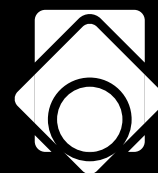


HSS

Metric Dimensions and Sections Properties



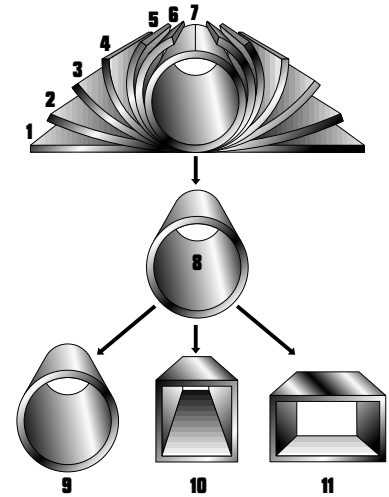
**Steel Tube
Institute**
OF NORTH AMERICA

HSS Manufacturing Methods

The transformation of steel strip into hollow structural sections (HSS) is the result of operations including forming, welding and sizing. Currently three methods are being used in North America for the manufacture of HSS. These methods, including two ERW methods and an SAW method, are described below. Both ERW methods meet ASTM A 500 and CSA G-40.21 requirements for the manufacture of HSS, and the ERW sizes included in this publication may be produced to either standard. The SAW method is not included as a manufacturing process in the ASTM or CSA specification. SAW sizes listed in this publication can be specified to meet desired physical and dimensional criteria of ASTM A500 and CSA G-40.21

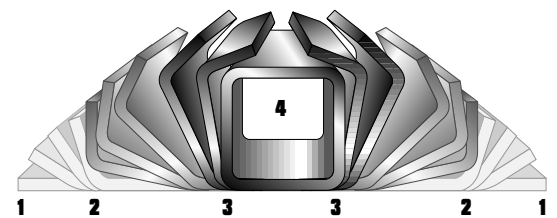
Electric Resistance Welding (ERW) Process

In the tube mill, flat steel strip (1) is formed continuously around its longitudinal axis to produce a round tube. This is done by moving the strip through a progressive set of rolls (2-6). The strip edges (7) are heated by either high frequency induction or contact welding and then forged together by weld rolls to create a continuous longitudinal weld without the addition of filler metal. The weld seam (8) is then cooled and processed through a set of sizing/shaping rolls which cold-form it into a round (9), square (10) or rectangular (11) section.



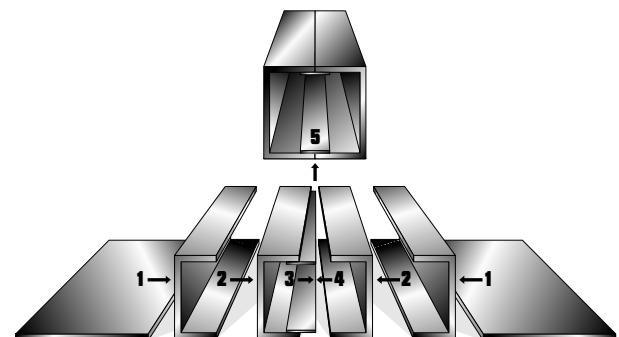
Form-Square Weld-Square (ERW) Process

In the weld mill, driven forming dies progressively shape the flat strip (1) by forming the top two corners (2) of the square or rectangular tube in the initial forming station. Subsequent stations form the bottom two corners (3) of the shape. No cold working of the sides of the shape is performed, and the shape's seam is welded by high-frequency contacts when the tube is near its final shape and size. The welded tube (4) is cooled and then driven through a series of sizing stations which qualifies the tube's final dimensions.



Submerged Arc Weld (SAW) Process

Two identical pieces of flat strip (1) are placed in a press brake and formed into two identical halves (2) of a finished tube size. A backup bar is tack welded to each leg of one of the half-sections (3). The two half-sections are fitted together toe-to-toe (4) and welded by the submerged arc process to complete the square or rectangular section (5).



STI/HSS Member Companies

Atlas Tube, Inc.

200 Clark Street, P.O. Box 970
Harrow, Ontario N0R 1G0
Telephone: (519) 738-3541
(800) 265-6912
Fax: (519) 738-3537

Bull Moose Tube Company

1819 Clarkson Road, Suite 100
Chesterfield, MO 63017
Telephone: (636) 537-2600
(800) 325-4467
Fax: (636) 537-5848

Eugene Welding Company

P.O. Box 249
Marysville, MI 48040
Telephone: (810) 364-7421
(800) 336-3926
Fax: (810) 364-4347

Hanna Steel Corporation

P.O. Box 558, Fairfield, AL 35064
Telephone: (205) 780-1111
(800) 633-8252
Fax: (205) 783-8296

Hannibal Industries, Inc.

P.O. Box 58814, 3851 Santa Fe Ave.
Los Angeles, CA 90058
Telephone: (323) 588-4261
Fax: (323) 589-5640

Independence Tube Corporation

6226 W. 74th Street
Chicago, IL 60638-6196
Telephone: (708) 496-0380
(800) 376-6000
Fax: (708) 563-1950

IPSCO Tubulars Inc.

P.O. Box 18, 2011 7th Avenue
Camanche, IA 52730
Telephone: (563) 242-0000
(800) 950-4772
Fax: (563) 242-9137

LTV Copperweld

1855 East 122nd Street
Chicago, IL 60633
Telephone: (800) 733-5683
Fax: (773) 646-6128
(In Canada)
14 Holtby Avenue
Brampton, Ontario
Canada L6X 2M3
Telephone: (905) 451-2400
(800) 268-3005
Fax: (905) 840-4716

Maverick Tube Corporation

16401 Swingley Ridge Road,
Suite 700
Chesterfield, MO 63017
Telephone: (314) 733-1600
(800) 840-8823
Fax: (314) 733-1677

Novamerican Steel Inc.

2175 Hymus Boulevard
Dorval, Quebec, Canada H9P 1J8
Telephone: (514) 335-6682
(800) 361-1496
Fax: (514) 683-5285
(In United States)
600 Dean Sievres Place
Morrisville, PA 19067
Telephone: (215) 295-8813
Fax: (215) 295-8798

Productos Laminados

de Monterrey, SA de CV
Headquarters & Monterrey Plant
Ave. Lazaro Cardenas 1525 Pte.
Col. Nino Artillero
Monterrey, N.L. Mexico C.P. 64280
Telephone: (8) 351-1625
(8) 351-1070

Fax: (8) 351-0322

(U.S. Office)

Prolamsa, Inc.

12603 SW Freeway, Suite 521
Stafford, TX 77477
Telephone: (281) 494-0900
Fax: (281) 494-0990

Valmont Industries

(Structural Tube Division)
P.O. Box 2620
Tulsa, OK 74101
Telephone: (918) 583-5881
(800) 331-3002
Fax: (918) 585-1927

Vest, Incorporated

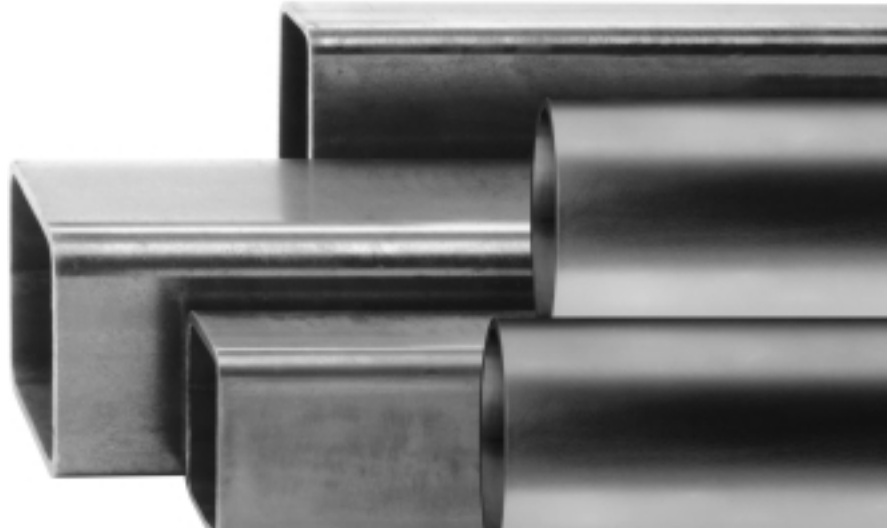
6023 Alcoa Avenue
Los Angeles, CA 90058
Telephone: (323) 581-8823
(800) 421-6370
Fax: (323) 581-3465

Welded Tube of Canada Limited

111 Rayette Road
Concord, Ontario,
Canada L4K 2E9
Telephone: (905) 669-1111
(800) 565-8823
Fax: (905) 738-4070

Please Note:

We've tried to make this brochure as comprehensive and factual as possible. However, some information may have been updated since the time of printing. Your HSS producer is your best source for up-to-date information.



The International System of units (System International or 'SI') has been adopted as the preferred system of measurement in the United States. As a result, architects, engineers and fabricators are increasingly being required to specify SI (metric) information for products used in construction applications.

This publication presents SI dimensions and section properties for U.S. customary sizes of rectangular, square and round Hollow Structural Sections (HSS) manufactured by the electric-resistance welding (ERW) process and the submerged arc welding (SAW) process. Refer to HSS Manufacturing Methods described on the inside front cover of this publication. The SAW method is not included as a manufacturing process in the ASTM or CSA specifications. This method is typically used to manufacture HSS sizes that are larger than the maximum 64-inch periphery defined in ASTM A500. SAW sizes listed in this publication can be specified to meet desired physical and dimensional criteria of ASTM A500 or CSA G-40.21.

Wall thickness, width and depth of rectangular and square HSS, and outside diameter of round HSS have converted to SI units and rounded to the nearest one-tenth of a millimeter. The conversion factor is 1 inch equals 25.4 millimeters exactly. All section property data have been calculated using these converted values. See, also, the Steel Tube Institute's publication "Recommendations for Soft Conversion of HSS Sizes from U.S.. Customary Units to Metric (SI) Units".

Section property data are based upon the design wall thickness. The design wall thickness, t , for ERW HSS is equal to 0.93 times the nominal wall thickness. For SAW HSS, the design wall thickness, t , is equal to the nominal wall thickness. The design wall thickness for each HSS size is included in the tabulated data.

Section property data based upon the design wall thickness, t , results in variations in the published area data that do not exceed 3.50% of the area data based upon the minimum permissible wall thickness stipulated in ASTM A500. This is consistent with similar section property information published for hot rolled structural shapes and the manufacturing tolerances associated with those products.

*The section property data for rectangular and square ERW HSS are based upon outside corner radii equal to 2.0 times the design wall thickness. The section property data for rectangular and square SAW HSS are based upon outside corner radii equal to 3.0 times the design wall thickness for 3/8 and 1/2 inch nominal wall thicknesses and 3.6 times the design wall thickness for 5/8 inch nominal wall thickness. SAW HSS sizes are indicated in the tables with an asterisk, *, after the nominal wall thickness.*

General availability information for each size of HSS is contained in the Steel Tube Institute's companion publication "Principal Producers and Capabilities".

The information presented in this publication has been prepared in accordance with recognized engineering principles and is for general information only. While it is believed to be accurate, this information should not be used or relied upon for any specific application without competent professional examination and verification of its accuracy, suitability, and applicability by a licensed professional engineer, designer, or architect. The publication of the material contained herein is not intended as a representation or warranty on the part of The Steel Tube Institute of North America or of any other person named herein, that this information is suitable for any general or particular use or of freedom from infringement of any patent or patents. Anyone making use of this information assumes all liability arising from such use.

Caution must be exercised when relying upon other specifications and codes developed by other bodies and incorporated by reference herein since such material may be modified or amended from time to time subsequent to the printing of this edition. The Institute bears no responsibility for such material other than to refer to it and incorporate it by reference at the time of the initial publication of this edition.

"Designs for the 21st Century"

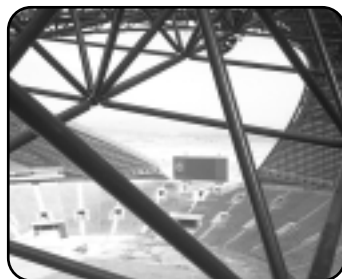
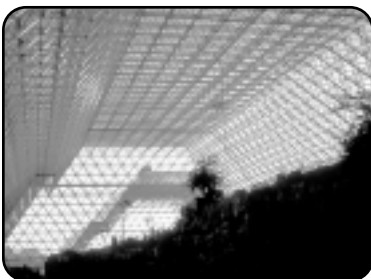
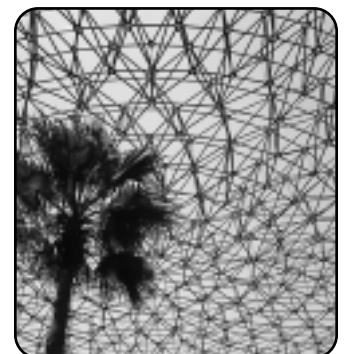
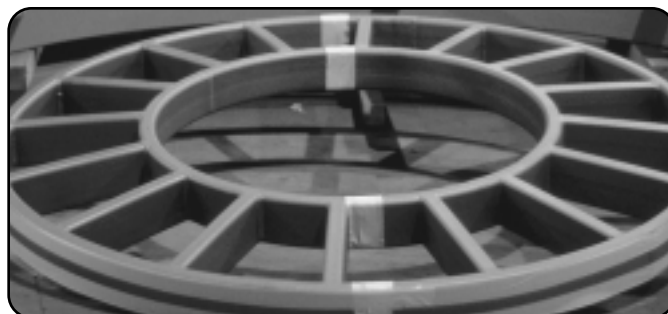
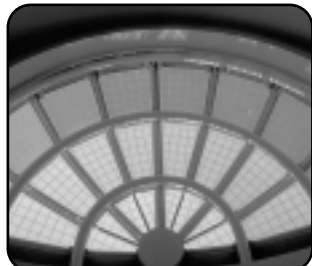


