.95	2.80-3.10
1332	1.05	3.80-4.10

3/4" TOP BOTTOM


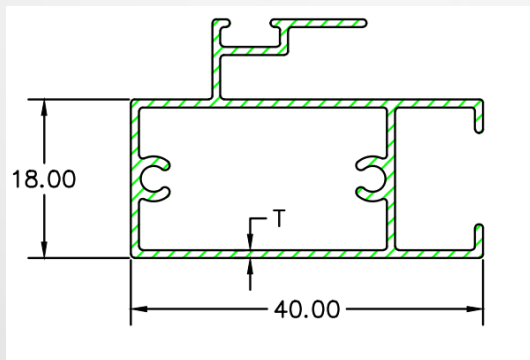
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1341	0.95	1.30-1.50
1342	1.05	1.60-1.80
1343	1.25	2.00-2.20

3/4" HANDLE


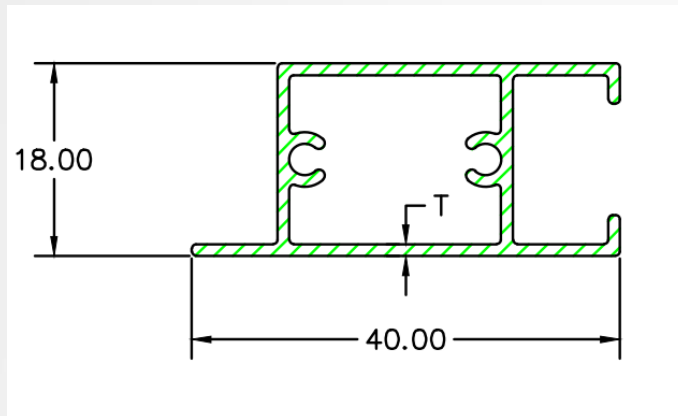
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1351	0.95	1.30-1.50
1352	1.05	1.60-1.80
1353	1.25	2.00-2.20

3/4" TOP BOTTOM S/L


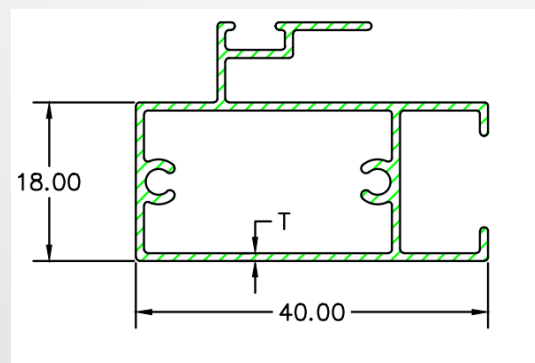
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1361	0.95	1.30-1.50
1362	1.05	1.60-1.80
1363	1.25	2.00-2.20

3/4" INTERLOCK


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1371	0.95	1.30-1.50
1372	1.05	1.60-1.80
1373	1.25	2.00-2.20

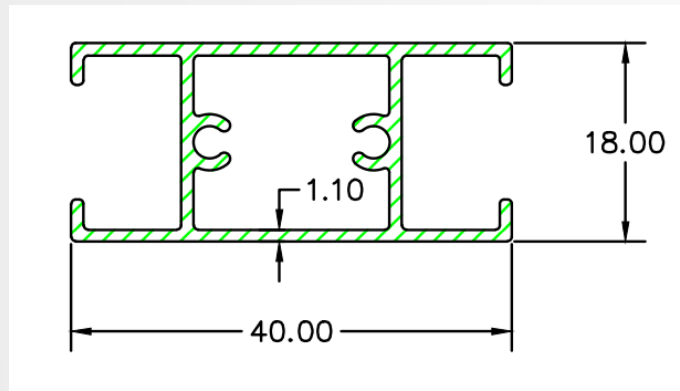
3/4" TOP BOTTOM S/L


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1361	0.95	1.30-1.50
1362	1.05	1.60-1.80
1363	1.25	2.00-2.20

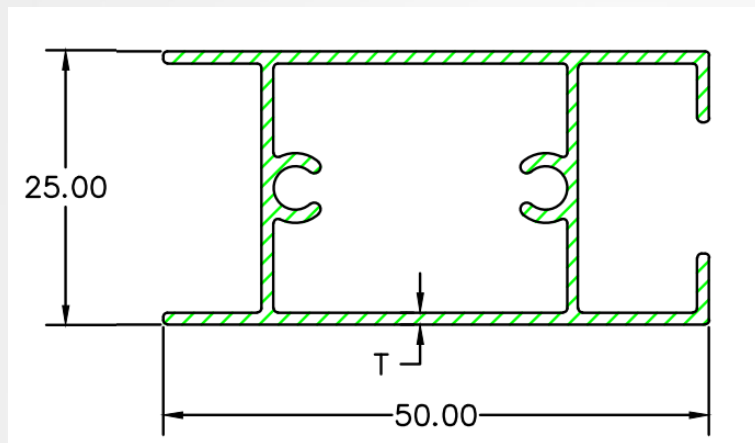
3/4" INTERLOCK


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1371	0.95	1.30-1.50
1372	1.05	1.60-1.80
1373	1.25	2.00-2.20

