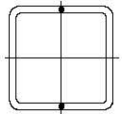




# HSS / Square Structural Steel Tubing

Allowable Concentric Loads in Kips

F<sub>y</sub>=50



ERW

Nominal Size	16 x 16				14 x 14				12 x 12					
Wall Thickness	5/8	1/2	3/8	5/16	5/8	1/2	3/8	5/16	5/8	1/2	3/8	5/16	1/4	
Weight Per Foot	127.37	103.30	78.52	65.87	110.36	89.68	68.31	57.36	93.34	76.07	58.10	48.86	39.43	
Design Wall Thickness	0.581	0.465	0.349*	0.291*	0.581	0.465	0.349*	0.291*	0.581	0.465	0.349	0.291*	0.233*	
<b>F<sub>y</sub> = 50 ksi</b>														
Effective length KL in feet	0	1050	849	587	444	909	738	550	417	771	627	480	388	275
	2	1040	842	583	442	900	731	546	414	762	620	474	385	273
	3	1040	838	581	441	895	727	544	412	757	615	471	383	272
	4	1030	834	579	439	889	722	542	411	751	611	468	381	271
	5	1030	829	577	438	884	718	539	409	745	606	464	379	269
	6	1020	824	575	436	878	713	537	407	739	601	461	377	268
	7	1010	820	573	435	871	708	534	405	732	596	456	374	267
	8	1010	815	570	433	865	703	531	403	725	590	452	372	265
	9	1000	809	568	431	858	697	528	401	718	584	448	369	263
	10	993	804	565	429	851	691	525	399	710	578	443	366	262
	11	986	798	562	427	843	685	521	396	702	572	439	363	260
	12	979	792	559	425	836	679	517	394	694	565	434	360	258
	13	971	786	556	423	828	673	512	392	686	559	428	357	256
	14	964	780	553	421	819	666	507	389	677	552	423	354	254
	15	955	774	550	419	811	659	502	386	668	544	418	350	252
	16	947	767	547	417	802	652	497	384	658	537	412	346	249
	17	939	760	543	414	793	645	491	381	649	529	406	341	247
	18	930	753	540	412	784	638	486	378	639	521	400	336	245
	19	921	746	536	410	774	630	480	375	628	513	394	331	242
	20	912	739	533	407	765	622	474	371	618	505	388	325	239
	21	903	731	529	404	755	614	468	368	607	496	381	320	237
	22	893	724	525	402	745	606	462	365	596	487	375	315	234
	23	883	716	521	399	734	598	456	361	585	478	368	309	231
	24	873	708	517	396	724	589	450	358	573	469	361	303	228
	25	863	700	512	393	713	581	443	354	562	460	354	297	225
	26	853	692	508	390	702	572	437	350	550	450	347	291	222
	27	842	683	503	387	691	563	430	346	537	441	339	285	218
	28	831	675	499	384	679	554	423	342	525	431	332	279	215
	29	820	666	494	381	667	544	416	338	512	420	324	273	211
	30	809	657	489	377	656	535	409	334	499	410	316	266	208
	31	798	648	484	374	643	525	402	329	486	399	309	260	204
	32	786	639	479	370	631	515	394	325	472	389	300	253	200
	33	775	629	474	367	619	505	387	320	459	378	292	246	195
	34	763	620	468	363	606	495	379	315	445	367	284	239	191
	35	751	610	463	359	593	485	371	310	430	355	275	232	186
	36	739	601	457	355	580	474	364	305	416	344	266	225	182
	37	726	591	451	351	566	463	356	299	401	332	257	217	177
	38	713	581	444	347	553	452	347	293	386	320	248	210	171
	39	701	570	436	343	539	441	339	286	370	307	239	202	165
	40	688	560	428	339	525	430	331	279	354	295	230	194	158
<b>PROPERTIES</b>														
Area, In. <sup>2</sup>	35.0	28.3	21.5	18.1	30.3	24.6	18.7	15.7	25.7	20.9	16.0	13.4	10.8	
I, In. <sup>4</sup>	1370	1130	873	739	896	743	577	490	548	457	357	304	248	
r, In.	6.25	6.31	6.37	6.39	5.44	5.49	5.55	5.58	4.62	4.68	4.73	4.76	4.79	
B, Bending Factor	0.204	0.200	0.197	0.196	0.237	0.232	0.227	0.224	0.281	0.274	0.269	0.264	0.261	
a ÷ 10 <sup>6</sup>	205	169	130	110	134	111	86.2	73.2	81.8	68.2	53.3	45.4	37.0	

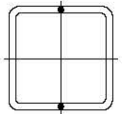
\*Slender element section. Width-Thickness and Depth-Thickness ratio exceeds AISC "Specification" Section B5.1 limiting value of  $253 / \sqrt{F_y}$ .



