

CANADIAN INSTITUTE OF STEEL CONSTRUCTION LIBRARY

# CANADIAN STEEL CONSTRUCTION

A Handbook containing information on structural steel shapes and plates rolled by various Canadian Steel Mills, together with mathematical data and tables to facilitate structural design using these materials.

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Second Edition—November, 1940

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## CANADIAN INSTITUTE OF STEEL CONSTRUCTION

Central Division Office

505 Bloor Building,  
Toronto, Ontario.

Eastern Division Office

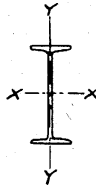
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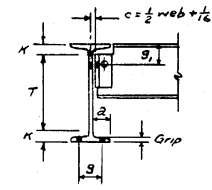
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**BEAMS  
AMERICAN STANDARD  
PROPERTIES FOR DESIGNING**



Nominal Size	Weight per Foot	Area of Section	Depth of Section	Width of Flange	Web Thickness	AXIS X - X			AXIS Y - Y		
						I	S	r	I	S	r
In.	Lb.	In. <sup>2</sup>	In.	In.	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.
15 x 5½	55.0	16.06	15.00	5.738	.648	508.7	67.8	5.63	17.0	5.9	1.03
	50.0	14.59	15.00	5.640	.550	481.1	64.2	5.74	16.0	5.7	1.05
	45.0	13.12	15.00	5.542	.452	453.6	60.5	5.88	15.0	5.4	1.07
	42.9	12.49	15.00	5.500	.410	441.8	58.9	5.95	14.6	5.3	1.08
12 x 5	35.0	10.20	12.00	5.078	.428	227.0	37.8	4.72	10.0	3.9	.99
	31.8	9.26	12.00	5.000	.350	215.8	36.0	4.83	9.5	3.8	1.01
10 x 4¾	40.0	11.69	10.00	5.091	.741	158.0	31.6	3.68	9.4	3.7	.90
	35.0	10.22	10.00	4.944	.594	145.8	29.2	3.78	8.5	3.4	.91
	30.0	8.75	10.00	4.797	.447	133.5	26.7	3.91	7.6	3.2	.93
	25.4	7.38	10.00	4.660	.310	122.1	24.4	4.07	6.9	3.0	.97
8 x 4	25.5	7.43	8.00	4.262	.532	68.1	17.0	3.03	4.7	2.2	.80
	23.0	6.71	8.00	4.171	.441	64.2	16.0	3.09	4.4	2.1	.81
	20.5	5.97	8.00	4.079	.349	60.2	15.1	3.18	4.0	2.0	.82
	18.4	5.34	8.00	4.000	.270	56.9	14.2	3.26	3.8	1.9	.84
7 x 3¾	20.0	5.83	7.00	3.860	.450	41.9	12.0	2.68	3.1	1.6	.74
	17.5	5.09	7.00	3.755	.345	38.9	11.1	2.77	2.9	1.6	.76
	15.3	4.43	7.00	3.660	.250	36.2	10.4	2.86	2.7	1.5	.78
6 x 3¾	17.25	5.02	6.00	3.565	.465	26.0	8.7	2.28	2.3	1.3	.68
	14.75	4.29	6.00	3.443	.343	23.8	7.9	2.36	2.1	1.2	.69
	12.50	3.61	6.00	3.330	.230	21.8	7.3	2.46	1.8	1.1	.72
5 x 3	14.75	4.29	5.00	3.284	.494	15.0	6.0	1.87	1.7	1.0	.63
	12.25	3.56	5.00	3.137	.347	13.5	5.4	1.95	1.4	.91	.63
	10.00	2.87	5.00	3.000	.210	12.1	4.8	2.05	1.2	.82	.65
4 x 2¾	10.50	3.05	4.00	2.870	.400	7.1	3.5	1.52	1.0	.70	.57
	9.50	2.76	4.00	2.796	.326	6.7	3.3	1.56	.91	.65	.58
	8.50	2.46	4.00	2.723	.253	6.3	3.2	1.60	.83	.61	.58
	7.70	2.21	4.00	2.660	.190	6.0	3.0	1.64	.77	.58	.59
3 x 2¾	7.50	2.17	3.00	2.509	.349	2.9	1.9	1.15	.59	.47	.52
	6.50	1.88	3.00	2.411	.251	2.7	1.8	1.19	.51	.43	.52
	5.70	1.64	3.00	2.330	.170	2.5	1.7	1.23	.46	.40	.53



