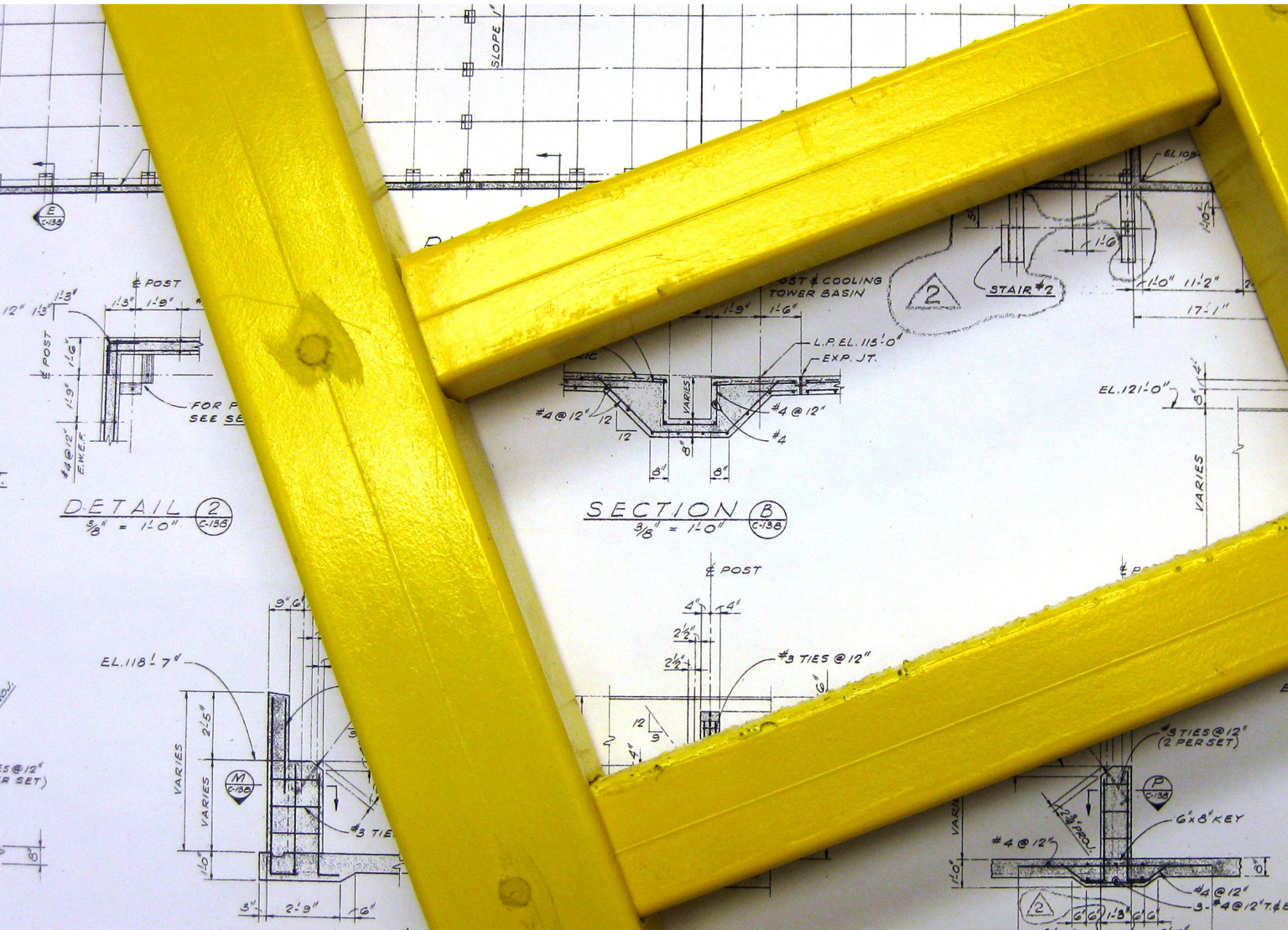
DESIGN GUIDE

Since 1974
BEDFORD
REINFORCED PLASTICS



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To receive a fax of the Standard Definition of Terms relating to Reinforced Plastic Pultruded Products call ASTM's Customer Service Line at 610-832-9585 for Designation: D 3918 - 80

ASTM definitions of Fiberglass Reinforced Products can also be found at www.astm.org

DESIGN GUIDE REGISTRATION

Returning this form registers your company to receive future updates.

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INTRODUCTION

CUSTOMER SERVICE COMMITMENT

Since 1974, one simple philosophy has guided our business at Bedford Reinforced Plastics - our Customer Service Commitment:

- We believe in providing quality products at a fair price, delivered when and where you want them.
- We believe it should be easy to place an order without restrictive policies, hidden conditional or time-consuming hassles.
- We believe every customer is entitled to the same level of service we expect for ourselves.
- Total Customer Satisfaction.

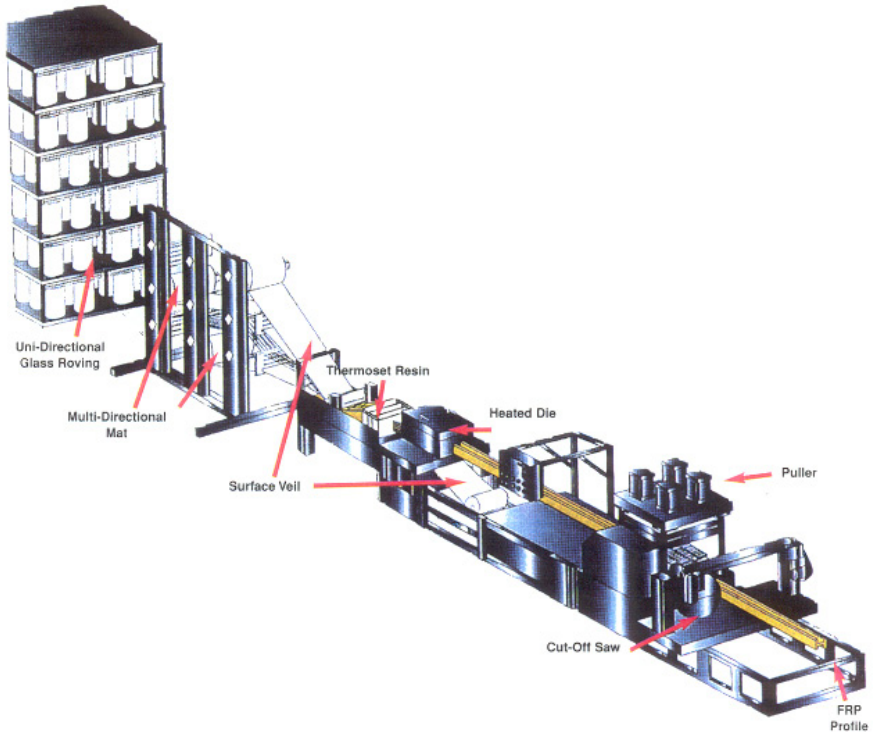
These basic principles have become as natural to us as our central Pennsylvania landscape. The next time you need high-performance structural fiberglass components, give us a call and find out about our simple, efficient customer service.

- **Special Applications** - Will a particular product perform as you require? We have detailed technical data, application histories and over thirty years' experience to help insure you get the right material for your application.
- **Special Requirements** - Need a different color? Specific tolerance? Unusual reinforcement sequence? How about a custom profile engineered to meet your particular application? Special requirements are not a problem and are a standard part of our Customer Service Commitment.
- **Special Discounts** - Interested in volume discounts or an annual contract? We will be glad to quote your requirements.
- **Warranty** - All of our material carries a full one-year limited warranty. Our commitment to quality means products you can count on.
- **Fast turnaround** - Order by phone, fax, email or mail. Stocked shapes will be shipped same day if the order is received by 11:00am, after 11:00am - next day. This pertains to the Bedford, PA warehouse. The Idaho and Houston facilities are next day after receipt of order if the order is received by 3:00pm eastern time. If after 3:00pm, the order will be shipped within 2 days.
- We currently have inventory stocked on the East, West and Gulf coast. You can check for stocked items on our website at www.bedfordplastics.com Each inventory is updated four times a day.
- **Full-Service Supplier** - Bedford Reinforced Plastics has:

  - More than 74,000 square feet of production space
  - More than 16,000 square feet of fabrication space
  - 16 pultrusion machines
  - More than 190 employees
  - Experienced engineering staff / CAD / CAM
  - Fabrication and assembly / CNC
  - Full-service machine shop / CNC

Whether it is a simple standard shape or a highly complex custom profile, we take pride in our ability to fulfill our Customer Service Commitment by rapidly responding to customers' product needs.

PULTRUSION PROCESS



Pultrusion is the continuous processing of raw materials by pulling resin-rich reinforcements through a heated steel die to form profiles of constant cross section of continuous length.

Pultrusion gets its name from the method by which the profiles are made. Raw materials are literally pulled by what is called the "puller." The puller is the machine made of pulling pads, which grip the product, and a drive system that keeps the product moving. The puller is located just before the cut-off saw.

The process starts with the reinforcements. Typically, unidirectional glass roving begins the process. This is the fiber that runs along the length of the profile. Then, the fiberglass mat is added, which is a multidirectional reinforcement. Next, the glass reinforcements are "wet-out" with a thermoset resin, typically polyester or vinylester. Finally, just before all the material is pulled into the heated die, surface veil may be added to enhance the surface appearance of the final product.

Next in the pultrusion process is the curing of the composite. The curing or hardening occurs while the wet-out reinforcements are being pulled through the heated die. The heat from the die causes the resin to cure and by the time the part exits the die, a hard part in the exact shape of the die cavity has been formed. The final result is a solid, rigid profile with all the reinforcements laminated within.

The puller then pulls the product exiting the die to the cut-off saw, which cuts it to the desired length.

Roving

Roving is made up of fiberglass unidirectional filaments, which are manufactured in continuous rolls. Roving is always present in pultruded products comprising 50% to 70% of the total glass content. In addition to supplying the necessary strength to pull the profile, roving supplies the product with high tensile, flexural properties and is a big contributor to the overall section stiffness.

Generally, fiberglass roving is used in pultrusion to achieve the required properties. In special structural applications where more stiffness is required, graphite roving can be used. Conversely, polyester roving may be used in applications where more flex is needed.

Mat

Continuous strand mat is the remainder of glass reinforcement used in the pultrusion process. Typically, it is 30%-50% of the total glass content. Unlike hand-laid-up or press-molded processes that use short chopped fibers, the pultrusion process must have a multidirectional mat that has good pull strength to facilitate getting it to the die after it has been wet-out with the resin. This continuous strand mat is designed specifically for the pultrusion process and offers good wet-out characteristics, conformability to a variety of shapes, and good physical properties including the required pull strength.

Generally, fiberglass continuous strand mat is used to obtain the desired transverse properties of the product. Whereas the roving ties the composite together in the longitudinal direction, the mat is responsible for tying the composite together in all directions, but mainly in the transverse direction. Although continuous strand mat is suitable for most applications, a variety of products such as woven roving, stitched roving, and woven fabrics can be used in custom applications to increase the desired transverse properties.

Veil

Veils are used to enhance the surface of pultruded profiles. Most widely used today are synthetic veils. A veil is added to the outside of a profile just prior to entrance of the die. As a result, the finished profile has a resin-rich surface that aids in resistance to ultraviolet (UV) degradation and makes the profile more hand-friendly. Since the veil brings more resin to the surface and the resin is the ingredient that gives the corrosion resistance, adding the veil increases the corrosion resistance.

All standard structural shapes are manufactured using a surface veil as well as UV inhibitors to protect against UV degradation.

RESIN SYSTEMS

Generally, two types of resins are most often used in the pultrusion process. They are isophthalic polyester resin and vinylester resin. Each resin is available in a fire retardant version as well as non-fire retardant. In selecting the proper resin, one must consider the environment in which the product will be used. Generally, polyester resin will be adequate to handle most environments. However, the vinylester will handle the more severe applications where better chemical resistance is needed. It is a good idea to check the resin corrosion guide for proper selection of system.

Standard structural shapes are stocked in three series: standard polyester, fire retardant polyester and fire retardant vinylester resin systems.

Standard Polyester (ST) Resin System

Standard structural shapes are manufactured using isophthalic polyester resin. This resin system is olive green in color and contains UV inhibitors. Polyester resin exhibits good corrosion resistance, good dielectric properties, low thermal conductivity, and excellent mechanical properties.

Fire Retardant Polyester (FR) Resin System

This resin system exhibits the same characteristics as standard polyester along with a fire retardant rating of 25 or less when tested in accordance with ASTM E-84 and exhibits low smoke generation. Products manufactured using this resin system are gray and yellow in color.

Fire Retardant Vinylester (VE) Resin System

Being fire retardant, this resin meets a rating of 25 or less when tested per ASTM E-84 and has low smoke generation. It is produced in beige and yellow. This system exhibits excellent corrosion resistance and is capable of higher service temperatures than polyester resin systems.

Generally, these resin systems cover most applications, and can be custom mixed to meet more stringent requirements for a specific application.

TEMPERATURE AND WEATHERING

Design Considerations for Fiberglass Pultrusion When Exposed to Continuous High Temperatures

Property loss is experienced in Fire Retardant (FR), Polyester, and Vinylester Fiberglass pultrusion when exposed to continuous high temperatures. The loss of properties should be considered during the designing stages. The following table shows the percentage of property retention at certain continuous temperatures.

ULTIMATE STRESS

TEMPERATURE	FR/POLYESTER	VINYLESTER
100° F (37°C)	85%	90%
125° F (51°C)	70%	80%
150° F (65°C)	50%	80%
175° F (79°C)	NOT RECOMMENDED	75%
200° F (93°C)	NOT RECOMMENDED	50%

MODULUS OF ELASTICITY

TEMPERATURE	FR/POLYESTER	VINYLESTER
100° F (37°C)	100%	100%
125° F (51°C)	90%	95%
150° F (65°C)	85%	90%
175° F (79°C)	NOT RECOMMENDED	88%
200° F (93°C)	NOT RECOMMENDED	85%

Weathering

After exposure to outdoor weathering, almost all plastics undergo some degradation in surface appearance.

The surface of pultrusions typically have good water and ambient temperature resistance, but are attacked by ultraviolet light.

Ultraviolet light is the light spectrum 290 to 400 nanometers. The light has higher energy and can significantly degrade polymers by breaking chemical bonds or starting chemical reactions that lead to polymer degradation. Fire retardant polyester formulations, which contain a halogen, are typically more susceptible to ultraviolet light degradation, due to the halogen additive.

Ultraviolet light will cause the surface of the pultrusion to fade (yellow) and lose gloss. Over a longer period of time, fiberglass closest to the surface will be exposed. This condition is known as fiberbloom. Physical Properties are not affected by this surface degradation.

Bedford Reinforced Plastics, Inc. adds a UV stabilizer to our resin mix formulation. This slows the affects of UV degradation. We also incorporate a layer of polyester veil directly to the surface of the pultrusion during processing. This veil gives a resin rich surface and acts as a barrier between the surface and the top layer of fiberglass reinforcement. Pigments used in our resin formulations also slow the effects of weathering. The best method to protect the pultrusion from the effects of outdoor weathering is to apply a protective coating. Urethane based paints can be used.

TYPICAL COUPON PROPERTIES

Below are test results for typical coupon properties of Bedford Reinforced Plastics' structural fiberglass profiles (Standard, Fire Retardant, & Vinylester shapes). Properties are derived per the ASTM test method shown. Synthetic surfacing veil and ultraviolet inhibitors are standard.

		ENGLISH		METRIC	
MECHANICAL PROPERTIES	**ASTM**	**Units**	**Value**	**Units**	**Value**
Tensile Stress, LW	D-638	psi	30,000	*MPa*	*206.8*
Tensile Stress, CW	D-638	psi	7,000	*MPa*	*48.2*
Tensile Modulus, LW	D-638	10^6 psi	2.5	*GPa*	*17.2*
Tensile Modulus, CW	D-638	10^6 psi	.8	*GPa*	*5.5*
Compressive Stress, LW	D-695	psi	30,000	*MPa*	*206.8*
Compressive Stress, CW	D-695	psi	15,000	*MPa*	*103.4*
Compressive Modulus, LW	D-695	10^6 psi	2.5	*GPa*	*17.2*
Compressive Modulus,CW	D-695	10^6 psi	1.0	GPa	6.9
Flexural Stress, LW	D-790	psi	30,000	*MPa*	*206.8*
Flexural Stress, CW	D-790	psi	10,000	*MPa*	*68.9*
Flexural Modulus, LW	D-790	10^6 psi	1.8	*GPa*	*12.4*
Flexural Modulus, CW	D-790	10^6 psi	.8	*GPa*	*5.5*
Modulus of Elasticity, E	Full Section	10^6 psi	2.8	*GPa*	*19.3*
Shear Modulus	——	10^6 psi	0.450	*GPa*	*3.1*
Short Beam Shear	D-2344	psi	4,500	*MPa*	*31.0*
Punch Shear	D-732	psi	10,000	*MPa*	*68.9*
Notched Izod Impact, LW	D-256	ft.-lbs./in.	25	*J/mm*	*1.33*
Notched Izod Impact, CW	D-256	ft.-lbs./in.	4	*J/mm*	*.21*
PHYSICAL PROPERTIES	**ASTM**	**Units**	**Value**	**Units**	**Value**
Barcol Hardness	D-2583	—-	45	*—-*	*45*
24 Hour Water Absorbtion	D-570	% max.	0.45	*% max.*	*0.45*
Density	D-792	lbs./in.^{3}	.062-.070	*g/cc*	*1.72-1.94*
Coefficient of Thermal Expansion, LW	D-696	10^{-6} in./in./°F	7	*10^{-6} cm./cm./°C*	*12*
ELECTRICAL PROPERTIES	**ASTM**	**Units**	**Value**	**Units**	**Value**
Arc Resistance, LW	D-495	seconds	120	*seconds*	*120*
Dielectric Strength, LW	D-149	kv./in.	35	*kv./mm*	*1.37*
Dielectric Strength, PF	D-149	volts/mil.	200	*volts/mil.*	*200*
Dielectric Constant, PF	D-150	@60hz	5	*@60hz*	*5*

Fire Retardant Polyester and Fire Retardant Vinylester Structural Profiles:

FLAMMABILITY PROPERTIES	**ASTM**	**Units**	**Value**
Tunnel Test	E-84	Flame Spread	25 max.
Flammability	D-635	——	Nonburning
UL	94	VO	
NBS Smoke Chamber	E-662	Smoke Density 600-700	

LW = Lengthwise CW = Crosswise PF = Perpendicular to Laminate Face

TYPICAL PROPERTIES OF THREADED ROD / NUTS

Bedford Reinforced Plastics' threaded rod and nuts are manufactured using premium vinylester resin containing UV inhibitors. The properties listed below are the result of the ASTM test method indicated.

PROPERTIES	ASTM	UNITS English *Metric*	VALUE (Diameter - Threads Per Inch (UNC)) 3/8-16 *9.5mm*	1/2-13 *12.7mm*	5/8-11 *15.9mm*	3/4-10 *19.0mm*	1-8 *25.4mm*
Ultimate Transverse Shear (Double Shear)	B-565	lb. *Newton*	4,200 *18,680*	6,800 *30,240*	10,000 *44,480*	13,400 *59,600*	24,000 *106,750*
Longitudinal Compressive Strength	D-695	psi *MPa*	50,000 *344*	50,000 *344*	50,000 *344*	50,000 *344*	50,000 *344*
Flexural Strength	D-790	psi *MPa*	70,000 *482*	70,000 *482*	70,000 *482*	70,000 *482*	70,000 *482*
Flexural Modulus	D-790	psi x 10^6 *GPa*	2.5 *17.2*	2.5 *17.2*	2.5 *17.2*	2.5 *17.2*	2.5 *17.2*
Flammability	D-635			Self-extinguishing for all			
Fire Retardant		E-84				Class 1	
Water Absorption (24 hr. immersion)	D-570	% max.	0.8	0.8	0.8	0.8	0.8
Longitudinal Coefficient of Thermal Expansion	D-696	10^{-6} in./in./°F *10^{-6} mm/mm/°C*	6 *11*	6 *11*	6 *11*	6 *11*	6 *11*
Ultimate Thread Shear using fiberglass nut	— —	lb. *Newton*	1,200 *5,337*	2,400 *10,670*	3,600 *16,010*	4,000 *17,790*	8,200 *36,470*
Ultimate Torque Strength fiberglass nut lubricated with SAE 10W30 motor oil		ft.-lb. *NewtonMeter*	8 *10*	16 *21*	35 *47*	50 *67*	110 *149*
Rod Weight	— —	lb./ft. *Kg./m*	0.07 *0.104*	0.14 *0.119*	0.2 *0.297*	0.3 *0.447*	0.5 *0.789*
Nut Weight	— —	lb. *grams*	0.01 *4.5*	0.02 *9.1*	0.04 *18.1*	0.06 *27.2*	0.14 *63.6*
Nut Dimensions	— —	in. (square) x in. (thick) *mm. (square) x mm. (thick)*	.68 x .45 *17.2x11.4*	.86 x .56 *21.8x14.2*	1.06 x .69 *26.9x17.5*	1.24 x .82 *31.5x20.8*	1.63 x 1.1 *41.4x27.9*
Color					Gray		

TYPICAL PROPERTIES OF ROD, BAR, AND FLATSTRIP

Below are test results for typical coupon properties of Bedford Reinforced Plastics' Rod, Bar, and Flatstrip reinforced with all unidirectional longitudinal fiberglass roving. Properties are derived per the ASTM test method shown.

MECHANICAL PROPERTIES	ASTM	UNITS	ROD	BAR	FLATSTRIP
Tensile Stress	D-638	psi	90,000	80,000	90,000
		MPa	*620.5*	*165.5*	*620.5*
Tensile Modulus	D-638	10^6psi	5.0	4.0	5.0
		GPa	*34.7*	*27.6*	*34.7*
Compressive Stress	D-695	psi	60,000	50,000	50,000
		MPa	*413.7*	*344.7*	*344.7*
Flexural Stress	D-790	psi	100,000	90,000	100,000
		MPa	*689.5*	*620.5*	*689.5*
Flexural Modulus	D-790	10^6psi	6.0	4.5	4.5
		GPa	*41.4*	*31.0*	*31.0*
Barcol Hardness	D-2583		60	60	60
Izod Impact	D-256	ft-lbs/in	40	40	40
		J/mm	*2.14*	*2.14*	*2.14*
Density	D-792	lbs/in^3	.065-.075	.065-.075	.065-.075
		gr/cc	*1.80-2.07*	*1.80-2.07*	*1.80-2.07*
Water Absorption (24 hour)	D-570	%	0.2	0.2	0.2

TYPICAL COUPON PROPERTIES OF FLAT SHEET

Below are test results for typical coupon properties of Bedford Reinforced Plastics' Standard, Fire Retardant and Vinylester Flat Sheet. Properties are derived per the ASTM test method shown. Synthetic surfacing veil and ultraviolet inhibitors are standard.

MECHANICAL PROPERTIES	ASTM	UNITS	THICKNESS (ENGLISH - METRIC)					
			STD & FR			VE		
			1/8" - 3.2	3/16"-1/4" - 4.8 - 6.4	3/8"-1" - 9.5-25.4	1/8" - 3.2	3/16"-1/4" - 4.80-6.4	3/8"-1" - 9.5-25.4
Tensile Stress, LW	D-638	psi - *MPa*	24,000 - *165.5*	24,000 - *165.5*	24,000 - *165.5*	24,000 - *165.5*	24,000 - *165.5*	24,000 - *165.5*
Tensile Stress, CW	D-638	psi - *MPa*	7,500 - *51.7*	10,000 - *68.9*	10,000 - *68.9*	7,500 - *51.7*	10,000 - *68.9*	10,000 - *68.9*
Tensile Modulus, LW	D-638	10^6psi - *GPa*	2.0 - *13.8*	2 - *13.8*	2.0 - *13.8*	2.0 - *13.8*	2.0 - *13.8*	2.0 - *13.8*
Tensile Modulus, CW	D-638	10^6psi - *GPa*	1.0 - *6.9*	1.1 - *7.6*	1.4 - *9.6*	1.0 - *6.9*	1.1 - *7.6*	1.4 - *9.6*
Compressive Stress, LW	D-695	psi - *MPa*	24,000 - *165.5*	24,000 - *165.5*	24,000 - *165.5*	24,000 - *165.5*	24,000 -*165.5*	24,000 -*165.5*
Compressive Stress, CW	D-695	psi - *MPa*	15,500 - *106.9*	16,500 - *113.8*	16,500 - *113.8*	16,500 - *113.8*	17,500 - *120.7*	17,500 - *120.7*
Compressive Modulus, LW	D-695	10^6psi - *GPa*	1.8 - *12.4*	1.8 - *12.4*	1.8 - *12.4*	1.8 - *12.4*	1.8 - *12.4*	1.8 - *12.4*
Compressive Modulus, CW	D-695	10^6psi - *GPa*	1.0 - *6.9*	1.0 - *6.9*	1.0 - *6.9*	1.0 - *6.9*	1.0 - *6.9*	1.0 - *6.9*
Flexural Stress, LW	D-790	psi - *MPa*	35,000 - *241.3*	35,000 - *241.3*	30,000 - *206.8*	35,000 - *241.3*	35,000 - *241.3*	30,000 - *206.8*
Flexural Stress, CW	D-790	psi - *MPa*	15,000 - *103.4*	15,000 - *103.4*	18,000 - *124.1*	15,000 - *103.4*	15,000 - *103.4*	18,000 -*124.1*
Flexural Modulus, LW	D-790	10^6psi - *GPa*	1.6 - *11.0*	2.0 - *13.8*	2.0 - *13.8*	1.6 - *11.0*	2.0 - *13.8*	2.0 - *13.8*
Flexural Modulus, CW	D-790	10^6psi - *GPa*	0.9 - *6.2*	1.1 - *7.6*	1.4 - *9.6*	0.9 - *6.2*	1.1 - *7.6*	1.4 - *9.6*
Perpendicular Shear Stress, LW	D-3846	psi - *MPa*	6,000 - *41.3*	6,000 - *41.3*	6,000 - *41.3*	6,000 - *41.3*	6,000 - *41.3*	6,000 - *41.3*
Perpendicular Shear Stress, CW	D-3846	psi - *MPa*	6,000 - *41.3*	6,000 - *41.3*	6,000 - *41.3*	6,000 - *41.3*	6,000 - *41.3*	6,000 - *41.3*
Bearing Stress, LW	D-953	psi - *MPa*	32,000 - *220.6*	32,000 - *220.6*	32,000 - *220.6*	32,000 - *220.6*	32,000 - *220.6*	32,000 -*220.6*
Notched Izod Impact, LW	D-256	ft-lbs/in-*J/mm*	18.5 - *0.99*	20 - *1.1*	20 - *1.1*	18.5 - *1.0*	20 - *1.1*	20 - *1.06*
Notched Izod Impact, CW	D-256	ft-lbs/in-*J/mm*	5 - *0.27*	5 - *0.3*	5 - *0.3*	5 - *0.3*	5 - *0.3*	5 - *0.27*
PHYSICAL PROPERTIES								
Barcol Hardness	D-2583	----	40.0	40.0	40.0	40.0	40.0	40.0
		----	*40.0*	*40.0*	*40.0*	*40.0*	*40.0*	*40.0*
24 Hour Water Absorption	D-570	% max.	0.6	0.6	0.6	0.6	0.6	0.6
		% max.	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*
Density	D-792	lbs./in.^{3}	.062-.070	.062-.070	.062-.070	.062-.070	.062-.070	.062-.070
		g/cc	*1.72-1.94*	*1.72-1.94*	*1.72-1.94*	*1.72-1.94*	*1.72-1.94*	*1.72-1.94*
Coefficient Thermal Expansion, DW	D-696	10^{-6} in./in./F	4.4	4.4	4.4	4.4	4.4	4.4
		10^{-6} mm/mm/^{O}C	*8.0*	*8.0*	*8.0*	*8.0*	*8.0*	*8.0*
ELECTRICAL PROPERTIES								
Arc Resistance, LW	D-495	seconds	120.0	120.0	120.0	120.0	120.0	120.0
		seconds	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*
Dielectric Strength, LW	D-149	kv./in.	35	35	35	35	35	35
		kv./mm	*1.37*	*1.37*	*1.37*	*1.37*	*1.37*	*1.37*
Dielectric Strength, PF	D-149	volts/mil.	200.0			200.0		
		volts/mil.	*200.0*			*200.0*		
FLAMMABILITY PROPERTIES FOR FR & VE								
Tunnel Test	E-84	Flame Spread 25 max.						
Flammability	D-635	Nonburning						
UL	94	VO						
NBS Smoke Chamber	E-662	Smoke Density 600-700						

LW = Lengthwise CW = Crosswise PF = Perpendicular to Laminate Face

GENERAL TOLERANCES

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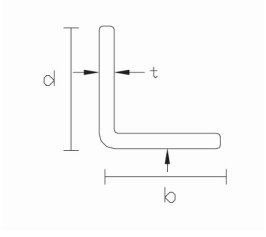
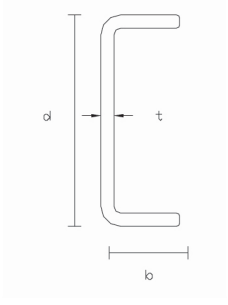
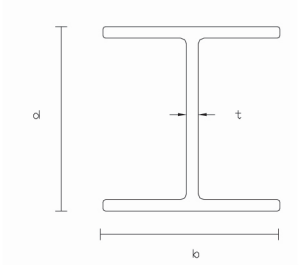
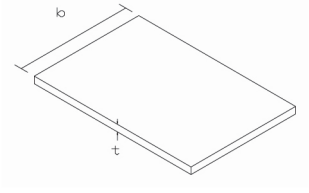
CROSS SECTIONAL TOLERANCES

SHAPE	DIMENSION	TOLERANCE % of Nominal	* MAXIMUM OR MINIMUM TOLERANCES
ANGLES 	t = thickness	± 10%	± 0.010” min. *±0.26mm min.*
	b = flange width	± 4%	± 0.094” max. *±2.4 mm max*
	d = depth	± 4%	± 0.094” max. *±2.4 mm max*
CHANNELS 	t = thickness	± 10%	± 0.010” min. *±0.26mm min.*
	b = flange width	± 4%	± 0.094” max. *±2.4 mm max*
	d = depth	± 4%	± 0.094” max. *±2.4 mm max*
BEAMS 	t = thickness	± 10%	± 0.010” min. *±0.26mm min.*
	b = flange width	± 4%	± 0.094” max. *±2.4 mm max*
	d = depth	± 4%	± 0.094” max. *±2.4 mm max*
FLAT SHEET 	t <= 0.125” *(3.175 mm)* t >= 0.125” *(3.175 mm)*	± 15% ± 10%	± 0.01”/*(0.25 mm)* min ± 0.05”/*(1.27 mm)* max
	b = width	± 4%	+0.094” max. *±2.4mm max.*

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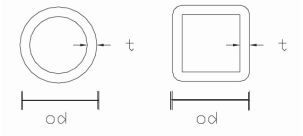
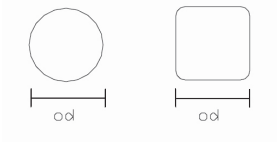
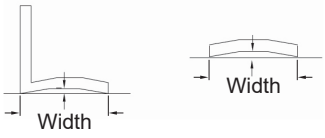
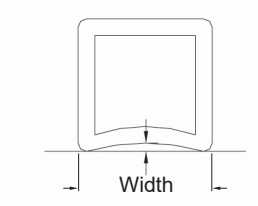
CROSS SECTIONAL TOLERANCES

SHAPE	DIMENSION	OUTSIDE DIMENSION CONDITION	TOLERANCES
CLOSED SHAPES (Round, Square and Rectangular Tubes) 	t = thickness	All	± 20% ± 0.01”/*(0.25 mm)* min
	od = outside dimension	All	± 4% ± 0.094”/*(2.39 mm)* max
ROUND ROD & SQUARE BAR 	od = outside dimension	All	± 4% ± 0.094”/*(2.39 mm)* max

FLATNESS

Flatness is the deviation measured vertically at the center of the part cross section with the weight of the profile minimizing the deviation by contact with the flat surface as shown below.

STRUCTURAL SHAPES RODS, BARS, & FLAT SHEET 	Allowable deviation from flat	
	Width	All Thickness
	Up to 1” *(25.4 mm)*	0.008” *(0.2 mm)*
	Over 1” *(25.4 mm)*	0.008” x Width of Part (0.25” *(6.3 mm)* Max for Flat Sheets
	In any 1” width *(25.4 mm)* (for parts over 1” width *(25.4 mm)*)	0.008” *(0.2 mm)*

HOLLOW SHAPES 	Allowable deviation from flat		
	Width	Thickness under 0.188”	Thickness 0.188” and over
	Up to 1” or any 1” increments of wider surfaces	0.012” *(0.3 mm)*	0.008” *(0.2 mm)*
	Over 1”	0.012” x width (in) *(mm)*	0.008” x width (in) *(mm)*

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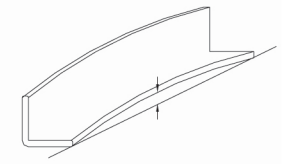
STRAIGHTNESS

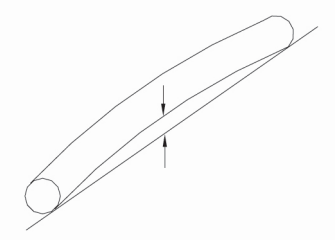
Straightness is the deviation measured vertically at the center along the length of the part with the weight of the profile minimizing the deviation by contact with the flat surface as shown below.

ANGLE, BEAM AND CHANNEL



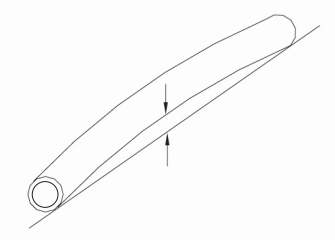
Allowable deviation from straight	
All widths	0.050”/ft. *4.2 mm/m*

RODS AND BARS



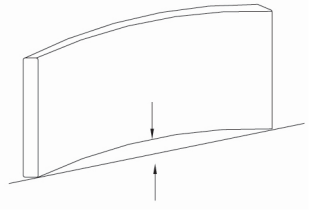
Width	Thickness	Allowable deviation from straight
Under 1.5” *(38.1 mm)*	under 0.095”	0.05”/ft *(4.17 mm/m)*
	0.095” *(2.4mm)* and over	0.04”/ft *(3.33 mm/m)*
1.5” *(38.1 mm)* and over	All Thickness	0.04”/ft *(3.33 mm/m)*

ROUND, SQUARE, AND RECTANGULAR TUBE



Allowable deviation from straight	
Diameter/Depth	Per Foot *Per Meter*
All	0.03”/ft *2.5 mm*

FLAT SHEET AND PLATE



Allowable deviation from straight	
All thickness and widths	0.03”/ft *2.5 mm*

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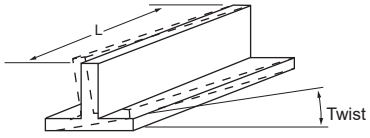
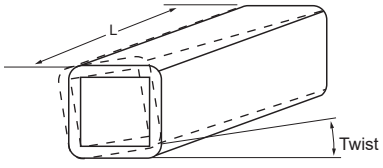
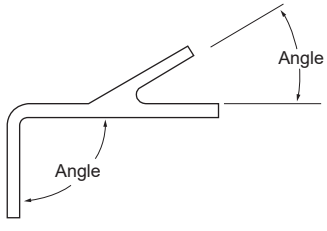
TWIST

Twist is the angle measured at the end of the profile with the weight of the profile minimizing the twist as shown below.

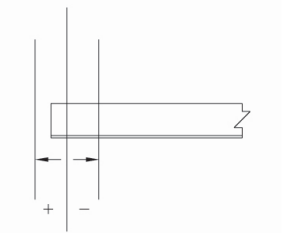
	Allowable twist
BARS AND OTHER STRUCTURAL PROFILES OTHER THAN TUBES 	1°/ft
CLOSED PROFILES (TUBES) 	1°/ft 7° max

ANGULARITY

Angularity is the angle measured between two perpendicular faces of the profile.

	Allowable deviation from specific angle	
ALL PROFILES 	Thickness up to 0.75” *Thickness up to 19mm*	2°

CUT LENGTHS

ALL PROFILES	Allowable deviation from specific length	
	up to 8’	-0 +1/4
	8’ <= 24’	-0 +1/2
	> 24’	-0 +3

*All parts being cut from stock must allow for blade width.

SQUARENESS OF ENDCUT

ALL PROFILES	Allowable deviation from specific length	
	Profiles 2” and under	± 2°
	Profiles over 2”	± 1°

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SECTION PROPERTIES

Elements of Sections of Structural Shapes

The section table values on the following pages have been calculated from nominal dimensions. All shapes shown in the tables are available, but not all are stocked. A shape availability list is included in the manual and, for convenience, availability information is noted on the individual uniform load tables.

Notation

A	cross sectional area (in.^{2} / *mm.*^{2})
b	width of section (in. / *mm.*)
d	depth of section / diameter of rod (in. / *mm.*)
h	length of angle leg (in. / *mm.*)
I	moment of inertia (in.^{4} /*mm.*^{4})
od	outside diameter of tube (in. / *mm.*)
r	radius of gyration (in. / *mm.*)
S	section modulus (in.^{3} / *mm.*^{3})
t	thickness (in. / *mm.*)
t_b	thickness of width dimension (in. / *mm.*)
t_d	thickness of depth dimension (in. / *mm.*)
Wt.	weight of section (lbs./ft. / *kgs./*m.)

EQUAL LEG ANGLE

SECTION DIMENSIONS				SECTION PROPERTIES			
Depth	Wall			X - X / Y - Y			
Width, in	Thickness, in	A, in2	Wt., lb/ft	I,in^4	S,in^3	r,in	C_x or C_y,in
in. / *mm.*	in. / *mm.*	in.^{2} / *mm.^{2}*	lb./ft. *Kg./m*	in.^{4} / *mm.^{4}*	in.^{3} / *mm.^{3}*	in. / *mm.*	in. / *mm.*
1.00	0.125	0.23	0.18	0.02	0.03	0.30	0.30
25.4	*3.18*	*151.17*	*0.27*	*9042.40*	*505.56*	*7.73*	*7.51*
1.25	0.125	0.30	0.23	0.04	0.05	0.38	0.36
31.75	*3.18*	*191.48*	*0.35*	*18291.87*	*807.85*	*9.77*	*9.11*
1.50	0.187	0.53	0.41	0.11	0.10	0.46	0.44
38.10	*4.75*	*339.29*	*0.61*	*45676.24*	*1702.22*	*11.60*	*11.27*
1.50	0.250	0.69	0.54	0.14	0.13	0.45	0.47
38.10	*6.35*	*443.44*	*0.80*	*57658.00*	*2195.17*	*11.40*	*11.83*
2.00	0.250	0.94	0.73	0.35	0.25	0.61	0.59
50.8	*6.35*	*604.69*	*1.09*	*144678.36*	*4044.50*	*15.47*	*15.03*
3.00	0.250	1.44	1.12	1.24	0.58	0.93	0.84
76.2	*6.35*	*927.19*	*1.67*	*517891.66*	*9450.02*	*23.63*	*21.40*
3.00	0.375	2.11	1.65	1.76	0.83	0.91	0.89
76.2	*9.53*	*1360.55*	*2.45*	*732434.19*	*13650.17*	*23.20*	*22.54*
3.00	0.5	2.75	2.15	2.22	1.07	0.90	0.93
76.2	*12.7*	*1773.75*	*3.20*	*922528.08*	*17561.32*	*22.80*	*23.67*
4.00	0.25	1.94	1.51	3.04	1.05	1.25	1.09
101.6	*6.35*	*1249.69*	*2.25*	*1265062.58*	*17131.47*	*31.81*	*27.76*
4.00	0.375	2.86	2.23	4.36	1.52	1.23	1.14
101.6	*9.53*	*1844.30*	*3.32*	*1814196.10*	*24959.13*	*31.36*	*28.91*
4.00	0.5	3.75	2.93	5.56	1.97	1.22	1.18
101.6	*12.7*	*2418.75*	*4.36*	*2314853.73*	*32355.97*	*30.93*	*30.06*
6.00	0.375	4.36	3.40	15.39	3.53	1.88	1.64
152.4	*9.53*	*2811.80*	*5.07*	*6404379.33*	*57818.72*	*47.72*	*41.63*
6.00	0.5	5.75	4.49	19.91	4.61	1.86	1.68
152.4	*12.70*	*3708.75*	*6.68*	*8286266.60*	*75600.12*	*47.26*	*42.79*

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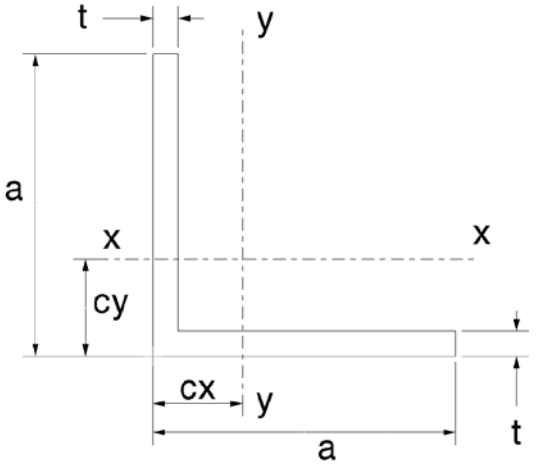
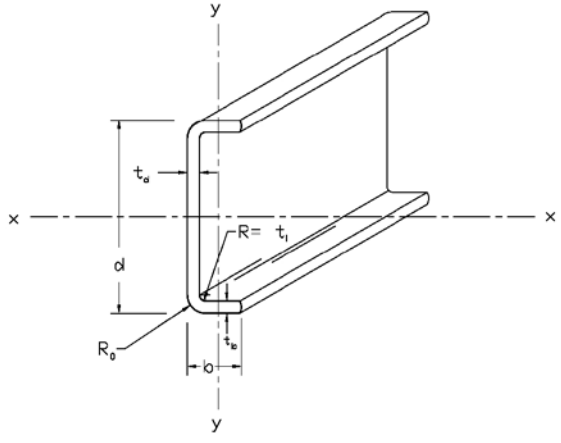


CHANNEL

SECTION DIMENSIONS						SECTION PROPERTIES										
						X - X			Y - Y							
	b	t_w	t_f	A	Wt.	I_x	S_x	r_x	I_y	S_y	r_y	J,in^4	h	C_x	C_y	A_w
in.	in.	in.	in.	in.^{2}	lb./ft.	in^4	in^3	in.	in.^{4}	in.^{3}	in.	in.	in.	in.	in.	in.
mm.	*mm.*	*mm.*	*mm.*	*mm^2*	*kg./m*	*mm^4*	*mm^3*	*mm.*	*mm^4*	*mm^3*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
2	9/16	1/8	1/8	.36	.28	0.18	0.18	0.71	0.01	0.02	0.15	0.002	1.75	0.15	1.00	0.219
50.8	*14.2875*	*3.175*	*3.175*	*231.854375*	*0.417666*	*74757.63*	*2943.205*	*17.95644*	*3366.77*	*319.8575*	*3.810652*	*846.8241*	*44.45*	*3.761685*	*25.4*	*141.129*
3	7/8	1/4	1/4	1.06	0.83	1.15	0.77	1.04	0.06	0.09	0.23	0.025	2.5	0.25	1.50	0.625
76.2	*6.35*	*6.35*	*485.482*	*685.4825*	*1.234838*	*480725.1*	*12617.42*	*26.481.98*	*23434.11*	*1484.895*	*5.846909*	*10297.38*	*63.5*	*6.443382*	*38.1*	*403.225*
3	1	1/ 4	1/ 4	1.13	0.88	1.27	0.85	1.06	0.08	0.12	0.27	0.03	2.5	0.29	1.5	0.63
76.2	*25.4*	*6.35*	*6.35*	*725.805*	*1.307475*	*530044.2*	*13911.88*	*27.02379*	*34956.9*	*1942.944*	*6.939956*	*10839.35*	*63.5*	*7.408333*	*38.1*	*403.225*
3	1 1/2	1/ 4	1/ 4	1.38	1.07	1.75	1.16	1.13	0.28	0.27	0.45	0.03	2.5	0.47	1.5	0.63
76.2	*38.1*	*6.35*	*6.35*	*887.095*	*1.598025*	*727320.3*	*19089.72*	*28.633.74*	*115315.9*	*4390.313*	*11.40144*	*13007.22*	*63.5*	*11.83409*	*38.1*	*403.225*
3 1/2	1 3/16	1/ 8	3/16	0.84	0.65	1.54	0.88	1.36	0.11	0.13	0.37	0	3.13	0.35	1.75	0.39
88.9	*30.1625*	*3.175*	*4.7625*	*539.313438*	*0.971527*	*641312.6*	*14427.69*	*34.48375*	*46437.71*	*2171.325*	*9.279295*	*1592.029*	*79.375*	*8.775759*	*44.45*	*252.016*
3 1/2	1 1/2	3/16	3/16	1.15	0.90	2.02	1.16	1.33	0.23	0.21	0.45	0.014	3.125	0.42	1.75	0.586
88.9	*38.1*	*4.7625*	*4.7625*	*740.925938*	*1.334714*	*841417.2*	*18929.47*	*33.69912*	*96058.44*	*3486.12*	*11.38625*	*5944.705*	*79.375*	*10.54554*	*44.45*	*378.023*
4	1 1/8	1/ 4	1/ 4	1.44	1.12	2.87	1.44	1.41	0.13	0.16	0.3	0.03	3.5	0.3	2	0.88
101.6	*28.575*	*6.35*	*6.35*	*927.4175*	*1.670663*	*1196122*	*23545.62*	*35.91289*	*53868.32*	*2558.86*	*7.621304*	*13549.19*	*88.9*	*7.52337*	*50.8*	*564.515*
4	1 3/8	3/16	3/16	1.2	0.93	2.62	1.31	1.48	0.19	0.18	0.40	0.02	3.63	0.35	2.00	0.68
101.6	*34.925*	*4.7625*	*4.7625*	*771.167813*	*1.389192*	*1090307*	*21462.68*	*37.60107*	*77665.79*	*2982.765*	*10.03554*	*6173.348*	*92.075*	*8.886887*	*50.8*	*438.507*
5 1/2	1 1/2	1/4	1/4	2.00	1.56	7.78	2.83	1.97	0.33	0.29	0.41	0.044	5	0.36	2.75	1.250
139.7	*38.1*	*6.35*	*6.35*	*1290.32*	*2.3244*	*3236630*	*46336.73*	*50.08388*	*137456.5*	*4744.467*	*10.32129*	*18426.89*	*127*	*9.128125*	*69.85*	*806.450*
6	1 5/8	1/ 4	1/ 4	2.19	1.71	10.19	3.4	2.16	0.43	0.34	0.44	0.05	5.5	0.38	3	1.38
152.4	*41.275*	*6.35*	*6.35*	*1411.2875*	*2.542313*	*4239811*	*55640.41*	*54.81075*	*177874.7*	*5626.449*	*11.22663*	*20052.8*	*139.7*	*9.661071*	*76.2*	*887.095*
6	1 11/16	3/ 8	3/ 8	3.23	2.52	14.55	4.85	2.12	0.66	0.53	0.45	0.17	5.25	0.44	3	1.97
152.4	*42.8625*	*9.525*	*9.525*	*2086.68938*	*3.758991*	*6055368*	*79466.55*	*53.86933*	*272708.4*	*8636.152*	*11.43196*	*68592.76*	*133.35*	*11.28505*	*76.2*	*1270.159*
8	2 3/16	3/ 8	3/ 8	4.36	3.40	35.77	8.94	2.86	1.53	0.92	0.59	0.22	7.25	0.53	4.00	2.72
203.2	*55.5625*	*9.525*	*9.525*	*2812.49438*	*5.066466*	*14890522*	*146559.8*	*72.76279*	*635340*	*15077.91*	*15.02995*	*90542.44*	*184.15*	*13.42547*	*101.6*	*1754.029*
10	2 3/ 4	1/ 2	1/ 2	7.25	5.66	92.48	18.5	3.57	3.99	1.92	0.74	0.65	9.00	0.68	5.00	4.50
254	*69.85*	*12.7*	*12.7*	*4677.41*	*8.42595*	*38492696*	*303091.2*	*90.71658*	*1659560*	*31513.82*	*18.83623*	*268815.9*	*228.6*	*17.18879*	*127*	*2903.220*
11 1/2	2 3/ 4	1/ 2	1/ 2	8	6.24	131.48	22.87	4.05	4.13	1.95	0.72	0.71	10.50	0.64	5.75	5.25
292.1	*69.85*	*12.7*	*12.7*	*5161.28*	*9.2976*	*54725705*	*374704.2*	*102.9715*	*1717580*	*31998.13*	*18.24231*	*294830.3*	*266.7*	*16.17266*	*146.05*	*3387.090*
12	3	1/2	1/2	8.50	6.63	154.71	25.78	4.27	5.40	2.34	0.80	0.750	11	0.69	6.00	5.500
304.8	*76.2*	*12.7*	*12.7*	*5483.86*	*9.8787*	*64394404*	*422534.2*	*422534.2*	*108.363*	*2246678*	*38310.27*	*20.24079*	*279.4*	*17.55588*	*152.4*	*3548.380*
14	3 1/2	3/4	3/4	14.63	11.41	352.74	50.39	4.91	12.16	4.62	0.91	2.953	12.5	0.87	7.00	9.375
355.6	*88.9*	*19.05*	*19.05*	*9435.465*	*16.99718*	*146822233.4*	*825769.5*	*124.7425*	*5061997*	*75735.3*	*23.16218*	*1229182*	*317.5*	*22.06218*	*177.8*	*6048.375*
18	2 3/8	3/8	3/8	8.25	6.44	298.76	33.20	6.02	2.31	1.17	0.53	0.40	17.25	.40	9.00	6.469
457.2	*60.325*	*9.525*	*9.525*	*5322.57*	*9.58815*	*124352263.10*	*543971.6*	*152.8503*	*961388.7*	*19197.61*	*13.43968*	*166451.8*	*438.15*	*10.24659*	*228.6*	*4173.379*