# HSS / Square Structural Steel Tubing

Allowable Concentric Loads in Kips

F<sub>y</sub>=50



ERW

Nominal Size		10 x 10						9 x 9				
Wall Thickness		5/8	1/2	3/8	5/16	1/4	3/16	1/2	3/8	5/16	1/4	3/16
Weight Per Foot		76.33	62.46	47.90	40.35	32.63	24.73	55.66	42.79	36.10	29.23	22.18
Design Wall Thickness		0.581	0.465	0.349	0.291	0.233*	0.174*	0.465	0.349	0.291	0.233	0.174*
<b>F<sub>y</sub> = 50 ksi</b>												
Effective length KL in feet	0	630	516	396	333	254	162	459	354	298	241	154
	2	621	508	390	328	251	160	451	348	293	237	153
	3	615	504	387	326	250	159	447	345	290	235	152
	4	609	500	384	323	248	158	442	341	287	232	151
	5	603	495	380	319	246	158	437	337	284	230	150
	6	597	489	376	316	245	156	432	333	280	227	148
	7	590	484	372	313	243	155	426	329	277	224	147
	8	582	478	367	309	241	154	419	324	273	221	146
	9	574	471	362	305	238	153	413	319	269	218	144
	10	566	465	357	301	236	152	406	314	264	214	143
	11	558	458	352	296	234	150	399	309	260	211	141
	12	549	451	347	292	231	149	391	303	255	207	140
	13	539	443	341	287	228	148	384	297	250	203	138
	14	530	436	336	283	225	146	376	291	245	199	136
	15	520	428	330	278	222	144	367	285	240	195	134
	16	510	420	324	272	219	143	359	278	235	191	132
	17	499	411	317	267	216	141	350	272	229	186	130
	18	488	402	311	262	212	139	341	265	224	181	128
	19	477	393	304	256	207	137	331	258	218	177	125
	20	466	384	297	250	203	135	322	251	212	172	123
	21	454	375	290	245	198	133	312	243	206	167	120
	22	442	365	283	238	193	131	301	235	199	162	118
	23	429	355	275	232	188	129	291	228	193	157	115
	24	417	345	268	226	183	127	280	219	186	151	112
	25	404	335	260	219	178	124	269	211	179	146	109
	26	390	324	252	213	173	122	258	203	172	140	105
	27	377	313	244	206	167	119	246	194	165	134	102
	28	363	302	236	199	162	116	234	185	157	128	98
	29	349	291	227	192	156	113	222	176	150	122	93
	30	334	279	218	185	150	110	209	166	142	116	89
	31	319	267	209	177	145	107	197	157	134	110	84
	32	304	255	200	170	138	103	184	147	126	103	79
	33	288	243	191	162	132	100	173	138	118	97	74
	34	272	230	181	154	126	96	163	130	112	91	70
	35	257	217	172	146	119	91	154	123	105	86	66
	36	243	205	162	138	113	87	146	116	99	81	62
	37	230	194	154	131	107	82	138	110	94	77	59
	38	218	184	146	124	101	78	131	104	89	73	56
	39	207	175	138	117	96	74	124	99	85	69	53
	40	197	166	131	112	92	70	118	94	81	66	51
<b>PROPERTIES</b>												
Area, in. <sup>2</sup>	21.0	17.2	13.2	11.1	8.96	6.76	15.3	11.8	9.92	8.03	6.06	
I, in. <sup>4</sup>	304	256	202	172	141	108	182	145	124	102	78.2	
r, in.	3.80	3.86	3.92	3.94	3.97	4.00	3.45	3.51	3.54	3.56	3.59	
B, Bending Factor	0.345	0.336	0.327	0.323	0.318	0.313	0.378	0.366	0.360	0.354	0.349	
a ÷ 10 <sup>6</sup>	45.4	38.2	30.2	25.7	21.1	16.1	27.2	21.7	18.5	15.2	11.7	

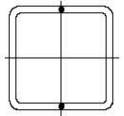
\*Slender element section. Width-Thickness and Depth-Thickness ratio exceeds AISC "Specification" Section B5.1 limiting value of  $253 / \sqrt{F_y}$ .



