

Comparison Criteria

- CSP shapes will be fabricated from Q345 Grade B steel. This is assumed to have a minimum yield strength (F_y) of 50 ksi, and an elastic modulus (E) of approximately 29,000 ksi.
- It was assumed that Q345 grade B steel will qualify under ASTM standard A6 as A992 structural steel.
- US standard shapes used in the comparison were considered meeting ASTM A992.
- Geometric properties of the various shapes were provided by CSP, and are included in the appendix, for reference.
- Values for the Torsional Constant (J) were not supplied by CSP. Calculated values used for this comparison may differ slightly from Manufacturer's numbers, and are conservative.
- The information provide in this summary is preliminary, and it not intended to be used for any portion of any structural design. It is provided for comparative purposes only.
- Compression comparison is based on the both the cross section area, and least radius of gyration.



Steel Shape Comparison Chart

Type	Profile	HxB (Beam Size in mm)	Similar US Wide Flange Depth (inches)	Weight per Linear Foot (pounds, US)	Flexure Comparison			Deflection Comparison			Compression Comparison		
					Nearest US Shape of Same Depth	Weight per Linear Foot (pounds, US)	% Increase in Weight from US Shape	Nearest US Shape of Same Depth	Weight Per Linear Foot (pounds, US)	% Increase in Weight from US Shape	Nearest US Shape of Same Depth	Weight Per Linear Foot (pounds, US)	% Increase in Weight from US Shape
HW	100x100	100x100	4	11.5	No Shape	#N/A	#N/A	No Shape	#N/A	#N/A	No Shape	#N/A	#N/A
	125x125	125x125	6	16.0	No Shape	#N/A	#N/A	W6x9	9	77.4%	W6X12	12	33.0%
	150x150	150x150	6	21.4	No Shape	#N/A	#N/A	W6x15	15	42.6%	W6X15	15	42.6%
	175x175	175x175	8	27.0	W8x21	21	28.7%	W8x18	18	50.2%	W8X24	24	12.6%
	200x200	200x200	8	33.9	W8x31	31	9.3%	W8x31	31	9.3%	W8X28	28	21.0%
		200x204	8	38.0	W8x31	31	22.7%	W8x31	31	22.7%	W8X28	28	35.8%
	250x250	250x250	10	48.6	W10x45	45	7.9%	W10x45	45	7.9%	W10X45	45	7.9%
		250x255	10	55.1	W10x49	49	12.5%	W10x49	49	12.5%	W10X45	45	22.5%
	300x300	294x302	12	57.0	W12x50	50	14.0%	W12x50	50	14.0%	W12X53	53	7.6%
		300x300	12	63.4	W12x58	58	9.3%	W12x58	58	9.3%	W12X58	58	9.3%
		300x305	12	71.1	W12x65	65	9.4%	W12x58	58	22.6%	W12X58	58	22.6%
	350x350	344x348	14	77.1	W14x68	68	13.4%	W14x68	68	13.4%	W14X74	74	4.2%
		350x350	14	91.9	W14x82	82	12.1%	W14x82	82	12.1%	W14X82	82	12.1%
	400x400	388x402	16	94.6	W16x77	77	22.8%	W16x77	77	22.8%	W16X89	89	6.3%
		394x398	16	98.6	W16x89	89	10.8%	W16x89	89	10.8%	W16X89	89	10.8%
		400x400	16	115.4	W16x100	100	15.4%	W16x100	100	15.4%	W16X100	100	15.4%
		414x405	18	156.3	W18x130	130	20.2%	W18x119	119	31.3%	W18X143	143	9.3%
		400x408	16	132.1	W16x100	100	32.1%	W16x100	100	32.1%	W16X100	100	32.1%
	428x407	18	190.5	W18x158	158	20.6%	W18x143	143	33.2%	W18X175	175	8.9%	

