



STEEL COMPRESSION MEMBER SELECTION TABLE ADDENDUM

FOR JUMBO HSS SIZES



This addendum to the steel compression member selection tables in the AISC Steel Construction Manual contains data for available strength in axial compression for rectangular, square and round Jumbo HSS.

Refer to this addendum when you're designing with HSS and consider how Atlas Tube Jumbo HSS can benefit your next project.



HSS34

Table 4-3
Available Strength in
Axial Compression, kips
Rectangular HSS

$F_y = 50$ ksi

Shape		HSS34×10×									
		1.0		$\frac{7}{8}^{[c]}$		$\frac{3}{4}^{[c]}$		$\frac{5}{8}^{[c]}$		$\frac{1}{2}^{[c]}$	
t_{design} , in.		0.930		0.814		0.698		0.581		0.465	
lb/ft		277.07		244.88		212.00		178.41		144.13	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	2280	3430	1880	2820	1490	2240	1120	1690	797	1200
	6	2230	3360	1850	2780	1470	2210	1110	1670	786	1180
	7	2220	3330	1840	2760	1460	2190	1100	1660	782	1180
	8	2200	3300	1830	2750	1450	2180	1100	1650	778	1170
	9	2170	3270	1810	2730	1440	2170	1090	1640	772	1160
	10	2150	3230	1800	2700	1430	2150	1080	1620	767	1150
	15	1990	3000	1700	2560	1360	2040	1030	1540	730	1100
	20	1790	2700	1580	2370	1260	1890	958	1440	682	1020
	25	1570	2360	1400	2100	1150	1720	874	1310	624	938
	30	1330	2000	1190	1790	1020	1530	782	1180	560	842
	35	1090	1640	983	1480	865	1300	684	1030	493	741
	40	873	1310	789	1190	698	1050	585	880	425	639
	45	690	1040	624	937	552	830	477	717	359	540
	50	559	839	505	759	447	672	386	581	307	462
	55	462	694	417	627	370	556	319	480	264	397
	60	388	583	351	527	311	467	268	403	222	333
	65	331	497	299	449	265	398	229	344	189	284
	68	302	454	273	410	242	363	209	314	173	259
	69	293	441	265	399	235	353	203	305	168	252
	70	285	428	258	387	228	343	197	296	163	245
	71					222	333	192	288	158	238
72							186	280	154	231	
73									150	225	
Properties											
A_g , in. ²	76.2		67.3		58.2		48.9		39.5		
I_x , in. ⁴	9600		8600		7550		6430		5260		
I_y , in. ⁴	1340		1210		1070		924		764		
r_y , in.	4.19		4.24		4.29		4.35		4.40		
r_x/r_y	2.67		2.67		2.66		2.64		2.62		
ASD	LRFD	[c] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly. Note: Heavy line indicates L_c/r_y equal to or greater than 200.									
$\Omega_c = 1.67$	$\phi_c = 0.90$										

$F_y = 50$ ksi

Table 4-3 (continued)
Available Strength in
Axial Compression, kips
Rectangular HSS



HSS30

Shape		HSS30×10×											
		1.0		$\frac{7}{8}$ ^[e]		$\frac{3}{4}$ ^[e]		$\frac{5}{8}$ ^[e]		$\frac{1}{2}$ ^[e]		$\frac{3}{8}$ ^[e]	
t_{design} , in.		0.930		0.814		0.698		0.581		0.465		0.349	
lb/ft		249.85		221.06		191.58		161.40		130.52		98.94	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	2060	3090	1810	2730	1450	2180	1100	1660	787	1180	507	763
	6	2010	3020	1780	2680	1430	2140	1090	1630	775	1170	500	752
	7	2000	3000	1770	2660	1420	2130	1080	1630	771	1160	498	748
	8	1980	2970	1750	2630	1410	2120	1080	1620	767	1150	495	743
	9	1960	2940	1730	2610	1400	2100	1070	1600	761	1140	491	738
	10	1930	2910	1710	2580	1390	2090	1060	1590	755	1140	488	733
	15	1790	2690	1590	2390	1310	1970	1000	1510	718	1080	464	697
	20	1610	2420	1430	2150	1220	1830	934	1400	669	1010	432	650
	25	1400	2110	1250	1880	1090	1640	849	1280	610	917	395	594
	30	1190	1780	1060	1600	932	1400	755	1140	546	820	355	533
	35	973	1460	876	1320	771	1160	656	986	478	718	312	469
	40	772	1160	700	1050	620	931	536	805	409	615	269	404
	45	610	917	553	831	490	736	424	638	344	517	227	342
	50	494	742	448	673	397	596	344	516	284	427	195	292
	55	408	614	370	556	328	493	284	427	235	353	169	254
	60	343	516	311	467	275	414	239	359	197	297	148	222
	65	292	439	265	398	235	353	203	306	168	253	130	196
	68	267	401	242	364	214	322	186	279	154	231	119	179
	69	259	390	235	353	208	313	180	271	149	224	116	174
	70			228	343	202	304	175	263	145	218	112	169
71					197	296	170	256	141	212	109	164	
72							166	249	137	206	106	159	
73											103	155	
Properties													
A_g , in. ²	68.7		60.8		52.6		44.3		35.8		27.1		
I_x , in. ⁴	6900		6190		5440		4640		3810		2930		
I_y , in. ⁴	1180		1070		952		820		679		527		
r_y , in.	4.15		4.20		4.25		4.31		4.36		4.41		
r_x/r_y	2.41		2.40		2.40		2.37		2.36		2.36		
ASD	LRFD	[e] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly. Note: Heavy line indicates L_c/r_y equal to or greater than 200.											
$\Omega_c = 1.67$	$\phi_c = 0.90$												



HSS24

Table 4-3 (continued)
Available Strength in
Axial Compression, kips
Rectangular HSS

$F_y = 50$ ksi

Shape		HSS24×16×											
		1.0		7/8		3/4		5/8 ^[e]		1/2 ^[e]		3/8 ^[e]	
t_{design} , in.		0.930		0.814		0.698		0.581		0.465		0.349	
lb/ft		249.85		221.06		191.58		161.40		130.52		98.94	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	2060	3090	1820	2740	1570	2370	1260	1900	930	1400	576	866
	6	2040	3060	1800	2710	1560	2350	1260	1890	923	1390	573	862
	7	2030	3050	1800	2700	1560	2340	1250	1880	921	1380	572	860
	8	2020	3040	1790	2690	1550	2330	1250	1880	918	1380	571	858
	9	2010	3030	1780	2680	1540	2320	1240	1870	915	1380	569	856
	10	2010	3010	1780	2670	1540	2310	1240	1860	912	1370	568	854
	15	1940	2920	1720	2590	1490	2240	1210	1820	891	1340	558	838
	20	1860	2790	1650	2470	1430	2140	1170	1760	861	1290	543	817
	25	1750	2640	1560	2340	1350	2030	1120	1680	825	1240	526	790
	30	1640	2460	1450	2180	1260	1900	1060	1590	783	1180	504	758
	35	1510	2260	1340	2010	1160	1750	986	1480	735	1110	480	722
	40	1370	2060	1220	1830	1060	1590	900	1350	684	1030	454	682
	45	1230	1850	1100	1650	955	1440	812	1220	631	948	425	639
	50	1090	1640	973	1460	849	1280	723	1090	575	865	389	585
	55	952	1430	853	1280	746	1120	637	957	519	781	352	530
	60	822	1240	738	1110	647	973	554	833	454	682	316	475
	65	702	1050	631	948	554	833	475	714	390	586	281	422
	70	605	909	544	817	478	718	410	616	336	505	249	374
	75	527	792	474	712	416	626	357	537	293	440	223	335
	80	463	696	416	626	366	550	314	472	257	387	198	297
85	410	617	369	554	324	487	278	418	228	343	175	263	
90	366	550	329	494	289	434	248	373	203	306	156	235	
95	329	494	295	444	259	390	223	334	183	274	140	211	
100	296	446	266	401	234	352	201	302	165	248	127	190	
Properties													
A_g , in. ²	68.7		60.8		52.6		44.3		35.8		27.1		
I_x , in. ⁴	5330		4780		4200		3580		2930		2250		
I_y , in. ⁴	2840		2550		2250		1920		1580		1210		
r_y , in.	6.43		6.48		6.53		6.59		6.64		6.69		
r_x/r_y	1.37		1.37		1.37		1.36		1.36		1.36		
ASD	LRFD	[e] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly.											
$\Omega_c = 1.67$	$\phi_c = 0.90$												