# HSS / Square Structural Steel Tubing

Allowable Concentric Loads in Kips

F<sub>y</sub>=50



ERW

Nominal Size		8 x 8						7 x 7					
Wall Thickness		5/8	1/2	3/8	5/16	1/4	3/16	5/8	1/2	3/8	5/16	1/4	3/16
Weight Per Foot		59.32	48.85	37.69	31.84	25.82	19.63	50.81	42.05	32.58	27.59	22.42	17.08
Design Wall Thickness		0.581	0.465	0.349	0.291	0.233	0.174*	0.581	0.465	0.349	0.291	0.233	0.174*
<b>F<sub>y</sub> = 50 ksi</b>													
Effective length KL in feet	0	492	405	312	263	213	146	420	348	269	228	185	137
	2	482	397	306	258	209	144	410	340	263	223	181	135
	3	477	393	303	255	207	143	405	336	260	220	179	134
	4	471	388	299	252	204	142	398	330	256	217	176	132
	5	464	382	295	249	202	141	391	325	252	213	173	131
	6	457	377	291	245	199	139	384	319	247	209	170	129
	7	449	370	286	241	196	138	376	312	242	205	167	127
	8	441	364	281	237	192	136	367	305	237	201	164	124
	9	432	357	276	233	189	135	358	298	232	196	160	121
	10	423	350	271	228	185	133	348	290	226	192	156	118
	11	414	342	265	224	181	131	338	282	220	187	152	115
	12	404	334	259	219	178	129	328	274	213	181	148	112
	13	394	326	253	214	173	127	317	265	207	176	144	109
	14	383	317	246	208	169	124	306	256	200	170	139	106
	15	372	308	240	203	165	122	294	246	193	164	134	102
	16	361	299	233	197	160	119	281	236	186	158	129	98
	17	349	290	226	191	155	117	269	226	178	152	124	95
	18	337	280	218	185	151	114	256	216	170	145	119	91
	19	324	270	211	179	145	111	242	205	162	138	114	87
	20	311	259	203	172	140	107	228	193	153	131	108	82
	21	298	249	195	166	135	103	213	182	145	124	102	78
	22	284	238	187	159	130	99	198	170	136	117	96	74
	23	270	226	178	152	124	95	183	157	126	109	90	69
	24	255	215	170	145	118	90	168	144	117	101	84	64
	25	240	203	161	137	112	86	155	133	108	93	77	59
	26	224	190	151	129	106	81	143	123	100	86	72	55
	27	209	177	142	122	100	77	133	114	92	80	66	51
	28	194	165	132	114	93	72	123	106	86	74	62	47
	29	181	154	123	106	87	67	115	99	80	69	58	44
	30	169	144	115	99	81	63	107	92	75	65	54	41
	31	158	135	108	93	76	59	101	87	70	61	50	39
	32	148	126	101	87	71	55	94	81	66	57	47	36
	33	140	119	95	82	67	52	89	76	62	53	44	34
	34	132	112	90	77	63	49	84	72	58	50	42	32
	35	124	106	85	73	60	46	79	68	55	48	40	30
	36	117	100	80	69	56	43	75	64	52	45	37	29
	37	111	95	76	65	53	41	71	61	49	43	35	27
	38	105	90	72	62	51	39	67	58	47	40	34	26
	39	100	85	68	59	48	37	64	55	44	38	32	24
	40	95	81	65	56	46	35	60	52	42	36	30	23
<b>PROPERTIES</b>													
Area, In. <sup>2</sup>	16.4	13.5	10.4	8.76	7.10	5.37	14.0	11.6	8.97	7.59	6.17	4.67	
I, In. <sup>4</sup>	146	125	99.6	85.6	70.7	54.4	93.3	80.5	64.9	56.1	46.5	36.0	
r, In.	2.99	3.04	3.10	3.13	3.15	3.18	2.58	2.63	2.69	2.72	2.75	2.77	
B, Bending Factor	0.449	0.432	0.418	0.409	0.402	0.395	0.525	0.504	0.484	0.474	0.464	0.454	
a ÷ 10 <sup>6</sup>	21.8	18.7	14.9	12.8	10.6	8.12	13.9	12.0	9.69	8.38	6.94	5.38	