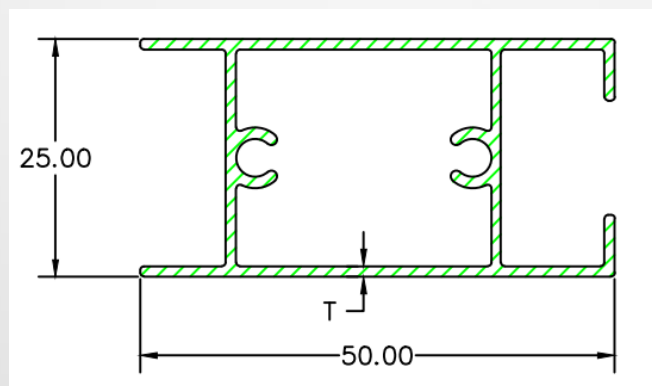
3/4" MIDDLE



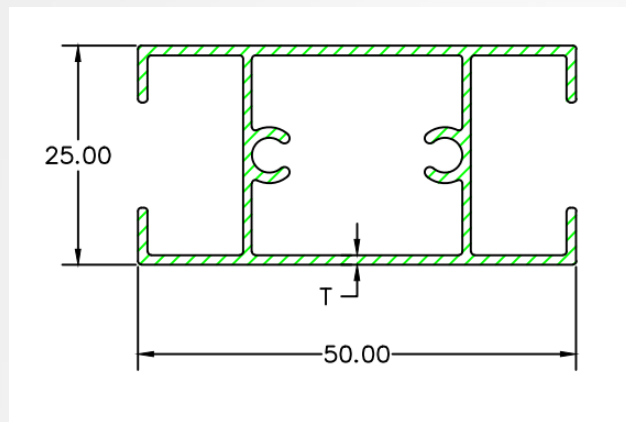
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1381	0.95	1.30-1.50
1382	1.05	1.60-1.80
1383	1.25	2.00-2.20

2 X 1 HANDLE


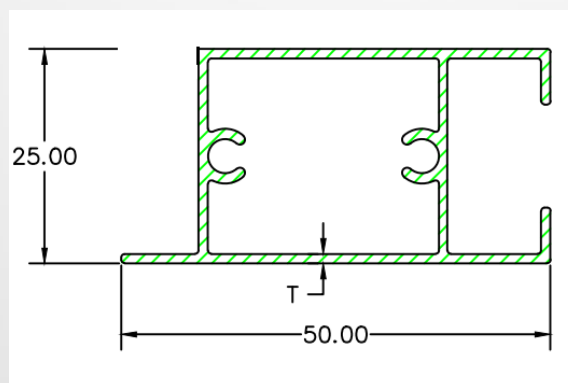
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1401	0.80	1.80-2.00
1402	0.90	2.00-2.20
1403	1.00	2.20-2.40

2 X 1 TOP BOTTOM


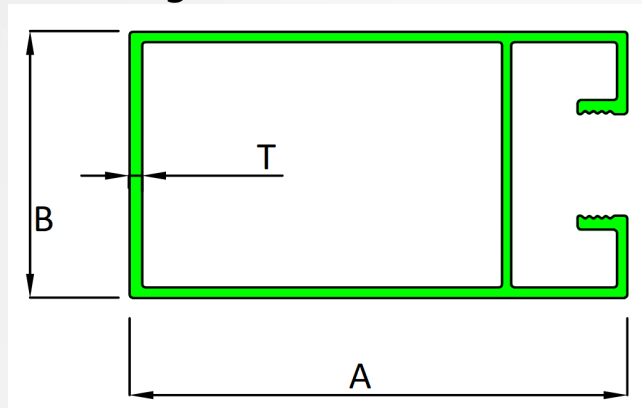
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1411	0.80	1.80-2.00
1412	0.90	2.00-2.20
1413	1.00	2.20-2.40

2 X 1 MIDDLE


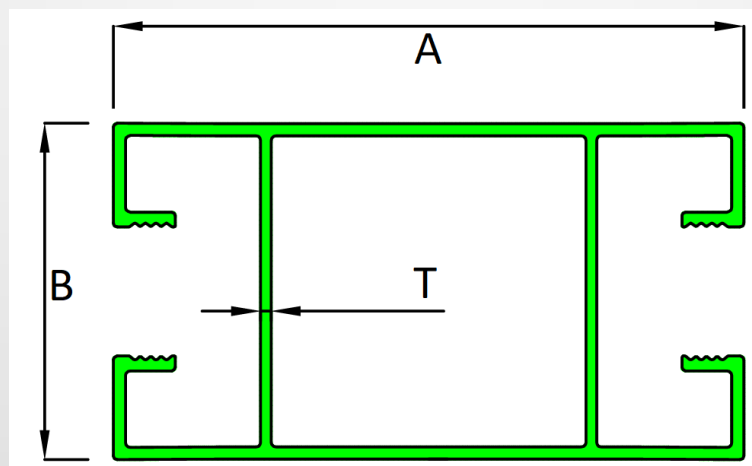
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1401	0.80	1.80-2.00
1402	0.90	2.00-2.20
1403	1.00	2.20-2.40

