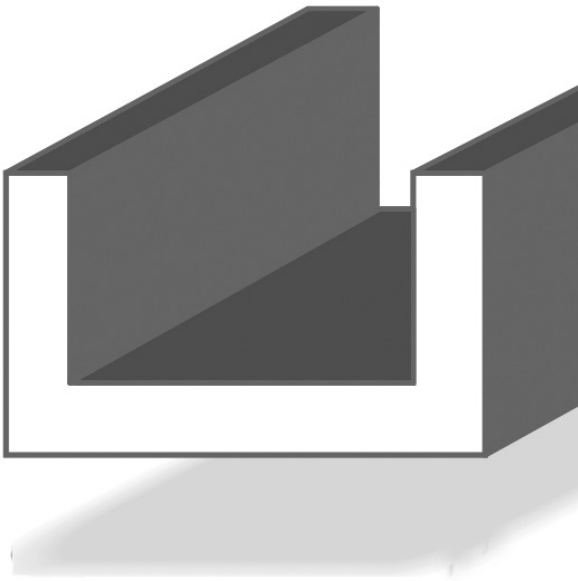
wakefield-vette

Standard
Aluminum Shapes



Contact:
Wakefield-Vette
33 Bridge St.
Pelham, NH 03076
603-635-2800
info@Wakefield-Vette.com

www.Wakefield-Vette.com

Thermal Cooling Solutions from **Smart** to **Finish**

wakefield-vette

TABLE OF CONTENTS

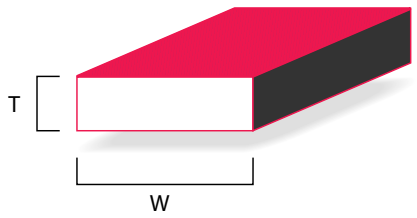
STANDARD DIE DATA

FLAT BAR 1-3
FLAT BAR CORNER 3
SQUARE BAR 4
CHANNELS 4-5
EQUAL LEG ANGLES 5
UNEQUAL LEG ANGLES 6
RECTANGULAR TUBES 7
SQUARE TUBES 8
ROUND ROD 9
EXTRUDED PIPE 9
ROUND TUBES 10
TEES 11
I BEAM 11
ZEE BAR 11
STRUCTURAL CHANNELS 12
STRUCTURAL ANGLES 12
CROSS SECTIONAL DIMENSION TOLERANCES 13
METAL DIMENSIONS • SPACE DIMENSIONS • CIRCUMSCRIBING CIRCLE SIZES
CLOSED SPACE DIMENSIONS 14
OPEN SPACE DIMENSIONS 14
LENGTH DIMENSIONS 15
STRAIGHTNESS 15
TWIST INFORMATION 16
FLATNESS (FLAT SURFACE) INFORMATION 16
FLATNESS (FLAT SURFACE) INFORMATION 17
SURFACE ROUGHNESS INFORMATION 17
SQUARENESS OF CUT ENDS INFORMATION 17
CORNER AND FILLET RADII INFORMATION 17
CONTOUR INFORMATION 17
ANGULARITY INFORMATION 17
DIAMETER TABLE 18
WIDTH AND DEPTH TABLE 18
WALL THICKNESS TABLES 19
LENGTH TABLE 20
TWIST TABLE 20
STRAIGHTNESS TABLE 20
SQUARENESS OF CUT ENDS INFORMATION 21
CORNER AND FILLET RADII INFORMATION 21
ANGULARITY INFORMATION 21
SURFACE ROUGHNESS TABLE 21
DENTS INFORMATION 21
DECIMAL EQUIVALENTS TABLE 22

wakefield-vette

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

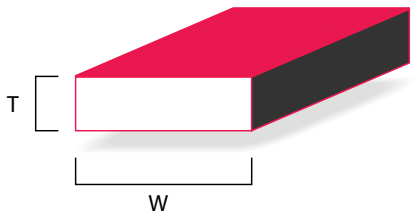


FLAT BAR

Thickness	Width	Est Wt Lbs/Ft	DIE#
.090	2.000	.216	11119
.093	2.625	.293	11120
.093	3.250	.363	11121
.094	1.000	.113	16439
.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	.263	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	S-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	1.438	.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
(c) .062 RadII All Corners • (d) .125 RadII All Corners
(e) .187 RadII All Corners

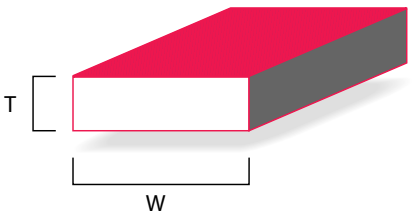


FLAT BAR

Thickness	Width	Est Wt Lbs/Ft	DIE#
.187	2.000	.449	438
.187	2.500	.562	571
.187	3.000	.673	2051
.187	4.000	.902	S-7462
.187	6.000	1.346	S-1010
.188	5.570	1.294	16662
.210	6.000	1.511	15670 (b)
.250	.500	.150	6909
.250	.625	.186	10843
.250	.750	.226	572
.250	1.000	.283	11879 (d)
.250	1.000	.300	S-1769
.250	1.250	.375	6310 (c)
.250	1.250	.374	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	.587	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	1.126	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	1.726	2200
.250	6.000	1.800	984
.250	6.500	1.950	14990
.250	7.000	2.100	14991
.312	.750	.281	2665
.312	1.000	.374	16642
.312	1.500	.561	6719