*ENGLISH

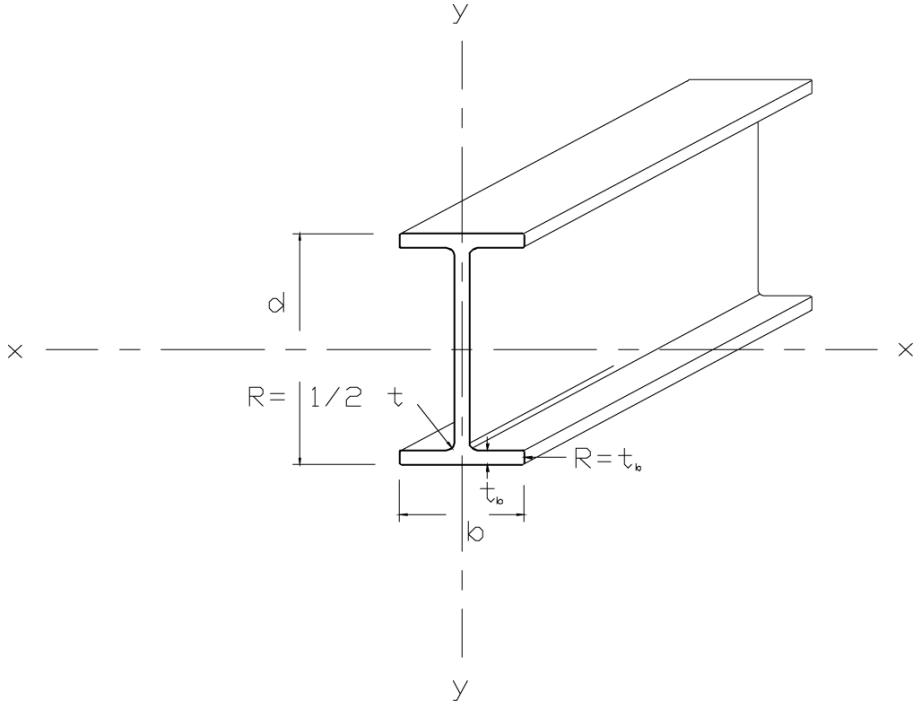
METRIC



I-BEAM

SECTION DIMENSIONS						SECTION PROPERTIES										
						X - X			Y - Y							
d, in.	b, in.	t_f in	t_w in	A, in.	Wt.	I	S	r	I	S	r	J	h	A	C	C
in.	in.	in.	in.	in^2	lb./ft.	$in.^4$	$in.^3$	in.	$in.^4$	$in.^3$	in.	$in.^4$	in.	$in.^2$	in.	in.
mm.	*mm.*	*mm.*	*mm.*	*$mm.^2$*	*kg./m*	*$mm.^4$*	*$mm.^3$*	*mm.*	*$mm.^4$*	*$mm.^3$*	*mm.*	*$mm.^4$*	*mm.*	*$mm.^2$*	*mm.*	*mm.*
3	1.5	0.25	1/4	1/4	1.38	1.75	1.16	1.13	0.14	0.19	0.32	0.029	2 1/2	0.625	0.75	1.50
76.2	*38.1*	*6.35*	*6.35*	*886.88*	*1.60*	*727321.06*	*19089.79*	*28.63*	*59887.46*	*3143.70*	*8.22*	*11923.30*	*63.50*	*403.23*	*19.05*	*38.10*
3.5	1.5	3/16	3/16	1.15	0.90	2.02	1.16	1.33	0.11	0.14	0.31	0.013	3 1/8	0.586	0.75	1.75
88.90	*38.10*	*4.76*	*4.76*	*740.74*	*1.33*	*841418.03*	*18929.54*	*33.70*	*44613.92*	*2341.94*	*7.76*	*5601.75*	*79.38*	*378.02*	*19.05*	*44.45*
4	2	1/4	1/4	1.88	1.46	4.41	2.21	1.53	.34	.34	.42	0.039	3.5	0.875	1.00	2.00
101.60	*50.80*	*6.35*	*6.35*	*1209.38*	*2.18*	*1837271.53*	*36166.76*	*38.97*	*140640.70*	*5537.04*	*10.78*	*16259.04*	*88.90*	*564.52*	*25.40*	*50.80*
5.5	2.5	1/4	1/4	2.50	1.95	11.22	4.08	2.12	0.66	0.53	0.51	0.052	5	1.25	1.25	2.75
139.70	*63.50*	*6.35*	*6.35*	*1612.50*	*2.91*	*4671764.18*	*66882.81*	*53.82*	*273693.84*	*8620.28*	*13.03*	*21678.72*	*127.00*	*806.45*	*31.75*	*69.85*
6	3	1/4	1/4	2.88	2.24	15.87	5.29	2.35	1.13	0.75	0.63	0.060	5 1/2	1.375	1.5	3.00
152.40	*76.20*	*6.35*	*6.35*	*1854.38*	*3.34*	*6606589.95*	*86700.66*	*59.68*	*471241.18*	*12368.53*	*15.94*	*24930.53*	*139.70*	*887.10*	*38.10*	*76.20*
6	3	3/8	3/8	4.22	3.29	22.35	7.45	2.30	1.71	1.14	0.64	0.198	5 1/4	1.969	1.5	3.00
152.40	*76.20*	*9.53*	*9.53*	*2721.09*	*4.90*	*9301187.11*	*122062.82*	*58.46*	*711993.53*	*18687.49*	*16.17*	*82311.39*	*133.35*	*1270.16*	*38.10*	*76.20*
8	4	3/8	3/8	5.72	4.46	55.55	13.89	3.12	4.03	2.02	0.84	0.268	7 1/4	2.719	2.00	4.00
203.20	*101.60*	*9.53*	*9.53*	*3688.59*	*6.65*	*23121371.16*	*227572.55*	*79.16*	*1678186.98*	*33035.18*	*21.33*	*111577.66*	*184.15*	*1754.03*	*50.80*	*101.60*
8	4	1/2	1/2	7.50	5.85	70.63	17.66	3.07	5.41	2.70	0.85	0.625	7	3.500	2.00	4.00
203.20	*101.60*	*12.70*	*12.70*	*4837.50*	*8.72*	*29396344.43*	*289334.10*	*77.94*	*2250251.14*	*44296.28*	*21.57*	*260144.64*	*177.80*	*2258.06*	*50.80*	*101.60*
10	5	3/8	3/8	7.22	5.63	111.63	22.33	3.93	7.85	3.14	1.04	0.338	9 1/4	3.469	2.50	5.00
254.00	*127.00*	*9.53*	*9.53*	*4656.09*	*8.39*	*46462849.07*	*365849.21*	*99.88*	*3268727.58*	*51476.02*	*26.49*	*140843.93*	*234.95*	*2237.90*	*63.50*	*127.00*
10	5	1/2	1/2	9.50	7.41	143.29	28.66	3.88	10.51	4.20	1.05	0.792	9	4.500	2.50	5.00
254.00	*127.00*	*12.70*	*12.70*	*6127.50*	*11.04*	*59642494.69*	*469625.94*	*98.65*	*4374765.71*	*68893.95*	*26.72*	*329516.55*	*228.60*	*2903.22*	*63.50*	*127.00*
12	6	1/2	1/2	11.50	8.97	253.96	42.33	4.70	18.11	6.04	1.26	0.958	11	5.500	3.00	6.00
304.80	*152.40*	*12.70*	*12.70*	*7417.50*	*13.37*	*105705439.13*	*693605.24*	*119.36*	*7539858.84*	*98948.28*	*31.88*	*398888.45*	*279.40*	*3548.38*	*76.20*	*152.20*
*18	4 1/2	1/2	3/8	10.88	8.48	498.16	55.35	6.77	7.67	3.41	0.84	0.674	17	6.375	2.25	9.00
*457.20	*114.30	*12.70	*9.53	*7014.38	*12.64	*207348286.11	*907035.37	*171.91	*3191852.80	*55850.44	*21.33	*280468.44	*431.80	*4112.90	*57.15	*228.60
*24	7 1/2	3/4	3/8	19.69	15.36	1876.82	156.40	9.76	52.83	14.09	1.64	2.505	22 1/2	8.438	3.75	12.00
*609.6	*190.5	*19.05	*9.53	*12698.44	*22.88	*781189968.36	*2562959.21	*248.00	*21990859.78	*230875.17	*41.61	*1042610.94	*571.50	*5443.54	*95.25	*304.80

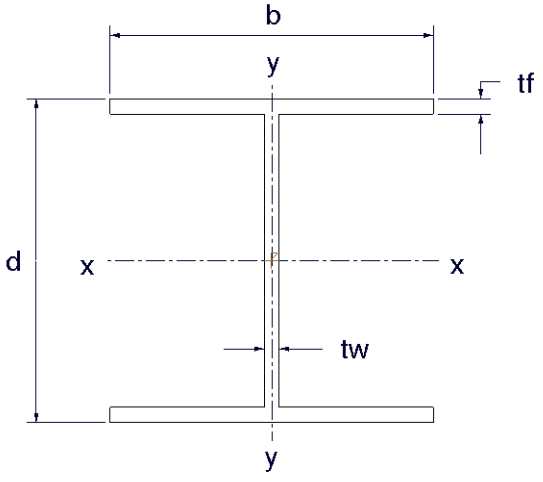
*18" I Beam - Web = 3/8" Flange = 1/2"
*457.20 I Beam - Web = 9.53mm Flange = 12.70mm
*24" I Beam - Web = 3/8" Flange = 3/4"
*609.60 I Beam - Web = 9.53mm Flange = 19.05mm
*ENGLISH
METRIC



WF-BEAM

SECTION DIMENSIONS					SECTION PROPERTIES					
					X -X			Y - Y		
d	b	t	A	Wt.	I	S	r	I	S	r
in. *mm.*	in. *mm.*	in. *mm.*	$in.^2$ $mm.^2$	lb./ft. *kg./m*	$in.^4$ $mm.^4$	$in.^3$ $mm.^3$	in. *mm.*	$in.^4$ $mm.^4$	$in.^3$ $mm.^3$	in. *mm.*
3	3	1/4	2.13	1.64	3.17	2.11	1.22	1.13	0.75	0.73
76.2	*76.2*	*6.4*	*1374.2*	*2.44*	*1319454*	*34577*	*31.0*	*470342*	*12290*	*18.5*
4	4	1/4	2.89	2.15	7.94	3.97	1.66	2.67	1.34	0.96
101.6	*101.6*	*6.4*	*1864.5*	*3.20*	*3304878*	*65057*	*42.2*	*1111338*	*21959*	*24.4*
6	6	1/4	4.39	3.40	28.28	9.43	2.54	9.01	3.00	1.43
152.4	*152.4*	*6.4*	*2832.3*	*5.06*	*11771025*	*154530*	*64.5*	*3750245*	*49161*	*36.3*
6	6	3/8	6.48	4.90	40.17	13.39	2.49	13.52	4.51	1.44
152.4	*152.4*	*9.5*	*4180.6*	*7.29*	*16720016*	*219423*	*63.2*	*5627449*	*73906*	*36.6*
8	8	3/8	8.73	6.49	99.19	24.80	3.37	32.03	8.01	1.92
203.2	*203.2*	*9.5*	*5632.2*	*9.66*	*41285995*	*406399*	*85.6*	*13331893*	*131260*	*48.8*
8	8	1/2	11.51	8.70	126.96	31.74	3.32	42.74	10.69	1.93
203.2	*203.2*	*12.7*	*7425.8*	*12.95*	*52844742*	*520125*	*84.3*	*17789731*	*175178*	*49.0*
10	10	3/8	11.06	8.74	198.53	39.71	4.24	62.54	12.51	2.38
254.0	*254.0*	*9.5*	*7135.5*	*13.01*	*82634425*	*650730*	*107.7*	*26031113*	*205002*	*60.5*
10	10	1/2	14.51	10.90	256.20	51.24	4.21	83.42	16.68	2.4
254.0	*254.0*	*12.7*	*9361.3*	*16.22*	*106638491*	*839673*	*106.9*	*34722026*	*273336*	*61.0*
12	12	1/2	17.51	13.20	452.45	75.45	5.08	144.11	24.02	2.87
304.8	*304.8*	*12.7*	*11296.8*	*19.64*	*188323909*	*1236404*	*129.0*	*59983111*	*393617*	*72.9*

*ENGLISH
METRIC

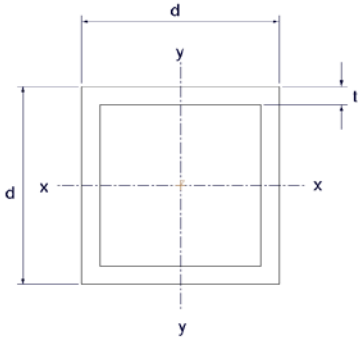


SQUARE TUBE

SECTION DIMENSIONS				SECTION PROPERTIES					
d=d_f,in	t,in	A, in^2	Wt, Lbs/ft	I, in^4	S, in^3	r, in	J, in^4	d_w	a_w
in.	in.	in^2	lb./ft.	$in.^4$	in^3	in.	$in.^4$	in^3	in.
mm.	*mm.*	*$mm.^2$*	*kg./m*	*$mm.^4$*	*$mm.^3$*	*mm.*	*$mm.^4$*	*$mm.^3$*	*mm.*
1.5	1/4	1.25	0.98	0.34	0.45	0.52	0.41	1	0.50
38.10	*6.35*	*806.25*	*1.45*	*140911.54*	*7396.91*	*13.22*	*169364.83*	*25.40*	*322.50*
1	1/8	0.44	0.34	0.06	0.11	0.36	0.07	0.75	0.19
25.40	*3.18*	*282.19*	*0.51*	*23711.08*	*1867.01*	*9.17*	*30498.37*	*19.05*	*120.94*
1	1/4	0.75	0.59	0.08	0.16	0.32	0.08	0.5	0.25
25.40	*6.35*	*483.75*	*0.87*	*32518.05*	*2560.47*	*8.20*	*32924.52*	*12.70*	*161.25*
1 1/4	1/8	0.56	0.44	0.12	0.19	0.46	0.16	1	0.25
31.75	*3.18*	*362.81*	*0.65*	*49996.50*	*3149.38*	*11.74*	*66672.16*	*25.40*	*161.25*
1 1/4	1/4	1	0.78	0.18	0.28	0.42	0.2	0.75	0.38
31.75	*6.35*	*645.00*	*1.16*	*73707.57*	*4642.98*	*10.69*	*83246.20*	*19.05*	*241.88*
1 1/2	1/8	0.69	0.54	0.22	0.29	0.56	0.3	1.25	0.31
38.10	*3.18*	*443.44*	*0.80*	*90915.04*	*4772.43*	*14.32*	*123983.52*	*31.75*	*201.56*
1 1/2	1/4	1.25	0.98	0.34	0.45	0.52	0.41	1	0.5
38.10	*6.35*	*806.25*	*1.45*	*140911.54*	*7396.91*	*13.22*	*169364.83*	*25.40*	*322.50*
1 3/4	1/8	0.81	0.63	0.36	0.41	0.67	0.5	1.5	0.38
44.45	*3.18*	*524.06*	*0.94*	*149718.51*	*6736.47*	*16.90*	*207309.81*	*38.10*	*241.88*
1.75	1/4	1.5	1.17	0.58	0.66	0.62	0.72	1.25	0.63
44.45	*6.35*	*967.50*	*1.74*	*240633.55*	*10827.13*	*15.77*	*301024.21*	*31.75*	*403.13*
2	1/8	0.94	0.73	0.55	0.55	0.77	0.77	1.75	0.44
50.80	*3.18*	*604.69*	*1.09*	*229658.71*	*9041.66*	*19.49*	*321528.54*	*44.45*	*282.19*
2	1/4	1.75	1.37	0.91	0.91	0.72	1.17	1.5	0.75
50.80	*6.35*	*1128.75*	*2.03*	*379377.21*	*14936.07*	*18.33*	*487973.94*	*38.10*	*483.75*
2	3/8	2.44	1.9	1.13	1.13	0.68	1.31	1.25	0.94
50.80	*9.53*	*1572.19*	*2.83*	*470292.25*	*18515.39*	*17.29*	*544188.24*	*31.75*	*604.69*
2 1/4	1/8	1.06	0.83	0.80	0.71	0.87	1.13	2.00	0.50
57.15	*3.18*	*685.31*	*1.23*	*333987.44*	*11688.07*	*22.07*	*471517.33*	*50.80*	*322.50*
2.25	1/4	2.00	1.56	1.35	1.2	0.82	1.78	1.75	0.88
57.15	*6.35*	*1290.00*	*2.32*	*563646.15*	*19725.09*	*20.90*	*739966.22*	*44.45*	*564.38*
3	1/8	1.44	1.12	1.98	1.32	1.17	2.85	2.75	0.69
76.20	*3.18*	*927.19*	*1.67*	*825822.90*	*21675.08*	*29.84*	*1184880.57*	*69.85*	*443.44*
3	1/4	2.75	2.15	3.49	2.33	1.13	4.77	2.50	1.25
76.20	*6.35*	*1773.75*	*3.20*	*1454640.63*	*38179.43*	*28.63*	*1983736.35*	*63.50*	*806.25*
3.5	1/4	3.25	2.54	5.76	3.29	1.33	7.97	3.00	1.50
88.90	*6.35*	*2096.25*	*3.78*	*2395496.12*	*53891.77*	*33.80*	*3316956.92*	*76.20*	*967.50*
4	3/8	5.44	4.24	12.04	6.02	1.49	16.19	3.25	2.44
101.60	*9.53*	*3507.19*	*6.32*	*5009811.60*	*98618.05*	*37.79*	*6738104.51*	*82.55*	*1572.19*
4	1/4	3.75	2.93	8.83	4.41	1.53	12.36	3.50	1.75
101.60	*6.35*	*2418.75*	*4.36*	*3674539.30*	*72333.24*	*38.97*	*5144456.63*	*89.90*	*1128.75*
6	3/8	8.44	6.58	44.69	14.9	2.3	62.57	5.25	3.94
152.40	*9.53*	*5442.19*	*9.81*	*18602355.19*	*244124.69*	*58.46*	*26043811.71*	*133.35*	*2539.69*

***ENGLISH**

METRIC

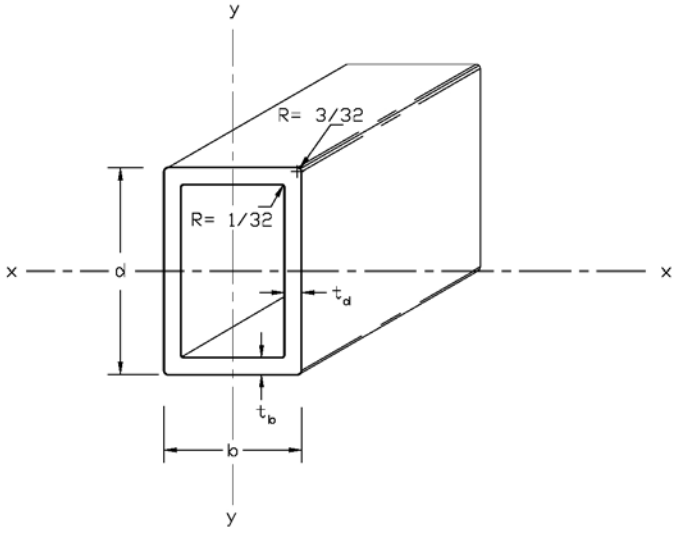


RECTANGULAR TUBE

SECTION DIMENSIONS						SECTION PROPERTIES								
						X -X				Y - Y				
d,in	b,in	t_d,in	t_b,in	A,in^2	Wt.	I,in^4	S,in^3	r,in	A_w,in^2	I,in^4	S,in^3	r,in	A_w,in^2	J,in^4
in.	in.	in.	in.	$in.^2$	lb./ft.	$in.^4$	$in.^3$	in.	in.	$in.^4$	$in.^3$	in.	in.	in.
mm.	*mm.*	*mm.*	*mm.*	*$mm.^2$*	*kg./m*	*$mm.^4$*	*$mm.^3$*	*mm.*	*mm.*	*$mm.^4$*	*$mm.^3$*	*mm.*	*mm.*	*mm.*
1 1/2	3/4	1/8	1/ 8	0.5000	0.39	0.13	0.17	0.51	0.31	0.04	0.11	0.28	0.13	0.09
38.1	*19.05*	*3.18*	*3.18*	*322.5000*	*0.58*	*53925.82*	*2830.75*	*12.93*	*7.94*	*16530.02*	*1735.44*	*7.16*	*80.65*	*38424.68*
1 1/2	1	1/8	1/ 8	0.5625	0.44	0.16	0.21	0.53	0.31	0.08	0.16	0.38	0.19	0.16
38.1	*25.4*	*3.18*	*3.18*	*362.8100*	*0.65*	*66255.59*	*3477.98*	*13.51*	*7.94*	*33737.51*	*2656.50*	*9.64*	*120.97*	*66944.34*
2	1/2	1/8	1/ 8	0.5625	0.44	0.22	0.22	0.63	0.44	0.02	0.07	0.18	0.06	0.05
50.8	*12.7*	*3.18*	*3.18*	*362.8100*	*0.65*	*92270.05*	*3632.68*	*15.95*	*11.11*	*7723.04*	*1216.23*	*4.61*	*40.32*	*22864.28*
2	1	1/8	1/ 8	0.6875	0.54	0.33	0.33	0.69	0.44	0.11	0.21	0.39	0.19	0.24
50.8	*25.4*	*3.18*	*3.18*	*443.4400*	*0.80*	*138066.35*	*5435.68*	*17.64*	*11.11*	*43763.92*	*3445.98*	*9.93*	*120.97*	*101849.95*
4	1	1/8	1/ 8	1.1875	0.93	2.04	1.02	1.31	0.94	0.20	0.40	0.41	0.19	0.61
101.6	*25.4*	*3.18*	*3.18*	*765.9400*	*1.38*	*848044.43*	*16693.79*	*33.27*	*23.81*	*83869.55*	*6603.90*	*10.46*	*120.97*	*251849.32*
4	2	1/8	1/4	1.8750	1.46	4.41	2.21	1.53	0.88	1.10	1.10	.77	0.88	2.64
101.6	*50.8*	*3.18*	*6.35*	*1209.3800*	*2.18*	*1837271.53*	*36166.76*	*38.97*	*22.23*	*459317.88*	*18083.38*	*19.49*	*564.52*	*1097485.20*
4 3/8	1 3/8	1/8	3/16	1.5156	1.18	3.60	1.64	1.54	1	0.47	0.69	0.56	0.42	1.36
111.13	*34.93*	*3.18*	*4.76*	*977.5800*	*1.76*	*1496449.87*	*26932.73*	*39.12*	*25.40*	*196946.09*	*11278.23*	*14.19*	*272.18*	*567843.60*
4 1/2	1 3/4	1/8	3/16	1.6875	1.32	4.52	2.01	1.64	1.03	0.85	0.97	0.71	0.56	2.28
114.3	*44.45*	*3.18*	*4.76*	*1088.4400*	*1.96*	*1879443.41*	*32886.15*	*41.55*	*26.19*	*353634.12*	*15911.55*	*18.02*	*362.90*	*947068.29*
5	2	1/8	1/ 8	1.6875	1.32	5.2	2.08	1.76	1.19	1.21	1.21	0.85	0.44	3.09
127.0	*50.8*	*3.18*	*3.18*	*1088.4400*	*1.96*	*2166110.61*	*34111.98*	*44.61*	*30.16*	*504436.72*	*19859.71*	*21.53*	*282.26*	*1288020.83*
5 1/2	3 1/2	1/4	1/ 4	4.2500	3.32	17.28	6.28	2.02	2.5	8.4	4.8	1.41	1.5	17.13
139.70	*88.90*	*6.35*	*6.35*	*2741.2500*	*4.94*	*7190831.45*	*102946.76*	*51.21*	*63.50*	*3496777.55*	*78667.66*	*35.71*	*967.74*	*7128058.80*
6	4	1/4	1/ 4	4.7500	3.71	23.47	7.82	2.22	2.75	12.35	6.17	1.61	1.75	24.47
152.40	*101.60*	*6.35*	*6.35*	*3063.7500*	*5.52*	*9770599.14*	*128223.09*	*56.47*	*69.85*	*5140024.53*	*101181.59*	*40.95*	*1129.03*	*10185432.86*
9	6	0.31	5/16	8.9844	7.01	101.38	22.53	3.36	5.23	53.62	17.87	2.44	3.36	106.15
228.60	*152.40*	*7.94*	*7.94*	*5794.9200*	*10.44*	*42198094.40*	*369187.18*	*85.32*	*132.95*	*22319385.54*	*292905.32*	*62.05*	*2167.33*	*44181401.17*

***ENGLISH**

METRIC



SQUARE BAR

SECTION DIMENSIONS				SECTION PROPERTIES					
				X - X			Y - Y		
d	b	A	Wt.	I	S	r	I	S	r
in. *mm.*	in. *mm.*	in.^{2} *mm.^{2}*	lb./ft. *kg./m*	in.^{4} *mm.^{4}*	in.^{3} *mm.^{3}*	in. *mm.*	in.^{4} *mm.^{4}*	in.^{3} *mm.^{3}*	in. *mm.*
1	1	1.00	0.88	0.08	0.17	0.29	0.08	0.17	0.29
25.4	*25.4*	*645.2*	*1.31*	*33299*	*2786*	*7.4*	*33299*	*2786*	*7.4*
1 1/4	1 1/4	1.56	1.37	0.20	0.33	0.36	0.20	0.33	0.36
31.8	*31.8*	*1006.4*	*2.04*	*83246*	*5408*	*9.1*	*83246*	*5408*	*9.1*
1 1/2	1 1/2	2.25	1.98	0.42	0.56	0.43	0.42	0.56	0.43
38.1	*38.1*	*1451.6*	*2.95*	*174817*	*9177*	*10.9*	*174817*	*9177*	*10.9*

RECTANGULAR BAR

SECTION DIMENSIONS				SECTION PROPERTIES					
				X - X			Y - Y		
d, in	b, in	A, in^2	Wt,lb/ft	I_x,in^4	S_x,in^3	r_x,in	I_y,in^4	S_y,in^3	r_y,in
in. *mm.*	in. *mm.*	in.2 *mm.^{2}*	lb./ft. *kg./m*	in.4 *mm.^{4}*	in.3 *mm.^{3}*	in. *mm.*	in.4 *mm.^{4}*	in.3 *mm.^{3}*	in. *mm.*
1 1/2	3/4	1.13	0.88	0.21	0.28	0.43	0.05	0.14	0.22
38.1	*19.05*	*725.81*	*1.31*	*87798.82*	*4608.86*	*11.00*	*21949.70*	*2304.43*	*5.50*
1 1/2	1	1.50	1.17	0.28	0.38	0.43	0.13	0.25	0.29
38.10	*25.4*	*967.74*	*1.74*	*117065.09*	*6145.15*	*11.*	*52028.93*	*4096.77*	*7.33*
2	1/2	1.00	0.78	0.33	0.33	0.58	0.02	0.08	0.14
50.8	*12.7*	*645.16*	*1.16*	*138743.81*	*5462.35*	*14.66*	*8671.49*	*1365.59*	*3.67*
2	1	2.00	1.56	0.67	0.67	0.58	0.17	0.33	0.29
50.8	*25.4*	*1290.32*	*2.32*	*277487.62*	*10924.71*	*14.66*	*69371.90*	*5462.35*	*7.33*
3	1/2	1.50	1.17	1.13	0.75	0.87	0.03	0.13	0.14
76.2	*12.7*	*967.74*	*1.74*	*468260.35*	*12290.30*	*22.00*	*13007.23*	*2048.38*	*3.67*

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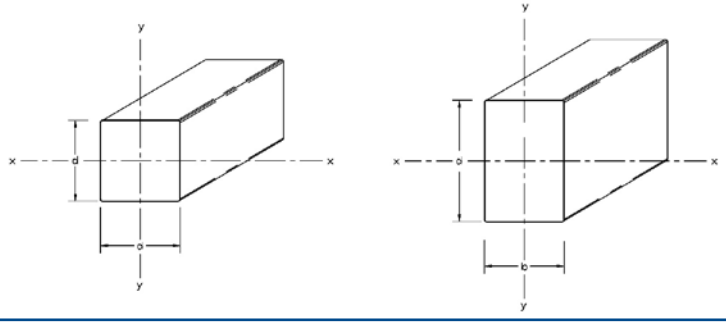
METRIC



SOLID ROUND ROD

SECTION DIMENSIONS			SECTION PROPERTIES		
d	A	Wt.	I	S	r
in. *mm.*	$in.^2$ *$mm.^2$*	lb./ft. *kg./m*	$in.^4$ *$mm.^4$*	in^{-3} *$mm.^3$*	in. *mm.*
0.2500	0.049	0.044	0.0002	0.0016	0.0625
6.4	*31.6*	*0.07*	*83*	*26*	*1.6*
0.3000	0.071	0.062	0.0004	0.0027	0.0750
7.6	*45.8*	*0.09*	*166*	*44*	*1.9*
0.3125	0.077	0.067	0.0005	0.0030	0.0781
7.9	*49.7*	*0.10*	*208*	*49*	*2.0*
0.3500	0.096	0.083	0.0007	0.0042	0.0875
8.9	*619*	*0.12*	*291*	*69*	*2.2*
0.3750	0.110	0.095	0.0010	0.0052	0.0938
9.5	*71.0*	*0.14*	*416*	*85*	*2.4*
0.4375	0.150	0.133	0.0018	0.0082	0.1094
11.1	*96.8*	*0.20*	*749*	*134*	*2.8*
0.4720	0.175	0.150	0.0024	0.0103	0.1180
12.0	*112.9*	*0.22*	*999*	*169*	*3.0*
0.4800	0.181	0.160	0.0026	0.0109	0.1200
12.2	*116.8*	*0.24*	*1082*	*179*	*3.0*
0.5000	0.196	0.172	0.0031	0.0123	0.1250
12.7	*126.5*	*0.26*	*1290*	*202*	*3.2*
0.6250	0.307	0.270	0.0075	0.0240	0.1563
15.9	*198.1*	*0.40*	*3122*	*393*	*4.0*
0.7500	0.442	0.397	0.0156	0.0414	0.1875
19.1	*285.2*	*0.59*	*6493*	*678*	*4.8*
0.8125	0.518	0.460	0.0214	0.0527	0.2031
20.6	*334.2*	*0.68*	*8907*	*864*	*5.2*
0.8750	0.601	0.534	0.0288	0.0658	0.2188
22.2	*387.7*	*0.79*	*11987*	*1078*	*5.6*
1.0000	0.785	0.697	0.0491	0.0982	0.2500
25.4	*506.5*	*1.04*	*20437*	*1609*	*6.4*
1.2500	1.227	1.094	0.1198	0.1917	0.3125
31.8	*791.6*	*163*	*49865*	*3141*	*7.9*
1.5000	1.766	1.571	0.2485	0.3313	0.3750
38.1	*1139.4*	*2.34*	*103434*	*5429*	*9.5*

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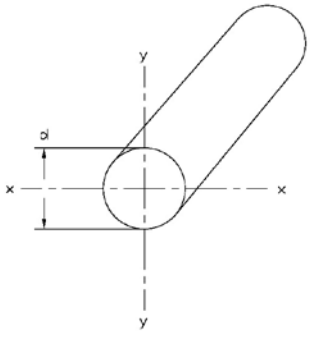
METRIC



ROUND TUBE

SECTION DIMENSIONS				SECTION PROPERTIES		
od	t	A	Wt.	I	S	r
in. *mm.*	in. *mm.*	$in.^2$ $mm.^2$	lb./ft. *kg./m*	$in.^4$ $mm.^4$	$in.^3$ $mm.^3$	in. *mm.*
1	3/32	0.27	0.22	0.03	0.06	0.32
25.4	*2.4*	*174.2*	*0.33*	*12487*	*983*	*8.1*
1	1/ 8	0.34	0.25	0.03	0.07	0.31
25.4	*3.2*	*219.4*	*0.37*	*12487*	*1147*	*7.9*
1 1/8	1/ 8	0.39	0.33	0.05	0.09	0.36
28.6	*3.2*	*251.6*	*0.49*	*20812*	*1475*	*9.1*
1 1/4	3/32	0.34	0.27	0.06	0.09	0.41
31.8	*2.4*	*219.4*	*0.40*	*24974*	*1475*	*10.4*
1 1/4	1/ 8	0.44	0.32	0.07	0.11	0.40
31.8	*3.2*	*283.9*	*0.48*	*29136*	*1803*	*10.2*
1 1/4	1/ 4	0.79	0.61	0.10	0.17	0.36
31.8	*6.4*	*509.7*	*0.91*	*41623*	*2786*	*9.1*
1 1/2	1/ 8	0.54	0.45	0.13	0.17	0.49
38.1	*3.2*	*348.4*	*0.67*	*54110*	*2786*	*12.4*
1 1/2	1/ 4	0.98	0.79	0.20	0.27	0.45
38.1	*6.4*	*632.3*	*1.18*	*83246*	*4425*	*11.4*
1 3/4	1/ 8	0.64	0.51	0.21	0.24	0.58
44.5	*3.2*	*412.9*	*0.76*	*87409*	*3933*	*14.7*
1 3/4	1/ 4	1.18	0.94	0.34	0.39	0.54
44.5	*6.4*	*761.3*	*1.40*	*141519*	*6391*	*13.7*
1 7/8	3/16	0.99	0.88	0.36	0.38	0.60
47.6	*4.8*	*638.7*	*1.31*	*149843*	*6227*	*15.2*
2	1/ 4	1.37	1.08	0.54	0.54	0.62
50.8	*6.4*	*883.9*	*1.61*	*224765*	*8849*	*15.7*
3	1/ 4	2.16	1.70	2.06	1.37	0.98
76.2	*6.4*	*1393.5*	*2.53*	*857437*	*22450*	*24.9*
3	1/ 2	3.93	2.98	3.19	2.13	0.90
76.2	*12.7*	*2535.5*	*4.43*	*1327778*	*34904*	*22.9*

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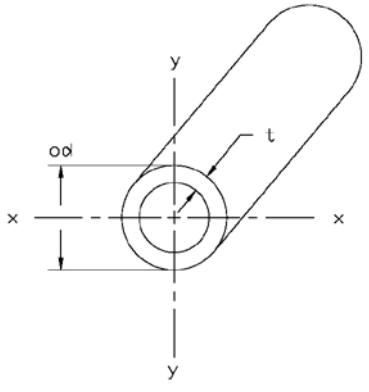
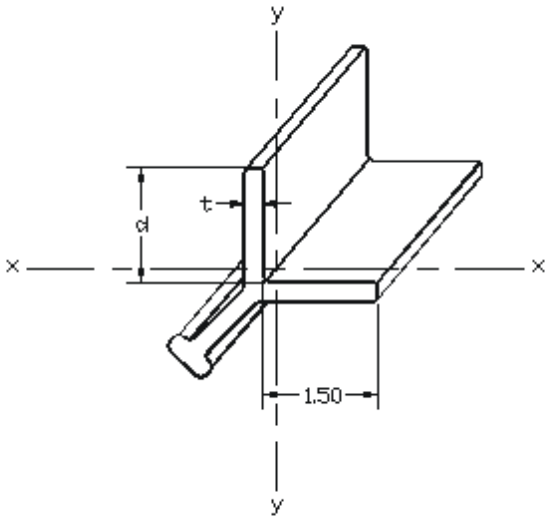
METRIC



EMBEDMENT ANGLE

SECTION DIMENSIONS				SECTION PROPERTIES					
				X - X			Y - Y		
d	t	A	Wt.	I	S	r	I	S	r
in. *mm.*	in. *mm.*	in^2 *$mm.^2$*	lb./ft. *kg./m*	$in.^4$ *$mm.^4$*	$in.^3$ *$mm.^3$*	in. *mm.*	$in.^4$ *$mm.^4$*	$in.^3$ *$mm.^3$*	in. *mm.*
1	1/4	1.08	.96	.28	.30	.51	.51	.33	.69
25.4	*6.4*	*696.8*	*1.43*	*116544*	*4916*	*12.9*	*212278*	*5407*	*17.5*
1 1/2	1/4	1.20	1.10	.51	.33	.65	.51	.33	.65
38.1	*6.4*	*774.2*	*1.64*	*212278*	*5407*	*16.5*	*212278*	*5407*	*16.5*
2	0.25	1.33	1.13	.88	.54	.81	.51	.33	.62
50.8	*6.4*	*858.1*	*1.68*	*366283*	*8849*	*20.6*	*212278*	*5407*	*15.7*

*ENGLISH/*METRIC*



BEAMS

BEAMS

Allowable Uniform Load Tables

Full section 3-point bending tests were conducted on Bedford Reinforced Plastics' H-Beams, I-Beams, Channels, and Square Tubes. The allowable uniform load tables were generated using these tests results as well as the formulas, properties, and assumptions listed below. Formulas for critical buckling and lateral-torsional buckling are developed from theory presented in Chapter 6 and 7 of the ASCE Structural Plastics Design Manual*.

Notation

A_w	area of web (in.^{2} / *mm.*^{2})
b	flange width (in. / *mm.*)
b_c	channel flange minus thickness (in. / *mm.*)
b_h	1/2 of flange width (in. / *mm.*)
d	depth of section (in. / *mm.*)
E	modulus of elasticity (lbs./in.^{2} /*GPa*)
f_b	actual flexural stress (lbs./in.^{2} / *MPa*)
F_b	maximum allowable flexural stress (lbs./in.^{2} /*MPa*)
F_{aCB}	maximum allowable buckling stress (lbs./in.^{2} / *MPa*)
F_{aLTB}	maximum allowable lateral-torsional buckling stress (lbs./in.^{2} / *MPa*)
f_v	actual shear stress (lbs./in.^{2} / *MPa*)
F_v	maximum allowable shear stress (lbs./in.^{2} / *MPa*)
G	shear modulus (lbs./in.^{2} / *GPa*)
I	moment of inertia (in.^{4} / *mm.*^{4})
J	torsion constant (in.^{4} / *mm.*^{4})
L	length of span (in. / *mm.*)
M	maximum moment (lbs.-in. / *N.-m.*)
S_x	section modulus (in.^{3} / *mm.*^{3})
t	flange thickness (in. / *mm.*)
V	vertical shear force (lbs. / *N.*)
w	uniform load (lbs./in. / *N/m.*)
v_L	poission's ratio (longitudinal)
v_r	poission's ratio (transverse)

Assumptions

Beam simply supported at both ends
Uniformly distributed load
Load is applied perpendicular to major axis
Part weight has been deducted in tables
Safety factor of 3.0 for both ultimate material flexural and shear stress and 2.5 for buckling stresses

* ASCE Manuals and Reports on Engineering Practice No. 63, Structural Plastics Design Manual Volumes 1 & 2, 1984

BEAMS

Properties / Allowables

$E = 2.8 \times 10^6$ lbs./in.^{2}
E = 19.3 GPa

$G = 450{,}000$ lbs./in.^{2}
G = 3.1 GPa

$F_b = 10{,}000$ lbs./in.^{2}
F_b = 68.9 MPa

$F_v = 1500$ lbs./in.^{2}
F_v = 10.3 MPa

Formulas

$$\Delta = \frac{5wL^4}{384EI} + \frac{wL^2}{8A_wG}$$

$$f_b = \frac{M}{S_x}$$

$$f_v = \frac{V}{A_w}$$

Allowable Critical Buckling Stress for laterally supported WF and I Beams

$$F_{aCB} = \frac{\pi^2}{b_h^{\,2}t}\left[.935\sqrt{\left(\frac{Et^3}{12\lambda}\right)\left(\frac{\nu_T Et^3}{12\lambda}\right)} - (.656)\left(\frac{\nu_T Et^3}{12\lambda}\right) + (2.082)\left(\frac{Gt^3}{12}\right)\right] / 2.5$$

$$\lambda = (1 - \nu_L \nu_T)$$

Allowable Lateral-Torsional Buckling Stress for laterally unsupported WF and I Beams

$$F_{aLTB} = \left[\frac{C\pi}{S(KL)}\sqrt{EI_yGJ + \frac{d^2\pi^2E^2I_y^{\,2}}{(4)(KL)^2}}\right] / 2.5$$

C = 1.13 and K = 1.0 for uniform load simple beam*

Allowable Critical Buckling Stress for Channels laterally supported to eliminate warping and twist

$$F_{aCB} = G(t/b_c)^2/2.5$$

Allowable Bending Stress for Square Tube (b/t <=16)

$F_b = 10{,}000$ psi.

* ASCE Manuals and Reports on Engineering Practice No. 63, Structural Plastics Design Manual Volumes 1 & 2, 1984

3 X 1 X 1/4 CHANNEL

76.2 x 25.4 x 6.4 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 0.625 in.^{2} / *403.2mm.^{2}*
I = 1.27 in.^{4} / *528614mm.^{4}*

Wt. = 0.79 lbs./ft. / *1.18kg/m.*
S = 0.85 in.^{3} / *13929mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
3 / *0.91*	624/*9110*	F_V	591/*8622*	394/*5744*	328/*4785*	246/*3586*	164/*2387*
4 / *1.22*	353/*5157*	F_b	267/*3901*	178/*2597*	148/*2162*	111/*1619*	74/*1075*
5 / *1.52*	226/*3296*	F_b	141/*2063*	94/*1371*	78/*1141*	58/*853*	39/*565*
6 / *1.83*	157/*2286*	F_b	83/*1213*	55/*805*	46/*669*	34/*498*	23/*328*
7 / *2.13*	115/*1676*	F_b	53/*769*	35/*509*	29/*422*	21/*314*	14/*205*
8 / *2.44*	88/*1281*	F_b	35/*515*	23/*340*	19/*281*	14/*208*	9/*135*
9 / *2.74*	69/*1009*	F_b	25/*360*	16/*236*	13/*195*	10/*143*	6/*92*
10 / *3.05*	56/*815*	F_b	18/*261*	12/*170*	10/*140*	7/*102*	4/*64*

The part weight has been deducted in the above table.

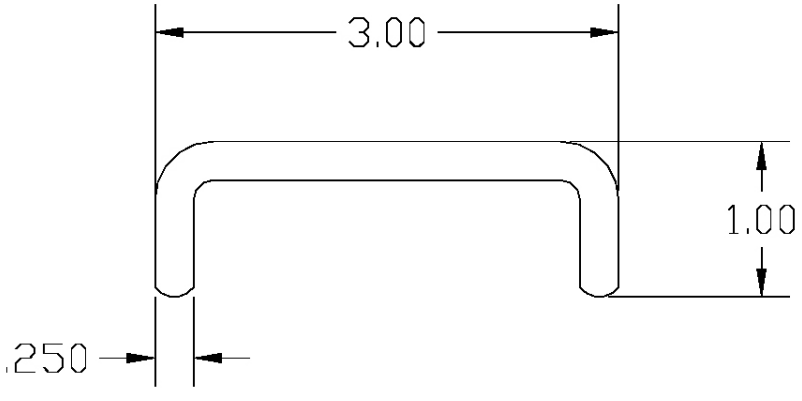
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 1,500 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



3 X 1 1/2 X 1/4 CHANNEL

76.2 x 38.1 x 6.4 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 0.625 in.^{2} / *403.2mm.^{2}*
I = 1.75 in.^{4} / *728405mm.^{4}*

Wt. = 1.01 lbs./ft. / *1.50kg/m.*
S = 1.16 in.^{3} / *19009mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
3 / *0.91*	617/*8999*	F_v	----/----	511/*7456*	425/*6208*	319/*4649*	212/*3090*
4 / *1.22*	346/*5049*	F_v	----/----	236/*3440*	196/*2862*	147/*2139*	97/*1416*
5 / *1.52*	221/*3221*	F_b	189/*2763*	126/*1832*	104/*1522*	78/*1134*	51/*746*
6 / *1.83*	153/*2228*	F_b	112/*1629*	74/*1077*	61/*892*	45/*662*	30/*432*
7 / *2.13*	112/*1629*	F_b	71/*1032*	46/*679*	38/*561*	28/*413*	18/*266*
8 / *2.44*	85/*1240*	F_b	47/*690*	31/*450*	25/*370*	19/*270*	12/*170*
9 / *2.74*	67/*974*	F_b	33/*479*	21/*310*	17/*253*	13/*183*	8/*112*
10 / *3.05*	54/*783*	F_b	24/*340*	15/*219*	12/*178*	9/*126*	5/*74*

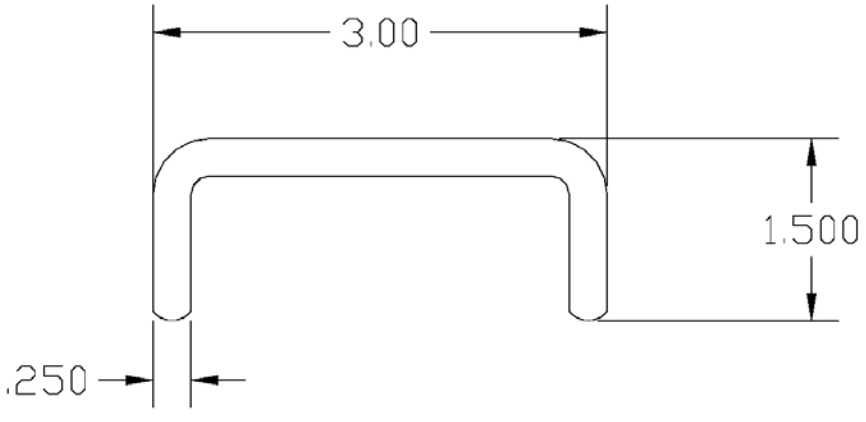
The part weight has been deducted in the above table. English/ *Metric*

This item is stocked in 20-foot lengths in Polyester Fire Retardant (FR).

Other lengths available in mill run quantities.

The mill run on this item is 1,200 feet.

Orders for less than mill run quantities will be subject to set up charges as well as premium per foot cost.



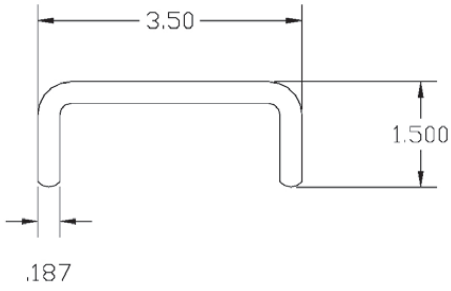
3 1/2 X 1 1/2 X 3/16 CHANNEL

88.9 x 38.1 x 4.8 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)

********Laterally Supported **********

A_w (in.^{2}/*mm.^{2}*)=0.54 / *348.3*
I(in.^{4}/*mm.^{4}*)=1.92 / *799164*
Wt.(lbs./*kg/m*)=0.86 / *1.28*
S(in.^{3} /*mm.^{3}*)=1.10 / *18026*



SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
3/*0.91*	298/*4353*	Fv	----/----	----/----	----/----	----/----	221/*3228*
4/*1.22*	167/*2442*	Fv	----/----	----/----	----/----	157/*2286*	104/*1519*
5/*1.52*	107/*1558*	Fb	----/----	----/----	----/----	84/*1233*	56/*817*
6/*1.83*	74/*1077*	Fb	----/----	----/----	67/*980*	50/*731*	33/*483*
7/*2.13*	54/*788*	Fb	----/----	52/*753*	43/*625*	32/*465*	21/*305*
8/*2.44*	41/*600*	Fb	----/----	35/*506*	29/*419*	21/*311*	14/*202*
9/*2.74*	32/*471*	Fb	----/----	24/*355*	20/*293*	15/*216*	10/*139*
10/*3.05*	26/*378*	Fb	----/----	18/*256*	14/*211*	11/*155*	7/*98*
11/*3.35*	21/*310*	Fb	20/*292*	13/*190*	11/*156*	8/*113*	5/*71*
12/*3.66*	18/*258*	Fb	15/*223*	10/*144*	8/*117*	6/*84*	4/*51*

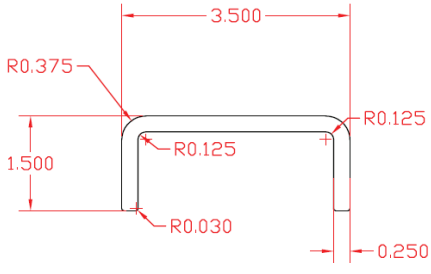
3 1/2 X 1 1/2 X 1/4 CHANNEL

88.9 x 38.1 x 6.35 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)

********Laterally Supported **********

A_w (in.^{2}/*mm.^{2}*)=0.75 / *483.8*
I(in.^{4}/*mm.^{4}*)=2.39 / *994793*
Wt.(lbs./*kg/m*)=1.17 / *1.74*
S(in.^{3} /*mm.^{3}*)=1.37 / *22450*



SPAN FT	MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
3	727	Fb	----	680	566	425	283
4	409	Fb	----	318	265	198	132
5	261	Fb	257	171	142	106	71
6	181	Fb	153	101	84	63	42
7	133	Fb	98	65	54	40	26
8	101	Fb	66	43	36	27	17
9	80	Fb	46	30	25	19	12

The part weight has been deducted in the above table.