2 X 1 TOP BOTTOM S/L


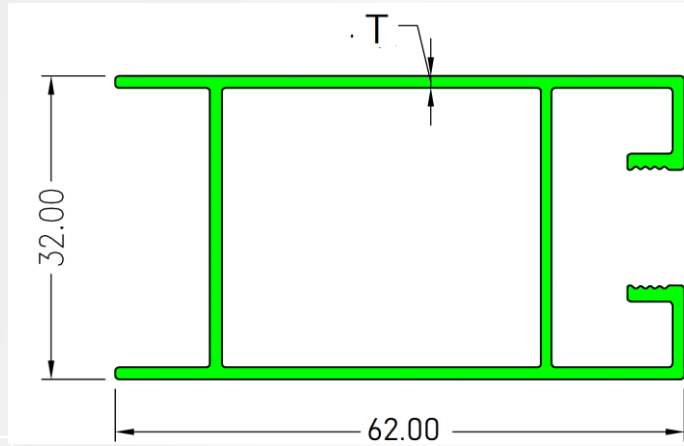
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1411	0.80	1.80-2.00
1412	0.90	2.00-2.20
1413	1.00	2.20-2.40

62 X 32 WINDOW SINGLE


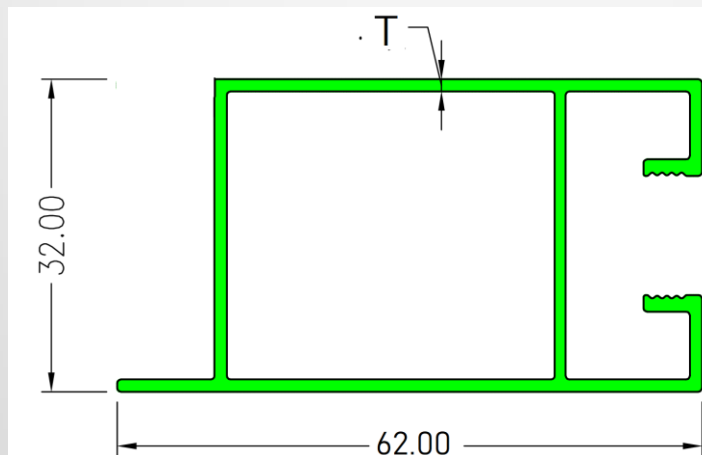
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1501	0.95	2.70-2.90
1502	1.20	3.80-4.20
1503	1.50	4.80-5.20

62 X 32 WINDOW MIDDLE


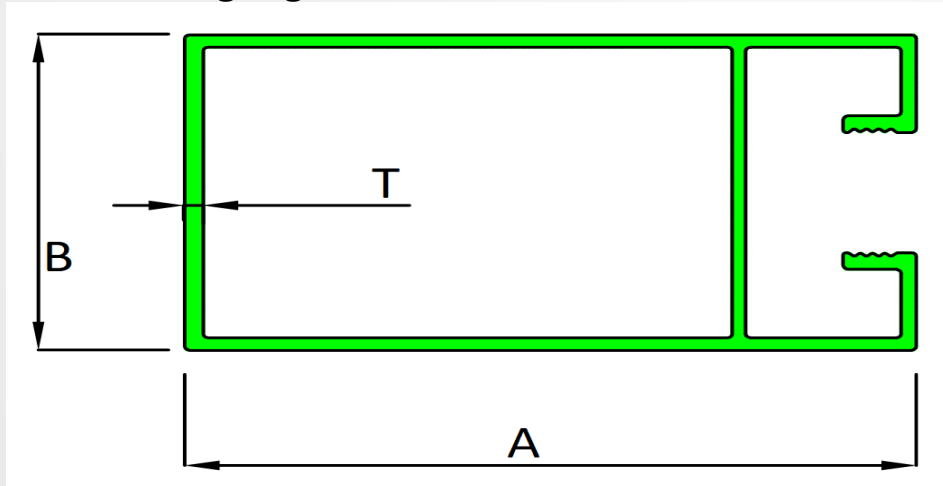
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1511	0.95	2.70-2.90
1512	1.20	3.80-4.20
1513	1.50	4.80-5.20