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

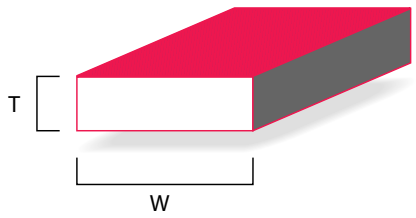


FLAT BAR

Thickness	Width	Est Wt Lbs/Ft	DIE#
.312	2.000	.748	5202
.312	3.000	1.123	13414
.312	4.000	1.497	13415
.312	5.000	1.876	S-764
.312	5.500	2.059	S-1059 (c)
.312	6.000	2.246	10503
.313	2.500	.937	16559
.313	3.250	1.219	16560
.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	.619	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	S-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
.375	11.000	4.950	16588
.500	.750	.450	778
.500	1.000	.584	S-524 (d)
.500	1.000	.595	642
.500	1.250	.750	671
.500	1.500	.900	289

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

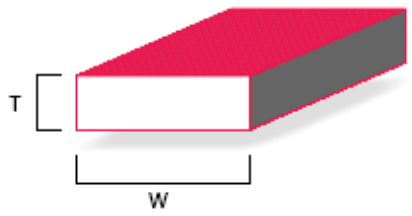


FLAT BAR

Thickness	Width	Est Wt Lbs/Ft	DIE#
.500	1.750	1.050	1768
.500	2.000	1.200	287
.500	2.500	1.500	S-776
.500	3.000	1.800	S-1054
.500	3.500	2.100	6858
.500	4.000	2.400	2047
.500	4.500	2.700	16903
.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 (c)
.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	1.126	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	2.000	1.800	1176
.750	3.000	2.700	S-1125
.750	3.500	3.150	6600
.750	4.000	3.600	S-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 (c)
.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

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



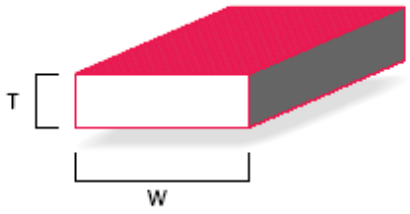
FLAT BAR

Thickness	Width	Est Wt Lbs/Ft	DIE#
.500	8.500	5.100	19122
.375	.875	.394	19548
.750	.750	6.64	19525
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)
1.000	3.250	3.900	2308
1.000	4.000	4.800	S-2223
1.000	5.000	5.999	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
1.250	8.500	12.750	19121
1.500	2.000	3.600	16815
1.500	2.500	4.500	16816
1.500	3.000	5.400	16817
1.500	4.000	7.200	15278
1.500	5.000	9.000	16840
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

Just Added Flat Bar Dies!

.625"	5.00"	3.75	19726
1.75"	5.00"	10.5	19727
.500"	5.50"	3.24	19728
.750"	4.50"	3.98	19729

STANDARD DIE DATA

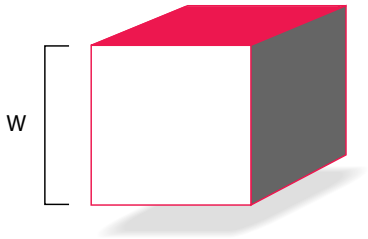


FLAT BAR RADIUS CORNER

Thickness	Width	Radius	Est Wt Lbs/Ft	DIE#
.250	1.000	.125	.283	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	2.000	.250	1.138	827
.750	4.000	.062	3.600	S-1058
.375	1.375	.188	.590	S-1117

STANDARD DIE DATA

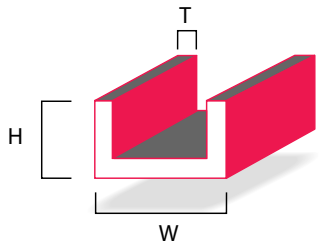
(a) .093 RadII All Corners • (b) .125 RadII All Corners
(c) .062 RadII All Corners



SQUARE BAR

Width	Est Wt Lbs/Ft	DIE#
.300+/-.006	.108	16636
.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)
1.125	1.519	1580
1.250	1.876	920 (a)
1.250	1.876	1200
1.375	2.269	15185
1.500	2.700	885
1.625	3.169	15072
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

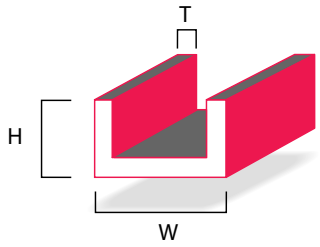
STANDARD DIE DATA



CHANNELS

Width	Heights	Thickness	Est Wt Lbs/Ft	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	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	.224	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	S-826
1.250	.500	.250	.413	S-796
1.250	.625	.125	.337	506
1.250	.750	.125	.376	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	747

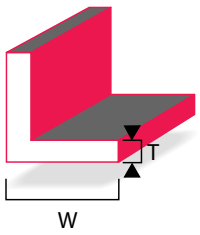
STANDARD DIE DATA



CHANNELS

Width	Heights	Thickness	Est Wt Lbs/Ft	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	.750	16941
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	2215
2.000	1.000	.118	.532	S-1189
2.000	1.000	.125	.526	444
2.000	1.000	.187	.815	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	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
2.875	1.000	.125	.695	15168
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	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	4152
4.500	1.750	.125	1.161	4151
4.500	2.000	.125	1.238	2056
5.000	2.000	.187	1.936	713
5.250	1.125	.125	1.087	11075
6.000	2.875	.250	4.210	15167

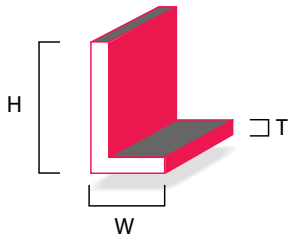
STANDARD DIE DATA



EQUAL LEG ANGLES

Width	Thickness	Est Wt Lbs/Ft	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	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
1.000	.058	.136	16532
1.050	.250	.554	16599
1.250	.062	.181	7300
1.250	.125	.356	450
1.250	.187	.520	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	5261
3.500	.125	1.031	7647
4.000	.125	1.180	5345
4.000	.375	3.436	15843