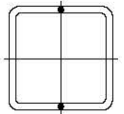
\*Slender element section. Width-Thickness and Depth-Thickness ratio exceeds AISC "Specification" Section B5.1 limiting value of  $253 / \sqrt{F_y}$ .



# HSS / Square Structural Steel Tubing

Allowable Concentric Loads in Kips

F<sub>y</sub>=50



ERW

Nominal Size		6 x 6						5 1/2 x 5 1/2					
Wall Thickness		5/8	1/2	3/8	5/16	1/4	3/16	1/8	3/8	5/16	1/4	3/16	1/8
Weight Per Foot		42.30	35.24	27.48	23.34	19.02	14.53	9.86	24.93	21.21	17.32	13.25	9.01
Design Wall Thickness		0.581	0.465	0.349	0.291	0.233	0.174	0.116*	0.349	0.291	0.233	0.174	0.116*
<b>F<sub>y</sub> = 50 ksi</b>													
Effective length KL in feet	0	351	292	227	193	157	119	69	206	176	143	109	66
	2	341	284	221	188	153	116	68	200	170	139	106	65
	3	335	279	218	185	151	115	67	197	167	137	104	64
	4	328	274	214	181	148	113	66	192	164	134	102	63
	5	321	268	209	178	145	110	65	188	160	131	100	62
	6	313	262	204	174	142	108	64	183	156	127	97	61
	7	304	255	199	169	138	105	63	177	151	124	94	60
	8	295	247	194	165	135	103	62	172	146	120	91	58
	9	285	240	188	160	131	100	61	165	141	116	88	57
	10	275	231	181	155	127	97	60	159	136	111	85	56
	11	264	223	175	149	122	93	58	152	130	107	82	54
	12	253	214	168	143	118	90	57	145	124	102	78	52
	13	241	204	161	138	113	86	55	138	118	97	74	50
	14	228	194	153	131	108	83	54	130	112	92	71	48
	15	215	184	146	125	103	79	52	122	105	86	67	46
	16	202	173	138	118	97	75	50	113	98	81	62	43
	17	188	162	129	111	92	71	48	104	90	75	58	40
	18	173	150	121	104	86	66	45	95	83	69	53	37
	19	158	138	111	96	80	62	43	86	75	62	49	34
	20	143	126	102	89	74	57	39	77	68	56	44	31
	21	130	114	93	81	67	53	36	70	61	51	40	28
	22	118	104	84	74	61	48	33	64	56	46	36	25
	23	108	95	77	67	56	44	30	58	51	42	33	23
	24	99	87	71	62	52	40	28	54	47	39	30	21
	25	91	80	65	57	48	37	26	49	43	36	28	20
	26	85	74	60	53	44	34	24	46	40	33	26	18
	27	78	69	56	49	41	32	22	42	37	31	24	17
	28	73	64	52	45	38	30	20	39	34	29	22	16
	29	68	60	49	42	35	28	19	37	32	27	21	15
	30	63	56	45	40	33	26	18	34	30	25	20	14
	31	59	52	43	37	31	24	17	32	28	23	18	13
	32	56	49	40	35	29	23	16	30	26	22	17	12
	33	52	46	38	33	27	21	15	28	25	21	16	11
	34	49	43	35	31	26	20	14	27	23	19	15	11
	35	47	41	33	29	24	19	13	25	22	18	14	10
	36	44	39	32	27	23	18	12	24	21	17	14	9
	37	42	37	30	26	22	17	12	23	20	16	13	9
	38	40	36	28	25	21	16	11	22	19	15	12	8
	39	38	34	27	24	20	15	11	21	18	14	11	8
	40	36	32	26	23	19	14	10	20	17	13	10	7
<b>PROPERTIES</b>													
Area, In. <sup>2</sup>	11.7	9.74	7.58	6.43	5.24	3.98	2.70	6.88	5.85	4.77	3.63	2.46	
I, In. <sup>4</sup>	55.1	48.2	39.4	34.3	28.6	22.3	15.5	29.7	25.9	21.7	17.0	11.8	
r, In.	2.17	2.23	2.28	2.31	2.34	2.37	2.39	2.08	2.11	2.13	2.16	2.19	
B, Bending Factor	0.637	0.606	0.577	0.562	0.550	0.535	0.523	0.637	0.621	0.604	0.587	0.573	
a ÷ 10 <sup>6</sup>	8.23	7.20	5.88	5.12	4.27	3.33	2.31	4.44	3.87	3.24	2.54	1.76	