$F_y = 50$ ksi

Table 4-3 (continued)
Available Strength in
Axial Compression, kips
Rectangular HSS



HSS24

Shape		HSS24×12×											
		1.0		7/8		3/4		5/8 ^[c]		1/2 ^[c]		3/8 ^[c]	
t_{design} , in.		0.930		0.814		0.698		0.581		0.465		0.349	
lb/ft		222.63		197.24		171.16		144.39		116.91		88.73	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	1840	2760	1630	2440	1410	2120	1120	1690	819	1230	539	810
	8	1780	2680	1580	2380	1370	2060	1100	1650	803	1210	529	794
	9	1770	2660	1570	2360	1360	2050	1090	1640	798	1200	526	790
	10	1760	2640	1560	2340	1350	2030	1090	1630	793	1190	523	786
	15	1660	2500	1470	2220	1280	1930	1040	1570	763	1150	503	756
	20	1540	2310	1370	2050	1190	1790	984	1480	722	1080	477	716
	25	1390	2090	1240	1860	1080	1630	914	1370	672	1010	445	668
	30	1230	1850	1100	1650	962	1450	815	1230	616	926	409	614
	35	1070	1600	956	1440	838	1260	712	1070	555	834	370	556
	40	905	1360	813	1220	715	1070	609	916	492	740	330	495
	45	750	1130	676	1020	597	897	510	767	421	632	289	435
	50	610	916	551	828	488	733	418	629	346	520	249	375
	55	504	757	455	684	403	606	346	520	286	430	215	323
	60	423	636	383	575	339	509	291	437	240	361	186	280
	65	361	542	326	490	289	434	248	372	205	308	159	238
	70	311	467	281	423	249	374	213	321	176	265	137	206
	75	271	407	245	368	217	326	186	279	154	231	119	179
	80	238	358	215	324	191	286	163	246	135	203	105	157
	81	232	349	210	316	186	279	159	240	132	198	102	154
	82			205	308	181	273	156	234	129	193	99.7	150
83					177	266	152	228	126	189	97.3	146	
84							148	223	123	184	95.0	143	
85											92.7	139	
Properties													
A_g , in. ²	61.3		54.3		47.1		39.6		32.1		24.3		
I_x , in. ⁴	4340		3910		3440		2940		2420		1860		
I_y , in. ⁴	1460		1320		1170		1000		829		642		
r_y , in.	4.88		4.93		4.98		5.03		5.08		5.14		
r_x/r_y	1.73		1.72		1.72		1.71		1.71		1.70		
ASD	LRFD		^[c] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly. Note: Heavy line indicates L_c/r_y equal to or greater than 200.										
$\Omega_c = 1.67$	$\phi_c = 0.90$												



Table 4-3 (continued)
Available Strength in Axial Compression, kips
Rectangular HSS

$F_y = 50$ ksi

HSS24-HSS22

Shape		HSS24×12×		HSS22×18×					
		5/16 ^[c]		1.0		7/8		3/4	
t_{design} , in.		0.291		0.930		0.814		0.698	
lb/ft		74.38		249.85		221.06		191.58	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	401	602	2060	3090	1820	2740	1570	2370
	6	397	597	2040	3070	1810	2720	1560	2350
	7	396	595	2040	3060	1800	2710	1560	2340
	8	394	593	2030	3050	1800	2700	1550	2340
	9	393	590	2020	3040	1790	2690	1550	2330
	10	391	588	2010	3030	1780	2680	1540	2320
	15	379	570	1960	2950	1740	2610	1500	2260
	20	363	545	1890	2840	1680	2520	1450	2180
	25	343	515	1810	2710	1600	2410	1390	2090
	30	315	474	1700	2560	1510	2270	1310	1970
	35	286	429	1590	2390	1410	2130	1230	1850
	40	255	383	1470	2210	1310	1970	1140	1710
	45	224	336	1350	2030	1200	1800	1040	1570
	50	193	290	1220	1830	1090	1630	949	1430
	55	167	251	1090	1640	976	1470	853	1280
	60	146	219	970	1460	867	1300	760	1140
	65	129	193	851	1280	763	1150	669	1010
	70	114	172	738	1110	662	995	582	875
	75	101	151	643	966	577	867	507	763
	80	88.6	133	565	849	507	762	446	670
86	76.7	115	489	735	439	659	386	580	
90			446	671	401	602	352	530	
95			401	602	359	540	316	475	
100			361	543	324	488	285	429	
Properties									
A_g , in. ²		20.4		68.7		60.8		52.6	
I_x , in. ⁴		1570		4720		4240		3720	
I_y , in. ⁴		543		3460		3110		2730	
r_{y_s} , in.		5.16		7.10		7.15		7.21	
r_x/r_y		1.70		1.17		1.17		1.17	
ASD	LRFD	[c] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly. Note: Heavy line indicates L_c/r_y equal to or greater than 200.							
$\Omega_c = 1.67$	$\phi_c = 0.90$								

$F_y = 50$ ksi

Table 4-3 (continued)
Available Strength in
Axial Compression, kips
Rectangular HSS



HSS22-HSS20

Shape		HSS22×18×						HSS20×16×	
		5/8 ^[c]		1/2 ^[c]		3/8 ^[c]		1.0	
t _{design} , in.		0.581		0.465		0.349		0.930	
lb/ft		161.40		130.52		98.94		222.63	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	1310	1970	957	1440	580	872	1840	2760
	6	1300	1960	953	1430	578	869	1820	2730
	7	1300	1950	951	1430	577	867	1810	2720
	8	1300	1950	949	1430	576	866	1800	2710
	9	1290	1940	947	1420	575	864	1800	2700
	10	1290	1940	945	1420	573	862	1790	2690
	15	1260	1900	929	1400	565	849	1730	2600
	20	1220	1840	908	1360	553	831	1650	2480
	25	1170	1760	880	1320	538	809	1550	2330
	30	1110	1670	842	1270	521	782	1440	2170
	35	1040	1560	799	1200	500	752	1320	1990
	40	963	1450	752	1130	478	718	1200	1800
	45	885	1330	701	1050	453	681	1070	1610
	50	805	1210	649	975	427	642	942	1420
	55	725	1090	591	888	399	600	818	1230
	60	646	971	527	793	371	557	701	1050
	65	570	857	466	701	337	507	597	898
	70	497	748	408	612	303	455	515	774
	75	433	651	355	534	270	406	449	674
	80	381	572	312	469	240	361	394	593
85	337	507	276	415	213	320	349	525	
90	301	452	247	371	190	285	312	468	
95	270	406	221	333	170	256	280	420	
100	244	366	200	300	154	231	252	379	
Properties									
A_g , in. ²		44.3		35.8		27.1		61.3	
I_x , in. ⁴		3170		2600		2000		3420	
I_y , in. ⁴		2330		1910		1470		2420	
r_y , in.		7.26		7.31		7.37		6.28	
r_x/r_y		1.17		1.17		1.16		1.19	
ASD	LRFD	[c] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly.							
$\Omega_c = 1.67$	$\phi_c = 0.90$								