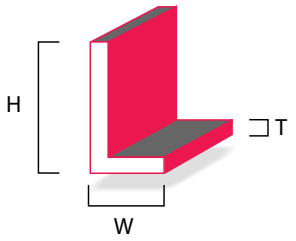
STANDARD DIE DATA



UNEQUAL LEG ANGLES

Width	Height	Thickness	Est Wt Lbs/Ft	DIE#
.310	.685	.060	.067	16533
.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
.75	1.625	.079	.204	15029
.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	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	5.250	.125	.956	16397

STANDARD DIE DATA

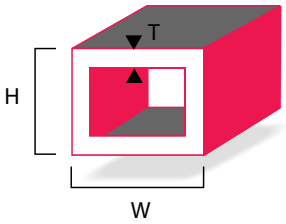


UNEQUAL LEG ANGLES

Width	Height	Thickness	Est Wt Lbs/Ft	DIE#
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
1.500	2.250	.125	.526	631
1.500	2.500	.125	.579	5201
1.500	2.500	.250	1.126	16644
1.500	4.000	.188	1.200	10575
1.938	3.000	.188	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	S-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	3.644	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

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

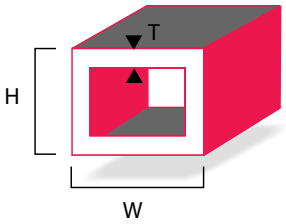


RECTANGULAR TUBES

Width	Heights	Thickness	Est Wt Lbs/Ft	DIE#
1.000	.500	.125	.374	TS-4631
1.500	.750	.062	.313	S-7119
1.500	.750	.078	.392	PH3007
1.500	.750	.125	.600	PH4630 (e, f)
1.500	1.000	.078	.437	PH3008
1.500	1.000	.125	.676	536
1.500	1.250	.250	1.313	PH15472
1.500	2.000	.125	.974	PH18074
1.500	3.000	.125	1.274	PH18037
1.525	.800	.150	.728	TS-11670
2.000	.750	.120	.750	S-TS-3189
2.000	1.000	.062	.428	PH11660
2.000	1.000	.118	.782	TS-3192
2.000	1.000	.125	.826	PH679
2.000	1.500	.125	.974	591
2.000	1.500	.188	1.410	PH15401 (b, c)
2.000	3.000	.250	2.700	PH18073
2.000	4.000	.250	3.300	PH18079
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	PH1470
2.500	1.500	.125	1.126	TS-865
3.000	1.000	.125	1.126	PH2060
3.000	1.250	.125	1.200	PH2229
3.000	1.750	.125	1.350	PH1221
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
3.000	6.000	.188	3.881	PH18075
3.250	1.500	.125	1.348	TS-8132
3.500	.875	.125	1.237	PH1437
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	1.000	.125	1.424	PH18099
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

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

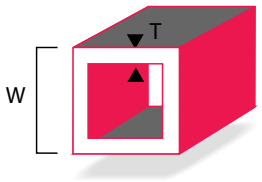


RECTANGULAR TUBES

Width	Height	Thickness	Est Wt Lbs/Ft	DIE#
2.500	.750	.125	.888	18149
4.000	1.750	.125	1.510	PH494
4.000	2.000	.125	1.725	18151
4.000	2.000	.125	1.726	TS-1633/S-7006
4.000	3.500	.063	1.115	PH15526
4.000	6.000	.250	5.700	PH18072
4.242	2.242	.090	1.345	TS-10489 (b)
4.500	1.250	.212	2.710	PH14672
4.500	1.750	.125	1.800	PH2421
4.500	2.000	.125	1.875	TS-10441
5.000	1.000	.118	1.621	PH15414 (a,b)
5.000	1.750	.125	1.950	PH2422
5.000	2.000	.125	2.026	S-PH2311
5.000	2.000	.125	2.009	PH18101 (b)
5.000	3.000	.125	2.330	PH3080
5.000	4.000	.250	5.100	PH8168 (a)
5.500	1.750	.125	2.100	PH4651
6.000	1.500	.125	2.176	PH2652
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	PH2131
6.000	3.000	.125	2.631	PH14605
6.000	3.000	.188	3.889	18163
6.000	4.000	.125	2.924	PH18082
7.000	2.000	.125	2.625	PH14606
7.000	3.000	.125	2.925	PH14607
8.000	2.000	.125	2.929	PH14608

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

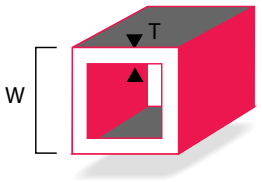


SQUARE TUBES

Width	Thickness	Est Wt Lbs/Ft	DIE#
.500	.062	.131	PH535
.500	.125	.224	S-7118
.625	.062	.167	PH456
.735	.042	.138	S-7223
.750	.055	.184	S-7053
.749	.062	.205	PH3128 (a)
.750	.062	.205	PH1434
.750	.095	.299	PH14507
.750	.125	.376	S-7122 (f)
1.000	.050	.228	TS-4689
1.000	.055	.244	S-7200
1.000	.064	.288	PH647
1.000	.065	.280	S-7037 (d)
1.000	.086	.324	S-7241
1.000	.090	.377	S-7022 (d)
1.000	.125	.526	725
1.000	.125	.522	S-7038 (c)
1.000	.125	.540	PH15310 (f)
1.125	.125	.601	PH15311 (f)
1.250	.078	.439	878
1.250	.090	.486	PH14674 (d)
1.250	.125	.676	PH1469
1.250	.125	.668	PH15312 (f)
1.250	.188	.956	PH15573
1.250	.250	1.200	S-7167
1.500	.063	.431	S-7035
1.500	.078	.532	S-PH4639
1.500	.085	.572	S-7225
1.500	.093	.628	S-6024
1.500	.118	.791	S-7212
1.500	.125	.818	PH15363 (f)
1.500	.125	.826	PH548
1.500	.188	1.185	PH1403 (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	PH422