62 X 32 WINDOW TOP/BOTTOM


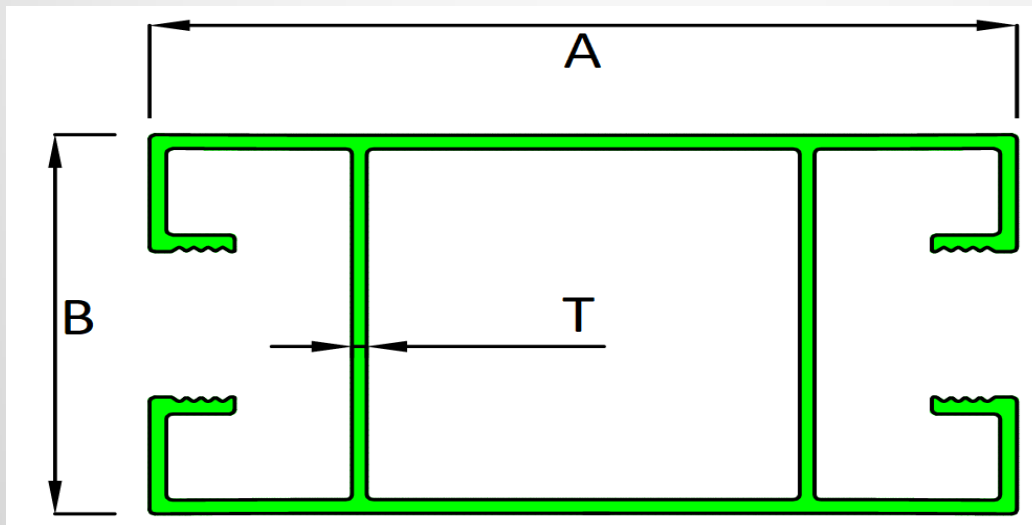
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1521	0.95	2.70-2.90
1522	1.20	3.80-4.20
1523	1.50	4.80-5.20

62 X 32 WINDOW S/L


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1531	0.95	2.70-2.90
1532	1.20	3.80-4.20
1533	1.50	4.80-5.20

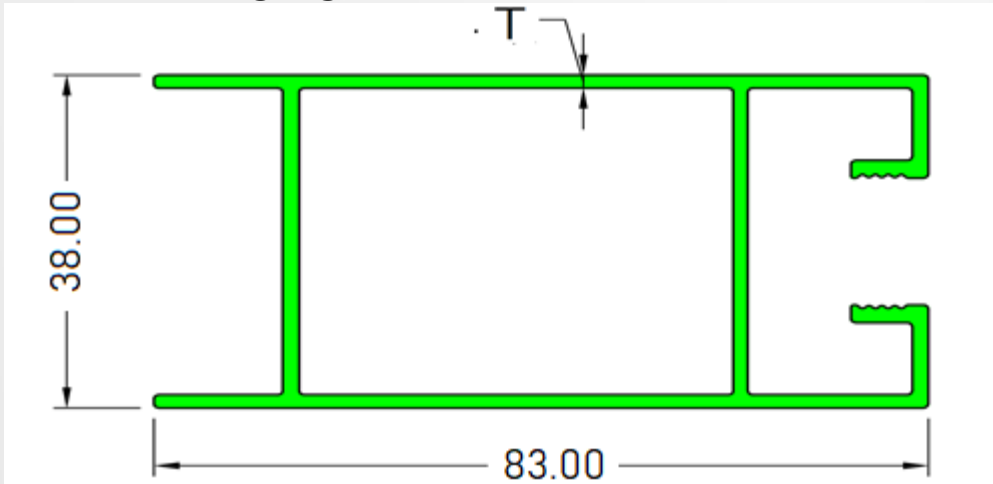
83 X 38 WINDOW SINGLE


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1541	0.95	4.70-5.00
1542	1.20	6.80-7.20

