



**FRP POLE
CROSSARM
PROFILES**



SHANGHAI TUNGHSING COMPOSITES CO. LTD.

**FRP POLE SPECIALIST -
Your One-Stop Solution Provider**

The Tunghsing Story

Start manufacturing of FRP lighting pole with self-innovated method to achieve high strength FRP poles. Our fabrication is different from the traditional methods of filament winding and centrifugal process

1975

Establishment of mother company Tung Hsing Technology Corporation in Taipei

1976

1994

Establishment of Shanghai Tung Hsing Technology Inc.

1998

Volume production of Shanghai Tung Hsing

2001

Qualified and received ISO9001:2000 certificate (Quality Management System)

2013

Qualified and received CE certificate (Europe, EN-40)

2012

Received Malaysia SIRIM certification for FRP pole

2015

We have been invited to draft the Chinese Roadway Lighting Pole – Fiberglass Pole Section; this industrial standard will be published and reinforced by end of 2017

2017

Relocated FRP pole manufacturing site to Jiangsu Province, China. Expanding production capacity using filament winding process. Main office remains in Shanghai

In the early days the overhead power cable mainly relied on wooden pole as the main material. As timber resources got scarce and difficult to obtain due to the protection by each country, concrete pole became an alternative. However, concrete pole is too heavy, not convenient to install and easy to be corroded by sandy wind, American and some European advanced countries pioneered using the FRP power pole as the replacement in attribute to its excellent properties of lightweight, good physical properties and anti-corrosion. Nowadays FRP power pole has been adopted as the choice of power transmission lines in most of the modern countries.



Advantages of FRP Poles

- Excellent mechanical properties
- Non-conductive and excellent insulation property
- Safe in accident cases
- Anti-corrosion and rust free – especially suitable to be used under extreme weather condition including high humidity coastal area, desert, oil field, high altitude and industrial area with acid and alkali condition
- Light weight, around 1/3 weight of the steel lighting pole. Easy installation and save on labor, time and equipment
- Maintenance free, long life span
- Aesthetics, smooth surface with good finishing. Also can be color matched to suit any environment



Strong/Reliable/Long Lasting

Originated from Taiwan, Shanghai Tunghsing Composites Co. Ltd. inherited the parent company for decades of FRP pole production experience, and later to carry forward and further advance in it's Shanghai factory. Shanghai Tunghsing Composites benefits from our core technical team with determination and devotion to offer the best quality, long lasting durability and top strength FRP pole at the most competitive and attractive price.

FRP Utility Pole

Pole Class	Breaking Load (pounds)	Working Load (pounds)	Pole Height (ft)
H3	4875	2438	35、40、45
H2	4160	2080	30、35、40、45
H1	3510	1755	20、30、35、40、45
1	2925	1463	20、30、35、40、45
2	2405	1203	20、30、35、40、45
3	1950	975	20、30、35、40、45
4	1560	780	20、30、35、40、45
5	1235	618	25、30
6	975	488	25、30

Reference:

1. ANSI O5.1.2008 Annex B
2. Tables 253-1 and 261-1A, NESC (2007 National Electric Safety Code)

CROSSARM

Tunghsing FRP crossarms are made to last through all climates and to stand the test of time. We test our crossarms regularly based on products' Mechanical, UV Resistance, Flammability and Electrical Performance to ensure our crossarms are performing as designed. Extensive testing are done both internally and externally, reports are available upon request.

Features & Benefits

- Can be used on composite, concrete, metal, or wood poles
- UV protection enhanced with inhibitor-laden resins, polyester veil, and UV resistant urethane coatings
- Closed cell polyurethane foam core: This high density, closed cell, expandable foamcore is designed to prevent moisture contamination
- Normal and easy installation: no special equipment needed
- Field drillable or pre-drilled at factory
- Environmentally friendly - no chemicals or preservatives
- Free from splinters, and rust
- Impervious to insects, woodpeckers, and weather
- Extensive UV exposure testing, advanced Tangent Eccentric Load system testing, as well as industry-standard beam tests