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

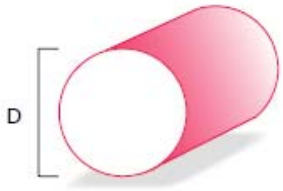


SQUARE TUBES

Width	Thickness	Est Wt Lbs/Ft	DIE#
1.982	.087	.791	S-7204
1.982	.118	1.056	S-7205
2.000	.060	.572	PH15430
2.000	.078	.720	PH1584
2.000	.093	.851	S-6013
2.000	.125	1.126	594
2.000	.188	1.611	S-7199
2.000	.188	1.638	15400 (d)
2.000	.250	2.099	S-7215
2.250	.078	.812	PH1144
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	PH722
3.000	.188	2.538	18076
3.000	.250	3.310	PH14681
4.000	.093	1.743	PH3125
4.000	.118	2.211	S-7219
4.000	.125	2.325	PH2306
4.000	.125	2.324	PH3162 (e)
4.000	.188	3.432	PH14695
4.000	.250	4.500	PH8157
4.014	.100	1.843	15331 (e)
4.500	.125	2.624	PH3104
5.000	.125	2.945	PH14609
5.000	.187	4.321	PH15574
5.000	.250	5.700	PH18071
5.500	.125	3.225	PH14610
6.000	.125	3.537	PH14611
6.000	.250	6.900	PH18070 **

**6063 ONLY

STANDARD DIE DATA



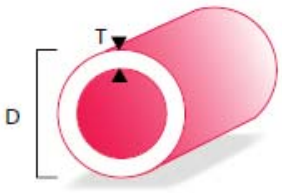
ROUND ROD

Depth	Est Wt Lbs/Ft	DIE#
.281	.074	15813
.312	.091	16534
.375	.131	616
.375	.132	15812
.438	.180	14302
.500	.235	2181
.530/.520	.260	15814
.562	.299	S-234
.625	.368	311
.750	.530	S-2496
.812	.623	2529
.812	.622	15767
.850	.681	15124
.875	.720	2513
.937	.826	3450
1.000	.942	1767
1.125	1.193	15756
1.187	1.330	301
1.250	1.472	1187
1.350	1.718	15795
1.375	1.744	6189/S-1276
1.375	1.781	15775
1.500	2.120	S-300
1.566	2.299	15766
1.625	2.488	15678
1.688	2.684	8364
1.750	2.886	13425
1.880	3.331	14303
2.000	3.768	S-2581
2.250	4.771	13426
2.375	5.274	3248
2.500	5.890	6184
2.750	7.128	15009
3.000	8.482	15010
3.500	11.546	14307
3.750	13.254	19078
4.000	15.079	16528

Newly Added Round Rod Die!

3.250	9.96	19741

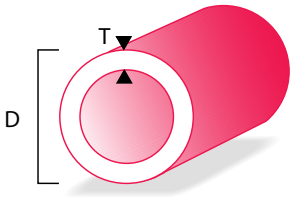
STANDARD DIE DATA



EXTRUDED PIPE

Thickness	Pipe (DIA)	Schedule	Est Wt Lbs/Ft	DIE#
.109	1	10	.496	PH13306
.109	1 1/2	10	.734	PH1659
.109	1 1/4	10	.625	PH1658
.109	2	10	.913	PH13307
.120	2 1/2	10	1.221	PH14620
.120	3	10	1.498	PH14621
.120	3 1/2	10	1.720	PH14622
.120	4	10	1.942	PH14623
.134	5	10	2.688	PH14624
.134	6	10	3.213	PH14625
.133	1	40	.593	PH509
.145	1 1/2	40	.939	PH244
.140	1 1/4	40	.785	PH277
.109	1/2	40	.300	S-7011
.154	2	40	1.290	PH1203
.203	2 1/2	40	2.042	TS-13304
.216	3	40	2.621	S-7230
.226	3 1/2	40	3.215	PH14616
.113	3/4	40	.399	PH510
.237	4	40	3.733	PH14617
.258	5	40	5.057	PH14618
.200	1 1/2	80	1.274	PH1548
.191	1 1/4	80	1.057	S-6016
.218	2	80	1.771	PH13303
.276	2 1/2	80	2.650	PH14668
.300	3	80	3.547	S-7106
.318	3 1/2	80	4.440	PH14626
.337	4	80	5.183	PH14627
.375	5	80	7.188	PH14628