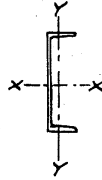
**BEAMS  
AMERICAN STANDARD  
DIMENSIONS FOR DETAILING**



Depth of Section	Weight per Foot	Flange		Web		Distance					Grip	Max. Flange Rivet	Usual Gage	
		Width	Mean Thickness	Thickness	Half Thickness	a	T	k	g <sub>1</sub>	c				
In.	Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
15	55.0	5¾	5/8	11/16	5/16	2½	12½	1¼	2¾	3/8	5/8	¾	3½	
	50.0	5½	5/8	9/16	7/16	2½	12½	1¼	2¾	3/8	5/8	¾	3½	
	45.0	5½	5/8	7/16	1/4	2½	12½	1¼	2¾	3/8	5/8	¾	3½	
	42.9	5½	5/8	7/16	1/4	2½	12½	1¼	2¾	3/8	5/8	¾	3½	
12	35.0	5½	9/16	7/16	1/4	2¾	9¾	1½	2½	5/16	1/2	¾	3	
	31.8	5	9/16	3/8	3/16	2¾	9¾	1½	2½	1/4	1/2	¾	3	
10	40.0	5½	1/2	3/4	3/8	2¾	8	1	2½	7/16	1/2	¾	2¾	
	35.0	5	1/2	3/4	3/8	2¾	8	1	2½	3/8	1/2	¾	2¾	
	30.0	4¾	1/2	3/4	3/8	2¾	8	1	2½	3/8	1/2	¾	2¾	
	25.4	4¾	1/2	3/4	3/8	2¾	8	1	2½	1/4	1/2	¾	2¾	
8	25.5	4¼	7/16	9/16	1/4	1¾	6¼	7/8	2¼	5/16	7/16	¾	2¼	
	23.0	4½	7/16	7/16	1/4	1¾	6¼	7/8	2¼	5/16	7/16	¾	2¼	
	20.5	4½	7/16	3/8	3/8	1¾	6¼	7/8	2¼	1/4	7/16	¾	2¼	
	18.4	4	7/16	3/8	3/8	1¾	6¼	7/8	2¼	1/4	7/16	¾	2¼	
7	20.0	3¾	3/8	7/16	1/4	1¾	5¾	15/16	2	5/16	3/8	5/8	2¼	
	17.5	3¾	3/8	3/8	1/4	1¾	5¾	15/16	2	1/4	3/8	5/8	2¼	
	15.3	3¾	3/8	1/4	3/8	1¾	5¾	15/16	2	5/16	3/8	5/8	2¼	
6	17.25	3½	3/8	1/2	1/4	1½	4½	¾	2	5/16	3/8	5/8	2	
	14.75	3½	3/8	1/2	1/4	1½	4½	¾	2	1/4	3/8	5/8	2	
	12.50	3½	3/8	1/4	3/8	1½	4½	¾	2	5/16	3/8	5/8	2	
5	14.75	3¼	5/16	1/2	1/4	1¾	3¾	11/16	2	5/16	5/16	1/2	1¾	
	12.25	3¾	5/16	3/8	3/8	1¾	3¾	11/16	2	1/4	5/16	1/2	1¾	
	10.00	3	5/16	1/4	3/8	1¾	3¾	11/16	2	5/16	5/16	1/2	1¾	
4	10.50	2¾	5/16	7/16	3/16	1¼	2¾	5/8	2	1/4	5/16	1/2	1½	
	9.50	2¾	3/16	5/16	3/16	1¼	2¾	5/8	2	1/4	5/16	1/2	1½	
	8.50	2¾	3/16	1/4	3/8	1¼	2¾	5/8	2	1/4	5/16	1/2	1½	
	7.70	2¾	3/16	1/4	3/8	1¼	2¾	5/8	2	5/16	5/16	1/2	1½	
3	7.50	2½	1/4	3/8	3/16	1½	1¾	9/16	1½	1/4	1/4	3/8	1½	
	6.50	2¾	1/4	1/4	1/4	1½	1¾	9/16	1½	1/4	1/4	3/8	1½	
	5.70	2¾	1/4	3/16	1/8	1½	1¾	9/16	1½	1/4	1/4	3/8	1½	