\*Slender element section. Width-Thickness and Depth-Thickness ratio exceeds AISC "Specification" Section B5.1 limiting value of  $253 / \sqrt{F_y}$ .

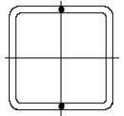
Note: Double Horizontal Line indicates K  $\ell/r$  limit of 200.



# HSS / Square Structural Steel Tubing

Allowable Concentric Loads in Kips

F<sub>y</sub>=50



ERW

Nominal Size	5 x 5						4 1/2 x 4 1/2					
Wall Thickness	1/2	3/8	5/16	1/4	3/16	1/8	1/2	3/8	5/16	1/4	3/16	1/8
Weight Per Foot	28.43	22.37	19.08	15.62	11.97	8.16	25.03	19.82	16.96	13.91	10.70	7.31
Design Wall Thickness	0.465	0.349	0.291	0.233	0.174	0.116*	0.465	0.349	0.291	0.233	0.174	0.116*

F <sub>y</sub> = 50 ksi													
Effective length KL in feet	0	236	185	158	129	98	63	209	164	140	115	88	60
	2	228	179	153	125	95	62	200	158	135	111	85	58
3	223	175	149	122	93	61	195	154	132	108	83	57	57
4	217	171	146	119	91	60	189	150	128	105	80	55	55
5	211	166	142	116	89	59	182	145	124	102	78	53	53
6	204	161	137	113	86	57	175	139	119	98	75	52	52
7	197	155	133	109	83	56	167	133	114	94	72	50	50
8	188	149	128	105	80	55	158	127	109	90	69	47	47
9	180	143	122	101	77	53	149	120	103	86	66	45	45
10	171	136	117	96	74	51	140	113	97	81	62	43	43
11	161	129	111	91	70	48	129	105	91	76	58	40	40
12	151	121	104	86	67	46	119	97	84	70	54	38	38
13	141	113	98	81	63	43	107	89	77	65	50	35	35
14	130	105	91	76	59	40	95	80	70	59	46	32	32
15	118	96	84	70	54	38	83	70	62	53	41	29	29
16	106	87	76	64	50	35	73	62	55	47	36	26	26
17	94	78	68	57	45	31	65	55	49	41	32	23	23
18	84	69	61	51	40	28	58	49	43	37	29	20	20
19	75	62	55	46	36	25	52	44	39	33	26	18	18
20	68	56	49	42	33	23	47	40	35	30	23	16	16
21	61	51	45	38	30	21	42	36	32	27	21	15	15
22	56	46	41	34	27	19	39	33	29	25	19	14	14
23	51	42	37	31	25	17	35	30	27	23	18	12	12
24	47	39	34	29	23	16	32	28	24	21	16	11	11
25	43	36	32	27	21	15	30	25	22	19	15	11	11
26	40	33	29	25	19	14	28	23	21	18	14	10	10
27	37	31	27	23	18	13	22	22	19	16	13	9	9
28	35	29	25	21	17	12	22	22	18	15	12	8	8
29	32	27	23	20	16	11	22	22	18	15	11	8	8
30	30	25	22	18	15	10	22	22	18	15	11	8	8
31	23	20	17	14	11	10	22	22	18	15	11	8	8
32	23	20	17	14	11	10	22	22	18	15	11	8	8
33	23	20	17	14	11	10	22	22	18	15	11	8	8
34	23	20	17	14	11	10	22	22	18	15	11	8	8
35	23	20	17	14	11	10	22	22	18	15	11	8	8
36	23	20	17	14	11	10	22	22	18	15	11	8	8
37	23	20	17	14	11	10	22	22	18	15	11	8	8
38	23	20	17	14	11	10	22	22	18	15	11	8	8
39	23	20	17	14	11	10	22	22	18	15	11	8	8
40	23	20	17	14	11	10	22	22	18	15	11	8	8