HSS20

Table 4-3 (continued)
Available Strength in
Axial Compression, kips
Rectangular HSS

$F_y = 50$ ksi

Shape		HSS20×16×									
		7/8		3/4		5/8		1/2 ^[e]		3/8 ^[e]	
t _{design} , in.		0.814		0.698		0.581		0.465		0.349	
lb/ft		197.24		171.16		144.39		116.91		88.73	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	1630	2440	1410	2120	1190	1780	905	1360	566	851
	6	1610	2420	1400	2100	1170	1770	899	1350	563	846
	7	1610	2410	1390	2090	1170	1760	896	1350	562	844
	8	1600	2400	1390	2080	1170	1750	894	1340	560	842
	9	1590	2390	1380	2080	1160	1750	891	1340	559	840
	10	1580	2380	1370	2070	1160	1740	887	1330	557	838
	15	1530	2300	1330	2000	1120	1680	865	1300	547	821
	20	1460	2200	1270	1910	1070	1610	834	1250	532	799
	25	1380	2070	1200	1800	1010	1520	796	1200	513	771
	30	1280	1930	1120	1680	943	1420	753	1130	491	738
	35	1180	1770	1030	1550	869	1310	704	1060	466	701
	40	1070	1610	933	1400	790	1190	645	970	439	660
	45	957	1440	837	1260	709	1070	580	872	408	614
	50	845	1270	740	1110	629	945	515	775	371	558
	55	736	1110	646	972	550	827	452	680	334	502
	60	633	951	557	838	475	714	392	589	297	446
	65	539	810	475	714	406	610	335	504	258	387
	70	465	699	410	616	350	526	289	434	222	334
	75	405	609	357	536	305	458	252	378	193	291
	80	356	535	314	471	268	403	221	332	170	256
85	315	474	278	418	237	357	196	294	151	226	
90	281	423	248	372	212	318	175	263	134	202	
95	252	379	222	334	190	285	157	236	121	181	
100	228	342	201	302	171	258	142	213	109	164	
Properties											
A_g , in. ²	54.3		47.1		39.6		32.1		24.3		
I_x , in. ⁴	3070		2710		2320		1900		1470		
I_y , in. ⁴	2180		1920		1640		1350		1040		
r_y , in.	6.34		6.39		6.44		6.50		6.55		
r_x/r_y	1.19		1.19		1.19		1.18		1.18		
ASD	LRFD	[e] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly.									
$\Omega_c = 1.67$	$\phi_c = 0.90$										

$F_y = 50$ ksi

Table 4-3 (continued)
Available Strength in
Axial Compression, kips
Rectangular HSS



HSS20

Shape		HSS20×12×						HSS20×8×			
		1.0		7/8		3/4		1.0		7/8	
t_{design} , in.		0.930		0.814		0.698		0.930		0.814	
lb/ft		195.40		173.43		150.75		168.18		149.61	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	1610	2420	1430	2150	1240	1870	1390	2090	1230	1850
	6	1580	2380	1410	2110	1220	1840	1340	2010	1190	1790
	7	1570	2370	1400	2100	1220	1830	1320	1980	1170	1770
	8	1560	2350	1390	2090	1210	1820	1300	1950	1160	1740
	9	1550	2330	1380	2070	1200	1800	1280	1920	1140	1710
	10	1540	2310	1370	2050	1190	1790	1250	1880	1120	1680
	15	1450	2180	1290	1940	1120	1690	1100	1650	984	1480
	20	1340	2010	1190	1790	1040	1560	918	1380	826	1240
	25	1210	1820	1080	1620	943	1420	728	1090	659	991
	30	1060	1600	951	1430	835	1250	547	823	500	752
	35	916	1380	822	1230	723	1090	402	605	369	554
	40	771	1160	694	1040	612	921	308	463	282	424
	45	634	952	573	861	508	763	243	366	223	335
	50	513	771	465	698	413	620	197	296	181	271
	53	457	687	414	621	367	552	175	264	161	242
	54	440	661	398	599	354	532			155	233
	60	356	536	323	485	287	431				
	65	304	456	275	413	244	367				
	70	262	394	237	356	211	316				
	75	228	343	206	310	183	276				
79	206	309	186	280	165	248					
80			181	273	161	242					
81					157	236					
Properties											
A_g , in. ²	53.8		47.7		41.5		46.4		41.2		
I_x , in. ⁴	2740		2480		2190		2060		1880		
I_y , in. ⁴	1230		1110		988		472		432		
r_y , in.	4.78		4.83		4.88		3.19		3.24		
r_x/r_y	1.49		1.49		1.49		2.09		2.08		
ASD	LRFD		Note: Heavy line indicates L_c/r_y equal to or greater than 200.								
$\Omega_c = 1.67$	$\phi_c = 0.90$										



HSS20

Table 4-3 (continued)
Available Strength in
Axial Compression, kips
Rectangular HSS

$F_y = 50$ ksi

Shape		HSS20×8×									
		3/4		5/8		1/2 [e]		3/8 [e]		5/16 [e]	
t _{design} , in.		0.698		0.581		0.465		0.349		0.291	
lb/ft		130.33		110.36		89.68		68.31		57.36	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	1070	1620	907	1360	681	1020	445	669	339	510
	6	1040	1560	877	1320	664	998	434	653	331	498
	7	1020	1540	866	1300	658	989	431	647	329	494
	8	1010	1520	854	1280	651	979	426	641	325	489
	9	993	1490	840	1260	643	967	422	634	322	484
	10	975	1470	825	1240	635	954	416	626	318	478
	15	864	1300	734	1100	581	874	383	576	293	440
	18	784	1180	668	1000	542	814	358	539	274	413
	21	700	1050	598	899	492	739	331	498	254	382
	24	614	923	527	792	435	653	303	455	233	350
	27	529	795	456	685	378	568	273	410	210	316
	30	448	673	388	583	323	485	243	365	188	283
	33	372	560	324	487	271	407	212	319	166	249
	36	313	470	272	409	228	342	178	268	145	218
	39	267	401	232	349	194	292	152	228	128	193
	42	230	346	200	301	167	251	131	197	112	168
	45	200	301	174	262	146	219	114	171	97.4	146
	48	176	265	153	230	128	192	100	151	85.6	129
	51	156	234	136	204	113	171	88.8	133	75.9	114
54	139	209	121	182	101	152	79.2	119	67.7	102	
55			117	175	97.6	147	76.4	115	65.2	98.0	
56					94.1	141	73.7	111	62.9	94.6	
57							71.1	107	60.7	91.3	
Properties											
A_g , in. ²	35.9		30.3		24.6		18.7		15.7		
I_x , in. ⁴	1670		1440		1190		926		786		
I_y , in. ⁴	388		338		283		222		189		
r_y , in.	3.29		3.34		3.39		3.44		3.47		
r_x/r_y	2.07		2.06		2.05		2.04		2.04		
ASD	LRFD	[e] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly. Note: Heavy line indicates L_c/r_y equal to or greater than 200.									
$\Omega_c = 1.67$	$\phi_c = 0.90$										

