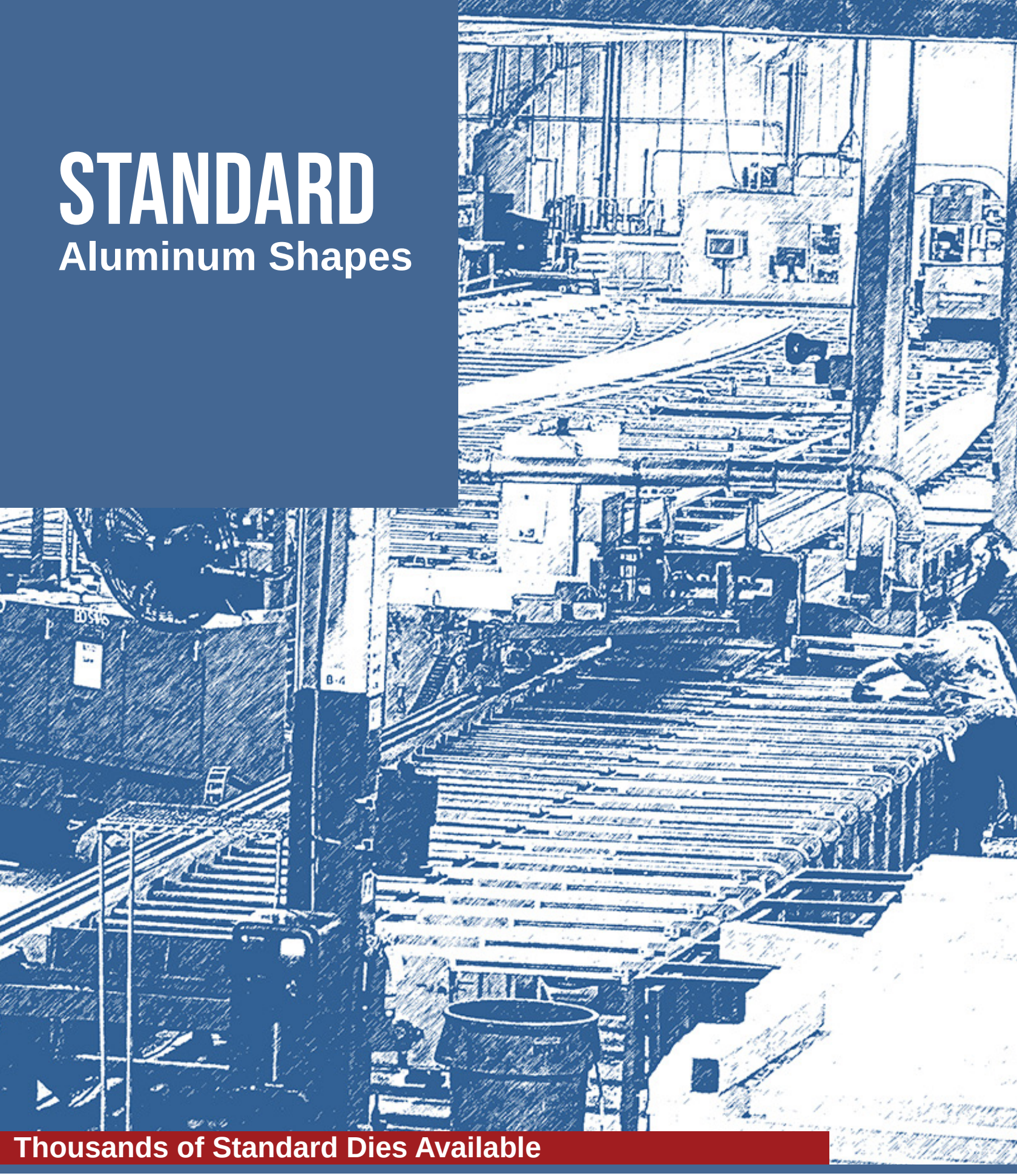
STANDARD
Aluminum Shapes



Thousands of Standard Dies Available

WAKEFIELDEXTRUSION.COM

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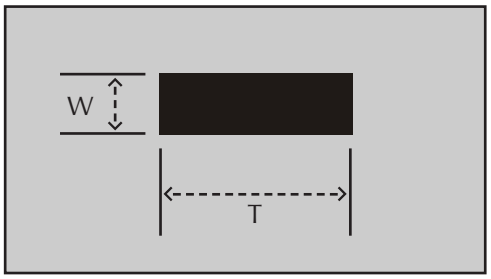
MID-WEST

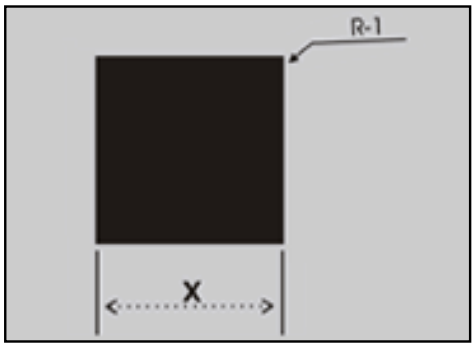
Withee, Wisconsin



Flat Bar

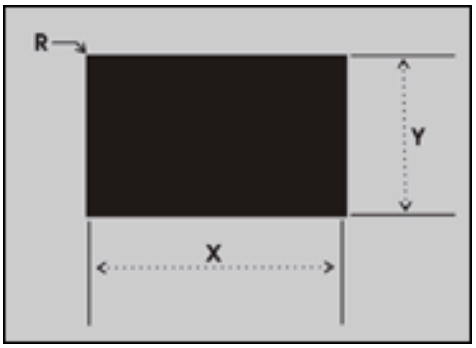
Die Number	W	T	Wt./Ft.
MS000428	1.2500	0.1250	0.1870
MS000430	2.5000	0.1880	0.5630
MS000431	4.0000	0.1880	0.9000
MS000432	0.7500	0.2500	0.2250
MS000433	4.5000	0.2500	1.3500
MS000434	1.7500	0.5000	1.0500
MS000435	0.7500	0.6250	0.5630
MS000436	1.5000	0.6250	1.1250
MS000437	1.7500	0.6250	1.3130
MS000438	2.0000	0.6250	1.5000
MS000439	1.7500	0.7500	1.5760
MS000440	2.0000	1.2500	3.0000
MS000441	1.0000	0.6250	0.7500
MS000449	0.5000	0.1250	0.0750
MS000450	0.5000	0.1880	0.1130
MS000451	1.0000	0.1880	0.2250
MS000452	0.3750	0.3750	0.1690
MS000453	5.0000	0.1880	0.1130
MS000454	0.7500	0.1880	0.1690
MS000455	0.5000	0.2500	0.1500
MS000456	3.5000	0.5000	2.1000
MS000457	2.5000	0.6250	1.8750
MS000458	3.5000	0.6250	2.6250
MS000459	4.0000	0.6250	3.0000
MS000460	1.5000	0.7500	1.3500
MS000463	4.5000	0.6250	3.3750
MS000484	2.2500	1.0000	2.7000
MS000486	1.0000	0.3130	0.3750

Die Number	W	T	Wt./Ft.
MS000487	1.5000	0.3130	0.6750
MS000488	2.0000	0.3130	0.9000
MS000489	3.0000	0.3130	1.1250
MS000490	0.5000	0.3750	0.2250
MS000491	4.5000	0.3750	2.0250
MS000492	1.5000	0.5000	0.9000
MS000493	2.0000	1.7500	4.2000
MS000494	2.2500	1.5000	4.5000



Square Bar

Die Number	X	R	Wt./Ft.
MS000101	0.5000	0.0150	0.2910
MS000237	0.6250	0.0000	0.4550
MS000236	0.7500	0.0000	0.6550
MS000229	1.0000	0.0000	1.1640
MS000155	1.5000	0.0150	2.6190
MS000196	2.0000	0.0150	4.6560
MS000481	1.7500	1.7500	3.6760
MS000505	1.2500	1.2500	1.8760

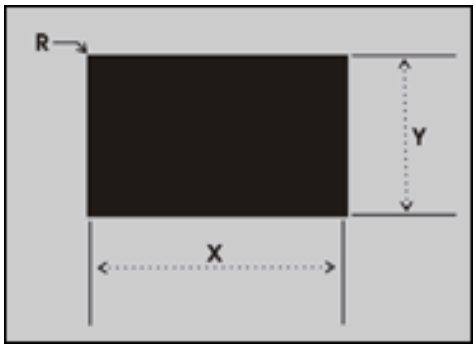


Rectangular Bar

Body

Die Number	X	Y	R	Wt./Ft.
MS000205	0.6250	0.1250	0.0100	0.0910
MS000238	0.7500	0.1250	0.0000	0.1090
MS000204	1.0000	0.1250	0.0150	0.1460
MS000172	1.5000	0.1250	0.0150	0.2180
MS000141	2.0000	0.1250	0.0150	0.2910
MS000154	3.0000	0.1250	0.0150	0.4370
MS000137	4.0000	0.1250	0.0150	0.5820
MS000350	4.5000	0.1250	0.0000	0.6548
MS000346	5.0000	0.1250	0.0000	0.7275
MS000239	8.0000	0.1250	0.0150	1.1640
MS000132	1.0000	0.1880	0.0150	0.2180
MS000225	1.2500	0.1875	0.0000	0.2730
MS000150	1.5000	0.1880	0.0000	0.3280
MS000139	1.7500	0.1880	0.0150	0.3820
MS000063	2.0000	0.1880	0.0000	0.4370
MS000277	2.2500	0.1875	0.0000	0.4910
MS000064	3.0000	0.1880	0.0150	0.6540
MS000170	4.0000	0.1880	0.0000	0.8730
MS000084	1.0000	0.2500	0.0150	0.2910
MS000072	1.0000	0.2500	0.1250	0.2760
MS000087	1.2500	0.2500	0.0150	0.3630
MS000070	1.2500	0.2500	0.1250	0.3480
MS000051	1.5000	0.2500	0.0150	0.4400
MS000052	1.7500	0.2500	0.0150	0.5090
MS000069	2.0000	0.2500	0.1250	0.5820
MS000055	2.0000	0.2500	0.0150	0.5820
MS000054	2.5000	0.2500	0.0150	0.7280
MS000068	2.5000	0.2500	0.1250	0.7120

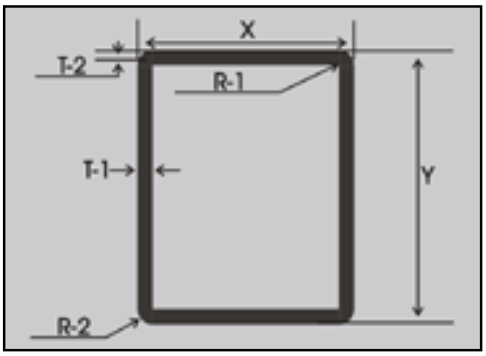
Die Number	X	Y	R	Wt./Ft.
MS000017	3.0000	0.2500	0.0150	0.8730
MS000117	3.5000	0.2500	0.0150	1.0220
MS000091	4.0000	0.2500	0.0150	1.1640
MS000319	4.2500	0.2500	0.0000	1.2368
MS000116	5.0000	0.2500	0.0150	1.4550
MS000121	6.0000	0.2500	0.0150	1.7460
MS000199	8.0000	0.2500	0.0080	2.3280
MS000358	9.1300	0.2500	0.0000	2.6554
MS000085	1.0000	0.3750	0.0150	0.4370
MS000056	1.2500	0.3750	0.0150	0.5460
MS000206	1.5000	0.3750	0.0150	0.6540
MS000094	2.0000	0.3750	0.0150	0.8730
MS000232	2.0000	0.3750	0.1875	0.8310
MS000325	2.5000	0.3750	0.0000	1.0913
MS000192	3.0000	0.3750	0.0150	1.3100
MS000124	4.0000	0.3750	0.0150	1.7460
MS000207	5.0000	0.3750	0.0150	2.1830
MS000140	6.0000	0.3750	0.0150	2.6190
MS000179	8.0000	0.3750	0.0000	3.4920
MS000173	0.7500	0.5000	0.0100	0.4370
MS000086	1.0000	0.5000	0.0150	0.5820
MS000215	1.2500	0.5000	0.0150	0.7280
MS000174	1.5000	0.5000	0.0150	0.8730
MS000095	2.0000	0.5000	0.0150	1.1640
MS000164	2.5000	0.5000	0.0000	1.4550
MS000118	3.0000	0.5000	0.0150	1.7460
MS000018	4.0000	0.5000	0.0150	2.3280
MS000175	5.0000	0.5000	0.0150	2.9100



Rec Bar

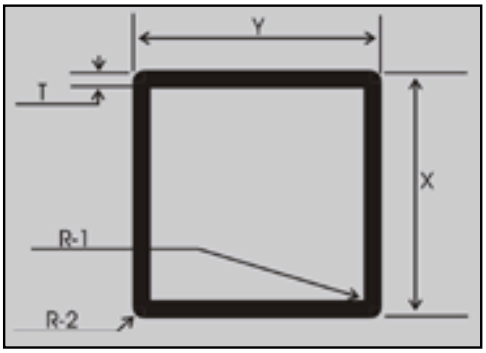
Continued

Die Number	X	Y	R	Wt./Ft.
MS000079	6.0000	0.5000	0.0150	3.4920
MS000407	4.0000	0.6250	0.0100	2.9090
MS000398	6.0000	0.6250	0.0100	4.3650
MS000228	1.0000	0.7500	0.0000	0.8730
MS000131	1.2500	0.7500	0.0150	1.0910
MS000165	1.5000	0.7500	0.0000	1.3100
MS000120	2.0000	0.7500	0.0150	1.7460
MS000115	2.5000	0.7500	0.0150	2.1830
MS000119	3.0000	0.7500	0.0150	2.6190
MS000078	4.0000	0.7500	0.0150	3.4920
MS000227	6.0000	0.7500	0.0000	5.2380
MS000322	1.2500	1.0000	0.0000	1.4550
MS000376	1.5000	1.0000	0.2500	1.7356
MS000183	1.5000	1.0000	0.0150	1.7460
MS000097	2.0000	1.0000	0.0150	2.3280
MS000098	3.0000	1.0000	0.0150	3.4920
MS000261	4.0000	1.0000	0.0000	4.6560
MS000130	1.5000	1.2500	0.0150	2.1830
MS000366	1.7500	1.2500	0.0000	2.5463
MS000323	2.0000	1.5000	0.0000	3.4920
MS000324	3.0000	1.5000	0.0000	5.2380



Rectangular Tube

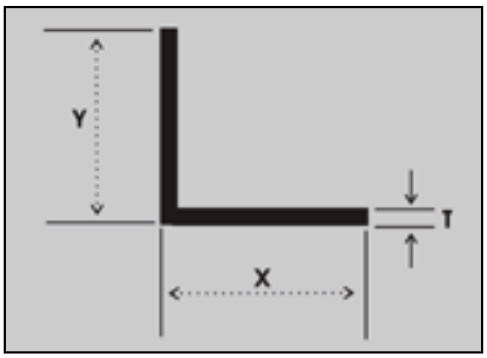
Die Number	X	Y	T-1	T-2	R-1	R-2	Wt./Ft
MH000159	1.125	0.750	0.125	0.125	0.010	0.030	0.256
MH000122	1.500	0.750	0.090	0.090	0.031	0.031	0.430
MH000153	2.000	0.750	0.125	0.125	0.000	0.015	0.728
MH000126	1.500	1.000	0.125	0.125	0.015	0.015	0.655
MH000273	2.000	1.000	0.125	0.125	0.062	0.125	0.789
MH000001	2.000	1.000	0.125	0.125	0.015	0.015	0.801
MH000368	3.000	1.000	0.125	0.125	0.010	0.010	1.091
MH000073	4.000	1.000	0.125	0.125	0.015	0.015	1.383
MH000308	2.000	1.500	0.125	0.125	0.000	0.000	0.946
MH000037	3.000	1.500	0.125	0.125	0.015	0.015	1.237
MH000076	3.000	1.500	0.125	0.125	0.015	0.063	1.233
MH000220	3.000	1.500	0.188	0.188	0.015	0.015	1.800
MH000219	3.000	1.750	0.125	0.125	0.015	0.015	1.310
MH000027	4.000	1.750	0.125	0.125	0.016	0.016	1.601
MH000360	4.500	1.750	0.125	0.125	0.010	0.010	1.746
MH000029	5.000	1.750	0.125	0.125	0.016	0.125	1.876
MH000038	3.000	2.000	0.125	0.125	0.015	0.015	1.383
MH000397	3.000	2.000	0.250	0.250	0.010	0.010	2.619
MH000004	4.000	2.000	0.125	0.125	0.015	0.015	1.674
MH000399	4.000	2.000	0.188	0.188	0.010	0.010	2.455
MH000255	4.000	2.000	0.250	0.250	0.000	0.000	3.201
MH000040	5.000	2.000	0.125	0.125	0.015	0.015	1.965
MH000006	6.000	2.000	0.125	0.125	0.005	0.015	2.255
MH000218	6.000	2.000	0.188	0.188	0.005	0.015	3.321
MH000442	1.000	0.500	0.125				0.375
MH000443	1.500	0.750	0.125				0.600
MH000444	2.500	1.250	0.125				1.050
MH000445	2.500	1.500	0.125				1.125