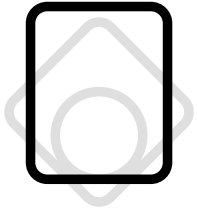
TABLE OF CONTENTS

	PAGE
Dimensions and Section Properties of Rectangular HSS	6
Dimensions and Section Properties of Square HSS	14
Dimensions and Section Properties of Round HSS	19

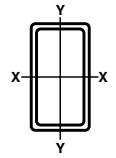
NOMENCLATURE

b	Nominal width minus 3 times the design wall thickness, t (mm)
C	Torsional shear constant of cross-section (mm ³)
D	Outside diameter of round HSS (mm)
h	Nominal depth minus 3 times the design wall thickness, t (mm)
I	Moment of inertia of cross-section (mm ⁴)
I _x	Moment of inertia of cross-section about the X-X axis (mm ⁴)
I _y	Moment of inertia of cross-section about the Y-Y axis (mm ⁴)
J	Torsional stiffness constant of cross-section (mm ⁴)
r	Governing radius of gyration (mm)
r _x	Radius of gyration with respect to the X-X axis (mm)
r _y	Radius of gyration with respect to the Y-Y axis (mm)
S	Elastic section modulus (mm ³)
S _x	Elastic section modulus about the X-X axis (mm ³)
S _y	Elastic section modulus about the Y-Y axis (mm ³)
t	Design wall thickness (mm)
Z	Plastic section modulus (mm ³)
Z _x	Plastic section modulus about the X-X axis (mm ³)
Z _y	Plastic section modulus about the Y-Y axis (mm ³)



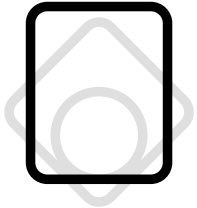


Metric Dimensions and Section Properties of Rectangular HSS

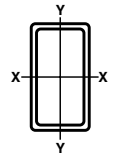


Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	X-X Axis				Y-Y Axis				Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric							I _x /10 ⁶	S _x /10 ³	r _x	Z _x /10 ³	I _y /10 ⁶	S _y /10 ³	r _y	Z _y /10 ³			
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
32 x 24 x 5/8*	812.8 x 609.6 x 15.9*	336.6	3.301	15.9	35.3	48.1	42900	4120	10100	310	12000	2660	8740	249	9920	5050000	15000	2.75
1/2*	12.7*	273.1	2.678	12.7	45.0	61.0	34800	3400	8360	313	9850	2200	7210	251	8120	4090000	12100	2.78
3/8*	9.5*	206.3	2.023	9.5	61.2	82.6	26300	2600	6390	314	7490	1680	5510	253	6170	3120000	9150	2.80
30 x 24 x 5/8*	762.0 x 609.6 x 15.9*	323.9	3.176	15.9	35.3	44.9	41300	3530	9280	293	11000	2520	8270	247	9440	4590000	14000	2.64
1/2*	12.7*	263.0	2.579	12.7	45.0	57.0	33500	2920	7660	295	8980	2080	6830	249	7730	3720000	11300	2.68
3/8*	9.5*	198.7	1.949	9.5	61.2	77.2	25300	2230	5860	297	6830	1590	5230	251	5880	2840000	8570	2.69
28 x 24 x 5/8*	711.2 x 609.6 x 15.9*	311.2	3.052	15.9	35.3	41.7	39600	3000	8450	275	9930	2380	7810	245	8960	4140000	13100	2.54
1/2*	12.7*	252.9	2.480	12.7	45.0	53.0	32200	2480	6990	278	8150	1970	6450	247	7350	3360000	10600	2.58
3/8*	9.5*	191.1	1.874	9.5	61.2	71.9	24300	1900	5350	280	6200	1510	4940	249	5590	2560000	7990	2.59
26 x 24 x 5/8*	660.4 x 609.6 x 15.9*	298.5	2.928	15.9	35.3	38.5	38000	2520	7650	258	8940	2240	7340	243	8480	3700000	12100	2.44
1/2*	12.7*	242.7	2.380	12.7	45.0	49.0	30900	2090	6330	260	7350	1850	6080	245	6960	3010000	9800	2.47
3/8*	9.5*	183.5	1.800	9.5	61.2	66.5	23400	1600	4850	262	5600	1420	4660	246	5300	2290000	7410	2.49
24 x 22 x 5/8*	609.6 x 558.8 x 15.9*	273.2	2.679	15.9	32.1	35.3	34800	1950	6400	237	7520	1710	6130	222	7090	2850000	10200	2.24
1/2*	12.7*	222.5	2.182	12.7	41.0	45.0	28300	1620	5320	239	6190	1420	5090	224	5840	2320000	8260	2.27
3/8*	9.5*	168.4	1.651	9.5	55.8	61.2	21500	1250	4090	241	4720	1090	3910	226	4460	1780000	6250	2.29
22 x 20 x 5/8*	558.8 x 508.0 x 15.9*	247.8	2.430	15.9	28.9	32.1	31600	1470	5270	216	6220	1280	5020	201	5830	2140000	8430	2.04
1/2*	12.7*	202.2	1.983	12.7	37.0	41.0	25800	1230	4400	218	5140	1060	4190	203	4820	1750000	6850	2.07
3/8*	9.5*	153.2	1.503	9.5	50.5	55.8	19500	947	3390	220	3930	820	3230	205	3680	1340000	5190	2.08
20 x 18 x 5/8*	508.0 x 457.2 x 15.9*	222.4	2.181	15.9	25.8	28.9	28300	1080	4250	195	5040	920	4030	180	4690	1560000	6840	1.83
1/2*	12.7*	182.0	1.784	12.7	33.0	37.0	23200	906	3570	198	4180	772	3380	183	3890	1280000	5570	1.86
3/8*	9.5*	138.1	1.354	9.5	45.1	50.5	17600	700	2760	199	3200	597	2610	184	2980	986000	4230	1.88
20 x 16 x 5/8*	508.0 x 406.4 x 15.9*	209.8	2.057	15.9	22.6	28.9	26700	982	3870	192	4640	700	3440	162	4000	1290000	6040	1.73
1/2*	12.7*	171.8	1.685	12.7	29.0	37.0	21900	827	3250	194	3860	589	2900	164	3320	1060000	4930	1.76
3/8*	9.5*	130.5	1.280	9.5	39.8	50.5	16600	640	2520	196	2960	456	2250	166	2550	818000	3750	1.78
20 x 12 x 5/8*	508.0 x 304.8 x 15.9*	184.4	1.808	15.9	16.2	28.9	23500	786	3090	183	3850	360	2360	124	2720	791000	4450	1.53
1/2	12.7	153.7	1.508	11.8	22.8	40.1	18300	644	2530	188	3080	293	1920	127	2170	613000	3420	1.59
3/8	9.5	116.6	1.143	8.9	31.2	54.1	13900	500	1970	189	2370	228	1500	128	1670	477000	2630	1.60
5/16	7.9	97.6	0.957	7.4	38.2	65.6	11700	422	1660	190	1990	193	1270	129	1410	404000	2200	1.60
20 x 8 x 5/8	508.0 x 203.2 x 15.9	164.5	1.613	14.8	10.7	31.3	19600	600	2360	175	3040	141	1390	84.8	1580	357000	2740	1.37
1/2	12.7	133.5	1.309	11.8	14.2	40.1	15900	496	1950	177	2480	118	1160	86.2	1300	298000	2240	1.38
3/8	9.5	101.4	0.995	8.9	19.8	54.1	12100	387	1520	179	1920	92.8	914	87.4	1010	235000	1720	1.39
5/16	7.9	85.0	0.833	7.4	24.5	65.6	10200	327	1290	179	1620	78.9	777	88.1	853	200000	1450	1.40

* This size produced by the submerged arc weld (SAW) process

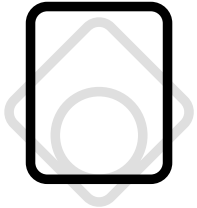


Metric Dimensions and Section Properties of *Rectangular* HSS

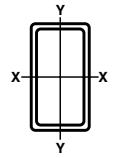


Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	X-X Axis				Y-Y Axis				Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric							I _x /10 ⁶	S _x /10 ³	r _x	Z _x /10 ³	I _y /10 ⁶	S _y /10 ³	r _y	Z _y /10 ³			
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
20 x 4 x 1/2	508.0 x 101.6 x 12.7	113.2	1.110	11.8	5.6	40.1	13500	348	1370	161	1890	24.4	480	42.6	557	76200	1050	1.18
3/8	9.5	86.3	0.846	8.9	8.4	54.1	10300	274	1080	163	1470	19.9	391	43.9	440	62200	821	1.19
5/16	7.9	72.4	0.710	7.4	10.7	65.6	8660	233	918	164	1240	17.2	338	44.5	375	53800	696	1.19
18 x 12 x 5/8 *	457.2 x 304.8 x 15.9 *	171.7	1.684	15.9	16.2	25.8	21900	606	2650	166	3270	326	2140	122	2490	678000	3990	1.43
1/2 *	12.7 *	141.4	1.387	12.7	21.0	33.0	18000	517	2260	169	2750	278	1830	124	2090	564000	3280	1.46
3/8 *	9.5 *	107.8	1.057	9.5	29.1	45.1	13700	403	1760	171	2120	217	1430	126	1610	438000	2500	1.48
18 x 6 x 5/8	457.2 x 152.4 x 15.9	139.1	1.364	14.8	7.3	27.9	16600	385	1680	152	2220	65.8	864	63.0	1000	178000	1790	1.17
1/2	12.7	113.2	1.110	11.8	9.9	35.7	13500	320	1400	154	1830	55.7	731	64.3	830	151000	1470	1.18
3/8	9.5	86.3	0.846	8.9	14.1	48.4	10300	252	1100	156	1420	44.4	583	65.6	649	121000	1140	1.19
5/16	7.9	72.4	0.710	7.4	17.6	58.8	8660	214	934	157	1200	38.0	499	66.3	550	103000	964	1.19
1/4	6.4	59.1	0.580	5.9	22.8	74.5	6960	174	760	158	971	31.2	409	66.9	447	84600	779	1.20
16 x 12 x 5/8 *	406.4 x 304.8 x 15.9 *	159.0	1.560	15.9	16.2	22.6	20300	453	2230	150	2730	293	1920	120	2250	568000	3520	1.32
1/2	12.7	133.5	1.309	11.8	22.8	31.4	15900	376	1850	154	2210	242	1590	123	1820	443000	2720	1.38
3/8	9.5	101.4	0.995	8.9	31.2	42.7	12100	293	1440	155	1710	189	1240	125	1410	346000	2090	1.39
5/16	7.9	85.0	0.833	7.4	38.2	51.9	10200	248	1220	156	1440	160	1050	125	1180	293000	1750	1.40
16 x 8 x 5/8	406.4 x 203.2 x 15.9	139.1	1.364	14.8	10.7	24.5	16600	340	1670	143	2120	114	1130	83.0	1300	262000	2170	1.17
1/2	12.7	113.2	1.110	11.8	14.2	31.4	13500	283	1390	145	1740	95.8	943	84.3	1070	220000	1780	1.18
3/8	9.5	86.3	0.846	8.9	19.8	42.7	10300	222	1090	146	1350	75.7	745	85.6	835	174000	1370	1.19
5/16	7.9	72.4	0.710	7.4	24.5	51.9	8660	188	925	147	1140	64.5	635	86.3	706	148000	1150	1.19
16 x 4 x 1/2	406.4 x 101.6 x 12.7	93.0	0.912	11.8	5.6	31.4	11100	189	931	131	1270	19.5	385	42.0	449	57600	830	0.98
3/8	9.5	71.1	0.697	8.9	8.4	42.7	8520	150	739	133	990	16.0	314	43.3	357	47300	653	0.99
5/16	7.9	59.8	0.586	7.4	10.7	51.9	7160	128	631	134	839	13.8	272	44.0	304	41000	555	0.99
14 x 12 x 1/2 *	355.6 x 304.8 x 12.7 *	121.2	1.188	12.7	21.0	25.0	15400	282	1590	135	1900	223	1460	120	1710	387000	2520	1.26
3/8 *	9.5 *	92.6	0.908	9.5	29.1	34.4	11800	222	1250	137	1470	175	1150	122	1330	302000	1930	1.27
14 x 10 x 5/8	355.6 x 254.0 x 15.9	139.1	1.364	14.8	14.2	21.0	16600	287	1610	131	1970	170	1340	101	1560	320000	2400	1.17
1/2	12.7	113.2	1.110	11.8	18.5	27.1	13500	238	1340	133	1620	142	1120	103	1280	267000	1960	1.18
3/8	9.5	86.3	0.846	8.9	25.5	37.0	10300	187	1050	134	1260	111	878	104	998	211000	1510	1.19
5/16	7.9	72.4	0.710	7.4	31.3	45.1	8660	158	891	135	1060	94.7	746	105	843	179000	1270	1.19
1/4	6.4	59.1	0.580	5.9	40.1	57.3	6960	129	724	136	857	77.1	607	105	682	146000	1020	1.20
14 x 6 x 5/8	355.6 x 152.4 x 15.9	113.8	1.116	14.8	7.3	21.0	13600	199	1120	121	1460	51.6	677	61.6	794	126000	1380	0.97
1/2	12.7	93.0	0.912	11.8	9.9	27.1	11100	167	941	123	1210	43.8	575	62.9	661	108000	1130	0.98
3/8	9.5	71.1	0.697	8.9	14.1	37.0	8520	132	745	125	942	35.1	461	64.2	520	86400	883	0.99
5/16	7.9	59.8	0.586	7.4	17.6	45.1	7160	113	634	126	798	30.1	395	64.9	441	74100	746	0.99
1/4	6.4	48.9	0.480	5.9	22.8	57.3	5770	92.1	518	126	647	24.8	325	65.5	359	60900	604	1.00
3/16	4.8	37.1	0.364	4.4	31.6	77.8	4340	70.4	396	127	491	19.0	250	66.2	273	46800	457	1.00