4 X 1 1/8 X 1/4 CHANNEL

101.6 x 28.6 x 6.4 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 0.875 in.^{2} / *564.5mm^2*
I = 2.87 in.^{4} / *1194584mm.^{4}*

Wt. = 1.05 lbs./ft. / *1.56kg./m.*
S = 1.44 in.^{3} / *23597mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
3/*0.91*	874/*12755*	F_v	----/----	812/*11843*	676/*9867*	507/*7396*	338/*4926*
4/1.22	532/*7767*	F_b	----/----	381/*5553*	317/*4625*	237/*3465*	158/*2305*
5/1.52	340/*4965*	F_b	308/*4497*	205/2993	171/*2492*	128/*1865*	85/*1238*
6/1.83	236/*3444*	F_b	183/*2677*	122/1779	101/*1480*	76/*1106*	50/*733*
7/2.13	173/*2526*	F_b	117/*1712*	78/1136	65/*944*	48/*705*	32/*465*
8/2.44	132/*1930*	F_b	79/*1156*	52/766	44/*636*	32/*473*	21/*310*
9/2.74	104/*1522*	F_b	56/*815*	37/538	31/*446*	23/*331*	15/*215*
10/3.05	84/*1230*	F_b	41/*594*	27/*391*	22/*323*	16/*238*	11/*154*

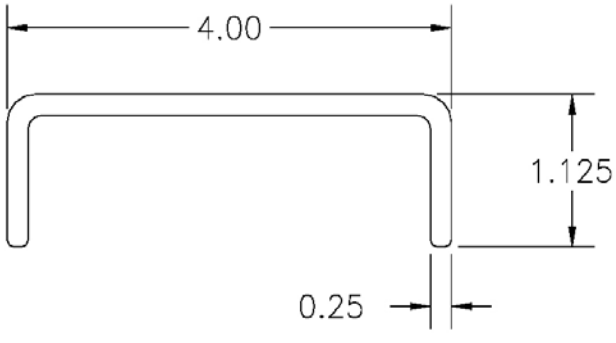
The part weight has been deducted in the above table. English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 1,200 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



4 X 1 3/8 X 3/16 CHANNEL

101.6 x 34.9 x 4.8 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 0.680 in.^{2} / *438.7mm^2*
I = 2.62 in.^{4} / *1090526mm.^{4}*

Wt. = 0.88 lbs./ft. / *1.31kg/m.*
S = 1.31 in.^{3} / *21467mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
3/*0.91*	435/*6343*	F_v	----/----	----/----	----/----	----/----	296/*4322*
4/*1.22*	244/*3562*	F_v	----/----	----/----	----/----	211/*3086*	141/*2053*
5/*1.52*	156/*2275*	F_b	----/----	----/----	153/*2237*	115/*1675*	76/*1112*
6/*1.83*	108/*1576*	F_b	----/----	----/----	92/*1336*	68/*999*	45/*662*
7/*2.13*	79/*1154*	F_b	----/----	71/*1029*	59/*855*	44/*638*	29/*421*
8/*2.44*	60/*881*	F_b	----/----	48/*695*	40/*577*	29/*430*	19/*282*
9/*2.74*	48/*693*	F_b	----/----	34/*490*	28/*406*	21/*301*	13/*196*
10/*3.05*	38/*559*	F_b	37/*540*	24/*356*	20/*295*	15/*218*	10/*141*

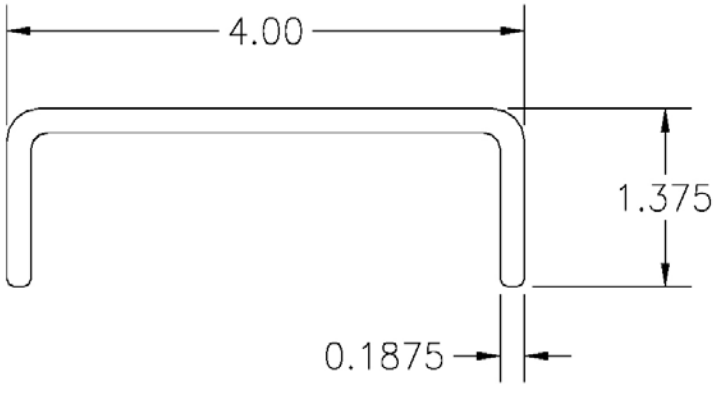
The part weight has been deducted in the above table. English/ *Metric*

This item is stocked in 20-foot lengths in Standard Polyester (ST) and Polyester Fire Retardant (FR).

Other lengths available in mill run quantities.

The mill run on this item is 1,000 feet.

Orders for less than mill run quantities will be subject to set up charges as well as premium per foot cost.



5 1/2 X 1 1/2 X 1/4 CHANNEL

139.7 x 38.1 x 6.4 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)

Major Axis

********Laterally Supported **********

A_w(in.^{2} / *mm.^{2}*)=1.3125 / *846.7*

I(in.^{4} / *mm.^{4}*)=7.38 / *3071788*

Wt.(lbs. / *kg/m*)=1.49 / *2.22*

S(in.^{3} /*mm.^{3}*)=2.684 / *43917.00*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
3/*0.91*	1311/*19127*	Fv	----/----	----/----	----/----	1118/*16318*	745/*10869*
4/*1.22*	803/*11722*	Fv	----/----	----/----	739/*10781*	554/*8078*	368/*5376*
5/*1.52*	513/*7491*	Fb	----/----	493/*7200*	411/*5995*	308/*4489*	204/*2983*
6/*1.83*	356/*5193*	Fb	----/----	299/*4365*	249/*3633*	186/*2717*	123/*1802*
7/*2.13*	261/*3808*	Fb	----/----	194/*2825*	161/*2349*	120/*1755*	79/*1160*
8/*2.44*	199/*2908*	Fb	199/*2899*	132/*1923*	109/*1597*	82/*1191*	54/*784*
9/*2.74*	157/*2292*	Fb	141/*2057*	93/*1362*	77/*1130*	58/*840*	38/*550*
10/*3.05*	127/*1851*	Fb	103/*1507*	68/*995*	56/*825*	42/*611*	27/*398*
11/*3.35*	104/*1525*	Fb	78/*1134*	51/*746*	42/*617*	31/*456*	20/*294*
12/*3.66*	87/*1276*	Fb	60/*872*	39/*572*	32/*472*	24/*346*	15/*221*
13/*3.96*	74/*1083*	Fb	47/*683*	31/*446*	25/*367*	18/*268*	12/*169*
14/*4.27*	64/*930*	Fb	37/*543*	24/*352*	20/*289*	14/*209*	9/*130*
15/*4.57*	55/*806*	Fb	30/*438*	19/*282*	16/*230*	11/*165*	7/*100*

Minor Axis

********Laterally Supported **********

A_w(in.^{2} / *mm.^{2}*)=0.56 / *361.2*

I(in.^{4} / *mm.^{4}*)= 0.32 / *133194*

Wt.(lbs. / *kg/m*)=1.49 / *2.22*

S(in.^{3} / *mm.^{3}*)=0.287 / *4752.00*

SPAN FT/m	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
3/*0.91*	211/*3073*	Fb	166/*2425*	110/*1607*	91/*1334*	68/*993*	45/*652*
4/*1.22*	118/*1716*	Fb	71/*1029*	46/*676*	38/*559*	28/*412*	18/*265*
5/*1.52*	75/*1088*	Fb	36/*518*	23/*336*	19/*275*	14/*199*	8/*123*
6/*1.83*	51/*746*	Fb	20/*289*	13/*183*	10/*148*	7/*104*	4/*59*

The part weight has been deducted in the above tables.

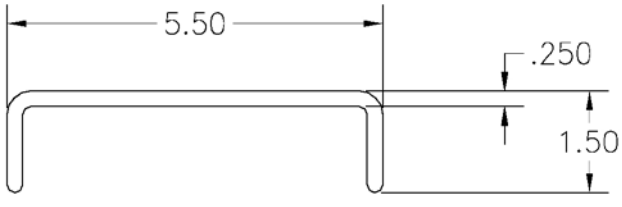
English/ *Metric*

This item is stocked in 20-foot lengths in Standard Polyester (STD) and Polyester Fire Retardant (FR).

Other lengths available in mill run quantities.

The mill run on this item is 1,000 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



6 X 1 5/8 X 1/4 CHANNEL

152.4 x 41.3 x 6.4 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 1.375 in.^{2} / *887.1mm.^{2}*
I = 10.18 in.^{4} / *4237236mm^4*

Wt. = 1.67 lbs./ft. / *2.49kg/m.*
S = 3.39 in.^{3} / *5552mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
5/*1.52*	536/*7820*	F_v	----/----	----/----	----/----	405/*5908*	269/*3929*
6/*1.83*	371/*5422*	F_b	----/----	----/----	332/*4845*	249/*3627*	165/*2408*
7/*2.13*	272/*3976*	F_b	----/----	261/*3803*	217/*3164*	162/*2366*	107/*1567*
8/*2.44*	208/*3037*	F_b	----/----	179/*2607*	149/*2167*	111/*1618*	73/*1069*
9/*2.74*	164/*2394*	F_b	----/----	127/*1857*	106/*1542*	79/*1149*	52/*757*
10/*3.05*	132/*1933*	F_b	----/----	93/*1364*	78/*1132*	58/*842*	38/*551*
11/*3.35*	109/*1593*	F_b	107/*1557*	70/*1028*	58/*852*	43/*632*	28/*411*
12/*3.66*	91/*1334*	F_b	82/*1202*	54/*792*	45/*655*	33/*484*	21/*313*
13/*3.96*	78/*1132*	F_b	65/*945*	43/*620*	35/*512*	26/*377*	17/*241*
14/*4.27*	67/*972*	F_b	52/*755*	34/*493*	28/*406*	20/*297*	13/*189*
15/*4.57*	58/*843*	F_b	42/*611*	27/*397*	22/*326*	16/*237*	10/*149*

The part weight has been deducted in the above table.

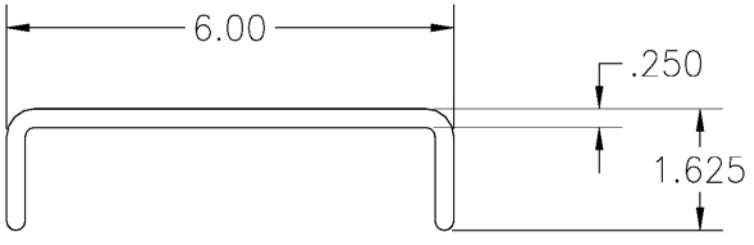
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 1,000 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



6 X 1 11/16 X 3/8 CHANNEL

152.4 x 42.9 x 9.5 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 1.969 in.^{2} / *1270.3mm.^{2}*
I = 14.55 in.^{4} / *6056167mm.^{4}*

Wt. = 2.39 lbs./ft. / *3.87kg/m.*
S = 4.85 in.^{3} / *79477mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
5/*1.52*	1178/*17199*	F_v	----/----	928/*13538*	773/*11274*	579/*8445*	385/*5615*
6/*1.83*	895/*13063*	F_b	857/*12500*	570/*8319*	475/*6925*	355/*5183*	236/*3441*
7/*2.13*	657/*9586*	F_b	560/*8173*	372/*5434*	310/*4521*	232/*3380*	153/*2239*
8/*2.44*	502/*7329*	F_b	384/*5608*	255/*3724*	212/*3096*	158/*2311*	105/*1526*
9/*2.74*	396/*5782*	F_b	274/*4000*	182/*2652*	151/*2203*	112/*1641*	74/*1079*
10/*3.05*	320/*4675*	F_b	202/*2944*	133/*1948*	111/*1616*	82/*1201*	54/*786*
11/*3.35*	264/*3856*	F_b	152/*2224*	101/*1468*	83/*1216*	62/*901*	40/*586*
12/*3.66*	222/*3233*	F_b	118/*1716*	77/*1130*	64/*934*	47/*690*	31/*445*
13/*3.96*	188/*2748*	F_b	92/*1349*	61/*885*	50/*730*	37/*537*	24/*343*
14/*4.27*	162/*2364*	F_b	74/*1077*	48/*703*	40/*579*	29/*423*	18/*267*
15/*4.57*	141/*2053*	F_b	60/*871*	39/*566*	32/*464*	23/*337*	14/*210*

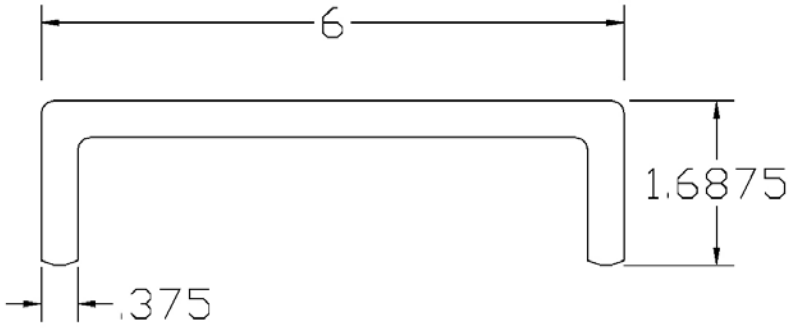
The part weight has been deducted in the above table. English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 800 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



8 X 2 3/16 X 3/8 CHANNEL

203.2 x 55.6 x 9.5 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 2.719 in.^{2} / *1754mm.^{2}*
I = 35.77 in.^{4} / *14888598mm.^{4}*

Wt. = 3.20 lbs./ft. / *4.76kg/m.*
S = 8.94 in.^{3} / *146500mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
5/*1.52*	1627/*23752*	F_v	----/----	----/----	----/----	1235/*18030*	822/*12001*
6/*1.83*	1271/*18545*	F_v	----/----	1261/*18405*	1050/*15327*	787/*11481*	523/*7634*
7/*2.13*	932/*13610*	F_v	----/----	845/*12333*	704/*10268*	527/*7686*	350/*5105*
8/*2.44*	713/*10406*	F_b	----/----	590/*8613*	491/*7168*	367/*5361*	244/*3555*
9/*2.74*	563/*8210*	F_b	----/----	426/*6224*	355/*5177*	265/*3868*	175/*2559*
10/*3.05*	455/*6639*	F_b	----/----	317/*4627*	264/*3846*	197/*2870*	130/*1894*
11/*3.35*	375/*5477*	F_b	364/*5314*	241/*3523*	201/*2926*	149/*2180*	98/*1434*
12/*3.66*	315/*4593*	F_b	283/*4135*	188/*2737*	156/*2271*	116/*1689*	76/*1106*
13/*3.96*	268/*3905*	F_b	224/*3275*	148/*2164*	123/*1793*	91/*1330*	59/*867*
14/*4.27*	230/*3359*	F_b	180/*2633*	119/*1736*	98/*1437*	73/*1063*	47/*689*
15/*4.57*	200/*2918*	F_b	147/*2145*	97/*1410*	80/*1165*	59/*860*	38/*554*
16/*4.88*	175/*2558*	F_b	121/*1767*	79/*1159*	65/*956*	48/*702*	31/*449*
17/*5.18*	155/*2259*	F_b	101/*1471*	66/*961*	54/*791*	40/*579*	25/*366*
18/*5.49*	138/*2009*	F_b	85/*1235*	55/*804*	45/*660*	33/*480*	21/*301*
19/*5.79*	123/*1797*	F_b	72/*1045*	46/*677*	38/*555*	27/*401*	17/*248*
20/*6.10*	111/*1616*	F_b	61/*890*	39/*574*	32/*469*	23/*337*	14/*205*

The part weight has been deducted in the above table.

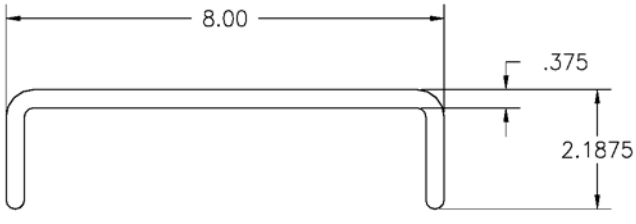
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 800 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



10 X 2 3/4 X 1/2 CHANNEL

254.0 x 69.9 x 12.7 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 4.50 in.^{2} / *2903.2mm.^{2}*
I = 92.49 in.^{4} / *38497245mm.^{4}*

Wt. = 5.30 lbs./ft. / *7.89kg/m.*
S = 18.50 in.^{3} / *303161mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
6/*1.83*	1869/*27278*	F_v	----/----	----/----	----/----	1802/*26298*	1199/*17503*
7/*2.13*	1601/*23369*	F_v	----/----	----/----	----/----	1239/*18077*	824/*12022*
8/*2.44*	1400/*20437*	F_v	----/----	----/----	1177/*17183*	882/*12865*	586/*8548*
9/*2.74*	1244/*18156*	F_v	----/----	1037/*15140*	864/*12602*	646/*9430*	429/*6257*
10/*3.05*	1090/*15910*	F_b	----/----	781/*11393*	650/*9479*	486/*7088*	322/*4696*
11/*3.35*	900/*13133*	F_b	----/----	600/*8762*	499/*7287*	373/*5443*	247/*3600*
12/*3.66*	755/*11022*	F_b	709/*10347*	470/*6866*	391/*5707*	292/*4258*	193/*2810*
13/*3.96*	643/*9378*	F_b	565/*8246*	375/*5468*	311/*4542*	232/*3385*	153/*2227*
14/*4.27*	553/*8074*	F_b	457/*6670*	303/*4418*	251/*3667*	187/*2728*	123/*1790*
15/*4.57*	481/*7022*	F_b	374/*5464*	248/*3614*	205/*2997*	153/*2226*	100/*1455*
16/*4.88*	422/*6161*	F_b	310/*4526*	205/*2988*	170/*2476*	126/*1835*	82/*1194*
17/*5.18*	373/*5448*	F_b	259/*3787*	171/*2495*	141/*2065*	105/*1527*	68/*989*
18/*5.49*	332/*4850*	F_b	219/*3196*	144/*2101*	119/*1737*	88/*1281*	56/*825*
19/*5.79*	298/*4344*	F_b	186/*2719*	122/*1783*	101/*1471*	74/*1082*	47/*692*
20/*6.10*	268/*3912*	F_b	160/*2329*	104/*1523*	86/*1255*	63/*919*	40/*584*
21/6.40	243/*3540*	F_b	138/*2008*	90/*1309*	74/*1077*	54/*786*	34/*495*
22/6.71	220/*3218*	F_b	119/*1741*	78/*1132*	64/*928*	46/*674*	29/*420*
23/7.01	201/*2936*	F_b	104/*1517*	67/*982*	55/*804*	40/*581*	25/*358*
24/7.32	184/*2690*	F_b	91/*1329*	59/*857*	48/*699*	34/*503*	21/*306*
25/7.62	169/*2472*	F_b	80/*1168*	51/*750*	42/*610*	30/*436*	18/*261*

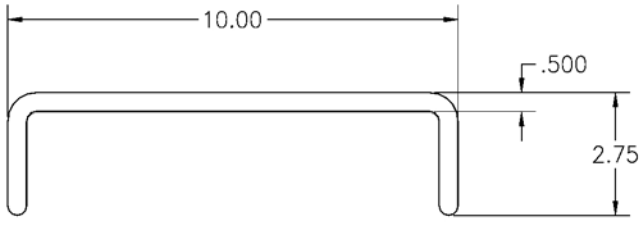
The part weight has been deducted in the above table. English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 800 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



11 1/2 X 2 3/4 X 1/2 CHANNEL

292.1 x 69.9 x 12.7 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 5.25 in.^{2} / *3387.1mm.^{2}*
I = 124.6 in.^{4} / *51862436mm.^{4}*

Wt. = 6.07 lbs./ft. / *9.04kg/m.*
S = 21.67 in.^{3} / *315007mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
6/*1.83*	2618/*31822*	F_v	----/----	----/----	----/----	----/----	1540/*22472*
7/*2.13*	1868/*27261*	F_v	----/----	----/----	----/----	1605/*23429*	1068/*15585*
8/*2.44*	1634/*23841*	F_v	----/----	----/----	1537/*22430*	1151/*16797*	765/*11164*
9/*2.74*	1451/*21181*	F_v	----/----	1362/*19875*	1134/*16545*	849/*12383*	563/*8222*
10/*3.05*	1277/*18635*	F_b	----/----	1029/*15023*	857/*12502*	641/*9351*	425/*6200*
11/*3.35*	1054/*15383*	F_b	----/----	795/*11596*	661/*9646*	494/*7209*	327/*4772*
12/*3.66*	885/*12910*	F_b	----/----	625/*9114*	519/*7578*	388/*5658*	256/*3738*
13/*3.96*	753/*10985*	F_b	752/*10968*	499/*7278*	414/*6048*	309/*4510*	204/*2973*
14/*4.27*	648/*9458*	F_b	609/*8891*	404/*5893*	335/*4894*	250/*3645*	164/*2396*
15/*4.57*	564/*8225*	F_b	500/*7296*	331/*4830*	275/*4008*	204/*2981*	134/*1953*
16/*4.88*	495/*7217*	F_b	415/*6054*	274/*4002*	227/*3318*	169/*2463*	110/*1608*
17/*5.18*	437/*6381*	F_b	348/*5072*	229/*3348*	190/*2773*	141/*2054*	91/*1335*
18/*5.49*	389/*5681*	F_b	294/*4287*	194/*2824*	160/*2336*	118/*1727*	77/*1117*
19/*5.79*	349/*5088*	F_b	250/*3652*	164/*2401*	136/*1984*	100/*1462*	64/*941*
20/*6.10*	314/*4582*	F_b	215/*3133*	141/*2055*	116/*1695*	85/*1246*	55/*796*
21/6.40	284/*4147*	F_b	185/*2705*	121/*1769*	100/*1457*	73/*1067*	46/*678*
22/6.71	258/*3769*	F_b	161/*2348*	105/*1532*	86/*1259*	63/*919*	40/*579*
23/7.01	236/*3440*	F_b	140/*2050*	91/*1332*	75/*1093*	54/*794*	34/*496*
24/7.32	216/*3151*	F_b	123/*1797*	80/*1164*	65/*953*	47/*689*	29/*425*
25/7.62	198/*2896*	F_b	108/*1583*	70/*1021*	57/*834*	41/*600*	25/*366*

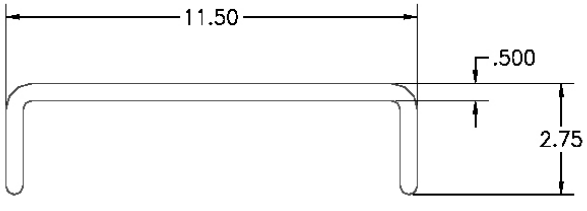
The part weight has been deducted in the above table.

English/*Metric*

At the time of this printing, this was a non-stocked part.

The mill run on this item is 600 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



12 X 3 X 1/2 CHANNEL

304.8 x 76.2 x 12.7 CHANNEL

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 5.5 in.^{2} / *3548.4mm.^{2}*
I = 143.5 in.^{4} / *59729209mm.^{4}*

Wt. = 6.50 lbs./ft. /*9.68kg/m.*
S = 23.90 in.^{3} / *391651mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
6/*1.83*	2285/*33342*	F_v	----/----	----/----	----/----	----/----	1714/*25014*
7/*2.13*	1957/*28564*	F_v	----/----	----/----	----/----	1799/*26248*	1197/*17465*
8/*2.44*	1712/*24981*	F_v	----/----	----/----	----/----	1296/*18916*	862/*12577*
9/*2.74*	1409/*20565*	F_v	----/----	----/----	1282/*18705*	960/*14003*	637/*9301*
10/*3.05*	1140/*16638*	F_v	----/----	----/----	972/*14181*	727/*10610*	482/*7039*
11/*3.35*	941/*13733*	F_v	----/----	903/*13185*	752/*10971*	562/*8202*	372/*5434*
12/*3.66*	790/*11523*	F_b	----/----	712/*10387*	592/*8639*	442/*6453*	292/*4268*
13/*3.96*	672/*9803*	F_b	----/----	569/*8310*	473/*6908*	353/*5156*	233/*3403*
14/*4.27*	578/*8439*	F_b	----/----	462/*6740*	384/*5600*	286/*4174*	188/*2749*
15/*4.57*	503/*7338*	F_b	----/----	379/*5533*	315/*4594*	234/*3420*	154/*2246*
16/*4.88*	441/*6437*	F_b	----/----	315/*4591*	261/*3809*	194/*2831*	127/*1853*
17/*5.18*	390/*5690*	F_b	----/----	264/*3846*	218/*3188*	162/*2365*	106/*1543*
18/*5.49*	347/*5065*	F_b	337/*4924*	223/*3249*	184/*2690*	137/*1992*	89/*1294*
19/*5.79*	311/*4535*	F_b	288/*4199*	190/*2766*	157/*2288*	116/*1690*	75/*1093*
20/*6.10*	280/*4083*	F_b	247/*3606*	162/*2370*	134/*1958*	99/*1443*	64/*928*

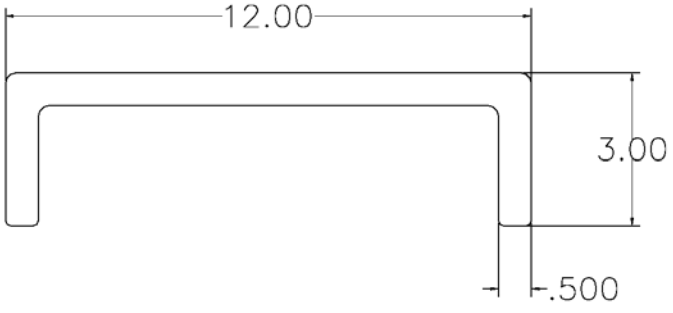
The part weight has been deducted in the above table.

English/ *Metric*

At the time of this printing, this was a non-stocked item.

The mill run on this item is 600 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



3 X 1 1/2 X 1/4 I-BEAM

76.2 x 38.1 x 6.41 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 0.63 in.^{2} / *403.2mm.^{2}*
I = 1.75 in.^{4} / *728405mm.^{4}*

Wt. = 1.10 lbs./ft. /*1.64kg/m.*
S = 1.17 in.^{3} / *19173mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT MAX. LOAD	LATERALLY SUPPORTED MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
4/*1.22*	102/*1488*	468/*6825*	F_v	355/*5188*	237/*3453*	197/*2875*	147/*2152*	98/*1429*
5/*1.52*	50/*724*	311/*4537*	F_b	190/*2776*	126/*1845*	105/*1535*	79/*1147*	52/*759*
6/*1.83*	28/*403*	216/*3146*	F_b	113/*1643*	75/*1090*	62/*905*	46/*675*	30/*445*
7/*2.13*	17/*244*	158/*2307*	F_b	72/*1046*	47/*692*	39/*574*	29/*426*	19/*279*
8/*2.44*	11/*156*	121/*1762*	F_b	48/*703*	32/*463*	26/*383*	19/*283*	13/*184*
9/*2.74*	7/*104*	95/*1389*	F_b	34/*493*	22/*323*	18/*266*	13/*196*	9/*125*
10/*3.05*	5/*71*	77/*1122*	F_b	24/*357*	16/*232*	13/*191*	10/*139*	6/*87*

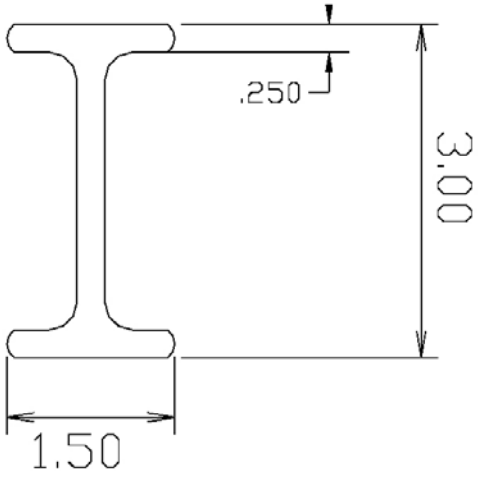
The part weight has been deducted in the above table.

English/ *Metric*

At the time of this printing, this was a non-stocked item.

The mill run on this item is 1,400 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



3 1/2 X 1 1/2 X 3/16 I-BEAM

88.9 x 38.1 x 4.7

ALLOWABLE UNIFORM LOADS (lbs./ft. / N/m.)

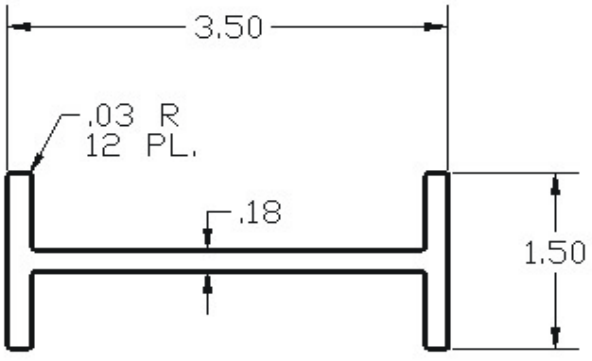
A_w (in.2 / *mm.*^{2}) = 0.585 / *377.4*
I (in.4 / *mm.*^{4}) = 2.01 / *836625*

Wt. (lbs. / *kg.m.*) = 0.88 / *1.31*
S (in.3 / *mm.*^{3}) = 1.15 / *18845*

SPAN FEET/ *METERS*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
	MAXIMUM LOAD	MAXIMUM LOAD		DEFLECTION				
				L/100	L/150	L/180	L/240	L/360
4/*1.22*	84/*984*	430/*6388*	Fb	397/*5795*	264/*3858*	220/*3213*	165/*2406*	110/*1599*
5/*1.52*	40/*461*	275/*4460*	Fb	215/*3131*	143/*2083*	119/*1733*	89/*1296*	59/*859*
6/*1.83*	22/*249*	191/*3093*	Fb	128/*1865*	85/*1238*	71/*1029*	53/*768*	35/*507*
7/*2.13*	13/146	140/*2269*	Fb	82/*1192*	54/*790*	45/*656*	33/*488*	22/*321*
8/*2.44*	8/*91*	107/*1733*	Fb	55/*804*	36/*531*	30/*440*	22/*327*	15/*213*
9/*2.74*	5/*59*	84/*1367*	Fb	39/*566*	26/*372*	21/*308*	16/*227*	10/*147*
10/*3.05*	4/*38*	68/*1104*	Fb	28/*411*	18/*269*	15/*222*	11/*163*	7/104

The part weight has been deducted in the above table.

This item is stocked in 20-foot lengths in Polyester Fire Retardant (FR).
Other lengths available in mill run quantities.
The mill run on this item is 1000 feet.
Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



4 X 2 X 1/4 I-BEAM

101.6 x 50.8 x 6.4 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 0.875 in.^{2} / *564.5mm.^{2}*
I = 4.41 in.^{4} / *1835581mm.^{4}*

Wt. = 1.50 lbs./ft. / *2.23kg/m.*
S = 2.21 in.^{3} / *36215mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
	MAX. LOAD	MAXIMUM LOAD		DEFLECTION				
				L/100	L/150	L/180	L/240	L/360
4/*1.22*	224/*3265*	655/*9555*	F_v	----/----	542/*7915*	452/*6592*	338/*4939*	225/*3285*
5/*1.52*	104/*1514*	524/*7640*	F_v	450/*6565*	299/*4369*	249/*3638*	187/*2723*	124/*1808*
6/*1.83*	56/*817*	408/*5950*	F_b	272/*3965*	181/*2636*	150/*2193*	112/*1639*	74/*1085*
7/*2.13*	33/*486*	299/*4366*	F_b	175/*2560*	116/*1699*	97/*1412*	72/*1054*	48/*695*
8/*2.44*	21/*310*	229/*3337*	F_b	119/*1740*	79/*1153*	66/*957*	49/*712*	32/*468*
9/*2.74*	14/*207*	180/*2632*	F_b	84/*1232*	56/*814*	46/*675*	34/*500*	22/*326*
10/*3.05*	10/*142*	146/*2128*	F_b	62/*901*	41/*593*	34/*491*	25/*362*	16/*234*
11/*3.35*	7/*100*	120/*1755*	F_b	46/*676*	30/*443*	25/*366*	18/*269*	12/*172*
12/*3.66*	5/*71*	101/*1471*	F_b	36/*519*	23/*338*	19/*278*	14/*203*	9/*128*

The part weight has been deducted in the above table.

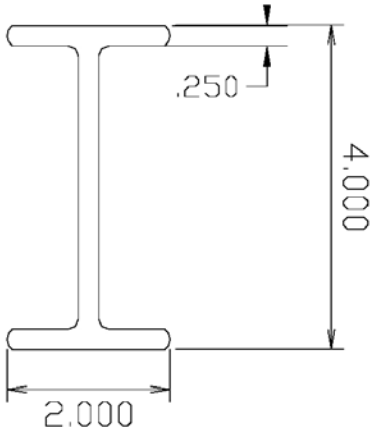
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 1,000 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



5 1/2 X 2 1/2 X 1/4 I-BEAM

139.7 x 63.5 x 6.4

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)

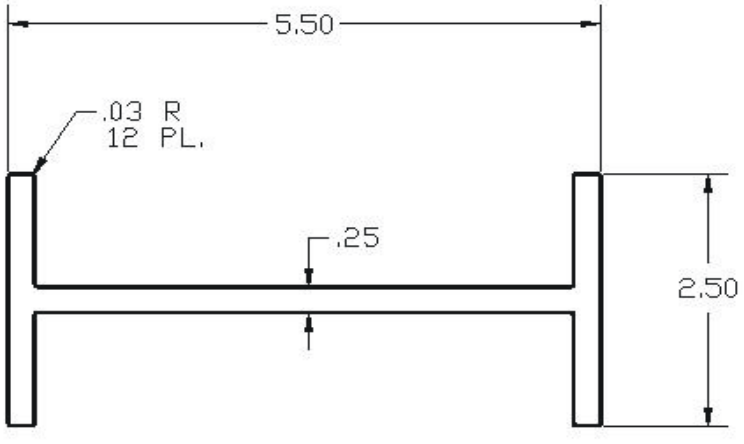
A_w (in.2 / *mm.*^{2}) = 1.25 / *806*
I (in.4 / *mm.*^{4}) = 11.21 / *4665954*

Wt. (lbs. / *kg.m.*) = 1.92 / *2.86*
S (in.3 / *mm.*^{3}) = 4.08 / *66859.00*

SPAN FEET/ *METERS*	NO LATERAL SUPPORT MAXIMUM LOAD	LATERALLY SUPPORTED MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
4/*1.22*	482/*7034*	936/*13654*	Fv	----/----	----/----	----/----	742/*10829*	494/*7210*
5/*1.52*	265/*3874*	748/*10917*	Fv	----/----	686/*10013*	571/*8340*	428/*6248*	285/*4156*
6/*1.83*	138/*2010*	623/*9093*	Fv	----/----	426/*6221*	355/*5179*	266/*3878*	176/*2576*
7/*2.13*	80/*1164*	498/*7262*	Fb	422/*6156*	281/*4094*	*233/ 3407*	175/*2549*	116/*1690*
8/*2.44*	50/*728*	381/*5554*	Fb	291/*4247*	193/*2822*	161/*2347*	120/*1753*	79/*1159*
9/*2.74*	33/*482*	300/*4382*	Fb	208/*3041*	138/*2018*	115/*1677*	86/*1251*	57/*825*
10/*3.05*	23/*332*	243/*3544*	Fb	154/*2246*	102/*1488*	85/*1235*	63/*919*	41/*604*
11/*3.35*	16/*236*	200/*2924*	Fb	117/*1701*	77/*1125*	64/*933*	47/*692*	31/*452*
12/*3.66*	12/*171*	168/*2453*	Fb	90/*1316*	59/*868*	49/*719*	36/*532*	24/*345*
13/*3.96*	9/*126*	143/*2086*	Fb	71/*1037*	47/*682*	39/*564*	28/*416*	18/*268*
14/*4.27*	6/*94*	123/*1795*	Fb	57/*830*	37/*544*	31/*449*	23/*329*	14/*210*
15/*4.57*	5/*70*	107/*1560*	Fb	46/*673*	30/*439*	25/*361*	18/*264*	11/*167*

The part weight has been deducted in the above table.

This item is stocked in 20-foot lengths in Polyester Fire Retardant (FR).
Other lengths available in mill run quantities.
The mill run on this item is 1000 feet.
Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



6 X 3 X 1/4 I-BEAM

152.4 x 76.2 x 6.4 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 1.375 in.^{2} / *887.1mm.^{2}*
I = 15.87 in.^{4} / *7071772mm.^{4}*

Wt. = 2.20 lbs./ft. / *3.27kg/m.*
S = 5.29 in.^{3} / *92751mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
		MAXIMUM LOAD		DEFLECTION				
	MAX. LOAD			L/100	L/150	L/180	L/240	L/360
5/*1.52*	364/*5307*	823/*12008*	F_v	----/----	----/----	759/*11083*	569/*8304*	379/*5525*
6/*1.83*	184/*2689*	685/*10001*	F_v	----/----	576/*8400*	479/*6995*	359/*5238*	239/*3481*
7/*2.13*	104/*1524*	587/*8568*	F_v	576/*8403*	383/*5591*	319/*4654*	239/*3483*	158/*2311*
8/*2.44*	64/*936*	513/*7493*	F_v	400/*5844*	266/*3885*	221/*3232*	166/*2416*	110/*1600*
9/*2.74*	42/*610*	433/*6321*	F_v	289/*4211*	192/*2796*	159/*2325*	119/*1736*	79/*1146*
10/*3.05*	28/*415*	350/*5114*	F_b	214/*3124*	142/*2072*	118/*1721*	88/*1283*	58/*845*
11/*3.35*	20/*292*	289/*4221*	F_b	163/*2376*	108/*1573*	89/*1306*	67/*971*	44/*637*
12/*3.66*	14/*210*	243/*3542*	F_b	126/*1845*	84/*1219*	69/*1011*	51/*750*	34/*489*
13/*3.96*	11/*154*	206/*3013*	F_b	100/*1458*	66/*961*	55/*796*	40/*589*	26/*382*
14/*4.27*	8/*114*	178/*2594*	F_b	80/*1170*	53/*769*	44/*636*	32/*469*	21/*302*
15/*4.57*	6/*84*	155/*2255*	F_b	65/*951*	43/*623*	35/*514*	26/*377*	17/*241*

The part weight has been deducted in the above table.

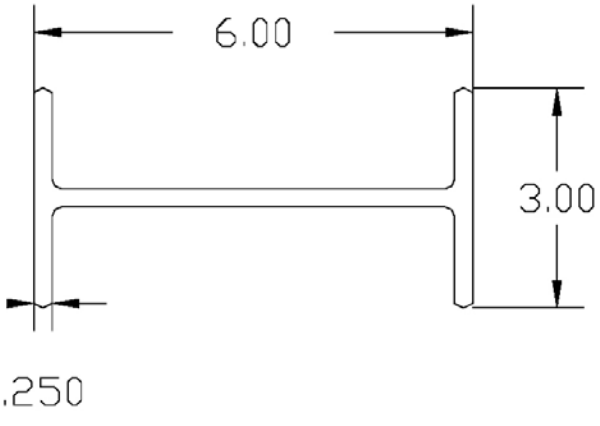
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 800 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



6 X 3 X 3/8 I-BEAM

152.4 x 76.2 x 9.5 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 1.969 in.^{2} / *1270mm.^{2}*
I = 22.35 in.^{4} / *9302772mm.^{4}*

Wt. = 3.20 lbs./ft./*4.76kg/m.*
S = 7.45 in.^{3} / *122084mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT MAX. LOAD	LATERALLY SUPPORTED MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
5/*1.52*	634/*9256*	1178/*17195*	F_v	----/----	----/----	1074/*15678*	805/*11747*	536/*7816*
6/*1.83*	333/*4860*	981/*14321*	F_v	----/----	813/*11870*	677/*9884*	507/*7401*	337/*4918*
7/*2.13*	195/*2847*	841/*12268*	F_v	813/*11865*	541/*7894*	450/*6571*	337/*4916*	224/*3262*
8/*2.44*	123/*1801*	735/*10729*	F_v	565/*8246*	376/*5482*	313/*4561*	234/*3409*	155/*2257*
9/*2.74*	83/*1206*	610/*8901*	F_b	407/*5939*	270/*3944*	225/*3279*	168/*2447*	111/*1616*
10/*3.05*	58/*842*	493/*7201*	F_b	302/*4405*	200/*2921*	166/*2426*	124/*1808*	82/*1190*
11/*3.35*	42/*607*	407/*5943*	F_b	229/*3349*	152/*2217*	126/*1840*	94/*1368*	61/*896*
12/*3.66*	31/*449*	342/*4986*	F_b	178/*2599*	118/*1717*	98/*1423*	72/*1056*	47/*688*
13/*3.96*	23/*338*	291/*4242*	F_b	141/*2053*	93/*1353*	77/*1120*	57/*828*	37/*537*
14/*4.27*	18/*258*	250/*3651*	F_b	113/*1647*	74/*1082*	61/*894*	45/*659*	29/*424*
15/*4.57*	14/*199*	218/*3174*	F_b	92/*1339*	60/*877*	50/*723*	36/*530*	23/*338*
16/*4.88*	11/*154*	191/*2784*	F_b	75/*1100*	49/*718*	40/*591*	30/*431*	19/*272*
17/*5.18*	8/*120*	169/*2461*	F_b	63/*913*	41/*593*	33/*487*	24/*353*	15/*220*
18/*5.49*	6/*93*	150/*2190*	F_b	52/*765*	34/*494*	28/*404*	20/*291*	12/*179*

The part weight has been deducted in the above table.

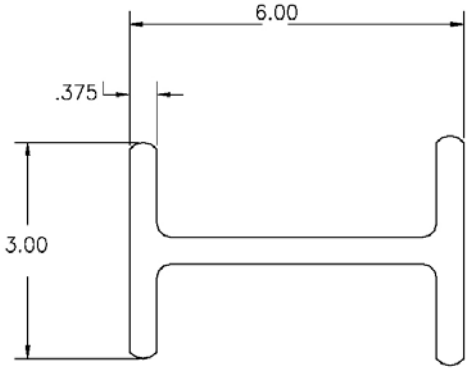
English/ *Metric*

This item is stocked in 20-foot lengths in Polyester Fire Retardant (FR) and Vinylester Fire Retardant (VE).

Other lengths available in mill run quantities.

The mill run on this item is 800 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



8 X 4 X 3/8 I-BEAM

203.2 x 101.6 x 9.5 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 2.719 in.^{2} / *1754mm.^{2}*
I = 55.55 in.^{4} / *23121656mm.^{4}*

Wt. = 4.30 lbs./ft. / *6.4kg/m.*
S = 13.89 in.^{3} / *227616mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT MAX. LOAD	LATERALLY SUPPORTED MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
4/*1.22*	2035/*29698*	2035/*29698*	F_v	----/----	----/----	----/----	----/----	1744/*25452*
5/*1.52*	1627/*23746*	1627/*23746*	F_v	----/----	----/----	----/----	----/----	1094/*15970*
6/*1.83*	837/*12217*	1355/*19778*	F_v	----/----	----/----	----/----	1084/*15815*	721/*10522*
7/*2.13*	471/*6880*	1161/*16943*	F_v	----/----	----/----	994/*14506*	744/*10864*	495/*7222*
8/*2.44*	288/*4210*	1015/*14818*	F_v	----/----	850/*12400*	707/*10323*	529/*7727*	352/*5130*
9/*2.74*	188/*2741*	902/*13164*	F_v	----/----	623/*9093*	518/*7567*	388/*5659*	257/*3752*
10/*3.05*	128/*1872*	811/*11841*	F_v	705/*10289*	469/*6838*	390/*5688*	291/*4250*	193/*2813*
11/*3.35*	91/*1327*	737/*10759*	F_v	542/*7915*	360/*5256*	299/*4370*	223/*3261*	148/*2153*
12/*3.66*	66/*969*	639/*9321*	F_b	425/*6205*	282/*4116*	234/*3420*	175/*2549*	115/*1678*
13/*3.96*	50/*724*	544/*7933*	F_b	339/*4945*	224/*3276*	186/*2720*	139/*2024*	91/*1328*
14/*4.27*	38/*551*	468/*6831*	F_b	274/*3998*	181/*2644*	150/*2193*	112/*1629*	73/*1065*
15/*4.57*	29/*426*	407/*5943*	F_b	224/*3273*	148/*2161*	123/*1790*	91/*1327*	59/*864*
16/*4.88*	23/*332*	357/*5216*	F_b	186/*2709*	122/*1785*	101/*1477*	75/*1092*	48/*707*
17/*5.18*	18/*261*	316/*4613*	F_b	155/*2265*	102/*1489*	84/*1230*	62/*907*	40/*584*
18/*5.49*	14/*206*	281/*4108*	F_b	131/*1910*	86/*1252*	71/*1033*	52/*759*	33/*485*
19/*5.79*	11/*163*	252/*3680*	F_b	111/*1623*	73/*1061*	60/*874*	44/*640*	28/*406*
20/*6.10*	9/*129*	227/*3315*	F_b	95/*1389*	62/*905*	51/*744*	37/*542*	23/*341*

The part weight has been deducted in the above table.

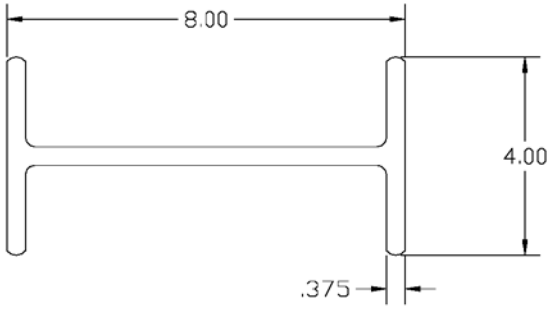
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 600 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



8 X 4 X 1/2 I-BEAM

203.2 x 101.6 x 12.7 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 3.50 in.^{2} / *2258mm.^{2}*
I = 70.62 in.^{4} / *29394263mm.^{4}*

Wt. = 5.70 lbs./ft. / *8.48kg/m.*
S = 17.66 in.^{3} / *289396mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT MAX. LOAD	MAXIMUM LOAD		DEFLECTION				
				L/100	L/150	L/180	L/240	L/360
6/*1.83*	1233/*17993*	1744/*25456*	F_v	----/----	----/----	----/----	1383/*20182*	920/*13427*
7/*2.13*	709/*10346*	1494/*21808*	F_v	----/----	----/----	1267/*18497*	949/*13852*	631/*9207*
8/*2.44*	442/*6455*	1307/*19071*	F_v	----/----	1083/*15802*	901/*13154*	675/*9845*	448/*6536*
9/*2.74*	293/*4280*	1161/*16943*	F_v	----/----	794/*11581*	660/*9637*	494/*7207*	327/*4777*
10/*3.05*	204/*2972*	1044/*15240*	F_v	898/*13101*	597/*8706*	496/*7241*	371/*5410*	245/*3579*
11/*3.35*	147/*2140*	949/*13847*	F_v	690/*10075*	458/*6689*	381/*5560*	284/*4149*	188/*2738*
12/*3.66*	109/*1586*	812/*11847*	F_b	541/*7896*	359/*5236*	298/*4350*	222/*3241*	146/*2133*
13/*3.96*	82/*1203*	691/*10083*	F_b	431/*6291*	285/*4166*	237/*3458*	176/*2573*	116/*1687*
14/*4.27*	64/*929*	595/*8682*	F_b	348/*5084*	230/*3362*	191/*2788*	142/*2070*	93/*1352*
15/*4.57*	50/*728*	518/*7552*	F_b	285/*4161*	188/*2746*	156/*2275*	115/*1685*	75/*1096*
16/*4.88*	40/*577*	454/*6628*	F_b	236/*3444*	155/*2268*	129/*1876*	95/*1386*	61/*896*
17/*5.18*	32/*462*	402/*5862*	F_b	197/*2878*	130/*1891*	107/*1562*	79/*1151*	51/*739*
18/*5.49*	25/*372*	358/*5219*	F_b	166/*2426*	109/*1590*	90/*1311*	66/*962*	42/*614*
19/*5.79*	21/*301*	320/*4676*	F_b	141/*2061*	92/*1346*	76/*1108*	56/*810*	35/*512*
20/*6.10*	17/*244*	289/*4212*	F_b	121/*1763*	79/*1148*	65/*943*	47/*686*	29/*430*

The part weight has been deducted in the above table.

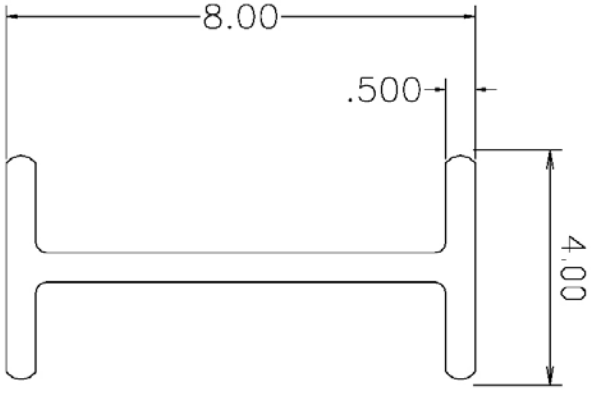
English/ *Metric*

This item is stocked in 20-foot and 25-foot lengths in Polyester Fire Retardant (FR) and Vinylester Fire Retardant (VE).

Other lengths available in mill run quantities.