# CHANNELS AMERICAN STANDARD

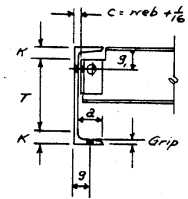
## PROPERTIES FOR DESIGNING



Nominal Size	Weight per Foot	Area of Section	Depth of Section	Width of Flange	Web Thickness	AXIS X - X			AXIS Y - Y				
						I	S	r	I	S	r	x	
In.	Lb.	In. <sup>2</sup>	In.	In.	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.	In.	
<b>15 x 3 1/2</b>	55.0	16.11	15.00	3.814	.814	429.0	57.2	5.16	12.1	4.1	.87	.82	
	50.0	14.64	15.00	3.716	.716	401.4	53.6	5.24	11.2	3.8	.87	.80	
	45.0	13.17	15.00	3.618	.618	373.9	49.8	5.33	10.3	3.6	.88	.79	
	40.0	11.70	15.00	3.520	.520	346.3	46.2	5.44	9.3	3.4	.89	.78	
	35.0	10.23	15.00	3.422	.422	318.7	42.5	5.58	8.4	3.2	.91	.79	
	33.9	9.90	15.00	3.400	.400	312.6	41.7	5.62	8.2	3.2	.91	.79	
<b>12 x 3</b>	40.0	11.73	12.00	3.415	.755	196.5	32.8	4.09	6.6	2.5	.75	.72	
	35.0	10.26	12.00	3.292	.632	178.8	29.8	4.18	5.9	2.3	.76	.69	
	30.0	8.79	12.00	3.170	.510	161.2	26.9	4.28	5.2	2.1	.77	.63	
	25.0	7.32	12.00	3.047	.387	143.5	23.9	4.43	4.5	1.9	.79	.68	
	20.7	6.03	12.00	2.940	.280	128.1	21.4	4.61	3.9	1.7	.81	.70	
	<b>10 x 2 5/8</b>	35.0	10.27	10.00	3.180	.820	115.2	23.0	3.34	4.6	1.9	.67	.69
30.0		8.80	10.00	3.033	.673	103.0	20.6	3.42	4.0	1.7	.67	.65	
25.0		7.33	10.00	2.886	.526	90.7	18.1	3.52	3.4	1.5	.68	.62	
20.0		5.86	10.00	2.739	.379	78.5	15.7	3.66	2.8	1.3	.70	.61	
15.3		4.47	10.00	2.600	.240	66.9	13.4	3.87	2.3	1.2	.72	.64	
<b>9 x 2 1/2</b>		25.0	7.33	9.00	2.812	.612	70.5	15.7	3.10	3.0	1.4	.64	.61
	20.0	5.86	9.00	2.648	.448	60.6	13.5	3.22	2.4	1.2	.65	.59	
	15.0	4.39	9.00	2.485	.285	50.7	11.3	3.40	1.9	1.0	.67	.59	
	13.4	3.89	9.00	2.430	.230	47.3	10.5	3.49	1.8	.97	.67	.61	
	<b>8 x 2 1/4</b>	21.25	6.23	8.00	2.619	.579	47.6	11.9	2.77	2.2	1.1	.60	.59
		18.75	5.49	8.00	2.527	.487	43.7	10.9	2.82	2.0	1.0	.60	.57
16.25		4.76	8.00	2.435	.395	39.8	9.9	2.89	1.8	.94	.61	.56	
13.75		4.02	8.00	2.343	.303	35.8	9.0	2.99	1.5	.86	.62	.56	
11.50		3.36	8.00	2.260	.220	32.3	8.1	3.10	1.3	.79	.63	.58	
<b>7 x 2 1/8</b>		19.75	5.79	7.00	2.509	.629	33.1	9.4	2.39	1.8	.96	.56	.58
	17.25	5.05	7.00	2.404	.524	30.1	8.6	2.44	1.6	.86	.56	.55	
	14.75	4.32	7.00	2.299	.419	27.1	7.7	2.51	1.4	.79	.57	.53	
	12.25	3.58	7.00	2.194	.314	24.1	6.9	2.59	1.2	.71	.58	.53	
	9.80	2.85	7.00	2.090	.210	21.1	6.0	2.72	.98	.63	.59	.55	