Square Tube

Die Number	X	T	R-1	R-2	Wt./Ft.
MH000022	0.750	0.125	0.015	0.015	0.364
MH000050	1.000	0.063	0.125	0.125	0.272
MH000021	1.000	0.063	0.015	0.015	0.274
MH000160	1.000	0.081	0.044	0.125	0.333
MH000010	1.000	0.125	0.063	0.125	0.511
MH000020	1.000	0.125	0.015	0.015	0.510
MH000270	1.250	0.090	0.062	0.125	0.474
MH000102	1.250	0.125	0.015	0.015	0.655
MH000016	1.250	0.125	0.015	0.125	0.639
MH000019	1.500	0.125	0.015	0.015	0.801
MH000075	1.500	0.125	0.015	0.063	0.796
MH000015	1.500	0.125	0.015	0.125	0.785
MH000181	1.750	0.125	0.015	0.015	0.946
MH000014	1.750	0.125	0.015	0.125	0.930
MH000002	2.000	0.125	0.015	0.015	1.092
MH000025	2.000	0.125	0.000	0.125	1.092
MH000035	2.000	0.188	0.015	0.015	1.582
MH000036	2.000	0.250	0.015	0.015	2.037
MH000226	2.500	0.125	0.000	0.000	1.472
MH000146	2.500	0.188	0.015	0.015	2.024
MH000198	2.500	0.218	0.015	0.125	2.301
MH000197	3.000	0.125	0.015	0.015	1.674
MH000182	3.000	0.188	0.015	0.015	2.455
MH000026	3.000	0.250	0.015	0.015	3.201
MH000012	4.000	0.125	0.015	0.015	2.256
MH000083	4.000	0.250	0.015	0.015	4.365

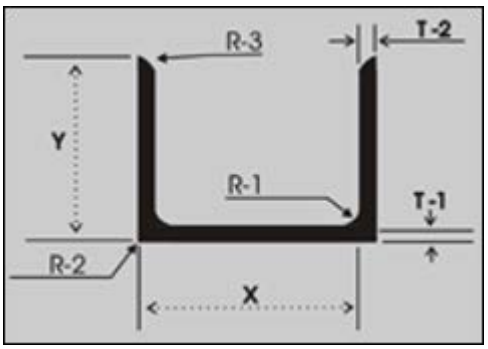
Die Number	X	T	R-1	R-2	Wt./Ft.
MH000507	2.625	0.125	0.020	0.125	1.484
MH000511	3.000	0.125	0.015	0.125	1.709
MH000497	1.000	0.900			0.394
MH000448	2.500	0.250			2.700
MH000479	0.750	0.062			0.205



Architectural Angle

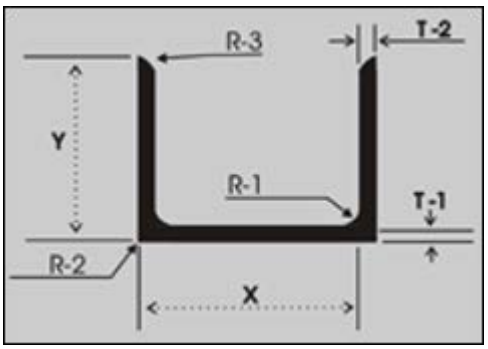
Die Number	Y	X	T	Wt./ Ft.
MS000195	0.5000	1.0000	0.1250	0.2000
MS000113	0.7500	0.7500	0.1250	0.2000
MS000134	1.0000	1.0000	0.1250	0.2720
MS000125	1.0000	1.1250	0.1250	0.2910
MS000135	1.0000	2.0000	0.1250	0.4180
MS000380	1.5000	0.6250	0.1250	0.2999
MS000009	1.2500	1.2500	0.2500	0.6540
MS000065	1.3130	1.3130	0.1880	0.5320
MS000104	1.3750	1.0000	0.1250	0.3270
MS000222	1.5000	1.0000	0.1250	0.3460
MS000359	1.5000	1.2500	0.1250	0.3817
MS000005	1.5000	1.5000	0.1250	0.4180
MS000106	1.5000	1.5000	0.1870	0.6130
MS000362	1.5000	1.5000	0.2500	0.8003
MS000235	1.5000	1.5000	0.1875	0.6140
MS000071	1.5000	2.0000	0.2500	0.9450
MS000221	2.0000	1.5000	0.1250	0.4910
MS000168	2.0000	2.0000	0.1250	0.5630
MS000007	2.0000	2.0000	0.1880	0.8320
MS000008	2.0000	2.0000	0.2500	1.0910
MS000032	2.0000	2.0000	0.3750	1.5820
MS000066	2.0000	2.5000	0.2500	1.2360
MS000061	2.0000	3.0000	0.1250	0.7090
MS000062	2.0000	3.0000	0.2500	1.3820

Die Number	Y	X	T	Wt./ Ft.
MS000156	2.0000	4.0000	0.1250	0.8540
MS000129	2.5000	2.5000	0.3750	2.0180
MS000233	2.5000	3.5000	0.2500	1.6730
MS000047	3.0000	3.0000	0.2500	1.6730
MS000105	3.0000	4.1250	0.1500	1.1340
MS000067	3.0000	5.0000	0.2500	2.2550
MS000240	3.5000	1.5000	0.1250	0.7090
MS000149	3.5000	5.0000	0.3750	3.5470
MS000217	3.7500	2.7500	0.2500	1.8190
MS000147	4.0000	4.0000	0.2500	2.2550
MS000136	4.0000	5.0000	0.2500	2.5460
MS000148	4.0000	6.0000	0.3750	4.2010
MS000469	0.5000	0.5000	0.6300	0.0700
MS000470	1.0000	1.0000	0.0630	0.1450
MS000471	0.5000	0.5000	0.1250	0.1310
MS000472	0.7500	0.7500	0.1250	0.2060
MS000473	1.5000	1.5000	0.1250	0.4310
MS000474	2.0000	1.0000	0.1250	0.4310
MS000475	2.0000	2.0000	0.1250	0.5810
MS000476	2.0000	2.0000	0.1880	0.8580
MS000477	1.5000	1.5000	0.0630	0.8250
MS000478	3.0000	2.0000	0.2500	1.4250
MS000429	1.7500	1.7500	0.2500	0.9750
MS000510	3.0000	3.0000	0.3750	2.5310



Channel

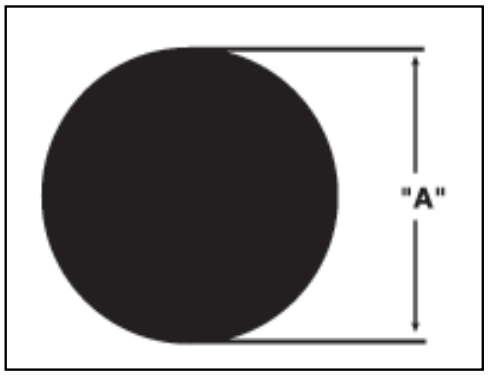
Die Number	X	Y	T-1	T-2	R-1	R-2	R-3	Wt./Ft.
MS000158	0.7500	1.7500	0.1250	0.1250	0.0000	0.0000	0.0100	0.5820
MS000203	1.0000	1.0000	0.1250	0.1250	0.0150	0.0150	0.0150	0.4000
MS000361	1.2500	1.2500	0.1250	0.1250	0.0100	0.0100	0.0100	0.5093
MS000375	1.2500	1.5000	0.5000	0.5000	0.0630	0.1250	0.0630	1.9339
MS000193	1.5000	0.7500	0.1250	0.1250	0.0000	0.0000	0.0150	0.4000
MS000202	1.5000	1.0000	0.1250	0.1250	0.0150	0.0150	0.0150	0.4730
MS000378	1.5000	1.5000	0.1250	0.1250	0.0000	0.0000	0.0000	0.6183
MS000128	2.0000	1.0000	0.1250	0.1250	0.0125	0.0150	0.0125	0.5460
MS000048	2.0000	1.0000	0.1250	0.1250	0.0150	0.0150	0.0150	0.5460
MS000363	2.0000	2.0000	0.2500	0.2500	0.0150	0.0150	0.0150	1.6500
MS000208	3.0000	1.4100	0.1700	0.1700	0.2700	0.0150	0.1000	1.4150
MS000280	3.0000	1.5000	0.1300	0.2000	0.2500	0.0000	0.0000	1.1230
MS000223	3.0000	1.5000	0.1300	0.2000	0.2500	0.0000	0.0000	1.1230
MS000209	4.0000	1.6470	0.2470	0.1800	0.2800	0.0150	0.1100	2.0680
MS000092	4.0000	2.2500	0.1800	0.2900	0.0150	0.0150	0.0150	2.2350
MS000329	5.0000	1.7500	0.1900	0.3090	0.2900	0.0000	0.1100	2.3630
MS000163	5.0000	1.8850	0.3250	0.1890	0.2900	0.0000	0.1100	2.9090
MS000133	5.0000	1.5000	0.2500	0.2500	0.0150	0.0150	0.0150	2.1830
MS000281	5.0000	2.2500	0.1500	0.2600	0.3000	0.0000	0.0000	2.1890
MS000161	5.0000	2.7500	0.1900	0.3200	0.3000	0.0000	0.0000	2.2380
MS000276	6.0000	1.9200	0.2000	0.2000	0.3000	0.0000	0.1200	2.8260
MS000191	6.0000	2.0340	0.3140	0.2000	0.3000	0.0000	0.1200	3.5790
MS000282	7.0000	2.7500	0.1700	0.2900	0.3000	0.0000	0.0000	3.1720



Channel

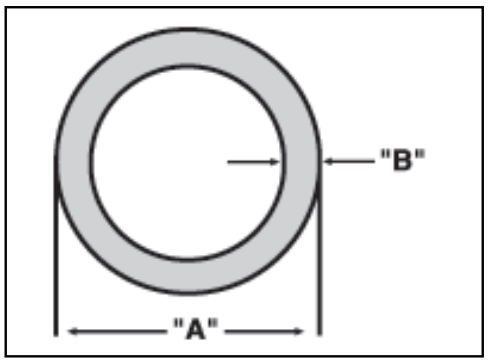
Continued

Die Number	X	Y	T-1	T-2	R-1	R-2	R-3	Wt./Ft.
MS000464	3.0000	1.5960	0.3560	0.3560	0.2500		0.1000	2.3680
MS000465	0.5000	0.5000	0.0940	0.0940				0.1480
MS000466	1.0000	0.5000	0.1250	0.1250				0.2630
MS000467	2.5000	1.5000	0.1250	0.1250				0.7870
MS000468	2.0000	0.5000	0.1250	0.1250				0.4130
MS000499	0.7500	0.7500	0.1250	0.1250				0.3000
MS000500	0.7500	0.5000	0.1250	0.1250				0.2250
MS000501	1.5000	0.5000	0.1250	0.1250				0.3380
MS000502	3.0000	1.0000	0.1250	0.1250				0.7130
MS000503	4.0000	1.0000	0.1250	0.1250				0.8630
MS000504	0.5000	0.5000	0.0630	0.0630				0.1030
MS000508	1.2500	0.7500	0.1880	0.1880				0.5340



Round Bar

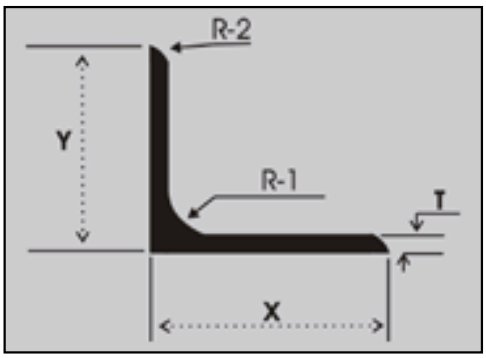
Die Number	A	Wt./ Ft.
MS000033	0.3750	0.1290
MS000059	0.4370	0.1750
MS000081	0.5000	0.2280
MS000186	0.6250	0.3570
MS000057	0.7500	0.5140
MS000242	0.8750	0.7000
MS000090	1.0000	0.9140
MS000103	1.2500	1.4280
MS000109	1.5000	2.0570
MS000210	1.7500	2.7990
MS000080	2.0000	3.6570
MS0000100	2.1250	4.1290
MS000326	2.2500	4.6282
MS000230	2.5000	5.7140
MS000231	3.0000	8.2280
MS000446	1.1880	1.3290
MS000447	1.7500	2.8860
MS000461	1.1250	1.1930
MS000462	1.3130	1.6240



Round Tube

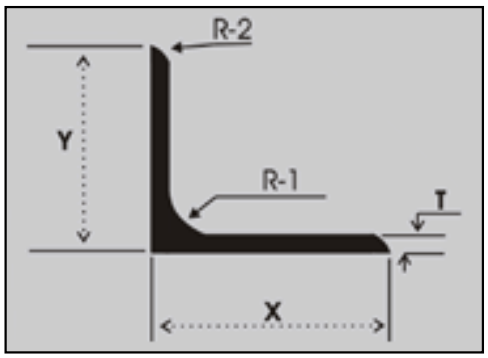
Die Number	I.D.	O.D.	B	Wt./Ft.
MH000370	0.2510	0.3750	0.0620	0.0731
MH000138	0.5000	0.7500	0.1250	0.2860
MH000387	0.6250	1.0000	0.1880	0.5570
MH000082	0.6350	0.8750	0.1200	0.3320
MH000053	0.7500	1.0000	0.1250	0.4000
MH000058	1.0000	1.2500	0.1250	0.5140
MH000166	1.0000	1.5000	0.2500	1.1430
MH000041	1.2500	1.5000	0.1250	0.6290
MH000167	1.2500	1.7500	0.2500	1.3710
MH000107	1.3750	1.5000	0.0630	0.3280
MH000157	1.7500	2.0000	0.1250	0.8570
MH000364	1.7500	2.5000	0.3750	2.9140
MH000013	1.7550	2.3750	0.3100	2.3400
MH000216	2.0000	2.5000	0.2500	2.0570
MH000112	2.1570	2.3750	0.1090	0.9030
MH000042	2.5000	3.0000	0.2500	2.5140
MH000212	2.8700	3.0000	0.0650	0.6980
MH000389	3.5000	4.2500	0.3750	5.4782
MH000213	3.8700	4.0000	0.0650	0.9350
MH000423		1.7500	0.1250	0.7660
MH000424		2.2500	0.2500	1.8850
MH000425		1.0000	0.2500	0.7070
MH000426		2.5000	0.6500	0.5960
MH000427		3.0000	0.3750	3.7120
MH000485		1.2500	0.6500	2.9000
MH000509		2.3750	0.2180	1.7720

Die Number	I.D.	O.D.	B	Wt./Ft.
MH000480		1.2500	0.2500	0.9420
MH000482		3.0000	0.1250	1.3550
MH000483		1.7500	0.0830	0.5220
MH000496		2.0000	0.1200	0.8510
MH000498		0.6750	0.1820	0.2000
MH000495		2.5000	0.1250	1.1180