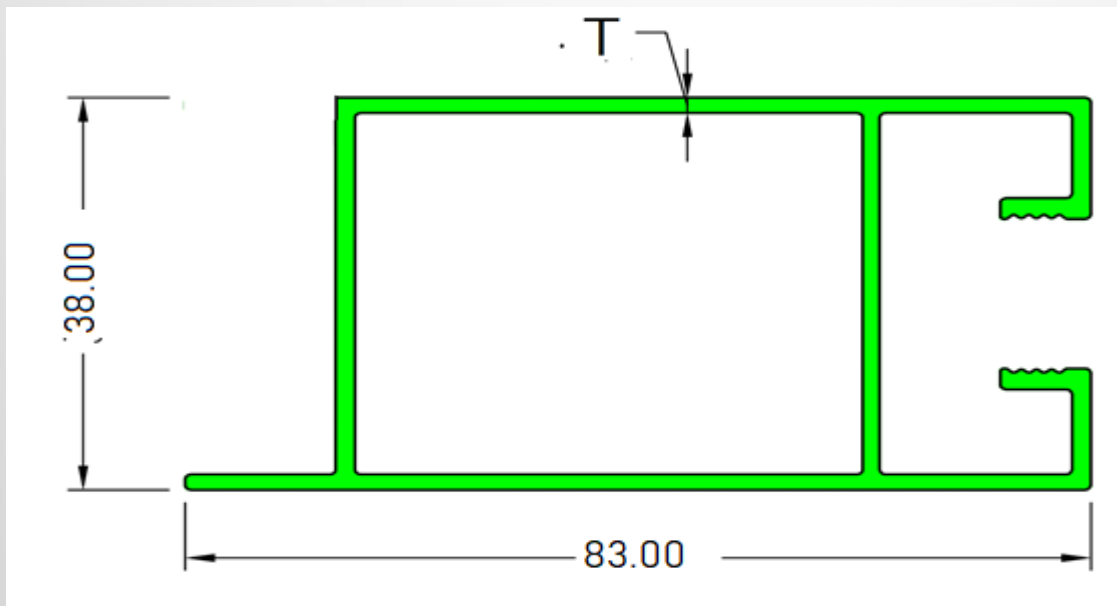
83 X 38 WINDOW MIDDLE


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1551	0.95	4.70- 5.00
1552	1.20	6.80-7.20

83 X 38 WINDOW TOP/BOTTOM

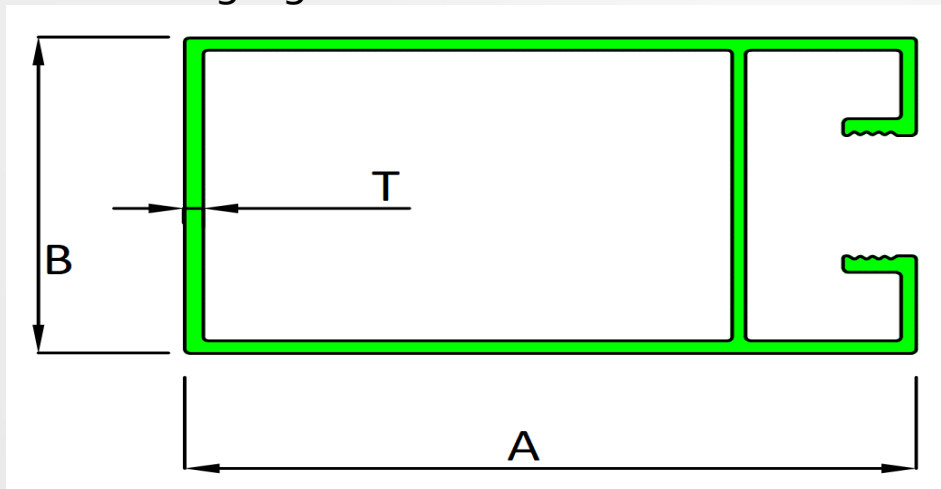


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1561	0.95	4.70-5.00
1562	1.20	6.80-7.20
83 X 38 WINDOW S/L		



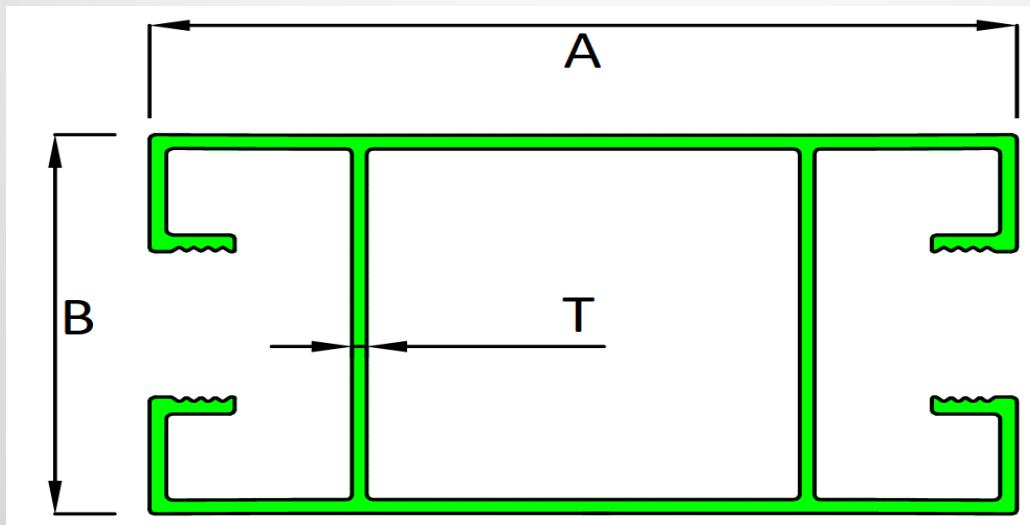
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1571	0.95	2.70-2.90
1572	1.20	3.80-4.20