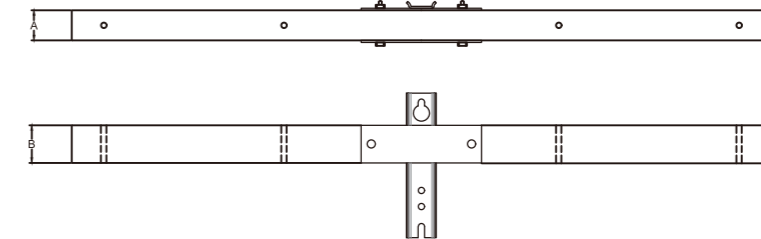
Center Mount

Standard Tangent

Dimensions (A*B) (in.)	Length (ft.)	Weight * (lbs.)	Phases per Arm	Ultimate Vertical Load Per Phase (lbs)
2.95 x 3.93 (75 x 100mm)	8 (2.44m)	22	2	2600
	10 (3.05m)	28	2	2600
	12 (3.66m)	33	2	2200
3-5/8 x 4-5/8 (92 x 117.5mm)	5 (1.52m)	16	2	6500
	8 (2.44m)	25	2	6400
	10 (3.05m)	32	2	5400
	12 (3.66m)	38	2	4200

* Weight excluding mounting bracket

Tangent Crossarms



Heavy Tangent

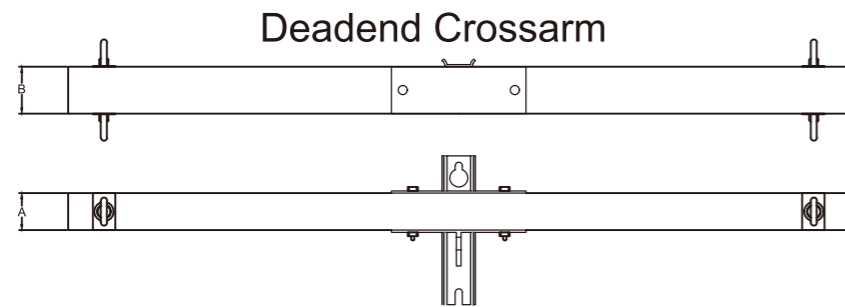
Dimensions (A*B) (in.)	Length (ft.)	Weight * (lbs.)	Phases per Arm	Ultimate Vertical Load Per Phase (lbs)
3-5/8 x 4-5/8 (92 x 117.5mm)	8 (2.44m)	33	2	10000
	10 (3.05m)	41	2	9400
	12 (3.66m)	50	2	8000

* Weight excluding mounting bracket

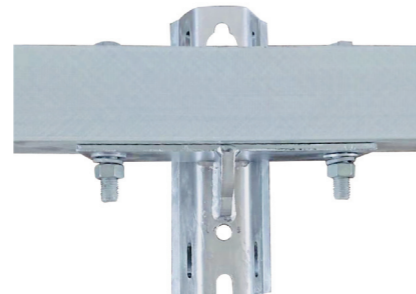
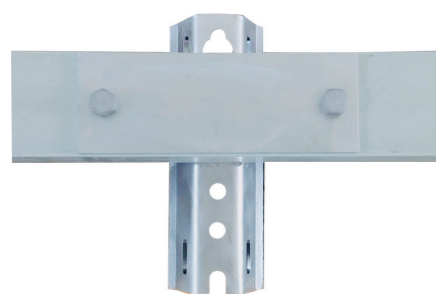
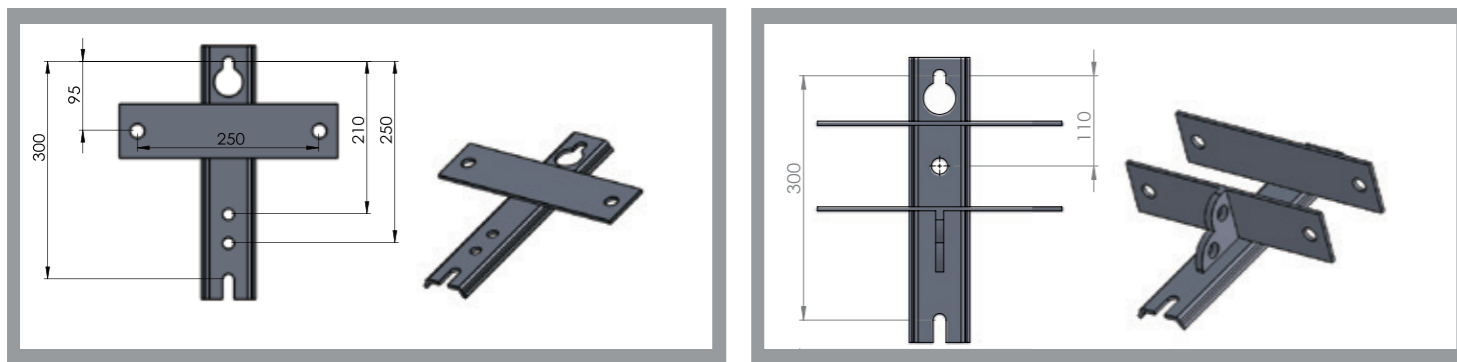
Center Mount