$F_y = 50$ ksi

Table 4-3 (continued)
Available Strength in
Axial Compression, kips
Rectangular HSS



HSS20

Shape		HSS20×4×								
		1/2		3/8 ^[c]		5/16 ^[c]		1/4 ^[c]		
t _{design} , in.		0.465		0.349		0.291		0.233		
lb/ft		76.07		58.10		48.86		39.43		
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	570	857	364	547	271	407	188	283	
	6	517	778	333	501	248	373	173	261	
	7	499	751	323	486	241	362	168	253	
	8	479	721	311	468	233	349	163	245	
	9	458	688	299	449	223	336	157	235	
	10	431	648	285	428	213	321	150	225	
	15	270	406	208	312	158	238	113	169	
	16	241	361	192	288	147	221	105	158	
	17	213	320	173	260	135	203	97.2	146	
	18	190	286	154	232	124	187	89.8	135	
	19	171	256	138	208	115	173	83.2	125	
	20	154	231	125	188	107	160	77.4	116	
	21	140	210	113	170	97.1	146	72.3	109	
	22	127	191	103	155	88.5	133	67.6	102	
	23	116	175	94.5	142	81.0	122	63.4	95.3	
	24	107	161	86.8	130	74.4	112	59.6	89.6	
	25	98.5	148	80.0	120	68.5	103	56.2	84.4	
	26	91.1	137	73.9	111	63.4	95.2	52.8	79.4	
	27	84.5	127	68.6	103	58.8	88.3	49.0	73.6	
	28	78.5	118	63.8	95.8	54.6	82.1	45.6	68.5	
	29					50.9	76.6	42.5	63.8	
	Properties									
	A_g , in. ²	20.9		16.0		13.4		10.8		
	I_x , in. ⁴	838		657		560		458		
	I_y , in. ⁴	58.7		47.6		41.2		34.3		
	r_y , in.	1.68		1.73		1.75		1.78		
	r_x/r_y	3.77		3.71		3.69		3.65		
	ASD	LRFD	^[c] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly. Note: Heavy line indicates L_c/r_y equal to or greater than 200.							
	$\Omega_c = 1.67$	$\phi_c = 0.90$								



HSS18

Table 4-3 (continued)
**Available Strength in
 Axial Compression, kips**
Rectangular HSS

 $F_y = 50$ ksi

Shape		HSS18×6×									
		5/8		1/2 ^[c]		3/8 ^[c]		5/16 ^[c]		1/4 ^[c]	
t_{design} , in.		0.581		0.465		0.349		0.291		0.233	
lb/ft		93.34		76.07		58.10		48.86		39.43	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	769	1160	609	915	399	600	301	453	214	322
	6	723	1090	582	875	383	575	289	435	206	309
	7	708	1060	572	860	377	566	285	428	203	305
	8	690	1040	562	844	370	556	280	421	199	300
	9	670	1010	548	823	363	546	275	413	196	294
	10	648	975	531	798	355	533	269	404	192	288
	12	601	904	494	742	337	507	256	385	182	274
	14	550	827	453	681	317	477	241	363	172	259
	16	496	746	411	617	295	444	225	339	161	242
	18	442	664	367	552	272	409	209	313	149	224
	20	388	583	324	487	249	374	191	287	137	206
	22	336	505	282	424	223	335	174	261	125	188
	24	286	431	242	364	193	289	156	234	113	169
	26	244	367	207	310	164	247	139	208	101	151
	28	210	316	178	268	142	213	122	183	90.1	135
	30	183	276	155	233	124	186	106	159	81.3	122
	32	161	242	136	205	109	163	93.0	140	73.7	111
	34	143	215	121	182	96.2	145	82.4	124	67.2	101
	36	127	191	108	162	85.8	129	73.5	110	60.2	90.4
	38	114	172	96.7	145	77.0	116	66.0	99.2	54.0	81.2
41	98.1	148	83.1	125	66.1	99.4	56.7	85.2	46.4	69.7	
42			79.2	119	63.0	94.7	54.0	81.2	44.2	66.4	
43					60.1	90.4	51.5	77.5	42.2	63.4	
Properties											
A_g , in. ²	25.7		20.9		16.0		13.4		10.8		
I_x , in. ⁴	923		770		602		513		419		
I_y , in. ⁴	158		134		106		91.3		75.1		
r_y , in.	2.48		2.53		2.58		2.61		2.63		
r_x/r_y	2.42		2.40		2.38		2.37		2.37		
ASD	LRFD	[c] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly. Note: Heavy line indicates L_c/r_y equal to or greater than 200.									
$\Omega_c = 1.67$	$\phi_c = 0.90$										

$F_y = 50$ ksi

Table 4-3 (continued)
Available Strength in
Axial Compression, kips
Rectangular HSS



HSS16

Shape		HSS16×12×						HSS16×8×			
		1.0		7/8		3/4		7/8		3/4	
t_{design} , in.		0.930		0.814		0.698		0.814		0.698	
lb/ft		168.18		149.61		130.33		125.79		109.91	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	1390	2090	1230	1850	1070	1620	1040	1560	907	1360
	6	1360	2050	1210	1820	1060	1590	1000	1500	875	1310
	7	1360	2040	1210	1810	1050	1580	987	1480	863	1300
	8	1350	2020	1200	1800	1040	1570	972	1460	850	1280
	9	1340	2010	1190	1780	1030	1560	954	1430	836	1260
	10	1320	1990	1180	1770	1030	1540	936	1410	820	1230
	15	1240	1870	1110	1670	968	1450	821	1230	722	1080
	20	1140	1720	1020	1530	892	1340	683	1030	604	908
	25	1020	1540	916	1380	803	1210	540	811	481	723
	30	895	1340	803	1210	706	1060	404	608	364	547
	35	763	1150	688	1030	607	912	297	447	268	402
	40	635	955	575	865	509	766	227	342	205	308
	45	515	774	469	705	418	628	180	270	162	243
	50	417	627	380	571	338	508	146	219	131	197
	52	386	580	351	528	313	470	135	202	121	182
	53	371	558	338	508	301	452			117	175
	60	290	435	264	397	235	353				
	65	247	371	225	338	200	301				
	70	213	320	194	291	173	259				
77	176	264	160	241	143	214					
78			156	235	139	209					
79					135	204					
Properties											
A_g , in. ²	46.4		41.2		35.9		34.7		30.3		
I_x , in. ⁴	1570		1430		1270		1050		939		
I_y , in. ⁴	1000		910		810		348		314		
r_y , in.	4.64		4.70		4.75		3.17		3.22		
r_x/r_y	1.25		1.25		1.25		1.74		1.73		
ASD	LRFD	Note: Heavy line indicates L_c/r_y equal to or greater than 200.									
$\Omega_c = 1.67$	$\phi_c = 0.90$										



