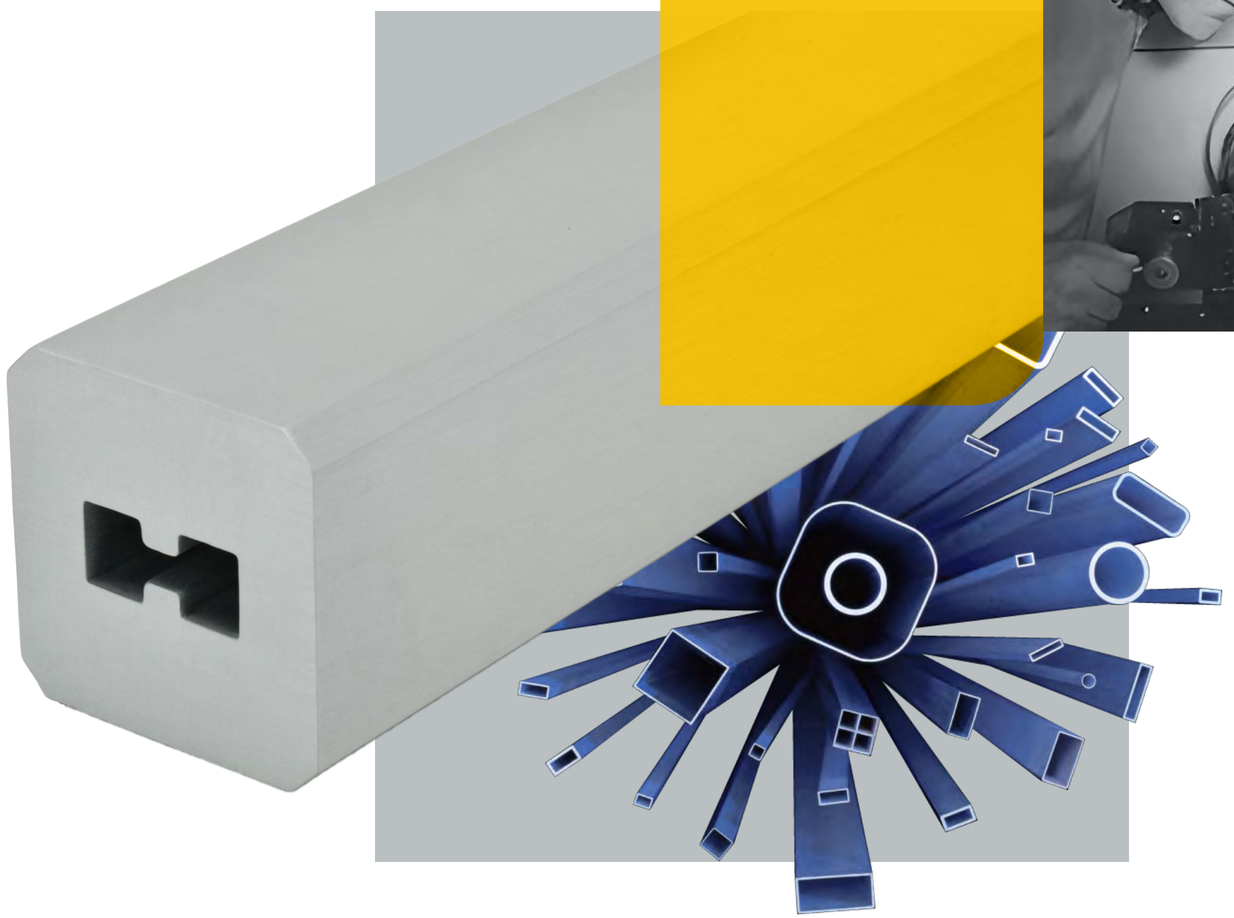


A-Alpha Waveguide

A PRODUCT LINE OF

QUINSTAR TECHNOLOGY, INC.