Structural Angle

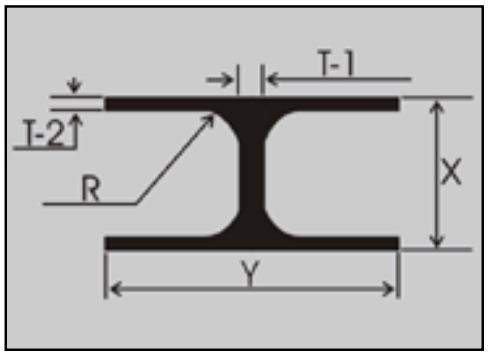
Die Number	Y	X	T	R-1	R-2	Wt./ Ft.
MS000176	0.7500	0.7500	0.1250	0.1250	0.0940	0.1990
MS000045	0.7500	0.7500	0.1250	0.1250	0.1250	0.1960
MS000381	1.0000	1.0000	0.1250	0.1250	0.0940	0.2720
MS000111	1.0000	1.0000	0.1250	0.1250	0.1250	0.2690
MS000247	1.0000	1.0000	0.1875	0.1250	0.0973	0.3950
MS000187	1.0000	1.0000	0.1880	0.1250	0.0940	0.3950
MS000243	1.0000	1.0000	0.2500	0.1250	0.0937	0.5090
MS000201	1.2500	1.2500	0.1880	0.1880	0.1250	0.5080
MS000188	1.2500	1.2500	0.1250	0.1880	0.1250	0.3470
MS000190	1.2500	1.2500	0.2500	0.1880	0.1250	0.6550
MS000110	1.5000	1.5000	0.1250	0.1250	0.1250	0.4140
MS000382	1.5000	1.5000	0.1250	0.1880	0.1250	0.4190
MS000169	1.5000	1.5000	1.8800	1.8800	0.1250	0.6160
MS000189	1.5000	1.5000	0.2500	0.1870	0.1250	0.8010
MS000386	1.5000	2.0000	0.1250	0.1880	0.1250	0.5070
MS000123	2.0000	2.0000	0.1250	0.1250	0.1250	0.5720
MS000089	2.0000	2.0000	0.1880	0.2500	0.1250	0.8390
MS000077	2.0000	2.0000	0.1880	0.1880	0.1880	0.8230
MS000011	2.0000	2.0000	0.2500	0.2500	0.1250	1.0990
MS000385	2.0000	2.0000	0.3750	0.2500	0.1250	1.5900
MS000127	2.0000	2.0000	0.3750	0.3750	0.3750	1.5470
MS000384	2.0000	3.0000	0.3750	0.3130	0.1880	2.0256



Structural Angle

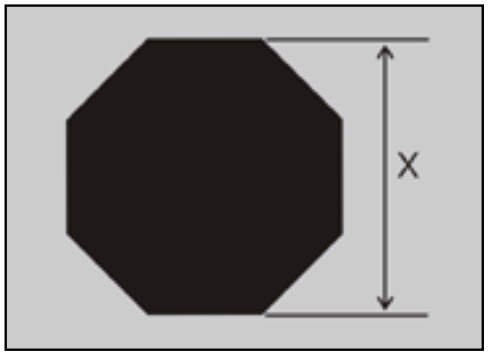
Continued

Die Number	Y	X	T	R-1	R-2	Wt./ Ft.
MS000388	2.5000	2.5000	0.1250	0.1880	0.1250	0.7103
MS000162	2.5000	2.5000	0.1880	0.2500	0.1250	1.0580
MS000177	2.5000	2.5000	0.2500	0.2500	0.1250	1.3900
MS000074	2.5000	2.5000	0.3750	0.3750	0.3750	1.9830
MS000390	2.5000	3.5000	0.2500	0.3130	0.2500	1.7179
MS000234	2.0000	3.0000	0.2500	0.2500	0.3120	1.3490
MS000178	2.0000	3.0000	0.1880	0.3120	0.1880	1.0590
MS000049	3.0000	3.0000	0.1880	0.3120	0.1000	1.2870
MS000046	3.0000	3.0000	0.2500	0.3120	0.2500	1.6660
MS000185	3.0000	3.0000	0.3750	0.3130	0.2500	2.4480
MS000211	3.0000	4.0000	0.2500	0.3750	0.2500	1.9680
MS000392	3.0000	5.0000	0.2500	0.3750	0.3130	2.2456
MS000271	3.0000	5.0000	0.3750	0.3750	0.3125	3.3150
MS000214	3.5000	3.5000	0.2500	0.3750	0.2500	1.9680
MS000383	3.5000	5.0000	0.3750	0.3750	0.3130	3.6420
MS000393	4.0000	4.0000	0.2500	0.3750	0.2500	2.3291
MS000093	4.0000	4.0000	0.2500	0.2500	0.2500	2.2400
MS000374	4.0000	4.0000	0.3130	0.3130	0.3130	2.7719
MS000391	4.0000	6.0000	0.3750	0.5000	0.3750	4.1935
MS000506	4.0000	4.0000	0.3750	0.3750	0.3750	3.3960



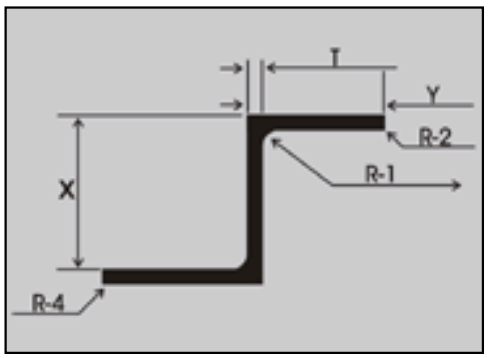
I-Beam

Die Number	X	Y	T-1	T-2	R	Wt./Ft.
MS000224	3.00000	2.33000	0.17000	0.17000	0.27000	2.007
MS000194	4.00000	2.66000	0.19000	0.19000	0.29000	2.521



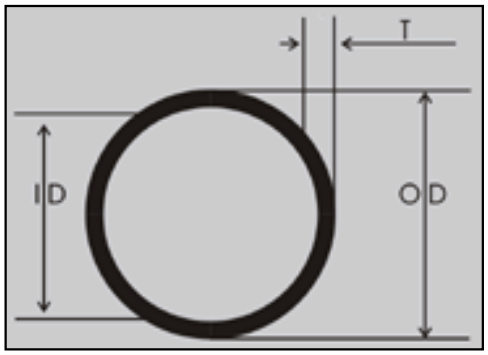
Hex

Die Number	X	Wt./ Ft.
MS000180	0.5000	0.2510



Z-Bar

Die Number	Y	X	T-1	T-2	R-1	R-2	Wt./ Ft.
MS000269	2.6875	3.0000	0.2500	0.2500	0.3130	0.2500	2.3090



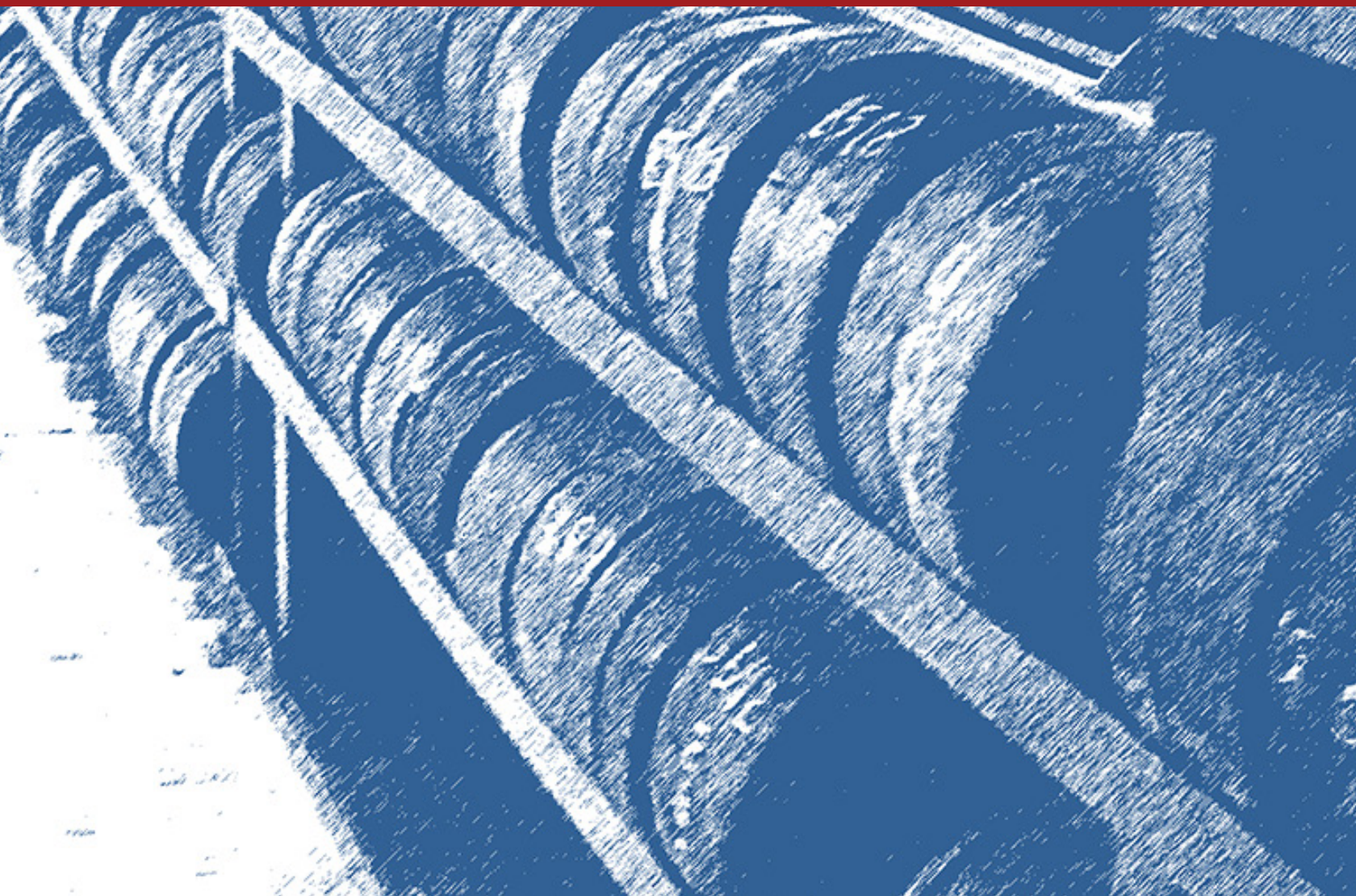
Schedule Pipe

Die Number	I.D.	O.D.	T	Pipe Size	Schedule	Wt./ Ft.
MH000405	0.622	0.84	0.109	0.5	40	0.2913
MH000171	0.8240	1.0500	0.1130	0.75	40	0.3880
MH000023	1.0490	1.3150	0.1330	1.00	40	0.5750
MH000241	0.9570	1.3150	0.1790	1.00	80	0.7440
MH000039	1.3800	1.6600	0.1400	1.25	40	0.7790
MH000184	1.2780	1.6600	0.1910	1.25	80	1.0250
MH000030	1.6100	1.9000	0.1450	1.50	40	0.9310
MH000256	1.5000	1.9000	0.2000	1.50	80	1.2430
MH000152	2.0670	2.3750	0.1540	2.00	40	1.2510
MH000112	2.1570	2.3750	0.1090	2.00	10	0.9030
MH000318	2.4690	2.8750	0.2030	2.50	40	2.0039
MH000043	3.0680	3.5000	0.2160	3.00	40	2.5930
MH000317	3.5480	4.0000	0.2260	3.50	40	3.1510
MH000044	4.0260	4.5000	0.2370	4.00	40	3.6950
MH000396	6.0650	6.6250	0.2800	6.00	40	6.4970

WAKEFIELD EXTRUSION

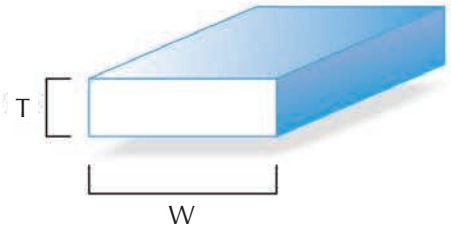
NORTH-EAST

Pelham, New Hampshire



STANDARD DIE DATA

(a) .015 RadII All Corners •(b) .030 RadII All Corners
(c) .062 RadII All Corners • (d) .125 RadII All Corners
(e) .187 RadII All Corners



FLAT BAR

Thickness	Width	Est Wt Lbs/Ft	NNE DIE#
.090	2.000	.216	11119
.093	2.625	.293	11120
.093	3.250	.363	11121
.125	.375	.056	731
.125	.500	.076	351
.125	.625	.094	750
.125	.688	.103	5072
.125	.750	.113	529
.125	.875	.121	4015 (b)
.125	1.000	.150	528
.125	1.125	.169	517
.125	1.250	.187	748
.125	1.500	.226	790
.125	1.750	.262	753
.125	2.000	.300	754
.125	2.250	.337	13400*
.125	2.500	.374	S-2052
.125	2.750	.412	14993*
.125	3.000	.450	975
.125	3.250	.487	14480*
.125	3.500	.524	681
.125	3.750	.562	14481*
.125	4.000	.600	982
.125	4.250	.637	13404*
.125	4.500	.674	S-340
.125	4.750	.713	5780
.125	5.000	.750	2589
.125	5.250	.787	14716*
.125	5.500	.824	682
.125	5.750	.862	14789
.125	6.000	.900	2590
.187	.500	.112	406
.187	.750	.169	15827
.187	1.000	.224	352
.187	1.250	.282	4284
.187	1.375	.308	3455
.187	1.437	.323	11161
.187	1.500	.338	411
.187	1.750	.395	5368

STANDARD DIE DATA

(a) .015 RadII All Corners •(b) .030 RadII All Corners
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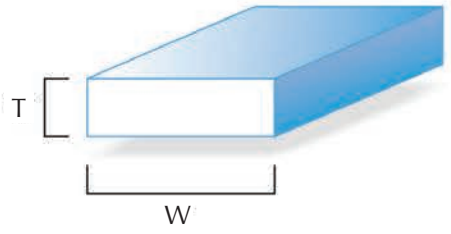
(e) .187 RadII All Corners



FLAT BAR

Thickness	Width	Est Wt Lbs/Ft	NNE DIE#
.187	2.000	.449	438
.187	2.500	.562	S-571
.187	3.000	.673	2051
.187	4.000	.902	7462
.187	6.000	1.346	S-1010
.210	6.000	1.511	15670 (b)
.250	.500	.150	6909
.250	.750	.226	572
.250	1.000	.283	11879 (d)
.250	1.000	.300	1769
.250	1.250	.375	6310 (c)
.250	1.250	.375	4283
.250	1.281	.384	5074
.250	1.375	.413	5198
.250	1.500	.450	1627
.250	1.750	.526	2651
.250	1.875	.562	7170
.250	2.000	.600	S-511
.250	2.250	.675	14998*
.250	2.500	.750	2201/S-1069
.250	2.750	.825	13408*
.250	3.000	.900	788
.250	3.250	.980	8819
.250	3.500	1.050	6969
.250	3.750	1.125	13409
.250	4.000	1.200	1225
.250	4.250	1.275	13410*
.250	4.500	1.350	12641
.250	5.000	1.500	983
.250	5.250	1.575	13412*
.250	5.500	1.650	2231
.250	5.750	1.725	2200
.250	6.000	1.800	984/S-1014
.250	6.500	1.950	14990*
.250	7.000	2.100	14991*
.312	.750	.281	2665
.312	1.500	.561	6719
.312	2.000	.748	5202
.312	3.000	1.123	13414

STANDARD DIE DATA

(a) .015 RadII All Corners •(b) .030 RadII All Corners
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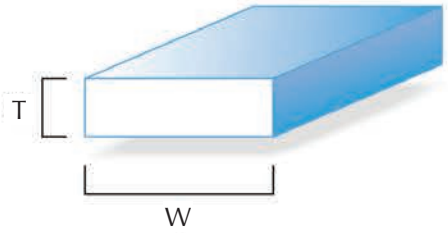
(e) .187 RadII All Corners

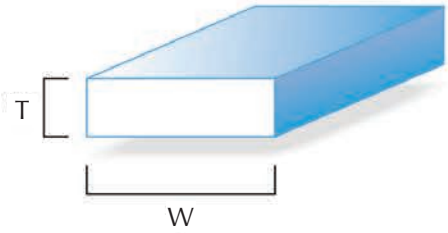


FLAT BAR

Thickness	Width	Est Wt Lbs/Ft	NNE DIE#
.312	4.000	1.498	13415
.312	5.000	1.872	S-764
.312	5.500	2.059	S-1059 (c)
.312	6.000	2.246	10503
.375	.500	.224	762
.375	.625	.281	S-759
.375	.750	.338	758
.375	1.000	.450	S-777
.375	1.250	.563	314
.375	1.375	.630	S-1117 (e)
.375	1.500	.676	1179
.375	1.750	.787	2050
.375	2.000	.900	777
.375	2.250	1.012	13417*
.375	2.500	1.126	318
.375	2.750	1.237	13418*
.375	3.000	1.350	S-717
.375	3.250	1.462	13419*
.375	3.500	1.576	2049
.375	3.750	1.687	13420
.375	4.000	1.800	2048
.375	4.250	1.912	13421*
.375	4.500	2.030	13422
.375	4.750	2.138	13423*
.375	5.000	2.250	6830
.375	5.500	2.475	14992*
.375	6.000	2.700	14903
.375	6.500	2.925	14994*
.375	7.000	3.150	14995*
.375	8.000	3.600	14996
.500	.750	.450	778
.500	1.000	.584	524 (d)
.500	1.000	.595	642
.500	1.250	.750	671
.500	1.500	.900	289
.500	1.750	1.050	1768
.500	2.000	1.200	287
.500	2.500	1.500	776
.500	3.000	1.800	S-1054