PROPERTIES													
Area, In. <sup>2</sup>	7.88	6.18	5.26	4.30	3.28	2.23	6.95	5.48	4.68	3.84	2.93	2.00	2.00
I, In. <sup>4</sup>	26.0	21.7	19.0	16.0	12.6	8.80	18.0	15.3	13.5	11.4	9.02	6.35	6.35
r, In.	1.82	1.87	1.90	1.93	1.96	1.99	1.61	1.67	1.70	1.73	1.75	1.78	1.78
B, Bending Factor	0.758	0.712	0.692	0.672	0.651	0.634	0.869	0.806	0.780	0.758	0.731	0.709	0.709
a ÷ 10 <sup>6</sup>	3.88	3.24	2.84	2.39	1.88	1.31	2.69	2.28	2.02	1.70	1.35	0.948	0.948

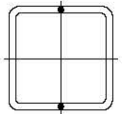
\*Slender element section. Width-Thickness and Depth-Thickness ratio exceeds AISC "Specification" Section B5.1 limiting value of 253 / √F<sub>y</sub>.  
 Note: Double Horizontal Line indicates K ℓ/r limit of 200.



# HSS / Square Structural Steel Tubing

Allowable Concentric Loads in Kips

F<sub>y</sub>=50



ERW

Nominal Size		4 x 4						3 1/2 x 3 1/2				
Wall Thickness		1/2	3/8	5/16	1/4	3/16	1/8	3/8	5/16	1/4	3/16	1/8
Weight Per Foot		21.63	17.27	14.83	12.21	9.42	6.46	14.72	12.70	10.51	8.15	5.61
Design Wall Thickness		0.465	0.349	0.291	0.233	0.174	0.116	0.349	0.291	0.233	0.174	0.116
<b>F<sub>y</sub> = 50 ksi</b>												
Effective length KL in feet	0	181	143	123	101	77	53	123	106	87	67	46
	2	172	137	118	97	74	51	116	100	83	64	44
	3	167	133	114	94	72	50	112	96	80	62	43
	4	160	128	110	91	70	48	107	92	77	59	41
	5	153	123	106	87	67	46	101	88	73	56	39
	6	146	117	101	83	64	44	95	82	69	53	37
	7	137	111	96	79	61	42	88	77	64	50	35
	8	128	104	90	75	58	40	81	71	59	46	32
	9	118	97	84	70	54	38	73	64	54	43	30
	10	108	89	78	65	50	35	65	57	49	38	27
	11	97	81	71	59	46	32	56	50	43	34	24
	12	86	72	63	54	42	30	47	42	37	29	21
	13	73	63	56	47	38	27	40	36	31	25	18
	14	63	54	48	41	33	23	34	31	27	22	15
	15	55	47	42	36	29	20	30	27	23	19	13
	16	48	41	37	32	25	18	26	24	21	17	12
	17	43	37	33	28	22	16	23	21	18	15	10
	18	38	33	29	25	20	14	21	19	16	13	9
	19	34	29	26	22	18	13	19	17	15	12	8
	20	31	26	24	20	16	11	17	15	13	11	7
	21	28	24	21	18	15	10	15	14	12	10	7
	22	26	22	20	17	13	9	14	13	11	9	6
	23	23	20	18	15	12	9	13	12	10	8	6
	24	21	18	16	14	11	8	12	11	9	7	5
	25	19	16	14	12	10	7	11	10	8	6	4
	26	17	14	12	10	8	6	10	9	7	5	3
	27	15	12	10	8	6	5	9	8	6	4	2
	28	13	10	8	6	5	4	8	7	5	3	1
	29	11	8	6	5	4	3	7	6	4	2	1
	30	9	7	5	4	3	2	6	5	3	2	1
	31	7	5	4	3	2	1	5	4	2	1	0
	32	6	4	3	2	1	1	4	3	1	0	0
	33	5	3	2	1	1	0	3	2	1	0	0
	34	4	2	1	1	0	0	2	1	0	0	0
	35	3	1	1	0	0	0	1	0	0	0	0
	36	2	1	0	0	0	0	1	0	0	0	0
	37	1	0	0	0	0	0	0	0	0	0	0
	38	0	0	0	0	0	0	0	0	0	0	0
	39	0	0	0	0	0	0	0	0	0	0	0
	40	0	0	0	0	0	0	0	0	0	0	0
<b>PROPERTIES</b>												
Area, in. <sup>2</sup>	6.02	4.78	4.10	3.37	2.58	1.77	4.09	3.52	2.91	2.24	1.54	
I, in. <sup>4</sup>	11.9	10.3	9.14	7.80	6.21	4.40	6.48	5.84	5.04	4.05	2.90	
r, in.	1.41	1.46	1.49	1.52	1.55	1.58	1.26	1.29	1.32	1.35	1.37	
B, Bending Factor	1.01	0.928	0.897	0.864	0.831	0.805	1.10	1.05	1.01	0.968	0.929	
a ÷ 10 <sup>6</sup>	1.78	1.54	1.36	1.16	0.927	0.657	0.968	0.872	0.753	0.605	0.433	