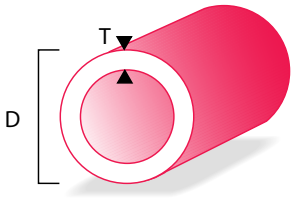
STANDARD DIE DATA



ROUND TUBES

(DIA)	Thickness	Est Wt Lbs/Ft	DIE#
.594	.047	.096	PH3141
.625	.150	.268	PH15549
.625	.058	.124	PH15314
.625	.112	.219	S-7245
.750	.050	.132	S-6040
.750	.062	.160	11555
.750	.125	.294	S-7216
.750	.180	.379	PH11652
.812	.080	.222	PH11538
1.000	.055	.195	S-7224
1.000	.063	.222	S-7129
1.000	.065	.229	PH10471
1.000	.075	.262	PH11537
1.000	.050	.196	PH15581
1.000	.125	.407	S-7018
1.000	.188	.569	PH18009
1.250	.065	.290	PH15351
1.250	.080	.353	PH11561
1.250	.090	.394	S-7047
1.250	.095	.414	PH768
1.250	.110	.475	PH769
1.250	.125	.530	S-7107
1.315	.109	.496	PH13306
1.315	.125	.560	S-7217
1.375	.080	.392	PH3031
1.375	.250	1.050	PH18008
1.500	.065	.352	S-7024
1.500	.080	.428	PH11659
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
1.625	.070	.402	PH15525
1.660	.130	.749	S-7203
1.750	.065	.413	S-7043
1.875	.120	.794	PH15420
1.905	.176	1.147	PH15304
1.977	.065	.469	PH11554
2.000	.065	.474	4767

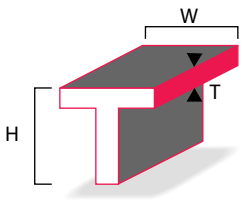
STANDARD DIE DATA



ROUND TUBES

(DIA)	Thickness	Est Wt Lbs/Ft	DIE#
2.000	.075	.544	PH15436
2.000	.093	.668	S-7109
2.000	.125	.883	S-7010
2.000	.250	1.650	PH18016
2.000	.500	2.827	PH15387
2.125	.156	1.157	PH14683
2.250	.065	.559	S-7055
2.250	.125	1.000	PH14680
2.250	.375	2.624	PH18004
2.362	.197	1.608	PH15303
2.375	.140	1.181	S-7213
2.375	.200	1.642	S-7214
2.500	.065	.596	PH4633
2.500	.125	1.120	S-7108
2.500	.156	1.378	PH14682
2.500	.250	2.121	PH15389
2.500	.375	2.974	PH18002
2.500	.500	3.770	PH18018
2.500	.625	4.042	PH15497
2.750	.375	3.324	PH18003
3.000	.125	1.348	3190
3.000	.250	2.592	PH18019
3.250	.125	1.475	S-7137
3.250	.375	4.024	PH18001
3.250	.875	7.834	PH15407
3.500	.120	1.530	PH1554
3.500	.250	3.032	PH18007
3.500	.300	3.547	S-7106
3.650	1.225	11.199	PH15321
3.750	.125	1.709	11541
4.000	.125	1.824	3191
4.000	.250	3.534	PH15388
4.000	.318	4.440	PH14626
4.000	.500	6.530	PH18005
4.500	.125	2.041	PH18006
4.500	.500	7.540	PH15309
4.750	.500	8.012	PH15347
5.000	.125	2.298	PH14613
5.375	.250	4.831	PH15559
5.500	.125	2.532	PH14614
6.000	.125	2.770	PH14615

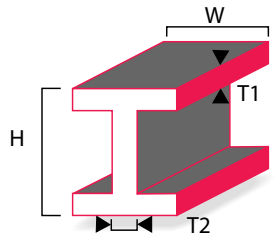
STANDARD DIE DATA



TEES

Width	Height	Thickness	Est Wt Lbs/Ft	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	.188	.860	522

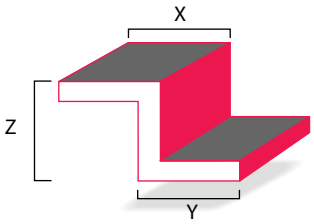
STANDARD DIE DATA



I BEAM

Height	Width	T1	T2	WT	DIE#
2.500	2.000	.125	.125	.956	S-1160
4.000	3.000	.290	.170	2.852	15246
5.000	3.500	.320	.190	3.750	15247
6.000	4.000	.350	.210	4.724	15248

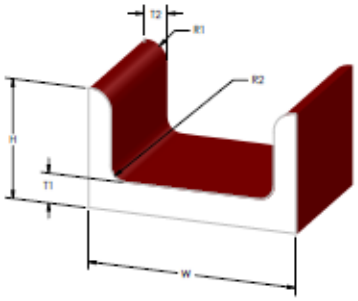
STANDARD DIE DATA



ZEE BAR

X	Y	Z	Thickness	Est Wt Lbs/Ft	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
2.000	2.000	1.812	.250	1.594	16818

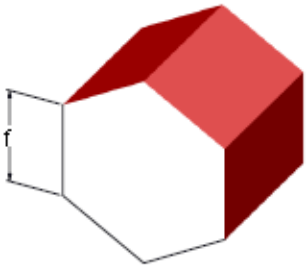
STANDARD DIE DATA



STRUCTURAL CHANNEL

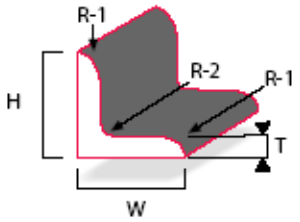
Width	Height	T1	T2	R1	R2	Wt	DIE#
3.000	1.410	.170	.170	.100	.270	1.422	S-1131
3.000	1.750	.170	.260		.250	1.567	S-1151
3.000	1.498	.258	.170	.100	.270	1.729	S-1070
3.000	1.596	.356	.170	.100	.270	2.074	S-1168
3.500	1.250	.125	.187	.094	.250	1.057	15870
4.000	2.000	.150	.230		.250	1.739	15996
4.000	2.250	.190	.290		.250	2.198	S-1150
4.000	1.580	.180	.180	.110	.280	1.811	S-1077
4.000	1.647	.250	.180	.110	.280	2.161	15040
5.000	1.750	.190	.190	.110	.290	1-2.089	15012
5.000	2.000	.375	.375	.375	.250	3.672	16886
5.000	2.250	.150	.260		.300	2.212	15995
6.000	1.920	.200	.200	.120	.300	2.826	15064
6.000	2.034	.314	.200	.120	.300	3.631	15131
6.000	3.000	.500	.375	.250	.375	5.832	15289
8.000	2.290	.250	.220	.130	.320	4.252	15065