STANDARD DIE DATA

(a) .015 RadII All Corners •(b) .030 RadII All Corners
(c) .062 RadII All Corners • (d) .125 RadII All Corners
(e) .187 RadII All Corners

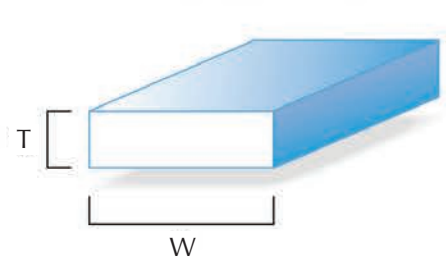


FLAT BAR

Thickness	Width	Est Wt Lbs/Ft	NNE DIE#
.500	3.500	2.100	6858
.500	4.000	2.400	2047
.500	5.000	3.000	S-1156
.500	6.000	3.600	8617
.500	7.000	4.200	2182
.500	8.000	4.800	14997
.562	3.000	2.018	304 (e)
.625	1.000	.750	592
.625	1.750	1.313	831
.625	2.000	1.500	980
.625	3.000	2.250	981
.625	3.250	3.900	1438
.630	9.00	5.803	15758
.750	1.000	.900	593
.750	1.250	1.125	2043
.750	1.500	1.350	315
.750	1.750	1.576	1817
.750	2.000	1.800	775
.750	2.500	2.250	317
.750	2.500	2.214	1321 (e)
.750	2.750	2.474	1176
.750	3.000	2.700	15001*
.750	3.500	3.150	6600
.750	4.000	3.600	2657
.750	5.000	4.500	S-783
.750	6.000	5.400	15044
.750	7.000	6.300	14999*
.750	8.000	7.200	15000
.750	9.310	8.379	14971
.780	9.000	8.424	14724
.860	1.360	1.365	5325
.860	1.860	1.854	5326 (c)
1.000	1.250	1.400	4822
1.000	1.500	1.800	316
1.000	1.750	2.100	2307
1.000	2.000	2.400	766
1.000	2.500	3.000	767
1.000	3.000	3.600	319
1.000	3.000	3.600	3439 (d)

STANDARD DIE DATA

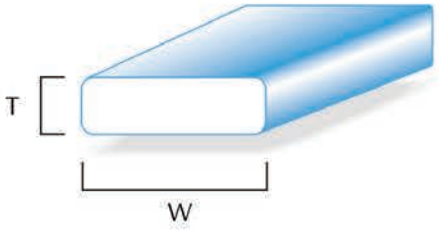
(a) .015 RadII All Corners •(b) .030 RadII All Corners
(c) .062 RadII All Corners • (d) .125 RadII All Corners
(e) .187 RadII All Corners



FLAT BAR

Thickness	Width	Est Wt Lbs/Ft	NNE DIE#
1.000	3.250	3.900	2308
1.000	4.000	4.800	2223
1.000	5.000	6.000	15614
1.000	5.500	6.600	2340
1.000	6.000	7.200	15060
1.000	7.000	8.400	15002*
1.000	8.000	9.600	15847
1.125	2.500	3.375	7653
1.250	2.000	3.000	9335
1.250	2.500	3.750	S-13427
1.250	2.750	4.124	1450 (e)
1.250	3.000	4.500	336
1.500	4.000	7.200	15278
2.000	2.500	6.000	15846
2.000	3.000	7.200	13164
2.000	3.250	7.800	15673
2.000	4.000	9.600	15277
2.500	3.000	9.000	15845

STANDARD DIE DATA



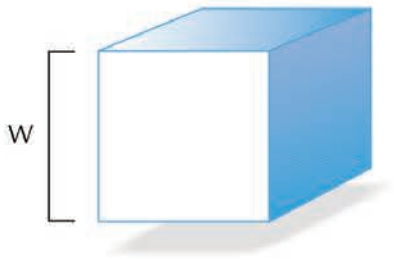
FLAT BAR RADIUS CORNER

Thickness	Width	Radius	Est Wt Lbs/Ft	NNE DIE#
.250	1.000	.125	.125	11879
.250	2.000	.125	.584	3740
.250	3.000	.125	.884	3739
.250	4.000	.125	1.184	3738
.250	5.000	.125	1.484	3737
.312	5.500	.062	2.059	S-1059
.500	.000	.250	1.138	S-827
.750	4.000	.062	3.600	S-1058
.375	1.375	.188	.590	S-1117

*Die may not be available. Check with a customer service representative

STANDARD DIE DATA

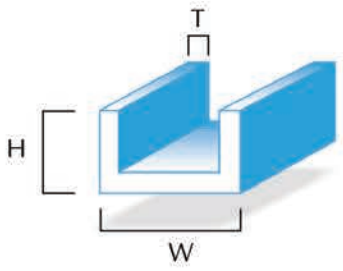
(a) .093 Radll All Corners •(b) .125 Radll All Corners
(c) .062 Radll All Corners



SQUARE BAR

Width	Est Wt Lbs/Ft	NNE DIE#
.250	.075	6182
.312	.116	1199
.375	.169	661
.500	.300	1180
.562	.379	8363
.625	.469	979
.750	.674	1181
.875	.918	7498
1.000	1.200	1182
1.000	1.200	4052 (b)
1.250	1.876	920 (a)
1.250	1.876	S-1200
1.375	2.269	15185
1.500	2.700	885
1.750	3.676	12692
1.750	3.674	S-1057 (c)
2.000	4.800	2224
2.250	6.075	15003
2.500	7.500	15004
2.750	9.075	15005*
3.000	10.800	15059
3.500	15.000	15844

STANDARD DIE DATA

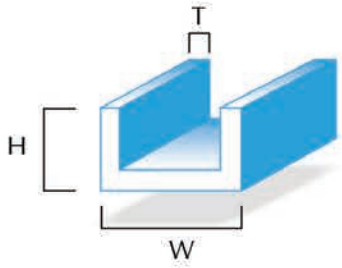


CHANNELS

Width	Heights	Thickness	Est Wt Lbs/Ft	NNE DIE#
.432	.500	.060	.094	137
.500	.375	.125	.148	6449
.500	.500	.093	.146	S-662
.500	.500	.125	.187	4156
.500	.750	.125	.262	S-2313
.500	1.000	.093	.244	3746
.543	.625	.125	.232	2577
.565	.625	.125	.235	2578
.625	.500	.125	.206	530
.625	.625	.064	.134	439
.625	.625	.125	.244	477
.625	.750	.094	.217	4155
.625	1.000	.125	.356	1373
.687	.422	.093	.148	10292
.750	.375	.125	.187	6939
.750	.500	.062	.121	268
.750	.500	.125	.226	531
.750	.750	.125	.300	478
.750	.875	.125	.337	4998
.875	1.000	.125	.393	7275
1.000	.500	.125	.263	508
1.000	.625	.125	.300	2233
1.000	.750	.093	.259	2727
1.000	.750	.125	.337	2053
1.000	1.000	.125	.413	446
1.000	2.000	.125	.713	S-1037
1.031	.625	.062	.161	S-323
1.250	.375	.125	.263	507
1.250	.500	.125	.300	340
1.250	.500	.250	.413	S-796
1.250	.625	.125	.337	506
1.250	.750	.125	.376	S-1583
1.250	1.250	.125	.526	663
1.312	1.750	.125	.682	8859
1.375	.750	.062	.205	924
1.375	.875	.125	.431	505
1.500	.375	.125	.300	504
1.500	.500	.125	.337	S-445
1.500	.625	.125	.376	503
1.500	.750	.125	.413	2054
1.500	1.000	.118	.466	S-1221
1.500	1.000	.125	.487	S-747

WAKEFIELD EXTRUSION

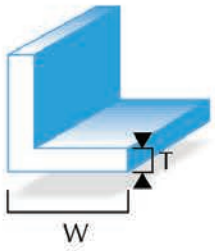
STANDARD DIE DATA



CHANNELS

Width	Heights	Thickness	Est Wt Lbs/Ft	NNE DIE#
1.500	1.062	.062	.261	10056*
1.500	1.250	.125	.563	632
1.500	1.500	.125	.637	563
1.750	.500	.125	.376	501
1.750	.750	.125	.437	499
1.750	1.000	.125	.524	4157
1.750	1.750	.125	.625	S-1032
1.750	2.000	.093	.620	S-574
1.800	3.500	.120	1.232	7709
2.000	.500	.125	.413	15658
2.000	1.000	.093	.426	S-2215
2.000	1.000	.118	.532	S-1189
2.000	1.000	.125	.526	444
2.000	1.000	.187	.815	S-2569
2.000	1.000	.250	1.050	6749
2.000	1.250	.125	.637	S-266
2.000	2.000	.125	.863	524
2.187	6.250	.250	4.256	8316*
2.250	.875	.125	.562	S-7386
2.263	1.125	.105	.546	S-1039
2.500	.750	.125	.562	S-2055
2.500	1.000	.187	.926	2570
2.500	1.500	.125	.787	2057
2.500	2.500	.125	1.087	3510
2.500	5.500	.125	1.987	5547
2.750	1.125	.250	1.350	2007
3.000	.500	.125	.563	1496
3.000	.750	.125	.637	S-700
3.000	1.000	.093	.537	10009
3.000	1.000	.125	.713	S-816
3.000	1.500	.125	.845	S-556
3.000	2.000	.125	1.013	5266
3.000	2.000	.375	2.813	2008
3.000	3.000	.125	1.313	3511
3.625	.812	.125	.750	2790
4.000	1.500	.125	1.013	605
4.000	1.750	.125	1.087	S-4152
4.500	1.750	.125	1.161	4151
4.500	2.000	.125	1.238	S-2056
5.000	2.000	.187	1.936	713
5.250	1.125	.125	1.087	11075

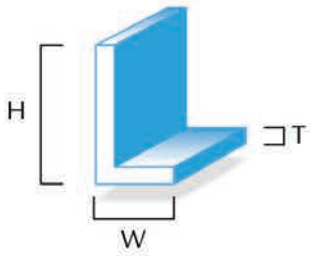
STANDARD DIE DATA



EQUAL LEG ANGLES

Width	Thickness	Est Wt Lbs/Ft	NNE DIE#
.500	.093	.101	461
.500	.125	.131	447
.500	.062	.070	442
.625	.062	.089	463
.625	.093	.130	462
.625	.125	.168	441
.625	.188	.239	9142
.750	.125	.199	S-378
.750	.062	.107	S-464
.750	.093	.157	465
1.000	.250	.526	466
1.000	.187	.407	473
1.000	.125	.281	165
1.000	.050	.118	S-698
1.000	.062	.144	470
1.250	.062	.181	7300
1.250	.125	.356	450
1.250	.187	.520	S-270
1.250	.250	.676	467
1.500	.093	.324	S-1038
1.500	.125	.431	339
1.500	.187	.631	443
1.500	.250	.825	S-183
1.500	.500	1.500	9773
1.500	.062	.218	3432
1.750	.125	.506	S-468
1.750	.187	.744	440
1.750	.250	.936	7886
1.750	.437	1.606	427
2.000	.093	.440	S-977
2.000	.250	1.126	448
2.000	.125	.581	178
2.000	.187	.856	S-469
2.500	.125	.730	5199
2.500	.187	1.085	8282
3.000	.125	.881	521
3.000	.187	1.310	4952
3.000	.250	1.725	S-5261
3.500	.125	1.031	7647
4.000	.125	1.180	5345
4.000	.375	3.436	15843

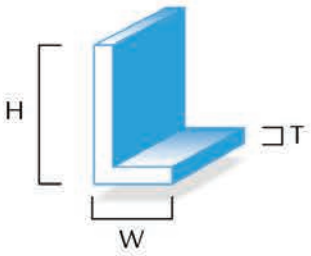
STANDARD DIE DATA



UNEQUAL LEG ANGLES

Width	Height	Thickness	Est Wt Lbs/Ft	NNE DIE#
.312	2.000	.125	.328	1388
.375	.750	.093	.115	781
.375	1.000	.062	.100	329
.500	.750	.062	.089	800
.500	.750	.125	.168	4154
.500	1.000	.093	.157	782
.500	1.000	.125	.206	S-787
.500	1.062	.187	.308	344
.500	1.250	.125	.244	588
.500	1.500	.125	.281	2059
.500	2.000	.125	.356	10342
.500	3.000	.125	.506	10245
.625	.875	.125	.206	1528
.625	1.000	.188	.324	6014
.625	1.750	.090	.247	S-111
.625	1.750	.125	.300	7878
.750	1.000	.125	.244	678
.750	1.000	.250	.450	13612
.750	1.250	.125	.281	419
.750	1.500	.125	.319	S-786
.750	1.800	.250	.690	14204
.750	2.000	.125	.394	2058
.750	2.250	.125	.431	625
.750	2.250	.250	.825	241
.813	1.062	.050	.109	7710
1.000	1.500	.060	.180	15818
1.000	1.500	.125	.356	S-785
1.000	1.500	.156	.439	449
1.000	1.750	.125	.393	4979
1.000	2.000	.125	.431	346
1.000	2.000	.187	.631	955
1.000	2.500	.125	.506	5196
1.000	3.000	.125	.581	523
1.000	3.250	.250	1.080	3699
1.000	4.000	.125	.730	4153
1.125	2.250	.125	.487	680
1.250	2.000	.250	.900	760
1.250	3.500	.125	.694	792
1.250	6.000	.125	1.062	15087
1.500	1.750	.125	.468	6943
1.500	2.000	.125	.506	5200
1.500	2.000	.188	.747	15682

STANDARD DIE DATA



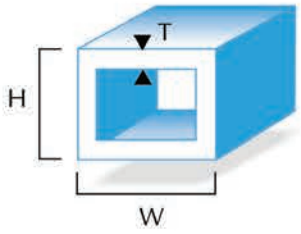
UNEQUAL LEG ANGLES

Width	Height	Thickness	Est Wt Lbs/Ft	NNE DIE#
1.500	2.250	.125	.526	631
1.500	2.500	.125	.579	5201
1.500	4.000	.188	1.200	10575
1.938	3.000	.187	1.071	3775
2.000	2.250	.250	1.200	4828
2.000	2.500	.125	.660	7760
2.000	3.000	.125	.731	5144
2.000	3.000	.250	1.424	S-4808
2.000	3.500	.125	.806	7096
2.000	4.000	.125	.881	S-530
2.000	5.000	.125	1.019	S-1261
2.250	5.250	.125	1.144	5256
2.500	3.500	.125	.808	6806
2.750	4.750	.250	2.176	5044
3.000	3.500	.125	.956	5545
3.000	4.000	.125	1.031	6944
3.000	5.000	.125	1.180	5258
3.000	5.500	.375	3.655	6888
3.187	4.500	.187	1.688	10853
4.000	5.000	.125	1.330	5257
5.000	2.000	.125	1.019	S-1261
6.000	1.250	.125	1.062	15087

WAKEFIELD EXTRUSION

STANDARD DIE DATA

(a) Inside Corners .062 RadII •(b) Outside Corners .125 RadII
(c) Inside Corners .125 RadII • (d) Shape has ID Work
(e) Outside Corners .031