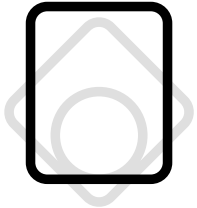
* This size produced by the submerged arc weld (SAW) process



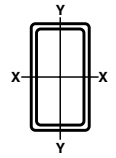
Metric Dimensions and Section Properties of *Rectangular* HSS



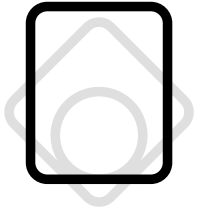
Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	X-X Axis				Y-Y Axis				Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric							I _x /10 ⁶	S _x /10 ³	r _x	Z _x /10 ³	I _y /10 ⁶	S _y /10 ³	r _y	Z _y /10 ³			
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
14 x 4 x 5/8	355.6 x 101.6 x 15.9	101.1	0.991	14.8	3.9	21.0	12100	156	875	113	1200	19.6	387	40.3	468	55300	863	0.86
1/2	12.7	82.8	0.812	11.8	5.6	27.1	9870	132	741	116	1000	17.1	337	41.6	395	48500	722	0.87
3/8	9.5	63.5	0.623	8.9	8.4	37.0	7620	105	592	118	785	14.0	276	42.9	315	39900	569	0.88
5/16	7.9	53.5	0.525	7.4	10.7	45.1	6410	90.0	506	119	667	12.2	239	43.6	269	34700	484	0.89
1/4	6.4	43.8	0.430	5.9	14.2	57.3	5170	73.8	415	120	542	10.1	199	44.2	220	28800	394	0.89
3/16	4.8	33.3	0.326	4.4	20.1	77.8	3900	56.6	318	121	413	7.86	155	44.9	169	22400	300	0.90
12 x 10 x 1/2	304.8 x 254.0 x 12.7	103.1	1.011	11.8	18.5	22.8	12300	164	1080	116	1290	124	977	101	1140	212000	1670	1.08
3/8	9.5	78.7	0.772	8.9	25.5	31.2	9430	129	849	117	1000	97.9	771	102	888	167000	1290	1.09
5/16	7.9	66.1	0.648	7.4	31.3	38.2	7910	110	722	118	849	83.3	656	103	750	142000	1080	1.09
1/4	6.4	54.0	0.530	5.9	40.1	48.7	6360	89.6	588	119	688	67.9	535	103	608	116000	874	1.10
12 x 8 x 5/8	304.8 x 203.2 x 15.9	113.8	1.116	14.8	10.7	17.6	13600	165	1090	110	1350	87.6	863	80.3	1020	172000	1600	0.97
1/2	12.7	93.0	0.912	11.8	14.2	22.8	11100	139	910	112	1120	73.8	727	81.6	843	145000	1320	0.98
3/8	9.5	71.1	0.697	8.9	19.8	31.2	8520	110	719	113	871	58.7	577	83.0	660	116000	1020	0.99
5/16	7.9	59.8	0.586	7.4	24.5	38.2	7160	93.4	613	114	737	50.1	493	83.6	559	98600	860	0.99
1/4	6.4	48.9	0.480	5.9	31.4	48.7	5770	76.2	500	115	598	41.0	404	84.3	454	80700	695	1.00
3/16	4.8	37.1	0.364	4.4	43.2	66.3	4340	58.2	382	116	454	31.4	309	85.0	345	61800	525	1.00
12 x 6 x 5/8	304.8 x 152.4 x 15.9	101.1	0.991	14.8	7.3	17.6	12100	134	877	105	1130	44.4	583	60.6	691	101000	1170	0.86
1/2	12.7	82.8	0.812	11.8	9.9	22.8	9870	113	741	107	940	37.9	497	61.9	577	86800	966	0.87
3/8	9.5	63.5	0.623	8.9	14.1	31.2	7620	89.8	589	109	737	30.5	400	63.2	455	69900	753	0.88
5/16	7.9	53.5	0.525	7.4	17.6	38.2	6410	76.7	504	109	625	26.2	343	63.9	387	60000	637	0.89
1/4	6.4	43.8	0.430	5.9	22.8	48.7	5170	62.9	412	110	508	21.5	283	64.6	315	49400	516	0.89
3/16	4.8	33.3	0.326	4.4	31.6	66.3	3900	48.1	316	111	387	16.6	218	65.2	240	38000	391	0.90
12 x 4 x 5/8	304.8 x 101.6 x 15.9	88.4	0.867	14.8	3.9	17.6	10600	102	670	98.2	912	16.8	331	39.8	403	44900	733	0.76
1/2	12.7	72.7	0.713	11.8	5.6	22.8	8680	87.1	572	100	764	14.7	289	41.1	341	39600	615	0.77
3/8	9.5	56.0	0.549	8.9	8.4	31.2	6710	70.0	460	102	603	12.1	238	42.4	273	32700	486	0.78
5/16	7.9	47.2	0.463	7.4	10.7	38.2	5650	60.1	394	103	513	10.5	207	43.1	233	28400	413	0.79
1/4	6.4	38.7	0.380	5.9	14.2	48.7	4570	49.5	325	104	419	8.74	172	43.7	191	23700	337	0.79
3/16	4.8	29.4	0.289	4.4	20.1	66.3	3450	38.0	250	105	319	6.80	134	44.4	147	18400	257	0.80
12 x 3 1/2 x 3/8	304.8 x 88.9 x 9.5	54.1	0.530	8.9	7.0	31.2	6490	65.1	427	100	570	8.88	200	37.0	231	25100	419	0.76
5/16	7.9	45.6	0.447	7.4	9.0	38.2	5470	56.0	367	101	486	7.75	174	37.7	198	22000	357	0.76
12 x 3 x 5/16	304.8 x 76.2 x 7.9	44.0	0.432	7.4	7.3	38.2	5280	51.8	340	99.1	458	5.45	143	32.1	164	16100	301	0.74
1/4	6.4	36.2	0.355	5.9	9.9	48.7	4270	42.8	281	100	374	4.59	121	32.8	135	13600	247	0.74
3/16	4.8	27.5	0.270	4.4	14.3	66.3	3230	33.0	217	101	286	3.62	94.9	33.5	104	10700	189	0.75
12 x 2 x 1/4	304.8 x 50.8 x 6.4	33.6	0.330	5.9	5.6	48.7	3970	36.1	237	95.4	329	1.83	72.0	21.5	83.1	5930	158	0.69
3/16	4.8	25.6	0.251	4.4	8.5	66.3	3000	28.0	183	96.5	252	1.47	58.0	22.1	64.9	4790	122	0.70



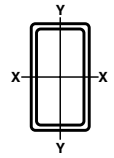
Metric Dimensions and Section Properties of *Rectangular* HSS



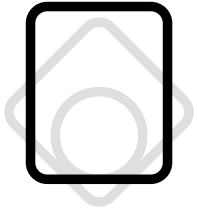
Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	X-X Axis				Y-Y Axis				Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric							I _x /10 ⁶	S _x /10 ³	r _x	Z _x /10 ³	I _y /10 ⁶	S _y /10 ³	r _y	Z _y /10 ³			
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
10 x 8 x 1/2	254.0 x 203.2 x 12.7	82.8	0.812	11.8	14.2	18.5	9870	88.9	700	94.9	849	62.8	618	79.8	728	110000	1090	0.87
3/8	9.5	63.5	0.623	8.9	19.8	25.5	7620	70.7	557	96.3	666	50.1	493	81.1	572	88000	845	0.88
5/16	7.9	53.5	0.525	7.4	24.5	31.3	6410	60.4	476	97.1	565	42.9	422	81.8	485	75300	713	0.89
1/4	6.4	43.8	0.430	5.9	31.4	40.1	5170	49.5	389	97.8	459	35.2	346	82.5	395	61800	577	0.89
3/16	4.8	33.3	0.326	4.4	43.2	54.7	3900	37.9	298	98.6	349	27.0	265	83.2	300	47400	436	0.90
10 x 6 x 5/8	254.0 x 152.4 x 15.9	88.4	0.867	14.8	7.3	14.2	10600	83.8	660	89.0	842	37.3	489	59.3	587	77300	962	0.76
1/2	12.7	72.7	0.713	11.8	9.9	18.5	8680	71.3	561	90.6	704	31.9	419	60.7	493	66600	797	0.77
3/8	9.5	56.0	0.549	8.9	14.1	25.5	6710	57.1	450	92.2	555	25.8	338	62.0	390	53900	623	0.78
5/16	7.9	47.2	0.463	7.4	17.6	31.3	5650	49.0	385	93.0	472	22.2	291	62.7	332	46400	528	0.79
1/4	6.4	38.7	0.380	5.9	22.8	40.1	4570	40.2	317	93.9	385	18.3	240	63.3	271	38300	428	0.79
3/16	4.8	29.4	0.289	4.4	31.6	54.7	3450	30.9	243	94.7	293	14.1	185	64.0	207	29500	325	0.80
10 x 5 x 3/8	254.0 x 127.0 x 9.5	52.2	0.512	8.9	11.3	25.5	6260	50.3	396	89.6	500	16.9	267	52.0	307	38900	513	0.73
5/16	7.9	44.0	0.432	7.4	14.2	31.3	5280	43.2	340	90.5	426	14.7	231	52.7	263	33600	435	0.74
1/4	6.4	36.2	0.355	5.9	18.5	40.1	4270	35.6	280	91.4	348	12.2	191	53.4	215	27900	354	0.74
3/16	4.8	27.5	0.270	4.4	25.9	54.7	3230	27.4	216	92.2	265	9.42	148	54.0	165	21600	269	0.75
10 x 4 x 5/8	254.0 x 101.6 x 15.9	75.7	0.743	14.8	3.9	14.2	9090	62.3	490	82.8	662	13.9	274	39.2	338	34600	602	0.66
1/2	12.7	62.6	0.614	11.8	5.6	18.5	7480	53.7	423	84.7	559	12.2	241	40.5	288	30800	507	0.67
3/8	9.5	48.4	0.474	8.9	8.4	25.5	5810	43.5	343	86.6	444	10.1	199	41.7	231	25600	402	0.68
5/16	7.9	40.9	0.401	7.4	10.7	31.3	4900	37.5	295	87.5	379	8.82	174	42.4	198	22300	342	0.69
1/4	6.4	33.6	0.330	5.9	14.2	40.1	3970	31.0	244	88.4	310	7.36	145	43.1	163	18600	279	0.69
3/16	4.8	25.6	0.251	4.4	20.1	54.7	3000	23.9	189	89.3	238	5.74	113	43.7	125	14500	213	0.70
10 x 3 1/2 x 3/16	254.0 x 88.9 x 4.8	24.7	0.242	4.4	17.2	54.7	2890	22.2	175	87.6	224	4.28	96.2	38.5	106	11400	185	0.67
10 x 3 x 3/8	254.0 x 76.2 x 9.5	44.6	0.437	8.9	5.6	25.5	5360	36.7	289	82.8	389	5.18	136	31.1	160	14500	291	0.63
5/16	7.9	37.7	0.370	7.4	7.3	31.3	4530	31.8	250	83.8	333	4.56	120	31.7	138	12800	250	0.63
1/4	6.4	31.1	0.305	5.9	9.9	40.1	3670	26.4	208	84.8	273	3.85	101	32.4	114	10800	205	0.64
3/16	4.8	23.7	0.232	4.4	14.3	54.7	2780	20.5	161	85.8	210	3.04	79.8	33.1	88.4	8540	157	0.65
1/8	3.2	16.1	0.158	3.0	22.4	81.7	1920	14.5	114	86.7	147	2.18	57.3	33.7	62.3	6130	110	0.65
10 x 2 x 3/8	254.0 x 50.8 x 9.5	40.8	0.400	8.9	2.7	25.5	4900	29.9	236	78.1	334	1.95	76.9	20.0	94.7	6000	180	0.58
5/16	7.9	34.6	0.339	7.4	3.9	31.3	4150	26.1	205	79.3	287	1.76	69.5	20.6	83.0	5470	157	0.58
1/4	6.4	28.5	0.280	5.9	5.6	40.1	3370	21.8	171	80.4	236	1.53	60.0	21.3	69.6	4760	131	0.59
3/16	4.8	21.8	0.214	4.4	8.5	54.7	2550	17.0	134	81.5	182	1.23	48.5	22.0	54.5	3860	102	0.59
9 x 7 x 5/8	228.6 x 177.8 x 15.9	88.4	0.867	14.8	9.0	12.4	10600	72.7	636	82.8	793	48.9	550	68.0	665	86800	1020	0.76
1/2	12.7	72.7	0.713	11.8	12.1	16.4	8680	61.8	541	84.4	663	41.7	470	69.4	557	74400	843	0.77
3/8	9.5	56.0	0.549	8.9	17.0	22.7	6710	49.5	433	85.9	522	33.6	378	70.7	440	60000	658	0.78
5/16	7.9	47.2	0.463	7.4	21.0	27.9	5650	42.5	371	86.7	444	28.8	324	71.4	374	51600	556	0.79
1/4	6.4	38.7	0.380	5.9	27.1	35.7	4570	34.9	305	87.4	362	23.7	267	72.1	305	42500	451	0.79
3/16	4.8	29.4	0.289	4.4	37.4	49.0	3450	26.8	235	88.2	276	18.3	206	72.8	233	32700	342	0.80



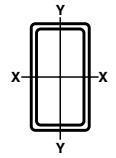
Metric Dimensions and Section Properties of *Rectangular* HSS