HSS22

Table 4-4
Available Strength in
Axial Compression, kips
Square HSS

$F_y = 50$ ksi

Shape		HSS22×22×									
		1.0		7/8		3/4		5/8 ^[c]		1/2 ^[c]	
t _{design} , in.		0.930		0.814		0.698		0.581		0.465	
lb/ft		277.07		244.88		212.00		178.41		144.13	
Design		P _n /Ω _c	φ _c P _n	P _n /Ω _c	φ _c P _n	P _n /Ω _c	φ _c P _n	P _n /Ω _c	φ _c P _n	P _n /Ω _c	φ _c P _n
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L _c (ft), with respect to least radius of gyration, r _y	0	2280	3430	2010	3030	1740	2620	1430	2150	987	1480
	6	2270	3410	2000	3010	1730	2610	1430	2150	984	1480
	7	2270	3400	2000	3010	1730	2600	1430	2140	983	1480
	8	2260	3400	2000	3000	1730	2600	1420	2140	982	1480
	9	2250	3390	1990	2990	1720	2590	1420	2140	980	1470
	10	2250	3380	1990	2990	1720	2580	1420	2130	978	1470
	15	2210	3320	1950	2930	1690	2540	1400	2110	968	1450
	20	2150	3240	1900	2860	1650	2480	1380	2070	953	1430
	25	2080	3130	1840	2770	1600	2400	1340	2020	934	1400
	30	2000	3010	1770	2660	1540	2310	1290	1940	911	1370
	35	1910	2870	1690	2540	1470	2200	1230	1860	885	1330
	40	1810	2720	1600	2410	1390	2090	1170	1760	855	1290
	45	1700	2560	1510	2270	1310	1970	1100	1660	822	1240
	50	1590	2390	1410	2120	1230	1840	1030	1550	787	1180
	55	1470	2220	1310	1970	1140	1710	961	1440	749	1130
	60	1360	2040	1210	1810	1050	1580	887	1330	710	1070
	65	1240	1860	1100	1660	962	1450	813	1220	662	996
	70	1120	1690	1000	1510	874	1310	741	1110	604	907
	75	1010	1520	903	1360	790	1190	669	1010	547	822
	80	906	1360	808	1220	708	1060	601	903	491	739
85	803	1210	717	1080	629	946	535	804	438	658	
90	716	1080	640	962	561	843	477	717	391	587	
95	643	966	574	863	504	757	428	643	351	527	
100	580	872	518	779	455	683	386	581	316	476	
Properties											
A _g , in. ²		76.2		67.3		58.2		48.9		39.5	
I _x = I _y , in. ⁴		5550		4970		4350		3710		3030	
r _x = r _y , in.		8.54		8.59		8.65		8.70		8.76	
ASD	LRFD	[c] Shape is slender for compression with F _y = 50 ksi; tabulated values have been adjusted accordingly.									
Ω _c = 1.67	φ _c = 0.90										

$F_y = 50$ ksi

Table 4-4 (continued)
Available Strength in
Axial Compression, kips
Square HSS



HSS20

Shape		HSS20×20×											
		1.0		7/8		3/4		5/8		1/2 ^[c]		3/8 ^[c]	
t_{design} , in.		0.930		0.814		0.698		0.581		0.465		0.349	
lb/ft		249.85		221.06		191.58		161.40		130.52		98.94	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	2060	3090	1820	2740	1570	2370	1330	1990	961	1440	582	874
	6	2040	3070	1810	2720	1570	2350	1320	1980	957	1440	580	871
	7	2040	3060	1800	2710	1560	2350	1320	1980	955	1440	579	870
	8	2030	3060	1800	2710	1560	2340	1310	1970	954	1430	578	869
	9	2030	3050	1790	2700	1550	2330	1310	1970	952	1430	577	867
	10	2020	3040	1790	2690	1550	2330	1300	1960	950	1430	576	865
	15	1980	2970	1750	2630	1520	2280	1280	1920	937	1410	569	854
	20	1920	2880	1700	2550	1470	2210	1240	1860	919	1380	558	839
	25	1840	2770	1630	2450	1410	2130	1190	1790	896	1350	546	820
	30	1750	2640	1560	2340	1350	2030	1140	1710	869	1310	531	797
	35	1660	2490	1470	2210	1280	1920	1080	1620	837	1260	513	771
	40	1550	2330	1380	2070	1200	1800	1010	1520	802	1210	494	742
	45	1440	2160	1280	1920	1110	1670	941	1410	763	1150	472	710
	50	1320	1990	1180	1770	1030	1540	868	1300	707	1060	449	675
	55	1210	1810	1070	1610	938	1410	794	1190	648	973	425	638
	60	1090	1640	972	1460	850	1280	720	1080	588	884	399	600
	65	975	1470	871	1310	764	1150	648	974	530	797	373	560
	70	865	1300	775	1160	680	1020	578	869	474	712	346	520
	75	760	1140	681	1020	600	902	510	767	420	631	319	479
	80	668	1000	599	900	527	793	449	674	369	555	283	425
85	592	889	530	797	467	702	397	597	327	491	251	377	
90	528	793	473	711	417	626	354	533	292	438	224	336	
95	474	712	425	638	374	562	318	478	262	393	201	301	
100	427	642	383	576	337	507	287	432	236	355	181	272	
Properties													
A_g , in. ²		68.7		60.8		52.6		44.3		35.8		27.1	
$I_x = I_y$, in. ⁴		4100		3670		3230		2750		2260		1740	
$r_x = r_y$, in.		7.72		7.77		7.84		7.88		7.95		8.00	
ASD		LRFD		^[c] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly.									
$\Omega_c = 1.67$		$\phi_c = 0.90$											



HSS18

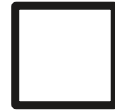
Table 4-4 (continued)
Available Strength in
Axial Compression, kips
Square HSS

$F_y = 50$ ksi

Shape		HSS18x18x											
		1.0		7/8		3/4		5/8		1/2 ^[c]		3/8 ^[c]	
t_{design} , in.		0.930		0.814		0.698		0.581		0.465		0.349	
lb/ft		222.63		197.24		171.16		144.39		116.91		88.73	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	1840	2760	1630	2440	1410	2120	1190	1780	927	1390	567	853
	6	1820	2740	1610	2420	1400	2100	1180	1770	923	1390	565	849
	7	1820	2730	1610	2420	1400	2100	1170	1760	921	1380	564	848
	8	1810	2720	1600	2410	1390	2090	1170	1760	919	1380	563	846
	9	1800	2710	1600	2400	1390	2080	1170	1750	917	1380	562	844
	10	1800	2700	1590	2390	1380	2070	1160	1740	914	1370	560	842
	15	1750	2620	1550	2330	1340	2020	1130	1700	898	1350	551	828
	20	1680	2520	1490	2240	1290	1950	1090	1640	876	1320	539	810
	25	1600	2400	1420	2130	1230	1850	1040	1560	844	1270	523	786
	30	1500	2260	1340	2010	1160	1750	981	1470	798	1200	505	759
	35	1400	2100	1250	1870	1090	1630	916	1380	746	1120	483	727
	40	1290	1940	1150	1730	1000	1510	846	1270	690	1040	460	691
	45	1170	1760	1050	1570	915	1380	774	1160	632	950	434	653
	50	1060	1590	944	1420	827	1240	700	1050	573	861	407	612
	55	940	1410	842	1270	739	1110	627	942	514	772	378	569
	60	828	1240	743	1120	653	982	555	835	456	685	349	524
	65	721	1080	649	975	572	859	487	732	401	602	307	461
	70	622	934	560	842	494	743	422	634	348	522	267	401
	75	542	814	488	734	431	647	367	552	303	455	232	349
	80	476	715	429	645	379	569	323	485	266	400	204	307
85	422	634	380	571	335	504	286	430	236	354	181	272	
90	376	565	339	509	299	450	255	383	210	316	161	243	
95	338	507	304	457	268	403	229	344	189	284	145	218	
100	305	458	275	413	242	364	207	311	170	256	131	197	
Properties													
A_g , in. ²		61.3		54.3		47.1		39.6		32.1		24.3	
$I_x = I_y$, in. ⁴		2920		2630		2320		1980		1630		1250	
$r_x = r_y$, in.		6.90		6.96		7.02		7.07		7.13		7.18	
ASD	LRFD	^[c] Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly.											
$\Omega_c = 1.67$	$\phi_c = 0.90$												