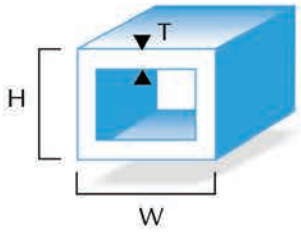


RECTANGULAR TUBES

Width	Heights	Thickness	Est Wt Lbs/Ft	NNE DIE#
1.000	.500	.125	.374	TS-4631
1.500	.750	.062	.313	S-7119
1.500	.750	.078	.392	PH-3007
1.500	.750	.125	.600	S-PH-4630 (e, f)
1.500	1.000	.078	.437	PH-3008*
1.500	1.000	.125	.675	S-PH-536
1.525	.800	.150	.728	TS-11670
2.000	.750	.125	.750	S-TS-3189
2.000	1.000	.062	.428	PH-11660
2.000	1.000	.118	.782	TS-3192
2.000	1.000	.125	.826	PH-679
2.000	1.500	.125	.974	PH-591 (b, c)
2.000	1.500	.188	.141	PH-15401 (b, c)
2.250	1.750	.120	1.082	TS-1123
2.250	1.750	.125	1.129	PH14660 (c)
2.500	1.250	.125	1.050	PH-1470
2.500	1.500	.125	1.126	TS-865
3.000	1.000	.125	1.126	PH-2060
3.000	1.250	.125	1.200	PH-2229
3.000	1.750	.125	1.350	PH-1221
3.000	2.000	.125	1.426	TS-1455
3.000	2.000	.188	2.050	S-7117
3.000	2.500	.125	1.548	S-7246
3.250	1.500	.125	1.348	TS-8132
3.500	.875	.125	1.237	PH-1437
3.500	1.750	.062	.763	S-6037
3.500	1.750	.125	1.500	TS-1435
3.500	2.000	.093	1.186	TS-10499 (a)
4.000	1.000	.119	1.310	TS-4742
4.000	1.500	.093	1.186	S-6061
4.000	1.500	.125	1.558	S-7250
4.000	1.750	.093	1.255	TS-1953
4.000	1.750	.102	1.357	TS-3120
4.000	1.750	.125	1.650	PH-494
4.000	2.000	.125	1.726	TS-1633/S-7006
4.062	2.242	.090	1.345	TS-10489 (b)
4.500	1.250	.212	2.710	PH14672
4.500	1.750	.125	1.800	PH-2421
4.500	2.000	.125	1.875	TS-10441

STANDARD DIE DATA

(a) Inside Corners .062 RadII •(b) Outside Corners .125 RadII
(c) Inside Corners .125 RadII • (d) Shape has ID Work
(e) Outside Corners .031



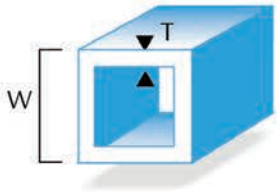
RECTANGULAR TUBES

Width	Heights	Thickness	Est Wt Lbs/Ft	NNE DIE#
5.000	1.750	.125	1.950	PH-2422
5.000	2.000	.125	2.026	S-PH-2311
5.000	3.000	.125	2.330	PH-3080
5.000	4.000	.250	5.100	PH-8168 (a)
5.500	1.750	.125	2.100	PH-4651
6.000	1.500	.125	2.176	PH-2652
6.000	1.750	.125	2.232	S-7114
6.000	2.000	.090	1.689	S-7099
6.000	2.000	.118	2.207	S-7220
6.000	2.000	.125	2.326	PH-2131
6.000	3.000	.125	2.631	PH-14605
7.000	2.000	.125	2.625	PH-14606*
7.000	3.000	.125	2.925	PH-14607*
8.000	2.000	.125	2.929	PH-14608

*Die may not be available. Check with a customer service representative

STANDARD DIE DATA

(a) .031 Radius on Outside Corners • (b) .060 Radius on Inside Corners
(c) .060 Radius on Outside Corners • (d) .125 Radius on Outside Corners
(e) .125 Radius on Inside Corners • (f) .093 Radius on Outside Corners
(g) .163 Radius on Inside Corners • (h) .313 Radius on Outside Corners

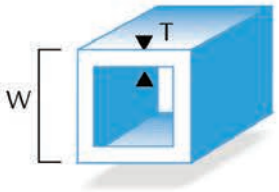


SQUARE TUBES

Thickness	Width	Est Wt Lbs/Ft	NNE DIE#
.500	.062	.131	PH-535
.500	.125	.224	S-7118
.625	.062	.167	PH-456
.735	.042	.138	S-7223
.750	.055	.184	S-7053
.750	.062	.205	PH-3128
.750	.062	.205	PH-1434
.750	.095	.299	PH-14507
.750	.125	.376	S-7122 (f)
1.000	.050	.228	TS-4689
1.000	.055	.244	S-7200
1.000	.064	.288	PH-647
1.000	.065	.280	S-7037
1.000	.086	.324	S-7241
1.000	.090	.377	S-7022 (b, d)
1.000	.125	.526	PH-725
1.000	.125	.522	S-7038 Rounded Corners- .060
1.000	.125	.540	PH15310 Rounded Corners- .09375
1.125	.125	.601	PH15311 (f)
1.250	.065	.290	PH15351
1.250	.078	.439	S-PH-878
1.250	.090	.486	PH14674 (d)
1.250	.125	.676	PH-1469
1.250	.125	.668	PH15312 (f)
1.250	.250	1.200	S-7167
1.500	.063	.431	S-7035
1.500	.078	.532	S-PH-4639
1.500	.085	.572	S-7225
1.500	.093	.628	S-6024
1.500	.118	.791	S-7212
1.500	.125	.818	PH15363
1.500	.125	.826	PH-548
1.500	.188	1.185	PH-1403 (d, e)
1.500	.250	1.500	S-7155
1.750	.090	.718	S-7094
1.750	.125	.970	PH15362 (f)
1.750	.125	.976	PH-422

STANDARD DIE DATA

(a) .031 Radius on Outside Corners • (b) .060 Radius on Inside Corners
(c) .060 Radius on Outside Corners • (d) .125 Radius on Outside Corners
(e) .125 Radius on Inside Corners • (f) .093 Radius on Outside Corners
(g) .163 Radius on Inside Corners • (h) .313 Radius on Outside Corners

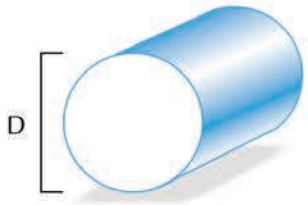


SQUARE TUBES

Thickness	Width	Est Wt Lbs/Ft	NNE DIE#
1.982	.087	.791	S-7204
1.982	.118	1.056	S-7205
2.000	.060	0	PH-15430
2.000	.078	.720	PH-1584
2.000	.093	.851	S-6013
2.000	.125	1.126	PH-594
2.000	.188	1.611	S-7199
2.000	.188	1.638	PH-15402 (d, e)
2.000	.250	2.099	S-7215
2.250	.078	.812	PH-1144
2.250	.125	1.129	PH14660
2.500	.075	.883	PH14690
2.500	.125	1.424	TS-683
2.500	.250	2.700	S-7050
3.000	.093	1.297	S-6023
3.000	.118	1.646	S-7218
3.000	.125	1.730	PH-722
3.000	.250	3.310	PH14681
4.000	.093	1.743	PH-3125
4.000	.118	2.211	S-7219
4.000	.125	2.325	PH-2306
4.000	.125	2.234	PH-3162 (e)
4.000	.188	3.432	PH14695
4.000	.250	4.500	PH-8157
4.014	.100	1.843	PH15331
4.500	.125	2.624	PH-3104
5.000	.125	2.945	PH-14609
5.500	.125	3.225	PH-14610*
6.000	.125	3.525	PH-14611

WAKEFIELD EXTRUSION

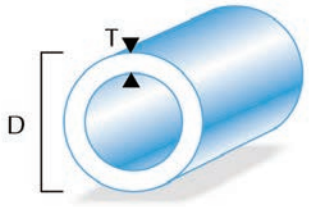
STANDARD DIE DATA



ROUND ROD

Depth	Est Wt Lbs/Ft	NNE DIE#
.281±.003	.074	15183
.312	.090	S-887
.375	.131	616
.375±.003	.132	15812
.437		14302
.500	.235	2181
.530/.520	.260	15814
.562	.299	S-234
.625	.368	S-311
.750	.530	S-2496
.812	.623	2529
.812±.006	.622	15767
.875	.750	2513
.937	.826	3450
1.000	.942	1767
1.125±.003	1.193	15756
1.187	1.330	301
1.250	1.472	1187
1.350±.012	1.718	15795
1.375	1.744	6189/S-1276
1.375±.006		15775
1.500	2.120	S-300
1.562±.006		15766
1.625	2.488	15678*
1.625±.006	2.488	15678
1.687	2.684	8364
1.750	2.884	13425
1.875	3.331	14303
2.000	3.768	S-2581
2.250	4.768	13426*
2.375	5.274	3248
2.500	5.890	6184
2.750	7.124	15009
3.000	8.478	15010
3.500	11.546	14307

STANDARD DIE DATA

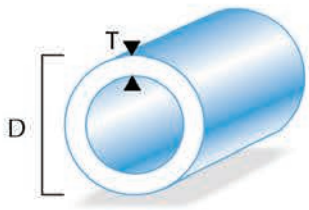


EXTRUDED PIPE

Thickness	Diameter	Pipe Size	Schedule	Est Wt Lbs/Ft	NNE DIE#
.109	1.315	1	10	.496	PH13306
.109	1.900	1 1/2	10	.721	PH1659
.109	1.660	1 1/4	10	.625	PH1658
.109	2.375	2	10	.913	PH13307
.120	2.875	2 1/2	10	1.221	PH14620*
.120	3.500	3	10	1.498	PH14621
.120	4.000	3 1/2	10	1.720	PH14622
.120	4.500	4	10	1.942	PH14623
.134	5.563	5	10	2.688	PH14624*
.134	6.625	6	10	3.213	PH14625*
.133	1.315	1	40	.592	PH509
.145	1.900	1 1/2	40	.939	PH244
.140	1.660	1 1/4	40	.785	PH277
.109	.840	1/2	40	.300	S-7011
.154	2.375	2	40	1.290	PH1203
.203	2.875	2 1/2	40	2.044	TS-13304
.216	3.500	3	40	2.621	S-7230
.226	4.000	3 1/2	40	3.215	PH14616
.113	1.050	3/4	40	.399	PH-510
.237	4.500	4	40	3.733	PH14617
.258	5.563	5	40	5.057	PH14618
.280	6.625	6	40	6.697	PH14619
.200	1.900	1 1/2	80	1.274	PH-1548
.191	1.660	1 1/4	80	1.057	S-6016
.218	2.375	2	80	1.772	PH13303
.276	2.875	2 1/2	80	2.650	PH14668
.300	3.500	3	80	3.547	S-7106
.318	4.000	3 1/2	80	4.440	PH14626
.337	4.500	4	80	5.183	PH14627*
.375	5.563	5	80	7.188	PH14628
.432	6.625	6	80	9.884	PH14629*

*Die may not be available. Check with a customer ser service representative

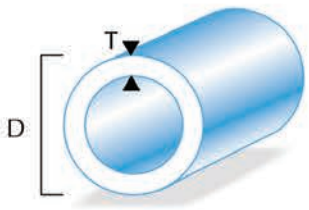
STANDARD DIE DATA



ROUND TUBES

Diameter	Thickness	Est Wt Lbs/Ft	NNE DIE#
.594	.047	.096	PH-3141
.625	.058	.124	PH-15314
.625+.000/-	.112	.219	S-7245
.750	.050	.132	S-6040
.750	.062	.162	PH-11555
.750	.125	.294	S-7216
.750	.176	.379	PH-11652
.812	.080	.222	PH-11538
1.000	.055	.195	S-7224
1.000	.063	.222	S-7129
1.000	.065	.229	PH-10471
1.000	.075	.262	PH-11537
1.000	.125	.407	S-7018
1.250	.065	.290	PH15351
1.250	.080	.353	PH-11561
1.250	.090	.394	S-7047
1.250	.095	.414	PH-768
1.250	.110	.475	PH-769
1.250	.125	.530	S-7107
1.315	.109	.496	PH13306
1.315	.125	.560	S-7217
1.375	.080	.392	PH-3031
1.500	.065	.352	PH-7024
1.500	.080	.428	PH-11659
1.500	.093	.493	S-7185
1.500	.115	.600	S-7226
1.500	.125	.648	TS-10477
1.500	.250	1.178	S-7134
1.575	.125	.683	PH15305
1.660	.130	.749	S-7203
1.750	.065	.413	S-7043
1.905	.176	1.147	PH15304
1.997	.065	.469	PH11554
2.000	.065	.474	TS-4767
2.000	.093	.668	S-7109
2.000	.125	.883	S-7010
2.000	.500	2.827	PH15387
2.125	.156	1.157	PH14683
2.250	.065	.559	S-7055
2.250	.125	.100	PH14680
2.362	.197	1.608	PH15303

STANDARD DIE DATA

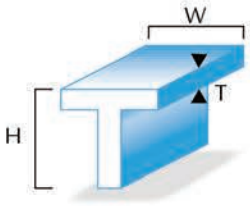


ROUND TUBES

Diameter	Thickness	Est Wt Lbs/Ft	NNE DIE#
2.375	.140	1.181	S-7213
2.375	.200	1.642	S-7214
2.500	.065	.596	PH-4633
2.500	.125	1.12	S-7108
2.500	.156	1.378	PH14682
2.500	.250	2.121	PH15389
3.000	.125	1.348	TS-3190
3.250	.125	1.475	S-7137
3.500	.300	3.547	S-7106
3.750	.125	1.709	TS-11541
4.000	.125	1.824	TS-3191
4.000	.250	3.534	PH15388
4.000	.318	4.440	PH14626
4.500	.125	2.061	PH-14612*
4.500	.500	.754	PH15309
5.000	.125	2.298	PH-14613
5.500	.125	2.532	PH-14614*
6.000	.125	2.767	PH-14615*

*Die may not be available. Check with a customer service representative

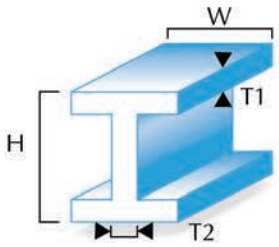
STANDARD DIE DATA



TEES

Width	Height	Thickness	Est Wt Lbs/Ft	NNE DIE#
.500	1.000	.062	.109	328
.750	.750	.125	.205	6793
.750	1.250	.125	.281	7082
1.000	.750	.125	.214	6543
1.000	1.000	.125	.281	832
1.125	1.125	.125	.319	520
1.250	.875	.125	.300	4968
1.375	1.375	.125	.396	1052
1.500	1.500	.125	.431	3509
1.500	1.750	.187	.688	1472
1.750	.625	.125	.300	7879
2.000	.750	.125	.393	6859
2.000	1.624	.156	.649	242
2.000	2.000	.187	.860	522

STANDARD DIE DATA

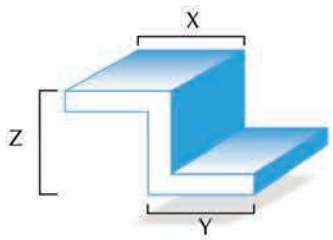


I BEAM

Width	Height	T1	T2	Est Wt Lbs/Ft	NNE DIE#
2.000	2.500	.125	.125	.956	S-1160
2.500	3.000	.125	.125	.994	S-1154
4.000	3.000	.170	.290	2.852	15246
5.000	3.500	.190	.320	3.750	15247
6.000	4.000	.210	.350	4.274	15248

*Die may not be available. Check with a customer service representative

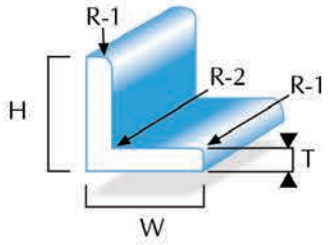
STANDARD DIE DATA



ZEE BAR

X	Y	Z	Thickness	Est Wt Lbs/Ft	NNE DIE#
.500	.500	.500	.093	.146	6937
.625	.875	1.000	.125	.337	519
.750	.750	.750	.125	.300	518
.750	.750	.875	.125	.318	7298
1.000	1.000	1.625	.125	.487	7151
1.125	1.125	.375	.125	.413	5925
1.125	1.125	1.000	.125	.450	6912