The mill run on this item is 600 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



10 X 5 X 3/8 I-BEAM

254 x 127 x 9.5 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 3.469 in.^{2} / *2237mm.^{2}*
I = 111.63 in.^{4} / *46463914mm.^{4}*

Wt. = 5.78 lbs./ft. / *8.6kg/m.*
S = 22.33 in.^{3} / *365923mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
	MAX. LOAD	MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
7/*2.13*	1032/*15066*	1481/*21613*	F_v	----/----	----/----	----/----	1305/*19046*	868/*12669*
8/*2.44*	618/*9026*	1295/*18900*	F_v	----/----	----/----	1271/*18543*	952/*13886*	632/*9229*
9/*2.74*	395/*5761*	1151/*16791*	F_v	----/----	1141/*16652*	950/*13860*	711/*10374*	472/*6888*
10/*3.05*	265/*3863*	1035/*15104*	F_v	----/----	871/*12717*	725/*10583*	542/*7916*	360/*5249*
11/*3.35*	185/*2694*	940/*13723*	F_v	----/----	678/*9898*	564/*8235*	422/*6155*	279/*4075*
12/*3.66*	133/*1939*	861/*12572*	F_v	808/*11793*	537/*7834*	446/*6514*	333/*4864*	220/*3215*
13/*3.96*	98/*1432*	795/*11599*	F_v	649/*9478*	431/*6291*	358/*5228*	267/*3900*	176/*2572*
14/*4.27*	74/*1080*	738/*10764*	F_v	529/*7719*	351/*5118*	291/*4251*	217/*3167*	143/*2083*
15/*4.57*	57/*828*	656/*9570*	F_b	436/*6359*	289/*4211*	240/*3496*	178/*2601*	117/*1706*
16/*4.88*	44/*644*	576/*8401*	F_b	363/*5294*	240/*3501*	199/*2904*	148/*2157*	97/*1410*
17/*5.18*	35/*506*	509/*7432*	F_b	305/*4449*	201/*2938*	167/*2434*	124/*1804*	81/*1175*
18/*5.49*	27/*401*	454/*6620*	F_b	258/*3770*	170/*2485*	141/*2057*	104/*1521*	68/*986*
19/*5.79*	22/*319*	407/*5933*	F_b	221/*3218*	145/*2117*	120/*1750*	89/*1292*	57/*833*
20/*6.10*	17/*255*	366/*5346*	F_b	190/*2766*	124/*1816*	103/*1499*	76/*1103*	48/*708*
21/*6.40*	14/*203*	332/*4842*	F_b	164/*2393*	107/*1567*	89/*1292*	65/*948*	41/*604*
22/*6.71*	11/*162*	302/*4404*	F_b	143/*2081*	93/*1359*	77/*1119*	56/*818*	35/*517*
23/*7.01*	9/*128*	276/*4022*	F_b	125/*1819*	81/*1185*	67/*973*	49/*709*	30/*444*
24/*7.32*	7/*100*	253/*3687*	F_b	109/*1598*	71/*1037*	58/*850*	42/*616*	26/*383*
25/*7.62*	5/*77*	232/*3391*	F_b	97/*1409*	62/*911*	51/*745*	37/*538*	23/*330*

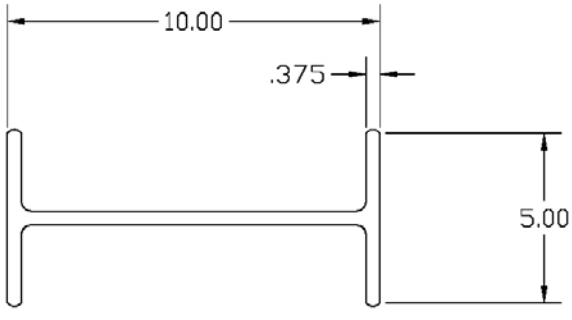
The part weight has been deducted in the above table.

English/ *Metric*

At the time of this printing, this was a non-stocked item.

The mill run on this item is 700 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



10 X 5 X 1/2 I-BEAM

254 x 127 x 12.7 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = *4.50 in.*^{2} / 2903mm.^{2}
I = 143.29 in.^{4} / *59641801mm.*^{4}

Wt. = 7.20 lbs./ft. / *10.71 kg/m.*
S = 28.66 in.^{3} / *469653mm.*^{3}

SPAN FT/*m*	NO LATERAL SUPPORT MAX. LOAD	LATERALLY SUPPORTED MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
7/*2.13*	1471/*21472*	1921/*28040*	F_v	----/----	----/----	----/----	1682/*24542*	1119/*16326*
8/*2.44*	894/*13050*	1680/*24522*	F_v	----/----	----/----	1636/*23879*	1225/*17883*	815/*11887*
9/*2.74*	579/*8452*	1493/*21786*	F_v	----/----	1468/*21429*	1222/*17840*	915/*13354*	608/*8868*
10/*3.05*	394/*5752*	1343/*19597*	F_v	----/----	1121/*16363*	933/*13618*	698/*10188*	463/*6757*
11/*3.35*	279/*4070*	1220/*17806*	F_v	----/----	873/*12733*	726/*10594*	543/*7919*	359/*5244*
12/*3.66*	204/*2973*	1118/*16313*	F_v	1039/*15165*	690/*10075*	574/*8378*	429/*6258*	283/*4137*
13/*3.96*	153/*2228*	1031/*15050*	F_v	835/*12187*	554/*8090*	461/*6724*	344/*5017*	227/*3309*
14/*4.27*	117/*1705*	957/*13968*	F_v	680/*9924*	451/*6581*	375/*5466*	279/*4074*	184/*2681*
15/*4.57*	91/*1327*	842/*12287*	F_b	560/*8175*	371/*5415*	308/*4495*	229/*3345*	150/*2195*
16/*4.88*	72/*1048*	739/*10786*	F_b	466/*6806*	308/*4502*	256/*3734*	190/*2774*	124/*1815*
17/*5.18*	57/*837*	654/*9542*	F_b	392/*5719*	259/*3777*	215/*3130*	159/*2322*	104/*1513*
18/*5.49*	46/*675*	582/*8500*	F_b	332/*4846*	219/*3196*	181/*2645*	134/*1958*	87/*1270*
19/*5.79*	38/*548*	522/*7618*	F_b	283/*4137*	187/*2723*	154/*2252*	114/*1663*	74/*1073*
20/*6.10*	31/*448*	470/*6865*	F_b	244/*3557*	160/*2336*	132/*1929*	97/*1421*	62/*912*
21/*6.40*	25/*367*	426/*6217*	F_b	211/*3076*	138/*2016*	114/*1662*	84/*1221*	53/*779*
22/*6.71*	21/*301*	388/*5656*	F_b	183/*2676*	120/*1749*	99/*1440*	72/*1054*	46/*667*
23/*7.01*	17/*247*	354/*5165*	F_b	160/*2339*	104/*1525*	86/*1253*	63/*913*	39/*574*
24/*7.32*	14/*202*	324/*4735*	F_b	141/*2055*	91/*1335*	75/*1095*	54/*795*	34/*495*
25/*7.62*	11/*165*	298/*4356*	F_b	124/*1812*	80/*1173*	66/*960*	48/*694*	29/*428*

The part weight has been deducted in the above table.

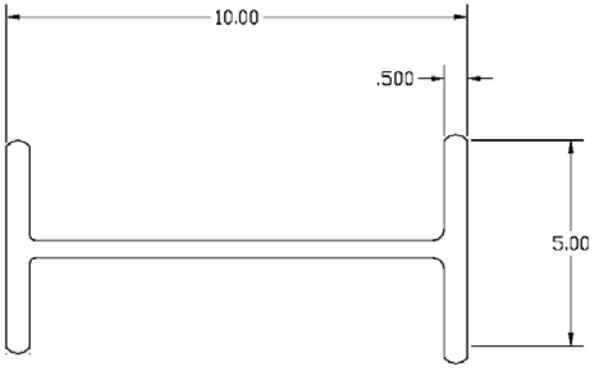
English/ *Metric*

This item is stocked in 20-foot and 25-foot lengths in Polyester Fire Retardant (FR) and Vinylester Fire Retardant (VE).

Other lengths available in mill run quantities.

The mill run on this item is 600 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



12 X 6 X 1/2 I-BEAM

304.8 x 152.4 x 12.7 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 5.5 in.^{2} / *3548mm.^{2}*
I = 253.96 in.^{4}/*105706133mm.^{4}*

Wt. = 8.70 lbs./ft. / *12.95kg/m.*
S = 42.33 in.^{3} / *693664mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
	MAX. LOAD	MAXIMUM LOAD		DEFLECTION				
				L/100	L/150	L/180	L/240	L/360
7/*2.13*	2348/*34273*	2348/*34273*	F_v	----/----	----/----	----/----	----/----	1715/*25029*
8/*2.44*	1693/*24706*	2054/*29973*	F_v	----/----	----/----	----/----	1922/*28049*	1278/*18657*
9/*2.74*	1080/*15757*	1825/*26629*	F_v	----/----	----/----	----/----	1463/*21350*	972/*14191*
10/*3.05*	724/*10567*	1641/*23953*	F_v	----/----	----/----	1515/*22105*	1134/*16547*	753/*10989*
11/*3.35*	505/*7377*	1491/*21764*	F_v	----/----	1434/*20929*	1194/*17420*	893/*13033*	592/*8646*
12/*3.66*	365/*5322*	1366/*19940*	F_v	----/----	1147/*16739*	954/*13928*	714/*10414*	473/*6901*
13/*3.96*	270/*3945*	1261/*18396*	F_v	----/----	929/*13564*	773/*11282*	578/*8430*	382/*5578*
14/*4.27*	205/*2990*	1170/*17073*	F_v	1147/*16746*	762/*11121*	634/*9247*	473/*6903*	312/*4560*
15/*4.57*	158/*2310*	1091/*15926*	F_v	952/*13886*	631/*9215*	525/*7658*	391/*5712*	258/*3766*
16/*4.88*	124/*1812*	1023/*14923*	F_v	797/*11627*	528/*7709*	439/*6403*	327/*4770*	215/*3138*
17/*5.18*	99/*1441*	962/*14038*	F_v	673/*9820*	446/*6504*	370/*5399*	275/*4018*	181/*2636*
18/*5.49*	79/*1159*	862/*12583*	F_b	573/*8360*	379/*5531*	314/*4588*	234/*3409*	153/*2230*
19/*5.79*	64/*940*	773/*11280*	F_b	491/*7168*	325/*4736*	269/*3926*	200/*2913*	130/*1899*
20/*6.10*	53/*768*	697/*10168*	F_b	424/*6187*	280/*4082*	232/*3381*	172/*2504*	111/*1627*
21/*6.40*	43/*631*	631/*9211*	F_b	368/*5372*	242/*3539*	201/*2928*	148/*2164*	96/*1400*
22/*6.71*	36/*521*	574/*8381*	F_b	321/*4690*	211/*3084*	175/*2549*	129/*1880*	83/*1211*
23/*7.01*	30/*431*	525/*7658*	F_b	282/*4115*	185/*2701*	152/*2230*	112/*1640*	72/*1051*
24/*7.32*	24/*357*	481/*7022*	F_b	249/*3627*	163/*2376*	134/*1959*	98/*1437*	63/*916*
25/*7.62*	20/*296*	443/*6462*	F_b	220/*3211*	144/*2098*	118/*1727*	87/*1264*	55/*800*
26/*7.92*	17/*245*	409/*5965*	F_b	196/*2853*	127/*1860*	105/*1529*	76/*1115*	48/*701*
27/*8.23*	14/*201*	378/*5522*	F_b	174/*2545*	113/*1654*	93/*1357*	68/*986*	42/*615*
28/*8.53*	11/*165*	351/*5126*	F_b	156/*2277*	101/*1476*	83/*1208*	60/*875*	37/*541*
29/*8.84*	9/*133*	327/*4770*	F_b	140/*2044*	90/*1320*	74/*1079*	53/*777*	33/*476*
30/*9.14*	7/*106*	305/*4449*	F_b	126/*1839*	81/*1184*	66/*965*	47/*692*	29/*419*

The part weight has been deducted in the above table.

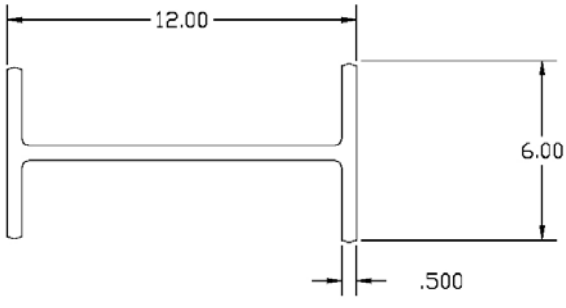
English/ *Metric*

This item is stocked in 20-foot and 25-foot lengths in Polyester Fire Retardant (FR) and Vinylester Fire Retardant (VE).

Other lengths available in mill run quantities.

The mill run on this item is 400 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



18 X 3/8 X 4 1/2 X 1/2 I-BEAM

457.2 x 9.5 x 114.3 x 12.7 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 6.375 in.^{2} / *4112mm.^{2}*
I = 498.15 in.^{4} / *207345685mm^4*

Wt. = 8.70 lbs./ft. / *12.95kg/m.*
S = 55.35 in.^{3} / *907024mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
	MAX. LOAD	MAXIMUM LOAD		DEFLECTION				
				L/100	L/150	L/180	L/240	L/360
6/*1.83*	2864/*41793*	3179/*46391*	F_v	----/----	----/----	----/----	----/----	3032/*44253*
7/*2.13*	1566/*22848*	2723/*39746*	F_v	----/----	----/----	----/----	----/----	2301/*33580*
8/*2.44*	930/*13571*	2382/*34762*	F_v	----/----	----/----	----/----	----/----	1777/*25940*
9/*2.74*	588/*8585*	2116/*30885*	F_v	----/----	----/----	----/----	2096/*30585*	1394/*20348*
10/*3.05*	391/*5705*	1904/*27784*	F_v	----/----	----/----	----/----	1667/*24334*	1109/*16180*
11/*3.35*	270/*3942*	1730/*25247*	F_v	----/----	----/----	----/----	1343/*19601*	892/*13025*
12/*3.66*	193/*2810*	1585/*23132*	F_v	----/----	----/----	1462/*21333*	1094/*15968*	727/*10603*
13/*3.96*	141/*2055*	1462/*21343*	F_v	----/----	1446/*21106*	1204/*17567*	901/*13143*	598/*8720*
14/*4.27*	105/*1535*	1357/*19809*	F_v	----/----	1203/*17550*	1001/*14604*	748/*10921*	496/*7239*
15/*4.57*	80/*1165*	1266/*18480*	F_v	----/----	1009/*14723*	839/*12248*	627/*9154*	415/*6060*
16/*4.88*	61/*896*	1187/*17317*	F_v	----/----	853/*12451*	709/*10354*	530/*7734*	350/*5114*
17/*5.18*	48/*696*	1116/*16291*	F_v	1095/*15975*	727/*10608*	604/*8818*	451/*6582*	298/*4346*
18/*5.49*	37/*545*	1054/*15379*	F_v	940/*13712*	623/*9099*	518/*7562*	386/*5639*	255/*3717*
19/*5.79*	29/*428*	998/*14563*	F_v	812/*11846*	538/*7855*	447/*6524*	333/*4862*	219/*3199*
20/*6.10*	23/*337*	914/*13335*	F_b	705/*10293*	467/*6820*	388/*5662*	289/*4215*	190/*2768*
21/*6.40*	18/*264*	828/*12083*	F_b	616/*8993*	408/*5953*	338/*4940*	252/*3673*	165/*2406*
22/*6.71*	14/*206*	754/*10998*	F_b	541/*7897*	358/*5222*	297/*4331*	220/*3216*	144/*2102*
23/*7.01*	11/*159*	689/*10052*	F_b	477/*6967*	315/*4602*	261/*3814*	194/*2829*	126/*1843*
24/*7.32*	8/*121*	632/*9221*	F_b	423/*6173*	279/*4073*	231/*3373*	171/*2498*	111/*1623*
25/*7.62*	6/*89*	582/*8488*	F_b	376/*5491*	248/*3619*	205/*2994*	152/*2214*	98/*1434*
26/*7.92*	4/*62*	537/*7838*	F_b	336/*4904*	221/*3227*	183/*2668*	135/*1969*	87/*1270*
27/*8.23*	3/*39*	497/*7259*	F_b	301/*4394*	198/*2887*	163/*2385*	120/*1757*	77/*1129*
28/*8.53*	1/*20*	462/*6741*	F_b	271/*3950*	178/*2591*	147/*2138*	108/*1572*	69/*1006*
29/*8.84*	----/----	430/*6276*	F_b	244/*3562*	160/*2332*	132/*1922*	97/*1410*	62/*898*
30/*9.14*	----/----	401/*5856*	F_b	221/*3221*	144/*2105*	119/*1733*	87/*1268*	55/*803*

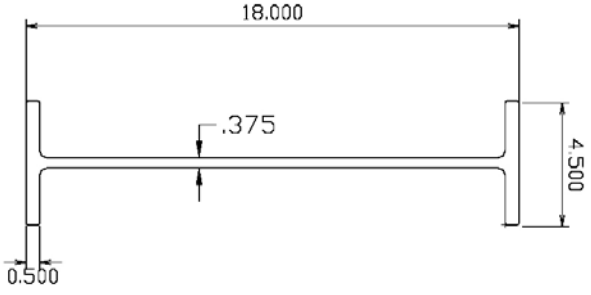
The part weight has been deducted in the above table.

English/ *Metric*

At the time of this printing, this was a non-stocked item.

The mill run on this item is 600 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



24 X 3/8 X 7 1/2 X 3/4 I-BEAM

609.6 x 9.5 x 190.5 x 19.1 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 8.44 in.^{2} / *5445mm.^{2}*
I = 1877 in.^{4} / *781266386mm.^{4}*

Wt. = 15.20 lbs./ft. / *22.62kg/m.*
S = 156.42 in.^{3} / *2563265mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
	MAX. LOAD	MAXIMUM LOAD		DEFLECTION				
				L/100	L/150	L/180	L/240	L/360
10/*3.05*	2517/*36730*	2517/*36730*	F_v	----/----	----/----	----/----	----/----	2421/*35335*
11/*3.35*	2287/*33371*	2287/*33371*	F_v	----/----	----/----	----/----	----/----	2048/*29887*
12/*3.66*	1649/*24071*	2095/*30571*	F_v	----/----	----/----	----/----	----/----	1744/*25450*
13/*3.96*	1204/*17569*	1932/*28203*	F_v	----/----	----/----	----/----	----/----	1494/*21804*
14/*4.27*	899/*13127*	1793/*26172*	F_v	----/----	----/----	----/----	----/----	1287/*18782*
15/*4.57*	686/*10006*	1673/*24413*	F_v	----/----	----/----	----/----	----/----	1114/*16262*
16/*4.88*	532/*7760*	1567/*22873*	F_v	----/----	----/----	----/----	1462/*21330*	969/*14146*
17/*5.18*	419/*6108*	1474/*21514*	F_v	----/----	----/----	----/----	1278/*18651*	847/*12360*
18/*5.49*	334/*4870*	1391/*20307*	F_v	----/----	----/----	----/----	1122/*16378*	743/*10844*
19/*5.79*	269/*3926*	1317/*19226*	F_v	----/----	----/----	----/----	989/*14439*	655/*9552*
20/*6.10*	219/*3196*	1251/*18254*	F_v	----/----	----/----	1172/*17111*	876/*12778*	579/*8445*
21/*6.40*	180/*2624*	1191/*17374*	F_v	----/----	----/----	1042/*15205*	778/*11348*	513/*7492*
22/*6.71*	149/*2170*	1136/*16574*	F_v	----/----	1118/*16314*	929/*13558*	693/*10113*	457/*6668*
23/*7.01*	124/*1806*	1086/*15844*	F_v	----/----	1000/*14598*	831/*12128*	619/*9041*	408/*5953*
24/*7.32*	104/*1511*	1040/*15174*	F_v	----/----	898/*13104*	746/*10883*	556/*8107*	365/*5331*
25-40 see following page								

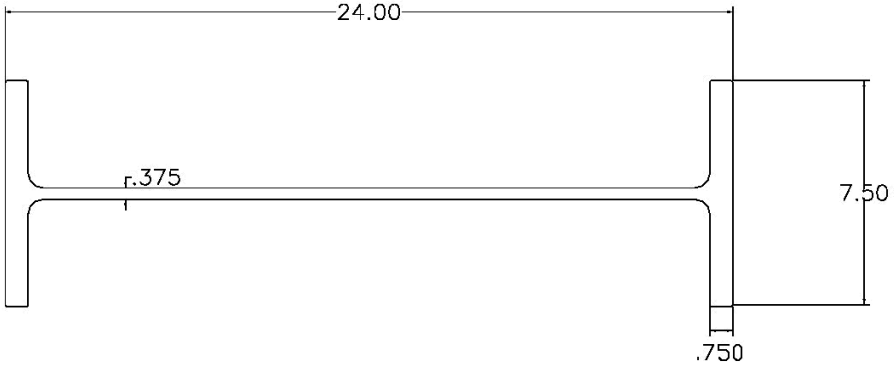
The part weight has been deducted in the above table.

English/ *Metric*

At the time of this printing, this was a non-stocked item.

The mill run on this item is 500 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



24 X 3/8 X 7 1/2 X 3/4 I-BEAM

609.6 x 9.5 x 190.5 x 19.1 I-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 8.44 in.^{2} / *5445mm.^{2}*
I = 1877 in.^{4} / *781266386mm.^{4}*

Wt. = 15.20 lbs./ft. / *22.62kg/m.*
S = 156.42 in.^{3} / *2563265mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT MAX. LOAD	MAXIMUM LOAD		LATERALLY SUPPORTED DEFLECTION L/100	L/150	L/180	L/240	L/360
10-24 see preceding page								
25/*7.62*	87/*1269*	998/*14559*	F_v	----/----	808/*11798*	671/*9794*	500/*7290*	328/*4786*
26/*7.92*	73/*1069*	959/*13990*	F_v	----/----	730/*10651*	606/*8839*	450/*6574*	295/*4309*
27/*8.23*	62/*903*	923/*13464*	F_v	----/----	661/*9641*	548/*7997*	407/*5943*	266/*3888*
28/*8.53*	52/*764*	889/*12975*	F_v	----/----	600/*8749*	497/*7254*	369/*5385*	241/*3516*
29/*8.84*	44/*647*	858/*12520*	F_v	826/*12049*	545/*7959*	452/*6596*	335/*4891*	218/*3187*
30/*9.14*	37/*547*	829/*12095*	F_v	753/*10996*	497/*7256*	412/*6010*	305/*4452*	198/*2894*
31/*9.45*	32/*462*	802/*11698*	F_v	689/*10056*	454/*6630*	376/*5488*	278/*4061*	180/*2633*
32/*9.75*	27/*389*	776/*11326*	F_v	632/*9216*	416/*6070*	344/*5022*	254/*3711*	164/*2400*
33/*10.06*	22/*325*	752/*10976*	F_v	580/*8463*	382/*5568*	315/*4603*	233/*3397*	150/*2191*
34/*10.36*	19/*271*	730/*10646*	F_v	534/*7787*	351/*5117*	290/*4227*	213/*3115*	137/*2003*
35/*10.67*	15/*223*	708/*10336*	F_v	492/*7177*	323/*4711*	266/*3889*	196/*2861*	126/*1834*
36/*10.97*	12/*181*	688/*10043*	F_v	454/*6627*	298/*4344*	246/*3583*	180/*2632*	115/*1681*
37/*11.28*	10/*144*	669/*9765*	F_v	420/*6129*	275/*4012*	227/*3306*	166/*2424*	106/*1542*
38/*11.58*	8/*112*	651/*9502*	F_v	389/*5677*	254/*3711*	209/*3055*	153/*2236*	97/*1417*
39/*11.89*	6/*83*	634/*9253*	F_v	361/*5267*	236/*3437*	194/*2827*	141/*2065*	89/*1303*
40/*12.19*	4/*58*	618/*9016*	F_v	335/*4893*	218/*3188*	179/*2620*	131/*1909*	82/*1199*

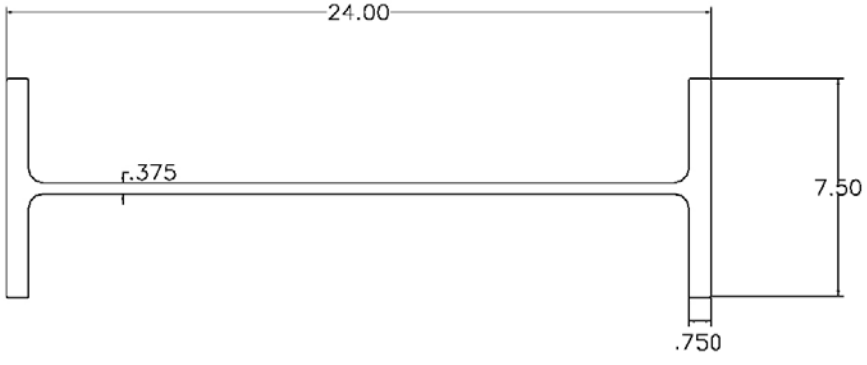
The part weight has been deducted in the above table.

English/ *Metric*

At the time of this printing, this was a non-stocked item.

The mill run on this item is 500 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



3 X 3 X 1/4 WF-BEAM

76.2 x 76.2 x 6.4 WF-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = .625 in.^{2} / *403.2mm.^{2}*
I = 3.17 in.^{4} / *1319454mm.^{4}*

Wt. = 1.64 lbs./ft. / *2.44kg/m.*
S = 2.11 in.^{3} / *34577mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT MAX. LOAD	LATERALLY SUPPORTED MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
4/*1.22*	467/*6817*	467/*6817*	F_v	----/----	389/*5674*	324/*4724*	242/*3537*	161/*2350*
5/*1.52*	225/*3278*	373/*5449*	F_v	323/*4707*	214/*3130*	178/*2604*	133/*1947*	88/*1290*
6/*1.83*	119/*1741*	311/*4537*	F_v	195/*2840*	129/*1885*	107/*1567*	80/*1169*	53/*772*
7/*2.13*	70/*1028*	266/*3885*	F_v	125/*1831*	83/*1213*	69/*1007*	51/*749*	34/*491*
8/*2.44*	45/*654*	218/*3183*	F_b	85/*1242*	56/*820*	47/*679*	35/*504*	22/*328*
9/*2.74*	30/*439*	172/*2510*	F_b	60/*877*	40/*577*	33/*477*	24/*351*	16/*226*
10/*3.05*	21/*306*	139/*2029*	F_b	44/*639*	29/*418*	24/*344*	17/*252*	11/*160*

The part weight has been deducted in the above table.

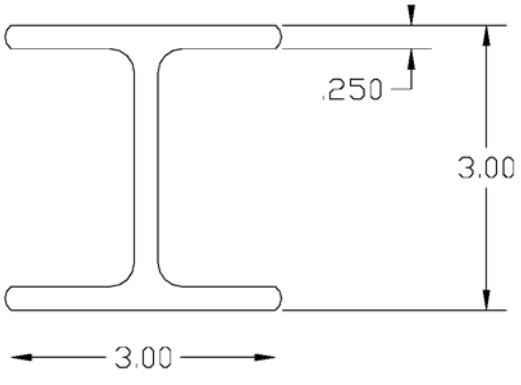
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 1,000 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



4 X 4 X 1/4 WF-BEAM

101.6 x 101.6 x 6.4 WF-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = .875 in.^{2} / *564.5mm.^{2}*
I = 7.94 in.^{4} / *3304878mm.^{4}*

Wt. = 2.15 lbs./ft. / *3.20 kg/m.*
S = 3.97 in.^{3} / *65057mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
	MAX. LOAD	MAXIMUM LOAD		DEFLECTION				
				L/100	L/150	L/180	L/240	L/360
4/*1.22*	654/*9546*	654/*9546*	F_v	----/----	----/----	----/----	523/*7630*	348/*5076*
5/*1.52*	523/*7630*	523/*7630*	F_v	----/----	484/*7062*	403/*5879*	302/*4402*	200/*2924*
6/*1.83*	289/*4219*	435/*6353*	F_v	----/----	301/*4386*	250/*3650*	187/*2729*	124/*1809*
7/*2.13*	164/*2396*	373/*5441*	F_v	297/*4342*	198/*2884*	164/*2398*	123/*1791*	81/*1183*
8/*2.44*	101/*1477*	326/*4757*	F_v	205/*2993*	136/*1985*	113/*1649*	84/*1229*	55/*809*
9/*2.74*	66/*967*	285/*4156*	F_b	147/*2140*	97/*1417*	81/*1175*	60/*874*	39/*572*
10/*3.05*	45/*663*	230/*3360*	F_b	108/*1578*	71/*1041*	59/*863*	44/*639*	28/*416*
11/*3.35*	32/*471*	190/*2772*	F_b	82/*1193*	54/*785*	44/*649*	33/*479*	21/*309*
12/*3.66*	24/*344*	159/*2324*	F_b	63/*920*	41/*603*	34/*497*	25/*365*	16/*233*
13/*3.96*	18/*256*	135/*1976*	F_b	50/*723*	32/*471*	27/*388*	19/*283*	12/*178*
14/*4.27*	13/*194*	116/*1699*	F_b	39/*576*	26/*373*	21/*306*	15/*222*	9/*137*
15/*4.57*	10/*149*	101/*1476*	F_b	32/*465*	21/*299*	17/*244*	12/*175*	7/*106*

The part weight has been deducted in the above table.

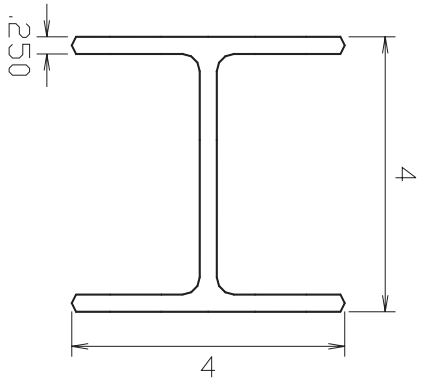
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 800 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



6 X 6 X 1/4 WF-BEAM

152.4 x 152.4 x 6.4 WF-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 1.375 in.^{2} / *887.1mm.^{2}*
I = 28.28 in.^{4} / *11771025mm.^{4}*

Wt. = 3.40 lbs./ft. / *5.06kg/m.*
S = 9.43 in.^{3} / *154530mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
		MAXIMUM LOAD		DEFLECTION				
	MAX. LOAD			L/100	L/150	L/180	L/240	L/360
5/*1.52*	822/*11990*	822/*11990*	F_v	----/----	----/----	----/----	----/----	554/*8091*
6/*1.83*	678/*9896*	678/*9896*	F_b	----/----	----/----	----/----	549/*8016*	365/*5328*
7/*2.13*	497/*7258*	497/*7258*	F_b	----/----	----/----	----/----	377/*5504*	250/*3652*
8/*2.44*	380/*5545*	380/*5545*	F_b	----/----	----/----	358/*5230*	268/*3910*	177/*2590*
9/*2.74*	260/*3790*	299/*4371*	F_b	----/----	----/----	262/*3830*	196/*2860*	130/*1890*
10/*3.05*	173/*2522*	242/*3531*	F_b	----/----	237/*3460*	197/*2875*	147/*2144*	97/*1413*
11/*3.35*	120/*1746*	199/*2909*	F_b	----/----	182/*2656*	151/*2205*	112/*1641*	74/*1078*
12/*3.66*	85/*1248*	167/*2437*	F_b	----/----	142/*2076*	118/*1722*	88/*1279*	57/*836*
13/*3.96*	63/*915*	142/*2069*	F_b	----/----	113/*1649*	94/*1366*	69/*1012*	45/*658*
14/*4.27*	47/*685*	122/*1777*	F_b	----/----	91/*1328*	75/*1098*	56/*811*	36/*524*
15/*4.57*	36/*522*	106/*1542*	F_b	----/----	74/*1082*	61/*893*	45/*658*	29/*422*

The part weight has been deducted in the above table.

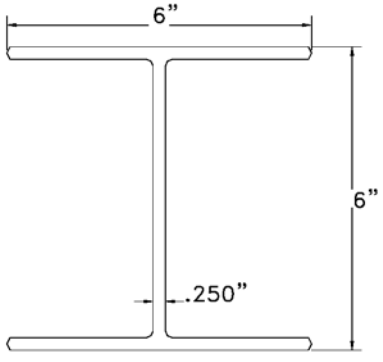
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 700 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



6 X 6 X 3/8 WF-BEAM

152.4 x 152.4 x 9.5 WF-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 1.969 in.^{2} / *1270mm.^{2}*
I = 40.17 in.^{4} / *16720016mm.^{4}*

Wt. = 4.90 lbs./ft. / *7.29kg/m.*
S = 13.39 in.^{3} / *219423mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT MAX. LOAD	LATERALLY SUPPORTED MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
4/*1.22*	1472/*21480*	1472/*21480*	F_v	----/----	----/----	----/----	----/----	1260/*18393*
5/*1.52*	1177/*17170*	1177/*17170*	F_v	----/----	----/----	----/----	----/----	790/*11529*
6/*1.83*	980/*14296*	980/*14296*	F_v	----/----	----/----	----/----	782/*11415*	520/*7586*
7/*2.13*	839/*12244*	839/*12244*	F_v	----/----	----/----	717/*10468*	537/*7833*	356/*5198*
8/*2.44*	670/*9783*	733/*10704*	F_v	----/----	613/*8943*	510/*7441*	381/*5563*	252/*3685*
9/*2.74*	432/*6306*	651/*9507*	F_v	----/----	449/*6551*	373/*5447*	279/*4067*	184/*2688*
10/*3.05*	293/*4272*	586/*8549*	F_v	508/*7416*	337/*4920*	280/*4088*	209/*3048*	138/*2008*
11/*3.35*	206/*3011*	532/*7765*	F_v	390/*5699*	259/*3775*	215/*3134*	160/*2333*	105/*1531*
12/*3.66*	150/*2191*	487/*7112*	F_v	306/*4462*	202/*2951*	168/*2447*	125/*1817*	81/*1188*
13/*3.96*	112/*1636*	449/*6560*	F_v	243/*3550*	161/*2343*	133/*1941*	99/*1438*	64/*935*
14/*4.27*	86/*1249*	395/*5765*	F_b	196/*2865*	129/*1886*	107/*1560*	79/*1152*	51/*744*
15/*4.57*	66/*970*	343/*5013*	F_b	160/*2341*	105/*1537*	87/*1269*	64/*934*	41/*599*

The part weight has been deducted in the above table.

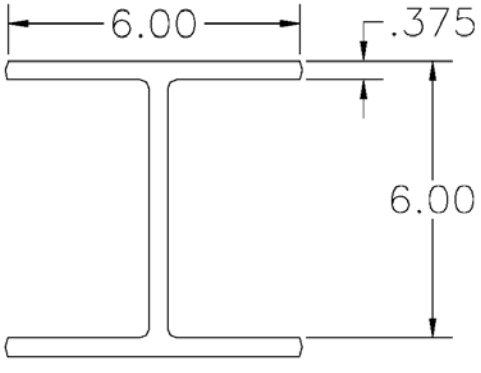
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 600 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



8 X 8 X 3/8 WF-BEAM

203.2 x 203.2 x 9.5 WF-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 2.719 in.^{2} / *1754mm.^{2}*
I = 99.19 in.^{4} / *41285995mm.^{4}*

Wt. = 6.49 lbs./ft. / *9.66 kg/m.*
S = 24.80 in.^{3} / *406399mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
	MAX. LOAD	MAXIMUM LOAD		DEFLECTION				
				L/100	L/150	L/180	L/240	L/360
4/*1.22*	2033/*29666*	2033/*29666*	Fv	——/——	——/——	——/——	——/——	——/——
5/*1.52*	1625/*23714*	1625/*23714*	Fv	——/——	——/——	——/——	——/——	1483/*21636*
6/*1.83*	1353/*19746*	1353/*19746*	Fv	——/——	——/——	——/——	——/——	1028/*15008*
7/*2.13*	1159/*16911*	1159/*16911*	Fv	——/——	——/——	——/——	1106/*16139*	735/*10727*
8/*2.44*	1013/*14786*	1013/*14786*	Fv	——/——	——/——	——/——	812/*11849*	539/*7868*
9/*2.74*	900/*13132*	900/*13132*	Fv	——/——	——/——	815/*11898*	610/*8900*	404/*5902*
10/*3.05*	803/*11716*	809/*11810*	Fv	——/——	752/*10968*	625/*9125*	467/*6820*	309/*4515*
11/*3.35*	556/*8108*	668/*9755*	Fb	——/——	587/*8566*	488/*7123*	364/*5318*	241/*3514*
12/*3.66*	397/*5800*	561/*8182*	Fb	——/——	466/*6797*	387/*5648*	289/*4212*	190/*2777*
13/*3.96*	292/*4265*	477/*6958*	Fb	——/——	375/*5469*	311/*4541*	232/*3382*	152/*2223*
14/*4.27*	220/*3210*	410/*5986*	Fb	——/——	305/*4455*	253/*3696*	188/*2749*	123/*1801*
15/*4.57*	169/*2463*	356/*5202*	Fb	——/——	251/*3669*	208/*3042*	155/*2258*	101/*1474*
16/*4.88*	132/*1922*	313/*4561*	Fb	——/——	209/*3052*	173/*2527*	128/*1872*	83/*1216*
17/*5.18*	104/*1521*	276/*4029*	Fb	266/*3888*	175/*2561*	145/*2118*	107/*1565*	69/*1012*
18/*5.49*	83/*1219*	246/*3584*	Fb	226/*3295*	148/*2165*	123/*1789*	90/*1318*	58/*847*
19/*5.79*	68/*986*	220/*3207*	Fb	193/*2813*	126/*1844*	104/*1521*	77/*1117*	49/*713*
20/*6.10*	55/*805*	198/*2885*	Fb	166/*2417*	108/*1580*	89/*1301*	65/*952*	41/*603*

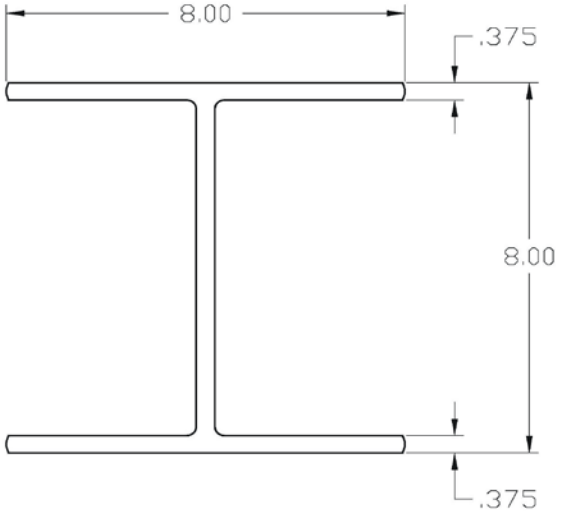
The part weight has been deducted in the above table. English/*Metric*

This item is stocked in 20-foot lengths in Polyester Fire Retardant (FR) and Vinylester Fire Retardant (VE).

Other lengths available in mill run quantities.

The mill run on this item is 400 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



8 X 8 X 1/2 WF-BEAM

203.2 x 203.2 x 12.7 WF-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 3.5 in.^{2} / *2258mm.^{2}*
I =126.96 in.^{4}/*52844742mm.^{4}*

Wt. = 8.70 lbs./ft. / *12.95 kg/m.*
S = 31.74 in.^{3} / *520125mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT MAX. LOAD	LATERALLY SUPPORTED MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
6/*1.83*	1741/*25412*	1741/*25412*	F_v	----/----	----/----	----/----	----/----	1319/*19254*
7/*2.13*	1491/*21764*	1491/*21764*	F_v	----/----	----/----	----/----	1418/*20696*	943/*13755*
8/*2.44*	1304/*19028*	1304/*19028*	F_v	----/----	----/----	----/----	1041/*15189*	691/*10083*
9/*2.74*	1158/*16899*	1158/*16899*	F_v	----/----	----/----	1045/*15247*	781/*11404*	518/*7560*
10/*3.05*	1041/*15197*	1041/*15197*	F_v	----/----	963/*14052*	801/*11689*	599/*8735*	396/*5781*
11/*3.35*	795/*11596*	946/*13804*	F_v	----/----	752/*10972*	625/*9122*	467/*6810*	308/*4497*
12/*3.66*	574/*8378*	866/*12643*	F_v	----/----	596/*8703*	495/*7231*	369/*5391*	243/*3552*
13/*3.96*	426/*6222*	799/*11660*	F_v	724/*10563*	480/*7000*	398/*5812*	297/*4327*	195/*2843*
14/*4.27*	324/*4730*	741/*10818*	F_v	590/*8614*	391/*5701*	324/*4729*	241/*3515*	158/*2301*
15/*4.57*	251/*3667*	691/*10089*	F_v	487/*7104*	322/*4694*	267/*3890*	198/*2886*	129/*1882*
16/*4.88*	198/*2890*	648/*9450*	F_v	405/*5918*	267/*3903*	221/*3231*	164/*2392*	106/*1552*
17/*5.18*	158/*2311*	609/*8887*	F_v	341/*4974*	224/*3273*	185/*2707*	137/*1998*	88/*1290*
18/*5.49*	128/*1870*	565/*8242*	F_b	289/*4214*	190/*2767*	157/*2285*	115/*1682*	74/*1079*
19/*5.79*	105/*1529*	506/*7385*	F_b	246/*3597*	161/*2355*	133/*1942*	98/*1425*	62/*907*
20/*6.10*	86/*1262*	456/*6652*	F_b	212/*3090*	138/*2017*	114/*1660*	83/*1213*	53/*767*
21/*6.40*	72/*1049*	413/*6022*	F_b	183/*2670*	119/*1738*	98/*1427*	71/*1038*	45/*650*
22/*6.71*	60/*878*	375/*5476*	F_b	159/*2319*	103/*1504*	84/*1232*	61/*892*	38/*553*
23/*7.01*	51/*738*	343/*4999*	F_b	139/*2025*	90/*1308*	73/*1068*	53/*770*	32/*471*
24/*7.32*	43/*623*	314/*4581*	F_b	122/*1775*	78/*1141*	64/*930*	46/*666*	28/*401*
25/*7.62*	36/*528*	289/*4212*	F_b	107/*1563*	68/*999*	56/*812*	40/*577*	23/*342*

The part weight has been deducted in the above table.

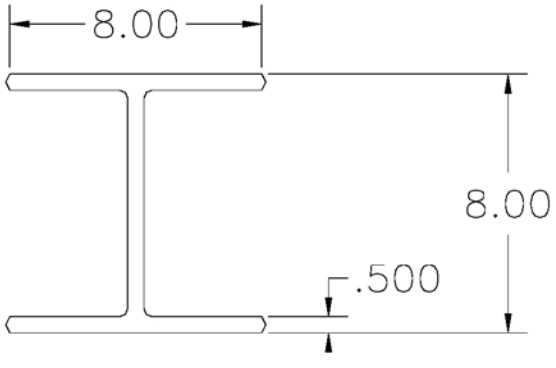
English/ *Metric*

This item is stocked in 20-foot and 25-foot lengths in Polyester Fire Retardant (FR) and Vinylester Fire Retardant (VE).

Other lengths available in mill run quantities.

The mill run on this item is 400 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



10 X 10 X 3/8 WF-BEAM

254 x 254 x 9.5 WF-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 3.469 in.^{2} / *2237mm.^{2}*
I =198.53 in.^{4}/*82634425mm.^{4}*

Wt. = 8.74 lbs./ft. / *13.01kg/m.*
S = 39.71 in.^{3} / *650730mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
	MAX. LOAD	MAXIMUM LOAD		DEFLECTION				
				L/100	L/150	L/180	L/240	L/360
7/*2.13*	1478/*21569*	1478/*21569*	F_v	----/----	----/----	----/----	----/----	1211/*17668*
8/*2.44*	1292/*18857*	1292/*18857*	F_v	----/----	----/----	----/----	----/----	915/*13349*
9/*2.74*	1025/*14953*	1025/*14953*	F_b	----/----	----/----	----/----	----/----	703/*10266*
10/*3.05*	828/*12088*	828/*12088*	F_b	----/----	----/----	----/----	----/----	550/*8022*
11/*3.35*	683/*9968*	683/*9968*	F_b	----/----	----/----	----/----	658/*9600*	436/*6357*
12/*3.66*	573/*8355*	573/*8355*	F_b	----/----	----/----	----/----	529/*7718*	350/*5103*
13/*3.96*	487/*7100*	487/*7100*	F_b	----/----	----/----	----/----	430/*6278*	284/*4143*
14/*4.27*	418/*6105*	418/*6105*	F_b	----/----	----/----	----/----	354/*5161*	233/*3398*
15/*4.57*	363/*5301*	363/*5301*	F_b	----/----	----/----	----/----	293/*4283*	193/*2813*
16/*4.88*	294/*4288*	318/*4644*	F_b	----/----	----/----	----/----	246/*3585*	161/*2348*
17/*5.18*	231/*3375*	281/*4099*	F_b	----/----	----/----	279/*4075*	207/*3024*	135/*1974*
18/*5.49*	184/*2690*	250/*3643*	F_b	----/----	----/----	238/*3467*	176/*2569*	114/*1670*
19/*5.79*	149/*2169*	223/*3256*	F_b	----/----	----/----	203/*2970*	150/*2195*	97/*1421*
20/*6.10*	121/*1765*	201/*2926*	F_b	----/----	----/----	175/*2558*	129/*1887*	83/*1215*
21/*6.40*	99/*1448*	181/*2642*	F_b	----/----	----/----	152/*2216*	112/*1630*	72/*1044*
22/*6.71*	82/*1197*	164/*2396*	F_b	----/----	160/*2339*	132/*1928*	97/*1414*	62/*900*
23/*7.01*	68/*996*	149/*2182*	F_b	----/----	140/*2048*	115/*1685*	84/*1232*	53/*779*
24/*7.32*	57/*832*	137/*1993*	F_b	----/----	123/*1800*	101/*1479*	74/*1077*	46/*676*
25/*7.62*	48/*698*	125/*1827*	F_b	----/----	109/*1588*	89/*1302*	65/*945*	40/*587*

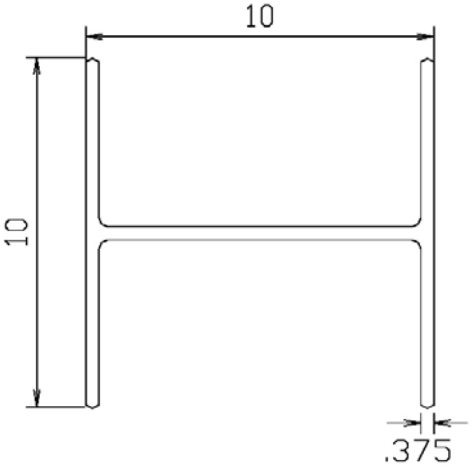
The part weight has been deducted in the above table.

English/ *Metric*

At the time of this printing, this was a non-stocked item.

The mill run on this item is 400 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



10 X 10 X 1/2 WF-BEAM

254 x 254 x 12.7 WF-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 4.50 in.^{2} / *2903mm^2*
I =256.20 in.^{4}/*106638491mm^4*

Wt. = 10.90 lbs./ft. / *16.22 kg/m.*
S = 51.24 in.^{3} / *839673mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
		MAXIMUM LOAD		DEFLECTION				
	MAX. LOAD			L/100	L/150	L/180	L/240	L/360
7/*2.13*	1918/*27986*	1918/*27986*	F_v	----/----	----/----	----/----	----/----	1567/*22865*
8/*2.44*	1677/*24468*	1677/*24468*	F_v	----/----	----/----	----/----	----/----	1183/*17270*
9/*2.74*	1489/*21732*	1489/*21732*	F_v	----/----	----/----	----/----	1370/*19999*	910/*13280*
10/*3.05*	1339/*19543*	1339/*19543*	F_v	----/----	----/----	----/----	1072/*15642*	711/*10375*
11/*3.35*	1216/*17752*	1216/*17752*	F_v	----/----	----/----	1138/*16603*	851/*12413*	563/*8222*
12/*3.66*	1114/*16259*	1114/*16259*	F_v	----/----	1101/*16062*	915/*13358*	684/*9979*	452/*6600*
13/*3.96*	929/*13552*	1028/*14996*	F_v	----/----	896/*13083*	745/*10876*	556/*8117*	367/*5358*
14/*4.27*	698/*10190*	953/*13914*	F_v	----/----	738/*10772*	613/*8950*	457/*6673*	301/*4396*
15/*4.57*	536/*7819*	842/*12294*	F_b	----/----	614/*8956*	510/*7437*	379/*5538*	249/*3639*
16/*4.88*	418/*6105*	739/*10786*	F_b	----/----	515/*7513*	427/*6234*	318/*4636*	208/*3038*
17/*5.18*	332/*4839*	653/*9536*	F_b	----/----	435/*6353*	361/*5268*	268/*3911*	175/*2554*
18/*5.49*	266/*3886*	582/*8489*	F_b	562/*8197*	371/*5411*	307/*4483*	228/*3323*	148/*2162*
19/*5.79*	216/*3157*	521/*7603*	F_b	482/*7039*	318/*4640*	263/*3840*	195/*2840*	126/*1841*
20/*6.10*	178/*2591*	469/*6846*	F_b	417/*6083*	274/*4002*	227/*3309*	167/*2442*	108/*1575*
21/*6.40*	147/*2145*	424/*6195*	F_b	362/*5287*	238/*3471*	196/*2866*	145/*2110*	93/*1354*
22/*6.71*	123/*1789*	386/*5630*	F_b	316/*4618*	207/*3026*	171/*2495*	126/*1832*	80/*1168*
23/*7.01*	103/*1502*	352/*5138*	F_b	278/*4054*	182/*2650*	149/*2181*	109/*1596*	69/*1011*
24/*7.32*	87/*1268*	322/*4705*	F_b	245/*3574*	160/*2330*	131/*1915*	96/*1396*	60/*878*
25/*7.62*	74/*1076*	296/*4324*	F_b	217/*3163*	141/*2056*	116/*1687*	84/*1225*	52/*764*
26/*7.92*	63/*917*	273/*3986*	F_b	193/*2810*	125/*1820*	102/*1491*	74/*1078*	46/*666*
27/*8.23*	54/*783*	252/*3684*	F_b	172/*2505*	111/*1617*	91/*1321*	65/*951*	40/*581*
28/*8.53*	46/*671*	234/*3415*	F_b	153/*2240*	99/*1440*	80/*1174*	58/*841*	35/*507*
29/*8.84*	39/*576*	217/*3173*	F_b	138/*2009*	88/*1286*	72/*1045*	51/*744*	30/*443*
30/*9.14*	34/*495*	202/*2954*	F_b	124/*1806*	79/*1151*	64/*933*	45/*660*	26/*387*

The part weight has been deducted in the above table.