$F_y = 50$ ksi

Table 4-4 (continued)
Available Strength in
Axial Compression, kips
Square HSS



HSS16-HSS14

Shape		HSS16×16×						HSS14×14×	
		1.0		7/8		3/4		1.0	
t_{design} , in.		0.930		0.814		0.698		0.930	
lb/ft		195.40		173.43		150.75		168.18	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	1610	2420	1430	2150	1240	1870	1390	2090
	6	1590	2400	1410	2130	1230	1850	1370	2060
	7	1590	2390	1410	2120	1230	1840	1360	2050
	8	1580	2380	1400	2110	1220	1830	1360	2040
	9	1570	2370	1400	2100	1220	1830	1350	2020
	10	1570	2350	1390	2090	1210	1820	1340	2010
	15	1510	2270	1340	2020	1170	1760	1280	1920
	20	1440	2160	1280	1920	1110	1670	1190	1790
	25	1350	2030	1200	1800	1050	1570	1100	1650
	30	1250	1880	1110	1670	970	1460	988	1480
	35	1140	1710	1010	1520	887	1330	873	1310
	40	1020	1540	913	1370	800	1200	757	1140
	45	907	1360	811	1220	712	1070	645	969
	50	792	1190	710	1070	625	940	538	809
	55	682	1030	614	922	541	813	445	668
	60	579	870	521	784	461	693	374	562
	65	493	741	444	668	393	590	318	479
	70	425	639	383	576	339	509	275	413
	75	370	557	334	502	295	443	239	359
	80	325	489	293	441	259	390	210	316
85	288	433	260	390	230	345	186	280	
88	269	404	242	364	214	322	174	261	
95	231	347	208	313	184	276			
100	208	313	188	282	166	249			
Properties									
A_g , in. ²		53.8		47.7		41.5		46.4	
$I_x = I_y$, in. ⁴		1990		1800		1590		1290	
$r_x = r_y$, in.		6.09		6.14		6.19		5.27	
ASD	LRFD	Note: Heavy line indicates L_c/r_y equal to or greater than 200.							
$\Omega_c = 1.67$	$\phi_c = 0.90$								



HSS14-HSS10

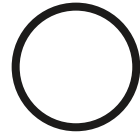
Table 4-4 (continued)
Available Strength in
Axial Compression, kips
Square HSS

$F_y = 50$ ksi

Shape		HSS14×14×				HSS12×12×		HSS10×10×	
		7/8		3/4		3/4		3/4	
t_{design} , in.		0.814		0.698		0.698		0.698	
lb/ft		149.61		130.33		109.91		89.50	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r_y	0	1230	1850	1070	1620	907	1360	740	1110
	6	1220	1830	1060	1590	891	1340	720	1080
	7	1210	1820	1060	1590	885	1330	713	1070
	8	1200	1810	1050	1580	878	1320	705	1060
	9	1200	1800	1040	1570	871	1310	696	1050
	10	1190	1790	1040	1560	862	1300	686	1030
	15	1130	1710	990	1490	810	1220	625	939
	20	1060	1600	929	1400	741	1110	548	824
	25	978	1470	856	1290	661	994	463	696
	30	884	1330	775	1160	575	864	377	567
	35	783	1180	688	1030	488	733	296	444
	40	682	1020	601	903	404	606	227	341
	45	582	875	515	773	325	488	179	269
	50	488	734	433	651	263	395	145	218
	55	404	607	359	539	217	327	120	180
	60	339	510	301	453	183	275	101	151
	62	318	478	282	424	171	257	94.3	142
	65	289	435	257	386	156	234		
	70	249	375	221	333	134	202		
	75	217	326	193	290	117	176		
76	212	318	188	282	114	171			
80	191	287	169	255					
85	169	254	150	226					
89	154	232	137	206					
Properties									
A_g , in. ²		41.2		35.9		30.3		24.7	
$I_x = I_y$, in. ⁴		1170		1040		631		347	
$r_x = r_y$, in.		5.33		5.38		4.56		3.75	
ASD	LRFD	Note: Heavy line indicates L_c/r_y equal to or greater than 200.							
$\Omega_c = 1.67$	$\phi_c = 0.90$								

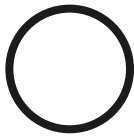
$F_y = 50$ ksi

Table 4-5
Available Strength in
Axial Compression, kips
Round HSS



HSS28.000

Shape		HSS28.000 \times											
		1.000		0.875		0.750		0.625		0.500		0.375 ^(c)	
t_{design} , in.		0.930		0.814		0.698		0.581		0.465		0.349	
lb/ft		288.63		253.72		218.48		182.90		146.99		110.74	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_e (ft), with respect to least radius of gyration, r	0	2370	3560	2080	3130	1790	2690	1500	2250	1200	1810	854	1280
	6	2360	3540	2070	3110	1780	2680	1490	2250	1200	1800	850	1280
	7	2350	3540	2070	3110	1780	2680	1490	2240	1200	1800	849	1280
	8	2350	3530	2070	3100	1780	2670	1490	2240	1200	1800	848	1270
	9	2350	3530	2060	3100	1770	2670	1490	2230	1190	1790	846	1270
	10	2340	3520	2060	3090	1770	2660	1480	2230	1190	1790	844	1270
	15	2310	3470	2030	3050	1750	2620	1460	2200	1170	1760	833	1250
	20	2260	3400	1990	2990	1710	2570	1430	2160	1150	1730	817	1230
	25	2200	3310	1940	2910	1670	2510	1400	2100	1120	1690	797	1200
	30	2140	3210	1880	2820	1620	2430	1360	2040	1090	1640	773	1160
	35	2060	3090	1810	2720	1560	2340	1310	1970	1050	1580	746	1120
	40	1970	2960	1730	2610	1490	2250	1250	1880	1010	1510	716	1080
	45	1880	2820	1650	2480	1420	2140	1200	1800	961	1440	683	1030
	50	1780	2670	1570	2350	1350	2030	1130	1700	912	1370	648	975
	55	1670	2520	1470	2220	1270	1910	1070	1610	860	1290	612	920
	60	1570	2360	1380	2080	1190	1790	1000	1510	807	1210	574	863
	65	1460	2190	1290	1930	1110	1670	935	1410	753	1130	536	806
	70	1350	2030	1190	1790	1030	1550	867	1300	699	1050	498	748
75	1240	1870	1100	1650	949	1430	799	1200	645	969	460	691	
80	1140	1710	1000	1510	870	1310	733	1100	592	889	422	634	
85	1030	1550	915	1370	792	1190	668	1000	540	811	385	579	
90	935	1410	828	1240	718	1080	606	911	490	736	350	526	
95	840	1260	744	1120	645	970	545	819	441	663	315	474	
100	758	1140	671	1010	582	875	492	740	398	598	285	428	
Properties													
A_g , in. ²	79.1		69.5		59.8		50.1		40.2		30.3		
I , in. ⁴	7250		6430		5580		4710		3810		2900		
r , in.	9.58		9.62		9.66		9.70		9.74		9.78		
ASD	LRFD	^(c) Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly.											
$\Omega_c = 1.67$	$\phi_c = 0.90$												