Standard Deadend				
Dimensions (A*B) (in.)	Length (ft.)	Weight * (lbs.)	Phases per Arm	Ultimate Vertical Load Per Phase (lbs)
3-5/8 x 4-5/8 (92 x 117.5mm)	5 (1.52m)	16	2	10000
	8 (2.44m)	25	2	10000
	10 (3.05m)	32	2	7500
	12 (3.66m)	38	2	6000

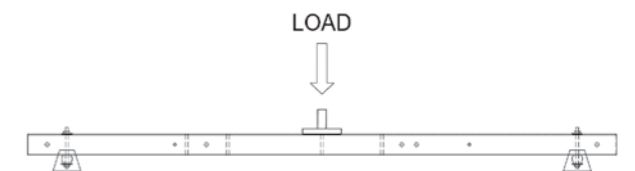
* Weight excluding mounting bracket



Mounting Bracket - Tangent & Deadend



Quality Assurance Beam and Pin Torque Loading Test



Crossarm testing is based on ASTM D8019-15.

Test Report



FRP Pole
Deflection &
Strength Test:
2009



FRP Pole Dielectric Strength /
Flammability / Water Absorption:
2015



FRP Crossarm 5000 hours
Accelerated Aging and Weather
Test: 2017

Applications

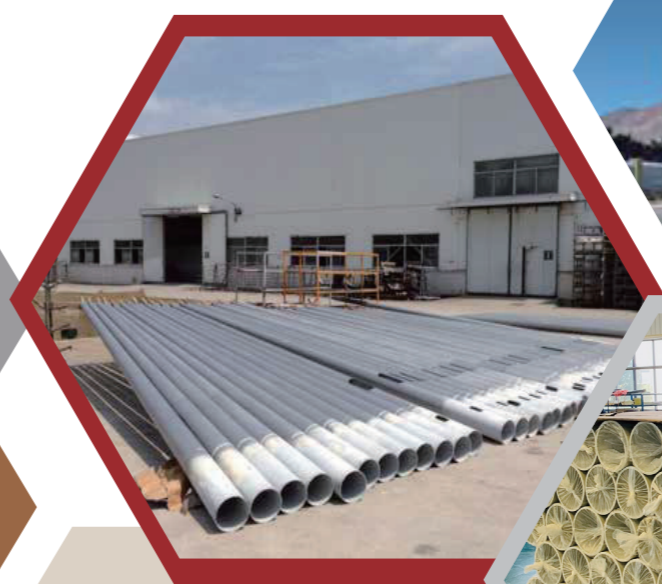
- Taiwan Nuclear Power Plant II
Installation: Jun 1975
- Formosa Plastic Chemical Plant in Yi Lan
Installation: Jun 1976
- Penghu City
Installation: May 1981