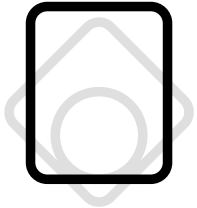
Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	X-X Axis				Y-Y Axis				Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric							I _x /10 ⁶	S _x /10 ³	r _x	Z _x /10 ³	I _y /10 ⁶	S _y /10 ³	r _y	Z _y /10 ³			
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
9 x 5 x 5/8	228.6 x 127.0 x 15.9	75.7	0.743	14.8	5.6	12.4	9090	55.5	485	78.1	632	21.6	341	48.8	416	46500	698	0.66
1/2	12.7	62.6	0.614	11.8	7.8	16.4	7480	47.7	417	79.9	533	18.8	296	50.1	352	40700	583	0.67
3/8	9.5	48.4	0.474	8.9	11.3	22.7	5810	38.6	338	81.5	423	15.4	242	51.4	281	33400	459	0.68
5/16	7.9	40.9	0.401	7.4	14.2	27.9	4900	33.3	291	82.4	361	13.3	210	52.1	240	29000	390	0.69
1/4	6.4	33.6	0.330	5.9	18.5	35.7	3970	27.5	240	83.2	295	11.1	174	52.8	197	24100	317	0.69
3/16	4.8	25.6	0.251	4.4	25.9	49.0	3000	21.2	185	84.0	226	8.58	135	53.5	151	18700	242	0.70
9 x 3 x 1/2	228.6 x 76.2 x 12.7	52.4	0.514	11.8	3.5	16.4	6280	33.6	294	73.2	403	5.49	144	29.6	177	14600	323	0.57
3/8	9.5	40.8	0.400	8.9	5.6	22.7	4900	27.7	242	75.1	324	4.66	122	30.8	145	12600	260	0.58
5/16	7.9	34.6	0.339	7.4	7.3	27.9	4150	24.1	210	76.1	278	4.12	108	31.5	125	11100	224	0.58
1/4	6.4	28.5	0.280	5.9	9.9	35.7	3370	20.0	175	77.1	229	3.48	91.4	32.1	104	9430	184	0.59
3/16	4.8	21.8	0.214	4.4	14.3	49.0	2550	15.6	136	78.1	176	2.75	72.2	32.8	80.4	7460	141	0.59
8 x 6 x 5/8	203.2 x 152.4 x 15.9	75.7	0.743	14.8	7.3	10.7	9090	47.5	468	72.3	592	30.1	395	57.6	484	54500	755	0.66
1/2	12.7	62.6	0.614	11.8	9.9	14.2	7480	40.8	402	73.9	499	26.0	341	59.0	408	47300	629	0.67
3/8	9.5	48.4	0.474	8.9	14.1	19.8	5810	33.0	325	75.4	396	21.1	277	60.3	325	38600	494	0.68
5/16	7.9	40.9	0.401	7.4	17.6	24.5	4900	28.5	280	76.2	338	18.2	239	61.0	278	33400	419	0.69
1/4	6.4	33.6	0.330	5.9	22.8	31.4	3970	23.5	231	77.0	276	15.1	198	61.7	227	27700	340	0.69
3/16	4.8	25.6	0.251	4.4	31.6	43.2	3000	18.1	178	77.7	211	11.7	153	62.4	174	21400	259	0.70
8 x 4 x 5/8	203.2 x 101.6 x 15.9	63.0	0.618	14.8	3.9	10.7	7580	34.1	336	67.1	451	11.1	218	38.2	272	24800	472	0.56
1/2	12.7	52.4	0.514	11.8	5.6	14.2	6280	29.8	294	68.9	384	9.81	193	39.5	234	22300	399	0.57
3/8	9.5	40.8	0.400	8.9	8.4	19.8	4900	24.5	241	70.7	308	8.18	161	40.8	189	18700	318	0.58
5/16	7.9	34.6	0.339	7.4	10.7	24.5	4150	21.3	209	71.6	264	7.15	141	41.5	163	16400	271	0.58
1/4	6.4	28.5	0.280	5.9	14.2	31.4	3370	17.7	174	72.4	217	5.99	118	42.2	134	13700	222	0.59
3/16	4.8	21.8	0.214	4.4	20.1	43.2	2550	13.7	135	73.3	167	4.69	92.3	42.8	103	10800	170	0.59
1/8	3.2	14.8	0.145	3.0	30.9	64.7	1770	9.71	95.5	74.1	117	3.34	65.8	43.5	72.7	7670	118	0.60
8 x 3 x 1/2	203.2 x 76.2 x 12.7	47.4	0.465	11.8	3.5	14.2	5680	24.3	240	65.5	327	4.86	127	29.2	158	12400	285	0.52
3/8	9.5	37.0	0.363	8.9	5.6	19.8	4450	20.2	199	67.4	264	4.15	109	30.5	129	10700	230	0.53
5/16	7.9	31.4	0.308	7.4	7.3	24.5	3780	17.6	174	68.4	228	3.67	96.3	31.2	112	9500	198	0.53
1/4	6.4	26.0	0.255	5.9	9.9	31.4	3070	14.7	145	69.3	188	3.11	81.6	31.8	93.2	8070	163	0.54
3/16	4.8	19.9	0.195	4.4	14.3	43.2	2330	11.5	113	70.3	145	2.46	64.6	32.5	72.3	6400	125	0.54
1/8	3.2	13.5	0.132	3.0	22.4	64.7	1620	8.18	80.5	71.1	102	1.77	46.6	33.1	51.1	4610	87.8	0.55
8 x 2 x 3/8	203.2 x 50.8 x 9.5	33.2	0.326	8.9	2.7	19.8	4000	16.0	157	63.2	220	1.55	61.1	19.7	75.8	4490	142	0.48
5/16	7.9	28.3	0.277	7.4	3.9	24.5	3400	14.0	138	64.3	191	1.41	55.4	20.3	66.7	4120	124	0.48
1/4	6.4	23.4	0.230	5.9	5.6	31.4	2770	11.8	116	65.4	158	1.22	48.1	21.0	56.1	3600	104	0.49
3/16	4.8	18.0	0.176	4.4	8.5	43.2	2110	9.30	91.5	66.4	123	0.990	39.0	21.7	44.1	2930	80.8	0.49
1/8	3.2	12.2	0.120	3.0	13.9	64.7	1460	6.65	65.5	67.4	86.5	0.728	28.7	22.3	31.6	2160	57.3	0.50



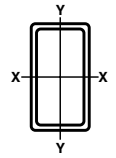
Metric Dimensions and Section Properties of *Rectangular* HSS



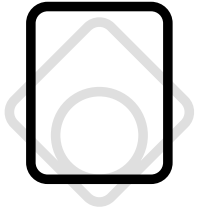
Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	X-X Axis				Y-Y Axis				Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric							I _x /10 ⁶	S _x /10 ³	r _x	Z _x /10 ³	I _y /10 ⁶	S _y /10 ³	r _y	Z _y /10 ³			
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
7 x 5 x 5/8	177.8 x 127.0 x 15.9	63.0	0.618	14.8	5.6	9.0	7580	28.9	325	61.7	420	16.9	266	47.2	331	31200	529	0.56
1/2	12.7	52.4	0.514	11.8	7.8	12.1	6280	25.2	284	63.4	358	14.8	233	48.6	283	27700	445	0.57
3/8	9.5	40.8	0.400	8.9	11.3	17.0	4900	20.7	232	64.9	287	12.2	192	49.9	227	23000	352	0.58
5/16	7.9	34.6	0.339	7.4	14.2	21.0	4150	17.9	202	65.7	246	10.6	167	50.6	195	20000	300	0.58
1/4	6.4	28.5	0.280	5.9	18.5	27.1	3370	14.9	167	66.5	202	8.85	139	51.3	161	16700	245	0.59
3/16	4.8	21.8	0.214	4.4	25.9	37.4	2550	11.6	130	67.3	155	6.90	109	52.0	124	13000	187	0.59
1/8	3.2	14.8	0.145	3.0	39.3	56.3	1770	8.18	92.0	68.0	109	4.90	77.1	52.6	86.6	9250	130	0.60
7 x 4 x 1/2	177.8 x 101.6 x 12.7	47.4	0.465	11.8	5.6	12.1	5680	21.1	237	60.9	308	8.60	169	38.9	207	18200	345	0.52
3/8	9.5	37.0	0.363	8.9	8.4	17.0	4450	17.4	196	62.6	249	7.20	142	40.2	168	15400	276	0.53
5/16	7.9	31.4	0.308	7.4	10.7	21.0	3780	15.2	171	63.4	214	6.31	124	40.9	145	13500	236	0.53
1/4	6.4	26.0	0.255	5.9	14.2	27.1	3070	12.7	142	64.3	176	5.30	104	41.6	120	11400	193	0.54
3/16	4.8	19.9	0.195	4.4	20.1	37.4	2330	9.88	111	65.1	136	4.16	81.9	42.2	92.5	8930	148	0.54
1/8	3.2	13.5	0.132	3.0	30.9	56.3	1620	7.01	78.9	65.8	95.5	2.97	58.5	42.9	65.1	6380	103	0.55
7 x 3 x 1/2	177.8 x 76.2 x 12.7	42.3	0.415	11.8	3.5	12.1	5080	16.9	190	57.7	258	4.23	111	28.9	139	10200	246	0.47
3/8	9.5	33.2	0.326	8.9	5.6	17.0	4000	14.2	160	59.6	211	3.63	95.3	30.1	114	8860	200	0.48
5/16	7.9	28.3	0.277	7.4	7.3	21.0	3400	12.5	140	60.5	182	3.22	84.6	30.8	99.3	7900	172	0.48
1/4	6.4	23.4	0.230	5.9	9.9	27.1	2770	10.5	118	61.4	151	2.74	71.9	31.5	82.7	6730	142	0.49
3/16	4.8	18.0	0.176	4.4	14.3	37.4	2110	8.19	92.2	62.4	117	2.17	57.1	32.1	64.3	5350	109	0.49
1/8	3.2	12.2	0.120	3.0	22.4	56.3	1460	5.85	65.8	63.2	82.2	1.57	41.2	32.7	45.6	3860	76.7	0.50
6 x 5 x 3/8	152.4 x 127.0 x 9.5	37.0	0.363	8.9	11.3	14.1	4450	14.1	186	56.4	228	10.6	167	48.9	201	18100	299	0.53
5/16	7.9	31.4	0.308	7.4	14.2	17.6	3780	12.3	162	57.1	196	9.27	146	49.6	173	15800	255	0.53
1/4	6.4	26.0	0.255	5.9	18.5	22.8	3070	10.3	135	57.9	161	7.75	122	50.3	142	13200	209	0.54
3/16	4.8	19.9	0.195	4.4	25.9	31.6	2330	8.01	105	58.6	124	6.06	95.4	51.0	110	10400	159	0.54
6 x 4 x 1/2	152.4 x 101.6 x 12.7	42.3	0.415	11.8	5.6	9.9	5080	14.1	185	52.7	240	7.38	145	38.1	180	14300	292	0.47
3/8	9.5	33.2	0.326	8.9	8.4	14.1	4000	11.8	155	54.3	195	6.23	123	39.5	147	12200	234	0.48
5/16	7.9	28.3	0.277	7.4	10.7	17.6	3400	10.3	136	55.1	169	5.48	108	40.1	127	10700	201	0.48
1/4	6.4	23.4	0.230	5.9	14.2	22.8	2770	8.66	114	55.9	139	4.61	90.8	40.8	105	9080	165	0.49
3/16	4.8	18.0	0.176	4.4	20.1	31.6	2110	6.79	89.1	56.7	108	3.63	71.5	41.5	81.6	7150	126	0.49
1/8	3.2	12.2	0.120	3.0	30.9	47.8	1460	4.84	63.5	57.5	75.9	2.60	51.2	42.1	57.6	5120	88.3	0.50
6 x 3 x 1/2	152.4 x 76.2 x 12.7	37.3	0.365	11.8	3.5	9.9	4480	11.2	146	49.9	198	3.60	94.5	28.3	119	8030	207	0.42
3/8	9.5	29.4	0.289	8.9	5.6	14.1	3550	9.48	124	51.7	163	3.12	81.8	29.6	99.0	7070	169	0.43
5/16	7.9	25.1	0.246	7.4	7.3	17.6	3020	8.36	110	52.6	141	2.78	72.8	30.3	86.4	6340	146	0.43
1/4	6.4	20.9	0.205	5.9	9.9	22.8	2470	7.06	92.6	53.5	117	2.37	62.1	31.0	72.1	5420	121	0.44
3/16	4.8	16.0	0.157	4.4	14.3	31.6	1880	5.56	73.0	54.3	91.2	1.89	49.5	31.6	56.3	4330	93.2	0.44
1/8	3.2	11.0	0.107	3.0	22.4	47.8	1310	3.99	52.3	55.1	64.5	1.37	35.9	32.3	40.0	3140	65.5	0.45



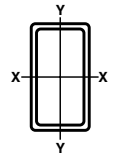
Metric Dimensions and Section Properties of *Rectangular* HSS