STANDARD DIE DATA



STRUCTURAL ANGLES

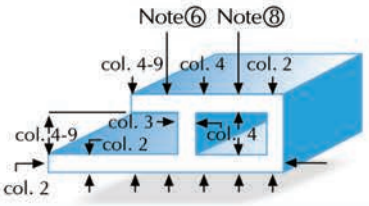
Width	Height	Thickness	R1	R2	Est Wt Lbs/Ft	NNE DIE#
1.500	1.500	.125	.125	.188	.433	S-1139
1.000	1.000	.125	.094	.125	.284	S-793
2.000	2.000	.125	.125	.250	.589	S-1142
1.250	1.250	.125	.125	.188	.343	15061
2.000	1.500	.188	.188	.188	.730	S-778
2.000	3.000	.188	.188	.188	1.070	S-782
1.000	1.000	.188	.094	.125	.400	15056
3.000	3.000	.188	.250	.312	1.275	S-794
2.000	2.000	.188	.188	.188	.850	S-774
2.500	2.500	.188	.125	.250	1.100	S-792
1.500	1.500	.188	.125	.187	.64	13027
1.250	1.250	.188	.125	.188	.510	15062
1.500	1.500	.250	.125	.188	.828	S-2488
1.750	1.750	.250	.125	.188	.748	15744
4.000	3.000	.250	.250	.375	2.024	2253
1.750	1.750	.250	.125	.188	.956	15129
4.000	4.000	.250	.250	.375	2.283	15063
2.000	1.500	.250	.250	.250	.960	S-779
2.000	3.000	.250	.250	.250	1.40	S-772
3.000	3.000	.250	.250	.312	1.723	S-1167
3.000	2.500	.250	.250	.250	1.540	S-780
2.000	2.000	.250	.250	.250	1.115	S-1050
2.500	2.500	.250	.125	.250	1.404	15058
6.000	3.500	.313	.313	.500	3.46	13028
5.000	3.000	.375	.312	.375	3.423	15042
6.000	6.000	.375	.375	.500	5.119	15130
2.500	2.500	.375	.125	.250	2.047	15715
2.000	2.000	.375	.125	.250	1.606	15057
4.000	4.000	.375	.205	.375	3.436	15843
3.000	3.000	.375	.375	.375	2.470	S-781
3.500	3.500	.375	.250	.375	2.926	15113
4.050	4.000	.500	.375	.500	4.531	15106
6.000	4.000	.500	.375	.500	5.725	15107

*Die may not be available. Check with a customer service representative

WAKEFIELD EXTRUSION

EXTRUDED CROSS-SECTIONAL DIMENSION TOLERANCES

wire, rod, bar & profiles (shapes) [1]
except for profiles (shapes) in T3510, T4510, T6510, T63510 and T8510 [7]



TOLERANCES [2] [3] — in. plus and minus																
	METAL DIMENSIONS				SPACE DIMENSIONS											
specified dimension in.	allowable deviation from specified dimension where 75 percent or more of the dimension is metal [9] [10]				allowable deviation from specified dimension where more than 25 percent of the dimension is space [6] [8]											
	All Except Those Covered by Column 3		Wall Thickness[4] Completely[5] Enclosing Space 0.11 sq. in. and Over (Eccentricity)		At Dimensioned Points 0.250 - 0.624 Inches from Base of Leg		At Dimensioned Points 0.625 - 1.249 Inches from Base of Leg		At Dimensioned Points 1.250 - 2.499 Inches from Base of Leg		At Dimensioned Points 2.500 - 3.999 Inches from Base of Leg		At Dimensioned Points 4.000 - 5.999 Inches from Base of Leg		At Dimensioned Points 6.000 - 8.000 Inches from Base of Leg	
Col. 1	Col. 2		Col. 3		Col. 4		Col. 5		Col. 6		Col. 7		Col. 8		Col. 9	
	Alloys 5083, 5086, 5454	11 Other Alloys	Alloys 5083, 5086, 5454	11 Other Alloys	Alloys 5083, 5086, 5454	11 Other Alloys	Alloys 5083, 5086, 5454	11 Other Alloys	Alloys 5083, 5086, 5454	11 Other Alloys	Alloys 5083, 5086, 5454	11 Other Alloys	Alloys 5083, 5086, 5454	11 Other Alloys	Alloys 5083, 5086, 5454	11 Other Alloys
CIRCUMSCRIBING CIRCLE SIZES LESS THAN 10 INCHES IN DIAMETER																
Up thru 0.124	.009	.006	±15% of specified dimension; ±.090 max. ±.015 min.	±10% of specified dimension; ±.060 max. ±.010 min.	.013	.010	.015	.012	-	-	-	-	-	-	-	-
0.125-0.249	.011	.007			.016	.012	.018	.014	.020	.016	-	-	-	-	-	-
0.250-0.499	.012	.008			.018	.014	.020	.016	.022	.018	.024	.020	-	-	-	-
0.500-0.749	.014	.009			.021	.016	.023	.018	.025	.020	.027	.022	-	-	-	-
0.750-0.999	.015	.010			.023	.018	.025	.020	.027	.022	.030	.025	.035	.030	-	-
1.000-1.499	.018	.012			.027	.021	.029	.023	.032	.026	.036	.030	.041	.035	-	-
1.500-1.999	.021	.014			.031	.024	.033	.026	.038	.031	.043	.036	.049	.042	.057	.050
2.000-3.999	.036	.024			.046	.034	.050	.038	.060	.048	.069	.057	.080	.068	.092	.080
4.000-5.999	.051	.034			.061	.044	.067	.050	.081	.064	.095	.078	.111	.094	.127	.110
6.000-7.999	.066	.044			.076	.054	.084	.062	.104	.082	.121	.099	.142	.120	.162	.140
8.000-9.999	.081	.054			.091	.064	.101	.074	.127	.100	.147	.120	.182	.145	.197	.170
CIRCUMSCRIBING CIRCLE SIZES LESS THAN 10 INCHES IN DIAMETER AND OVER																
Up thru 0.124	.021	.014	±15% of specified dimension; ±.090 max. ±.025 min.	±15% of specified dimension; ±.090 max. ±.015 min.	.025	.018	.027	.020	-	-	-	-	-	-	-	-
0.125-0.249	.022	.015			.026	.019	.029	.022	.035	.028	-	-	-	-	-	-
0.250-0.499	.024	.016			.028	.020	.032	.024	.038	.030	.058	.050	-	-	-	-
0.500-0.749	.025	.017			.030	.022	.035	.027	.049	.040	.068	.060	-	-	-	-
0.750-0.999	.027	.018			.031	.023	.039	.030	.057	.050	.079	.070	.099	.090	-	-
1.000-1.499	.028	.019			.033	.024	.043	.034	.069	.060	.089	.080	.109	.100	-	-
1.500-1.999	.036	.024			.046	.034	.056	.044	.082	.070	.102	.090	.122	.110	.182	.170
2.000-3.999	.051	.034			.061	.044	.071	.054	.097	.080	.117	.100	.137	.120	.197	.180
4.000-5.999	.066	.044			.076	.054	.086	.064	.112	.090	.132	.110	.152	.130	.212	.190
6.000-7.999	.081	.054			.091	.064	.101	.074	.127	.100	.147	.120	.167	.140	.227	.200
8.000-9.999	.096	.064			.106	.074	.116	.084	.142	.110	.162	.130	.182	.150	.242	.210
10.000-11.999	.111	.074			.121	.084	.131	.094	.157	.120	.177	.140	.197	.160	.257	.220
12.000-13.999	.126	.084			.136	.094	.146	.104	.172	.130	.192	.150	.212	.170	.272	.230
14.000-15.999	.141	.094			.151	.104	.161	.114	.187	.140	.207	.160	.227	.180	.287	.240
16.000-17.999	.156	.104			.166	.114	.176	.124	.202	.150	.222	.170	.242	.190	.302	.250
18.000-19.999	.171	.114			.181	.124	.191	.134	.217	.160	.237	.180	.257	.200	.317	.260
20.000-21.999	.186	.124			.196	.134	.206	.144	.232	.170	.252	.190	.272	.210	.332	.270
22.000-24.000	.201	.134			.211	.144	.221	.154	.247	.180	.267	.200	.287	.220	.347	.280

Footnotes:

[1] These Standard Tolerances are applicable to the average profile (shape); wider tolerances may be required for some profiles (shapes) and closer tolerances may be possible for others.

[2] The tolerances applicable to a dimension composed of two or more component dimensions is the sum of the tolerances of the component dimensions if all of the component dimensions are indicated.

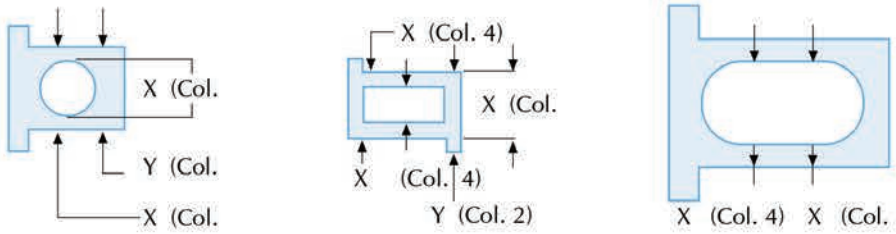
[3] When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which applies to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.

[4] Where dimensions specified are outside and inside, rather than wall thickness itself, the allowable deviation (eccentricity) given in Column 3 applies to mean wall thickness. (Mean wall thickness is the average of two wall thickness measurements taken at opposite sides of the void.)

[5] In the case of Class 1 Hollow Profiles (Shapes) the standard wall thickness tolerance for extruded round tube is applicable. (A Class 1 Hollow Profile (Shape) is one whose void is round and one inch or more in diameter and whose weight is equally distributed on opposite sides of two or more equally spaced axes.)

EXAMPLES ILLUSTRATING USE OF CROSS-SECTIONAL DIMENSION TOLERANCES

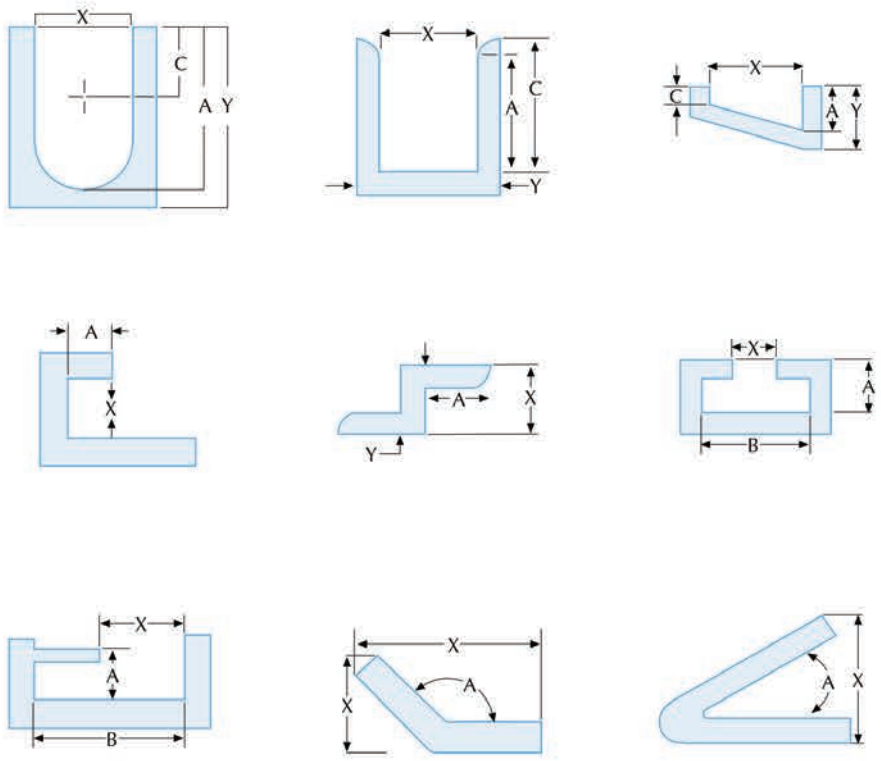
CLOSED-SPACE DIMENSIONS



All dimensions designated "Y" are classed as "metal dimensions," and tolerances are determined from column 2.

Dimensions designated "X" are classed as "space dimensions through an enclosed void," and the tolerances applicable are determined from column 4 unless 75 percent or more of the dimension is metal, in which case column 2 applies.

OPEN-SPACE DIMENSIONS



Tolerances applicable to dimensions "X" are determined as follows:

1. Locate dimension "X" in column 1.
2. Determine which of columns 4-9 is applicable, dependent on distance "A."
3. Locate proper tolerances in column 4, 5, 6, 7, 8 or 9 in the same line as dimension "X."

Dimensions "Y" are "metal dimensions"; tolerances are determined from column 2.

Distances "C" are shown merely to indicate incorrect values for determining which of columns 4-9 apply.

Tolerances applicable to dimensions "X" are determined as follows:

1. Locate distance "B" in column 1.
2. Determine which of columns 4-9 is applicable, dependent on distance "A."
3. Locate proper tolerances in column 4, 5, 6, 7, 8 or 9 in the same line as value chosen in column 1.

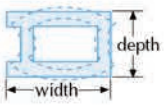
Tolerances applicable to dimensions "X" are determined by standard tolerances applicable to angles "A."

Footnotes (continued):

[6] At points less than 0.250 inch from base of leg the tolerances in Col. 2 are applicable.

[7] Tolerances for extruded profiles (shapes) in T3510, T4510, T6510, T7350, T76510, T8510 tempers shall be as agreed upon between purchaser and vendor at the time the contract or order is entered.

[8] The following tolerances apply where the space is completely enclosed (hollow profiles (shapes)); For the width (A), the balance is the value shown in Col. 4 for the depth dimension (D). For the depth (D), the tolerance is the value shown in Col. 4 for the width dimension (A). In no case is the tolerance for either width or depth less than the metal dimensions (Col. 2) at the corners.



Example – Alloy 6061 hollow profile (shape) having 1 × 3 rectangular outside dimensions: width tolerances is ±0.021 inch and depth tolerance ±.034 inch. (Tolerances at corners, Col. 2 metal dimensions, are ±.0.024 inch for the width and ±0.012 inch for the depth.) Note that the Col. 4 tolerances of 0.021 inch must be adjusted to 0.024 inch so that it is not less than the Col. 2 tolerance.

[9] These tolerances do not apply to space dimensions such as dimensions "X" and "Z" of the example (left), even when "Y" is 75 percent or more of "X." For the tolerance applicable to dimensions "X" and "Z," use Col. 4, 5, 6, 7, 8 or 9, dependent on distance "A."

[10] The wall thickness tolerance for hollow or semihollow profiles (shapes) shall be agreed upon between purchaser and vendor at the time the contract or order is entered when the nominal thickness of one wall is three times or greater than that of the opposite wall.

LENGTH[1]

wire, rod, bar & profiles (shapes)

Specified Diameter (Wire and Rod); Specified Width (Bar); Circumscribing Circle Diameter[4] (Profiles (Shapes)) in.	Tolerance – in. plus			
	Allowable Deviation from Specified Length			
	Specified Length – ft.			
	Up thru 12	Over 12 thru 30	Over 30 thru 50	Over 50
Up through 2.999	1 1/4⁸	1 1/4⁴	3 1/4⁸	1
3.000-7.999	3 1/4¹⁶	5 1/4¹⁶	7 1/4¹⁶	1
8.000 and over	1 1/4⁴	3 1/4⁸	1 1/4²	1

STRAIGHTNESS[1]

rod, bar & profiles (shapes)

Product	Temper	Specified Diameter (Rod); Specified Width (Bar); Circumscribing Circle Diameter[4] (Profiles (Shapes)) in.	Specified Thickness (Rectangles); Minimum Thickness (Profiles (Shapes)) in.	Tolerance[3] – in. Allowable Deviation from Straight  In Total Length or in any Measured Segment of One Ft. or more of Total Length
Rod and Square Hexagonal and Octagonal Bar	All except o TX510[2] TX511[2]	All	-	.0215 X Measured Length, ft.
	o	0.500 and over	-	.050 X Measured Length, ft.
	TX510[2]	0.500 and over	-	.050 X Measured Length, ft.
	TX511[2]	0.500 and over	-	.0125 X Measured Length, ft.
Rectangular Bar	All except o TX510[2] TX511[2]	Up through 1.499	Up through 0.094[7]	.050 X Measured Length, ft.
			0.095 and over	.0125 X Measured Length, ft.
		1.500 and over	All	.0125 X Measured Length, ft.
	o	Over 0.500	0.500 and over	.050 X Measured Length, ft.
	TX510[2]	Over 0.500	0.500 and over	.050 X Measured Length, ft.
	TX511[2]	Over 0.500	0.500 and over	.0125 X Measured Length, ft.
Profiles (Shapes)	All except o TX510[2] TX511[2]	Up through 1.499	Up through 0.094[7]	.050 X Measured Length, ft.
			0.095 and over	.0125 X Measured Length, ft.
		1.500 and over	All	.0125 X Measured Length, ft.
	o	Over 0.500	Up through 0.094[7]	.200 X Measured Length, ft.
			0.095 and over	.050 X Measured Length, ft.
	TX511[2]	0.500 and over	Up through 0.094[7]	.050 X Measured Length, ft.
			0.095 and over	.0125 X Measured Length, ft.