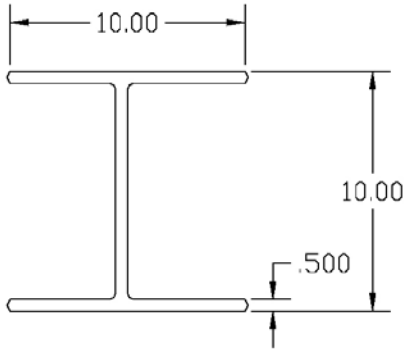
English/ *Metric*

This item is stocked in 20-foot and 25-foot lengths in Polyester Fire Retardant (
and Vinylester Fire Retardant (VE).

Other lengths available in mill run quantities.

The mill run on this item is 400 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



12 X 12 X 1/2 WF-BEAM

304.8 x 304.8 x 12.7 WF-BEAM

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 5.5 in.^{2} / *3548mm.^{2}*
I = 452.45 in.^{4} / *188323909mm.^{4}*

Wt. = 13.20 lbs./ft. / *19.64 kg/m.*
S = 75.45 in.^{3} / *1236404mm.^{3}*

SPAN FT/*m*	NO LATERAL SUPPORT	LATERALLY SUPPORTED						
	MAX. LOAD	MAXIMUM LOAD		DEFLECTION L/100	L/150	L/180	L/240	L/360
7/*2.13*	2344/*34207*	2344/*34207*	F_v	----/----	----/----	----/----	----/----	2274/*33180*
8/*2.44*	2049/*29907*	2049/*29907*	F_v	----/----	----/----	----/----	----/----	1761/*25696*
9/*2.74*	1820/*26563*	1820/*26563*	F_v	----/----	----/----	----/----	----/----	1384/*20199*
10/*3.05*	1637/*23887*	1637/*23887*	F_v	----/----	----/----	----/----	----/----	1102/*16087*
11/*3.35*	1487/*21698*	1487/*21698*	F_v	----/----	----/----	----/----	1339/*19544*	888/*12965*
12/*3.66*	1350/*19702*	1350/*19702*	F_b	----/----	----/----	----/----	1092/*15938*	724/*10561*
13/*3.96*	1148/*16759*	1148/*16759*	F_b	----/----	----/----	----/----	900/*13128*	595/*8688*
14/*4.27*	988/*14424*	988/*14424*	F_b	----/----	----/----	----/----	748/*10913*	494/*7211*
15/*4.57*	859/*12540*	859/*12540*	F_b	----/----	----/----	840/*12261*	627/*9148*	413/*6034*
16/*4.88*	754/*10998*	754/*10998*	F_b	----/----	----/----	710/*10367*	529/*7727*	349/*5087*
17/*5.18*	642/*9363*	666/*9720*	F_b	----/----	----/----	605/*8827*	450/*6572*	296/*4317*
18/*5.49*	513/*7485*	593/*8649*	F_b	----/----	----/----	518/*7566*	386/*5626*	253/*3687*
19/*5.79*	415/*6055*	531/*7743*	F_b	----/----	----/----	447/*6524*	332/*4845*	217/*3166*
20/*6.10*	339/*4950*	478/*6969*	F_b	----/----	468/*6827*	388/*5657*	287/*4194*	187/*2732*
21/*6.40*	280/*4084*	432/*6304*	F_b	----/----	408/*5654*	338/*4930*	250/*3649*	162/*2369*
22/*6.71*	233/*3398*	392/*5726*	F_b	----/----	358/*5218*	296/*4316*	219/*3189*	141/*2062*
23/*7.01*	195/*2847*	358/*5223*	F_b	----/----	315/*4593*	260/*3795*	192/*2798*	123/*1801*
24/*7.32*	165/*2401*	328/*4781*	F_b	----/----	278/*4059*	230/*3350*	169/*2465*	108/*1579*
25/*7.62*	140/*2036*	301/*4391*	F_b	----/----	247/*3600*	203/*2968*	149/*2178*	95/*1388*
26/*7.92*	119/*1736*	277/*4045*	F_b	----/----	220/*3205*	181/*2638*	132/*1931*	84/*1223*
27/*8.23*	102/*1486*	256/*3737*	F_b	----/----	196/*2861*	161/*2352*	118/*1716*	74/*1080*
28/*8.53*	87/*1277*	237/*3461*	F_b	----/----	176/*2562*	144/*2103*	105/*1529*	65/*955*
29/*8.84*	75/*1100*	220/*3214*	F_b	----/----	158/*2300*	129/*1885*	94/*1366*	58/*846*
30/*9.14*	65/*951*	205/*2990*	F_b	----/----	142/*2070*	116/*1693*	84/*1222*	51/*750*
31/*9.45*	56/*823*	191/*2788*	F_b	----/----	128/*1868*	104/*1524*	75/*1095*	46/*666*
32/*9.75*	49/*713*	179/*2605*	F_b	----/----	116/*1688*	94/*1375*	67/*983*	40/*591*
33/*10.06*	42/*619*	167/*2438*	F_b	164/*2389*	105/*1529*	85/*1242*	61/*883*	36/*525*
34/*10.36*	37/*537*	157/*2286*	F_b	149/*2176*	95/*1387*	77/*1123*	54/*794*	32/*465*
35/*10.67*	32/*465*	147/*2146*	F_b	136/*1986*	86/*1260*	70/*1018*	49/*715*	28/*412*

The part weight has been deducted in the above table.

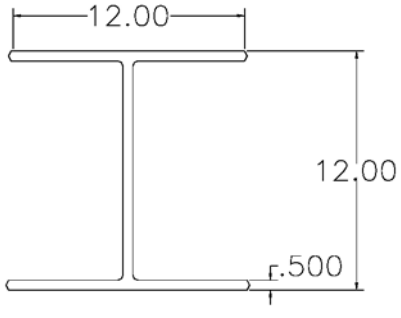
English/ *Metric*

This item is stocked in 20-foot and 25-foot lengths in Polyester Fire Retardant (FR) and Vinylester Fire Retardant (VE).

Other lengths available in mill run quantities.

The mill run on this item is 300 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



4 X 1/8 X 2 X 1/4 RECT TUBE

101.6 X 3.2 X 50.8 X 6.4 RECT TUBE

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 0.44 in.^{2} / *283mm.^{2}*
I = 4.38 in.^{4} / *1823093mm.^{4}*

Wt. = 1.46 lbs./ft. / *2.17kg/m.*
S = 2.19 in.^{3} / *35887mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
5/*1.52*	262/*3824*	F_v	----/----	260/*3794*	217/*3167*	162/*2364*	107/*1562*
6/*1.83*	218/*3181*	F_b	----/----	162/*2364*	135/*1970*	101/*1474*	66/*963*
7/*2.13*	187/*2729*	F_b	161/*2350*	107/*1562*	89/*1299*	66/*963*	43/*628*
8/*2.44*	163/*2379*	F_b	111/*1620*	73/*1065*	61/*890*	45/*657*	29/*423*
9/*2.74*	145/*2116*	F_b	79/*1153*	52/*759*	43/*628*	32/*467*	21/*306*
10/*3.05*	130/*1897*	F_b	58/*846*	38/*555*	32/*467*	23/*336*	15/*219*
11/*3.35*	118/*1722*	F_b	44/*642*	29/*423*	24/*350*	17/*248*	11/*161*
12/*3.66*	99/*1445*	F_b	34/*496*	22/*321*	18/*263*	13/*190*	8/*117*

The part weight has been deducted in the above table.

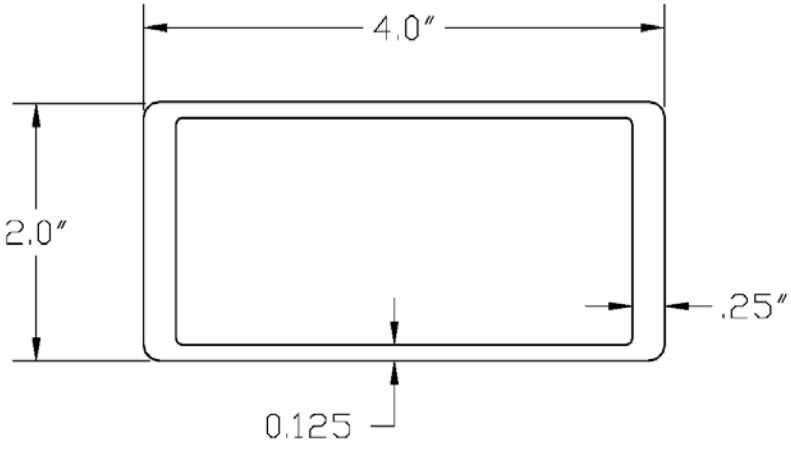
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quanitites.

The mill run on this item is 1200 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



6 X 4 X 1/4 RECT TUBE

152.4 x 101.6 x 6.4 RECT TUBE

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Support

Major Axis

A_w = 2.42 in.^{2} / *1561mm.^{2}*
I = 22.89 in.^{4} / *9527537mm.^{4}*

Wt. = 3.80 lbs./ft. / *5.66 kg/m.*
S = 7.63 in.^{3} / *125033mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
6/*1.83*	1004/*14652*	F_v	----/----	862/*12580*	718/*10478*	537/*7837*	357/*5210*
7/*2.13*	1033/*15076*	F_b	855/*12478*	569/*8304*	473/*6903*	354/*5166*	235/*3430*
8/*2.44*	791/*11544*	F_b	591/*8625*	392/*5721*	326/*4758*	244/*3561*	161/*2350*
9/*2.74*	624/*9107*	F_b	423/*6173*	281/*4101*	233/*3400*	174/*2539*	115/*1678*
10/*3.05*	505/*7370*	F_b	313/*4568*	207/*3021*	172/*2510*	128/*1868*	84/*1226*
11/*3.35*	416/*6071*	F_b	237/*3459*	157/*2291*	130/*1897*	96/*1401*	63/*919*
12/*3.66*	349/*5093*	F_b	184/*2685*	121/*1766*	100/*1459*	74/*1080*	48/*701*
13/*3.96*	297/*4334*	F_b	145/*2116*	95/*1386*	79/*1153*	58/*846*	37/*540*
14/*4.27*	255/*3721*	F_b	116/*1693*	76/*1109*	63/*919*	46/*671*	29/*423*
15/*4.57*	222/*3240*	F_b	94/*1372*	61/*890*	50/*730*	37/*540*	23/*336*
16/*4.88*	195/*2846*	F_b	77/*1124*	50/*730*	41/*598*	30/*438*	18/*263*

Minor Axis

A_w = 1.54 in.^{2} / *993mm.^{2}*
I = 12.09 in.^{4} / *5032237mm.^{4}*

Wt. = 3.80 lbs./ft. / *5.66 kg/m.*
S = 6.05 in.^{3} / *99141mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
6/*1.83*	638/*9311*	F_v	----/----	468/*6830*	389/*5677*	291/*4247*	193/*2817*
7/*2.13*	546/*7968*	F_v	461/*6728*	306/*4466*	254/*3707*	190/*2773*	125/*1824*
8/*2.44*	477/*6961*	F_v	316/*4612*	209/*3050*	174/*2539*	129/*1883*	85/*1240*
9/*2.74*	424/*6188*	F_v	225/*3284*	149/*2175*	123/*1795*	92/*1343*	60/*876*
10/*3.05*	381/*5560*	F_v	166/*2423*	109/*1591*	90/*1313*	67/*978*	43/*628*
11/*3.35*	329/*4801*	F_b	125/*1824*	82/*1197*	68/*992*	50/*730*	32/*467*
12/*3.66*	276/*4028*	F_b	96/*1401*	63/*919*	52/*759*	38/*555*	24/*350*
13/*3.96*	235/*3430*	F_b	75/*1095*	49/*715*	40/*584*	29/*423*	18/*263*
14/*4.27*	202/*2948*	F_b	60/*876*	38/*555*	31/*452*	23/*336*	14/*204*
15/*4.57*	175/*2554*	F_b	48/*701*	31/*452*	25/*365*	18/*263*	10/*146*
16/*4.88*	154/*2247*	F_b	39/*569*	25/*365*	20/*292*	14/*204*	8/*117*

The part weight has been deducted in the above tables

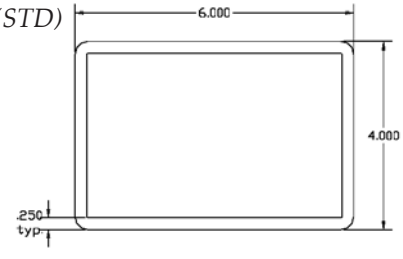
English/*Metric*

This item is stocked in 20-foot and 25-foot lengths in Standard Polyester (STD) and Polyester Fire Retardant (FR).

Other lengths available in mill run quantities.

The mill run on this item is 1,200 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



3 X 1/4 SQUARE TUBE

76.2 x 6.4 SQUARE TUBE

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 1.25 in.^{2} / *806mm.^{2}*
I = 3.50 in.^{4} / *1456810mm.^{4}*

Wt. = 2.07 lbs./ft. / *3.08 kg/m.*
S = 2.33 in.^{3} / *38182mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
4/*1.22*	935/*13645*	F_v	710/*10362*	472/*6888*	393/*5735*	294/*4291*	195/*2846*
5/*1.52*	618/*9019*	F_b	380/*5546*	252/*3678*	210/*3065*	156/*2277*	103/*1503*
6/*1.83*	428/*6246*	F_b	224/*3269*	149/*2175*	123/*1795*	92/*1343*	60/*876*
7/*2.13*	314/*4583*	F_b	142/*2072*	94/*1372*	78/*1138*	58/*846*	37/*540*
8/*2.44*	240/*3503*	F_b	96/*1401*	63/*919*	52/*759*	38/*555*	24/*350*
9/*2.74*	189/*2758*	F_b	67/*978*	43/*628*	36/*525*	26/*379*	16/*234*
10/*3.05*	152/*2218*	F_b	48/*701*	31/*452*	25/*365*	18/*263*	11/*161*
11/*3.35*	125/*1824*	F_b	36/*525*	23/*336*	18/*263*	13/*190*	8/*117*
12/*3.66*	105/*1532*	F_b	27/*394*	17/*248*	14/*204*	9/*131*	5/*73*

The part weight has been deducted in the above table.

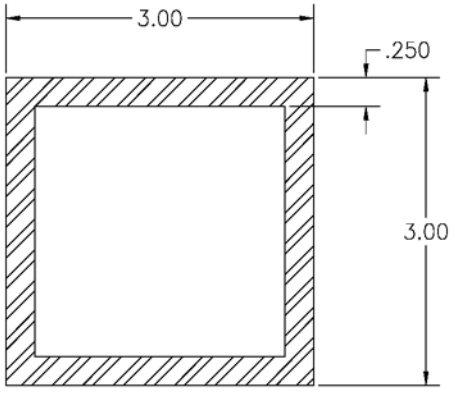
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 800 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



3 1/2 X 1/4 SQUARE TUBE

88.9 x 6.4 SQUARE TUBE

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

A_w = 1.5 in.^{2} / *967mm.^{2}*
I = 5.73 in.^{4} / *2385006mm.^{4}*

Wt. = 2.49 lbs./ft. / *3.71 kg/m.*
S = 3.27 in.^{3} / *53585mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
4/*1.22*	1122/*16374*	F_v	1113/*16243*	741/*10814*	617/*9004*	462/*6742*	307/*4480*
5/*1.52*	869/*12682*	F_b	605/*8829*	402/*5867*	335/*4889*	250/*3649*	166/*2423*
6/*1.83*	602/*8786*	F_b	361/*5268*	240/*3503*	199/*2904*	149/*2175*	98/*1430*
7/*2.13*	442/*6451*	F_b	231/*3741*	153/*2233*	127/*1853*	95/*1386*	62/*905*
8/*2.44*	338/*4933*	F_b	156/*2277*	103/*1503*	85/*1240*	63/*919*	41/*598*
9/*2.74*	266/*3882*	F_b	110/*1605*	72/*1051*	60/*876*	44/*642*	28/*409*
10/*3.05*	215/*3138*	F_b	80/*1168*	52/*759*	43/*628*	32/*467*	20/*292*
11/*3.35*	177/*2583*	F_b	60/*876*	39/*569*	32/*467*	23/*336*	14/*204*
12/*3.66*	148/*2160*	F_b	45/*657*	29/*423*	24/*350*	17/*248*	10/*146*
13/*396*	126/*1839*	F_b	35/*511*	22/*321*	18/*263*	13/*190*	8/*117*
14/*4.27*	108/*1576*	F_b	28/*409*	17/*248*	14/*204*	10/*146*	6/*88*

The part weight has been deducted in the above table.

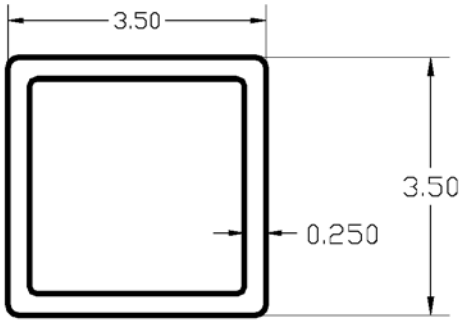
English/ *Metric*

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 800 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



4 X 1/4 SQUARE TUBE

101.6 x 6.4 SQUARE TUBE

ALLOWABLE UNIFORM LOADS (lbs./ft.)

Aw(in^2)=	1.75	Wt.(lbs.)=	2.83
I(in^4)=	8.82	S(in^3)=	4.41

SPAN FEET	LATERALLY SUPPORTED						
	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
4	1310	Fv	-----	1085	903	677	450
5	1047	Fv	900	599	499	373	248
6	814	Fb	543	361	301	225	149
7	597	Fb	351	233	194	144	95
8	456	Fb	238	158	131	98	64
9	360	Fb	169	112	92	69	45
10	291	Fb	123	81	67	50	32
11	240	Fb	93	61	50	37	24
12	201	Fb	71	46	38	28	18
13	171	Fb	56	36	30	21	13
14	147	Fb	44	28	23	17	10

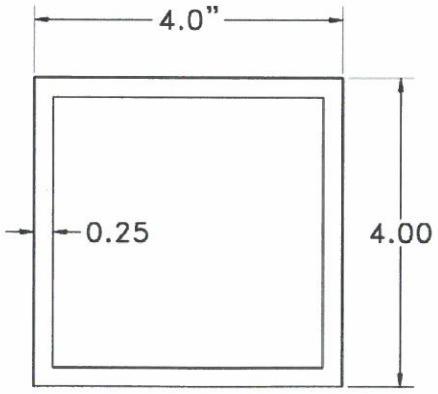
The part weight has been deducted in the above table.

This item is stocked in 20-foot lengths.

Other lengths available in mill run quantities.

The mill run on this item is 700 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



4 X 3/8 SQUARE TUBE

101.6 x 9.5 SQUARE TUBE

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)
Laterally Supported

Aw= 2.44in.^{2} / *1574mm.^{2}*
I = 12.03in.^{4}/*5007264mm.^{4}*

Wt. = 4.24lbs. / *6.31 kg/m.*
S = 6.01in.^{3} / *98486mm.^{3}*

SPAN FT/*m*	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
5/*1.52*	1459/*21293*	F_v	1230/*17951*	818/*11938*	681/*9939*	510/*7443*	338/*4933*
6/*1.83*	1108/*16170*	F_b	742/*10829*	493/*7195*	410/*5984*	306/*4466*	202/*2948*
7/*2.13*	813/*11865*	F_b	478/*6976*	317/*4626*	264/*3853*	196/*2860*	129/*1883*
8/*2.44*	621/*9063*	F_b	325/*4743*	215/*3138*	178/*2598*	132/*1926*	87/*1270*
9/*2.74*	490/*7151*	F_b	230/*3357*	151/*2204*	125/*1824*	93/*1357*	60/*876*
10/*3.05*	396/*5779*	F_b	168/*2452*	110/*1605*	91/*1328*	67/*978*	43/*628*
11/*3.35*	326/*4758*	F_b	126/*1839*	82/*1197*	68/*992*	49/*715*	31/*452*
12/*3.66*	273/*3984*	F_b	96/*1401*	62/*905*	51/*744*	37/*540*	23/*336*
13/*3.96*	232/*3386*	F_b	75/*1095*	48/*701*	39/*569*	28/*409*	17/*248*
14/*4.27*	199/*2904*	F_b	59/*861*	38/*555*	31/*452*	22/*321*	13/*190*
15/*4.57*	173/*2525*	F_b	47/*686*	30/*438*	24/*350*	17/*248*	10/*146*
16/*4.88*	151/*2204*	F_b	38/*555*	24/*350*	19/*277*	13/*190*	7/*102*
17/*5.18*	134/*1956*	F_b	31/*452*	19/*277*	15/*219*	10/*146*	5/*73*
18/*5.49*	119/*1737*	F_b	25/*365*	15/*219*	12/*175*	8/*117*	3/*44*
19/*5.79*	106/*1547*	F_b	21/*306*	12/*175*	9/*131*	6/*88*	2/*29*
20/*6.10*	95/*1386*	F_b	17/*248*	10/*146*	7/*102*	4/*58*	1/*15*

The part weight has been deducted in the above table.

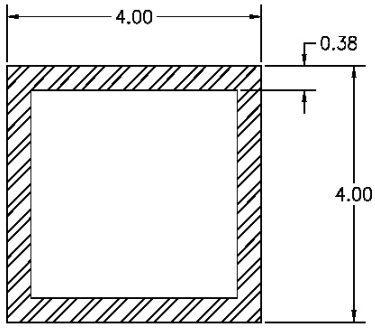
English/ *Metric*

This item is stocked in 20-foot lengths in Standard Polyester (STD) and Polyester Fire Retardant (FR).

Other lengths available in mill run quantities.

The mill run on this item is 700 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



6 X 6 X 3/8 SQUARE TUBE

152.4 x 152.4 x 9.5 SQUARE TUBE

ALLOWABLE UNIFORM LOADS (lbs./ft. / *N/m.*)

Aw(in²/*mm²*)= 1.969 in² / *2535 mm²*
I(in⁴/*mm⁴*) = 22.35 in⁴/*9302772 mm⁴*

Wt.(lbs./*kg/m*) = 6.54 lbs. / *9.73 kg/m*
S(in³/*mm³*) = 7.45 in³ / *122083 mm³*

SPAN FT/*m*	LATERALLY SUPPORTED						
	MAXIMUM LOAD		DEFLECTION				
			L/100	L/150	L/180	L/240	L/360
5/*1.52*	1879/*27428*	Fv	——/——	——/——	——/——	1577/*23009*	1049/*15305*
6/*1.83*	1565/*22839*	Fv	——/——	——/——	1324/*19325*	991/*14469*	659/*9612*
7/*2.13*	1340/*19562*	Fv	——/——	1056/*15416*	879/*12829*	658/*9597*	436/*6364*
8/*2.44*	1172/*17104*	Fv	1103/*16090*	733/*10693*	609/*8894*	455/*6645*	301/*4396*
9/*2.74*	1041/*15192*	Fv	793/*11578*	527/*7685*	438/*6387*	326/*4765*	215/*3142*
10/*3.05*	936/*13663*	Fv	588/*8581*	390/*5686*	324/*4722*	241/*3516*	158/*2310*
11/*3.35*	792/*11563*	Fb	447/*6518*	295/*4311*	245/*3576*	182/*2656*	119/*1737*
12/*3.66*	665/*9700*	Fb	346/*5055*	229/*3336*	189/*2763*	140/*2047*	91/*1330*
13/*3.96*	565/*8250*	Fb	273/*3991*	180/*2626*	149/*2172*	110/*1603*	71/*1035*
14/*4.27*	486/*7099*	Fb	219/*3198*	144/*2098*	119/*1731*	87/*1273*	56/*815*
15/*4.57*	423/*6171*	Fb	178/*2597*	116/*1697*	96/*1397*	70/*1022*	44/*648*
16/*4.88*	371/*5411*	Fb	146/*2132*	95/*1387*	78/*1139*	57/*829*	36/*518*
17/*5.18*	328/*4782*	Fb	121/*1768*	78/*1145*	64/*937*	46/*677*	29/*417*
18/*5.49*	292/*4254*	Fb	101/*1479*	65/*952*	53/*776*	38/*556*	23/*337*
19/*5.79*	261/*3808*	Fb	85/*1246*	55/*796*	44/*647*	31/*459*	19/*272*
20/*6.10*	235/*3426*	Fb	72/*1056*	46/*670*	37/*541*	26/*381*	15/*220*

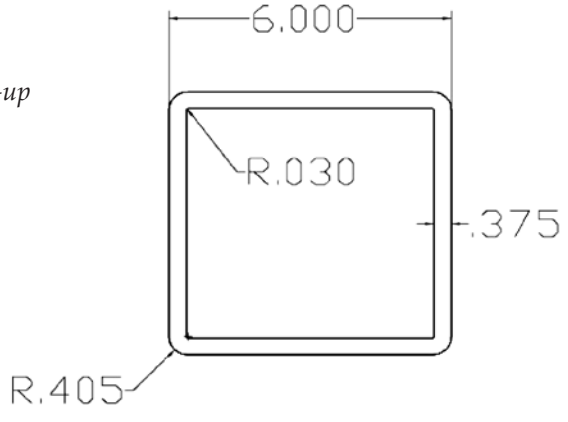
The part weight has been deducted in the above table. English/*Metric*

This item is stocked in 20-foot lengths in Standard Polyester (STD) and Polyester Fire Retardant (FR).

Other lengths available in mill run quantities.

The mill run on this item is 700 feet.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



12″ INTERLOCKING DECKBOARD

Load / Deflection Table

Wt. = 3.01 lbs / *4.48 kg/m.* S = 1.27in^3 / *20811mm^3* I = 1.84 in^4 / *765865mm^4*

U Inches deflection for Uniform Load

C Inches deflection for Concentrated Load

LOAD Lbs/square ft. for Uniform Load or lbs. across width of deck for Concentrated Center load.

SPAN FEET	LOAD	50 lb.	100 lb.	150 lb.	200 lb.	300 lb.	500 lb.	1000 lb.	1500 lb.
2	U	0.006	0.012	0.018	0.024	0.036	0.060	0.120	0.180
	C	0.004	0.008	0.012	0.016	0.024	0.040	0.080	0.119
2.5	U	0.012	0.024	0.037	0.049	0.073	0.122	0.245	
	C	0.007	0.014	0.020	0.027	0.041	0.068	0.136	0.204
3	U	0.023	0.045	0.068	0.091	0.136	0.227	0.453	
	C	0.011	0.022	0.033	0.043	0.065	0.109	0.217	0.326
3.5	U	0.039	0.078	0.117	0.156	0.234	0.389		
	C	0.016	0.033	0.049	0.066	0.098	0.164	0.328	
4	U	0.063	0.126	0.189	0.252	0.378	0.631		
	C	0.024	0.047	0.071	0.094	0.142	0.236	0.472	
4.5	U	0.097	0.195	0.292	0.389	0.584			
	C	0.033	0.066	0.098	0.131	0.197	0.328	0.656	
5	U	0.144	0.289	0.433	0.577				
	C	0.044	0.088	0.133	0.177	0.265	0.442		
5.5	U	0.207	0.414	0.621	0.828				
	C	0.058	0.116	0.174	0.232	0.348	0.580		
6	U	0.288	0.577	0.865	1.154				
	C	0.075	0.149	0.224	0.298	0.447	0.746		

English

U Millimeters deflection for Uniform Load

C Millimeters deflection for Concentrated Load

LOAD Total Newtons uniformly loaded across length of span and width of one deckboard or Total Newtons Concentrated Center load across width of one deckboard.

SPAN METER	*LOAD*	*250*	*500*	*750*	*1000*	*1500*	*2000*	*4000*	*6000*
0.5	*U*	*0.1*	*0.1*	*0.2*	*0.2*	*0.3*	*0.5*	*0.9*	*1.4*
	C	*0.1*	*0.1*	*0.2*	*0.3*	*0.4*	*0.6*	*1.2*	*1.8*
0.75	*U*	*0.1*	*0.3*	*0.4*	*0.5*	*0.8*	*1.1*	*2.2*	*3.2*
	C	*0.2*	*0.4*	*0.6*	*0.7*	*1.1*	*1.5*	*3.0*	*4.5*
1	*U*	*0.3*	*0.5*	*0.8*	*1.1*	*1.6*	*2.2*	*4.3*	*6.5*
	C	*0.4*	*0.8*	*1.2*	*1.6*	*2.4*	*3.1*	*6.3*	
1.25	*U*	*0.5*	*1.0*	*1.4*	*1.9*	*2.9*	*3.9*	*7.7*	*11.6*
	C	*0.7*	*1.4*	*2.2*	*2.9*	*4.3*	*5.8*	*11.6*	
1.5	*U*	*0.8*	*1.6*	*2.4*	*3.2*	*4.7*	*6.3*	*12.6*	*19.0*
	C	*1.2*	*2.4*	*3.6*	*4.8*	*7.2*	*9.6*		
1.75	*U*	*1.2*	*2.4*	*3.6*	*4.9*	*7.3*	*9.7*	*19.4*	
	C	*1.9*	*3.7*	*5.6*	*7.5*	*11.2*	*15.0*		
2	*U*	*1.8*	*3.5*	*5.3*	*7.1*	*10.6*	*14.2*		
	C	*2.8*	*5.5*	*8.3*	*11.0*	*16.6*	*22.1*		

Metric

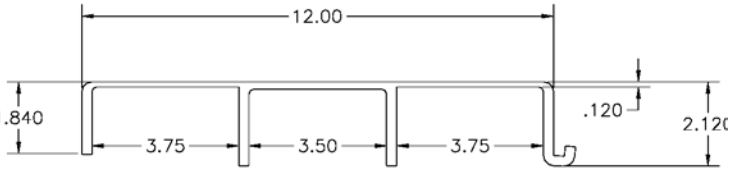
This item is stocked in 20-foot lengths in Polyester Fire Retardant (FR).

Other lengths available in mill run quantities.

The mill run on this item is 600 feet.

Options: Anti-skid Surface (When used as a horizontal walking surface anti-skid surface is necessary) and Vented Surface.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



24" X 1 1/8" INTERLOCKING DECKBOARD

Load / Deflection Table

Wt. = 3.80 lbs / *5.66 kg/m.* S = 0.51in^3 / *8357mm^3* I = 0.44 in^4 / *183142mm^4*

U Inches deflection for Uniform Load

C Inches deflection for Concentrated Load

LOAD Lbs/square ft. for Uniform Load or lbs. across width of deck for Concentrated Center load.

SPAN FEET	LOAD	20 lb.	40 lb.	60 lb.	80 lb.	100 lb.	150 lb.	200 lb.	300 lb.
2	U	0.011	0.022	0.032	0.043	0.054	0.081	0.108	0.161
	C	0.004	0.008	0.012	0.016	0.020	0.030	0.041	0.061
2.5	U	0.025	0.050	0.074	0.099	0.124	0.186	0.248	
	C	0.008	0.015	0.023	0.031	0.038	0.057	0.076	0.114
3	U	0.050	0.100	0.149	0.199	0.249	0.373	0.498	
	C	0.013	0.026	0.039	0.052	0.065	0.097	0.129	0.194
3.5	U	0.090	0.181	0.271	0.361	0.452	0.677		
	C	0.020	0.040	0.061	0.081	0.101	0.152	0.202	0.303
4	U	0.152	0.304	0.456	0.608	0.760			
	C	0.030	0.060	0.090	0.120	0.150	0.225	0.299	0.449
4.5	U	0.241	0.482	0.724	0.965				
	C	0.042	0.085	0.127	0.169	0.212	0.318	0.424	0.636
5	U	0.365	0.730	1.095					
	C	0.058	0.116	0.174	0.231	0.289	0.434	0.579	
5.5	U	0.532	1.064	1.596					
	C	0.077	0.154	0.230	0.307	0.384	0.576	0.768	
6	U	0.750	1.501						
	C	0.099	0.199	0.298	0.398	0.497	0.746		

English

U Millimeters deflection for Uniform Load

C Millimeters deflection for Concentrated Load

LOAD Total Newtons uniformly loaded across length of span and width of one deckboard or Total Newtons Concentrated Center load across width of one deckboard.

SPAN METER	*LOAD*	*250*	*500*	*750*	*1000*	*1500*	*2000*	*4000*	*5000*
0.5	*U*	*0.1*	*0.2*	*0.3*	*0.5*	*0.7*	*0.9*	*1.8*	*2.3*
	C	*0.2*	*0.3*	*0.5*	*0.7*	*1.0*	*1.3*	*2.7*	*3.4*
0.75	*U*	*0.3*	*0.7*	*1.0*	*1.4*	*2.0*	*2.7*	*5.4*	*6.8*
	C	*0.5*	*1.0*	*1.6*	*2.1*	*3.1*	*4.2*	*8.3*	*10.4*
1	*U*	*0.8*	*1.5*	*2.3*	*3.1*	*4.6*	*6.1*	*12.2*	
	C	*1.2*	*2.4*	*3.6*	*4.8*	*7.2*	*9.6*		
1.25	*U*	*1.5*	*2.9*	*4.4*	*5.8*	*8.8*	*11.7*		
	C	*2.3*	*4.6*	*6.9*	*9.2*	*13.8*			
1.5	*U*	*2.5*	*5.0*	*7.5*	*10.0*	*14.9*	*19.9*		
	C	*3.9*	*7.9*	*11.8*	*15.8*				
1.75	*U*	*3.9*	*7.8*	*11.8*	*15.7*	*23.5*			
	C	*6.2*	*12.5*	*18.7*					
2	*U*	*5.8*	*11.7*	*17.5*	*23.3*				
	C	*9.3*	*18.5*	*27.8*					

Metric

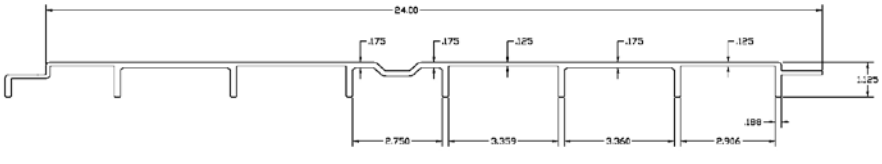
This item is stocked in 20-foot lengths in Polyester Fire Retardant (FR).

Other lengths available in mill run quantities.

The mill run on this item is 600 feet.

Options: Anti-skid Surface (When used as a horizontal walking surface anti-skid surface is necessary) and Vented Surface.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



24" X 1 1/2" INTERLOCKING DECKBOARD

Load / Deflection Table

Wt. = 4.71 lbs / *7.02 kg/m.* S = 0.88in^3 / *14421mm^3* I = 1.03 in^4 / *428718mm^4*

U Inches deflection for Uniform Load

C Inches deflection for Concentrated Load

LOAD Lbs/square ft. for Uniform Load or lbs. across width of deck for Concentrated Center load.

SPAN FEET	LOAD	20 lb.	40 lb.	60 lb.	80 lb.	100 lb.	150 lb.	200 lb.	300 lb.
2	U	0.005	0.010	0.015	0.020	0.025	0.038	0.051	0.076
	C	0.002	0.004	0.006	0.007	0.009	0.014	0.019	0.028
2.5	U	0.011	0.023	0.034	0.045	0.057	0.085	0.114	0.171
	C	0.003	0.007	0.010	0.014	0.017	0.026	0.034	0.051
3	U	0.022	0.045	0.067	0.089	0.112	0.168	0.224	0.336
	C	0.006	0.011	0.017	0.023	0.028	0.043	0.057	0.085
3.5	U	0.040	0.080	0.120	0.160	0.200	0.301	0.401	
	C	0.009	0.018	0.027	0.035	0.044	0.066	0.089	0.133
4	U	0.067	0.134	0.201	0.268	0.335	0.502	0.669	
	C	0.013	0.026	0.039	0.052	0.065	0.098	0.130	0.196
4.5	U	0.106	0.211	0.317	0.422	0.528			
	C	0.018	0.037	0.055	0.074	0.092	0.138	0.184	0.276
5	U	0.159	0.318	0.477	0.636				
	C	0.025	0.050	0.075	0.100	0.125	0.188	0.250	0.375
5.5	U	0.231	0.462	0.693					
	C	0.033	0.066	0.099	0.133	0.166	0.249	0.331	0.497
6	U	0.325	0.650						
	C	0.043	0.086	0.129	0.171	0.214	0.321	0.429	0.643

English

U Millimeters deflection for Uniform Load

C Millimeters deflection for Concentrated Load

LOAD Total Newtons uniformly loaded across length of span and width of one deckboard or Total Newtons Concentrated Center load across width of one deckboard.

SPAN METER	*LOAD*	*250*	*500*	*750*	*1000*	*1500*	*2000*	*4000*	*5000*
0.5	*U*	*0.1*	*0.1*	*0.2*	*0.2*	*0.3*	*0.4*	*0.9*	*1.1*
	C	*0.1*	*0.2*	*0.2*	*0.3*	*0.5*	*0.6*	*1.3*	*1.6*
0.75	*U*	*0.2*	*0.3*	*0.5*	*0.6*	*0.9*	*1.2*	*2.5*	*3.1*
	C	*0.2*	*0.5*	*0.7*	*0.9*	*1.4*	*1.9*	*3.7*	*4.7*
1	*U*	*0.3*	*0.7*	*1.0*	*1.4*	*2.0*	*2.7*	*5.5*	*6.8*
	C	*0.5*	*1.1*	*1.6*	*2.1*	*3.2*	*4.2*	*8.4*	
1.25	*U*	*0.6*	*1.3*	*1.9*	*2.6*	*3.9*	*5.1*	*10.3*	*12.8*
	C	*1.0*	*2.0*	*3.0*	*4.0*	*6.0*	*8.0*		
1.5	*U*	*1.1*	*2.2*	*3.3*	*4.3*	*6.5*	*8.7*	*17.4*	
	C	*1.7*	*3.4*	*5.1*	*6.8*	*10.2*	*13.6*		
1.75	*U*	*1.7*	*3.4*	*5.1*	*6.8*	*10.2*	*13.6*		
	C	*2.7*	*5.4*	*8.1*	*10.7*	*16.1*	*21.5*		
2	*U*	*2.5*	*5.0*	*7.6*	*10.1*	*15.1*			
	C	*4.0*	*8.0*	*12.0*	*15.9*	*23.9*			

Metric

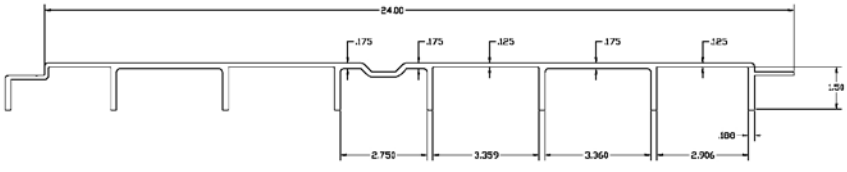
This item is stocked in 20-foot lengths in Polyester Fire Retardant (FR).

Other lengths available in mill run quantities.

The mill run on this item is 600 feet.

Options: Anti-skid Surface (When used as a horizontal walking surface anti-skid surface is necessary) and Vented Surface.

Orders for less than mill run quantities will be subject to set-up charges as well as premium per foot cost.



FLAT SHEETS

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1/4" FLAT SHEET

6.35mm. FLAT SHEET

LOAD/DEFLECTION TABLE

SPAN Lengthwise direction of the Flat Sheet
For span in the crosswise direction of the Flat Sheet multiply Load by .55
Maximum Loads shown are for deflections of the lesser of t/2 or L/100

SPAN FEET	LOAD	20	40	60	80	100	108	120	140	160	174
1	U	0.014	0.029	0.043	0.058	0.072	0.078	0.086	0.101	0.115	0.125
	C	0.023	0.046	0.070	0.093	0.116	0.125				
1.5	LOAD	10	20	30	32	35					
	U	0.036	0.073	0.109	0.116	0.127					
	C	0.039	0.078	0.118	0.125						
2	LOAD	5	10	11	14						
	U	0.058	0.115	0.127							
	C	0.046	0.093	0.102	0.130						

English

LOAD Lbs./Sq. Ft. for Uniform Load or Lbs./Ft. of Width for Concentrated Center Load
U Inches Deflection for Uniform Load
C Inches Deflection for Concentrated Load

SPAN METER	*LOAD*	*200*	*300*	*400*	*500*	*750*	*1000*	*1200*			
0.5	*U*	*0.55*	*0.83*	*1.10*	*1.38*	*2.07*	*2.76*	*3.31*			
	C	*1.78*	*2.68*	*3.57*							
0.75	*LOAD*	*100*	*125*	*200*	*250*						
	U	*1.40*	*1.75*	*2.80*	*3.49*						
	C	*3.01*	*3.76*								
1	*LOAD*	*50*	*75*								
	U	*2.21*	*3.31*								
	C	*3.57*									

Metric

LOAD N/m.^{2} for Uniform Load or N/m. of Width for Concentrated Center Load
U mm. Deflection for Uniform Load
C mm. Deflection for Concentrated Load

3/8" FLAT SHEET

LOAD/DEFLECTION TABLE

SPAN Lengthwise direction of the Flat Sheet
For span in the crosswise direction of the Flat Sheet multiply Load by .70
Maximum Loads shown are for deflections of the lesser of t/2 or L/100

SPAN FEET	LOAD	20	40	100	150	200	250	300	350	400	500	550	700	800	885
1	U	0.004	0.009	0.021	0.032	0.043	0.053	0.064	0.075	0.085	0.106	0.117	0.149	0.170	0.188
	C	0.007	0.014	0.034	0.052	0.069	0.086	0.103	0.120	0.138	0.172	0.189			
1.5	LOAD	20	40	60	80	100	120	140	162	170	174				
	U	0.022	0.043	0.065	0.086	0.108	0.129	0.151	0.175	0.183	0.188				
	C	0.023	0.046	0.070	0.093	0.116	0.139	0.163	0.188						
2	LOAD	10	20	30	40	50	55	60	68						
	U	0.034	0.068	0.102	0.136	0.170	0.187								
	C	0.028	0.055	0.083	0.110	0.138	0.151	0.165	0.187						
2.5	LOAD	10	20	23	30	35									
	U	0.083	0.166	0.191											
	C	0.054	0.108	0.124	0.161	0.188									
3	LOAD	10	11	20											
	U	0.173	0.190												
	C	0.093	0.102	0.186											

English

LOAD Lbs./Sq. Ft. for Uniform Load or Lbs./Ft. of Width for Concentrated Center Load
U Inches Deflection for Uniform Load
C Inches Deflection for Concentrated Load

SPAN METER	*LOAD*	*500*	*1000*	*2000*	*4000*	*6000*	*9500*	*15000*	*20000*	*30000*	*40000*	*60000*
0.5	*U*	*0.03*	*0.05*	*0.10*	*0.20*	*0.31*	*0.49*	*0.77*	*1.02*	*1.53*	*2.05*	*3.07*
	C	*0.17*	*0.33*	*0.66*	*1.32*	*1.98*	*3.14*					
0.75	*LOAD*	*200*	*500*	*1000*	*1500*	*1800*	*3000*	*4000*	*5000*	*6000*		
	U	*0.16*	*0.41*	*0.82*	*1.23*	*1.47*	*2.45*	*3.27*	*4.09*	*4.91*		
	C	*0.53*	*1.32*	*2.64*	*3.97*	*4.76*						
1	*LOAD*	*100*	*200*	*400*	*550*	*600*	*800*	*1000*	*1200*			
	U	*0.41*	*0.83*	*1.66*	*2.28*	*2.49*	*3.31*	*4.14*	*4.97*			
	C	*0.89*	*1.78*	*3.57*	*4.91*							
0.75	*LOAD*	*100*	*200*	*225*	*300*	*360*						
	U	*1.31*	*2.62*	*2.95*	*3.93*	*4.71*						
	C	*2.11*	*4.23*	*4.76*								
1	*LOAD*	*50*	*100*	*120*	*150*							
	U	*1.60*	*3.20*	*3.84*	*4.79*							
	C	*2.07*	*4.13*	*4.96*								

Metric

LOAD N/m.^{2} for Uniform Load or N/m. of Width for Concentrated Center Load
U mm. Deflection for Uniform Load
C mm. Deflection for Concentrated Load

1/2" FLAT SHEET

12.7mm. FLAT SHEET

LOAD/DEFLECTION TABLE

SPAN Lengthwise direction of the Flat Sheet
For span in the crosswise direction of the Flat Sheet multiply Load by .70
Maximum Loads shown are for deflections of the lesser of t/2 or L/100

SPAN FEET	LOAD	50	100	200	300	400	500	600	700	800	825	1000	1200	1340
1	U	0.004	0.009	0.018	0.027	0.036	0.045	0.054	0.063	0.072	0.074	0.090	0.108	0.120
	C	0.007	0.015	0.029	0.044	0.058	0.073	0.087	0.102	0.116	0.120			
1.5	LOAD	50	100	150	200	250	300	350	384	400	414			
	U	0.023	0.045	0.068	0.091	0.114	0.136	0.159	0.175	0.182	0.188			
	C	0.024	0.049	0.073	0.098	0.122	0.147	0.171	0.188					
2	LOAD	20	30	40	50	100	150	174	200	215				
	U	0.029	0.043	0.058	0.072	0.144	0.216	0.250						
	C	0.023	0.035	0.046	0.058	0.116	0.174	0.202	0.232	0.250				
2.5	LOAD	20	30	50	60	70	72	80	100	110				
	U	0.070	0.105	0.176	0.211	0.246	0.253							
	C	0.045	0.068	0.113	0.136	0.159	0.163	0.181	0.227	0.249				
3	LOAD	10	20	30	35	50	60	64						
	U	0.073	0.146	0.218	0.255									
	C	0.039	0.078	0.118	0.137	0.196	0.235	0.251						
3.5	LOAD	10	19	40										
	U	0.135	0.256											
	C	0.062	0.118	0.249										
4	LOAD	10	11	20	27									
	U	0.230	0.253											
	C	0.093	0.102	0.186	0.251									

English

LOAD Lbs./Sq. Ft. for Uniform Load or Lbs./Ft. of Width for Concentrated Center Load
U Inches Deflection for Uniform Load
C Inches Deflection for Concentrated Load

SPAN METER	*LOAD*	*5000*	*10000*	*20000*	*30000*	*40000*	*50000*	*60000*	*70000*	*80000*	*90000*	*100000*
0.25	*U*	*0.02*	*0.11*	*0.22*	*0.43*	*0.86*	*1.08*	*1.29*	*1.51*	*1.73*	*1.94*	*1.94*
	C	*0.14*	*0.70*	*1.39*	*2.79*							
0.5	*LOAD*	*1000*	*2000*	*4000*	*4500*	*6000*	*7000*	*8000*	*9000*	*10000*	*12000*	*15000*
	U	*0.35*	*0.69*	*1.38*	*1.55*	*2.07*	*2.42*	*2.76*	*3.11*	*3.45*	*4.14*	*5.18*
	C	*1.12*	*2.23*	*4.46*	*5.02*							
0.75	*LOAD*	*500*	*1000*	*1500*	*1700*	*2000*	*2500*	*3000*	*3500*	*3650*		
	U	*0.87*	*1.75*	*2.62*	*2.97*	*3.49*	*4.37*	*5.24*	*6.12*	*6.38*		
	C	*1.88*	*3.76*	*5.65*	*6.40*							
1	*LOAD*	*200*	*300*	*500*	*715*	*800*	*900*	*1000*	*1100*	*1150*		
	U	*1.10*	*1.66*	*2.76*	*3.95*	*4.42*	*4.97*	*5.52*	*6.07*	*6.35*		
	C	*1.78*	*2.68*	*4.46*	*6.38*							
1.25	*LOAD*	*50*	*100*	*200*	*300*	*370*	*400*	*475*				
	U	*0.67*	*1.35*	*2.70*	*4.04*	*4.99*	*5.39*	*6.40*				
	C	*0.87*	*1.74*	*3.48*	*5.23*	*6.45*						

Metric

LOAD N/m.^{2} for Uniform Load or N/m. of Width for Concentrated Center Load
U mm. Deflection for Uniform Load
C mm. Deflection for Concentrated Load

5/8" FLAT SHEET

15.9mm. FLAT SHEET

LOAD/DEFLECTION TABLE

SPAN Lengthwise direction of the Flat Sheet
For span in the crosswise direction of the Flat Sheet multiply Load by .70
Maximum Loads shown are for deflections of the lesser of t/2 or L/100