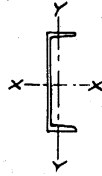
# CHANNELS AMERICAN STANDARD

## DIMENSIONS FOR DETAILING



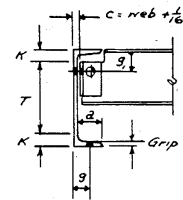
Depth of Section	Weight per Foot	Flange		Web		Distance					Grip	Max. Flange Rivet	Usual Gage	
		Width	Mean Thick-ness	Thick-ness	Half Thick-ness	a	T	k	g <sub>1</sub>	c				
In.	Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
<b>15</b>	55.0	3 7/8	5/8	13/16	7/16	3	12 3/8	1 5/8	2 3/4	7/8	1 1/8	1	2 1/4	
	50.0	3 3/4	5/8	3/4	3/8	3	12 3/8	1 5/8	2 3/4	1 1/8	1 1/8	1	2 3/4	
	45.0	3 3/8	5/8	5/8	5/8	3	12 3/8	1 5/8	2 3/4	1 1/8	1 1/8	1	2 3/4	
	40.0	3 1/2	5/8	7/16	7/16	3	12 3/8	1 5/8	2 3/4	1 1/8	1 1/8	1	2 3/4	
	35.0	3 3/8	7/16	7/16	7/16	3	12 3/8	1 5/8	2 3/4	1 1/8	1 1/8	1	2 3/4	
	33.9	3 3/8	5/8	7/16	7/16	3	12 3/8	1 5/8	2 3/4	1 1/8	1 1/8	1	2 3/4	
<b>12</b>	40.0	3 3/8	1/2	3/8	3/8	2 5/8	9 1/8	1 1/8	2 1/2	1 5/8	1 1/8	7/8	2	
	35.0	3 1/4	1/2	3/8	3/8	2 5/8	9 1/8	1 1/8	2 1/2	1 5/8	1 1/8	7/8	2	
	30.0	3 3/8	1/2	3/8	3/8	2 5/8	9 1/8	1 1/8	2 1/2	1 5/8	1 1/8	7/8	1 3/4	
	25.0	3	1/2	3/8	3/8	2 5/8	9 1/8	1 1/8	2 1/2	1 5/8	1 1/8	7/8	1 3/4	
	20.7	3	1/2	3/8	3/8	2 5/8	9 1/8	1 1/8	2 1/2	1 5/8	1 1/8	7/8	1 3/4	
	<b>10</b>	35.0	3 1/8	7/16	13/16	7/16	2 3/8	8 1/2	1 5/8	2 1/2	7/8	1 1/2	3/4	1 3/4
30.0		3	7/16	11/16	5/8	2 3/8	8 1/2	1 5/8	2 1/2	7/8	1 1/2	3/4	1 3/4	
25.0		2 7/8	7/16	9/16	3/4	2 3/8	8 1/2	1 5/8	2 1/2	7/8	1 1/2	3/4	1 3/4	
20.0		2 3/4	7/16	7/8	3/4	2 3/8	8 1/2	1 5/8	2 1/2	7/8	1 1/2	3/4	1 3/4	
15.3		2 3/8	7/16	7/8	3/4	2 3/8	8 1/2	1 5/8	2 1/2	7/8	1 1/2	3/4	1 3/4	
<b>9</b>		25.0	2 3/4	7/16	5/8	5/16	2 1/4	7 1/4	7/8	2 1/2	1 1/8	7/8	3/4	1 1/2
	20.0	2 3/8	7/16	7/16	3/4	2 1/4	7 1/4	7/8	2 1/2	1 1/8	7/8	3/4	1 1/2	
	15.0	2 1/2	7/16	5/8	5/8	2 1/4	7 1/4	7/8	2 1/2	1 1/8	7/8	3/4	1 1/2	
	13.4	2 3/8	7/16	7/16	3/8	2 1/4	7 1/4	7/8	2 1/2	1 1/8	7/8	3/4	1 1/2	
	<b>8</b>	21.25	2 5/8	3/8	5/8	5/16	2	6 5/8	1 5/8	2 1/4	1 1/8	3/8	3/4	1 1/2
		18.75	2 1/2	3/8	7/8	1/2	2	6 5/8	1 5/8	2 1/4	9/16	3/8	3/4	1 1/2
16.25		2 5/8	3/8	7/16	5/16	2	6 5/8	1 5/8	2 1/4	1 1/2	3/8	3/4	1 1/2	
13.75		2 3/8	3/8	5/16	3/16	2	6 5/8	1 5/8	2 1/4	3/2	3/8	3/4	1 1/2	
11.50		2 1/4	3/8	7/8	1/8	2	6 5/8	1 5/8	2 1/4	1 1/2	3/8	3/4	1 1/2	
<b>7</b>		19.75	2 1/2	3/8	5/8	5/16	1 7/8	5 5/8	1 3/8	2	1 1/8	3/8	5/8	1 1/2
	17.25	2 5/8	3/8	9/16	1/4	1 7/8	5 5/8	1 3/8	2	1 1/8	3/8	5/8	1 1/2	
	14.75	2 1/4	3/8	7/16	1/4	1 7/8	5 5/8	1 3/8	2	1 1/8	3/8	5/8	1 1/2	
	12.25	2 1/4	3/8	5/16	3/16	1 7/8	5 5/8	1 3/8	2	1 1/8	3/8	5/8	1 1/2	
	9.80	2 1/8	3/8	7/8	1/8	1 7/8	5 5/8	1 3/8	2	1 1/8	3/8	5/8	1 1/2	