HEX



f	Wt	DIE#
.750	.585	15810
.875	.796	15811

STANDARD DIE DATA



STRUCTURAL ANGLES

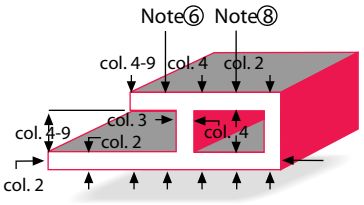
Width	Height	Thickness	R1	R2	Est Wt Lbs/Ft	DIE#
1.500	1.500	.125	.125	.188	.433	S-1139
1.000	1.000	.125	.094	.125	.284	S-793
2.000	2.000	.125	.125	.250	.589	S-1142
1.250	1.250	.125	.125	.188	.343	15061
2.000	1.500	.188	.188	.188	.730	S-778
2.000	3.000	.188	.188	.188	1.070	S-782
1.000	1.000	.188	.094	.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	.187	.125	.250	1.100	S-792
1.500	1.500	.188	.125	.188	.635	13027
1.250	1.250	.188	.125	.188	.510	15062
1.500	1.500	.250	.125	.188	.828	S-2488
1.750	1.750	.188	.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	S-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	.250	.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
4.000	4.000	.500	.375	.500	4.531	15106
6.000	4.000	.500	.375	.500	5.725	15107

Newly Added Structural Angle Dies

1.250"	1.250"	250"	.125	.188	.676	19713
.750"	.750"	.125"	.093	.125	.206	19714
1.00"	1.00"	.250"	.094	.125	524	19715

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.

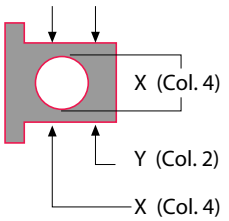
[3] When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which applies to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.

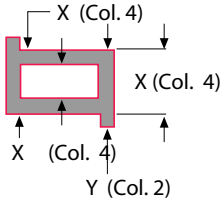
[4] Where dimensions specified are outside and inside, rather than wall thickness itself, the allowable deviation (eccentricity) given in Column 3 applies to mean wall thickness. (Mean wall thickness is the average of two wall thickness measurements taken at opposite sides of the void.)

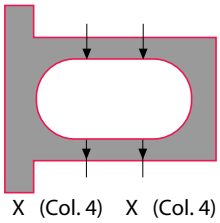
[5] In the case of Class 1 Hollow Profiles (Shapes) the standard wall thickness tolerance for extruded round tube is applicable. (A Class 1 Hollow Profile (Shape) is one whose void is round and one inch or more in diameter and whose weight is equally distributed on opposite sides of two or more equally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

EXAMPLES ILLUSTRATING USE OF CROSS-SECTIONAL DIMENSION TOLERANCES

CLOSED-SPACE DIMENSIONS



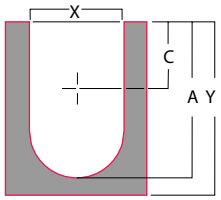


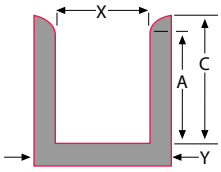


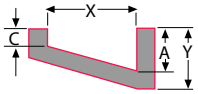
All dimensions designated "Y" are classed as "metal dimensions," and tolerances are determined from column 2.

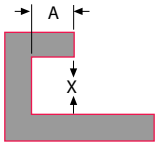
Dimensions designated "X" are classed as "space dimensions through an enclosed void," and the tolerances applicable are determined from column 4 unless 75 percent or more of the dimension is metal, in which case column 2 applies.

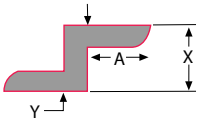
OPEN-SPACE DIMENSIONS

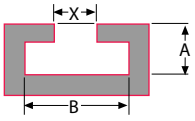


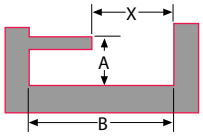


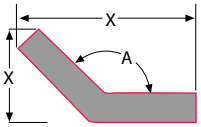


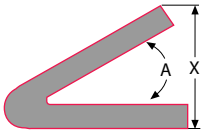












Tolerances applicable to dimensions "X" are determined as follows:

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.

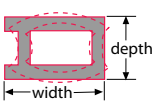
Tolerances applicable to dimensions "X" are determined by standard tolerances applicable to angles "A."

Footnotes (continued):

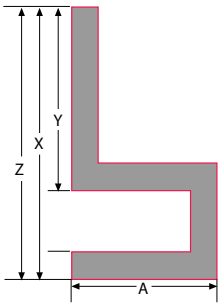
[6] At points less than 0.250 inch from base of leg the tolerances in Col. 2 are applicable.

[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.

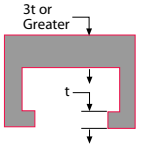


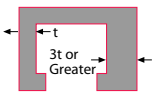
Example – Alloy 6061 hollow profile (shape) having 1 3 rectangular outside dimensions: width tolerances is ±0.021 inch and depth tolerance ±.034 inch. (Tolerances at corners, Col. 2 metal dimensions, are ±.0.024 inch for the width and ±0.012 inch for the depth.) Note that the Col. 4 tolerances of 0.021 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.