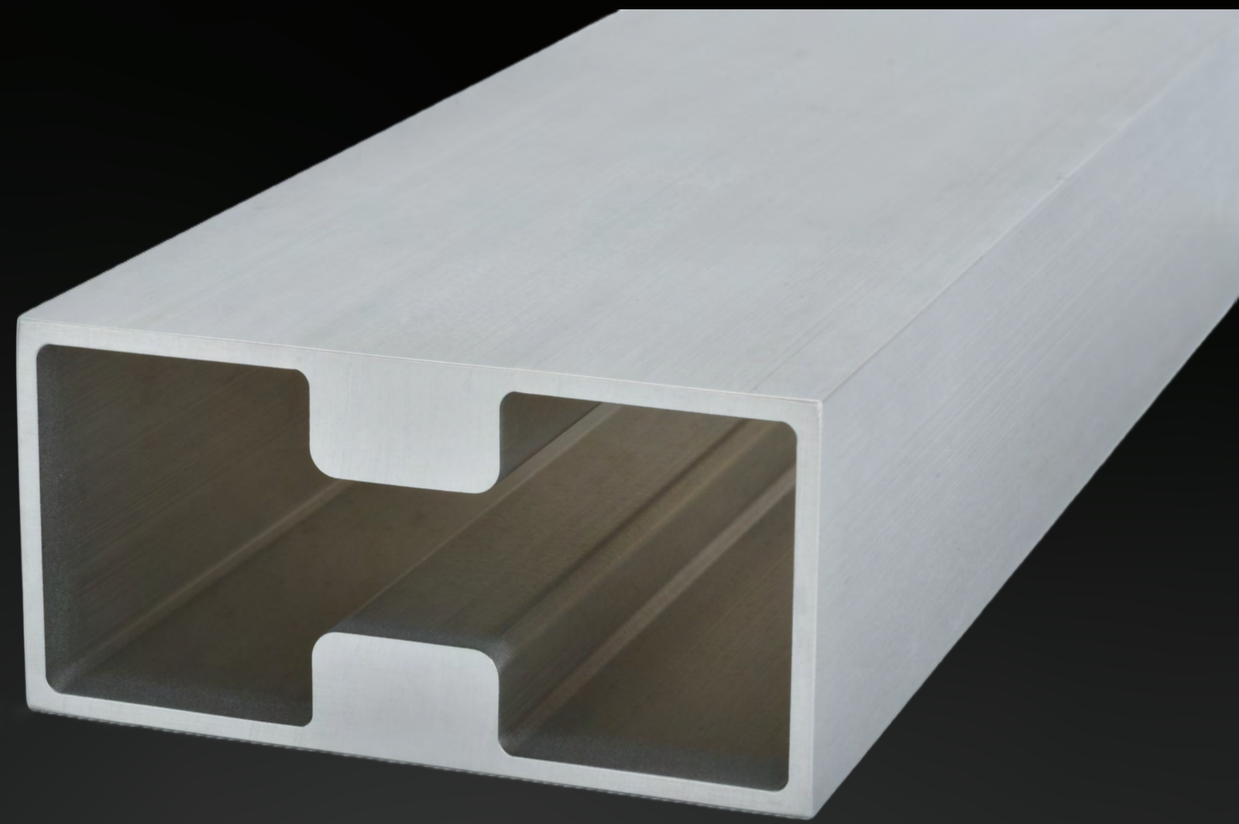
Manufacturer of Precision Cold Drawn Waveguide Tubing

All products manufactured in the U.S.A

Certified ISO9001:2015 & AS9100D

A-ALPHA WAVEGUIDE
HAS THE LARGEST INVENTORY
OF WAVEGUIDE IN THE U.S.

What makes us an industry leader is staying commited to mantain the highest quality and service.