**CHANNELS**  
**AMERICAN STANDARD**  
**PROPERTIES FOR DESIGNING**



Nominal Size	Weight per Foot	Area of Section	Depth of Section	Width of Flange	Web Thickness	AXIS X - X			AXIS Y - Y			
						I	S	r	I	S	r	x
In.	Lb.	In. <sup>2</sup>	In.	In.	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.	In.
<b>6 x 2</b>	15.5	4.54	6.00	2.279	.559	19.5	6.5	2.07	1.3	.73	.53	.55
	13.0	3.81	6.00	2.157	.437	17.3	5.8	2.13	1.1	.65	.53	.52
	10.5	3.07	6.00	2.034	.314	15.1	5.0	2.22	.87	.57	.53	.50
	8.2	2.39	6.00	1.920	.200	13.0	4.3	2.34	.70	.50	.54	.52
<b>5 x 1 3/4</b>	11.5	3.36	5.00	2.032	.472	10.4	4.1	1.76	.82	.54	.49	.51
	9.0	2.63	5.00	1.885	.325	8.8	3.5	1.83	.64	.45	.49	.48
	6.7	1.95	5.00	1.750	.190	7.4	3.0	1.95	.48	.38	.50	.49
<b>4 x 1 5/8</b>	7.25	2.12	4.00	1.720	.320	4.5	2.3	1.47	.44	.35	.46	.46
	6.25	1.82	4.00	1.647	.247	4.1	2.1	1.50	.38	.32	.45	.46
	5.4	1.56	4.00	1.580	.180	3.8	1.9	1.56	.32	.29	.45	.46
<b>3 x 1 1/2</b>	6.0	1.75	3.00	1.596	.356	2.1	1.4	1.08	.31	.27	.42	.46
	5.0	1.46	3.00	1.498	.258	1.8	1.2	1.12	.25	.24	.41	.44
	4.1	1.19	3.00	1.410	.170	1.6	1.1	1.17	.20	.21	.41	.44