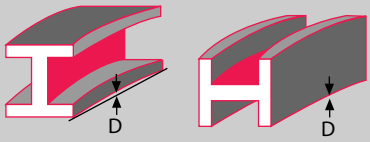
LENGTH [1]

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]1/4[8]	[1]1/4[4]	[3]1/4[8]	1
3.000-7.999	[3]1/4[16]	[5]1/4[16]	[7]1/4[16]	1
8.000 and over	[1]1/4[4]	[3]1/4[8]	[1]1/4[2]	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 Measured Length, ft.
	o	0.500 and over	-	.050 Measured Length, ft.
	TX510 [2]	0.500 and over	-	.050 Measured Length, ft.
	TX511 [2]	0.500 and over	-	.0125 Measured Length, ft.
Rectangular Bar	All except o TX510 [2]	Up through 1.499	Up through 0.094[7]	.050 Measured Length, ft.
			0.095 and over	.0125 Measured Length, ft.
	TX511 [2]	1.500 and over	All	.0125 Measured Length, ft.
	o	Over 0.500	0.500 and over	.050 Measured Length, ft.
	TX510 [2]	Over 0.500	0.500 and over	.050 Measured Length, ft.
	TX511 [2]	Over 0.500	0.500 and over	.0125 Measured Length, ft.
Profiles (Shapes)	All except o TX510 [2]	Up through 1.499	Up through 0.094[7]	.050 Measured Length, ft.
			0.095 and over	.0125 Measured Length, ft.
	TX511 [2]	1.500 and over	All	.0125 Measured Length, ft.
	o	Over 0.500	Up through 0.094 [7]	.200 Measured Length, ft.
			0.095 and over	.050 Measured Length, ft.
	TX511 [2]	0.500 and over	Up through 0.094 [7]	.050 Measured Length, ft.
			0.095 and over	.0125 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.

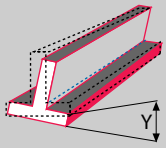
[6] See Standards Section (6) for Application of Twist Limits.

[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.

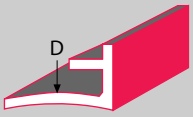
TWIST [1] [6]

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 Measured Length, ft.	7
	TX510 [2]	1.500-2.999	All	1 1/4 [2] Measured Length, ft.	5
	TX511 [2]	3.000 and over	All	1 1/4 [4] Measured Length, ft.	3
	o	0.500-1.499	0.500 and over	3 Measured Length, ft.	7
		1.500-2.999	0.500 and over	1 1/4 [2] Measured Length, ft.	5
		3.000-4.999	0.500 and over	3 1/4 [4] Measured Length, ft.	3
	TX510 [2]	0.500-2.999	0.500 and over	1 1 1/4 [2] Measured Length, ft.	7
		3.0500-1.499	0.500 and over	1 1/4 [2] Measured Length, ft.	5
	TX511 [2]	0.500-1.499	0.500 and over	1 Measured Length, ft.	7
		1.500-2.999	0.500 and over	1 1/4 [2] Measured Length, ft.	5
		3.000-over	0.500 and over	1 1/4 [4] Measured Length, ft.	3
Profiles (Shapes)	All except o	Up through 1.499	All	1 Measured Length, ft.	7
	TX510 [2 5]	1.500-2.999	All	1 1/4 [2] Measured Length, ft.	5
	TX511 [2]	3.000 and over	All	1 1/4 [4] Measured Length, ft.	3
	o	0.500 and over	Up through 0.094	3 Measured Length, ft.	7
		0.500-1.499	0.095 and over	3 Measured Length, ft.	7
		1.500-2.999	0.095 and over	1 1 1/4 [2] Measured Length, ft.	5
	TX511 [2]	0.500 and over	Up through 0.094	1 Measured Length, ft.	7
		0.500-1.499	0.095 and over	1 Measured Length, ft.	7
		1.500-2.999	0.095 and over	1 1/4 [2] Measured Length, ft.	5
		3.000 and over	0.095 and over	1 1/4 [4] 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]



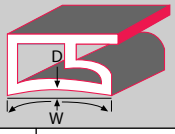
Surfaces Widths up thru 1 Inch or any 1 Inch Increment of Wider Surfaces
Maximum Allowable Deviation D = Tolerance (in.)

Widths Over 1 Inch
Maximum Allowable Deviation D = Tolerance 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 [18]

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

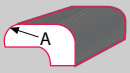
SQUARENESS OF CUT ENDS [1]

wire, rod, bar and profiles (shapes)

Allowable Deviation from Square: 1 Degree

CORNER AND FILLET RADII [1]

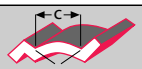
bar and profiles (shapes)

Specified Radius [9] in.	Tolerance – in.
	Allowable Deviation from Specified Radius  Difference between radius A and specified radius
Sharp corners	+1/64
0.016-0.187	±1/64
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 subtended 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.