SPAN FEET	LOAD	50	100	200	400	600	800	1000	1200	1500	1610	2000	2300	2600
1	U	0.002	0.005	0.009	0.018	0.028	0.037	0.046	0.055	0.069	0.074	0.092	0.106	0.120
	C	0.004	0.007	0.015	0.030	0.045	0.059	0.074	0.089	0.111	0.120			
1.5	LOAD	50	100	200	300	400	500	600	700	716	774			
	U	0.012	0.023	0.047	0.070	0.093	0.116	0.140	0.163	0.167	0.180			
	C	0.013	0.025	0.050	0.075	0.100	0.125	0.150	0.176	0.180				
2	LOAD	50	100	150	200	250	300	326	403					
	U	0.037	0.074	0.110	0.147	0.184	0.221	0.240						
	C	0.030	0.059	0.089	0.119	0.149	0.178	0.194	0.240					
2.5	LOAD	20	40	60	80	100	150	167	200	258				
	U	0.036	0.072	0.108	0.144	0.180	0.270	0.300						
	C	0.023	0.046	0.070	0.093	0.116	0.174	0.194	0.232	0.300				
3	LOAD	20	40	60	80	84	100	156						
	U	0.075	0.149	0.224	0.298	0.313								
	C	0.040	0.080	0.120	0.161	0.169	0.201	0.313						
3.5	LOAD	10	20	30	40	45	75	98						
	U	0.069	0.138	0.207	0.276	0.311								
	C	0.032	0.064	0.096	0.127	0.143	0.239	0.312						
4	LOAD	10	20	27	40	50	66							
	U	0.118	0.236	0.318										
	C	0.048	0.095	0.128	0.190	0.238	0.314							
4.5	LOAD	10	16	30	46									
	U	0.189	0.302											
	C	0.068	0.108	0.203	0.312									
5	LOAD	10	11	20	33									
	U	0.288	0.316											
	C	0.093	0.102	0.186	0.307									

English

LOAD Lbs./Sq. Ft. for Uniform Load or Lbs./Ft. of Width for Concentrated Center Load
U Inches Deflection for Uniform Load C Inches Deflection for Concentrated Load

SPAN METER	*LOAD*	*5000*	*10000*	*15000*	*20000*	*30000*	*35000*	*40000*	*50000*	*100000*	*200000*	*230000*
0.25	*U*	*0.06*	*0.11*	*0.17*	*0.22*	*0.33*	*0.39*	*0.44*	*0.55*	*1.10*	*2.21*	*2.54*
	C	*0.36*	*0.71*	*1.07*	*1.43*	*2.14*	*2.50*					
0.5	*LOAD*	*1000*	*2000*	*4000*	*6000*	*8800*	*10000*	*15000*	*20000*	*25000*	*28000*	
	U	*0.18*	*0.35*	*0.71*	*1.06*	*1.56*	*1.77*	*2.65*	*3.53*	*4.42*	*4.95*	
	C	*0.57*	*1.14*	*2.28*	*3.43*	*5.02*						
0.75	*LOAD*	*1000*	*2000*	*3000*	*3900*	*5000*	*6000*	*7000*	*8400*			
	U	*0.89*	*1.79*	*2.68*	*3.49*	*4.47*	*5.37*	*6.26*	*7.52*			
	C	*1.93*	*3.85*	*5.78*	*7.52*							
1	*LOAD*	*500*	*600*	*800*	*1000*	*1500*	*1650*	*2000*	*2500*	*2700*		
	U	*1.41*	*1.70*	*2.26*	*2.83*	*4.24*	*4.67*	*5.66*	*7.07*	*7.63*		
	C	*2.28*	*2.74*	*3.65*	*4.57*	*6.85*	*7.54*					
1.25	*LOAD*	*200*	*400*	*600*	*800*	*850*	*1000*	*1100*				
	U	*1.38*	*2.76*	*4.14*	*5.52*	*5.87*	*6.90*	*7.59*				
	C	*1.78*	*3.57*	*5.35*	*7.14*	*7.58*						
1.5	*LOAD*	*200*	*300*	*400*	*500*	*530*						
	U	*2.86*	*4.29*	*5.73*	*7.16*	*7.59*						
	C	*3.08*	*4.62*	*6.17*	*7.71*							
1.75	*LOAD*	*200*	*300*	*310*								
	U	*5.30*	*7.96*									
	C	*4.90*	*7.34*	*7.59*								

Metric

LOAD N/m.^{2} for Uniform Load or N/m. of Width for Concentrated Center Load
U mm. Deflection for Uniform Load C mm. Deflection for Concentrated Load

3/4" FLAT SHEET

19.0mm. FLAT SHEET

LOAD/DEFLECTION TABLE

SPAN Lengthwise direction of the Flat Sheet
For span in the crosswise direction of the Flat Sheet multiply Load by .70
Maximum Loads shown are for deflections of the lesser of t/2 or L/100

SPAN FEET	LOAD	100	200	300	400	800	1000	1000	1500	2000	3000	3500	4000	4500
1	U	0.003	0.005	0.008	0.011	0.021	0.027	0.027	0.040	0.053	0.080	0.093	0.106	0.120
	C	0.004	0.009	0.013	0.017	0.034	0.043	0.043	0.065	0.086	0.129			
1.5	LOAD	100	200	300	500	600	700	800	900	1000	1200	1300	1400	
	U	0.013	0.027	0.040	0.067	0.081	0.094	0.108	0.121	0.135	0.162	0.175	0.189	
	C	0.015	0.029	0.044	0.073	0.087	0.102	0.116	0.131	0.145	0.174	0.189		
2	LOAD	50	100	150	200	250	300	350	400	500	588	700	726	
	U	0.021	0.043	0.064	0.085	0.106	0.128	0.149	0.170	0.213	0.250			
	C	0.017	0.034	0.052	0.069	0.086	0.103	0.120	0.138	0.172	0.202	0.241	0.250	
2.5	LOAD	50	100	150	200	250	288	300	350	400	446			
	U	0.052	0.104	0.156	0.208	0.260	0.300							
	C	0.034	0.067	0.101	0.134	0.168	0.194	0.202	0.235	0.269	0.300			
3	LOAD	25	50	100	150	167	200	250	310					
	U	0.054	0.108	0.216	0.323	0.360								
	C	0.029	0.058	0.116	0.174	0.194	0.232	0.290	0.360					
3.5	LOAD	25	50	75	94	100	150	204						
	U	0.100	0.200	0.300	0.376									
	C	0.046	0.092	0.138	0.173	0.184	0.277	0.376						
4	LOAD	20	30	40	55	75	100	136						
	U	0.136	0.204	0.273	0.375									
	C	0.055	0.083	0.110	0.151	0.206	0.275	0.374						
4.5	LOAD	10	20	35	50	75	96							
	U	0.109	0.218	0.382										
	C	0.039	0.078	0.137	0.196	0.294	0.376							
5	LOAD	10	20	23	50	70								
	U	0.166	0.333	0.383										
	C	0.054	0.108	0.124	0.269	0.376								

English

LOAD Lbs./Sq. Ft. for Uniform Load or Lbs./Ft. of Width for Concentrated Center Load
U Inches Deflection for Uniform Load C Inches Deflection for Concentrated Load

SPAN METER	*LOAD*	*5000*	*10000*	*20000*	*30000*	*40000*	*50000*	*61000*	*100000*	*150000*	*200000*
0.25	*U*	*0.03*	*0.06*	*0.13*	*0.19*	*0.26*	*0.32*	*0.39*	*0.64*	*0.96*	*1.28*
	C	*0.21*	*0.41*	*0.83*	*1.24*	*1.65*	*2.07*	*2.52*			
0.5	*LOAD*	*1000*	*2000*	*5000*	*8000*	*10000*	*12000*	*15000*	*20000*	*25000*	*30000*
	U	*0.10*	*0.20*	*0.51*	*0.82*	*1.02*	*1.23*	*1.53*	*2.05*	*2.56*	*3.07*
	C	*0.33*	*0.66*	*1.65*	*2.64*	*3.30*	*3.97*	*4.96*	*6.61*	*8.26*	*9.91*
0.75	*LOAD*	*1000*	*2000*	*3000*	*4000*	*5000*	*6000*	*6800*	*8000*	*10000*	*12000*
	U	*0.52*	*1.04*	*1.55*	*2.07*	*2.59*	*3.11*	*3.52*	*4.14*	*5.18*	*6.21*
	C	*1.12*	*2.23*	*3.35*	*4.46*	*5.58*	*6.69*	*7.58*			
1	*LOAD*	*1000*	*2000*	*2500*	*3000*	*3600*	*4000*	*4500*	*5000*	*5500*	*5900*
	U	*1.64*	*3.27*	*4.09*	*4.91*	*5.89*	*6.55*	*7.36*	*8.18*	*9.00*	*9.65*
	C	*2.64*	*5.29*	*6.61*	*7.93*	*9.52*					
1.25	*LOAD*	*1000*	*1200*	*1500*	*1850*	*2000*	*2200*	*2300*	*2400*		
	U	*3.99*	*4.79*	*5.99*	*7.39*	*7.99*	*8.79*	*9.19*	*9.59*		
	C	*5.16*	*6.20*	*7.74*	*9.55*						
1.5	*LOAD*	*400*	*600*	*700*	*800*	*900*	*1000*	*1150*			
	U	*3.31*	*4.97*	*5.80*	*6.63*	*7.46*	*8.28*	*9.53*			
	C	*3.57*	*5.35*	*6.24*	*7.14*	*8.03*	*8.92*	*10.26*			

Metric

LOAD N/m.^{2} for Uniform Load or N/m. of Width for Concentrated Center Load
U mm. Deflection for Uniform Load C mm. Deflection for Concentrated Load

1" FLAT SHEET

25.4mm. FLAT SHEET

LOAD/DEFLECTION TABLE

SPAN Lengthwise direction of the Flat Sheet

For span in the crosswise direction of the Flat Sheet multiply Load by .70

Maximum Loads shown are for deflections of the lesser of t/2 or L/100

SPAN FEET	LOAD	100	200	500	800	1000	2000	3000	4000	5000	6640	8000	9000	10720
1	U	0.001	0.002	0.006	0.009	0.011	0.022	0.034	0.045	0.056	0.075	0.090	0.101	0.120
	C	0.002	0.004	0.009	0.015	0.018	0.036	0.054	0.073	0.091	0.120			
1.5	LOAD	100	200	300	400	500	750	1000	1500	2000	2500	3000	3075	3315
	U	0.006	0.011	0.017	0.023	0.028	0.043	0.057	0.085	0.114	0.142	0.171	0.175	0.188
	C	0.006	0.012	0.018	0.024	0.031	0.046	0.061	0.092	0.122	0.153	0.184	0.188	
2	LOAD	50	100	200	300	400	500	600	800	1000	1335	1500	1650	
	U	0.009	0.018	0.036	0.054	0.072	0.090	0.108	0.144	0.180	0.240			
	C	0.007	0.015	0.029	0.044	0.058	0.073	0.087	0.116	0.145	0.194	0.218	0.240	
2.5	LOAD	50	100	200	300	400	500	600	684	800	900	1057		
	U	0.022	0.044	0.088	0.132	0.176	0.219	0.263	0.300					
	C	0.014	0.028	0.057	0.085	0.113	0.142	0.170	0.194	0.227	0.255	0.300		
3	LOAD	50	100	200	300	396	500	600	735					
	U	0.045	0.091	0.182	0.273	0.360								
	C	0.024	0.049	0.098	0.147	0.194	0.245	0.294	0.360					
3.5	LOAD	50	100	200	249	300	400	540						
	U	0.084	0.169	0.337	0.420									
	C	0.039	0.078	0.156	0.194	0.233	0.311	0.420						
4	LOAD	50	100	167	300	350	413							
	U	0.144	0.288	0.480										
	C	0.058	0.116	0.194	0.348	0.406	0.480							
4.5	LOAD	25	50	109	200	302								
	U	0.115	0.230	0.502										
	C	0.041	0.083	0.180	0.331	0.499								
5	LOAD	25	50	71	100	220								
	U	0.176	0.351	0.498										
	C	0.057	0.113	0.161	0.227	0.499								

English

LOAD Lbs./Sq. Ft. for Uniform Load or Lbs./Ft. of Width for Concentrated Center Load

U Inches Deflection for Uniform Load C Inches Deflection for Concentrated Load

SPAN METER	*LOAD*	*100*	*200*	*500*	*800*	*1000*	*2000*	*3000*	*4000*	*5000*	*6640*	*8000*
0.5	*U*	*0.22*	*0.43*	*0.65*	*0.86*	*1.08*	*1.29*	*1.55*	*2.16*	*3.24*	*4.31*	*5.00*
	C	*0.70*	*1.39*	*2.09*	*2.79*	*3.48*	*4.18*	*5.02*				
0.75	*LOAD*	*1000*	*5000*	*7500*	*10000*	*15000*	*16000*	*20000*	*25000*	*30000*	*34500*	
	U	*0.22*	*1.09*	*1.64*	*2.18*	*3.28*	*3.49*	*4.37*	*5.46*	*6.55*	*7.54*	
	C	*0.47*	*2.35*	*3.53*	*4.70*	*7.06*	*7.53*					
1	*LOAD*	*1000*	*2000*	*5000*	*7500*	*9000*	*10000*	*12000*	*14000*	*14500*		
	U	*0.69*	*1.38*	*3.45*	*5.18*	*6.21*	*6.90*	*8.28*	*9.66*	*10.01*		
	C	*1.12*	*2.23*	*5.58*	*8.36*	*10.04*						
1.25	*LOAD*	*1000*	*2000*	*3000*	*4000*	*5000*	*6000*	*7000*	*7500*			
	U	*1.69*	*3.37*	*5.06*	*6.74*	*8.43*	*10.11*	*11.80*	*12.64*			
	C	*2.18*	*4.36*	*6.53*	*8.71*	*10.89*	*13.07*					
1.5	*LOAD*	*1000*	*2000*	*3000*	*3400*	*3600*						
	U	*3.49*	*6.99*	*10.48*	*11.88*	*12.58*						
	C	*3.76*	*7.53*	*11.29*	*12.80*							
1.75	*LOAD*	*1000*	*1500*	*2000*	*2100*							
	U	*6.47*	*9.71*	*12.95*								
	C	*5.98*	*8.96*	*11.95*	*12.55*							
2	*LOAD*	*1000*	*1150*	*1450*								
	U	*11.05*	*12.70*	*16.02*								
	C	*8.92*	*10.26*	*12.94*								

Metric

LOAD N/m.^{2} for Uniform Load or N/m. of Width for Concentrated Center Load

U mm. Deflection for Uniform Load C mm. Deflection for Concentrated Load

COLUMNS

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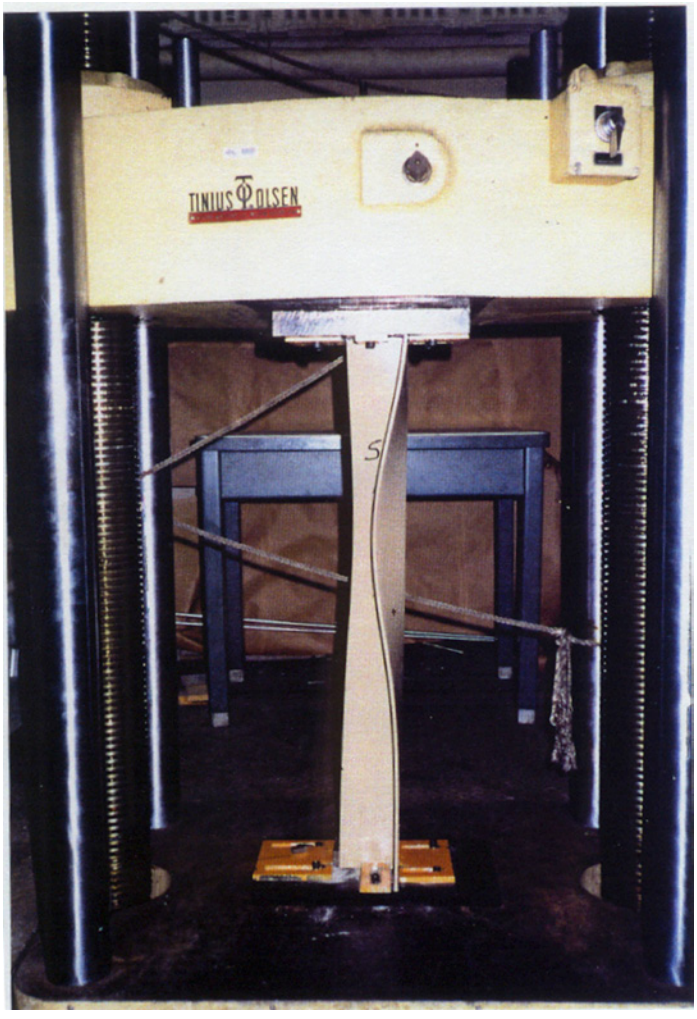

Full section column testing was conducted on Bedford Reinforced Plastics' Equal Leg Angles, I-Beams, H-Beams, and Square Tubes.

Ultimate stress vs. slenderness ratio curves were developed from the testing. The curves developed are based on the Euler Buckling Stress Equation $\left[\pi^2 E / \left(\frac{K}{r}\right)^2\right]$ and a straight line transition from Euler Buckling to ultimate stress.
The allowable concentric axial load tables were generated from these curves.

The tables are based on a safety factor of three.

COLUMN TABLES

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

Notation

A area (in.^{2} / *mm.*^{2})

b width of flange/leg/wall (in. / *mm.*)

t thickness of flange (in. / *mm.*)

r minimum radius gyration (in. / *mm.*)

l length (in. / m.)

K effective column length factor

F_a allowable column concentric axial stress (psi / *MPa*)

P_a allowable column centric axial load (lbs. / *N.*)

Angle

Maximum allowable stress:

b/t = 6	6,000 psi / *41.3MPa*
b/t = 8	4,862 psi / *33.5MPa*
b/t = 10.7	3,501 psi / *24.1MPa*
b/t = 12	2,833 psi / *19.5MPa*
b/t = 16	1,833 psi / *12.6MPa*

WF- & I-Beam

Maximum allowable stress:

b/t ≤ 12	10,000 psi / *68.9MPa*
b/t = 13.3	10,000 psi / *68.9MPa*
b/t = 16	7,318 psi / *50.5MPa*
b/t = 20	*4,684* psi / *32.3MPa*
b/t = 21.3	4,117 psi / *28.4MPa*
b/t = 24	3,253 psi / *22.4MPa*
b/t = 26.7	2,635 psi / *18.1MPa*

Square Tube (1/4" wall)

Maximum allowable stress:

b/t ≤ 16	10,000 psi / *68.9MPa*

2 X 2 X 1/4 ANGLE

50.8 x 50.8 x 6.4 ANGLE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = .92 in.^{2} / *593.5mm.^{2}*
r = .38 in. / *9.65mm.*
b/t = 8

Effective Length (ft. / *m*)	$\frac{Kl}{r}$	F_a (psi/*kPa*)	P_a (lbs./*N*)
1.00/*0.30*	31.6	3511/*24207*	3230/*14368*
1.50/*0.46*	47.4	2835/*19550*	2609/*11604*
2.00/*0.61*	63.2	2160/*14892*	1987/*8839*
2.50/*0.76*	78.9	1484/*10234*	1366/*6075*
3.00/*0.91*	94.7	1026/*7077*	944/*4200*
3.50/*1.07*	110.5	754/*5199*	694/*3086*
4.00/*1.22*	126.3	577/*3981*	531/*2363*
4.50/*1.37*	142.1	456/*3145*	420/*1867*
5.00/*1.52*	157.9	369/*2548*	340/*1512*
5.50/*1.68*	173.7	305/*2105*	281/*1250*
6.00/*1.83*	189.5	257/*1769*	236/*1050*

English/*Metric*

3 X 3 X 1/4 ANGLE

76.2 x 76.2 x 6.4 ANGLE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 1.42 in.^{2} / *916.1mm.^{2}*
r = .59 in. / *14.99mm.*
b/t = 12

Effective Length (ft/*m*)	$\frac{Kl}{r}$	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.00/*0.30*	20.3	2444/*16852*	3471/*15438*
1.50/*0.46*	30.5	2250/*15511*	3195/*14210*
2.00/*0.61*	40.7	2055/*14171*	2919/*12982*
2.50/*0.76*	50.8	1861/*12830*	2642/*11754*
3.00/*0.91*	61.0	1666/*11490*	2366/*10526*
3.50/*1.07*	71.2	1472/*10149*	2090/*9298*
4.00/*1.22*	81.4	1278/*8809*	1814/*8070*
4.50/*1.37*	91.5	1083/*7468*	1538/*6842*
5.00/*1.52*	101.7	891/*6141*	1265/*5626*
5.50/*1.68*	111.9	736/*5075*	1045/*4650*
6.00/*1.83*	122.0	619/*4265*	878/*3907*
6.5/*1.98*	132.2	527/*3634*	748/*3329*
7.0/*2.13*	142.4	454/*3133*	645/*2871*
7.5/*2.29*	152.5	396/*2729*	562/*2501*
8.0/*2.44*	162.7	348/*2399*	494/*2198*
8.5/*2.59*	172.9	308/*2125*	438/*1947*
9.0/*2.74*	183.1	275/*1895*	390/*1736*
9.5/*2.90*	193.2	247/*1701*	350/*1559*

English/*Metric*

3 X 3 X 3/8 ANGLE

76.2 x 76.2 x 9.5 ANGLE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 2.09 in.^{2} / *1348.4mm.^{2}*
r = .59 in. / *14.99 mm.*
b/t = 8

Effective Length (ft/*m*)	$\frac{Kl}{r}$	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.00/*0.30*	20.3	3992/*27523*	8343/*37111*
1.50/*0.46*	30.5	3557/*24523*	7434/*33066*
2.00/*0.61*	40.7	3122/*21523*	6524/*29021*
2.50/*0.76*	50.8	2687/*18523*	5615/*24976*
3.00/*0.91*	61.0	2251/*15523*	4706/*20932*
3.50/*1.07*	71.2	1816/*12524*	3796/*16887*
4.00/*1.22*	81.4	1392/*9596*	2909/*12939*
4.50/*1.37*	91.5	1100/*7582*	2298/*10223*
5.00/*1.52*	101.7	891/*6141*	1862/*8281*
5.50/*1.68*	111.9	736/*5075*	1539/*6844*
6.00/*1.83*	122.0	619/*4265*	1293/*5751*
6.5/*1.98*	132.2	527/*3634*	1102/*4900*
7.0/*2.13*	142.4	454/*3133*	950/*4225*
7.5/*2.29*	152.5	396/*2729*	827/*3680*
8.0/*2.44*	162.7	348/*2399*	727/*3235*
8.5/*2.59*	172.9	308/*2125*	644/*2865*
9.0/*2.74*	183.1	275/*1895*	575/*2556*
9.5/*2.90*	193.2	247/*1701*	516/*2294*

English/*Metric*

3 X 3 X 1/2 ANGLE

76.2 x 76.2 x 12.7 ANGLE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 2.70 in.^{2} / *1741.9mm.^{2}*
r = .59 in. / *14.99mm.*
b/t = 6

Effective Length (ft./*m.*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs./*N*)
1.00/*0.30*	20.3	4833/*33326*	13050/*58051*
1.50/*0.46*	30.5	4250/*29304*	11476/*51046*
2.00/*0.61*	40.7	3667/*25283*	9901/*44041*
2.50/*0.76*	50.8	3084/*21262*	8326/*37036*
3.00/*0.91*	61.0	2474/*17059*	6680/*29716*
3.50/*1.07*	71.2	1818/*12533*	4908/*21832*
4.00/*1.22*	81.4	1392/*9596*	3758/*16715*
4.50/*1.37*	91.5	1100/*7582*	2969/*13207*
5.00/*1.52*	101.7	891/*6141*	2405/*10698*
5.50/*1.68*	111.9	736/*5075*	1988/*8841*
6.00/*1.83*	122.0	619/*4265*	1670/*7429*
6.5/*1.98*	132.2	527/*3634*	1423/*6330*
7.0/*2.13*	142.4	454/*3133*	1227/*5458*
7.5/*2.29*	152.5	396/*2729*	1069/*4755*
8.0/*2.44*	162.7	348/*2399*	939/*4179*
8.5/*2.59*	172.9	308/*2125*	832/*3702*
9.0/*2.74*	183.1	275/*1895*	742/*3302*
9.5/*2.90*	193.2	247/*1701*	666/*2963*

English/*Metric*

4 X 4 X 1/4 ANGLE

101.6 x 101.6 x 6.4 ANGLE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 1.92 in.^{2} / *1225.8mm.^{2}*
r = .80 in. / *20.32mm.*
b/t = 16

Effective Length (ft./*m.*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs./*N*)
1.00/*0.30*	15.0	1684/*11610*	3233/*14381*
1.50/*0.46*	22.5	1609/*11095*	3090/*13744*
2.00/*0.61*	30.0	1535/*10581*	2947/*13107*
2.50/*0.76*	37.5	1460/*10067*	2803/*12470*
3.00/*0.91*	45.0	1386/*9553*	2660/*11833*
3.50/*1.07*	52.5	1311/*9039*	2517/*11196*
4.00/*1.22*	60.0	1236/*8524*	2374/*10559*
4.50/*1.37*	67.5	1162/*8010*	2231/*9922*
5.00/*1.52*	75.0	1087/*7496*	2087/*9285*
5.50/*1.68*	82.5	1013/*6982*	1944/*8648*
6.00/*1.83*	90.0	938/*6467*	1801/*8011*
6.5/*1.98*	97.5	863/*5953*	1658/*7374*
7.0/*2.13*	105.0	789/*5439*	1515/*6737*
7.5/*2.29*	112.5	714/*4925*	1371/*6100*
8.0/*2.44*	120.0	640/*4411*	1228/*5463*
8.5/*2.59*	127.5	567/*3907*	1088/*4840*
9.0/*2.74*	135.0	505/*3485*	970/*4317*
9.5/*2.90*	142.5	454/*3128*	871/*3874*
10.0/*3.05*	150.0	409/*2823*	786/*3497*

English/*Metric*

4 X 4 X 3/8 ANGLE

101.6 x 101.6 x 9.5 ANGLE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 2.84 in.^{2} / *1832.3mm^2*
r = .79 in. / *20.07mm*
b/t = 10.7

Effective Length (ft./*m.*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs./*N*)
1.00/*0.30*	15.2	3102/*21388*	8810/*39188*
1.50/*0.46*	22.8	2903/*20013*	8243/*36668*
2.00/*0.61*	30.4	2703/*18637*	7677/*34148*
2.50/*0.76*	38.0	2504/*17262*	7110/*31628*
3.00/*0.91*	45.6	2304/*15887*	6544/*29108*
3.50/*1.07*	53.2	2105/14511	5977/*26588*
4.00/*1.22*	60.8	1905/*13136*	5411/*24068*
4.50/*1.37*	68.4	1706/*11761*	4844/*21549*
5.00/*1.52*	75.9	1506/*10385*	4278/*19029*
5.50/*1.68*	83.5	1307/*9010*	3711/*16509*
6.00/*1.83*	91.1	1109/*7646*	3150/*14010*
6.5/*1.98*	98.7	945/*6515*	2684/*11937*
7.0/*2.13*	106.3	815/*5618*	2314/*10293*
7.5/*2.29*	113.9	710/*4894*	2016/*8966*
8.0/*2.44*	121.5	624/*4301*	1772/*7881*
8.5/*2.59*	129.1	553/*3810*	1569/*6981*
9.0/*2.74*	136.7	493/*3398*	1400/*6227*
9.5/*2.90*	144.3	442/*3050*	1256/*5588*
10.0/*3.05*	151.9	399/*2753*	1134/*5044*
10.5/*3.20*	159.5	362/*2497*	1028/*4575*
11.0/*3.35*	167.1	330/*2275*	937/*4168*
11.5/*3.51*	174.7	302/*2081*	857/*3814*
12.0/*3.66*	182.3	277/*1912*	787/*3502*
12.5/*3.81*	189.9	256/*1762*	726/*3228*

English/*Metric*

4 X 4 X 1/2 ANGLE

101.6 x 101.6 x 12.7 ANGLE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 3.70 in.^{2} / *2387.1mm^2*
r = .78 in. / *19.81mm*
b/t = 8

Effective Length (ft./*m.*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs./*N*)
1.00/*0.30*	15.4	4204/*28984*	15554/*69188*
1.50/*0.46*	23.1	3875/*26715*	14336/*63771*
2.00/*0.61*	30.8	3546/*24446*	13119/*58355*
2.50/*0.76*	38.5	3216/*22177*	11901/*52938*
3.00/*0.91*	46.1	2887/*19908*	10683/*47522*
3.50/*1.07*	53.8	2558/*17639*	9466/*42105*
4.00/*1.22*	61.5	2229/*15370*	8248/*36689*
4.50/*1.37*	69.2	1900/*13101*	7030/*31272*
5.00/*1.52*	76.9	1571/*10831*	5813/*25856*
5.50/*1.68*	84.6	1287/8871	4760/*21175*
6.00/*1.83*	92.3	1081/7454	4000/*17793*
6.5/*1.98*	100.0	921/*6351*	3408/*15161*
7.0/*2.13*	107.7	794/*5476*	2939/*13072*
7.5/*2.29*	115.4	692/*4770*	2560/*11388*
8.0/*2.44*	123.1	608/*4193*	2250/*10009*
8.5/*2.59*	130.8	539/*3714*	1993/*8866*
9.0/*2.74*	138.5	480/*3313*	1778/*7908*
9.5/*2.90*	146.2	431/*2973*	1596/*7098*
10.0/*3.05*	153.8	389/*2683*	1440/*6406*
10.5/*3.20*	161.5	353/*2434*	1306/*5810*
11.0/*3.35*	169.2	322/*2218*	1190/*5294*
11.5/*3.51*	176.9	294/*2029*	1089/*4843*
12.0/*3.66*	184.6	270/*1863*	1000/*4448*

English/*Metric*

6 X 6 X 3/8 ANGLE

152.4 x 152.4 x 9.4 ANGLE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 4.33 in.^{2}/ *2794 mm^2*
r = 1.14 in. / *28.96 mm*
b/t = 16

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	10.5	1728/*11916*	7484/*33289*
1.5/*0.46*	15.8	1676/*11556*	7257/*32281*
2.0/*0.61*	21.1	1624/*11195*	7030/*31273*
2.5/*0.76*	26.3	1571/*10834*	6804/*30265*
3.0/*0.91*	31.6	1519/*10473*	6577/*29257*
3.5/*1.07*	36.8	1467/*10112*	6351/*28249*
4.0/*1.22*	42.1	1414/*9751*	6124/*27241*
4.5/*1.37*	47.4	1362/*9390*	5897/*26232*
5.0/*1.52*	52.6	1310/*9030*	5671/*25224*
5.5/*1.68*	57.9	1257/*8669*	5444/*24216*
6.0/*1.83*	63.2	1205/*8308*	5217/*23208*
6.5/*1.98*	68.4	1153/*7947*	4991/*22200*
7.0/*2.13*	73.7	1100/*7586*	4764/*21192*
7.5/*2.29*	78.9	1048/*7225*	4538/*20184*
8.0/*2.44*	84.2	996/*6864*	4311/*19176*
8.5/*2.59*	89.5	943/*6504*	4084/*18168*
9.0/*2.74*	94.7	891/*6143*	3858/*17160*
9.5/*2.90*	100.0	839/*5782*	3631/*16152*
10.0/*3.05*	105.3	786/*5421*	3404/*15144*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
10.5/*3.20*	110.5	734/*5060*	3178/*14136*
11.0/*3.35*	115.8	682/*4699*	2951/*13128*
11.5/*3.51*	121.1	629/*4334*	2722/*12108*
12.0/*3.66*	126.3	577/*3981*	2500/*11120*
12.5/*3.81*	131.6	532/*3668*	2304/*10248*
13.0/*3.96*	136.8	492/*3392*	2130/*9475*
13.5/*4.12*	142.1	456/*3145*	1975/*8786*
14.0/*4.27*	147.4	424/*2924*	1837/*8170*
14.5/*4.42*	152.6	395/*2726*	1712/*7616*
15.0/*4.57*	157.9	369/*2548*	1600/*7117*
15.5/*4.72*	163.2	346/*2386*	1498/*6665*
16.0/*4.88*	168.4	325/*2239*	1406/*6255*
16.5/*5.03*	173.7	305/*2105*	1322/*5882*
17.0/*5.18*	178.9	288/*1983*	1246/*5541*
17.5/*5.33*	184.2	271/*1872*	1175/*5229*
18.0/*5.49*	189.5	257/*1769*	1111/*4942*
18.5/*5.64*	194.7	243/*1675*	1052/*4679*
19.0/*5.79*	200.0	230/*1588*	997/*4436*

English/*Metric*

6 X 6 X 1/2 ANGLE

152.4 x 152.4 x 12.7 ANGLE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 5.70 in.^{2} / *3677.4mm^2*
r = 1.19 in. / *30.2mm*
b/t = 12

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	10.1	2640/*18204*	15049/*66942*
1.5/*0.46*	15.1	2544/*17539*	14500/*64498*
2.0/*0.61*	20.2	2447/*16874*	13950/*62054*
2.5/*0.76*	25.2	2351/*16210*	13401/*59610*
3.0/*0.91*	30.3	2255/*15545*	12851/*57166*
3.5/*1.07*	35.3	2158/*14881*	12302/*54722*
4.0/*1.22*	40.3	2062/*14216*	11752/*52278*
4.5/*1.37*	45.4	1965/*13551*	11203/*49834*
5.0/*1.52*	50.4	1869/*12887*	10654/*47390*
5.5/*1.68*	55.5	1773/*12222*	10104/*44945*
6.0/*1.83*	60.5	1676/*11557*	9555/*42501*
6.5/*1.98*	65.5	1580/*10893*	9005/*40057*
7.0/*2.13*	70.6	1483/*10228*	8456/*37613*
7.5/*2.29*	75.6	1387/*9564*	7906/*35169*
8.0/*2.44*	80.7	1291/*8899*	7357/*32725*
8.5/*2.59*	85.7	1194/*8234*	6807/*30281*
9.0/*2.74*	90.8	1098/*7570*	6258/*27837*
9.5/*2.90*	95.8	1001/*6905*	5709/*25393*
10.0/*3.05*	100.8	906/*6246*	5164/*22968*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
10.5/*3.20*	105.9	822/*5665*	4683/*20833*
11.0/*3.35*	110.9	749/*5162*	4267/*18982*
11.5/*3.51*	116.0	685/*4723*	3904/*17367*
12.0/*3.66*	121.0	629/*4337*	3586/*15950*
12.5/*3.81*	126.1	580/*3997*	3305/*14700*
13.0/*3.96*	131.1	536/*3696*	3055/*13591*
13.5/*4.12*	136.1	497/*3427*	2833/*12603*
14.0/*4.27*	141.2	462/*3187*	2634/*11719*
14.5/*4.42*	146.2	431/*2971*	2456/*10924*
15.0/*4.57*	151.3	403/*2776*	2295/*10208*
15.5/*4.72*	156.3	377/*2600*	2149/*9560*
16.0/*4.88*	161.3	354/*2440*	2017/*8972*
16.5/*5.03*	166.4	333/*2294*	1897/*8437*
17.0/*5.18*	171.4	313/*2161*	1787/*7948*
17.5/*5.33*	176.5	296/*2039*	1686/*7500*
18.0/*5.49*	181.5	280/*1928*	1594/*7089*
18.5/*5.64*	186.6	265/*1825*	1509/*6711*
19.0/*5.79*	191.6	251/*1730*	1430/*6362*

English/*Metric*

3 X 1 1/2 X 1/4 I-BEAM

76.2 x 38.1 x 6.4 I-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 1.38 in.^{2} / *890mm^2*
r = .32 in. / *8mm*
b/t = 6

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	37.5	5245/*36164*	7238/*32198*
1.5/*0.46*	56.3	2911/*20073*	4018/*17871*
2.0/*0.61*	75.0	1638/*11291*	2260/*10053*
2.5/*0.76*	93.8	1048/*7226*	1446/*6434*
3.0/*0.91*	112.5	728/*5018*	1004/*4468*
3.5/*1.07*	131.3	535/*3687*	738/*3283*
4.0/*1.22*	150.0	409/*2823*	565/*2513*
4.5/*1.37*	168.8	323/*2230*	446/*1986*
5.0/*1.52*	187.5	262/*1807*	362/*1608*
5.5/*1.68*	206.3	217/*1493*	299/*1329*
6.0/*1.83*	225.0	182/*1255*	251/*1117*
6.5/*1.98*	243.8	155/*1069*	214/*952*
7.0/*2.13*	262.5	134/*922*	184/*821*
7.5/*2.29*	281.3	116/*803*	161/*715*
8.0/*2.44*	300.0	102/*706*	141/*628*
8.5/*2.59*	318.8	91/*625*	125/*557*
9.0/*2.74*	337.5	81/*558*	112/*496*
9.5/*2.90*	356.3	73/*500*	100/*446*
10.0/*3.05*	375.0	66/*452*	90/*402*
10.5/*3.20*	393.8	59/*410*	82/*365*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	412.5	54/*373*	75/*332*
11.5/*3.51*	431.3	50/*342*	68/*304*
12.0/*3.66*	450.0	45/*314*	63/*279*
12.5/*3.81*	468.8	42/*289*	58/*257*
13.0/*3.96*	487.5	39/*267*	53/*238*
13.5/*4.12*	506.3	36/*248*	50/*221*
14.0/*4.27*	525.0	33/*230*	46/*205*
14.5/*4.42*	543.8	31/*215*	43/*191*
15.0/*4.57*	562.5	29/*201*	40/*179*
15.5/*4.72*	581.3	27/*188*	38/*167*
16.0/*4.88*	600.0	26/*176*	35/*157*
16.5/*5.03*	618.8	24/*166*	33/*148*
17.0/*5.18*	637.5	23/*156*	31/*139*
17.5/*5.33*	656.3	21/*147*	30/*131*
18.0/*5.49*	675.0	20/*139*	28/*124*
18.5/*5.64*	693.8	19/*132*	26/*117*
19.0/*5.79*	712.5	18/*125*	25/*111*
19.5/*5.94*	731.3	17/*119*	24/*106*
20.0/*6.10*	750.0	16/*113*	23/*101*

English/*Metric*

4 X 2 X 1/4 I-BEAM

101.6 x 50.8 x 6.4 I-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 1.88 in.^{2} / *1213mm^2*
r = .43 in. / *11mm*
b/t = 8

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	27.9	6462/*44551*	12148/*54036*
1.5/*0.46*	41.9	4692/*32352*	8822/*39240*
2.0/*0.61*	55.8	2957/*20388*	5559/*24728*
2.5/*0.76*	69.8	1892/*13048*	3558/*15823*
3.0/*0.91*	83.7	1314/*9061*	2471/*10990*
3.5/*1.07*	97.7	966/*6657*	1815/*8075*
4.0/*1.22*	111.6	739/*5097*	1390/*6182*
4.5/*1.37*	125.6	584/*4027*	1098/*4885*
5.0/*1.52*	139.5	473/*3262*	889/*3957*
5.5/*1.68*	153.5	391/*2696*	735/*3270*
6.0/*1.83*	167.4	329/*2265*	618/*2748*
6.5/*1.98*	181.4	280/*1930*	526/*2341*
7.0/*2.13*	195.3	241/*1664*	454/*2019*
7.5/*2.29*	209.3	210/*1450*	395/*1758*
8.0/*2.44*	223.3	185/*1274*	347/*1546*
8.5/*2.59*	237.2	164/*1129*	308/*1369*
9.0/*2.74*	251.2	146/*1007*	275/*1221*
9.5/*2.90*	265.1	131/*904*	246/*1096*
10.0/*3.05*	279.1	118/*816*	222/*989*
10.5/*3.20*	293.0	107/*740*	202/*897*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	307.0	98/*674*	184/*817*
11.5/*3.51*	320.9	89/*617*	168/*748*
12.0/*3.66*	334.9	82/*566*	154/*687*
12.5/*3.81*	348.8	76/*522*	142/*633*
13.0/*3.96*	362.8	70/*483*	132/*585*
13.5/*4.12*	376.7	65/*447*	122/*543*
14.0/*4.27*	390.7	60/*416*	113/*505*
14.5/*4.42*	404.7	56/*388*	106/*470*
15.0/*4.57*	418.6	53/*362*	99/*440*
15.5/*4.72*	432.6	49/*339*	93/*412*
16.0/*4.88*	446.5	46/*319*	87/*386*
16.5/*5.03*	460.5	43/*300*	82/*363*
17.0/*5.18*	474.4	41/*282*	77/*342*
17.5/*5.33*	488.4	39/*266*	73/*323*
18.0/*5.49*	502.3	37/*252*	69/*305*
18.5/*5.64*	516.3	35/*238*	65/*289*
19.0/*5.79*	530.2	33/*226*	62/*274*
19.5/*5.94*	544.2	31/*214*	58/*260*
20.0/*6.10*	558.1	30/*204*	56/*247*

English/*Metric*

6 X 3 X 1/4 I-BEAM

152.4 x 76.2 x 6.4 I-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 2.88 in.^{2} / *1858mm^2*
r = .63 in. / *16mm*
b/t = 12

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	27.9	6462/*44551*	12148/*54036*
1.5/*0.46*	41.9	4692/*32352*	8822/*39240*
2.0/*0.61*	55.8	2957/*20388*	5559/*24728*
2.5/*0.76*	698	1892/*13048*	3558/*15823*
3.0/*0.91*	83.7	1314/*9061*	2471/*10990*
3.5/*1.07*	97.7	966/*6657*	1815/*8075*
4.0/*1.22*	111.6	739/*5097*	1390/*6182*
4.5/*1.37*	125.6	584/*4027*	1098/*4885*
5.0/*1.52*	139.5	473/*3262*	889/*3957*
5.5/*1.68*	153.5	391/*2696*	735/*3270*
6.0/*1.83*	167.4	329/*2265*	618/*2748*
6.5/*1.98*	181.4	280/*1930*	526/*2341*
7.0/*2.13*	195.3	241/*1664*	454/*2019*
7.5/*2.29*	209.3	210/*1450*	395/*1758*
8.0/*2.44*	223.3	185/*1274*	347/*1546*
8.5/*2.59*	237.2	164/*1129*	308/*1369*
9.0/*2.74*	251.2	146/*1007*	275/*1221*
9.5/*2.90*	265.1	131/*904*	246/*1096*
10.0/*3.05*	279.1	118/*816*	222/*989*
10.5/*3.20*	293.0	107/*740*	202/*897*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	307.0	98/*674*	184/*817*
11.5/*3.51*	320.9	89/*617*	168/*748*
12.0/*3.66*	334.9	82/*566*	154/*687*
12.5/*3.81*	348.8	76/*522*	142/*633*
13.0/*3.96*	362.8	70/*483*	132/*585*
13.5/*4.12*	376.7	65/*447*	122/*543*
14.0/*4.27*	390.7	60/*416*	113/*505*
14.5/*4.42*	404.7	56/*388*	106/*470*
15.0/*4.57*	418.6	53/*362*	99/*440*
15.5/*4.72*	432.6	49/*339*	93/*412*
16.0/*4.88*	446.5	46/*319*	87/*386*
16.5/*5.03*	460.5	43/*300*	82/*363*
17.0/*5.18*	474.4	41/*282*	77/*342*
17.5/*5.33*	488.4	39/*266*	73/*323*
18.0/*5.49*	502.3	37/*252*	69/*305*
18.5/*5.64*	516.3	35/*238*	65/*289*
19.0/*5.79*	530.2	33/*226*	62/*274*
19.5/*5.94*	544.2	31/*214*	58/*260*
20.0/*6.10*	558.1	30/*204*	56/*247*

English/*Metric*

6 X 3 X 3/8 I-BEAM

152.4 x 76.2 x 9.5 I-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 4.23 in.^{2} / *2729mm^2*
r = .64 in. / *16mm*
b/t = 8

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	18.8	7623/*52556*	32244/*143427*
1.5/*0.46*	28.1	6434/*44360*	27215/*121060*
2.0/*0.61*	37.5	5245/*36164*	22187/*98694*
2.5/*0.76*	46.9	4057/*27969*	17159/*76327*
3.0/*0.91*	56.3	2911/*20073*	12315/*54780*
3.5/*1.07*	65.6	2139/*14748*	9048/*40246*
4.0/*1.22*	75.0	1638/*11291*	6927/*30814*
4.5/*1.37*	84.4	1294/*8921*	5473/*24347*
5.0/*1.52*	93.8	1048/*7226*	4433/*19721*
5.5/*1.68*	103.1	866/*5972*	3664/*16298*
6.0/*1.83*	112.5	728/*5018*	3079/*13695*
6.5/*1.98*	121.9	620/*4276*	2623/*11669*
7.0/*2.13*	131.3	535/*3687*	2262/*10062*
7.5/*2.29*	140.6	466/*3212*	1970/*8765*
8.0/*2.44*	150.0	409/*2823*	1732/*7703*
8.5/*2.59*	159.4	363/*2500*	1534/*6824*
9.0/*2.74*	168.8	323/*2230*	1368/*6087*
9.5/*2.90*	178.1	290/*2002*	1228/*5463*
10.0/*3.05*	187.5	262/*1807*	1108/*4930*
10.5/*3.20*	196.9	238/*1639*	1005/*4472*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	206.3	217/*1493*	916/*4075*
11.5/*3.51*	215.6	198/*1366*	838/*3728*
12.0/*3.66*	225.0	182/*1255*	770/*3424*
12.5/*3.81*	234.4	168/*1156*	709/*3155*
13.0/*3.96*	243.8	155/*1069*	656/*2917*
13.5/*4.12*	253.1	144/*991*	608/*2705*
14.0/*4.27*	262.5	134/*922*	565/*2515*
14.5/*4.42*	271.9	125/*859*	527/*2345*
15.0/*4.57*	281.3	116/*803*	493/*2191*
15.5/*4.72*	290.6	109/*752*	461/*2052*
16.0/*4.88*	300.0	102/*706*	433/*1926*
16.5/*5.03*	309.4	96/*664*	407/*1811*
17.0/*5.18*	318.8	91/*625*	384/*1706*
17.5/*5.33*	328.1	86/*590*	362/*1610*
18.0/*5.49*	337.5	81/*558*	342/*1522*
18.5/*5.64*	346.9	77/*528*	324/*1441*
19.0/*5.79*	356.3	73/*500*	307/*1366*
19.5/*5.94*	365.6	69/*475*	291/*1297*
20.0/*6.10*	375.0	66/*452*	277/*1233*

English/*Metric*

8 X 4 X 3/8 I-BEAM

203.2 x 101.6 x 9.5 I-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 5.73 in.^{2} / *3697 mm^2*
r = .84 in. / *21mm*
b/t = 10.7

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	14.3	8189/*56459*	46921/*208715*
1.5/*0.46*	21.4	7283/*50214*	41731/*185631*
2.0/*0.61*	28.6	6377/*43970*	36542/*162547*
2.5/*0.76*	35.7	5472/*37726*	31352/*139462*
3.0/*0.91*	42.9	4566/*31481*	26163/*116378*
3.5/*1.07*	50.0	3660/*25237*	20973/*93294*
4.0/*1.22*	57.1	2821/*19451*	16165/*71904*
4.5/*1.37*	64.3	2229/*15368*	12772/*56813*
5.0/*1.52*	71.4	1805/*12448*	10345/*46019*
5.5/*1.68*	78.6	1492/*10288*	8550/*38032*
6.0/*1.83*	85.7	1254/*8645*	7184/*31958*
6.5/*1.98*	92.9	1068/*7366*	6122/*27230*
7.0/*2.13*	100.0	921/*6351*	5278/*23479*
7.5/*2.29*	107.1	802/*5533*	4598/*20453*
8.0/*2.44*	114.3	705/*4863*	4041/*17976*
8.5/*2.59*	121.4	625/*4307*	3580/*15923*
9.0/*2.74*	128.6	557/*3842*	3193/*14203*
9.5/*2.90*	135.7	500/*3448*	2866/*12748*
10.0/*3.05*	142.9	451/*3112*	2586/*11505*
10.5/*3.20*	150.0	409/*2823*	2346/*10435*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	157.1	373/*2572*	2137/*9508*
11.5/*3.51*	164.3	341/*2353*	1956/*8699*
12.0/*3.66*	171.4	313/*2161*	1796/*7989*
12.5/*3.81*	178.6	289/*1992*	1655/*7363*
13.0/*3.96*	185.7	267/*1841*	1530/*6808*
13.5/*4.12*	192.9	248/*1708*	1419/*6313*
14.0/*4.27*	200.0	230/*1588*	1320/*5870*
14.5/*4.42*	207.1	215/*1480*	1230/*5472*
15.0/*4.57*	214.3	201/*1383*	1149/*5113*
15.5/*4.72*	221.4	188/*1295*	1077/*4789*
16.0/*4.88*	228.6	176/*1216*	1010/*4494*
16.5/*5.03*	235.7	166/*1143*	950/*4226*
17.0/*5.18*	242.9	156/*1077*	895/*3981*
17.5/*5.33*	250.0	147/*1016*	845/*3757*
18.0/*5.49*	257.1	139/*961*	798/*3551*
18.5/*5.64*	264.3	132/*909*	756/*3361*
19.0/*5.79*	271.4	125/*862*	716/*3187*
19.5/*5.94*	278.6	119/*818*	680/*3026*
20.0/*6.10*	285.7	113/*778*	647/*2876*

English/*Metric*

8 X 4 X 1/2 I-BEAM

203.2 x 101.6 x 12.7 I-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 7.51 in.^{2} / *4845mm^2*
r = .85 in. / *22 mm*
b/t = 8