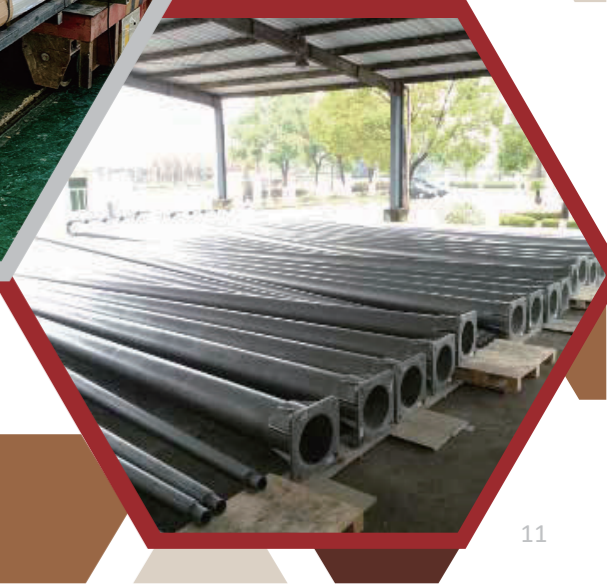
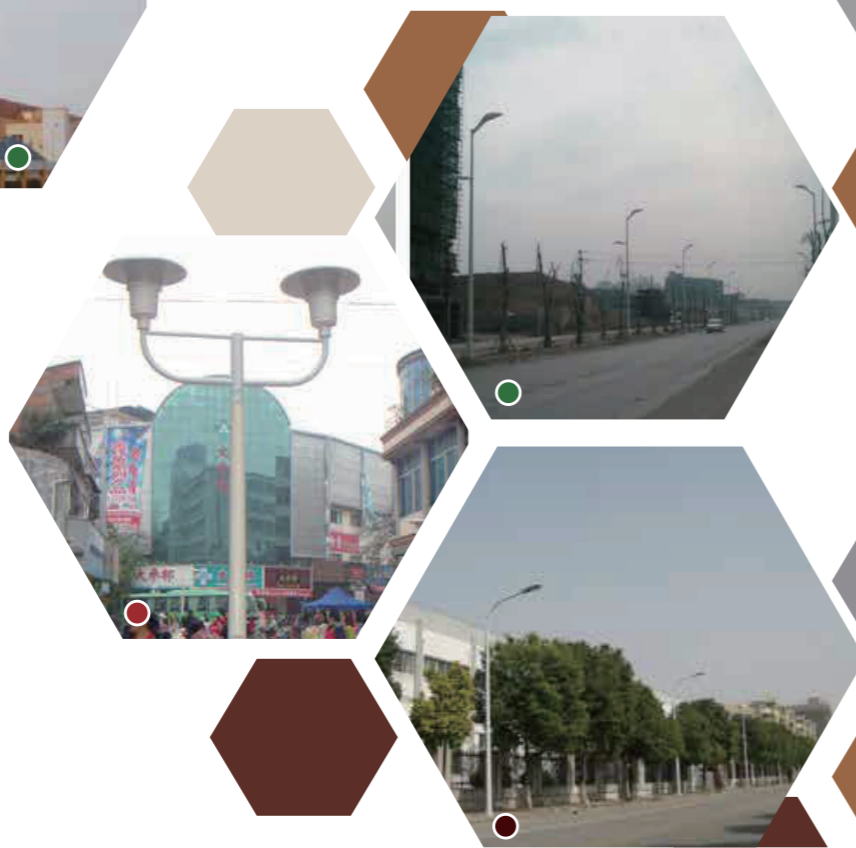
Overseas-USA/Australia/Latin America