83 X 32 WINDOW SINGLE



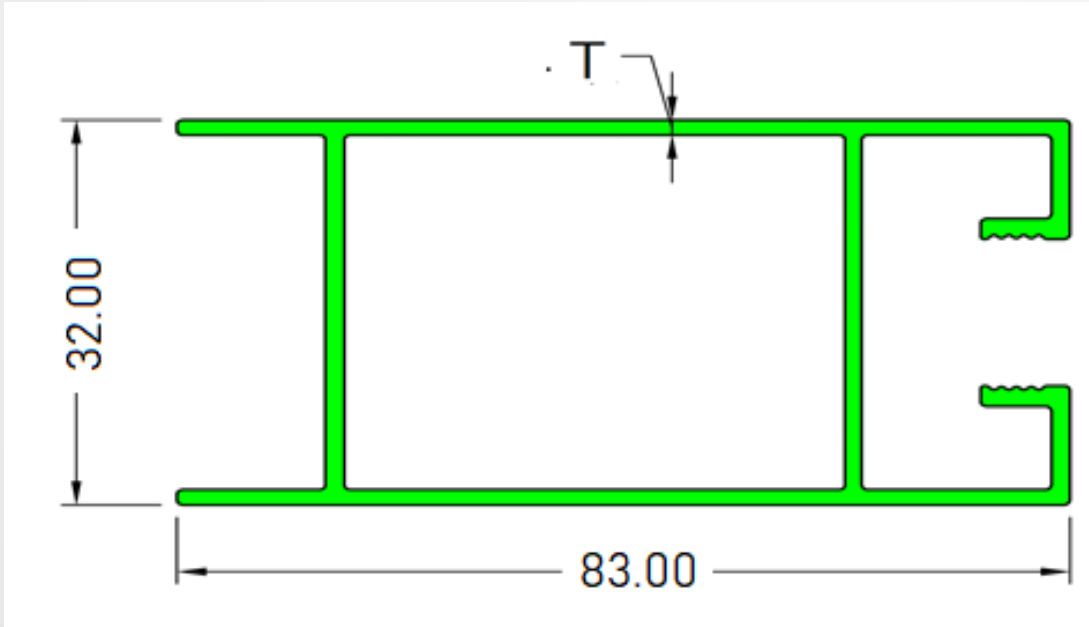
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1541	1.00	4.70-5.00
1542	1.20	6.80-7.20

83 X 32 WINDOW MIDDLE

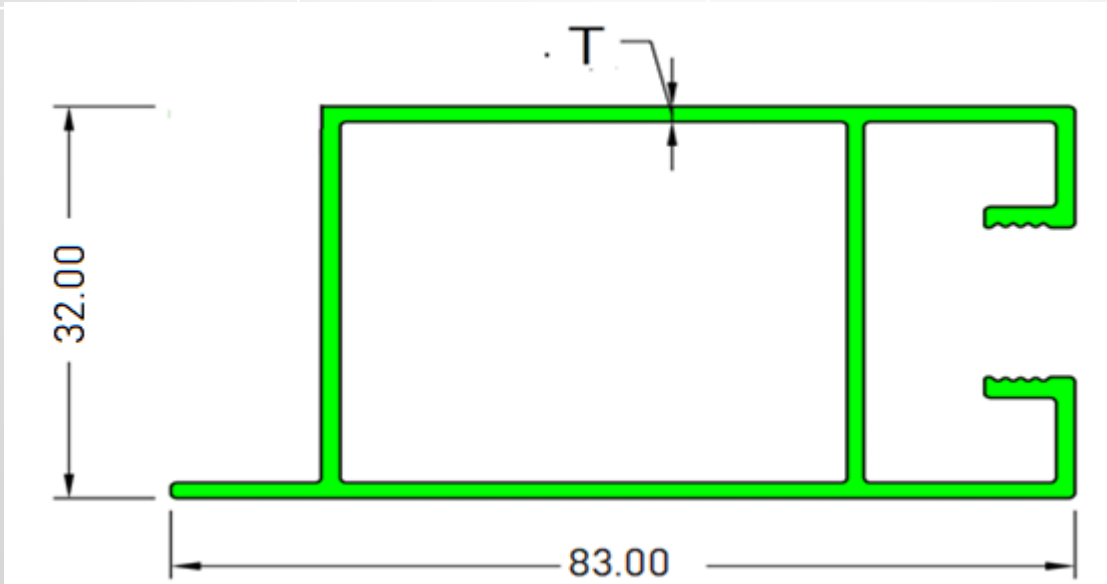


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/15 FT</u>
1551	1.00	4.70- 5.00
1552	1.20	6.80-7.20