Footnotes:

[1] These Standard Tolerances are applicable to the average profile (shape); wider tolerances may be required for some profiles (shapes), and closer tolerances may be possible for others.

[2] TX510 and TX511 are general designations for the following stress relieved tempers: T3510, T4510, T61510, T6510, T8510, T73510, T76510 and T3511, T4511, T61511, T6511, T8511, T73511, T76511, respectively.

[3] When weight of piece on flat surface minimizes deviation.

[4] The circumscribing circle diameter is the diameter of the smallest circle that will completely enclose the cross section of the extruded product.

[5] Tolerances for T3510, T4510, T6510, T73510, T76510, and T8510 tempers shall be as agreed upon between purchaser and vendor at the time the contract or order is entered.

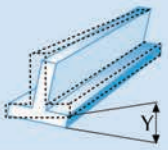
[6] See Standards Section (6) for Application of Twist Limits.

[7] Applies only if the thickness along at least 11/43 of the total perimeter is 0.094 or less. Otherwise use the tolerance shown for 0.095 and over.

[8] Tolerance for "o" temper material is four times the standard tolerances shown.

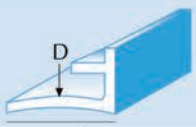
TWIST[1,6]

bar & profiles (shapes)

Product	Temper	Specified Width (Bar); Circumscribing Circle Diameter[4] (Profiles (Shapes)) in.	Specified Thickness (Rectangles); Minimum Thickness (Profiles (Shapes)) in.	Tolerance[3] – in. Allowable Deviation from Straight 	
				In Total Length or in any Measured Segment of One Ft. or more of Total Length	Maximum for Total Length
Bar	All except o	Up through 1.499	All	1 X Measured Length, ft.	7
	TX510[2]	1.500-2.999	All	1/4[2] X Measured Length, ft.	5
	TX511[2]	3.000 and over	All	1/4[4] X Measured Length, ft.	3
	o	0.500-1.499	0.500 and over	3 X Measured Length, ft.	7
		1.500-2.999	0.500 and over	1/4[2] X Measured Length, ft.	5
		3.000-4.999	0.500 and over	3/4[4] X Measured Length, ft.	3
	TX510[2]	0.500-2.999	0.500 and over	1 1/4[2] X Measured Length, ft.	7
		3.0500-1.499	0.500 and over	1/4[2] X Measured Length, ft.	5
	TX511[2]	0.500-1.499	0.500 and over	1 X Measured Length, ft.	7
		1.500-2.999	0.500 and over	1/4[2] X Measured Length, ft.	5
		3.000-over	0.500 and over	1/4[4] X Measured Length, ft.	3
Profiles (Shapes)	All except o	Up through 1.499	All	1 X Measured Length, ft.	7
	TX510[2,5]	1.500-2.999	All	1/4[2] X Measured Length, ft.	5
	TX511[2]	3.000 and over	All	1/4[4] X Measured Length, ft.	3
	o	0.500 and over	Up through 0.094	3 X Measured Length, ft.	7
		0.500-1.499	0.095 and over	3 X Measured Length, ft.	7
		1.500-2.999	0.095 and over	1 1/4[2] X Measured Length, ft.	5
	TX511[2]	0.500 and over	Up through 0.094	1 X Measured Length, ft.	7
		0.500-1.499	0.095 and over	1 X Measured Length, ft.	7
		1.500-2.999	0.095 and over	1/4[2] X Measured Length, ft.	5
		3.000 and over	0.095 and over	1/4[4] X Measured Length, ft.	3

FLATNESS (FLAT SURFACES)[1]

bar, solid profiles (shapes) and semihollow profiles (shapes) except for profiles (shapes) in o[8], T3510, T4510, T6510, T73510, T76510 and T8510 TEMPERS[4]



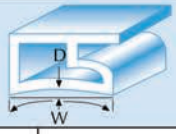
Surfaces Widths up thru 1 Inch or any 1 Inch Increment of Wider Surfaces
Maximum Allowable Deviation D = Tolerance (in.)

Widths Over 1 Inch
Maximum Allowable Deviation D = Tolerance X W (in.)

Minimum Thickness of Metal Forming the Surface in.	surface width - in. up to 5.999	6.000 to 7.999	8.000 to 9.999	10.000 to 11.999	12.000 to 13.999	14.000 to 15.999	16.000 to 17.999	18.000 to 19.999	20.000 to 21.999	22.000 to 23.999	24.000 and up
	tolerance										
Up thru 0.124	.004	.006	.010	.014	-	-	-	-	-	-	-
0.125-0.187	.004	.006	.008	.012	.014	.014	.014	-	-	-	-
0.188-0.249	.004	.006	.008	.010	.012	.012	.012	.014	.014	-	-
0.250-0.374	.004	.006	.006	.008	.010	.010	.012	.012	.012	.014	-
0.375-0.499	.004	.004	.006	.008	.008	.008	.010	.010	.010	.012	.014
0.500-0.749	.004	.004	.006	.006	.008	.008	.008	.008	.010	.010	.012
0.750-0.999	.004	.004	.006	.006	.008	.008	.008	.008	.008	.008	.010
1.000-1.499	.004	.004	.004	.006	.008	.008	.008	.008	.008	.008	.008
1.500-1.999	.004	.004	.004	.004	.006	.006	.006	.008	.008	.008	.008
2.000 and up	.004	.004	.004	.004	.006	.006	.006	.006	.008	.008	.008

FLATNESS (FLAT SURFACES)[1]

hollow profiles (shapes) except for profiles (shapes) in o[10], T3510, T4510, T6510, T73510, T76510 and T8510 TEMPERS[4]



Surfaces Widths up thru 1 Inch or any 1 Inch Increment of Wider Surfaces
Maximum Allowable Deviation D = Tolerance (in.)

Widths Over 1 Inch
Maximum Allowable Deviation D = Tolerance × W (in.)

Minimum Thickness of Metal Forming the Surface in.	surface width - in.										
	up to 5.999	6.000 to 7.999	8.000 to 9.999	10.000 to 11.999	12.000 to 13.999	14.000 to 15.999	16.000 to 17.999	18.000 to 19.999	20.000 to 21.999	22.000 to 23.999	24.000 and up
	tolerance										
Up thru 0.124	.006	.008	.012	.016	-	-	-	-	-	-	-
0.125-0.187	.006	.008	.010	.014	.016	-	-	-	-	-	-
0.188-0.249	.004	.006	.010	.012	.014	.014	.014	.016	-	-	-
0.250-0.374	.004	.006	.008	.010	.012	.012	.012	.014	.014	.016	-
0.375-0.499	.004	.006	.008	.010	.010	.010	.012	.012	.012	.014	.016
0.500-0.749	.004	.004	.006	.008	.008	.008	.010	.018	.012	.012	.014
0.750-0.999	.004	.004	.006	.006	.008	.008	.008	.008	.010	.010	.012
1.000 and up	.004	.004	.004	.006	.006	.008	.008	.0084	.008	.008	.008

SURFACE ROUGHNESS[1 8]

wire, rod, bar & profiles (shapes)

Specified Section Thickness in.	Allowable Depth of Conditions[2] in. max.
Up thru 0.063	.0015
0.064-0.125	.002
0.126-0.188	.0025
0.189-0.250	.003
0.251-0.500	.004
0.501 and over	.008

SQUARENESS OF CUT ENDS[1]

wire, rod, bar and profiles (shapes)

Allowable Deviation from Square: 1 Degree

CORNER AND FILLET RADII[1]

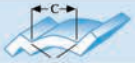
bar and profiles (shapes)

Specified Radius[9] in.	Tolerance – in.
	Allowable Deviation from Specified Radius  Difference between radius A and specified radius
Sharp corners	+1 1/4[6 4]
0.016-0.187	±1 1/4[6 4]
0.188 and over	±10%

[1] These Standard Tolerances are applicable to the average profile (shape); wider tolerances may be required for some profiles (shapes), and closer tolerances may be possible for others.
[2] Conditions include die lines and handling marks.
[3] As measured with a contour gauge whose surface is limited to a maximum subtended angle of 90 degrees. Extruded curved surfaces comprising more than a 90 degree sub-tended angle are checked by sliding the gauge across the surface, thus checking two or more 90-degree portions of the surface. Extruded profile (shape) surfaces comprising arcs formed by two or more radii require the use of a separate contour gauge for each portion of the surface formed by an individual radius.
[4] Tolerances for T3510, T4510, T6510, T73510, T76510 and T8510 tempers shall be agreed upon between purchaser and vendor and at the time the contract or order is entered.
[5] Angles are measured with protractors or with gauges. As illustrated, a four point contact system is used, two contact points being as close to the angle vertex as practical, and the others near the ends of the respective surfaces forming the angle. Between these points of measurement surface flatness is the controlling tolerance.

CONTOUR (CURVED SHAPES)[1 3]

profiles (shapes)

Temper	
All except o, TX510[4]	Allowable deviation from specified contour: 0.005 inch per inch of chord length; 0.005 inch minimum. Not applicable to contours with chord length 6 inches and over.
o	Allowable deviation from specified contour: 0.015 inch per inch of chord length; 0.015 inch minimum. Not applicable to contours with chord length 6 inches and over.

ANGULARITY[1 5]

bar and profiles (shapes)

Temper	Minimum Specified Leg Thickness in.	Tolerance Degrees plus and minus	
		Allowable Deviation from Specified Angle  Ratio:[6 7] Leg or Surface Length To Leg or Metal Thickness	
	Col. 1	Col. 2	Col. 3
All except o, TX510[4]	Up thru 0.187	1	1
	0.188-0.749	1	1 1/4[2]
	0.750 and over	1	1
o	Up thru 0.187	3	6
	0.188-0.749	3	4 1/4[2]
	0.750 and over	3	3

[6] When the area between the surface forming an angle is all metal, values in column 2 apply if the larger surface length to metal thickness ratio is 1 or less.
[7] When two legs are involved the one having the larger ratio determines the applicable column.
[8] Not applicable to 2219 alloy extrusions. Most profiles (shapes) in 2219 alloy will have die lines about twice the depth shown in the table; however for each profile (shape) the supplier should be contacted for the roughness value to apply.
[9] If unspecified, the radius shall be 1/4[32] in. maximum including tolerances.
[10] Tolerances for "o" temper material is four times the standard tolerances shown.

TABLE 12.2 DIAMETER

Round Tube Except for T3510, T4510, T6510, T73510 and T8510 Tempers[7]

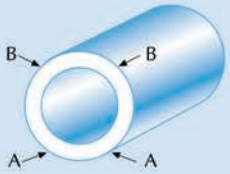
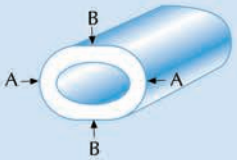
Specified Diameter[1] in.	Tolerance[2] – in. plus and minus			
	Allowable Deviation of Mean Diameter[3] from Specified Diameter (Size)  Difference between 1/4 (AA + BB) and specified diameter		Allowable Deviation of Diameter at any Point from Specified Diameter[4]  Difference between AA + BB and specified diameter	
Col. 1	Col. 2		Col. 3	
	Alloys 5083, 5086, 5454	Other Alloys[16]	Alloys 5083, 5086, 5454	Other Alloys[16]
0.500-0.999	.015	.010	.030	.020
1.000-1.999	.018	.012	.038	.025
2.000-3.999	.023	.015	.045	.030
4.000-5.999	.038	.025	.075	.050
6.000-7.999	.053	.035	.113	.075
8.000-9.999	.068	.045	.150	.100
10.000-11.999	.083	.055	.188	.125
12.000-13.999	.098	.065	.225	.150
14.000-15.999	.113	.075	.263	.175
16.000-17.999	.128	.085	.300	.200

TABLE 12.3 WIDTH AND DEPTH

Square, Rectangular, Hexagonal, Octagonal Tube Except for T3510, T4510, T6510, T73510 and T8510 Tempers[7]

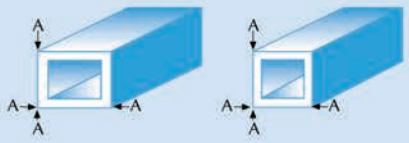
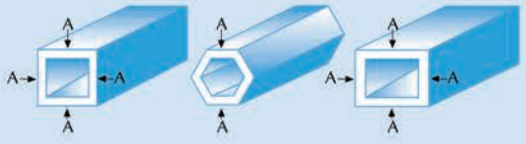
Specified Width or Depth[1] in.	Tolerance[2] – in. plus and minus				
	Allowable Deviation of Width or Depth at Corners from Specified Width or Depth  Difference between AA and specified width or depth		Allowable Deviation of Width or Depth not at Corners from Specified Width or Depth[4]  Difference between AA and specified width, depth or distance across flats		
Col. 1	Square, Rectangular Col. 2		Square, Hexagonal, Octagonal Col. 3		Rectangular Col.4
	Alloys 5083, 5086, 5454	Other Alloys[16]	Alloys 5083, 5086, 5454	Other Alloys[16]	All Alloys
0.500-0.749	.018	.012	.030	.020	The tolerance for the width is the value in the previous column for a dimension equal to the depth, and conversely, but in no case is the tolerance less than at the corners. Example: The with tolerance of a 1 × 3 inch alloy 6061 rectangular tube is ± 0.025 inch and the depth tolerance ± 0.035 inch.
0.750-0.999	.021	.014	.030	.020	
1.000-1.999	.027	.018	.038	.025	
2.000-3.999	.038	.025	.053	.035	
4.000-4.999	.053	.035	.068	.045	
5.000-5.999	.068	.045	.083	.055	
6.000-6.999	.083	.055	.098	.065	
7.000-7.999	.098	.065	.108	.075	
8.000-8.999	.113	.075	.123	.085	
9.000-9.999	.128	.085	.143	.095	
10.000-10.999	.143	.095	.158	.105	
11.000-12.999	.158	.105	.173	.115	

TABLE 12.4 WALL THICKNESS • Round Extruded Tube

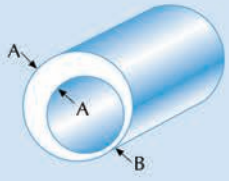
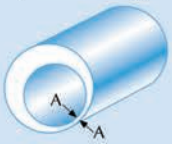
Specified Wall Thickness[6] in.	Tolerance[2] – in. plus and minus								
	Allowable Deviation of Mean Wall Thickness[5] from Specified Wall Thickness  Difference between [1]1/4[2] (AA + BB) and specified wall thickness								Allowable Deviation of Wall Thickness at any Point from Mean Wall Thickness[5] (Eccentricity)  Difference between AA and mean wall thickness
	Outside Diameter – in.								
	Under 1.250		1.250-1.299		3.000-4.999		5.000 and over		
	Col. 2		Col. 3		Col.4		Col. 5		Col. 6
Col. 1	Alloys 5083, 5086, 5454	Other Alloys[16]	Alloys 5083, 5086, 5454	Other Alloys[16]	Alloys 5083, 5086, 5454	Other Alloys[16]	Alloys 5083, 5086, 5454	Other Alloys[16]	All Alloys
Under 0.047	.009	.006	-	-	-	-	-	-	Plus and minus 10 % of mean wall thickness max ± 0.060 min ± 0.010
0.047-0.061	.011	.007	.012	.008	.012	.008	.015	.010	
0.062-0.077	.012	.008	.012	.008	.014	.009	.018	.012	
0.078-0.124	.014	.009	.014	.009	.015	.010	.023	.015	
0.125-0.249	.014	.009	.014	.009	.020	.013	.030	.020	
0.250-0.374	.017	.011	.017	.011	.024	.016	.038	.025	
0.375-0.499	-	-	.023	.015	.032	.021	.053	.035	
0.500-0.749	-	-	.030	.020	.042	.028	.068	.045	
0.750-0.999	-	-	-	-	.053	.035	.083	.055	
1.000-1.499	-	-	-	-	.068	.045	.098	.065	
1.500-2.000	-	-	-	-	-	-	.113	.075	
2.001-2.499	-	-	-	-	-	-	.128	.085	± 0.120
2.500-2.999	-	-	-	-	-	-	.143	.095	
3.000-3.499	-	-	-	-	-	-	.158	.105	
3.500-4.000	-	-	-	-	-	-	.173	.115	