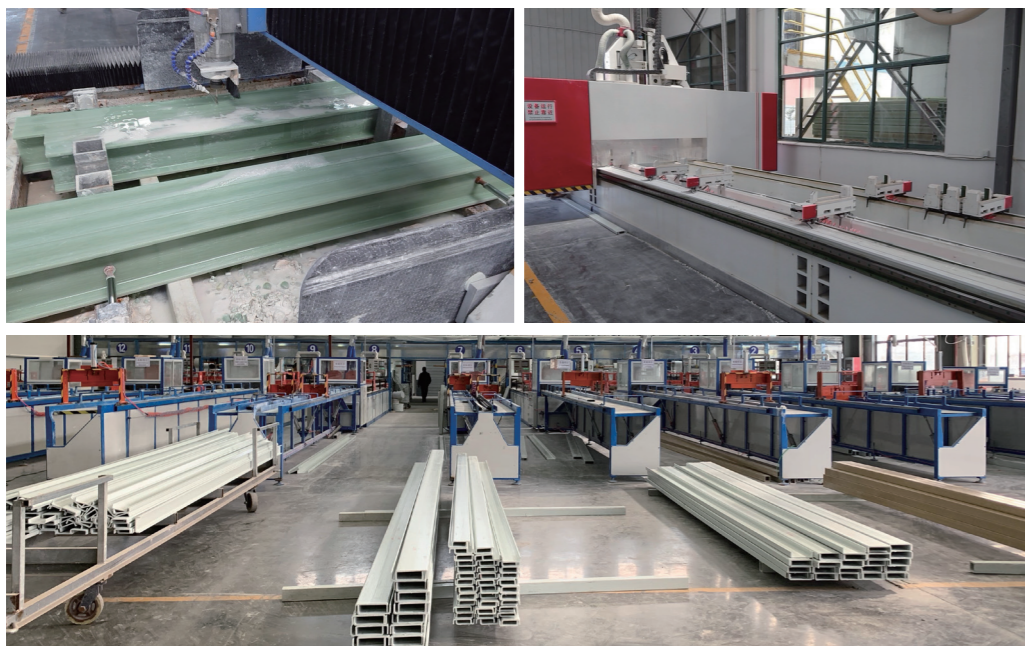
- Penghu City
Installation: Jun 1981
- Hua Lian Industrial Area
Installation: Jun 1982
- Taiwan Power Company Penghu Power Plant
Installation: Feb 1979



- Guangzhou (2010)
- Shanghai (2010)
- Fujian (2011)



Shanghai Tunghsing our manufacturing unit has existing 22 pultrusion lines with annual output of 70,000m per line hence can achieve 2 million meters per annum. We also have 8 production lines for different sizes of FRP gratings.



FRP offers a wide range of unique benefits — short production and installation time, light weight, long-term cost savings, corrosion resistance, and superior longevity

FRP PULTRUSION PROCESS

Pultrusion is a manufacturing process for converting reinforced fibers and liquid resin into a fiber-reinforced plastic, also known as fiber-reinforced polymer (FRP).

The pultrusion process allows continuous production of FRP structural shapes in an automated, energy-efficient process by pulling fiberglass rovings through a resin bath or resin impregnator that completely saturate the reinforcements. The resin hardens from the heated steel pultrusion die, resulting in a strong, lightweight final product that follows the shape of the die.

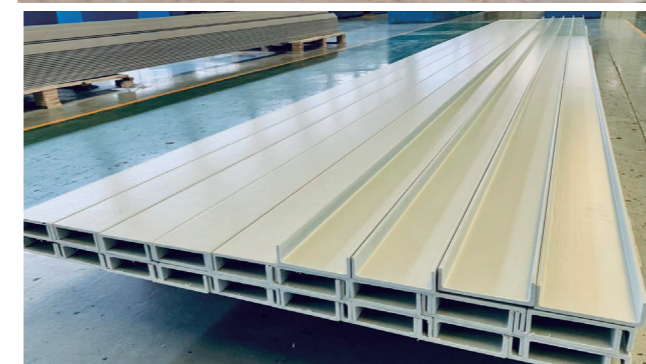
Typically pultrusion FRP profiles can be widely used in corrosive environments such as power plant, chemical plant, pharmaceutical factory, printing plant, sewage treatment plants, electroplating factory, municipal and subway project, large cooling tower internal structural material, desalination processing, marine platform, and in the field of solar energy photovoltaic stents and etc.