83 X 32 WINDOW TOP/BOTTOM

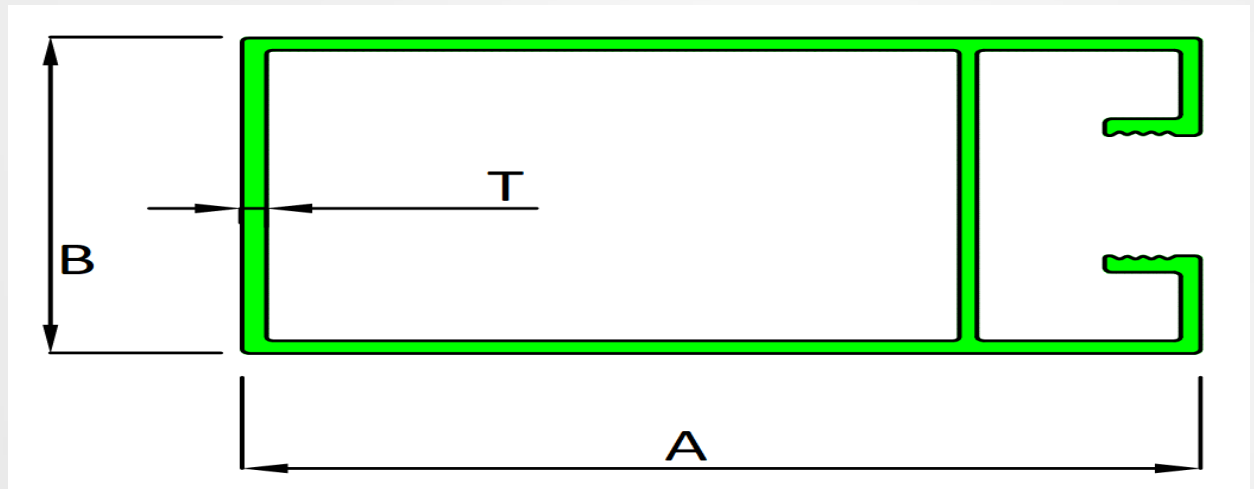


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1561	1.00	4.70-5.00
1562	1.20	6.80-7.20
83 X 32 WINDOW S/L		



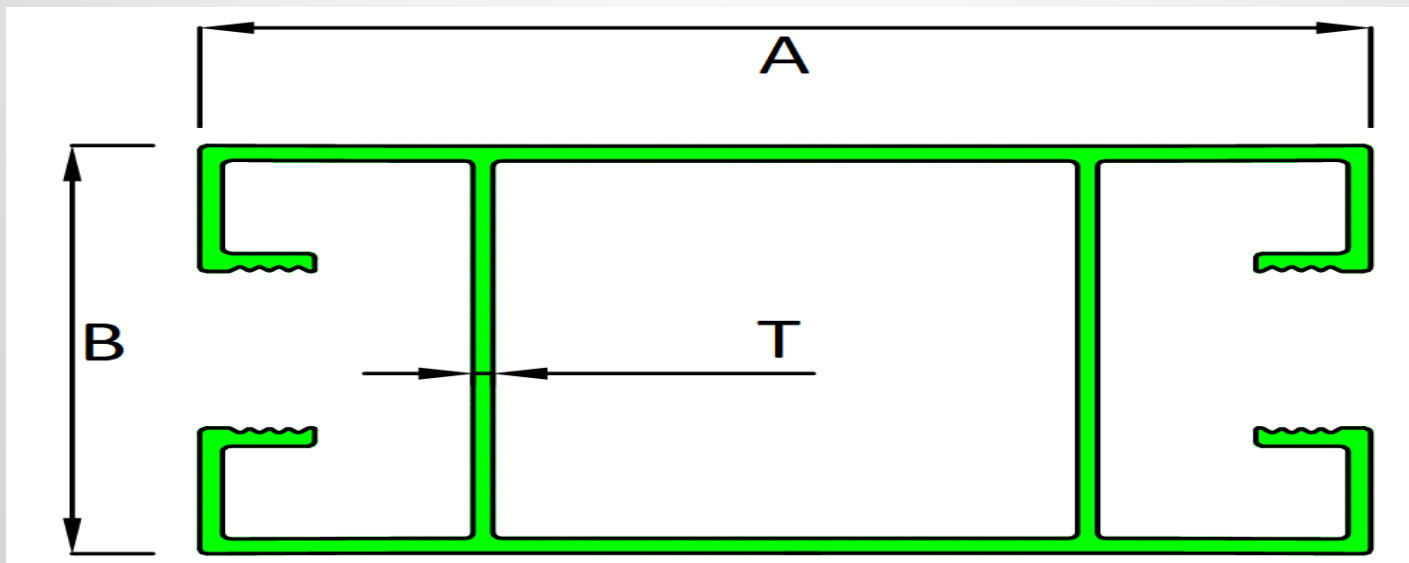
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1571	1.00	2.70-2.90
1572	1.20	3.80-4.20