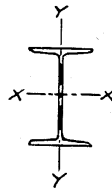
**CHANNELS**  
**AMERICAN STANDARD**  
**DIMENSIONS FOR DETAILING**



Depth of Section	Weight per Foot	Flange		Web		Distance					Grip	Max. Flange Rivet	Usual Gage g
		Width	Mean Thickness	Thickness	Half Thickness	a	T	k	g <sub>1</sub>	c			
In.	Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
<b>6</b>	15.5	2 1/4	3/8	1/16	1/4	1 3/4	4 1/2	3/4	2	5/8	3/8	5/8	1 3/8
	13.0	2 1/8	3/8	1/16	1/4	1 3/4	4 1/2	3/4	2	1/2	3/8	5/8	1 3/8
	10.5	2	3/8	1/16	1/4	1 3/4	4 1/2	3/4	2	3/8	3/8	5/8	1 3/8
	8.2	1 7/8	3/8	1/16	1/4	1 3/4	4 1/2	3/4	2	1/4	3/8	5/8	1 3/8
<b>5</b>	11.5	2	5/16	1/8	1/4	1 1/2	3 5/8	11/16	2	1/2	3/8	1/2	1 1/8
	9.0	1 7/8	5/16	1/8	1/4	1 1/2	3 5/8	11/16	2	3/8	1/2	1 1/8	1 1/8
	6.7	1 3/4	5/16	3/16	1/8	1 1/2	3 5/8	11/16	2	1/4	3/8	1/2	1 1/8
<b>4</b>	7.25	1 3/4	5/16	5/16	1/8	1 3/8	2 3/4	5/8	2	3/8	3/8	1/2	1
	6.25	1 5/8	5/16	1/4	1/8	1 3/8	2 3/4	5/8	2	5/16	3/8	1/2	1
	5.4	1 5/8	5/16	3/16	1/8	1 3/8	2 3/4	5/8	2	1/4	3/8	1/2	1
<b>3</b>	6.0	1 5/8	1/4	3/8	1/8	1 1/4	1 3/4	5/8	..	7/16	3/8	1/2	7/8
	5.0	1 1/2	1/4	1/4	1/8	1 1/4	1 3/4	5/8	..	5/16	3/8	1/2	7/8
	4.1	1 1/8	1/4	3/16	1/8	1 1/4	1 3/4	5/8	..	1/4	3/8	1/2	7/8

**H-BEAMS**  
**AND**  
**MODIFIED H-BEAMS**

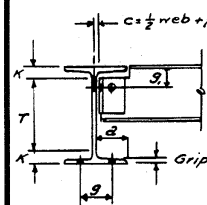
**PROPERTIES FOR DESIGNING**



Nominal Size	Weight per Foot	Area of Section	Depth of Section	Width of Flange	Web Thickness	AXIS X - X			AXIS Y - Y		
						I	S	r	I	S	r
In.	Lb.	In. <sup>2</sup>	In.	In.	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.
<b>6 x 6</b>	22.5	6.62	6.00	6.063	.375	41.0	13.7	2.49	12.2	4.0	1.36
	20.0	5.88	6.00	5.938	.250	38.8	12.9	2.57	11.4	3.8	1.39
<b>6 x 5 1/2</b>	27.75	8.15	6.00	5.500	.500	47.7	15.9	2.42	10.9	4.0	1.16
<b>8 x 6 1/2</b>	25.90	7.63	8.00	6.545	.310	87.20	21.8	3.37	18.18	5.56	1.54
	24.75	7.27	8.00	6.500	.265	85.19	21.3	3.41	17.75	5.46	1.56

**H-BEAMS**  
**AND**  
**MODIFIED H-BEAMS**

**DIMENSIONS FOR DETAILING**



Depth of Section	Weight per Foot	Flange		Web		Distance					Grip	Max. Flange Rivet	Usual Gage g
		Width	Mean Thickness	Thickness	Half Thickness	a	T	k	g <sub>1</sub>	c			
In.	Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
<b>6</b>	22.5	6 1/8	3/8	3/8	3/8	2 7/8	4 3/8	13/16	2 1/4	1/4	3/8	7/8	3 1/2
	20.0	6	3/8	1/4	3/8	2 7/8	4 3/8	13/16	2 1/4	3/16	3/8	7/8	3 1/2
<b>6</b>	27.75	5 1/2	1/2	1/2	1/4	2 1/2	4 1/4	1	2 1/4	5/16	1/2	3/4	3 1/2
<b>8</b>	25.9	6 5/8	1/8	5/16	3/8	3 1/8	6 1/4	7/8	2 1/4	1/4	1/8	7/8	3 1/2
	24.75	6 1/2	1/8	1/4	3/8	3 1/8	6 1/4	7/8	2 1/4	3/16	1/8	7/8	3 1/2