FRP STRUCTURAL PROFILE

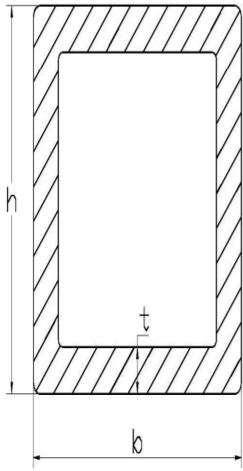
FRP Structural fabrications are made from FRP profiles which are available in a range of shapes e.g., C channels, I beam, tubes etc. As well as custom shaped profiles for specific applications.

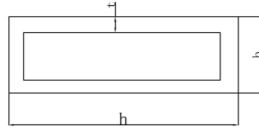
The profiles can be turned into a large array of assemblies for a range of applications. Some standard widely available applications:

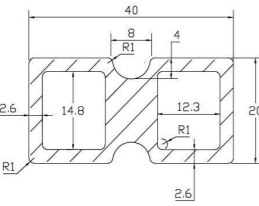
- Pedestrian bridges
- Walkways
- Trench cover/sealing cover
- Handrails/guardrail
- Tank access platforms and stairs
- Maintenance/Operating platforms
- Solar PV support
- Ladders and cages
- Cable tray

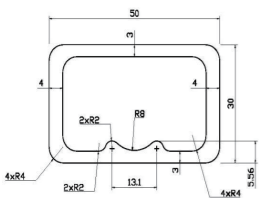


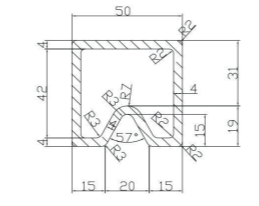
Structural Profile List/Table

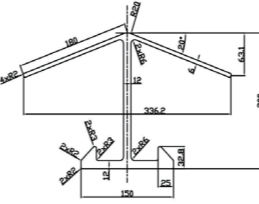
Square tube	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	38	38	4.0	4.0	5.4	1.046	
	2	38	38	6.35	6.35		1.600	
	3	50	50	4.0	4.0	7.4	1.463	
	4	50	50	6.0	6.0	10.6	2.006	
	5	50.8	50.8	6.35	6.35		2.260	
	6	62	62	5	5	11.4	2.280	
	7	63	63	3.5	3.5	8.3	1.666	
	8	63	63	4	4	9.4	1.76	
	9	63	63	6.35	6.35		2.773	
	10	64	64	4	4	9.6	1.796	
	11	64	64	6.4	6.4	14.7	2.942	
	12	75	75	6	6	16.6	3.393	
	13	75	75	9.5	9.5	24.9	4.818	
	14	76.2	76.2	6.35	6.35		3.539	
	15	76.2	76.2	9.525	9.525		5.125	
	16	80	80	8	8	23	4.378	
	17	88.9	88.9	6	6	19.9	4	
	18	90	90	6.4	6.4	21.4	4.28	
	19	90	90	8	8	26.2	5.449	
	20	100	100	5.3	5.3	20.1	3.815	
	21	100	100	8	8	29.4	5.88	
	22	102	102	5.3	5.3		4.046	
	23	102	102	4	4	15.68	3.136	

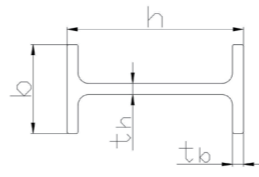
Rectangular tube	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	100	50	4.8	6.4	14.8	2.947	
	2	90	30	5	5		2.187	
	3	87	32	4	4	8.9	1.771	
	4	87	32	4	6.4	10.3	1.978	
	5	80	30	4	4	8.2	1.628	
	6	30	20	2.5	2.5	2.25	0.427	

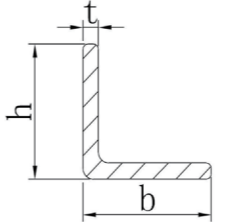
Rectangular tube	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	40	20	2.6	2.6	3.88	0.739	

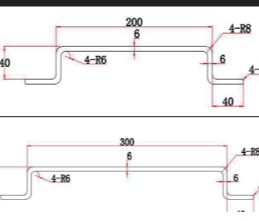
Rectangular tube	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	50	30	3	4	5.2	0.981	