HSS24.000

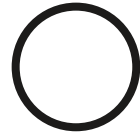
Table 4-5 (continued)
Available Strength in
Axial Compression, kips
Round HSS

$F_y = 50$ ksi

Shape		HSS24.000 ^x											
		1.000		0.875		0.750		0.625		0.500		0.375 ^(c)	
t_{design} , in.		0.930		0.814		0.698		0.581		0.465		0.349	
lb/ft		245.87		216.31		186.41		156.18		125.61		94.71	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r	0	2020	3030	1780	2670	1530	2300	1280	1930	1030	1550	765	1150
	6	2010	3020	1770	2650	1520	2290	1270	1920	1020	1540	761	1140
	7	2000	3010	1760	2650	1520	2280	1270	1910	1020	1540	760	1140
	8	2000	3000	1760	2640	1510	2280	1270	1910	1020	1530	758	1140
	9	1990	2990	1750	2630	1510	2270	1270	1900	1020	1530	756	1140
	10	1990	2990	1750	2630	1510	2260	1260	1900	1010	1520	754	1130
	15	1950	2930	1710	2580	1480	2220	1240	1860	995	1500	740	1110
	20	1890	2850	1670	2510	1440	2160	1210	1810	969	1460	721	1080
	25	1830	2750	1610	2420	1390	2090	1160	1750	937	1410	697	1050
	30	1750	2630	1540	2320	1330	2000	1120	1680	898	1350	668	1000
	35	1660	2500	1470	2200	1270	1900	1060	1600	855	1280	636	957
	40	1570	2360	1380	2080	1190	1790	1000	1510	807	1210	601	904
	45	1470	2200	1290	1940	1120	1680	939	1410	757	1140	564	848
	50	1360	2040	1200	1800	1040	1560	873	1310	704	1060	525	789
	55	1250	1880	1110	1660	957	1440	805	1210	650	977	485	729
	60	1140	1720	1010	1520	875	1320	737	1110	596	895	445	669
	65	1030	1550	916	1380	795	1190	670	1010	542	814	405	609
	70	930	1400	824	1240	716	1080	604	907	489	735	366	550
	75	829	1250	736	1110	640	961	540	812	438	658	328	493
	80	732	1100	650	977	566	850	479	719	388	584	291	438
85	648	974	576	866	501	753	424	637	344	517	258	388	
90	578	869	514	772	447	672	378	568	307	461	230	346	
95	519	780	461	693	401	603	339	510	275	414	207	311	
100	468	704	416	626	362	544	306	460	249	374	186	280	
Properties													
A_g , in. ²	67.4		59.3		51.1		42.8		34.4		25.9		
I , in. ⁴	4490		3990		3470		2930		2380		1810		
r , in.	8.16		8.20		8.24		8.28		8.32		8.36		
ASD	LRFD	^(c) Shape is slender for compression with $F_y = 50$ ksi; tabulated values have been adjusted accordingly.											
$\Omega_c = 1.67$	$\phi_c = 0.90$												

$F_y = 50$ ksi

Table 4-5 (continued)
Available Strength in
Axial Compression, kips
Round HSS



HSS20.000

Shape		HSS20.000 \times											
		1.000		0.875		0.750		0.625		0.500		0.375	
t_{design} , in.		0.930		0.814		0.698		0.581		0.465		0.349	
lb/ft		203.11		178.89		154.34		129.45		104.00		78.67	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_e (ft), with respect to least radius of gyration, r	0	1670	2510	1470	2210	1270	1900	1060	1600	853	1280	644	968
	6	1650	2490	1460	2190	1260	1890	1050	1580	847	1270	639	960
	7	1650	2480	1450	2180	1250	1880	1050	1580	844	1270	637	957
	8	1640	2470	1450	2170	1250	1880	1050	1570	841	1260	635	954
	9	1640	2460	1440	2160	1240	1870	1040	1570	838	1260	632	951
	10	1630	2450	1430	2160	1240	1860	1040	1560	835	1250	630	947
	15	1580	2380	1390	2090	1200	1810	1010	1520	812	1220	613	921
	20	1520	2290	1340	2010	1160	1740	972	1460	781	1170	590	887
	25	1440	2170	1270	1910	1100	1650	925	1390	743	1120	562	844
	30	1350	2040	1190	1800	1030	1550	870	1310	700	1050	529	795
	35	1260	1890	1110	1670	961	1440	809	1220	651	979	493	741
	40	1150	1730	1020	1530	883	1330	744	1120	600	901	454	683
	45	1040	1570	924	1390	802	1210	677	1020	546	821	414	622
	50	936	1410	829	1250	720	1080	609	915	492	739	373	561
	55	829	1250	735	1110	640	962	541	814	438	658	333	500
	60	726	1090	645	969	562	845	476	716	386	580	294	441
	65	627	942	558	839	487	733	414	622	336	505	256	385
	70	541	813	481	723	420	632	357	536	290	436	221	332
	75	471	708	419	630	366	550	311	467	253	380	193	290
	80	414	622	368	554	322	484	273	411	222	334	169	255
85	367	551	326	491	285	428	242	364	197	295	150	226	
90	327	492	291	438	254	382	216	325	175	264	134	201	
95	294	441	261	393	228	343	194	291	157	237	120	181	
100	265	398	236	354	206	310	175	263	142	213	108	163	
Properties													
A_g , in. ²	55.7		49.0		42.3		35.5		28.5		21.5		
I , in. ⁴	2540		2260		1970		1670		1360		1040		
r , in.	6.75		6.79		6.83		6.87		6.91		6.95		
ASD	LRFD												
$\Omega_c = 1.67$	$\phi_c = 0.90$												