TABLE 12.5 WALL THICKNESS • Other-Than-Round Extruded Tube

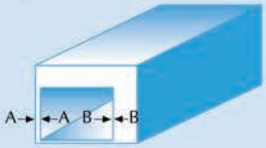
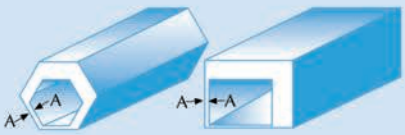
Specified Wall Thickness[6] in.	Tolerance[1 2] – in. plus and minus					
	Allowable Deviation of Mean Wall Thickness[5] from Specified Wall Thickness  Difference between [1]1/4[2] (AA + BB) and specified wall thickness				Allowable Deviation of Wall Thickness at any Point from Mean Wall Thickness[5] (Eccentricity)  Difference between AA and mean wall thickness	
	Circumscribing Circle Diameter[10] –in.					
	Under 5.000		5.000 and over		Under 5.000	5.000 and over
	Col. 2		Col. 3		Col.4	Col. 5
	Alloys 5083, 5086, 5454	Other Alloys[16]	Alloys 5083, 5086, 5454	Other Alloys[16]	All Alloys	All Alloys
Under 0.047	.008	.005	.012	.008	.005	Plus and minus 10 % of mean wall thickness max ± 0.060 min ± 0.010
0.047-0.061	.009	.006	.014	.009	.007	
0.062-0.124	.011	.007	.015	.010	.010	
0.125-0.249	.012	.008	.023	.015	.015	
0.250-0.374	.017	.011	.030	.020	.025	
0.375-0.499	.021	.014	.045	.030	.030	
0.500-0.749	.038	.025	.060	.040	.040	
0.750-0.999	.053	.035	.075	.050	.050	
1.000-1.499	.068	.045	.090	.060	.060	
1.500-2.000	-	-	.105	.070	-	

TABLE 12.6 LENGTH
Extruded Tube

Specified Outside Diameter or Width in.	Tolerance – in. plus except as noted							
	Allowable deviation from Specified Length							
	Straight				Coiled			
	Specified Length – ft.							
	Up thru 12	Over 12 thru 30	Over 30 thru 50	Over 50	Up thru 100	Over 100 thru 250	Over 250 thru 500	Over 500
0.500-1.249	1/4[8]	1/4[4]	1/4[8]	1	+5%, -0%	±10%	±15%	±20%
1.250-2.999	1/4[8]	1/4[4]	1/4[8]	1	-	-	-	-
3.000-7.999	1/4[16]	5/4[16]	7/4[16]	1	-	-	-	-
8.000 and over	1/4[4]	1/4[8]	1/4[2]	1	-	-	-	-

TABLE 12.7 TWIST[11]
Other-Than-Round Tube

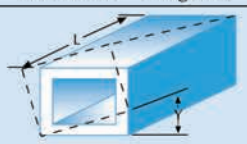
Temper	Specified Width in.	Specified Thickness in.	Tolerance – Degrees	
			 Y (max.) in degrees	
			In Total Length or in any Segment of One Ft. or More of Total Length	Maximum for Total Length
All except o, TX510, TX511[8]	0.500 thru 1.499	All	1 X Measured Length, ft.	7
	1.500-2.999	All	1/4[2] X Measured Length, ft.	5
	3.000 and over	All	1/4[4] X Measured Length, ft.	3
TX510[8]	0.500 and over	0.095 and over	[7]	[7]
TX511[8]	0.500-1.499	0.095 and over	1 X Measured Length, ft.	7
	1.500-2.999	0.095 and over	1/4[2] X Measured Length, ft.	5
	3.000 and over	0.095 and over	1/4[4] X Measured Length, ft.	3

TABLE 12.8 STRAIGHTNESS
Tube in Straight Lengths

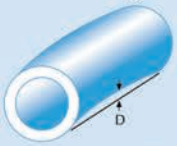
Temper	Specified Outside Diameter or Width in.	Tolerance[9,12] – in.
		Allowable Deviation (D) From Straight  In Total Length or in any Segment of One Ft. or More of Total Length
All except 0, TX510[8]	0.500-5.999	.010 X Measured length, ft.
	6.000 and over	.020 X Measured length, ft.
TX510[80]	.500 and over	[7]

TABLE 12.9 FLATNESS
Except for O, T2510, T4510, T6510, T73510, T76510, and T8510 Tempers

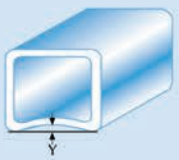
Minimum Thickness of Metal Forming the Surface in.	Tolerance – in.	
	 Maximum Allowable Deviation Y	
	Widths up thru 1 in. or any 1 in. Increment of Wider Surfaces	Widths over 1 in. thru 5.999 In.
Up thru 0.187	0.006	0.006 X W (Inches)
0.188 and over	0.004	0.004 X W (Inches)

TABLE 12.10 SQUARENESS OF CUT ENDS

Allowable Deviation from Square: 1 Degree

TABLE 12.11 CORNER AND FILLET RADII

Specified Radius[18] in.	Tolerance – in. Allowable Deviation from Specified Radius  Difference between radius A and specified radius
Sharp corners	+1/64
0.016-0.187	±1/64
0.188 and over	±10%

TABLE 12.12 ANGULARITY

Allowable Deviation from Specified Angle: ±2 Degrees

TABLE 12.13 SURFACE ROUGHNESS[14 17]

Specified Outside Diameter in.	Specified Wall Thickness in.	Allowable Depth of Conditions[13] in., max.
Up thru 12.750	Up through 0.063	0.0025
	0.064-0.125	0.003
	0.126-0.188	0.0035
	0.189-.0250	0.004
	0.251-0.500	0.005
	0.501 and over	0.008
12.751-15.000	Up thru 0.500	0.010
	0.501 and over	0.012
15.001-20.000	Up thru 0.500	0.012
	0.501 and over	0.015
20.001 and over	Up thru 0.500	0.015
	0.501 and over	0.020

TABLE 12.14 DENTS[15]

Depth of dents shall not exceed twice the tolerances specified in Table 12.2 for diameter at any point from specified diameter, except for tube having a wall thickness less than 2 1/42 percent of the outside diameter , in which case the following multipliers apply.

2% to 2 1/42% exclusive – 2.5 X tolerance (max.)
1 1/42% to 2% exclusive – 3.0 X tolerance (max.)
1% to 1 1/42% exclusive – 4.0 X tolerance (max.)

Footnotes:

[1] When the outside diameter, inside diameter, and wall thickness (or their equivalent dimensions in other than round tube) are all specified, standard tolerances are applicable to any two of these dimensions, but not to all three. When both outside and inside diameters or inside diameter and wall thickness are specified, the tolerance applicable to the specified or calculated O.D. dimension shall also apply to the I.D. dimension.

[2] When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which applied to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.

[3] Mean diameter is the average of two diameter measurements taken at right angles to each other at any point along the length.

[4] Not applicable in the annealed (O) temper of if wall thickness is less than 2 1/42 percent of outside diameter or equivalent round diameter. The equivalent round diameter is the diameter of a circle having a circumference equal to the perimeter of the tube.

[5] The mean wall thickness of round tube is the average of two measurements taken opposite each other. The mean wall thickness of other-than-round tube is the average of two measurements take opposite each other at approximate center line of tube and perpendicular to the longitudinal axis of the cross section.

[6] When dimensions specified are outside and inside, rather than wall thickness itself, allowable deviation at any point (eccentricity) applies to mean wall thickness.

[7] Tolerances for T3510, T4510, T6510, T73510, T76510, and T8510 tempers shall be as agreed upon between purchaser and vendor at the time the contract or order is entered.

[8] TX510 and TX511 are general designations for the following stress-relieved tempers: T3510, T4510, T6150, T8510, T73510, T76510; and T3511, T4511, T6511, T8511, T73511, T76511, respectively.

[9] When weight of piece on flat surface minimizes deviation.

[10] The circumscribing circle diameter is the diameter of the smallest circle that will completely enclose the cross section of the extruded product.

[11] See Standards Section (6) for Application of Twist Limits.

[12] Tolerances not applicable to TX510, or TX511 temper tube having a wall thickness less than 0.095 in.

[13] Conditions include die lines, mandrel lines and handling marks.

[14] For tube over 12.750 in. O.D. the 2000 and 7000 series alloys and 5000 series alloys with nominal magnesium content of 3 percent or more are excluded.

[15] Not applicable to O temper tube.

[16] Limited to those alloys listed in table 12.1.

[17] Not applicable to 2219 alloy tube. Most tubes in 2219 alloy will have die lines about twice the depth shown in the table; however, for each tube size the supplier should be contacted for the roughness value to apply.

[18] If unspecified, the radius shall be 1/32 in. maximum including tolerances.

DECIMAL EQUIVALENTS

1/64	.01562
1/32	.03125
3/64	.04687
1/16	.0625
5/64	.07812
3/32	.09375
7/64	.10937
1/8	.1250
9/64	.14062
5/32	.15625
11/64	.17187
3/16	.1875
13/64	.20312
7/32	.21875
15/64	.23437
1/4	.2500
17/64	.26562
9/32	.28125
19/64	.29687
5/16	.3125
21/64	.32812
11/32	.34375
23/64	.35937
3/8	.3750
25/64	.39062
13/32	.40625
27/64	.42187
7/16	.4375
29/64	.45312
15/32	.46875
31/64	.48437
1/2	.5000

33/64	.51562
17/32	.53125
35/64	.54687
9/16	.5625
37/64	.57812
19/32	.59375
39/64	.60937
5/8	.6250
41/64	.64062
21/32	.65625
43/64	.67187
11/16	.6875
45/64	.70312
23/32	.71875
47/64	.73437
3/4	.7500
49/64	.76562
25/32	.78125
51/64	.79687
13/16	.8125
53/64	.82812
27/32	.84375
55/64	.85937
7/8	.8750
57/64	.89062
29/32	.90625
59/64	.92187
15/16	.9375
61/64	.95312
31/32	.96875
63/64	.98437
1	1.0000

NOTES

NOTES

MANUFACTURING CAPABILITIES

- Extruding
- Precision Fly Cutting
- Prototyping
- Anodizing
- Epoxy Bonding
- Ultrasonic Cleaning
- Chromate Conversion
- Heat Treating
- Heliarc Welding
- CNC Machining
- Value Added Assembly
- Vacuum Brazing
- Dip Brazing
- Graining
- Sanding
- Painting
- Silk Screening
- Powder Coating
- Metal Tempering and Annealing
- Line Marking

ALUMINUM ALLOYS

- 6005
- 6061
- 6063
- 6082
- 6101
- 6105
- 6463
- Tempers: T4, T5, T6, T52

ALUMINUM EXTRUSION CAPABILITIES

- **53 Million Pounds Annual Capacity**
- Design Engineering Support
- Extrudability Analysis
- Premium Tolerances / Net Shape Design
- High Aspect Fin Ratios up to 16:1

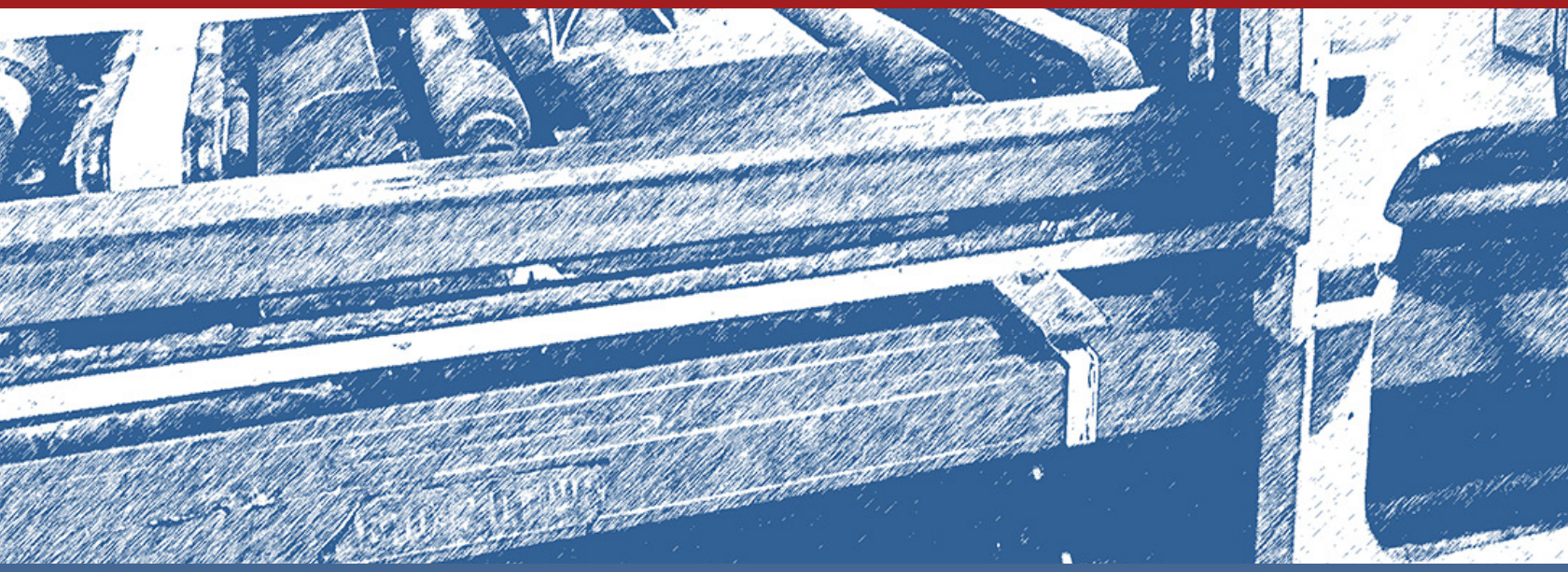
EQUIPMENT

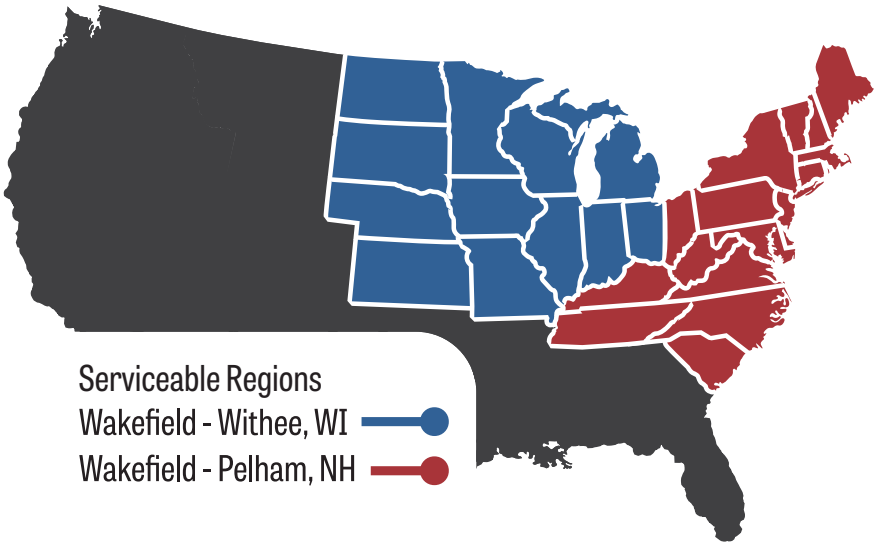
- 4 Aluminum Extrusion Presses
  - **3000 Ton Extrusion Press, 11-Inch**
  - **1900 Ton Extrusion Press, 8-Inch**
  - **1800 Ton Extrusion Press, 8-Inch**
  - **1650 Ton Extrusion Press, 7-Inch**
- 20 Automatic Cut Off Saws
- 90 CNC Machining Centers
- 35 Punch Presses
- Full Compliment of Finishing Equipment

QUALITY SYSTEMS

- ISO 9100:2015
- PPAP(Pre Production Approval Process)
- FMEA (Failure Mode Effects Analysis)
- Broad Range of Certified Inspection Equipment - Including CMM's, Torque and Hardness Testing
- SPC (Statistical Process Control)
- Calibration Program for All Measurement Equipment
- Incoming, Inprocess, and Final Inspection Procedures
- Internal Quality Audits
- New Products Design Review
- Material Review Board

WAKEFIELD EXTRUSION





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