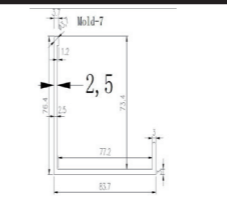
V-shape	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	50	50	4	4	8	1.526	
	2	80	80	4	4	12.880	2.577	

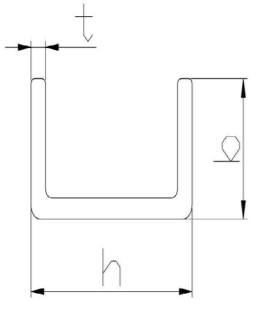
Beam	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	200	138	150	12	66.40	12.608	
	2	200	180	150	12	67.700	12.869	
	3	82		85	5	17.480	3.41	

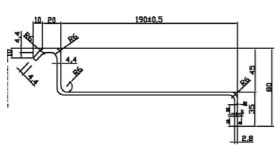
I-shape	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	25.4	15	4	5	2	0.403	
	2	38.1	15	4.5	5	2.7	0.516	
	3	80	30	3.5		4.4	0.84	
	4	102	51	6.4	6.4	12.5	2.409	
	5	152	76	6.4	6.4	19	3.71	
	6	152	152	10	10	43.6	8.284	
	7	200	100	10	10	38.6	7.583	

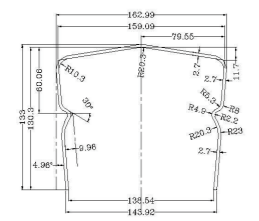
Angle Profile	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	25	25	3		1.4	0.268	
	2	40	40	3		2.3	0.439	
	3	50	50	6.4		6	1.141	
	4	76	76	6.4		9.3	1.842	
	5	100	100	9.5		18.1	3.439	
	6	100	75	6		10.2	2.024	
	7	80	50	3		39.0	0.78	
	8	101.6	101.6	6.35			2.499	

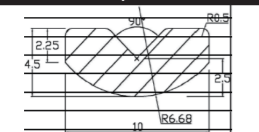
Channel Profile	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	200	40	6.0		16.1	3.111	
	2	300	40	6			5.47	

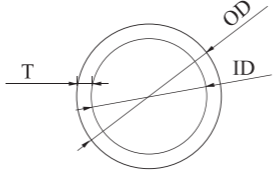
Channel Profile	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	76.4	83.7	2.5		4.830	0.967	

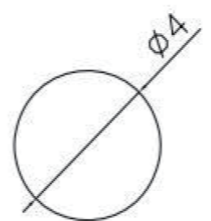
Channel Profile	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	50	30	4.5		4.5	0.947	
	2	70	26	3.0		3.5	0.694	
	3	76.2	22.575	6.35			1.304	
	4	76.2	38.1	6.35			1.7	
	5	86	53	4.0		7.4	1.398	
	6	88	54	4.0		7.5	1.43	
	7	101.6	41.3	4.8			1.764	
	8	102	35	4.8		7.8	1.492	
	9	102	35	6.0		9.6	1.832	
	10	102	35	9.5		14.4	2.888	
	11	127	35	6.5		12	2.386	
	12	152	43	6.4		14.4	2.972	
	13	152.4	41.275	6.35		13.75	2.752	
	14	152	43	9.5		20.8	4.241	
	15	200	60	10.0		30	5.885	
	16	200	41	6			3.163	
	17	250	125	10.0		48	9.12	
	18	90	35	5			1.484	
	19	76	35	5			1.342	
	20	50	14	3.5			0.49	
	21	101.6	28.575	6.35			1.749	
	22	203.2	55.525	6.35		18.530	3.707	
	23	203.2	55.626	9.652			5.534	

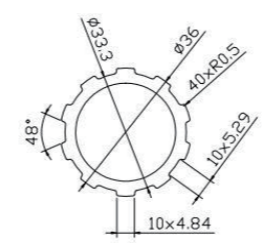
Side Panel	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	220	80	4.4	2.8	9.5	1.808	