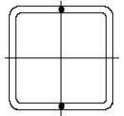
Note: Double Horizontal Line indicates K L/r limit of 200.



# HSS / Square Structural Steel Tubing

Allowable Concentric Loads in Kips

F<sub>y</sub>=50



ERW

Nominal Size		3 x 3					2 1/2 x 2 1/2				2 1/4 x 2 1/4		
Wall Thickness		3/8	5/16	1/4	3/16	1/8	5/16	1/4	3/16	1/8	1/4	3/16	1/8
Weight Per Foot		12.17	10.58	8.81	6.87	4.75	8.45	7.11	5.59	3.90	6.26	4.96	3.48
Design Wall Thickness		0.349	0.291	0.233	0.174	0.116	0.291	0.233	0.174	0.116	0.233	0.174	0.116
F <sub>y</sub> = 50 ksi													
Effective length KL in feet	0	102	88	73	57	39	71	59	46	32	52	41	29
	2	95	82	69	53	37	65	54	43	30	47	37	26
	3	90	79	66	51	35	60	51	40	28	44	35	25
	4	85	74	62	48	33	55	47	37	26	40	32	23
	5	79	69	58	45	31	50	43	34	24	35	28	20
	6	72	63	53	42	29	44	38	30	21	30	24	18
	7	64	57	48	38	27	37	32	26	19	24	20	15
	8	56	50	43	34	24	29	26	22	16	18	15	12
	9	48	43	37	30	21	23	21	17	13	14	12	9
	10	39	36	31	25	18	19	17	14	10	12	10	7
	11	32	29	26	21	15	16	14	12	9	10	8	6
	12	27	25	22	18	13	13	12	10	7	8	7	5
	13	23	21	18	15	11	11	10	8	6	7	6	4
	14	20	18	16	13	9	10	9	7	5	5	5	4
	15	17	16	14	11	8	7	7	6	5	5	5	4
	16	15	14	12	10	7	7	7	6	5	5	5	4
	17	13	12	11	9	6	6	6	5	4	4	4	3
	18	11	11	10	8	5	5	5	4	3	3	3	2
	19	10	10	9	7	4	4	4	3	2	2	2	2
	20	9	9	8	6	3	3	3	2	2	2	2	2
	21	8	8	7	5	2	2	2	2	2	2	2	2
	22	7	7	6	4	2	2	2	2	2	2	2	2
	23	6	6	5	3	2	2	2	2	2	2	2	2
	24	5	5	4	2	1	1	1	1	1	1	1	1
	25	4	4	3	2	1	1	1	1	1	1	1	1
	26	3	3	2	1	1	1	1	1	1	1	1	1
	27	2	2	1	1	1	1	1	1	1	1	1	1
	28	1	1	1	1	1	1	1	1	1	1	1	1
	29	1	1	1	1	1	1	1	1	1	1	1	1
	30	1	1	1	1	1	1	1	1	1	1	1	1
	31	1	1	1	1	1	1	1	1	1	1	1	1
	32	1	1	1	1	1	1	1	1	1	1	1	1
	33	1	1	1	1	1	1	1	1	1	1	1	1
	34	1	1	1	1	1	1	1	1	1	1	1	1
	35	1	1	1	1	1	1	1	1	1	1	1	1
	36	1	1	1	1	1	1	1	1	1	1	1	1
	37	1	1	1	1	1	1	1	1	1	1	1	1
	38	1	1	1	1	1	1	1	1	1	1	1	1
	39	1	1	1	1	1	1	1	1	1	1	1	1
	40	1	1	1	1	1	1	1	1	1	1	1	1
<b>PROPERTIES</b>													
Area, In. <sup>2</sup>	3.39	2.94	2.44	1.89	1.30	2.35	1.97	1.54	1.07	1.74	1.37	0.96	
I, In. <sup>4</sup>	3.77	3.45	3.02	2.46	1.78	1.82	1.63	1.35	0.998	1.13	0.952	0.712	
r, In.	1.05	1.08	1.11	1.14	1.17	0.879	0.908	0.937	0.965	0.805	0.835	0.863	
B, Bending Factor	1.35	1.28	1.21	1.15	1.10	1.61	1.51	1.43	1.34	1.73	1.62	1.52	
a ÷ 10 <sup>6</sup>	0.563	0.515	0.451	0.367	0.266	0.272	0.243	0.202	0.149	0.169	0.142	0.106	