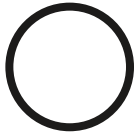


Table 4-5 (continued)
Available Strength in
Axial Compression, kips
Round HSS

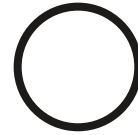
$F_y = 50$ ksi

HSS20.000-
HSS18.000

Shape		HSS20.000×				HSS18.000×							
		0.313		0.250		1.000		0.875		0.750		0.625	
t_{design} , in.		0.291		0.233		0.930		0.814		0.698		0.581	
lb/ft		65.77		52.78		181.73		160.19		138.30		116.09	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r	0	532	799	398	598	1490	2250	1310	1980	1130	1710	952	1430
	6	528	793	395	593	1480	2220	1300	1960	1120	1690	943	1420
	7	526	791	394	592	1470	2210	1300	1950	1120	1680	939	1410
	8	525	788	392	590	1470	2200	1290	1940	1110	1680	935	1410
	9	523	786	391	588	1460	2190	1280	1930	1110	1670	931	1400
	10	521	782	389	585	1450	2180	1280	1920	1100	1660	926	1390
	15	507	761	379	570	1400	2100	1230	1850	1070	1600	894	1340
	20	488	733	365	549	1330	2000	1170	1760	1010	1520	852	1280
	25	465	698	348	523	1250	1870	1100	1650	952	1430	801	1200
	30	438	658	328	493	1150	1730	1020	1530	881	1320	742	1110
	35	408	613	306	459	1050	1580	927	1390	804	1210	678	1020
	40	376	565	282	424	941	1420	833	1250	724	1090	611	918
	45	343	515	257	387	833	1250	738	1110	642	965	543	816
	50	309	465	232	349	726	1090	645	969	562	845	476	715
	55	276	415	207	312	624	938	555	835	485	729	411	618
	60	244	366	183	275	528	793	471	707	412	619	350	526
	65	213	320	160	241	450	676	401	603	351	527	298	448
	70	184	276	138	208	388	583	346	520	302	454	257	386
	75	160	241	121	181	338	508	301	453	263	396	224	337
	80	141	212	106	159	297	446	265	398	232	348	197	296
85	125	187	93.8	141	263	395	234	352	205	308	174	262	
90	111	167	83.7	126	235	353	209	314	183	275	155	234	
95	99.8	150	75.1	113	211	316	188	282	164	247	140	210	
100	90.1	135	67.8	102	190	286	169	255	148	223	126	189	
Properties													
A_g , in. ²	18.0		14.4		49.9		43.9		37.9		31.8		
I , in. ⁴	874		705		1820		1630		1420		1210		
r , in.	6.97		6.99		6.04		6.08		6.12		6.16		
ASD	LRFD												
$\Omega_c = 1.67$	$\phi_c = 0.90$												

$F_y = 50$ ksi

Table 4-5 (continued)
Available Strength in
Axial Compression, kips
Round HSS



HSS18.000–
HSS16.000

Shape		HSS18.000×								HSS16.000×			
		0.500		0.375		0.313		0.250		1.000		0.875	
t_{design} , in.		0.465		0.349		0.291		0.233		0.930		0.814	
lb/ft		93.54		70.66		59.09		47.44		160.35		141.48	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_c (ft), with respect to least radius of gyration, r	0	766	1150	581	873	485	729	370	557	1320	1980	1160	1750
	6	759	1140	575	865	480	722	367	551	1300	1950	1150	1720
	7	756	1140	573	862	479	719	366	549	1290	1940	1140	1720
	8	753	1130	571	858	477	717	364	547	1290	1930	1130	1710
	9	750	1130	568	854	475	713	362	545	1280	1920	1130	1700
	10	746	1120	565	850	472	710	361	542	1270	1910	1120	1680
	15	721	1080	547	821	457	686	349	524	1210	1820	1070	1610
	20	687	1030	521	784	436	655	333	500	1140	1710	1000	1510
	25	646	971	491	737	410	616	313	471	1050	1570	925	1390
	30	599	900	455	684	381	572	291	438	945	1420	837	1260
	35	548	824	417	627	349	525	267	401	838	1260	744	1120
	40	494	743	377	566	316	474	242	363	730	1100	649	976
	45	440	662	336	505	282	423	216	324	624	937	556	836
	50	386	581	295	444	248	372	190	286	523	787	468	703
	55	335	503	256	385	215	323	165	248	433	651	388	582
	60	285	429	219	329	184	277	141	213	364	547	326	489
	65	243	365	187	280	157	236	121	181	310	466	277	417
	70	210	315	161	242	135	203	104	156	267	402	239	360
	75	183	274	140	211	118	177	90.5	136	233	350	208	313
	80	160	241	123	185	104	156	79.6	120	205	308	183	275
85	142	214	109	164	91.7	138	70.5	106	181	272	162	244	
89	130	195	99.5	150	83.7	126	64.3	96.6	165	249	148	222	
95	114	171	87.4	131	73.4	110	56.4	84.8					
100	103	154	78.8	119	66.3	100	50.9	76.5					
Properties													
A_g , in. ²	25.6		19.4		16.2		13.0		44.0		38.8		
I , in. ⁴	985		754		634		512		1250		1120		
r , in.	6.20		6.24		6.26		6.28		5.34		5.38		
ASD	LRFD	Note: Heavy line indicates L_c/r_y equal to or greater than 200.											
$\Omega_c = 1.67$	$\phi_c = 0.90$												

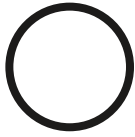


Table 4-5 (continued)
Available Strength in
Axial Compression, kips

$F_y = 50$ ksi

HSS16.000-
HSS12.750

Round HSS

Shape		HSS16.000x		HSS14.000x				HSS12.750x					
		0.750		0.875		0.750		0.875		0.750		0.625	
t_{design} , in.		0.698		0.814		0.698		0.814		0.698		0.581	
lb/ft		122.27		122.77		106.23		111.08		96.21		81.01	
Design		P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$	P_n/Ω_c	$\phi_c P_n$
		ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD
Effective length, L_e (ft), with respect to least radius of gyration, r	0	1000	1510	1010	1520	871	1310	914	1370	790	1190	665	999
	6	990	1490	992	1490	856	1290	895	1340	774	1160	651	979
	7	986	1480	985	1480	851	1280	888	1330	768	1150	646	972
	8	980	1470	978	1470	845	1270	880	1320	762	1140	641	963
	9	974	1460	970	1460	838	1260	871	1310	754	1130	635	954
	10	968	1450	961	1450	831	1250	862	1290	746	1120	628	944
	15	925	1390	905	1360	783	1180	800	1200	694	1040	585	879
	20	869	1310	832	1250	721	1080	722	1090	627	943	530	796
	25	802	1200	746	1120	648	973	633	951	551	828	466	701
	30	726	1090	653	982	568	854	538	809	470	706	399	600
	35	647	972	559	839	487	732	444	668	390	586	332	499
	40	565	850	466	700	408	613	356	535	314	472	268	403
	45	485	730	379	569	333	500	281	423	248	373	213	319
	50	409	615	307	461	270	405	228	343	201	302	172	259
	55	340	510	254	381	223	335	188	283	166	250	142	214
	60	285	429	213	320	187	281	158	238	140	210	120	180
	65	243	365	182	273	159	240	135	203	119	179	102	153
	70	210	315	157	235	138	207	116	175	103	154	87.8	132
	71	204	306	152	229	134	201			100	150	85.4	128
	72	198	298	148	222	130	195					83.0	125
78	169	254	126	190	111	166							
84	146	219											
90	127	191											
Properties													
A_g , in. ²	33.5		33.7		29.1		30.5		26.4		22.2		
I , in. ⁴	984		735		647		546		481		412		
r , in.	5.42		4.67		4.71		4.23		4.27		4.31		
ASD	LRFD	Note: Heavy line indicates L_e/r_y equal to or greater than 200.											
$\Omega_c = 1.67$	$\phi_c = 0.90$												

 **Atlas** *Tube*