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	14.1	8210/*56606*	61657/*274263*
1.5/*0.46*	21.2	7315/*50435*	54935/*244364*
2.0/*0.61*	28.2	6420/*44264*	48214/*214465*
2.5/*0.76*	35.3	5525/*38093*	41492/*184566*
3.0/*0.91*	42.4	4630/*31922*	34770/*154666*
3.5/*1.07*	49.4	3735/*25751*	28049/*124767*
4.0/*1.22*	56.5	2889/*19916*	21694/*96498*
4.5/*1.37*	63.5	2282/*15736*	17141/*76246*
5.0/*1.52*	70.6	1849/*12747*	13884/*61759*
5.5/*1.68*	77.6	1528/*10534*	11474/*51040*
6.0/*1.83*	84.7	1284/*8852*	9642/*42888*
6.5/*1.98*	91.8	1094/*7542*	8215/*36544*
7.0/*2.13*	98.8	943/*6503*	7084/*31510*
7.5/*2.29*	105.9	822/*5665*	6171/*27448*
8.0/*2.44*	112.9	722/*4979*	5423/*24125*
8.5/*2.59*	120.0	640/*4411*	4804/*21370*
9.0/*2.74*	127.1	571/*3934*	4285/*19061*
9.5/*2.90*	134.1	512/*3531*	3846/*17108*
10.0/*3.05*	141.2	462/*3187*	3471/*15440*
10.5/*3.20*	148.2	419/*2890*	3148/*14004*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	155.3	382/*2634*	2869/*12760*
11.5/*3.51*	162.4	349/*2410*	2625/*11675*
12.0/*3.66*	169.4	321/*2213*	2410/*10722*
12.5/*3.81*	176.5	296/*2039*	2221/*9881*
13.0/*3.96*	183.5	273/*1886*	2054/*9136*
13.5/*4.12*	190.6	254/*1748*	1905/*8472*
14.0/*4.27*	197.6	236/*1626*	1771/*7877*
14.5/*4.42*	204.7	220/*1516*	1651/*7344*
15.0/*4.57*	211.8	205/*1416*	1543/*6862*
15.5/*4.72*	218.8	192/*1326*	1445/*6427*
16.0/*4.88*	225.9	181/*1245*	1356/*6031*
16.5/*5.03*	232.9	170/*1170*	1275/*5671*
17.0/*5.18*	240.0	160/*1103*	1201/*5342*
17.5/*5.33*	247.1	151/*1041*	1133/*5042*
18.0/*5.49*	254.1	143/*984*	1071/*4765*
18.5/*5.64*	261.2	135/*931*	1014/*4511*
19.0/*5.79*	268.2	128/*883*	961/*4277*
19.5/*5.94*	275.3	122/*838*	913/*4060*
20.0/*6.10*	282.4	116/*797*	868/*3860*

English/*Metric*

10 X 5 X 3/8 I-BEAM

254 x 127 x 9.5 I-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 7.22 in.^{2} / *4658mm^2*
r = 1.04 in. / *26mm*
b/t = 13.3

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	11.5	8537/*58860*	61637/*274175*
1.5/*0.46*	17.3	7805/*53817*	56356/*250682*
2.0/*0.61*	23.1	7074/*48773*	51074/*227189*
2.5/*0.76*	28.8	6342/*43730*	45793/*203696*
3.0/*0.91*	34.6	5611/*38686*	40511/*180202*
3.5/*1.07*	40.4	4879/*33643*	35230/*156709*
4.0/*1.22*	46.2	4148/*28599*	29948/*133216*
4.5/*1.37*	51.9	3416/*23556*	24667/*109723*
5.0/*1.52*	57.7	2768/*19082*	19982/*88885*
5.5/*1.68*	63.5	2287/*15770*	16514/*73458*
6.0/*1.83*	69.2	1922/*13251*	13876/*61725*
6.5/*1.98*	75.0	1638/*11291*	11824/*52594*
7.0/*2.13*	80.8	1412/*9736*	10195/*45349*
7.5/*2.29*	86.5	1230/*8481*	8881/*39504*
8.0/*2.44*	92.3	1081/*7454*	7805/*34721*
8.5/*2.59*	98.1	958/*6603*	6914/*30756*
9.0/*2.74*	103.8	854/*5889*	6167/*27434*
9.5/*2.90*	109.6	767/*5286*	5535/*24622*
10.0/*3.05*	115.4	692/*4770*	4996/*22221*
10.5/*3.20*	121.2	628/*4327*	4531/*20155*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	126.9	572/*3943*	4129/*18365*
11.5/*3.51*	132.7	523/*3607*	3777/*16802*
12.0/*3.66*	138.5	480/*3313*	3469/*15431*
12.5/*3.81*	144.2	443/*3053*	3197/*14222*
13.0/*3.96*	150.0	409/*2823*	2956/*13149*
13.5/*4.12*	155.8	380/*2618*	2741/*12193*
14.0/*4.27*	161.5	353/*2434*	2549/*11337*
14.5/*4.42*	167.3	329/*2269*	2376/*10569*
15.0/*4.57*	173.1	308/*2120*	2220/*9876*
15.5/*4.72*	178.8	288/*1986*	2079/*9249*
16.0/*4.88*	184.6	270/*1863*	1951/*8680*
16.5/*5.03*	190.4	254/*1752*	1835/*8162*
17.0/*5.18*	196.2	239/*1651*	1729/*7689*
17.5/*5.33*	201.9	226/*1558*	1631/*7256*
18.0/*5.49*	207.7	214/*1472*	1542/*6858*
18.5/*5.64*	213.5	202/*1394*	1460/*6493*
19.0/*5.79*	219.2	192/*1321*	1384/*6155*
19.5/*5.94*	225.0	182/*1255*	1314/*5844*
20.0/*6.10*	230.8	173/*1193*	1249/*5555*

English/*Metric*

10 X 5 X 1/2 I-BEAM

254 x 127 x 12.7 I-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 9.51 in.^{2} / *6135mm^2*
r = 1.04 in. / *26mm*
b/t = 10

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	11.5	8537/*58860*	81187/*361137*
1.5/*0.46*	17.3	7805/*53817*	74230/*330192*
2.0/*0.61*	23.1	7074/*48773*	67273/*299247*
2.5/*0.76*	28.8	6342/*43730*	60317/*268303*
3.0/*0.91*	34.6	5611/*38686*	53360/*237358*
3.5/*1.07*	40.4	4879/*33643*	46404/*206413*
4.0/*1.22*	46.2	4148/*28599*	39447/*175469*
4.5/*1.37*	51.9	3416/*23556*	32490/*144524*
5.0/*1.52*	57.7	2768/*19082*	26320/*117076*
5.5/*1.68*	63.5	2287/*15770*	21752/*96757*
6.0/*1.83*	69.2	1922/*13251*	18278/*81303*
6.5/*1.98*	75.0	1638/*11291*	15574/*69276*
7.0/*2.13*	80.8	1412/*9736*	13428/*59733*
7.5/*2.29*	86.5	1230/*8481*	11698/*52034*
8.0/*2.44*	92.3	1081/*7454*	10281/*45733*
8.5/*2.59*	98.1	958/*6603*	9107/*40511*
9.0/*2.74*	103.8	854/*5889*	8123/*36135*
9.5/*2.90*	109.6	767/*5286*	7291/*32431*
10.0/*3.05*	115.4	692/*4770*	6580/*29269*
10.5/*3.20*	121.2	628/*4327*	5968/*26548*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	126.9	572/*3943*	5438/*24189*
11.5/*3.51*	132.7	523/*3607*	4975/*22132*
12.0/*3.66*	138.5	480/*3313*	4569/*20326*
12.5/*3.81*	144.2	443/*3053*	4211/*18732*
13.0/*3.96*	150.0	409/*2823*	3893/*17319*
13.5/*4.12*	155.8	380/*2618*	3610/*16060*
14.0/*4.27*	161.5	353/*2434*	3357/*14933*
14.5/*4.42*	167.3	329/*2269*	3130/*13921*
15.0/*4.57*	173.1	308/*2120*	2924/*13008*
15.5/*4.72*	178.8	288/*1986*	2739/*12183*
16.0/*4.88*	184.6	270/*1863*	2570/*11433*
16.5/*5.03*	190.4	254/*1752*	2417/*10751*
17.0/*5.18*	196.2	239/*1651*	2277/*10128*
17.5/*5.33*	201.9	226/*1558*	2149/*9557*
18.0/*5.49*	207.7	214/*1472*	2031/*9034*
18.5/*5.64*	213.5	202/*1394*	1923/*8552*
19.0/*5.79*	219.2	192/*1321*	1823/*8108*
19.5/*5.94*	225.0	182/*1255*	1730/*7697*
20.0/*6.10*	230.8	173/*1193*	1645/*7317*

English/*Metric*

12 X 6 X 1/2 I-BEAM

304.8 x 152.4 x 12.7 I-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 11.51 in.^{2} / *7426mm^2*
r = 1.26 in. / *32mm*
b/t = 12

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	9.5	8792/*60622*	101201/*450164*
1.5/*0.46*	14.3	8189/*56459*	94251/*419251*
2.0/*0.61*	19.0	7585/*52296*	87302/*388338*
2.5/*0.76*	23.8	6981/*48133*	80352/*357425*
3.0/*0.91*	28.6	6377/*43970*	73403/*326512*
3.5/*1.07*	33.3	5774/*39807*	66453/*295598*
4.0/*1.22*	38.1	5170/*35644*	59504/*264685*
4.5/*1.37*	42.9	4566/*31481*	52554/*233772*
5.0/*1.52*	47.6	3962/*27318*	45605/*202859*
5.5/*1.68*	52.4	3357/*23148*	38643/*171891*
6.0/*1.83*	57.1	2821/*19451*	32471/*144436*
6.5/*1.98*	61.9	2404/*16573*	27667/*123070*
7.0/*2.13*	66.7	2073/*14290*	23856/*106116*
7.5/*2.29*	71.4	1805/*12448*	20781/*92439*
8.0/*2.44*	76.2	1587/*10941*	18265/*81245*
8.5/*2.59*	81.0	1406/*9692*	16179/*71968*
9.0/*2.74*	85.7	1254/*8645*	14431/*64194*
9.5/*2.90*	90.5	1125/*7759*	12952/*57614*
10.0/*3.05*	95.2	1016/*7002*	11689/*51997*
10.5/*3.20*	100.0	921/*6351*	10603/*47163*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	104.8	839/*5787*	9661/*42973*
11.5/*3.51*	109.5	768/*5295*	8839/*39317*
12.0/*3.66*	114.3	705/*4863*	8118/*36109*
12.5/*3.81*	119.0	650/*4481*	7481/*33278*
13.0/*3.96*	123.8	601/*4143*	6917/*30767*
13.5/*4.12*	128.6	557/*3842*	6414/*28531*
14.0/*4.27*	133.3	518/*3573*	5964/*26529*
14.5/*4.42*	138.1	483/*3330*	5560/*24731*
15.0/*4.57*	142.9	451/*3112*	5195/*23110*
15.5/*4.72*	147.6	423/*2915*	4866/*21643*
16.0/*4.88*	152.4	397/*2735*	4566/*20311*
16.5/*5.03*	157.1	373/*2572*	4294/*19099*
17.0/*5.18*	161.9	351/*2423*	4045/*17992*
17.5/*5.33*	166.7	332/*2286*	3817/*16979*
18.0/*5.49*	171.4	313/*2161*	3608/*16048*
18.5/*5.64*	176.2	297/*2046*	3415/*15193*
19.0/*5.79*	181.0	281/*1940*	3238/*14404*
19.5/*5.94*	185.7	267/*1841*	3074/*13674*
20.0/*6.10*	190.5	254/*1751*	2922/*12999*

English/*Metric*

3 X 3 X 1/4 WF-BEAM

76.2 x 76.2 x 6.4 WF-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 2.13 in^2 / *1374.19 mm^2*
r=.73 in. / *18.54mm*
b/t=12

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.00/*0.30*	16.4	7916/*54577*	16860/*74999*
1.50/*0.46*	24.7	6874/*47392*	14641/*65125*
2.00/*0.61*	32.9	5831/*40206*	12421/*55251*
2.50/*0.76*	41.1	4789/*33021*	10201/*45377*
3.00/*0.91*	49.3	3747/*25835*	7981/*35503*
3.50/*1.07*	57.5	2783/*19187*	5927/*26366*
4.00/*1.22*	65.8	2131/*14690*	4538/*20187*
4.50/*1.37*	74.0	1683/*11607*	3586/*15950*
5.00/*1.52*	82.2	1364/*9402*	2904/*12920*
5.50/*1.68*	90.4	1127/*7770*	2400/*10677*
6.00/*1.83*	98.6	947/*6529*	2017/*8972*
6.5/*1.98*	106.8	807/*5563*	1719/*7645*
7.0/*2.13*	115.1	696/*4797*	1482/*6592*
7.5/*2.29*	123.3	606/*4178*	1291/*5742*
8.0/*2.44*	131.6	533/*3672*	1135/*5047*
8.5/*2.59*	139.7	472/*3253*	1005/*4470*
9.0/*2.74*	147.9	421/*2902*	896/*3988*
9.5/*2.90*	156.2	378/*2604*	805/*3579*
10.0/*3.05*	164.4	341/*2350*	726/*3230*
10.5/*3.20*	172.6	309/*2132*	659/*2930*
11.0/*3.35*	180.8	282/*1942*	600/*2669*
11.5/*3.51*	189.0	258/*1777*	549/*2442*
12.0/*3.66*	197.3	237/*1632*	504/*2243*

English/*Metric*

4 X 4 X 1/4 WF-BEAM

101.6 x 101.6 x 6.4 WF-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 2.89 in.^{2} / *1864.51mm^2*
r = .96 in. / *24.38mm*
b/t = 16

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	12.5	6328/*43630*	18288/*81348*
1.5/*0.46*	18.8	5833/*40217*	16857/*74984*
2.0/*0.61*	25.0	5338/*36804*	15427/*68621*
2.5/*0.76*	31.3	4843/*33390*	13996/*62257*
3.0/*0.91*	37.5	4348/*29977*	12565/*55893*
3.5/*1.07*	43.8	3853/*26564*	11135/*49529*
4.0/*1.22*	50.0	3358/*23151*	9704/*43166*
4.5/*1.37*	56.3	2863/*19738*	8273/*36802*
5.0/*1.52*	62.5	2368/*16325*	6843/*30438*
5.5/*1.68*	68.8	1949/*13437*	5632/*25054*
6.0/*1.83*	75.0	1638/*11291*	4733/*21052*
6.5/*1.98*	81.3	1395/*9621*	4033/*17938*
7.0/*2.13*	87.5	1203/*8295*	3477/*15467*
7.5/*2.29*	93.8	1048/*7226*	3029/*13473*
8.0/*2.44*	100.0	921/*6351*	2662/*11842*
8.5/*2.59*	106.3	816/*5626*	2358/*10490*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
9.0/*2.74*	112.5	728/*5018*	2103/*9357*
9.5/*2.90*	118.8	653/*4504*	1888/*8398*
10.0/*3.05*	125.0	590/*4065*	1704/*7579*
10.5/*3.20*	131.3	535/*3687*	1545/*6874*
11.0/*3.35*	137.5	487/*3359*	1408/*6264*
11.5/*3.51*	143.8	446/*3074*	1288/*5731*
12.0/*3.66*	150.0	409/*2823*	1183/*5263*
12.5/*3.81*	156.3	377/*2601*	1090/*4850*
13.0/*3.96*	162.5	349/*2405*	1008/*4485*
13.5/*4.12*	168.8	323/*2230*	935/*4158*
14.0/*4.27*	175.0	301/*2074*	869/*3867*
14.5/*4.42*	181.3	280/*1933*	810/*3605*
15.0/*4.57*	187.5	262/*1807*	757/*3368*
15.5/*4.72*	193.8	245/*1692*	709/*3155*
16.0/*4.88*	200.0	230/*1588*	666/*2960*

English/*Metric*

6 X 6 X 1/4 WF-BEAM

152.4 x 152.4 x 6.4 WF-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 4.39 in.^{2} / *2832.25mm^2*
r = 1.43 in. / *36.32mm*
b/t = 24

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	8.4	3056/*21067*	13414/*59668*
1.5/*0.46*	12.6	2957/*20387*	12980/*57740*
2.0/*0.61*	16.8	2858/*19706*	12547/*55812*
2.5/*0.76*	21.0	2759/*19025*	12114/*53884*
3.0/*0.91*	25.2	2661/*18345*	11680/*51957*
3.5/*1.07*	29.4	2562/*17664*	11247/*50029*
4.0/*1.22*	33.6	2463/*16983*	10814/*48101*
4.5/*1.37*	37.8	2364/*16303*	10380/*46173*
5.0/*1.52*	42.0	2266/*15622*	9947/*44245*
5.5/*1.68*	46.2	2167/*14941*	9513/*42317*
6.0/*1.83*	50.3	2068/*14261*	9080/*40390*
6.5/*1.98*	54.5	1970/*13580*	8647/*38462*
7.0/*2.13*	58.7	1871/*12899*	8213/*36534*
7.5/*2.29*	62.9	1772/*12219*	7780/*34606*
8.0/*2.44*	67.1	1673/*11538*	7346/*32678*
8.5/*2.59*	71.3	1575/*10857*	6913/*30750*
9.0/*2.74*	75.5	1476/*10177*	6480/*28823*
9.5/*2.90*	79.7	1377/*9496*	6046/*26895*
10.0/*3.05*	83.9	1279/*8815*	5613/*24967*
10.5/*3.20*	88.1	1180/*8135*	5179/*23039*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	92.3	1081/*7454*	4746/*21111*
11.5/*3.51*	96.5	989/*6820*	4342/*19315*
12.0/*3.66*	100.7	908/*6263*	3988/*17739*
12.5/*3.81*	104.9	837/*5772*	3675/*16349*
13.0/*3.96*	109.1	774/*5337*	3398/*15115*
13.5/*4.12*	113.3	718/*4949*	3151/*14016*
14.0/*4.27*	117.5	667/*4602*	2930/*13033*
14.5/*4.42*	121.7	622/*4290*	2731/*12150*
15.0/*4.57*	125.9	581/*4009*	2552/*11353*
15.5/*4.72*	130.1	544/*3754*	2390/*10633*
16.0/*4.88*	134.3	511/*3523*	2243/*9978*
16.5/*5.03*	138.5	480/*3313*	2109/*9383*
17.0/*5.18*	142.7	453/*3121*	1987/*8839*
17.5/*5.33*	146.9	427/*2945*	1875/*8341*
18.0/*5.49*	151.0	404/*2784*	1772/*7884*
18.5/*5.64*	155.2	382/*2635*	1678/*7464*
19.0/*5.79*	159.4	362/*2498*	1591/*7076*
19.5/*5.94*	163.6	344/*2372*	1510/*6718*
20.0/*6.10*	167.8	327/*2255*	1436/*6386*

English/*Metric*

6 X 6 X 3/8 WF-BEAM

152.4 x 152.4 x 9.5 WF-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 6.48 in.^{2} / *4180.64mm^2*
r = 1.44 in. / *36.58mm*
b/t = 16

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	8.3	6658/*45905*	43144/*191912*
1.5/*0.46*	12.5	6328/*43630*	41005/*182400*
2.0/*0.61*	16.7	5998/*41354*	38867/*172887*
2.5/*0.76*	20.8	5668/*39079*	36728/*163375*
3.0/*0.91*	25.0	5338/*36804*	34590/*153862*
3.5/*1.07*	29.2	5008/*34528*	32451/*144350*
4.0/*1.22*	33.3	4678/*32253*	30313/*134837*
4.5/*1.37*	37.5	4348/*29977*	28174/*125324*
5.0/*1.52*	41.7	4018/*27702*	26036/*115812*
5.5/*1.68*	45.8	3688/*25427*	23897/*106299*
6.0/*1.83*	50.0	3358/*23151*	21759/*96787*
6.5/*1.98*	54.2	3028/*20876*	19620/*87274*
7.0/*2.13*	58.3	2698/*18600*	17482/*77762*
7.5/*2.29*	62.5	2368/*16325*	15343/*68249*
8.0/*2.44*	66.7	2073/*14290*	13431/*59742*
8.5/*2.59*	70.8	1836/*12658*	11897/*52921*
9.0/*2.74*	75.0	1638/*11291*	10612/*47204*
9.5/*2.90*	79.2	1470/*10134*	9524/*42366*
10.0/*3.05*	83.3	1326/*9146*	8596/*38235*
10.5/*3.20*	87.5	1203/*8295*	7796/*34680*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	91.7	1096/*7558*	7104/*31599*
11.5/*3.51*	95.8	1003/*6916*	6500/*28911*
12.0/*3.66*	100.0	921/*6351*	5969/*26552*
12.5/*3.81*	104.2	849/*5853*	5501/*24470*
13.0/*3.96*	108.3	785/*5412*	5086/*22624*
13.5/*4.12*	112.5	728/*5018*	4716/*20979*
14.0/*4.27*	116.7	677/*4666*	4386/*19508*
14.5/*4.42*	120.8	631/*4350*	4088/*18186*
15.0/*4.57*	125.0	590/*4065*	3820/*16993*
15.5/*4.72*	129.2	552/*3807*	3578/*15915*
16.0/*4.88*	133.3	518/*3573*	3358/*14936*
16.5/*5.03*	137.5	487/*3359*	3157/*14044*
17.0/*5.18*	141.7	459/*3165*	2974/*13230*
17.5/*5.33*	145.8	433/*2986*	2807/*12485*
18.0/*5.49*	150.0	409/*2823*	2653/*11801*
18.5/*5.64*	154.2	388/*2672*	2511/*11172*
19.0/*5.79*	158.3	367/*2533*	2381/*10591*
19.5/*5.94*	162.5	349/*2405*	2261/*10055*
20.0/*6.10*	166.7	332/*2286*	2149/*9559*

English/*Metric*

8 X 8 X 3/8 WF-BEAM

203.2 x 203.2 x 9.5 WF-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 8.73 in.^{2} / *5632.25mm^2*
r = 1.92 in. / *48.77mm*
b/t = 21.3

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	6.3	3908/*26943*	34115/*151752*
1.5/*0.46*	9.4	3803/*26222*	33202/*147690*
2.0/*0.61*	12.5	3699/*25501*	32289/*143628*
2.5/*0.76*	15.6	3594/*24780*	31376/*139566*
3.0/*0.91*	18.8	3489/*24059*	30463/*135505*
3.5/*1.07*	21.9	3385/*23338*	29550/*131443*
4.0/*1.22*	25.0	3280/*22616*	28636/*127381*
4.5/*1.37*	28.1	3176/*21895*	27723/*123319*
5.0/*1.52*	31.3	3071/*21174*	26810/*119257*
5.5/*1.68*	34.4	2966/*20453*	25897/*115196*
6.0/*1.83*	37.5	2862/*19732*	24984/*111134*
6.5/*1.98*	40.6	2757/*19011*	24071/*107072*
7.0/*2.13*	43.8	2653/*18289*	23158/*103010*
7.5/*2.29*	46.9	2548/*17568*	22244/*98948*
8.0/*2.44*	50.0	2443/*16847*	21331/*94887*
8.5/*2.59*	53.1	2339/*16126*	20418/*90825*
9.0/*2.74*	56.3	2234/*15405*	19505/*86763*
9.5/*2.90*	59.4	2130/*14684*	18592/*82701*
10.0/*3.05*	62.5	2025/*13962*	17679/*78639*
10.5/*3.20*	65.6	1920/*13241*	16766/*74578*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	68.8	1816/*12520*	15853/*70516*
11.5/*3.51*	71.9	1711/*11799*	14939/*66454*
12.0/*3.66*	75.0	1607/*11078*	14026/*62392*
12.5/*3.81*	78.1	1502/*10356*	13113/*58330*
13.0/*3.96*	81.3	1395/*9621*	12182/*54187*
13.5/*4.12*	84.4	1294/*8921*	11296/*50247*
14.0/*4.27*	87.5	1203/*8295*	10504/*46722*
14.5/*4.42*	90.6	1122/*7733*	9792/*43556*
15.0/*4.57*	93.8	1048/*7226*	9150/*40700*
15.5/*4.72*	96.9	982/*6768*	8569/*38117*
16.0/*4.88*	100.0	921/*6351*	8042/*35772*
16.5/*5.03*	103.1	866/*5972*	7562/*33637*
17.0/*5.18*	106.3	816/*5626*	7124/*31687*
17.5/*5.33*	109.4	770/*5309*	6722/*29902*
18.0/*5.49*	112.5	728/*5018*	6354/*28264*
18.5/*5.64*	115.6	689/*4751*	6015/*26757*
19.0/*5.79*	118.8	653/*4504*	5703/*25367*
19.5/*5.94*	121.9	620/*4276*	5414/*24083*
20.0/*6.10*	125.0	590/*4065*	5147/*22894*

English/*Metric*

8 X 8 X 1/2 WF-BEAM

203.2 x 203.2 x 12.7 WF-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 11.51 in.^{2} / *7425.79mm^2*
r = 1.93 in. / *49.02mm*
b/t = 16

Effective Length (ft/*m*)	Kl/r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	6.2	6826/*47060*	78562/*349461*
1.5/*0.46*	9.3	6579/*45363*	75728/*336854*
2.0/*0.61*	12.4	6333/*43665*	72894/*324248*
2.5/*0.76*	15.5	6087/*41967*	70060/*311641*
3.0/*0.91*	18.7	5841/*40270*	67226/*299034*
3.5/*1.07*	21.8	5594/*38572*	64391/*286427*
4.0/*1.22*	24.9	5348/*36874*	61557/*273821*
4.5/*1.37*	28.0	5102/*35177*	58723/*261214*
5.0/*1.52*	31.1	4856/*33479*	55889/*248607*
5.5/*1.68*	34.2	4609/*31781*	53055/*236000*
6.0/*1.83*	37.3	4363/*30083*	50221/*223394*
6.5/*1.98*	40.4	4117/*28386*	47387/*210787*
7.0/*2.13*	43.5	3871/*26688*	44553/*198180*
7.5/*2.29*	46.6	3625/*24990*	41719/*185573*
8.0/*2.44*	49.7	3378/*23293*	38884/*172967*
8.5/*2.59*	52.8	3132/*21595*	36050/*160360*
9.0/*2.74*	56.0	2886/*19897*	33216/*147753*
9.5/*2.90*	59.1	2640/*18200*	30382/*135146*
10.0/*3.05*	62.2	2393/*16502*	27548/*122540*
10.5/*3.20*	65.3	2161/*14902*	24876/*110656*

Effective Length (ft/*m*)	Kl/r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	68.4	1969/*13578*	22666/*100825*
11.5/*3.51*	71.5	1802/*12423*	20738/*92248*
12.0/*3.66*	74.6	1655/*11409*	19046/*84721*
12.5/*3.81*	77.7	1525/*10515*	17553/*78079*
13.0/*3.96*	80.8	1410/*9721*	16229/*72188*
13.5/*4.12*	83.9	1307/*9015*	15049/*66940*
14.0/*4.27*	87.0	1216/*8382*	13993/*62244*
14.5/*4.42*	90.2	1133/*7814*	13045/*58025*
15.0/*4.57*	93.3	1059/*7302*	12189/*54221*
15.5/*4.72*	96.4	992/*6838*	11416/*50780*
16.0/*4.88*	99.5	931/*6418*	10713/*47655*
16.5/*5.03*	102.6	875/*6035*	10074/*44811*
17.0/*5.18*	105.7	825/*5685*	9490/*42214*
17.5/*5.33*	108.8	778/*5365*	8956/*39836*
18.0/*5.49*	111.9	735/*5071*	8465/*37654*
18.5/*5.64*	115.0	696/*4800*	8014/*35646*
19.0/*5.79*	118.1	660/*4551*	7597/*33794*
19.5/*5.94*	121.2	627/*4321*	7213/*32084*
20.0/*6.10*	124.4	596/*4107*	6857/*30499*

English/*Metric*

10 X 10 X 3/8 WF-BEAM

254.0 x 254.0 x 9.5 WF-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 11.06 in.^{2} / *7135.47mm^2*
r = 2.38 in. / *60.45mm*
b/t = 26.7

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	5.0	2549/*17572*	28187/*125384*
1.5/*0.46*	7.6	2505/*17274*	27710/*123258*
2.0/*0.61*	10.1	2462/*16976*	27232/*121133*
2.5/*0.76*	12.6	2419/*16678*	26754/*119007*
3.0/*0.91*	15.1	2376/*16380*	26276/*116881*
3.5/*1.07*	17.6	2333/*16082*	25798/*114756*
4.0/*1.22*	20.2	2289/*15785*	25320/*112630*
4.5/*1.37*	22.7	2246/*15487*	24842/*110504*
5.0/*1.52*	25.2	2203/*15189*	24365/*108379*
5.5/*1.68*	27.7	2160/*14891*	23887/*106253*
6.0/*1.83*	30.3	2117/*14593*	23409/*104128*
6.5/*1.98*	32.8	2073/*14295*	22931/*102002*
7.0/*2.13*	35.3	2030/*13997*	22453/*99876*
7.5/*2.29*	37.8	1987/*13699*	21975/*97751*
8.0/*2.44*	40.3	1944/*13401*	21497/*95625*
8.5/*2.59*	42.9	1901/*13103*	21020/*93500*
9.0/*2.74*	45.4	1857/*12806*	20542/*91374*
9.5/*2.90*	47.9	1814/*12508*	20064/*89248*
10.0/*3.05*	50.4	1771/*12210*	19586/*87123*
10.5/*3.20*	52.9	1728/*11912*	19108/*84997*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	55.5	1684/*11614*	18630/*82871*
11.5/*3.51*	58.0	1641/*11316*	18152/*80746*
12.0/*3.66*	60.5	1598/*11018*	17675/*78620*
12.5/*3.81*	63.0	1555/*10720*	17197/*76495*
13.0/*3.96*	65.5	1512/*10422*	16719/*74369*
13.5/*4.12*	68.1	1468/*10125*	16241/*72243*
14.0/*4.27*	70.6	1425/*9827*	15763/*70118*
14.5/*4.42*	73.1	1382/*9529*	15285/*67992*
15.0/*4.57*	75.6	1339/*9231*	14807/*65867*
15.5/*4.72*	78.2	1296/*8933*	14330/*63741*
16.0/*4.88*	80.7	1252/*8635*	13852/*61615*
16.5/*5.03*	83.2	1209/*8337*	13374/*59490*
17.0/*5.18*	85.7	1166/*8039*	12896/*57364*
17.5/*5.33*	88.2	1123/*7741*	12418/*55239*
18.0/*5.49*	90.8	1080/*7444*	11940/*53113*
18.5/*5.64*	93.3	1036/*7146*	11462/*50987*
19.0/*5.79*	95.8	993/*6848*	10985/*48862*
19.5/*5.94*	98.3	950/*6550*	10507/*46736*
20.0/*6.10*	100.8	906/*6246*	10019/*44567*

English/*Metric*

10 X 10 X 1/2 WF-BEAM

254.0 x 254.0 x 12.7 WF-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 14.51 in.^{2} / *9361.27mm^2*
r = 2.4 in. / *60.96mm*
b/t = 20

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	5.0	4481/*30894*	65016/*289205*
1.5/*0.46*	7.5	4379/*30193*	63541/*282646*
2.0/*0.61*	10.0	4278/*29493*	62067/*276088*
2.5/*0.76*	12.5	4176/*28792*	60592/*269529*
3.0/*0.91*	15.0	4074/*28091*	59118/*262970*
3.5/*1.07*	17.5	3973/*27391*	57644/*256411*
4.0/*1.22*	20.0	3871/*26690*	56169/*249852*
4.5/*1.37*	22.5	3769/*25989*	54695/*243294*
5.0/*1.52*	25.0	3668/*25289*	53220/*236735*
5.5/*1.68*	27.5	3566/*24588*	51746/*230176*
6.0/*1.83*	30.0	3465/*23887*	50271/*223617*
6.5/*1.98*	32.5	3363/*23187*	48797/*217058*
7.0/*2.13*	35.0	3261/*22486*	47322/*210500*
7.5/*2.29*	37.5	3160/*21786*	45848/*203941*
8.0/*2.44*	40.0	3058/*21085*	44373/*197382*
8.5/*2.59*	42.5	2956/*20384*	42899/*190823*
9.0/*2.74*	45.0	2855/*19684*	41424/*184264*
9.5/*2.90*	47.5	2753/*18983*	39950/*177706*
10.0/*3.05*	50.0	2652/*18282*	38475/*171147*
10.5/*3.20*	52.5	2550/*17582*	37001/*164588*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	55.0	2448/*16881*	35526/*158029*
11.5/*3.51*	57.5	2347/*16181*	34052/*151471*
12.0/*3.66*	60.0	2245/*15480*	32577/*144912*
12.5/*3.81*	62.5	2144/*14779*	31103/*138353*
13.0/*3.96*	65.0	2042/*14079*	29629/*131794*
13.5/*4.12*	67.5	1940/*13378*	28154/*125235*
14.0/*4.27*	70.0	1839/*12677*	26680/*118677*
14.5/*4.42*	72.5	1737/*11977*	25205/*112118*
15.0/*4.57*	75.0	1635/*11276*	23731/*105559*
15.5/*4.72*	77.5	1534/*10574*	22254/*98989*
16.0/*4.88*	80.0	1439/*9924*	20885/*92899*
16.5/*5.03*	82.5	1353/*9331*	19638/*87354*
17.0/*5.18*	85.0	1275/*8791*	18500/*82291*
17.5/*5.33*	87.5	1203/*8295*	17458/*77656*
18.0/*5.49*	90.0	1137/*7841*	16501/*73402*
18.5/*5.64*	92.5	1077/*7423*	15621/*69488*
19.0/*5.79*	95.0	1021/*7037*	14810/*65879*
19.5/*5.94*	97.5	969/*6681*	14060/*62544*
20.0/*6.10*	100.0	921/*6351*	13366/*59456*

English/*Metric*

12 X 12 X 1/2 WF-BEAM

304.8 x 304.8 x 12.7 WF-BEAM

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 17.51 in.^{2} / *11296.75mm^2*
r = 2.87 in. / *72.90mm*
b/t = 24

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	4.2	3155/*21750*	55237/*245708*
1.5/*0.46*	6.3	3105/*21411*	54376/*241877*
2.0/*0.61*	8.4	3056/*21072*	53515/*238046*
2.5/*0.76*	10.5	3007/*20733*	52653/*234214*
3.0/*0.91*	12.5	2958/*20394*	51792/*230383*
3.5/*1.07*	14.6	2909/*20055*	50931/*226552*
4.0/*1.22*	16.7	2859/*19715*	50070/*222721*
4.5/*1.37*	18.8	2810/*19376*	49208/*218889*
5.0/*1.52*	20.9	2761/*19037*	48347/*215058*
5.5/*1.68*	23.0	2712/*18698*	47486/*211227*
6.0/*1.83*	25.1	2663/*18359*	46624/*207395*
6.5/*1.98*	27.2	2614/*18020*	45763/*203564*
7.0/*2.13*	29.3	2564/*17681*	44902/*199733*
7.5/*2.29*	31.4	2515/*17341*	44040/*195902*
8.0/*2.44*	33.4	2466/*17002*	43179/*192070*
8.5/*2.59*	35.5	2417/*16663*	42318/*188239*
9.0/*2.74*	37.6	2368/*16324*	41456/*184408*
9.5/*2.90*	39.7	2318/*15985*	40595/*180576*
10.0/*3.05*	41.8	2269/*15646*	39734/*176745*
10.5/*3.20*	43.9	2220/*15307*	38873/*172914*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	46.0	2171/*14967*	38011/*169083*
11.5/*3.51*	48.1	2122/*14628*	37150/*165251*
12.0/*3.66*	50.2	2072/*14289*	36289/*161420*
12.5/*3.81*	52.3	2023/*13950*	35427/*157589*
13.0/*3.96*	54.4	1974/*13611*	34566/*153757*
13.5/*4.12*	56.4	1925/*13272*	33705/*149926*
14.0/*4.27*	58.5	1876/*12932*	32843/*146095*
14.5/*4.42*	60.6	1827/*12593*	31982/*142264*
15.0/*4.57*	62.7	1777/*12254*	31121/*138432*
15.5/*4.72*	64.8	1728/*11915*	30259/*134601*
16.0/*4.88*	66.9	1679/*11576*	29398/*130770*
16.5/*5.03*	69.0	1630/*11237*	28537/*126938*
17.0/*5.18*	71.1	1581/*10898*	27676/*123107*
17.5/*5.33*	73.2	1531/*10558*	26814/*119276*
18.0/*5.49*	75.3	1482/*10219*	25953/*115445*
18.5/*5.64*	77.4	1433/*9880*	25092/*111613*
19.0/*5.79*	79.4	1384/*9541*	24230/*107782*
19.5/*5.94*	81.5	1335/*9202*	23369/*103951*
20.0/*6.10*	83.6	1285/*8863*	22508/*100119*

English/*Metric*

2 X 2 X 1/4 SQUARE TUBE

50.8 x 50.8 x 6.4 SQUARE TUBE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 1.74 in.^{2} / *1122.58mm^2*
r = .73 in. / *18.54mm*
b/t = 8

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	16.4	7916/*54577*	13773/*61267*
1.5/*0.46*	24.7	6874/*47395*	11960/*53201*
2.0/*0.61*	32.9	5831/*40206*	10147/*45135*
2.5/*0.76*	41.1	4789/*33021*	8333/*37068*
3.0/*0.91*	49.3	3747/*25835*	6520/*29002*
3.5/*1.07*	57.5	2783/*19187*	4842/*21539*
4.0/*1.22*	65.8	2131/*14690*	3707/*16491*
4.5/*1.37*	74.0	1683/*11607*	2929/*13030*
5.0/*1.52*	82.2	1364/*9402*	2373/*10554*
5.5/*1.68*	90.4	1127/*7770*	1961/*8722*
6.0/*1.83*	98.6	947/*6529*	1648/*7329*
6.5/*1.98*	106.8	807/*5563*	1404/*6245*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
7.0/*2.13*	115.1	696/*4797*	1211/*5385*
7.5/*2.29*	123.3	606/*4178*	1055/*4691*
8.0/*2.44*	131.5	533/*3672*	927/*4123*
8.5/*2.59*	139.7	472/*3253*	821/*3652*
9.0/*2.74*	147.9	421/*2902*	732/*3257*
9.5/*2.90*	156.2	378/*2604*	657/*2924*
10.0/*3.05*	164.4	341/*2350*	593/*2639*
10.5/*3.20*	172.6	309/*2132*	538/*2393*
11.0/*3.35*	180.8	282/*1942*	490/*2181*
11.5/*3.51*	189.0	258/*1777*	449/*1995*
12.0/*3.66*	197.3	237/*1632*	412/*1832*

English/*Metric*

1 1/2 X 1 1/2 X 1/4 SQUARE TUBE

38.1 x 38.1 x 6.4 SQUARE TUBE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 1.24 in.^{2} / *800.0mm^2*
r = .52 in. / *13.21mm*
b/t = 8

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	23.1	7074/*48773*	8772/*39019*
1.5/*0.46*	34.6	5611/*38686*	6958/*30949*
2.0/*0.61*	46.2	4148/*28599*	5143/*22879*
2.5/*0.76*	57.7	2768/*19082*	3432/*15265*
3.0/*0.91*	69.2	1922/*13251*	2383/*10601*
3.5/*1.07*	80.8	1412/*9736*	1751/*7789*
4.0/*1.22*	92.3	1081/*7454*	1341/*5963*
4.5/*1.37*	103.8	854/*5889*	1059/*4712*
5.0/*1.52*	115.4	692/*4770*	858/*3816*
5.5/*1.68*	126.9	572/*3943*	709/*3154*
6.0/*1.83*	138.5	480/*3313*	596/*2650*
6.5/*1.98*	150.0	409/*2823*	508/*2258*
7.0/*2.13*	161.5	353/*2434*	438/*1947*
7.5/*2.29*	173.1	308/*2120*	381/*1696*
8.0/*2.44*	184.6	270/*1863*	335/*1491*
8.5/*2.59*	196.2	239/*1651*	297/*1321*

English/*Metric*

1 3/4 X 1 3/4 X 1/4 SQUARE TUBE

44.45 x 44.45 x 6.4 SQUARE TUBE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 1.49 in.^{2} / *961.29mm^2*
r = .62 in. / *15.75mm*
b/t = 8

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	19.4	7546/*52027*	11243/*50013*
1.5/*0.46*	29.0	6319/*43567*	9415/*41881*
2.0/*0.61*	38.7	5092/*35107*	7587/*33748*
2.5/*0.76*	48.4	3865/*26647*	5759/*25615*
3.0/*0.91*	58.1	2732/*18838*	4071/*18109*
3.5/*1.07*	67.7	2007/*13840*	2991/*13304*
4.0/*1.22*	77.4	1537/*10596*	2290/*10186*
4.5/*1.37*	87.1	1214/*8372*	1809/*8048*
5.0/*1.52*	96.8	984/*6782*	1466/*6519*
5.5/*1.68*	106.5	813/*5605*	1211/*5388*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
6.0/*1.83*	116.1	683/*4710*	1018/*4527*
6.5/*1.98*	125.8	582/*4013*	867/*3857*
7.0/*2.13*	135.5	502/*3460*	748/*3326*
7.5/*2.29*	145.2	437/*3014*	651/*2897*
8.0/*2.44*	154.8	384/*2649*	572/*2547*
8.5/*2.59*	164.5	340/*2347*	507/*2256*
9.0/*2.74*	174.2	304/*2093*	452/*2012*
9.5/*2.90*	183.9	272/*1879*	406/*1806*
10.0/*3.05*	193.5	246/*1695*	366/*1630*

English/*Metric*

2 1/2 X 2 1/2 X 1/4 SQUARE TUBE

67.2 x 67.2 x 6.4 SQUARE TUBE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A = 2.24 in.^{2} / *1445.16mm^2*
r = .92 in. / *23.37mm*
b/t = 10

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	13.0	8346/*57545*	18695/*83161*
1.5/*0.46*	19.6	7519/*51843*	16843/*74922*
2.0/*0.61*	26.1	6692/*46142*	14991/*66682*
2.5/*0.76*	32.6	5865/*40440*	13138/*58443*
3.0/*0.91*	39.1	5038/*34739*	11286/*50203*
3.5/*1.07*	45.7	4212/*29038*	9434/*41964*
4.0/*1.22*	52.2	3384/*23332*	7580/*33718*
4.5/*1.37*	58.7	2674/*18435*	5989/*26642*
5.0/*1.52*	65.2	2166/*14932*	4851/*21580*
5.5/*1.68*	71.7	1790/*12341*	4009/*17834*
6.0/*1.83*	78.3	1504/*10370*	3369/*14986*
6.5/*1.98*	84.8	1282/*8836*	2871/*12769*
7.0/*2.13*	91.3	1105/*7619*	2475/*11010*
7.5/*2.29*	97.8	963/*6637*	2156/*9591*
8.0/*2.44*	104.3	846/*5833*	1895/*8430*
8.5/*2.59*	110.9	749/*5167*	1679/*7467*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
9.0/*2.74*	117.4	668/*4609*	1497/*6660*
9.5/*2.90*	123.9	600/*4136*	1344/*5978*
10.0/*3.05*	130.4	541/*3733*	1213/*5395*
10.5/*3.20*	137.0	491/*3386*	1100/*4893*
11.0/*3.35*	143.5	447/*3085*	1002/*4459*
11.5/*3.51*	150.0	409/*2823*	917/*4079*
12.0/*3.66*	156.5	376/*2592*	842/*3746*
12.5/*3.81*	163.0	347/*2389*	776/*3453*
13.0/*3.96*	169.6	320/*2209*	718/*3192*
13.5/*4.12*	176.1	297/*2048*	665/*2960*
14.0/*4.27*	182.6	276/*1905*	619/*2753*
14.5/*4.42*	189.1	258/*1776*	577/*2566*
15.0/*4.57*	195.7	241/*1659*	539/*2398*

English/*Metric*

3 X 3 X 1/4 SQUARE TUBE

76.2 x 76.2 x 6.4 SQUARE TUBE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 2.74 in.^{2} / *1767.74mm^2*
r = 1.13 in. / *28.70mm*
b/t = 12

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	10.6	8654/*59964*	23711/*105470*
1.5/*0.46*	15.9	7980/*55022*	21866/*97264*
2.0/*0.61*	21.2	7307/*50380*	20021/*89059*
2.5/*0.76*	26.5	6634/*45738*	18177/*80853*
3.0/*0.91*	31.9	5961/*41096*	16332/*72648*
3.5/*1.07*	37.2	5287/*36455*	14487/*64442*
4.0/*1.22*	42.5	4614/*31813*	12642/*56236*
4.5/*1.37*	47.8	3941/*27171*	10798/*48031*
5.0/*1.52*	53.1	3267/*22527*	8952/*39823*
5.5/*1.68*	58.4	2700/*18618*	7399/*32911*
6.0/*1.83*	63.7	2269/*15644*	6217/*27655*
6.5/*1.98*	69.0	1933/*13330*	5297/*23564*
7.0/*2.13*	74.3	1667/*11494*	4568/*20318*
7.5/*2.29*	79.6	1452/*10012*	3979/*17699*
8.0/*2.44*	85.0	1276/*8800*	3497/*15556*
8.5/*2.59*	90.3	1131/*7795*	3098/*13779*
9.0/*2.74*	95.6	1008/*6953*	2763/*12291*
9.5/*2.90*	100.9	905/*6240*	2480/*11031*
10.0/*3.05*	106.2	817/*5632*	2238/*9956*
10.5/*3.20*	111.5	741/*5108*	2030/*9030*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	116.8	675/*4654*	1850/*8228*
11.5/*3.51*	122.1	618/*4258*	1692/*7528*
12.0/*3.66*	127.4	567/*3911*	1554/*6914*
12.5/*3.81*	132.7	523/*3604*	1432/*6372*
13.0/*3.96*	138.1	483/*3332*	1324/*5891*
13.5/*4.12*	143.4	448/*3090*	1228/*5463*
14.0/*4.27*	148.7	417/*2873*	1142/*5079*
14.5/*4.42*	154.0	389/*2679*	1065/*4735*
15.0/*4.57*	159.3	363/*2503*	995/*4425*
15.5/*4.72*	164.6	340/*2344*	932/*4144*
16.0/*4.88*	169.9	319/*2200*	874/*3889*
16.5/*5.03*	175.2	300/*2069*	822/*3657*
17.0/*5.18*	180.5	283/*1949*	774/*3445*
17.5/*5.33*	185.8	267/*1839*	731/*3251*
18.0/*5.49*	191.2	252/*1738*	691/*3073*
18.5/*5.64*	196.5	239/*1646*	654/*2909*

English/*Metric*

3 1/2 X 1/4 SQUARE TUBE

88.9 x 88.9 x 6.4 SQUARE TUBE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 2.74 in.^{2} / *1767.74mm^2*
r = 1.13 in. / *28.70mm*
b/t = 14

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	9.1	8847/*61000*	28665/*127510*
1.5/*0.46*	13.6	8271/*57026*	26798/*119203*
2.0/*0.61*	18.2	7695/*53053*	24931/*110897*
2.5/*0.76*	22.7	7118/*49079*	23063/*102591*
3.0/*0.91*	27.3	6542/*45105*	21196/*94284*
3.5/*1.07*	31.8	5966/*41132*	19329/*85978*
4.0/*1.22*	36.4	5389/*37158*	17461/*77672*
4.5/*1.37*	40.9	4813/*33184*	15594/*69365*
5.0/*1.52*	45.5	4237/*29210*	13727/*61059*
5.5/*1.68*	50.0	3660/*25237*	11859/*52753*
6.0/*1.83*	54.5	3096/*21347*	10032/*44622*
6.5/*1.98*	59.1	2638/*18189*	8548/*38021*
7.0/*2.13*	63.6	2275/*15684*	7370/*32784*
7.5/*2.29*	68.2	1982/*13662*	6420/*28558*
8.0/*2.44*	72.7	1742/*12008*	5643/*25100*
8.5/*2.59*	77.3	1543/*10637*	4998/*22234*
9.0/*2.74*	81.8	1376/*9488*	4458/*19832*
9.5/*2.90*	86.4	1235/*8515*	4001/*17800*
10.0/*3.05*	90.9	1115/*7685*	3611/*16064*
10.5/*3.20*	95.5	1011/*6971*	3276/*14571*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	100.0	921/*6351*	2985/*13276*
11.5/*3.51*	104.5	843/*5811*	2731/*12147*
12.0/*3.66*	109.1	774/*5337*	2508/*11156*
12.5/*3.81*	113.6	713/*4918*	2311/*10281*
13.0/*3.96*	118.2	660/*4547*	2137/*9505*
13.5/*4.12*	122.7	612/*4217*	1982/*8814*
14.0/*4.27*	127.3	569/*3921*	1843/*8196*
14.5/*4.42*	131.8	530/*3655*	1718/*7640*
15.0/*4.57*	136.4	495/*3416*	1605/*7140*
15.5/*4.72*	140.9	464/*3199*	1503/*6686*
16.0/*4.88*	145.5	435/*3002*	1411/*6275*
16.5/*5.03*	150.0	409/*2823*	1326/*5900*
17.0/*5.18*	154.5	386/*2659*	1250/*5558*
17.5/*5.33*	159.1	364/*2509*	1179/*5245*
18.0/*5.49*	163.6	344/*2372*	1115/*4958*
18.5/*5.64*	168.2	326/*2245*	1055/*4694*
19.0/*5.79*	172.7	309/*2129*	1000/*4450*
19.5/*5.94*	177.3	293/*2021*	950/*4225*
20.0/*6.10*	181.8	279/*1921*	903/*4016*

English/*Metric*

ADDITIONAL INFORMATION IS AVAILABLE REGARDING THIS TABLE - PLEASE SEE THE ADDENDUM ON OUR WEBSITE
http://bit.ly/1xAfdYL

4 X 4 X 3/8 SQUARE TUBE

101.6 x 101.6 x 9.5 SQUARE TUBE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 5.43 in.^{2} / *3503.22mm^2*
r = 1.48 in. / *37.59mm*
b/t = 10.7