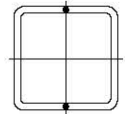
Note: Double Horizontal Line indicates K L/r limit of 200.



# HSS / Square Structural Steel Tubing

Allowable Concentric Loads in Kips

$F_y = 50$



ERW

Nominal Size		2 x 2			1 3/4 x 1 3/4	1 5/8 x 1 5/8		1 1/2 x 1 1/2		1 1/4 x 1 1/4	
Wall Thickness		1/4	3/16	1/8	3/16	3/16	1/8	3/16	1/8	3/16	1/8
Weight Per Foot		5.41	4.32	3.05	3.68	3.36	2.42	3.04	2.20	2.40	1.78
Design Wall Thickness		0.233	0.174	0.116	0.174	0.174	0.116	0.174	0.116	0.174	0.116
$F_y = 50$ ksi											
Effective length KL in feet	0	45	36	25	31	28	20	25	18	20	15
	2	40	32	23	27	24	17	21	15	16	12
	3	36	29	21	24	21	15	18	13	12	9
	4	32	26	19	20	17	13	14	11	8	7
	5	27	22	16	16	13	10	10	8	5	4
	6	21	18	13	12	9	7	7	5	3	3
	7	16	13	10	9	7	5	5	4	3	2
	8	12	10	8	7	5	4	4	3	<u>3</u>	<u>2</u>
	9	10	8	6	5	4	3	<u>3</u>	2	<u>3</u>	<u>2</u>
	10	8	7	5	4	<u>4</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>3</u>	<u>2</u>
	11	<u>6</u>	5	4	<u>4</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>3</u>	<u>2</u>
	12	<u>6</u>	<u>5</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>3</u>	<u>2</u>
	13		<u>5</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>3</u>	<u>2</u>
	14										
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	<b>PROPERTIES</b>										
Area, In. <sup>2</sup>		1.51	1.19	0.84	1.02	0.93	0.67	0.84	0.61	0.67	0.49
I, In. <sup>4</sup>		0.745	0.640	0.486	0.405	0.312	0.246	0.235	0.188	0.121	0.101
r, In.		0.703	0.732	0.761	0.630	0.579	0.608	0.528	0.556	0.425	0.454
B, Bending Factor		2.03	1.86	1.73	2.20	2.42	2.21	2.68	2.43	3.46	3.03
a ÷ 10 <sup>6</sup>		0.111	0.096	0.073	0.060	0.047	0.037	0.035	0.028	0.018	0.015

Note: Double Horizontal Line indicates K  $\ell$ /r limit of 200.