Safety Cover	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	133	162.99	2.7		10.96	2.138	

V-shape Rob	NO.	SIZE				Area of section cm ²	Unit weight kg/m	Remark
		h	b	th	tb			
	1	10	4.5	2.5		0.34	0.045	

Round Tube	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		OD	T	ID			
	1	19	3.15	12.7		0.313	
	2	25.4	2.5	20.4	1.8	0.342	
	3	25.4	3	19.4	2.1	0.401	
	4	30					
	5	32	3			0.546	
	6	34.3	2.05	30.2	2.1	0.394	
	7	34.7	2.25		2.3	0.436	
	8	38	2.5	33	2.8	0.544	
	9	45					
	10	50	3	44	4.4	0.841	
	11	50	5	40	7.180	1.4	
	12	51					
	13	59	4	51	6.9	1.313	
	14	60	5	50	8.760	1.71	
	15	65	10				
	16	76	5	66	11.1	2.118	
	17	76	6	64	13.2	2.506	
	18	89	3	83	8.1	1.539	
	19	89	4.5	80	11.9	2.269	
	20	110	3	104	10.1	1.915	
	21	142	4	134	17.3	3.293	
	22	142	5	132	21.5	4.087	

Solid Rod	NO.	SIZE	Area of section cm ²	Unit weight kg/m	Remark
		Diameter			
	1	4	0.1	0.024	
	2	5	0.2	0.038	
	3	6	0.3	0.054	
	4	7	0.4	0.073	
	5	7.9	0.5	0.101	
	6	8.5	0.6	0.149	
	7	9.5	0.7	0.135	
	8	10.1	0.8	0.152	
	9	11	0.9	0.18	
	10	12.05	1.1	0.217	
	11	12.7	1.3	0.241	
	12	13	1.3	0.252	
	13	14	1.5	0.3	

Plum Blossom Tube	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		OD	T	ID			
	1	36			3.4	0.654	
	2	47					

Special-shaped Solid Rods	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		h	b	t			
	1	9.4		6		0.083	

Kickboard	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		h	b	t			
	1	100		3.0	3.8	0.719	

305 panel 1	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		h	b	t			
	1	30	140	7	15.36	2.996	
	2	28	305	4	18.2	3.465	
					with grit	3.75	

305 panel 2	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		h	b	t			
	1	54	305	4.8	28.2	5.353	
					with grit	5.681	

500 panel	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		高 h	宽 b	t			
	1	54	500	4.8	41.5	7.884	

609.6 panel	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		h	b	t			
	1	28	609.6	4.8	37.5	7.123	
					with grit	7.857	

Flat	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		h	b	t			
	1		75	12	9	1.904	
	2		76.2	12.7		1.933	
	3		80	6.4	5.110	1.15	
	4		50	3	1.510	0.295	
	5		600	11.8	70.800	13.452	
	6		75	6	4.600	0.898	
	7		76	8.8	6.860	1.338	

Pallet	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		h	b	t			
	1	100	80	2.5			

Cable Tray	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		h	b	t			
	1	94	84	3	6.35	1.206	

Cable Tray	NO.	SIZE			Area of section cm ²	Unit weight kg/m	Remark
		h	b	t			
	1	101	9.5	3	3.71	0.705	

Mold Grating	NO.	SIZE				Panel Size m	Unit weight kg/m	Remark
		h	b	th	Spec			
	1	38	38	25	1"	1.22×3.66	12.5	
	2	38	38	30	1.2"	1.22×3.66	15.4	
	3	38	38	38	1.5"	1.22×3.66	19.5	
	4	50	50	50	2"	1.22×4.0	21.5	
	1	38	38	25	3	with pattern panel	19.5	
	2	38	38	38	3	with pattern panel	26.5	
	3	50	50	50	3	with pattern panel	28.5	
	5	40/13	40/13	38	1.5"	1010×4045	22	
	6	25/18	25/18	28	1.5"	1025×1025	19	
	7	100	25	38	1.5"	1010×4010	19.5	

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