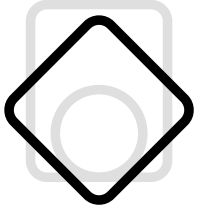
Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	X-X Axis				Y-Y Axis				Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric							I _x /10 ⁶	S _x /10 ³	r _x	Z _x /10 ³	I _y /10 ⁶	S _y /10 ³	r _y	Z _y /10 ³			
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
6 x 2 x 3/8	152.4 x 50.8 x 9.5	25.6	0.252	8.9	2.7	14.1	3100	7.15	93.8	48.0	130	1.15	45.2	19.3	56.8	3030	104	0.38
5/16	7.9	22.0	0.216	7.4	3.9	17.6	2650	6.38	83.7	49.1	114	1.05	41.3	19.9	50.4	2800	91.6	0.38
1/4	6.4	18.3	0.179	5.9	5.6	22.8	2170	5.45	71.5	50.1	95.5	0.917	36.1	20.6	42.7	2470	76.8	0.39
3/16	4.8	14.1	0.139	4.4	8.5	31.6	1660	4.34	56.9	51.1	74.7	0.748	29.5	21.2	33.8	2030	60.1	0.39
1/8	3.2	9.7	0.095	3.0	13.9	47.8	1160	3.14	41.2	52.0	53.2	0.554	21.8	21.8	24.3	1500	42.7	0.40
5 x 4 x 1/2	127.0 x 101.6 x 12.7	37.3	0.365	11.8	5.6	7.8	4480	8.82	139	44.4	179	6.17	121	37.1	153	10600	238	0.42
3/8	9.5	29.4	0.289	8.9	8.4	11.3	3550	7.47	118	45.9	147	5.25	103	38.5	126	9130	192	0.43
5/16	7.9	25.1	0.246	7.4	10.7	14.2	3020	6.58	104	46.7	128	4.64	91.4	39.2	109	8100	165	0.43
1/4	6.4	20.9	0.205	5.9	14.2	18.5	2470	5.55	87.5	47.4	106	3.93	77.3	39.9	91.0	6880	136	0.44
3/16	4.8	16.0	0.157	4.4	20.1	25.9	1880	4.38	68.9	48.2	82.4	3.10	61.1	40.6	70.8	5450	105	0.44
5 x 3 x 1/2	127.0 x 76.2 x 12.7	32.2	0.316	11.8	3.5	7.8	3880	6.82	107	41.9	145	2.97	78.0	27.7	100	5990	169	0.37
3/8	9.5	25.6	0.252	8.9	5.6	11.3	3100	5.89	92.8	43.6	121	2.60	68.3	29.0	83.8	5360	139	0.38
5/16	7.9	22.0	0.216	7.4	7.3	14.2	2650	5.24	82.5	44.5	105	2.33	61.1	29.7	73.4	4830	120	0.38
1/4	6.4	18.3	0.179	5.9	9.9	18.5	2170	4.45	70.1	45.3	88.0	2.00	52.4	30.3	61.6	4160	100	0.39
3/16	4.8	14.1	0.139	4.4	14.3	25.9	1660	3.54	55.7	46.1	68.7	1.60	41.9	31.0	48.3	3340	77.1	0.39
1/8	3.2	9.7	0.095	3.0	22.4	39.3	1160	2.55	40.2	46.9	48.8	1.16	30.5	31.6	34.4	2430	54.4	0.40
5 x 2 1/2 x 1/4	127.0 x 63.5 x 6.4	17.0	0.167	5.9	7.8	18.5	2020	3.90	61.5	44.0	78.9	1.30	40.9	25.4	48.3	2970	81.5	0.36
3/16	4.8	13.2	0.129	4.4	11.4	25.9	1550	3.12	49.1	44.8	61.9	1.05	33.1	26.0	38.1	2410	63.4	0.37
1/8	3.2	9.0	0.089	3.0	18.2	39.3	1080	2.26	35.6	45.7	44.1	0.770	24.3	26.7	27.3	1770	44.9	0.37
5 x 2 x 3/8	127.0 x 50.8 x 9.5	21.9	0.214	8.9	2.7	11.3	2640	4.31	67.9	40.4	93.8	0.947	37.3	18.9	47.4	2320	85.4	0.33
5/16	7.9	18.8	0.185	7.4	3.9	14.2	2270	3.89	61.3	41.4	82.8	0.871	34.3	19.6	42.2	2170	75.3	0.33
1/4	6.4	15.8	0.154	5.9	5.6	18.5	1870	3.35	52.8	42.4	69.9	0.765	30.1	20.2	36.0	1920	63.4	0.34
3/16	4.8	12.2	0.120	4.4	8.5	25.9	1440	2.70	42.5	43.3	55.0	0.628	24.7	20.9	28.6	1590	49.7	0.34
1/8	3.2	8.4	0.082	3.0	13.9	39.3	1010	1.97	31.0	44.2	39.4	0.467	18.4	21.5	20.6	1180	35.5	0.35
4 x 3 x 3/8	101.6 x 76.2 x 9.5	21.9	0.214	8.9	5.6	8.4	2640	3.30	65.1	35.4	84.1	2.09	54.7	28.1	68.6	3740	108	0.33
5/16	7.9	18.8	0.185	7.4	7.3	10.7	2270	2.97	58.5	36.2	74.0	1.88	49.4	28.8	60.5	3400	94.4	0.33
1/4	6.4	15.8	0.154	5.9	9.9	14.2	1870	2.55	50.2	37.0	62.4	1.62	42.7	29.5	51.1	2960	78.6	0.34
3/16	4.8	12.2	0.120	4.4	14.3	20.1	1440	2.05	40.3	37.7	49.0	1.31	34.4	30.2	40.2	2390	61.1	0.34
1/8	3.2	8.4	0.082	3.0	22.4	30.9	1010	1.49	29.3	38.5	35.1	0.957	25.1	30.8	28.8	1750	43.2	0.35
4 x 2 1/2 x 5/16	101.6 x 63.5 x 7.9	17.3	0.169	7.4	5.6	10.7	2080	2.55	50.2	35.0	65.2	1.20	37.9	24.0	46.7	2420	76.6	0.30
1/4	6.4	14.5	0.142	5.9	7.8	14.2	1720	2.21	43.5	35.8	55.2	1.05	33.1	24.7	39.7	2130	64.3	0.31
3/16	4.8	11.3	0.110	4.4	11.4	20.1	1330	1.78	35.1	36.7	43.6	0.855	26.9	25.4	31.5	1740	50.2	0.32



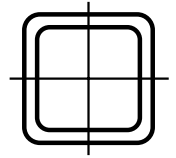
Metric Dimensions and Section Properties of *Rectangular* HSS



Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	X-X Axis				Y-Y Axis				Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric							I _x /10 ⁶	S _x /10 ³	r _x	Z _x /10 ³	I _y /10 ⁶	S _y /10 ³	r _y	Z _y /10 ³			
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
4 x 2 x 3/8	101.6 x 50.8 x 9.5	18.1	0.177	8.9	2.7	8.4	2190	2.33	45.9	32.6	63.1	0.746	29.4	18.4	37.9	1640	66.4	0.27
5/16	7.9	15.7	0.154	7.4	3.9	10.7	1900	2.13	42.0	33.6	56.3	0.692	27.2	19.1	34.0	1550	58.9	0.28
1/4	6.4	13.2	0.129	5.9	5.6	14.2	1570	1.87	36.7	34.5	48.0	0.613	24.2	19.8	29.2	1390	49.9	0.28
3/16	4.8	10.3	0.101	4.4	8.5	20.1	1210	1.52	29.9	35.4	38.2	0.507	20.0	20.4	23.4	1160	39.4	0.29
1/8	3.2	7.1	0.070	3.0	13.9	30.9	855	1.12	22.0	36.2	27.6	0.379	14.9	21.1	17.0	871	28.2	0.29
3 1/2 x 2 1/2 x 3/8	88.9 x 63.5 x 9.5	18.1	0.177	8.9	4.1	7.0	2190	1.98	44.5	30.0	59.0	1.15	36.2	22.9	46.4	2090	75.0	0.27
5/16	7.9	15.7	0.154	7.4	5.6	9.0	1900	1.81	40.6	30.9	52.5	1.05	33.2	23.6	41.4	1950	66.1	0.28
1/4	6.4	13.2	0.129	5.9	7.8	12.1	1570	1.58	35.4	31.7	44.7	0.925	29.1	24.3	35.3	1730	55.6	0.28
3/16	4.8	10.3	0.101	4.4	11.4	17.2	1210	1.28	28.8	32.5	35.5	0.757	23.8	25.0	28.2	1420	43.6	0.29
1/8	3.2	7.1	0.070	3.0	18.2	26.6	855	0.943	21.2	33.2	25.7	0.561	17.7	25.6	20.4	1060	31.1	0.29
3 x 2 1/2 x 5/16	76.2 x 63.5 x 7.9	14.1	0.138	7.4	5.6	7.30	1710	1.21	31.8	26.6	41.1	0.906	28.5	23.0	36.1	1500	55.6	0.25
1/4	6.4	11.9	0.117	5.9	7.8	9.92	1420	1.07	28.0	27.4	35.3	0.800	25.2	23.7	31.0	1350	47.0	0.26
3/16	4.8	9.3	0.092	4.4	11.4	14.3	1100	0.876	23.0	28.2	28.2	0.659	20.8	24.5	24.9	1120	37.0	0.26
1/8	3.2	6.5	0.064	3.0	18.2	22.4	779	0.651	17.1	28.9	20.5	0.491	15.5	25.1	18.1	838	26.5	0.27
3 x 2 x 5/16	76.2 x 50.8 x 7.9	12.5	0.123	7.4	3.9	7.3	1520	0.989	26.0	25.5	34.6	0.513	20.2	18.4	25.9	975	42.6	0.23
1/4	6.4	10.6	0.104	5.9	5.6	9.9	1270	0.883	23.2	26.4	30.0	0.462	18.2	19.1	22.5	893	36.5	0.23
3/16	4.8	8.4	0.082	4.4	8.5	14.3	990	0.732	19.2	27.2	24.2	0.386	15.2	19.8	18.2	756	29.0	0.24
1/8	3.2	5.9	0.057	3.0	13.9	22.4	703	0.549	14.4	27.9	17.7	0.292	11.5	20.4	13.4	575	20.9	0.24
3 x 1 1/2 x 1/4	76.2 x 38.1 x 6.4	9.4	0.092	5.9	3.5	9.9	1120	0.697	18.3	24.9	24.7	0.225	11.8	14.2	14.9	502	25.9	0.21
3/16	4.8	7.4	0.073	4.4	5.7	14.3	879	0.588	15.4	25.9	20.2	0.193	10.2	14.8	12.3	439	21.0	0.21
1/8	3.2	5.2	0.051	3.0	9.7	22.4	627	0.447	11.7	26.7	14.9	0.150	7.86	15.5	9.14	343	15.3	0.22
3 x 1 x 3/16	76.2 x 25.4 x 4.8	6.5	0.063	4.4	2.8	14.3	767	0.444	11.6	24.1	16.2	0.071	5.62	9.65	7.06	188	12.9	0.19
1/8	3.2	4.6	0.045	3.0	5.5	22.4	550	0.345	9.04	25.0	12.1	0.058	4.56	10.3	5.40	156	9.73	0.19
2 1/2 x 1 1/2 x 1/4	63.5 x 38.1 x 6.4	8.1	0.079	5.9	3.5	7.8	970	0.426	13.4	21.0	18.1	0.186	9.75	13.8	12.5	374	21.1	0.18
3/16	4.8	6.5	0.063	4.4	5.7	11.4	767	0.366	11.5	21.8	14.9	0.162	8.48	14.5	10.4	333	17.2	0.19
1/8	3.2	4.6	0.045	3.0	9.7	18.2	550	0.282	8.88	22.6	11.2	0.126	6.63	15.1	7.80	263	12.6	0.19
2 x 1 1/2 x 3/16	50.8 x 38.1 x 4.8	5.5	0.054	4.4	5.7	8.6	655	0.205	8.08	17.7	10.4	0.130	6.80	14.1	8.51	232	13.4	0.16
1/8	3.2	3.9	0.039	3.0	9.7	13.9	474	0.161	6.36	18.5	7.90	0.103	5.39	14.7	6.47	187	9.96	0.17
2 x 1 x 3/16	50.8 x 25.4 x 4.8	4.6	0.045	4.4	2.8	8.6	543	0.145	5.71	16.3	7.84	0.046	3.66	9.24	4.71	102	8.25	0.14
1/8	3.2	3.3	0.032	3.0	5.5	13.9	398	0.118	4.64	17.2	6.08	0.039	3.05	9.86	3.70	87.9	6.32	0.14

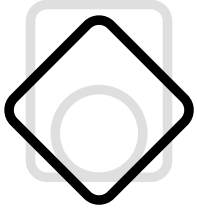


Metric Dimensions and Section Properties of *Square* HSS

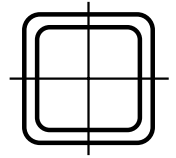


Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	I/10 ⁶	S/10 ³	r	Z/10 ³	Torsional Stiffness Constant J/10 ⁹	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric													
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
32 x 32 x 5/8 *	812.8 x 812.8 x 15.9 *	387.3	3.798	15.9	48.1	48.1	49300	5140	12700	323	14600	7960000	20100	3.15
1/2 *	12.7 *	313.6	3.076	12.7	61.0	61.0	40000	4220	10400	325	11900	6440000	16200	3.19
3/8 *	9.5 *	236.6	2.320	9.5	82.6	82.6	30100	3220	7920	327	9040	4890000	12300	3.20
30 x 30 x 5/8 *	762.0 x 762.0 x 15.9 *	361.9	3.549	15.9	44.9	44.9	46100	4210	11000	302	12800	6520000	17600	2.95
1/2 *	12.7 *	293.4	2.877	12.7	57.0	57.0	37400	3460	9090	304	10400	5280000	14200	2.98
3/8 *	9.5 *	221.4	2.171	9.5	77.2	77.2	28200	2640	6940	306	7920	4020000	10700	3.00
28 x 28 x 5/8 *	711.2 x 711.2 x 15.9 *	336.6	3.301	15.9	41.7	41.7	42900	3390	9550	281	11100	5270000	15300	2.75
1/2 *	12.7 *	273.1	2.678	12.7	53.0	53.0	34800	2800	7870	284	9050	4270000	12400	2.78
3/8 *	9.5 *	206.3	2.023	9.5	71.9	71.9	26300	2140	6020	285	6880	3250000	9350	2.80
26 x 26 x 5/8 *	660.4 x 660.4 x 15.9 *	311.2	3.052	15.9	38.5	38.5	39600	2690	8150	261	9460	4190000	13100	2.54
1/2 *	12.7 *	252.9	2.480	12.7	49.0	49.0	32200	2230	6740	263	7760	3400000	10600	2.58
3/8 *	9.5 *	191.1	1.874	9.5	66.5	66.5	24300	1700	5160	265	5910	2590000	8040	2.59
24 x 24 x 5/8 *	609.6 x 609.6 x 15.9 *	285.8	2.803	15.9	35.3	35.3	36400	2090	6870	240	8000	3270000	11100	2.34
1/2 *	12.7 *	232.6	2.281	12.7	45.0	45.0	29600	1740	5700	242	6580	2660000	9030	2.37
3/8 *	9.5 *	176.0	1.726	9.5	61.2	61.2	22400	1330	4370	244	5010	2030000	6830	2.39
22 x 22 x 5/8 *	558.8 x 558.8 x 15.9 *	260.5	2.554	15.9	32.1	32.1	33200	1590	5700	219	6650	2490000	9310	2.14
1/2 *	12.7 *	212.3	2.082	12.7	41.0	41.0	27000	1330	4750	221	5490	2030000	7550	2.17
3/8 *	9.5 *	160.8	1.577	9.5	55.8	55.8	20500	1020	3650	223	4190	1560000	5720	2.19
20 x 20 x 5/8 *	508.0 x 508.0 x 15.9 *	235.1	2.306	15.9	28.9	28.9	30000	1180	4640	198	5430	1850000	7630	1.93
1/2 *	12.7 *	192.1	1.884	12.7	37.0	37.0	24500	985	3880	201	4500	1510000	6210	1.97
3/8 *	9.5 *	145.7	1.428	9.5	50.5	50.5	18600	760	2990	202	3440	1160000	4710	1.98
18 x 18 x 5/8 *	457.2 x 457.2 x 15.9 *	209.8	2.057	15.9	25.8	25.8	26700	842	3680	177	4340	1330000	6130	1.73
1/2 *	12.7 *	171.8	1.685	12.7	33.0	33.0	21900	708	3100	180	3610	1090000	5000	1.76
3/8 *	9.5 *	130.5	1.280	9.5	45.1	45.1	16600	548	2400	182	2770	840000	3800	1.78
16 x 16 x 5/8	406.4 x 406.4 x 15.9	189.9	1.862	14.8	24.5	24.5	22600	571	2810	159	3290	854000	4530	1.57
1/2	12.7	153.7	1.508	11.8	31.4	31.4	18300	469	2310	160	2680	703000	3670	1.59
3/8	9.5	116.6	1.143	8.9	42.7	42.7	13900	365	1790	162	2070	547000	2810	1.60
5/16	7.9	97.6	0.957	7.4	51.9	51.9	11700	308	1510	162	1740	461000	2350	1.60