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HM	150x100	148x100	6	14.4	No Shape	#N/A	#N/A	W6x12	12	19.6%	W6X12	12	19.6%
	200x150	194x150	8	20.9	W8x18	18	16.3%	W8x18	18	16.3%	W8X21	21	-0.3%
	250x175	244x175	10	29.6	W10x26	26	13.8%	W10x26	26	13.8%	W10X26	26	13.8%
	300x200	294x200	12	38.4	W12x35	35	9.8%	W12x30	30	28.1%	W12X35	35	9.8%
	350x250	340x250	14	53.5	W14x48	48	11.4%	W14x48	48	11.4%	W14X53	53	0.9%
	400x300	390x300	16	71.8	W16x67	67	7.1%	W16x57	57	25.9%	W16X67	67	7.1%
	450x300	440x300	18	83.2	W18x76	76	9.4%	W18x76	76	9.4%	W18X76	76	9.4%
	500x300	482x300	21	77.1	W21x68	68	13.4%	W21x62	62	24.4%	W21X73	73	5.7%
		488x300	21	86.5	W21x83	83	4.2%	W21x73	73	18.5%	W21X83	83	4.2%
	600x300	582x300	24	91.9	W24x84	84	9.4%	W24x84	84	9.4%	W24X84	84	9.4%
		588x300	24	101.3	W24x94	94	7.7%	W24x94	94	7.7%	W24X94	94	7.7%
		594x302	24	117.4	W24x104	104	12.9%	W24x104	104	12.9%	W24X103	103	14.0%

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HN	175x90	175x90	8	12.2	W8x10	10	22.1%	W6x15	15	-18.6%	No Shape	#N/A	#N/A
	200x100	198x99	8	12.4	W8x10	10	24.1%	W8x10	10	24.1%	W8X10	10	24.1%
		200x100	8	14.6	W8x13	13	12.0%	W8x13	13	12.0%	W8X13	13	12.0%
	250x125	248x124	10	17.3	W10x17	17	1.8%	W10x17	17	1.8%	W10X17	17	1.8%
		250x125	10	19.9	W10x19	19	4.8%	W10x19	19	4.8%	W10X19	19	4.8%
	300x150	298x149	12	21.9	W12x22	22	-0.6%	W12x19	19	15.1%	W12X19	19	15.1%
		300x150	12	25.0	W12x22	22	13.7%	W12x22	22	13.7%	W12X22	22	13.7%
	350x175	346x174	14	28.0	W14x26	26	7.8%	W14x26	26	7.8%	W14X26	26	7.8%
		350x175	14	33.5	W14x30	30	11.8%	W14x30	30	11.8%	W14X30	30	11.8%
	400x150	400x150	16	37.4	W16x31	31	20.7%	W16x31	31	20.7%	W16X31	31	20.7%
	400x200	396x199	16	38.0	W16x36	36	5.6%	W16x36	36	5.6%	W16X36	36	5.6%
		400x200	16	44.3	W16x40	40	10.7%	W16x40	40	10.7%	W16X40	40	10.7%
	450x150	450x150	18	43.9	W18x40	40	9.8%	W18x40	40	9.8%	No Shape	#N/A	#N/A
	450x200	446x199	18	44.7	W18x40	40	11.8%	W18x40	40	11.8%	W18X40	40	11.8%
		450x200	18	51.3	W18x50	50	2.6%	W18x50	50	2.6%	W18X50	50	2.6%
	500x200	496x199	21	53.3	W21x50	50	6.6%	W21x50	50	6.6%	W21X50	50	6.6%
		500x200	21	60.1	W21x57	57	5.4%	W21x50	50	20.2%	W21X50	50	20.2%
		506x201	21	69.1	W21x62	62	11.4%	W21x62	62	11.4%	W21X55	55	25.6%
	600x200	596x199	24	63.8	W24x62	62	2.9%	W24x62	62	2.9%	W24X62	62	2.9%
		600x200	24	71.1	W24x62	62	14.7%	W24x62	62	14.7%	W24X62	62	14.7%
606x201		24	80.5	W24x68	68	18.4%	W24x68	68	18.4%	W24X62	62	29.8%	
700x300	692x300	27	111.3	W27x114	114	-2.3%	W27x114	114	-2.3%	W27X102	102	9.2%	
	700x300	27	124.1	W27x114	114	8.8%	W27x114	114	8.8%	W27X114	114	8.8%	
800x300	729x300	27	128.1	W27x129	129	-0.7%	W27x129	129	-0.7%	W27X114	114	12.4%	
	800x300	30	140.9	W30x148	148	-4.8%	W30x148	148	-4.8%	W30X132	132	6.7%	