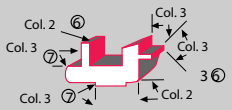
CONTOUR (CURVED SHAPES) [13]

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 [15]

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 1/42
	0.750 and over	1	1
o	Up thru 0.187	3	6
	0.188-0.749	3	4 1/42
	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]

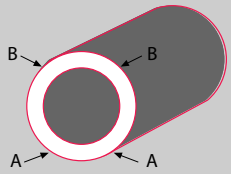
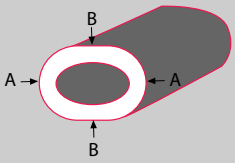
Specified Diameter [1] in.	Tolerance [2] – in. plus and minus			
	Allowable Deviation of Mean Diameter [3] from Specified Diameter (Size)  Difference between [1]1/4[2] (AA + BB) and specified diameter		Allowable Deviation of Diameter at any Point from Specified Diameter [4]  Difference between AA + BB 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]

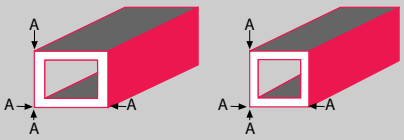
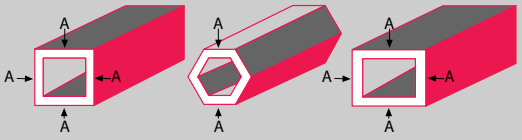
Specified Width or Depth [1] in.	Tolerance [2] – in. plus and minus				
	Allowable Deviation of Width or Depth at Corners from Specified Width or Depth  Difference between AA and specified width or depth		Allowable Deviation of Width or Depth not at Corners from Specified Width or Depth [4]  Difference between AA and specified width, depth or distance across flats		
Col. 1	Square, Rectangular		Square, Hexagonal, Octagonal		Rectangular
	Col. 2		Col. 3		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

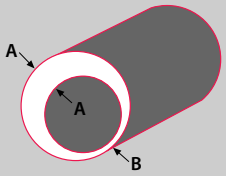
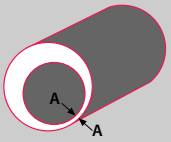
Specified Wall Thickness [6] in.	Tolerance[2] – in. plus and minus								
	Allowable Deviation of Mean Wall Thickness [5] from Specified Wall Thickness  Difference between [1]1/4[2] (AA + BB) and specified wall thickness								Allowable Deviation of Wall Thickness at any Point from Mean Wall Thickness [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

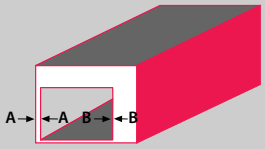
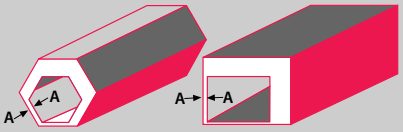
Specified Wall Thickness [6] in.	Tolerance[1 2] – in. plus and minus					
	Allowable Deviation of Mean Wall Thickness [5] from Specified Wall Thickness  Difference between [1]1/4[2] (AA + BB) and specified wall thickness				Allowable Deviation of Wall Thickness at any Point from Mean Wall Thickness [5] (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
Col. 1	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 1/4 [8]	1 1/4 [4]	3 1/4 [8]	1	+5%, -0%	±10%	±15%	±20%
1.250-2.999	1 1/4 [8]	1 1/4 [4]	3 1/4 [8]	1	-	-	-	-
3.000-7.999	3 1/4 [16]	5 1/4 [16]	7 1/4 [16]	1	-	-	-	-
8.000 and over	1 1/4 [4]	3 1/4 [8]	1 1/4 [2]	1	-	-	-	-

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

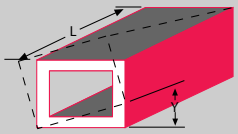
Temper	Specified Width in.	Specified Thickness in.	Tolerance – Degrees	
			 Y (max.) in degrees	
			In Total Length or in any Segment of One Ft. or More of Total Length	Maximum for Total Length
All except o, TX510, TX511 [8]	0.500 thru 1.499	All	1 Measured Length, ft.	7
	1.500-2.999	All	1 1/4 [2] Measured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

TABLE 12.8 STRAIGHTNESS
Tube in Straight Lengths

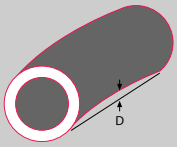
Temper	Specified Outside Diameter or Width in.	Tolerance [9 12] – in.	
		Allowable Deviation (D) From Straight 	
		In Total Length or in any Segment of One Ft. or More of Total Length	
All except 0, TX510 [8]	0.500-5.999	.010	Measured length, ft.
	6.000 and over	.020	Measured length, ft.
TX510 [80]	.500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

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

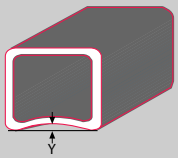
Minimum Thickness of Metal Forming the Surface in.	Tolerance – in.		
	 Maximum Allowable Deviation Y		
	Widths up thru 1 in. or any 1 in. Increment of Wider Surfaces	Widths over 1 in. thru 5.999 In.	
Up thru 0.187	0.006	0.006	W (Inches)
0.188 and over	0.004	0.004	W (Inches)

TABLE 12.10 SQUARENESS OF CUT ENDS

Allowable Deviation from Square: 1 Degree

TABLE 12.11 CORNER AND FILLET RADII

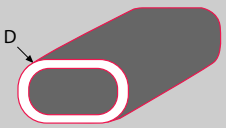
Specified Radius [18] in.	Tolerance – in.
	Allowable Deviation from Specified Radius  Difference between radius A and specified radius
Sharp corners 0.016-0.187 0.188 and over	+1/4[6,4] ±1/4[6,4] ±10%

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 0.064-0.125 0.126-0.188 0.189-.0250 0.251-0.500 0.501 and over	0.0025 0.003 0.0035 0.004 0.005 0.008
12.751-15.000	Up thru 0.500 0.501 and over	0.010 0.012
15.001-20.000	Up thru 0.500 0.501 and over	0.012 0.015
20.001 and over	Up thru 0.500 0.501 and over	0.015 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 1/4[2] percent of the outside diameter , in which case the following multipliers apply.

2% to 2 1/4[2]% exclusive – 2.5 tolerance (max.)
1 1/4[2]% to 2% exclusive – 3.0 tolerance (max.)
1% to 1 1/4[2]% exclusive – 4.0 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 1/4[2] 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 1/4[3,2] 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