* This size produced by the submerged arc weld (SAW) process

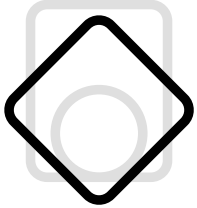


Metric Dimensions and Section Properties of *Square* HSS

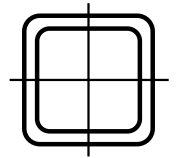


Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	I/10 ⁶	S/10 ³	r	Z/10 ³	Torsional Stiffness Constant J/10 ⁹	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric													
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
14 x 14 x 5/8	355.6 x 355.6 x 15.9	164.5	1.613	14.8	21.0	21.0	19600	374	2100	138	2480	559000	3430	1.37
1/2	12.7	133.5	1.309	11.8	27.1	27.1	15900	309	1740	140	2030	463000	2780	1.38
3/8	9.5	101.4	0.995	8.9	37.0	37.0	12100	241	1360	141	1570	361000	2140	1.39
5/16	7.9	85.0	0.833	7.4	45.1	45.1	10200	204	1150	142	1320	306000	1790	1.40
12 x 12 x 5/8	304.8 x 304.8 x 15.9	139.1	1.364	14.8	17.6	17.6	16600	229	1500	117	1780	341000	2480	1.17
1/2	12.7	113.2	1.110	11.8	22.8	22.8	13500	190	1250	119	1470	284000	2020	1.18
3/8	9.5	86.3	0.846	8.9	31.2	31.2	10300	149	979	120	1140	224000	1560	1.19
5/16	7.9	72.4	0.710	7.4	38.2	38.2	8660	127	831	121	961	190000	1310	1.19
1/4	6.4	59.1	0.580	5.9	48.7	48.7	6960	103	676	122	777	154000	1050	1.20
10 x 10 x 5/8	254.0 x 254.0 x 15.9	113.8	1.116	14.8	14.2	14.2	13600	127	1000	96.6	1200	189000	1680	0.97
1/2	12.7	93.0	0.912	11.8	18.5	18.5	11100	106	838	98.0	994	159000	1380	0.98
3/8	9.5	71.1	0.697	8.9	25.5	25.5	8520	84.3	664	99.4	777	126000	1070	0.99
5/16	7.9	59.8	0.586	7.4	31.3	31.3	7160	71.8	566	100	657	108000	898	0.99
1/4	6.4	48.9	0.480	5.9	40.1	40.1	5770	58.7	462	101	534	88000	726	1.00
3/16	4.8	37.1	0.364	4.4	54.7	54.7	4340	44.8	353	102	405	67200	548	1.00
9 x 9 x 1/2	228.6 x 228.6 x 12.7	82.8	0.812	11.8	16.4	16.4	9870	75.9	664	87.7	793	113000	1100	0.87
3/8	9.5	63.5	0.623	8.9	22.7	22.7	7620	60.4	529	89.1	622	90400	856	0.88
5/16	7.9	53.5	0.525	7.4	27.9	27.9	6410	51.7	452	89.8	527	77300	723	0.89
1/4	6.4	43.8	0.430	5.9	35.7	35.7	5170	42.3	370	90.5	429	63400	584	0.89
3/16	4.8	33.3	0.326	4.4	49.0	49.0	3900	32.4	284	91.2	326	48600	442	0.90
8 x 8 x 5/8	203.2 x 203.2 x 15.9	88.4	0.867	14.8	10.7	10.7	10600	60.9	599	75.8	734	90100	1040	0.76
1/2	12.7	72.7	0.713	11.8	14.2	14.2	8680	51.8	510	77.3	614	77100	858	0.77
3/8	9.5	56.0	0.549	8.9	19.8	19.8	6710	41.6	409	78.7	484	62100	669	0.78
5/16	7.9	47.2	0.463	7.4	24.5	24.5	5650	35.7	351	79.4	412	53400	566	0.79
1/4	6.4	38.7	0.380	5.9	31.4	31.4	4570	29.3	289	80.1	336	43900	459	0.79
3/16	4.8	29.4	0.289	4.4	43.2	43.2	3450	22.6	222	80.9	256	33800	347	0.80

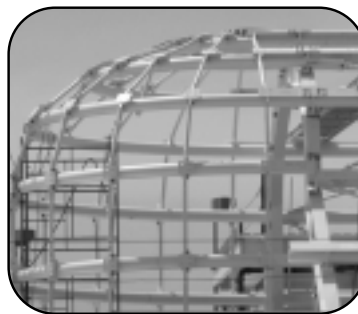


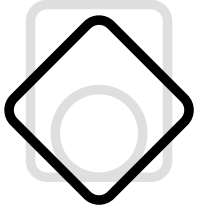


Metric Dimensions and Section Properties of *Square* HSS

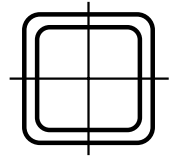


Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t			Area					Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric				b/t	h/t			l/10 ⁶	S/10 ³	r			
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
7 x 7 x 5/8	177.8 x 177.8 x 15.9	75.7	0.743	14.8	9.0	9.0	9090	38.9	438	65.4	543	57300	774	0.66
1/2	12.7	62.6	0.614	11.8	12.1	12.1	7480	33.5	377	66.9	457	49700	644	0.67
3/8	9.5	48.4	0.474	8.9	17.0	17.0	5810	27.1	305	68.3	363	40400	505	0.68
5/16	7.9	40.9	0.401	7.4	21.0	21.0	4900	23.4	263	69.0	310	34900	428	0.69
1/4	6.4	33.6	0.330	5.9	27.1	27.1	3970	19.3	217	69.8	254	28900	348	0.69
3/16	4.8	25.6	0.251	4.4	37.4	37.4	3000	14.9	168	70.5	194	22400	264	0.70
6 x 6 x 5/8	152.4 x 152.4 x 15.9	63.0	0.618	14.8	7.3	7.3	7580	23.0	301	55.0	381	33500	548	0.56
1/2	12.7	52.4	0.514	11.8	9.9	9.9	6280	20.1	263	56.5	324	29600	460	0.57
3/8	9.5	40.8	0.400	8.9	14.1	14.1	4900	16.5	216	57.9	260	24500	364	0.58
5/16	7.9	34.6	0.339	7.4	17.6	17.6	4150	14.3	188	58.7	223	21300	310	0.58
1/4	6.4	28.5	0.280	5.9	22.8	22.8	3370	11.9	156	59.4	183	17800	252	0.59
3/16	4.8	21.8	0.214	4.4	31.6	31.6	2550	9.23	121	60.1	141	13800	192	0.59
1/8	3.2	14.8	0.145	3.0	47.8	47.8	1770	6.54	85.8	60.8	98.7	9800	134	0.60
5 1/2 x 5 1/2 x 3/8	139.7 x 139.7 x 9.5	37.0	0.363	8.9	12.7	12.7	4450	12.4	177	52.8	215	18400	302	0.53
5/16	7.9	31.4	0.308	7.4	15.9	15.9	3780	10.8	155	53.5	185	16100	257	0.53
1/4	6.4	26.0	0.255	5.9	20.7	20.7	3070	9.02	129	54.2	152	13500	210	0.54
3/16	4.8	19.9	0.195	4.4	28.8	28.8	2330	7.04	101	54.9	117	10500	161	0.54
1/8	3.2	13.5	0.132	3.0	43.6	43.6	1620	5.00	71.6	55.6	82.5	7500	112	0.55
5 x 5 x 1/2	127.0 x 127.0 x 12.7	42.3	0.415	11.8	7.8	7.8	5080	10.8	170	46.1	214	15800	307	0.47
3/8	9.5	33.2	0.326	8.9	11.3	11.3	4000	9.05	143	47.6	174	13400	246	0.48
5/16	7.9	28.3	0.277	7.4	14.2	14.2	3400	7.93	125	48.3	150	11800	210	0.48
1/4	6.4	23.4	0.230	5.9	18.5	18.5	2770	6.65	105	49.0	124	9930	172	0.49
3/16	4.8	18.0	0.176	4.4	25.9	25.9	2110	5.22	82.2	49.7	96.1	7810	132	0.49
1/8	3.2	12.2	0.120	3.0	39.3	39.3	1460	3.72	58.6	50.4	67.7	5580	92.2	0.50
4 1/2 x 4 1/2 x 1/2	114.3 x 114.3 x 12.7	37.3	0.365	11.8	6.7	6.7	4480	7.51	131	40.9	167	10900	242	0.42
3/8	9.5	29.4	0.289	8.9	9.8	9.8	3550	6.37	111	42.4	137	9400	195	0.43
5/16	7.9	25.1	0.246	7.4	12.4	12.4	3020	5.62	98.3	43.1	119	8340	168	0.43
1/4	6.4	20.9	0.205	5.9	16.4	16.4	2470	4.74	83.0	43.8	99.1	7070	138	0.44
3/16	4.8	16.0	0.157	4.4	23.0	23.0	1880	3.74	65.5	44.6	76.9	5600	106	0.44
1/8	3.2	11.0	0.107	3.0	35.1	35.1	1310	2.69	47.0	45.2	54.4	4020	74.2	0.45

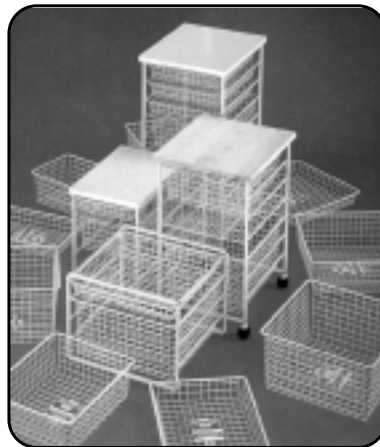


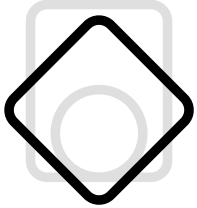


Metric Dimensions and Section Properties of *Square* HSS

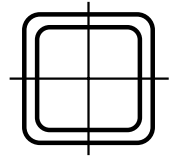


Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t	b/t	h/t	Area	I/10 ⁶	S/10 ³	r	Z/10 ³	Torsional Stiffness Constant J/10 ⁹	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric													
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
4 x 4 x 1/2	101.6 x 101.6 x 12.7	32.2	0.316	11.8	5.6	5.6	3880	4.95	97.5	35.7	126	7120	184	0.37
3/8	9.5	25.6	0.252	8.9	8.4	8.4	3100	4.28	84.2	37.2	105	6280	150	0.38
5/16	7.9	22.0	0.216	7.4	10.7	10.7	2650	3.81	74.9	37.9	91.7	5630	130	0.38
1/4	6.4	18.3	0.179	5.9	14.2	14.2	2170	3.24	63.8	38.6	76.7	4820	107	0.39
3/16	4.8	14.1	0.139	4.4	20.1	20.1	1660	2.57	50.7	39.4	59.9	3850	82.8	0.39
1/8	3.2	9.7	0.095	3.0	30.9	30.9	1160	1.86	36.6	40.0	42.6	2790	58.2	0.40
3 1/2 x 3 1/2 x 3/8	88.9 x 88.9 x 9.5	21.9	0.214	8.9	7.0	7.0	2640	2.70	60.8	32.0	77.1	3940	111	0.33
5/16	7.9	18.8	0.185	7.4	9.0	9.0	2270	2.43	54.7	32.7	67.9	3580	96.7	0.33
1/4	6.4	15.8	0.154	5.9	12.1	12.1	1870	2.09	47.1	33.5	57.2	3100	80.5	0.34
3/16	4.8	12.2	0.120	4.4	17.2	17.2	1440	1.68	37.8	34.2	45.0	2510	62.5	0.34
1/8	3.2	8.4	0.082	3.0	26.6	26.6	1010	1.22	27.6	34.9	32.2	1830	44.2	0.35
3 x 3 x 3/8	76.2 x 76.2 x 9.5	18.1	0.177	8.9	5.6	5.6	2190	1.57	41.2	26.8	53.4	2260	77.9	0.27
5/16	7.9	15.7	0.154	7.4	7.3	7.3	1900	1.44	37.7	27.5	47.6	2090	68.5	0.28
1/4	6.4	13.2	0.129	5.9	9.9	9.9	1570	1.25	32.9	28.3	40.5	1850	57.5	0.28
3/16	4.8	10.3	0.101	4.4	14.3	14.3	1210	1.02	26.8	29.0	32.2	1520	45.0	0.29
1/8	3.2	7.1	0.070	3.0	22.4	22.4	855	0.753	19.8	29.7	23.3	1130	32.0	0.29
2 1/2 x 2 1/2 x 5/16	63.5 x 63.5 x 7.9	12.5	0.123	7.4	5.6	5.6	1520	0.757	23.8	22.3	30.9	1090	45.0	0.23
1/4	6.4	10.6	0.104	5.9	7.8	7.8	1270	0.676	21.3	23.1	26.7	988	38.4	0.23
3/16	4.8	8.4	0.082	4.4	11.4	11.4	990	0.561	17.7	23.8	21.6	832	30.4	0.24
1/8	3.2	5.9	0.057	3.0	18.2	18.2	703	0.421	13.3	24.5	15.8	629	21.9	0.24
2 1/4 x 2 1/4 x 1/4	57.2 x 57.2 x 6.4	9.4	0.092	5.9	6.7	6.7	1120	0.471	16.5	20.5	20.9	683	30.3	0.21
3/16	4.8	7.4	0.073	4.4	10.0	10.0	879	0.396	13.9	21.2	17.1	585	24.2	0.21
1/8	3.2	5.2	0.051	3.0	16.1	16.1	627	0.301	10.5	21.9	12.6	449	17.5	0.22