100 X 32 WINDOW SINGLE



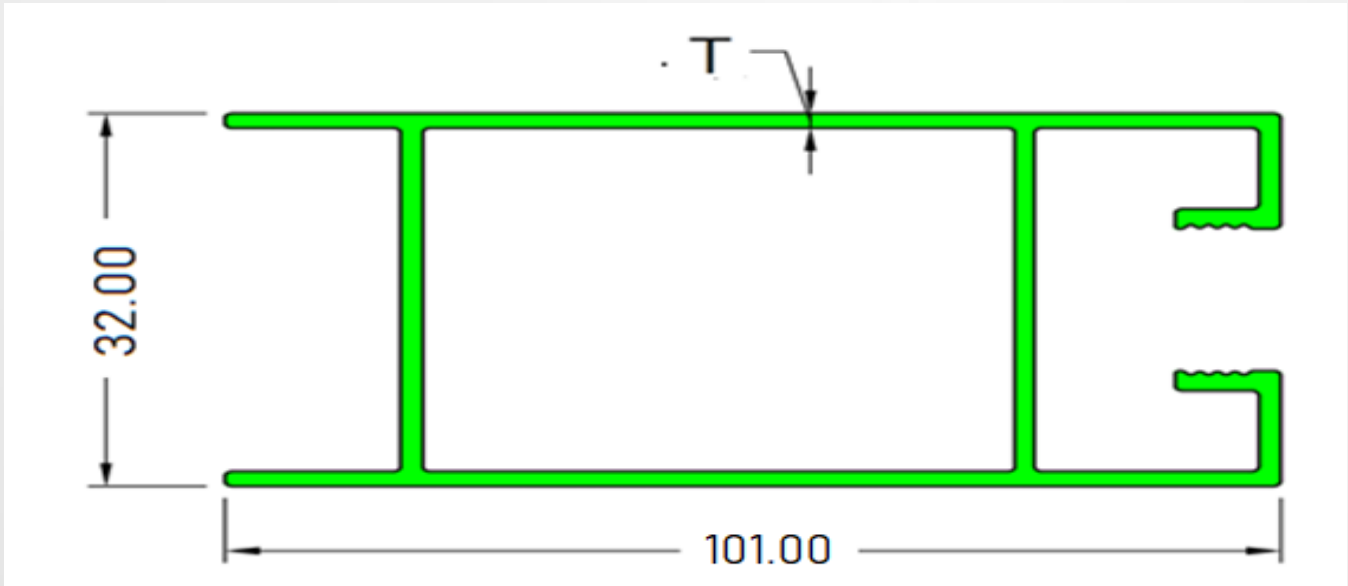
<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1541	1.00	4.70-5.00
1542	1.20	6.80-7.20

100 X 32 WINDOW MIDDLE

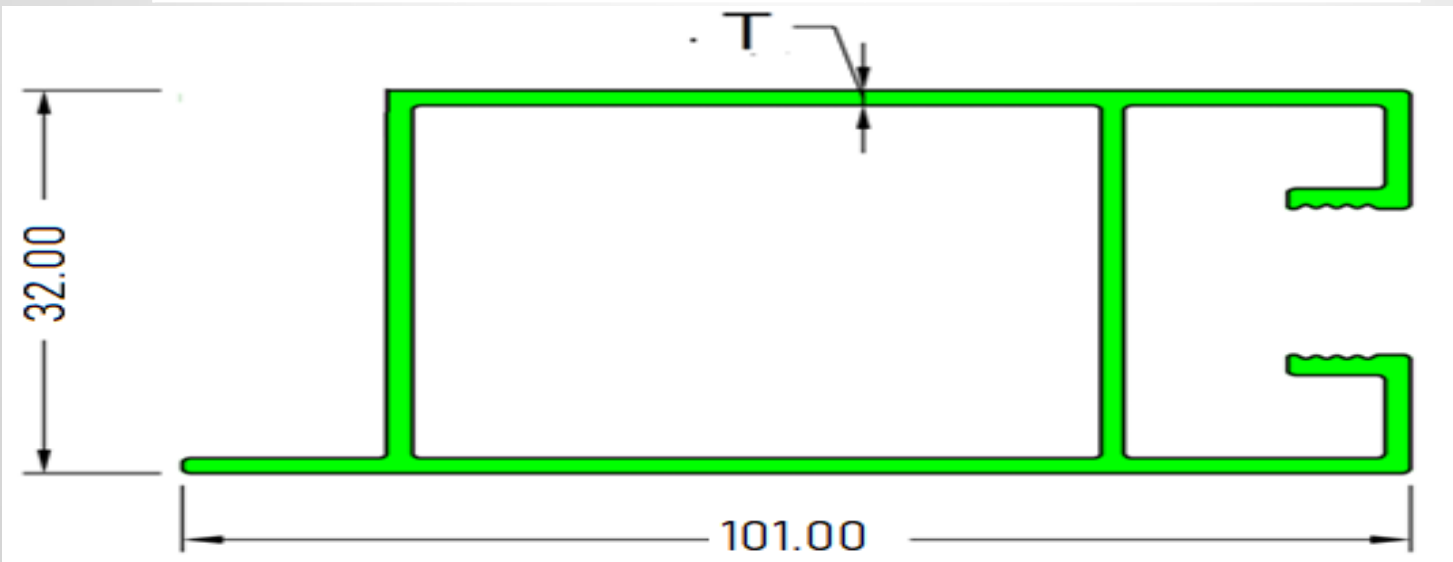


<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1551	1.00	4.70- 5.00
1552	1.20	6.80-7.20

100 X 32 WINDOW TOP/BOTTOM



<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1561	1.00	4.80-5.20
100 X 32 WINDOW S/L		



<u>SECTION NO</u>	<u>THICKNESS</u>	<u>WT RANGE/ 15 FT</u>
1571	1.00	2.70-2.90



THANK YOU

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