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	8.1	8972/*61859*	48718/*216707*
1.5/*0.46*	12.2	8458/*58315*	45926/*204291*
2.0/*0.61*	16.2	7944/*54771*	43135/*191875*
2.5/*0.76*	20.3	7430/*51227*	40344/*179459*
3.0/*0.91*	24.3	6916/*47683*	37553/*167043*
3.5/*1.07*	28.4	6402/*44139*	34762/*154628*
4.0/*1.22*	32.4	5888/*40595*	31970/*142212*
4.5/*1.37*	36.5	5374/*37050*	29179/*129796*
5.0/*1.52*	40.5	4860/*33506*	26388/*117380*
5.5/*1.68*	44.6	4346/*29962*	23597/*104964*
6.0/*1.83*	48.6	3832/*26418*	20806/*92548*
6.5/*1.98*	52.7	3316/*22866*	18008/*80105*
7.0/*2.13*	56.8	2860/*19716*	15528/*69070*
7.5/*2.29*	60.8	2491/*17175*	13526/*60168*
8.0/*2.44*	64.9	2189/*15095*	11888/*52882*
8.5/*2.59*	68.9	1939/*13372*	10531/*46843*
9.0/*2.74*	73.0	1730/*11927*	9393/*41783*
9.5/*2.90*	77.0	1553/*10705*	8430/*37501*
10.0/*3.05*	81.1	1401/*9661*	7609/*33844*
10.5/*3.20*	85.1	1271/*8763*	6901/*30698*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	89.2	1158/*7985*	6288/*27971*
11.5/*3.51*	93.2	1060/*7305*	5753/*25591*
12.0/*3.66*	97.3	973/*6709*	5284/*23503*
12.5/*3.81*	101.4	897/*6183*	4869/*21660*
13.0/*3.96*	105.4	829/*5717*	4502/*20026*
13.5/*4.12*	109.5	769/*5301*	4175/*18570*
14.0/*4.27*	113.5	715/*4929*	3882/*17268*
14.5/*4.42*	117.6	666/*4595*	3619/*16097*
15.0/*4.57*	121.6	623/*4294*	3382/*15042*
15.5/*4.72*	125.7	583/*4021*	3167/*14087*
16.0/*4.88*	129.7	547/*3774*	2972/*13220*
16.5/*5.03*	133.8	515/*3549*	2795/*12431*
17.0/*5.18*	137.8	485/*3343*	2633/*11711*
17.5/*5.33*	141.9	458/*3155*	2484/*11051*
18.0/*5.49*	145.9	432/*2982*	2348/*10446*
18.5/*5.64*	150.0	409/*2823*	2223/*9889*
19.0/*5.79*	154.1	388/*2676*	2108/*9375*
19.5/*5.94*	158.1	368/*2541*	2001/*8901*
20.0/*6.10*	162.2	350/*2415*	1902/*8461*

English/*Metric*

4 X 4 X 1/4 SQUARE TUBE

101.6 x 101.6 x 6.4 SQUARE TUBE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 3.74 in.^{2} / *2412.90mm^2*
r = 1.53 in. / *38.86mm*
b/t = 16

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	7.8	9006/*62091*	33681/*149819*
1.5/*0.46*	11.8	8508/*58663*	31821/*141547*
2.0/*0.61*	15.7	8011/*55234*	29961/*133275*
2.5/*0.76*	19.6	7514/*51806*	28102/*125003*
3.0/*0.91*	23.5	7017/*48378*	26242/*116731*
3.5/*1.07*	27.5	6519/*44949*	24382/*108458*
4.0/*1.22*	31.4	6022/*41521*	22523/*100186*
4.5/*1.37*	35.3	5525/*38093*	20663/*91914*
5.0/*1.52*	39.2	5028/*34665*	18803/*83642*
5.5/*1.68*	43.1	4530/*31236*	16944/*75370*
6.0/*1.83*	47.1	4033/*27808*	15084/*67098*
6.5/*1.98*	51.0	3536/*24380*	13225/*58826*
7.0/*2.13*	54.9	3056/*21071*	11430/*50842*
7.5/*2.29*	58.8	2662/*18355*	9957/*44289*
8.0/*2.44*	62.7	2340/*16132*	8751/*38926*
8.5/*2.59*	66.7	2073/*14290*	7752/*34481*
9.0/*2.74*	70.6	1849/*12747*	6914/*30756*
9.5/*2.90*	74.5	1659/*11440*	6206/*27604*
10.0/*3.05*	78.4	1497/*10325*	5601/*24912*
10.5/*3.20*	82.4	1358/*9365*	5080/*22596*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	86.3	1238/*8533*	4629/*20589*
11.5/*3.51*	90.2	1132/*7807*	4235/*18837*
12.0/*3.66*	94.1	1040/*7170*	3889/*17300*
12.5/*3.81*	98.0	958/*6608*	3584/*15944*
13.0/*3.96*	102.0	886/*6109*	3314/*14741*
13.5/*4.12*	105.9	822/*5665*	3073/*13669*
14.0/*4.27*	109.8	764/*5268*	2857/*12710*
14.5/*4.42*	113.7	712/*4911*	2664/*11849*
15.0/*4.57*	117.6	666/*4589*	2489/*11072*
15.5/*4.72*	121.6	623/*4297*	2331/*10369*
16.0/*4.88*	125.5	585/*4033*	2188/*9731*
16.5/*5.03*	129.4	550/*3792*	2057/*9151*
17.0/*5.18*	133.3	518/*3573*	1938/*8620*
17.5/*5.33*	137.3	489/*3371*	1829/*8135*
18.0/*5.49*	141.2	462/*3187*	1729/*7689*
18.5/*5.64*	145.1	438/*3017*	1636/*7279*
19.0/*5.79*	149.0	415/*2860*	1551/*6901*
19.5/*5.94*	152.9	394/*2715*	1473/*6552*
20.0/*6.10*	156.9	374/*2581*	1400/*6228*

English/*Metric*

6 X 6 X 3/8 SQUARE TUBE

152.4 x 153.4 x 9.5 SQUARE TUBE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 8.27 in.^{2} / *5335.47mm^2*
r = 2.29 in. / *58.17mm*
b/t = 16

Effective Length (ft/*m*)	Kl r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	5.2	7537/*51967*	62332/*277266*
1.5/*0.46*	7.9	7306/*50371*	60418/*268753*
2.0/*0.61*	10.5	7074/*48775*	58504/*260239*
2.5/*0.76*	13.1	6843/*47179*	56590/*251725*
3.0/*0.91*	15.7	6611/*45584*	54676/*243211*
3.5/*1.07*	18.3	6380/*43988*	52762/*234697*
4.0/*1.22*	21.0	6148/*42392*	50848/*226183*
4.5/*1.37*	23.6	5917/*40797*	48934/*217669*
5.0/*1.52*	26.2	5686/*39201*	47020/*209155*
5.5/*1.68*	28.8	5454/*37605*	45106/*200641*
6.0/*1.83*	31.4	5223/*36009*	43192/*192127*
6.5/*1.98*	34.1	4991/*34414*	41278/*183613*
7.0/*2.13*	36.7	4760/*32818*	39364/*175099*
7.5/*2.29*	39.3	4528/*31222*	37450/*166585*
8.0/*2.44*	41.9	4297/*29626*	35536/*158071*
8.5/*2.59*	44.5	4066/*28031*	33622/*149557*
9.0/*2.74*	47.2	3834/*26435*	31708/*141043*
9.5/*2.90*	49.8	3603/*24839*	29794/*132529*
10.0/*3.05*	52.4	3355/*23129*	27743/*123407*
10.5/*3.20*	55.0	3043/*20979*	25164/*111934*

Effective Length (ft/*m*)	Kl r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	57.6	2772/*19115*	22928/*101981*
11.5/*3.51*	60.3	2537/*17489*	20978/*93313*
12.0/*3.66*	62.9	2330/*16062*	19266/*85699*
12.5/*3.81*	65.5	2147/*14803*	17755/*78980*
13.0/*3.96*	68.1	1985/*13686*	16416/*73022*
13.5/*4.12*	70.7	1841/*12691*	15222/*67713*
14.0/*4.27*	73.4	1712/*11801*	14155/*62963*
14.5/*4.42*	76.0	1596/*11001*	13195/*58693*
15.0/*4.57*	78.6	1491/*10280*	12330/*54847*
15.5/*4.72*	81.2	1396/*9627*	11548/*51360*
16.0/*4.88*	83.8	1310/*9035*	10837/*48200*
16.5/*5.03*	86.5	1232/*8496*	10190/*45328*
17.0/*5.18*	89.1	1161/*8003*	9600/*42701*
17.5/*5.33*	91.7	1095/*7552*	9059/*40296*
18.0/*5.49*	94.3	1035/*7139*	8563/*38089*
18.5/*5.64*	96.9	980/*6758*	8106/*36057*
19.0/*5.79*	99.6	929/*6407*	7685/*34185*
19.5/*5.94*	102.2	882/*6083*	7296/*32454*
20.0/*6.10*	104.8	839/*5782*	6936/*30852*

English/*Metric*

6 X 4 X 1/4 RECTANGLE TUBE

152.4 x 101.6 x 6.4 RECTANGLE TUBE

Column Table

ALLOWABLE CONCENTRIC AXIAL STRESSES AND LOADS

A= 4.68 in.^{2} / *3019.3mm^2*
r = 1.61 in. / *40.89mm*
b/t = 24

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
1.0/*0.30*	7.5	4969/*34263*	23257/*103453*
1.5/*0.46*	11.2	4786/*33000*	22400/*99638*
2.0/*0.61*	14.9	4603/*31736*	21542/*95823*
2.5/*0.76*	18.6	4420/*30473*	20684/*92008*
3.0/*0.91*	22.4	4236/*29209*	19827/*88193*
3.5/*1.07*	26.1	4053/*27946*	18969/*84378*
4.0/*1.22*	29.8	3870/*26682*	18111/*80563*
4.5/*1.37*	33.5	3687/*25419*	17254/*76748*
5.0/*1.52*	37.3	3503/*24155*	16396/*72933*
5.5/*1.68*	41.0	3320/*22892*	15538/*69118*
6.0/*1.83*	44.7	3137/*21628*	14681/*65303*
6.5/*1.98*	48.4	2954/*20365*	13823/*61488*
7.0/*2.13*	52.2	2770/*19101*	12965/*57673*
7.5/*2.29*	55.9	2587/*17838*	12108/*53858*
8.0/*2.44*	59.6	2404/*16574*	11250/*50043*
8.5/*2.59*	63.4	2221/*15311*	10392/*46228*
9.0/*2.74*	67.1	2037/*14047*	9535/*42413*
9.5/*2.90*	70.8	1837/*12668*	8599/*38248*
10.0/*3.05*	74.5	1658/*11433*	7760/*34519*
10.5/*3.20*	78.3	1504/*10370*	7039/*31310*

Effective Length (ft/*m*)	Kl / r	F_a (psi/*kPa*)	P_a (lbs/*N*)
11.0/*3.35*	82.0	1370/*9448*	6413/*28528*
11.5/*3.51*	85.7	1254/*8645*	5868/*26101*
12.0/*3.66*	89.4	1152/*7939*	5389/*23972*
12.5/*3.81*	93.2	1061/*7317*	4967/*22092*
13.0/*3.96*	96.9	981/*6765*	4592/*20426*
13.5/*4.12*	100.6	910/*6273*	4258/*18941*
14.0/*4.27*	104.3	846/*5833*	3959/*17612*
14.5/*4.42*	108.1	789/*5438*	3691/*16418*
15.0/*4.57*	111.8	737/*5081*	3449/*15342*
15.5/*4.72*	115.5	690/*4759*	3230/*14368*
16.0/*4.88*	119.3	648/*4466*	3031/*13484*
16.5/*5.03*	123.0	609/*4199*	2850/*12679*
17.0/*5.18*	126.7	574/*3956*	2685/*11944*
17.5/*5.33*	130.4	541/*3733*	2534/*11272*
18.0/*5.49*	134.2	512/*3529*	2395/*10654*
18.5/*5.64*	137.9	484/*3340*	2267/*10086*
19.0/*5.79*	141.6	459/*3167*	2150/*9562*
19.5/*5.94*	145.3	436/*3007*	2041/*9078*
20.0/*6.10*	149.1	415/*2858*	1940/*8630*

English/*Metric*

CONNECTION DETAILS

Since 1974
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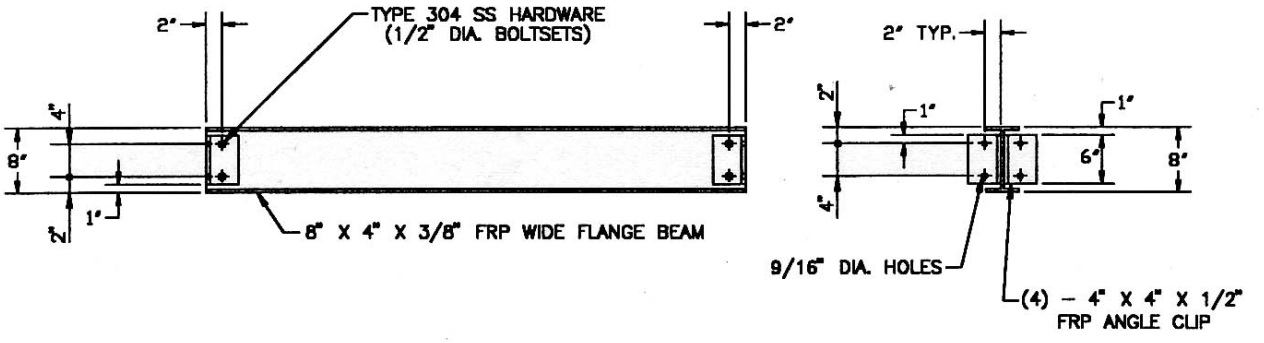
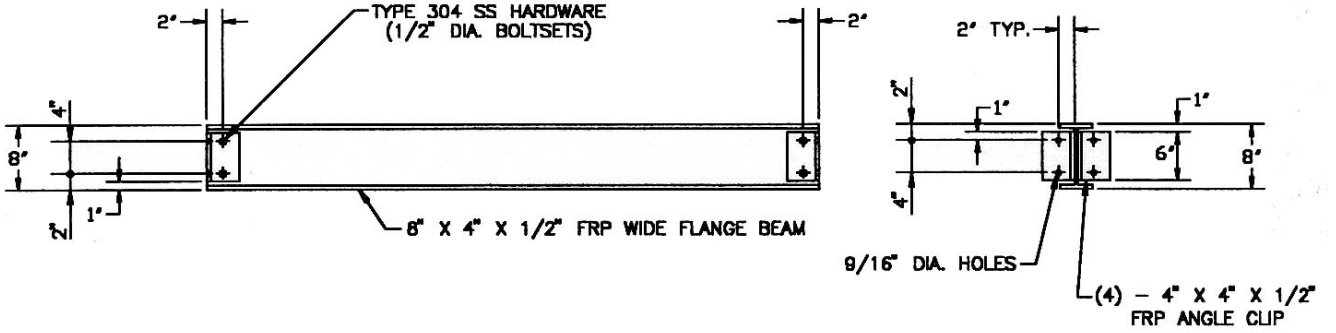
Typical Framing Practices for PFRP Sections

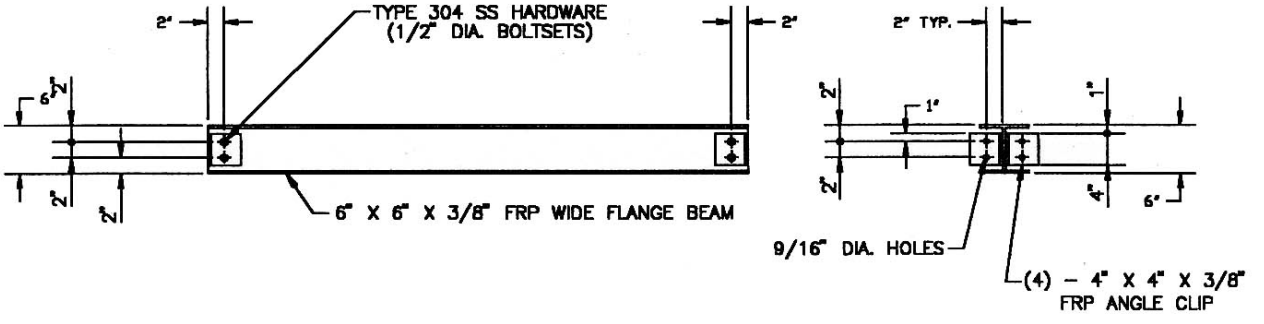
Connections for PFRP frame structures play the major role of both efficient and safe design of the frame structures. To date, most of the available connection details are duplicates of the steel connections. These sections will provide the structural engineer and the fabricator with recommended details which were the results of the current research in the area of the frame connections. Bedford Reinforced Plastics recognizes the importance of providing the Plastics Industry with the appropriate and safe state-of-the-art research development in this vital area.

The following connection details are furnished courtesy of Structural Fiberglass, Inc. and IKG Industries.

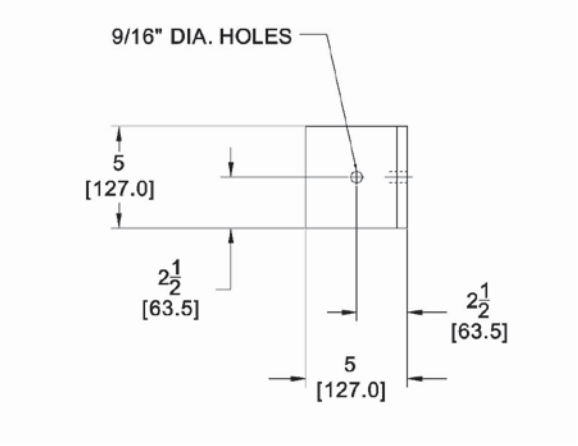
TYPICAL BEAM CONNECTION DETAILS

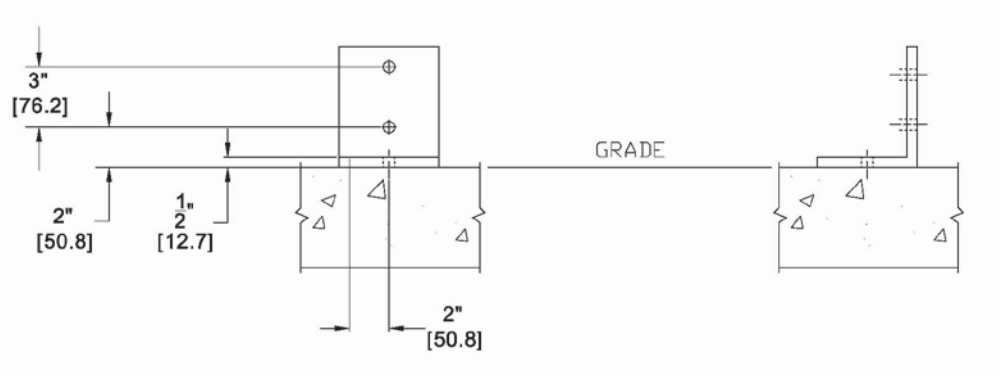




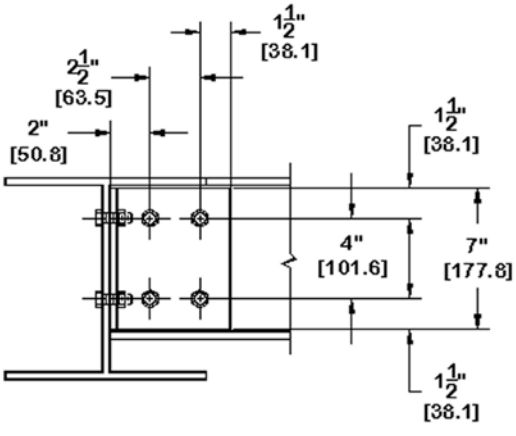


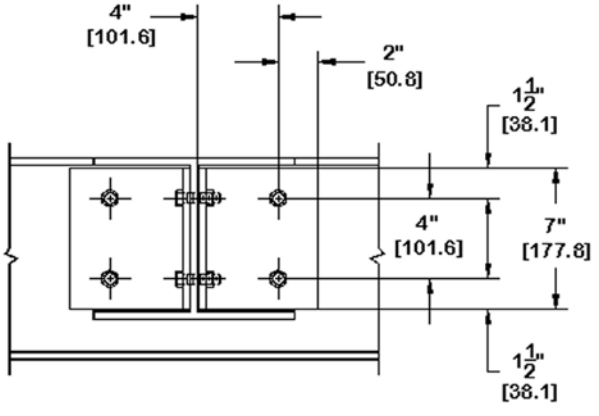
TYPICAL BASE DETAIL



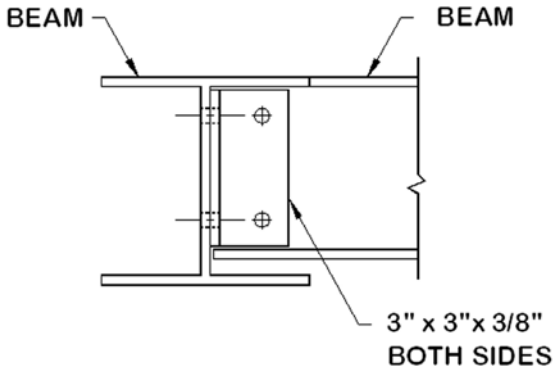


TYPICAL CONNECTION DETAIL

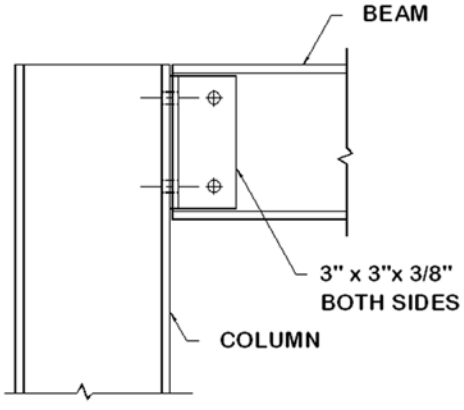




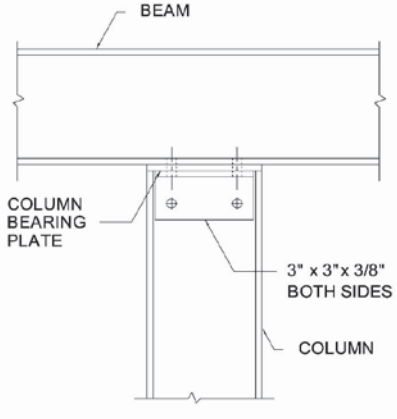
BEAM TO BEAM CONNECTION



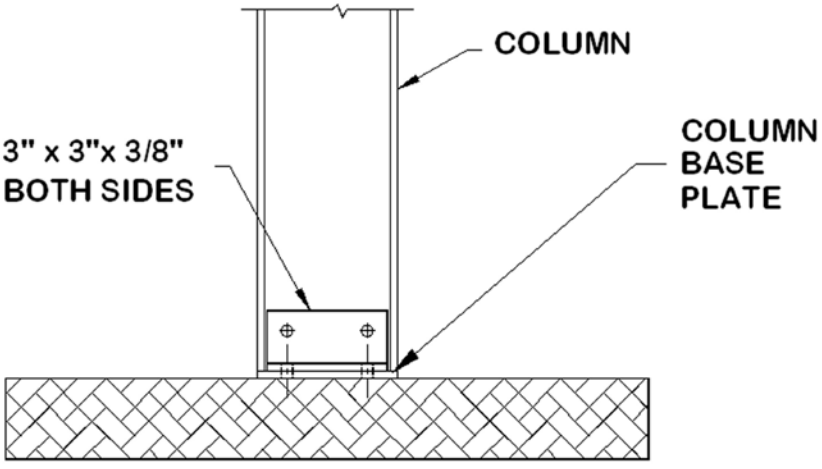
BEAM TO BEAM COLUMN



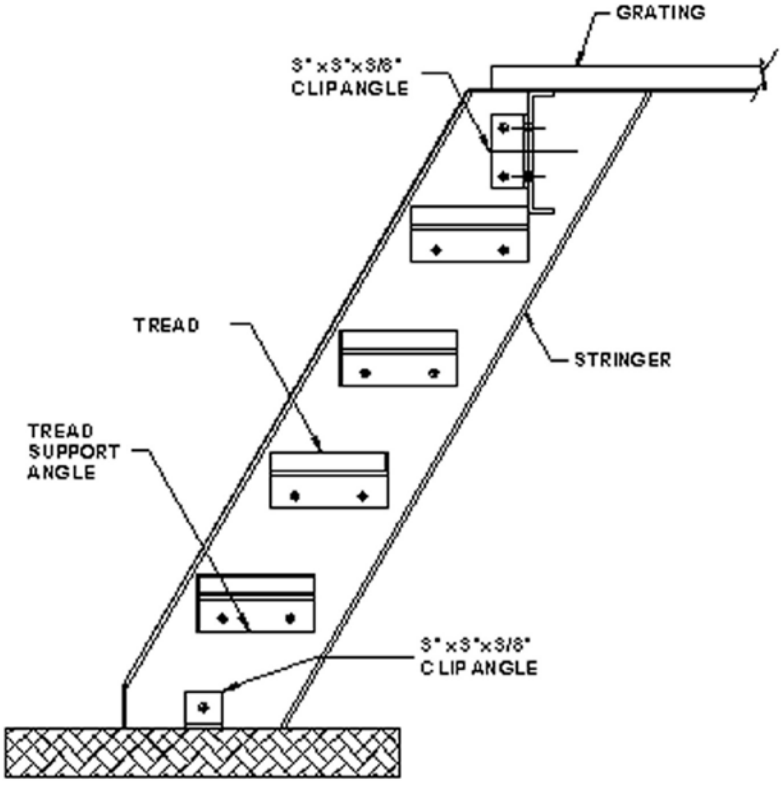
BEAM OVER COLUMN



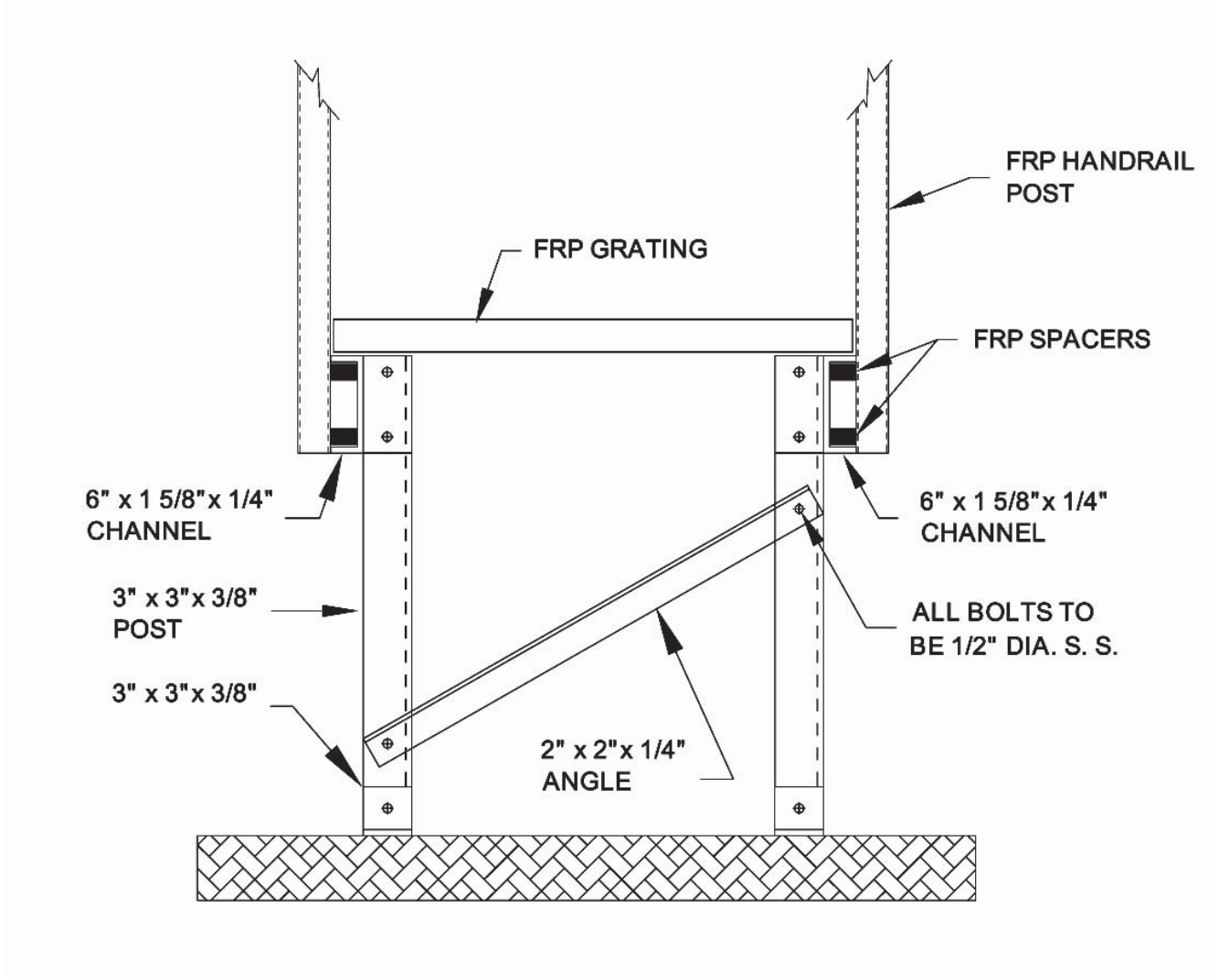
PINNED COLUMN BASE (No Uplift)



STAIR STRINGER



SMALL PLATFORM ASSEMBLY (Foot Traffic Loading)



CORROSION GUIDE

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4/2012

CORROSION GUIDE

The data in this corrosion guide is based on field service performance, laboratory testing and extrapolated values from our resin manufacturers' recommendations. Data shown is intended as a guide only. It is recommended that for a specific application, testing be done in the actual chemical environment.
The following conditions will effect the suitability of a specific resin laminate:

- Periodic changes in temperature
- Changes in chemical concentrations
- Exposure to vapors only
- Exposure to intermittent splashes and spills
- Load bearing or non-load bearing requirements
- Temperature spikes
- Combinations of chemicals
- Exposure to frequent splashes and spills
- Frequency of maintenance wash down

Chemical Environment	Maximum Recommended Service Temperatures, °F / *°C*	
	Vinylester	Polyester
Acetic Acid, to 10%	170 / *76*	80 / *26*
Acetic Acid, to 50%	180 / *81*	NR / *NR*
Acetic Acid, Glacial	NR / *NR*	NR / *NR*
Acetone	NR / *NR*	NR / *NR*
Aluminum Chloride	170 / *76*	120 / *49*
Aluminum Hydroxide	140 / *60*	120 / *49*
Aluminum Nitrate	140 / *60*	120 / *49*
Aluminum Sulfate	170 / *76*	120 / *49*
Ammonium Chloride	170 / *76*	120 / *49*
Ammonium Hydroxide, 5%	140 / *60*	NR / *NR*
Ammonium Nitrate, to 50%	170 / *76*	120 / *49*
Ammonium Nitrate, Saturated	170 / *76*	NR / *NR*
Ammonium Persulfate, to 25%	140 / *60*	90 / *32*
Ammonium Phosphate	170 / *76*	120 / *49*
Ammonium Sulfate	170 / *76*	120 / *49*
Amyl Alcohol	80 / *26*	NR / *NR*
Barium Carbonate	170 / *76*	120 / *49*
Barium Chloride	170 / *76*	120 / *49*
Barium Sulfate	170 / *76*	120 / *49*
Benzene	NR / *NR*	NR / *NR*
Benzene Sulfonic Acid 50%	110 / *43*	NR / *NR*
Benzoic Acid	170 / *76*	120 / *49*
Benzyl Alcohol	NR / *NR*	NR / *NR*
Borax	170 / *76*	120 / *49*
Brine (Sodium Chloride Sol.)	170 / *76*	120 / *49*
Bromine, Liquid or Vapor	NR / *NR*	NR / *NR*
Ethyl Alcohol	NR / *NR*	NR / *NR*
Ethylene Glycol	170 / *76*	120 / *49*

Chemical Environment	Maximum Recommended Service Temperatures, °F / *°C*	
	Vinylester	Polyester
Butyl Acetate	NR / *NR*	NR / *NR*
Butyl Alcohol	80 / *26*	NR / *NR*
Calcium Carbonate	170 / *76*	120 / *49*
Calcium Hydroxide	140 / *60*	120 / *49*
Calcium Hypochlorite	120 / *49*	NR / *NR*
Calcium Nitrate	170 / *76*	120 / *49*
Calcium Sulfate	170 / *76*	120 / *49*
Carbon Disulfide	NR / *NR*	NR / *NR*
Carbon Monoxide Gas	170 / *76*	160 / *60*
Carbon Dioxide Gas	170 / *76*	160 / *60*
Carbon Tetrachloride	70 / *20*	NR / *NR*
Liquid or Vapor	110 / *43*	NR / *NR*
Chlorine, Dry Gas	170 / *76*	NR / *NR*
Chlorine, Wet Gas	170 / *76*	NR / *NR*
Chlorine Water	140 / *60*	NR / *NR*
Chloroform	140 / *60*	NR / *NR*
Chromic Acid, to 5%	110 / *43*	NR / *NR*
Chromous Sulfate	140 / *60*	120 / *49*
Citric Acid	170 / *76*	120 / *49*
Copper Chloride	170 / *76*	170 / *76*
Copper Cyanide	170 / *76*	170 / *76*
Copper Nitrate	170 / *76*	170 / *76*
Crude Oil, Sour	170 / *76*	170 / *76*
Cyclohexane, Liquid and Vapor	170 / *76*	NR / *NR*
Diesel Fuel	140 / *60*	90 / *32*
Ethyl Acetate	NR / *NR*	NR / *NR*
Phosphoric Acid, Vapor	170 / *76*	120 / *49*
Potassium Aluminum Sulfate	170 / *76*	120 / *49*

Chemical Environment	Maximum Recommended Service Temperatures, °F / °C	
	Vinylester	Polyester
Fatty Acids	170 / 76	80 / 26
Ferric Chloride	170 / 76	110 / 43
Ferric Sulfate	170 / 76	110 / 43
Formaldehyde	110 / 43	NR / NR
Fuel Oil	140 / 60	80 / 26
Gasoline, Aviation and Ethyl	140 / 60	80 / 26
Glucose	170 / 76	100 / 37
Glycerine	170 / 76	100 / 37
Hexane	120 / 49	90 / 32
Hydraulic Fluid (Glycol Based)	140 / 60	NR / NR
Hydraulic Fluid Skydraul	140 / 60	NR / NR
Hydrobromic Acid	110 / 43	NR / NR
Hydrochloric Acid, up to 15%	140 / 60	80 / 26
Hydrochloric Acid, Concentrated	110 / 43	NR / NR
Hydrogen Bromide, Dry Gas	140 / 60	80 / 26
Hydrogen Bromine, Wet Gas	140 / 60	NR / NR
Hydrogen Chloride, Dry Gas	170 / 76	80 / 26
Hydrogen Chloride, Wet Gas	170 / 76	80 / 26
Hydrogen Fluoride, Sol or Vapor	NR / NR	NR / NR
Hydrogen Peroxide, to 10%	110 / 43	NR / NR
Hydrogen Sulfide, Dry Gas	140 / 60	80 / 26
Hydrogen Sulfide, Wet Gas	140 / 60	80 / 26
Isopropyl Alcohol	80 / 26	NR / NR
JP-4	140 / 60	80 / 26
Kerosene	140 / 60	110 / 43
Lactic Acid	170 / 76	120 / 49
Lead Acetate	170 / 76	120 / 49
Linseed Oil	170 / 76	100 / 37
Lithium Chloride	170 / 76	120 / 49
Magnesium Carbonate	170 / 76	120 / 49
Magnesium Chloride	170 / 76	120 / 49
Magnesium Hydroxide	170 / 76	100 / 37
Magnesium Nitrate	170 / 76	120 / 49
Magnesium Sulfate	170 / 76	120 / 49
Mercuric Chloride	170 / 76	120 / 49
Mercury Metal	170 / 76	120 / 49
Methyl Ethyl Ketone	NR / NR	NR / NR
Mineral Oil	170 / 76	120 / 49
Monochlorobenzene	NR / NR	NR / NR
Naphtha	140 / 60	120 / 49
Nickel Chloride	170 / 76	120 / 49
Nitric Acid, to 5%	110 / 43	100 / 37
Nitric Acid, Concentrated	NR / NR	NR / NR
Nitric Acid, Vapor	140 / 60	100 / 37
Oleic Acid	170 / 76	120 / 49
Oxalic Acid	170 / 76	120 / 49
Paper Mill Liquor	100 / 37	100 / 37
Phenol Solution or Vapor	NR / NR	NR / NR
Phosphoric Acid	170 / 76	100 / 37
Phosphoric Acid, Salts thereof	170 / 76	120 / 49

Chemical Environment	Maximum Recommended Service Temperatures, °F / °C	
	Vinylester	Polyester
Potassium Bicarbonate	110 / 43	100 / 37
Potassium Carbonate, to 10%	110 / 43	NR / NR
Potassium Chloride	170 / 76	120 / 49
Potassium Hydroxide	140 / 60	NR / NR
Potassium Nitrate	170 / 76	120 / 49
Potassium Sulfate	170 / 76	120 / 49
Propylene Glycol	170 / 76	120 / 49
Sodium Acetate	170 / 76	120 / 49
Sodium Benzoate	140 / 60	120 / 49
Sodium Bicarbonate	140 / 60	120 / 49
Sodium Bisulfate	170 / 76	120 / 49
Sodium Bisulfite	170 / 76	120 / 49
Sodium Borate	170 / 76	120 / 49
Sodium Bromide	170 / 76	120 / 49
Sodium Carbonate, to 10%	140 / 60	70 / 20
Sodium Chloride	170 / 76	120 / 49
Sodium Cyanide	170 / 76	120 / 49
Sodium Dichromate	170 / 76	120 / 49
Sodium Di-Phosphate	170 / 76	120 / 49
Sodium Hydroxide, 10%	140 / 60	NR / NR
Sodium Hypochlorite, to 5 1/4%	110 / 43	70 / 20
Sodium Monophosphate	170 / 76	120 / 49
Sodium Nitrate	170 / 76	120 / 49
Sodium Nitrite	170 / 76	120 / 49
Sodium Sulfate	170 / 76	120 / 49
Sodium Tetraborate	140 / 60	120 / 49
Sodium Thiosulfate	140 / 60	120 / 49
Soy Oil	170 / 76	100 / 37
Stearic Acid	170 / 76	120 / 49
Styrene	NR / NR	NR / NR
Sulfamic Acid	170 / 76	120 / 49
Sulfated Detergents	NR / NR	120 / 49
Sulfite Liquor	160 / 71	100 / 37
Sulfur Dioxide, gas-dry	170 / 76	120 / 49
Sulfur Dioxide, gas-wet	170 / 76	70 / 20
Sulfur Trioxide, gas-wet or dry	170 / 76	NR / NR
Sulfuric Acid, to 25%	170 / 76	80 / 26
Tartaric Acid	170 / 76	120 / 49
Tetrachloroethylene	NR / NR	NR / NR
Toluene	NR / NR	NR / NR
Trichloroethylene vapor	NR / NR	NR / NR
Trisodium Phosphate	170 / 76	NR / NR
Urea, 35%	110 / 43	NR / NR
Vinegar	170 / 76	150 / 65
Water, Distilled	180 / 81	150 / 65
Water, Tap	180 / 81	120 / 65
Zinc Chloride	170 / 76	120 / 49
Zinc Nitrate	170 / 76	120 / 49
Zinc Sulfate	170 / 76	120 / 49

APPENDIX

SPI COMPOSITES INSTITUTE
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THE PULTRUSION INDUSTRY COUNCIL

January 23, 1992

RECOMMENDED SPECIFICATION FOR MATERIALS USED IN PULTRUDED STRUCTURAL SHAPES

1.0 SCOPE

1.1 This model specification offers recommendations with respect to the minimum properties of various types of commercially available from open stock pultruded fiberglass reinforced structural shapes whose materials of construction, or classification, tolerances and defects are defined by existing American Society for Testing And Materials (ASTM) documents. It is not intended to restrict or limit technological changes affecting performance when those changes are agreed upon between purchaser and seller.

1.2 The values stated in inch-pound units are to regarded as the standard. The values in parentheses are for information only.

1.3 This model specification may involve hazardous materials, operations, and equipment. This document does not purport to address all of the safety problems that may arise (with its use). It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1.4 DISCLAIMER

This Recommended Specification has been prepared by the Pultrusion Industry Council (PIC) of the Composites Institute of the Society of the Plastics Industry, Inc. (SPI) as a service to its members and their customers. It is intended to be used only as a guide in developing appropriate final specifications suited to the purchaser's particular needs. This recommended specification is not intended as a substitute for or use as a contract specification. It is offered in good faith and is based on information believed to be accurate and reliable, but is offered without warranty to any kind, either expressed or implied. SPI and its members accept no responsibility for any harm resulting from reliance on this recommended specification. Compliance with all applicable government regulations or industry standards remains the full responsibility of the parties to whom the regulation or standard applies. SPI and CI do not endorse any particular product or process of any manufacturer.

Note 1 The classification of pultruded structural shapes into types based in relative response to laboratory flame tests shall not be considered a fire hazard classification.

Note 2 This specification is designed as a guide for existing structural shapes with thickness of approximately .250". The data should not be extrapolated to thin section (<.155") or to thick section (>.300").

2.0 REFERENCED DOCUMENTS

2.1 ASTM STANDARDS AND TEST METHODS

D256 Test Methods for Impact Resistance of Plastics and Electrical Insulating Materials.

D570 Test Method for Water Absorption of Plastics.

D618 Methods of Conditioning Plastics and Electrical Insulating Material for Testing.

D635 Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position.

D638 Test Method for Tensile Properties of Plastics.

D695 Test Method for Compressive Properties of Rigid Plastics.

D696 Test Methods for Coefficient of Linear Thermal Expansion of Plastics.

D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

D792 Test Methods for Specific Gravity and Density of Plastics by Displacement.

D833 Definitions of Terms Relating to Plastics.

D2343 Test Method for Tensile Properties of Glass Fiber Strands, Yarns and Rovings Used in Reinforced Plastics.

D2344 Apparent Interlaminar Sheer Strength of Parallel Fiber Composites by Short-Beam Method.

D2583 Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impresser.

D2584 Test Method for Ignition Loss of Cured Reinforced Resins.

D2734 Test Methods for Void Content of Reinforced Plastics.

D3647 Practice for Classifying Reinforced Plastic Pultruded Shapes According to Composition.

D3846 Test Method for In-Plane Shear Strength of Reinforced Plastics.

D3914 Test Method for In-Plane Shear Strength of Pultruded Glass-Reinforced Plastic Rod.

D3916 Test Method for Tensile Properties of Pultruded Glass-Reinforced Plastic Rod.

D3917 Specification for Dimensional Tolerance of Thermosetting Glass-Reinforced Plastic Pultruded Shapes.

D3918 Definitions of Terms Relating to Reinforced Plastic Pultruded Products.

D4065 Practice for Determining and Reporting Dynamic Mechanical Properties of Plastics.

D4357 Specifications for Plastic Laminates Made from Woven-Roving and Woven-Yarn Glass Fabrics.

D4385 Practice for Classifying Visual Defects in Thermosetting Reinforced Plastic Pultruded Products.

D4475 Test Methods for Apparent Horizontal Shear Strength of Pultruded Reinforced Plastic Rods by the Short-Beam Method.

D4476 Test Method for Flexural Properties of Fiber Reinforced Pultruded Plastic Rods.

E84 Test Method for Surface Burning Characteristic of Burning Materials.

3.0 TERMINOLOGY

3.1 Definition of terms relating to this specification other than those below can be found in ASTM D883 and ASTM D3918.

A pultrusion run is defined as the amount of an individual product produced during the continuous operation of a single machine. Run should not exceed six calendar months or 100,000 ft.

A pultrusion lot is defined as the amount of an individual product produced by a single machine during one calendar day (24 hours).

A producer is defined as the primary manufacturer of the material.

A supplier includes only the category of jobbers and distributors as distinct from producers.

4.0 CLASSIFICATION

4.1 Pultruded shapes will be classified by composition using ASTM D3647.

4.2 Pultruded shapes may be segregated by type based on functional performance.

4.2.1 TYPE I: General purpose. General purpose structural shapes meet the minimum mechanical properties of TABLE I.

4.2.2 TYPE II: Flame retardant. Flame retardant structural shapes meet the minimum mechanical properties of TABLE I and have a flame spread rating less than or equal to 25 when tested according to ASTM E84.

4.2.3 TYPE III: Chemical resistant. Chemical resistant structural shapes meet the minimum mechanical properties of TABLE I and incorporate an appropriate resin to improve corrosion resistance, such as vinyl ester, bisphenol, or chlorendic anhydride or epoxy resins.

4.3 PROPERTIES

4.3.1 Mechanical Properties: All three types of pultruded structural shapes meet or exceed the minimum mechanical properties as stated in TABLE I.

4.3.2 Physical Properties: For information only, typical physical properties of pultruded structural shapes are given in TABLE II. Actual properties may vary from these typical values owing to materials and formulation differences.

5.0 TOLERANCES

5.1 All tolerances on standard pultruded shapes will be defined as per ASTM D3917.

6.0 WORKMANSHIP, FINISH, AND APPEARANCE

6.1 Pultruded shapes will be free from defects as per ASTM D4385.

7.0 TEST METHODS

7.1 Samples will be conditioned for testing as per ASTM D618.

7.2 Samples shall be selected randomly from the pultrusion lots of a pultrusion run.

7.3 The mechanical properties of a pultruded structural shape will be defined as per the test methods and values found in TABLE I.

8.0 CERTIFICATION

8.1 The producer shall supply upon advance request Certificates of Compliance to this specification for each pultrusion run. The form of the Certificate of Compliance is to be by agreement between the buyer and seller.

9.0 PRECISION AND BIAS

9.1 The precision and bias statements for each of the mechanical test methods specified in TABLE 1 can be obtained from the Pultrusion Industry Council. These tests were performed in .250″ thickness specimens using ASTM Round Robin Criteria and analyzed as per ASTM 691.

TABLE I

RECOMMENDED MECHANICAL PROPERTIES FOR PULTRUDED STRUCTURAL SHAPES

PROPERTY	UNITS	TEST METHOD	MINIMUM	
Tensile Strength	psi	D638		
Lengthwise	(MPA)		30,000	(206.80)
Crosswise			6,500	(44.80)
Tensile Modulus	psi x 10^6	D638		
Lengthwise	(GPA)		2.3	(15.85)
Crosswise			0.8	(5.51)
Flexural Strength	psi	D790		
Lengthwise	(MPA)		30,000	(206.80)
Crosswise			10,000	(44.80)
Flexural Modulus	psi x 10^6	D790		
Lengthwise	(GPA)		1.5	(10.30)
Crosswise			0.7	(4.80)
Compressive Strength	psi	D695		
Lengthwise	(MPA)		30,000	(206.80)
Crosswise			10,000	(44.80)
Izod Impact	Ft.-Lbs./in.	D256		
Lengthwise			20	
Crosswise			4	
Apparent Horizontal Shear	psi	D2344		
Lengthwise	MPA		3,000	-20.7

TABLE II

TYPICAL PHYSICAL PROPERTIES OF PULTRUDED STRUCTURAL SHAPES

PROPERTY	UNITS	TEST METHOD	TYPICAL
Barcol Hardness		D2583	
Flatwise			50[1]
Water Absorption	% max.	D570	0.7[2]
Density	Lb./in.^{3}	D792	.060 - .068
	(g/cm^3)		(1.6 - 1.9)
Specific Gravity		D792	1.6 - 1.0
Coefficient of Thermal Expansion			
Lengthwise	in./in./ °F	D696	2.9 x 10^{-6}
	(in./in./ °C)		(5.2 x 10^{-6})
Glass Content	% by Wt.	D2584	50 ± 5

1. Surface veils could cause this number to vary.
2. Maximum value for this composite construction.

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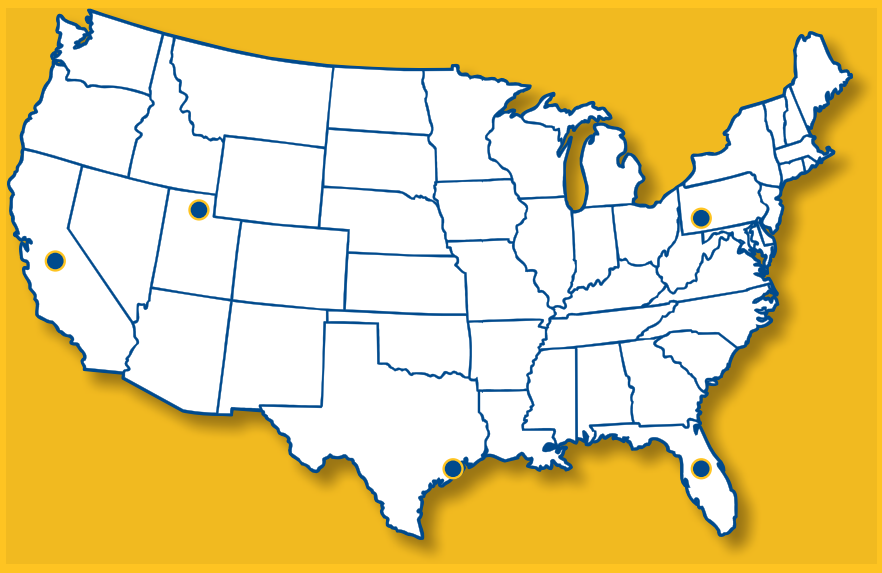

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