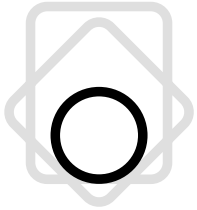


Metric Dimensions and Section Properties of *Square* HSS

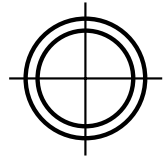


Nominal Size		Mass Per Meter	Weight Per Meter	Design Wall Thickness t			Area					Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary	SI / Metric				b/t	h/t		l/10 ⁶	S/10 ³	r	Z/10 ³			
Inches	Millimeters	kg	kN	mm			mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
2x2x1/4	50.8x50.8x6.4	8.1	0.079	5.9	5.6	5.6	970	0.310	12.2	17.9	15.8	445	23.0	0.18
3/16	4.8	6.5	0.063	4.4	8.5	8.5	767	0.266	10.5	18.6	13.0	390	18.6	0.19
1/8	3.2	4.6	0.045	3.0	13.9	13.9	550	0.205	8.07	19.3	9.72	305	13.6	0.19
1 3/4x1 3/4x3/16	44.5x44.5x4.8	5.5	0.054	4.4	7.1	7.1	656	0.169	7.58	16.0	9.59	246	13.8	0.16
1 5/8x1 5/8x3/16	41.3x41.3x4.8	5.0	0.049	4.4	6.4	6.4	600	0.130	6.29	14.7	8.04	188	11.7	0.15
1/8	3.2	3.6	0.036	3.0	10.8	10.8	436	0.104	5.02	15.4	6.15	153	8.70	0.15
1 1/2x1 1/2x3/16	38.1x38.1x4.8	4.6	0.045	4.4	5.7	5.7	543	0.098	5.13	13.4	6.63	140	9.67	0.14
1/8	3.2	3.3	0.032	3.0	9.7	9.7	398	0.079	4.16	14.1	5.13	117	7.29	0.14
1 1/4x1 1/4x3/16	31.8x31.8x4.8	3.6	0.035	4.4	4.2	4.2	432	0.051	3.19	10.8	4.25	71.1	6.28	0.11
1/8	3.2	2.7	0.026	3.0	7.6	7.6	322	0.043	2.70	11.5	3.39	62.6	4.87	0.12

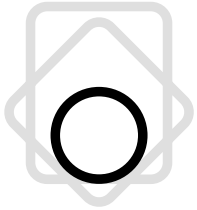




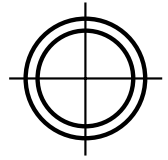
Metric Dimensions and Section Properties of *Round* HSS



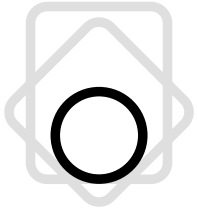
Nominal Size		Mass Per Meter	Design Weight Per Meter	Wall Thickness t	D/t	Area	I/10 ⁶	S/10 ³	r	Z/10 ³	Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary Outside Diameter	SI / Metric Outside Diameter												
Inches	Millimeters	kg	kN	mm		mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
20.000 x 0.500	508.0 x 12.7	155.1	1.521	11.8	43.1	18400	566	2230	175	2910	1130000	4460000	1.60
0.375	9.5	116.8	1.145	8.9	57.1	14000	435	1710	176	2220	869000	3420000	1.60
18.000 x 0.500	457.2 x 12.7	139.2	1.365	11.8	38.7	16500	410	1790	158	2340	819000	3580000	1.44
0.375	9.5	104.9	1.029	8.9	51.4	12500	315	1380	159	1790	630000	2760000	1.44
16.000 x 0.500	406.4 x 12.7	123.3	1.209	11.8	34.4	14600	285	1400	140	1840	570000	2800000	1.28
0.438	11.1	108.2	1.061	10.3	39.5	12800	252	1240	140	1620	503000	2480000	1.28
0.375	9.5	93.0	0.912	8.9	45.7	11100	220	1080	141	1410	439000	2160000	1.28
0.312	7.9	77.6	0.761	7.4	54.9	9280	185	909	141	1180	369000	1820000	1.28
14.000 x 0.500	355.6 x 12.7	107.4	1.053	11.8	30.1	12700	189	1060	122	1400	377000	2120000	1.12
0.375	9.5	81.1	0.795	8.9	40.0	9690	146	820	123	1070	291000	1640000	1.12
0.312	7.9	67.7	0.664	7.4	48.1	8090	123	690	123	897	245000	1380000	1.12
12.750 x 0.500	323.9 x 12.7	97.5	0.956	11.8	27.4	11600	141	871	110	1150	282000	1740000	1.02
0.375	9.5	73.7	0.722	8.9	36.4	8810	109	675	111	883	219000	1350000	1.02
0.250	6.4	50.1	0.491	5.9	54.9	5890	74.5	460	112	597	149000	920000	1.02
12.500 x 0.625	317.5 x 15.9	118.3	1.160	14.8	21.5	14100	162	1020	107	1360	323000	2040000	1.00
0.500	12.7	95.5	0.936	11.8	26.9	11300	133	835	108	1100	265000	1670000	1.00
0.375	9.5	72.2	0.708	8.9	35.7	8630	103	648	109	848	206000	1300000	1.00
0.312	7.9	60.3	0.592	7.4	42.9	7210	86.7	546	110	712	173000	1090000	1.00
0.250	6.4	49.1	0.482	5.9	53.8	5780	70.1	442	110	573	140000	883000	1.00
0.188	4.8	37.0	0.363	4.4	72.2	4330	53.0	334	111	431	106000	668000	1.00
12.313 x 0.625	312.8 x 15.9	116.4	1.141	14.8	21.1	13900	154	985	105	1310	308000	1970000	0.98
0.500	12.7	94.0	0.922	11.8	26.5	11200	127	809	106	1070	253000	1620000	0.98
0.375	9.5	71.0	0.697	8.9	35.1	8500	98.1	628	107	822	196000	1260000	0.98
0.312	7.9	59.4	0.582	7.4	42.3	7100	82.8	529	108	690	166000	1060000	0.98
0.250	6.4	48.4	0.474	5.9	53.0	5690	67.0	428	109	556	134000	856000	0.98
0.188	4.8	36.5	0.357	4.4	71.1	4260	50.7	324	109	418	101000	648000	0.98
12.250 x 0.625	311.2 x 15.9	115.8	1.135	14.8	21.0	13800	152	975	105	1300	303000	1950000	0.98
0.500	12.7	93.5	0.917	11.8	26.4	11100	124	800	106	1060	249000	1600000	0.98
0.375	9.5	70.7	0.693	8.9	35.0	8450	96.6	621	107	813	193000	1240000	0.98
0.312	7.9	59.1	0.579	7.4	42.0	7060	81.5	524	107	683	163000	1050000	0.98
0.250	6.4	48.1	0.472	5.9	52.7	5660	65.9	424	108	550	132000	847000	0.98
0.188	4.8	36.3	0.356	4.4	70.7	4240	49.9	321	108	414	100000	641000	0.98



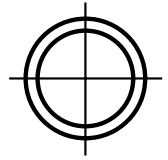
Metric Dimensions and Section Properties of *Round* HSS



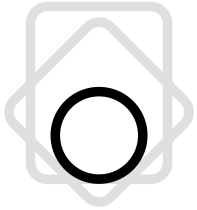
Nominal Size		Mass Per Meter	Design Weight Per Meter	Wall Thickness t	D/t	Area	I/10 ⁶	S/10 ³	r	Z/10 ³	Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary Outside Diameter	SI / Metric Outside Diameter												
Inches	Millimeters	kg	kN	mm		mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
11.250 x 0.625	285.8 x 15.9	105.8	1.038	14.8	19.3	12600	116	812	96.0	1090	232000	1620000	0.90
0.500	12.7	85.5	0.839	11.8	24.2	10200	95.5	668	97.0	886	191000	1340000	0.90
0.375	9.5	64.7	0.635	8.9	32.1	7740	74.3	520	97.9	683	149000	1040000	0.90
0.312	7.9	54.1	0.531	7.4	38.6	6470	62.7	439	98.5	574	125000	878000	0.90
0.250	6.4	44.1	0.432	5.9	48.4	5190	50.8	356	99.0	462	102000	711000	0.90
0.188	4.8	33.3	0.326	4.4	65.0	3890	38.5	270	99.5	348	77000	539000	0.90
10.750 x 0.500	273.1 x 12.7	81.6	0.800	11.8	23.1	9690	82.8	607	92.5	806	166000	1210000	0.86
0.365	9.3	60.5	0.593	8.6	31.8	7150	62.6	458	93.6	602	125000	916000	0.86
0.250	6.4	42.1	0.413	5.9	46.3	4950	44.2	324	94.5	421	88400	648000	0.86
10.000 x 0.625	254.0 x 15.9	93.4	0.916	14.8	17.2	11100	79.8	629	84.7	848	160000	1260000	0.80
0.500	12.7	75.6	0.741	11.8	21.5	8980	66.0	520	85.7	693	132000	1040000	0.80
0.375	9.5	57.3	0.562	8.9	28.5	6850	51.5	406	86.7	535	103000	811000	0.80
0.312	7.9	47.9	0.470	7.4	34.3	5730	43.6	343	87.2	450	87200	687000	0.80
0.250	6.4	39.1	0.383	5.9	43.1	4600	35.4	279	87.7	363	70800	558000	0.80
0.188	4.8	29.5	0.289	4.4	57.7	3450	26.9	212	88.3	274	53800	423000	0.80
9.625 x 0.500	244.5 x 12.7	72.6	0.712	11.8	20.7	8630	58.5	479	82.4	640	117000	958000	0.77
0.375	9.5	55.1	0.540	8.9	27.5	6590	45.8	374	83.4	494	91500	749000	0.77
0.312	7.9	46.1	0.452	7.4	33.0	5510	38.8	317	83.9	416	77500	634000	0.77
0.250	6.4	37.6	0.369	5.9	41.4	4420	31.5	258	84.4	336	63000	515000	0.77
0.188	4.8	28.4	0.278	4.4	55.6	3320	23.9	196	84.9	254	47800	391000	0.77
8.750 x 0.500	222.3 x 12.7	65.6	0.644	11.8	18.8	7800	43.4	390	74.5	523	86700	780000	0.70
0.375	9.5	49.9	0.489	8.9	25.0	5970	34.0	306	75.5	406	68000	612000	0.70
0.312	7.9	41.8	0.410	7.4	30.0	5000	28.9	260	76.0	342	57700	520000	0.70
0.250	6.4	34.1	0.334	5.9	37.7	4010	23.5	211	76.5	276	47000	423000	0.70
0.188	4.8	25.7	0.252	4.4	50.5	3010	17.9	161	77.1	209	35800	322000	0.70
8.625 x 0.500	219.1 x 12.7	64.6	0.634	11.8	18.6	7680	41.4	378	73.4	508	82800	756000	0.69
0.375	9.5	49.1	0.482	8.9	24.6	5880	32.5	297	74.4	393	65000	594000	0.69
0.322	8.2	42.6	0.418	7.6	28.8	5050	28.3	258	74.8	340	56500	516000	0.69
0.250	6.4	33.6	0.329	5.9	37.1	3950	22.5	205	75.4	268	44900	410000	0.69
0.188	4.8	25.4	0.249	4.4	49.8	2970	17.1	156	75.9	203	34200	312000	0.69
7.625 x 0.375	193.7 x 9.5	43.2	0.423	8.9	21.8	5170	22.1	228	65.4	304	44200	457000	0.61
0.328	8.3	37.9	0.372	7.7	25.2	4500	19.5	201	65.8	267	39000	402000	0.61
0.125	3.2	15.0	0.147	2.9	66.8	1740	7.91	81.7	67.5	106	15800	163000	0.61



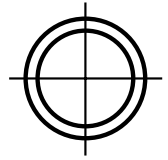
Metric Dimensions and Section Properties of *Round* HSS



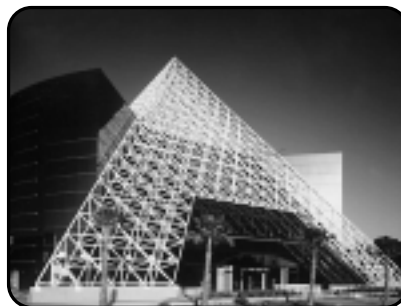
Nominal Size		Mass Per Meter	Design Weight Per Meter	Wall Thickness t	D/t	Area	I/10 ⁶	S/10 ³	r	Z/10 ³	Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary Outside Diameter	SI / Metric Outside Diameter												
Inches	Millimeters	kg	kN	mm		mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
7.500 x 0.500	190.5 x 12.7	55.7	0.546	11.8	16.1	6620	26.6	279	63.3	377	53100	558000	0.60
0.375	9.5	42.4	0.416	8.9	21.4	5080	21.0	220	64.3	294	42000	441000	0.60
0.312	7.9	35.6	0.349	7.4	25.7	4260	17.9	188	64.8	248	35700	375000	0.60
0.250	6.4	29.1	0.285	5.9	32.3	3420	14.6	153	65.3	201	29200	306000	0.60
0.188	4.8	22.0	0.216	4.4	43.3	2570	11.1	117	65.8	152	22300	234000	0.60
7.000 x 0.500	177.8 x 12.7	51.7	0.507	11.8	15.1	6150	21.3	240	58.8	326	42600	479000	0.56
0.375	9.5	39.4	0.387	8.9	20.0	4720	16.9	190	59.8	254	33800	380000	0.56
0.312	7.9	33.1	0.325	7.4	24.0	3960	14.4	162	60.3	215	28800	324000	0.56
0.250	6.4	27.1	0.265	5.9	30.1	3190	11.8	133	60.8	174	23600	265000	0.56
0.188	4.8	20.5	0.201	4.4	40.4	2400	9.01	101	61.3	132	18000	203000	0.56
0.125	3.2	13.8	0.135	2.9	61.3	1590	6.09	68.6	61.8	88.7	12200	137000	0.56
6.875 x 0.500	174.6 x 12.7	50.7	0.497	11.8	14.8	6040	20.1	230	57.7	313	40200	460000	0.55
0.375	9.5	38.7	0.379	8.9	19.6	4630	15.9	183	58.7	245	31900	365000	0.55
0.312	7.9	32.5	0.318	7.4	23.6	3890	13.6	156	59.2	207	27200	312000	0.55
0.250	6.4	26.5	0.260	5.9	29.6	3130	11.1	128	59.7	168	22300	255000	0.55
0.188	4.8	20.1	0.197	4.4	39.7	2350	8.52	97.6	60.2	127	17000	195000	0.55
6.625 x 0.500	168.3 x 12.7	48.7	0.478	11.8	14.3	5800	17.9	212	55.5	290	35700	425000	0.53
0.432	11.0	42.7	0.418	10.2	16.5	5070	15.9	189	56.0	255	31800	378000	0.53
0.375	9.5	37.2	0.365	8.9	18.9	4460	14.2	169	56.4	226	28400	337000	0.53
0.312	7.9	31.3	0.306	7.4	22.7	3740	12.1	144	56.9	192	24300	288000	0.53
0.280	7.1	28.2	0.277	6.6	25.5	3350	11.0	130	57.2	173	22000	261000	0.53
0.250	6.4	25.6	0.251	5.9	28.5	3010	9.94	118	57.5	156	19900	236000	0.53
0.188	4.8	19.4	0.190	4.4	38.3	2270	7.61	90.5	58.0	118	15200	181000	0.53
0.125	3.2	13.0	0.128	2.9	58.0	1510	5.15	61.3	58.5	79.3	10300	123000	0.53
6.125 x 0.500	155.6 x 12.7	44.8	0.439	11.8	13.2	5330	13.9	178	51.0	245	27700	357000	0.49
0.375	9.5	34.2	0.336	8.9	17.5	4100	11.1	142	52.0	192	22100	285000	0.49
0.312	7.9	28.8	0.282	7.4	21.0	3450	9.48	122	52.5	163	19000	244000	0.49
0.250	6.4	23.5	0.231	5.9	26.4	2770	7.78	100	53.0	132	15600	200000	0.49
0.188	4.8	17.9	0.175	4.4	35.4	2090	5.98	76.8	53.5	101	12000	154000	0.49
6.000 x 0.500	152.4 x 12.7	43.8	0.429	11.8	12.9	5210	13.0	170	49.9	234	25900	340000	0.48
0.375	9.5	33.5	0.328	8.9	17.1	4010	10.4	136	50.8	184	20700	272000	0.48
0.312	7.9	28.2	0.276	7.4	20.6	3370	8.88	117	51.3	156	17800	233000	0.48
0.280	7.1	25.4	0.249	6.6	23.1	3020	8.05	106	51.6	140	16100	211000	0.48
0.250	6.4	23.0	0.226	5.9	25.8	2720	7.30	95.8	51.8	127	14600	192000	0.48
0.188	4.8	17.5	0.171	4.4	34.6	2050	5.61	73.6	52.3	96.4	11200	147000	0.48
0.125	3.2	11.8	0.115	2.9	52.6	1360	3.81	50.0	52.9	64.8	7610	99900	0.48

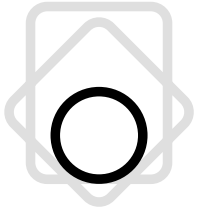


Metric Dimensions and Section Properties of *Round* HSS

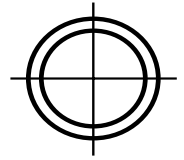


Nominal Size		Mass Per Meter	Design Weight Per Meter	Wall Thickness t	D/t	Area	I/10 ⁶	S/10 ³	r	Z/10 ³	Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary Outside Diameter	SI / Metric Outside Diameter												
Inches	Millimeters	kg	kN	mm		mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
5.563 x 0.375	141.3 x 9.5	30.9	0.303	8.9	15.9	3700	8.15	115	46.9	156	16300	231000	0.44
0.258	6.6	21.9	0.215	6.1	23.1	2590	5.94	84.1	47.8	112	11900	168000	0.44
0.188	4.8	16.2	0.158	4.4	32.1	1890	4.44	62.8	48.4	82.5	8880	126000	0.44
0.134	3.4	11.6	0.113	3.2	44.2	1390	3.31	46.9	48.8	60.0	6600	93700	0.44
5.500 x 0.500	139.7 x 12.7	39.8	0.390	11.8	11.8	4740	9.78	140	45.4	194	19600	280000	0.44
0.375	9.5	30.5	0.299	8.9	15.7	3660	7.86	112	46.4	153	15700	225000	0.44
0.258	6.6	21.7	0.212	6.1	22.9	2560	5.72	81.9	47.3	109	11400	164000	0.44
5.000 x 0.500	127.0 x 12.7	35.8	0.351	11.8	10.8	4270	7.16	113	40.9	157	14300	225000	0.40
0.375	9.5	27.5	0.270	8.9	14.3	3300	5.79	91.2	41.9	124	11600	182000	0.40
0.312	7.9	23.2	0.228	7.4	17.2	2780	4.99	78.6	42.4	106	9980	157000	0.40
0.258	6.6	19.6	0.192	6.1	20.8	2320	4.24	66.8	42.8	89.2	8490	134000	0.40
0.250	6.4	19.0	0.187	5.9	21.5	2240	4.12	65.0	42.9	86.6	8250	130000	0.40
0.188	4.8	14.5	0.142	4.4	28.9	1690	3.19	50.2	43.4	66.2	6380	100000	0.40
0.125	3.2	9.8	0.096	2.9	43.8	1130	2.18	34.3	43.9	44.7	4360	68600	0.40
4.500 x 0.337	114.3 x 8.6	22.4	0.220	8.0	14.3	2670	3.79	66.4	37.7	90.6	7590	133000	0.36
0.237	6.0	16.0	0.157	5.6	20.4	1910	2.83	49.6	38.5	66.2	5660	99100	0.36
0.188	4.8	13.0	0.127	4.4	26.0	1520	2.30	40.2	38.9	53.2	4590	80000	0.36
0.125	3.2	8.8	0.086	2.9	39.4	1010	1.58	27.6	39.4	36.0	3150	55100	0.36
4.000 x 0.337	101.6 x 8.6	19.7	0.193	8.0	12.7	2350	2.60	51.1	33.2	70.3	5190	102000	0.32
0.313	8.0	18.5	0.181	7.4	13.7	2190	2.44	48.1	33.4	65.8	4890	96200	0.32
0.250	6.4	15.0	0.147	5.9	17.2	1770	2.04	40.1	33.9	54.1	4080	80300	0.32
0.237	6.0	14.1	0.139	5.6	18.1	1690	1.95	38.4	34.0	51.7	3900	76900	0.32
0.226	5.7	13.5	0.132	5.3	19.2	1600	1.86	36.7	34.1	49.2	3730	73400	0.32
0.220	5.6	13.3	0.130	5.2	19.5	1570	1.83	36.1	34.1	48.4	3670	72200	0.32
0.188	4.8	11.5	0.112	4.4	23.1	1340	1.59	31.3	34.4	41.6	3180	62600	0.32
0.125	3.2	7.8	0.076	2.9	35.0	899	1.10	21.6	34.9	28.3	2190	43100	0.32





Metric Dimensions and Section Properties of *Round* HSS



Nominal Size		Mass Per Meter	Design Weight Per Meter	Wall Thickness t	D/t	Area	I/10 ⁶	S/10 ³	r	Z/10 ³	Torsional Stiffness Constant J/10 ³	Torsional Shear Constant C/10 ³	Surface Area Per Meter
US Customary Outside Diameter	SI / Metric Outside Diameter												
Inches	Millimeters	kg	kN	mm		mm ²	mm ⁴	mm ³	mm	mm ³	mm ⁴	mm ³	m ²
3.500 x 0.313	88.9 x 8.0	16.0	0.157	7.4	12.0	1890	1.59	35.7	28.9	49.3	3170	71400	0.28
0.300	7.6	15.2	0.149	7.1	12.5	1820	1.54	34.6	29.0	47.6	3080	69200	0.28
0.250	6.4	13.0	0.128	5.9	15.1	1540	1.33	30.0	29.4	40.7	2660	59900	0.28
0.216	5.5	11.3	0.111	5.1	17.4	1340	1.18	26.6	29.7	35.9	2370	53200	0.28
0.203	5.2	10.7	0.105	4.8	18.5	1270	1.12	25.3	29.8	34.0	2250	50600	0.28
0.188	4.8	10.0	0.098	4.4	20.2	1170	1.05	23.5	29.9	31.4	2090	47000	0.28
0.125	3.2	6.8	0.066	2.9	30.7	784	0.725	16.3	30.4	21.5	1450	32600	0.28
3.000 x 0.300	76.2 x 7.6	12.9	0.126	7.1	10.7	1540	0.930	24.4	24.6	34.0	1860	48800	0.24
0.250	6.4	11.0	0.108	5.9	12.9	1300	0.811	21.3	24.9	29.2	1620	42600	0.24
0.216	5.5	9.6	0.094	5.1	14.9	1140	0.724	19.0	25.2	25.8	1450	38000	0.24
0.203	5.2	9.1	0.089	4.8	15.9	1080	0.689	18.1	25.3	24.5	1380	36200	0.24
0.188	4.8	8.5	0.083	4.4	17.3	992	0.642	16.8	25.4	22.7	1280	33700	0.24
0.152	3.9	7.0	0.068	3.6	21.2	821	0.542	14.2	25.7	19.0	1080	28500	0.24
0.134	3.4	6.1	0.060	3.2	23.8	734	0.490	12.9	25.8	17.1	980	25700	0.24
0.120	3.0	5.4	0.053	2.8	27.2	646	0.435	11.4	26.0	15.1	871	22900	0.24
2.875 x 0.250	73.0 x 6.4	10.5	0.103	5.9	12.4	1240	0.705	19.3	23.8	26.6	1410	38700	0.23
0.203	5.2	8.7	0.085	4.8	15.2	1030	0.601	16.5	24.2	22.4	1200	32900	0.23
0.188	4.8	8.1	0.079	4.4	16.6	948	0.560	15.3	24.3	20.7	1120	30700	0.23
0.125	3.2	5.5	0.054	2.9	25.2	639	0.393	10.8	24.8	14.3	786	21500	0.23
2.500 x 0.250	63.5 x 6.4	9.0	0.088	5.9	10.8	1070	0.447	14.1	20.5	19.6	895	28200	0.20
0.188	4.8	6.9	0.068	4.4	14.4	817	0.359	11.3	21.0	15.4	717	22600	0.20
0.125	3.2	4.8	0.047	2.9	21.9	552	0.254	8.00	21.4	10.7	508	16000	0.20
2.375 x 0.250	60.3 x 6.4	8.5	0.083	5.9	10.2	1010	0.377	12.5	19.3	17.5	755	25000	0.19
0.218	5.5	7.4	0.073	5.2	11.6	900	0.345	11.4	19.6	15.8	689	22900	0.19
0.188	4.8	6.6	0.064	4.4	13.7	773	0.304	10.1	19.8	13.8	607	20100	0.19
0.154	3.9	5.4	0.053	3.6	16.8	641	0.259	8.58	20.1	11.6	517	17200	0.19
0.125	3.2	4.5	0.044	2.9	20.8	523	0.216	7.16	20.3	9.56	432	14300	0.19
1.900 x 0.145	48.3 x 3.7	4.1	0.040	3.4	14.2	480	0.122	5.03	15.9	6.87	234	10100	0.15
1.660 x 0.140	42.2 x 3.6	3.4	0.034	3.3	12.8	403	0.077	3.64	13.8	5.01	154	7280	0.13



Steel Tube Institute

OF NORTH AMERICA

8500 Station Street, Suite 270, Mentor, Ohio 44060

Tel: (440) 974-6990 • Fax: (440) 974-6994

E-mail: sti@apk.net • Website: <http://www.steeltubeinstitute.org>



American
Iron and Steel
Institute