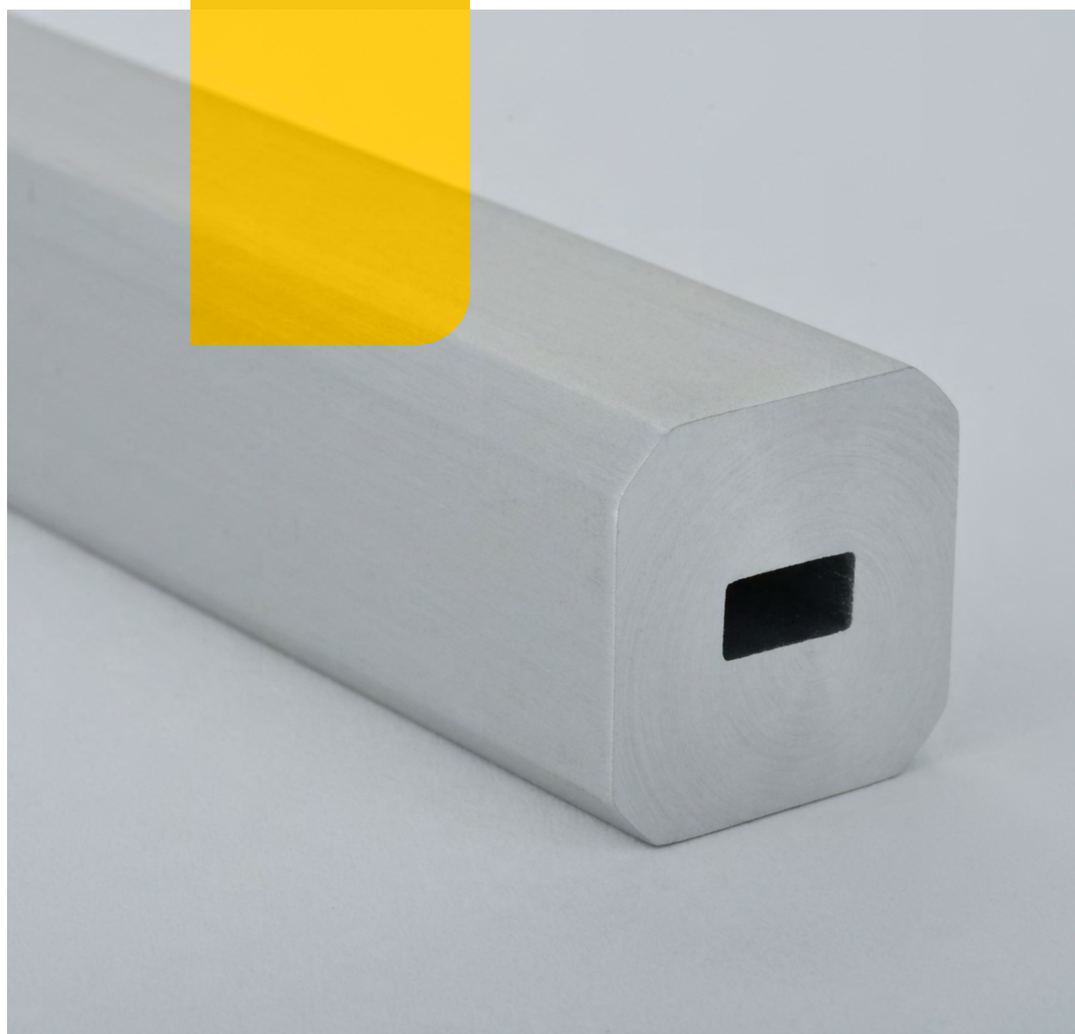


A-ALPHA WAVEGUIDE

Your best choice for waveguide and special close tolerance tubing

A-Alpha Waveguide Company was established in 1979 to supply a growing market with very high quality, close tolerance, drawn tubing. Its initial aim was waveguide tubing - rectangular tubing used in the electronics industry for satellites, radar, and many types of communications applications. However, clients requested the manufacturing of customized tubing for various other applications. We now manufacture thin wall tubing to tolerances of plus or minus one-thousandth of an inch (+ - 001) and have designed many new industry products.

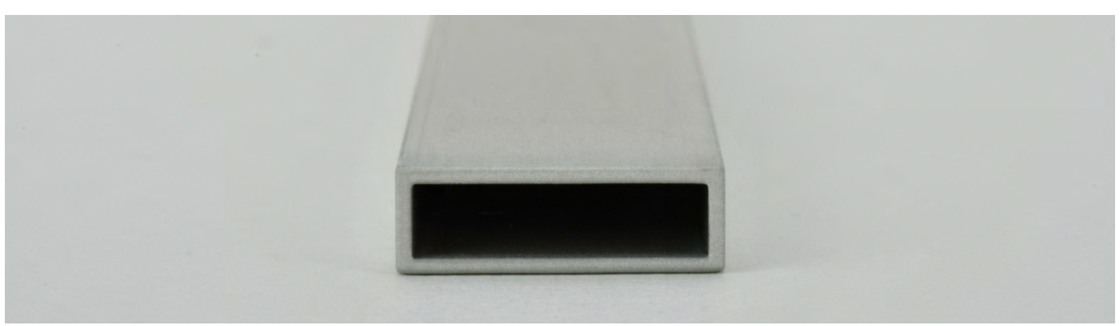
Since its inception, A-Alpha Waveguide has outgrown its original facility, now totalling over 25,000 square feet. This facility houses finished waveguide tubing, as well as additional products for distribution. We lead the telecommunications industry by offering a vast inventory of readily available materials such as aluminum, copper and bronze waveguide tube as well as invar, stainless steel, and coin silver waveguide tubing. Additional products offered include aluminum flange stock and brass and beryllium copper flexible waveguide.



OUR TOOLING IS MANUFACTURED IN-HOUSE TO ENSURE MAXIMUM CONTROL OF DELIVERY DATES.

We maintain the tolerances and any secondary tooling required to achieve configuration and quality. Walls as thin as .010 of an inch can be produced to tight tolerances on a regular production basis. The maximum outside dimension is generally 2.5 inches.

A-Alpha Waveguide also manufactures customized tubing for various applications, including aluminum tubing (which is used in fuel gauge sending units for wing tanks of large aircraft and a revolutionary concept for aircraft instruments that slide in and out of panels for easy replacement.

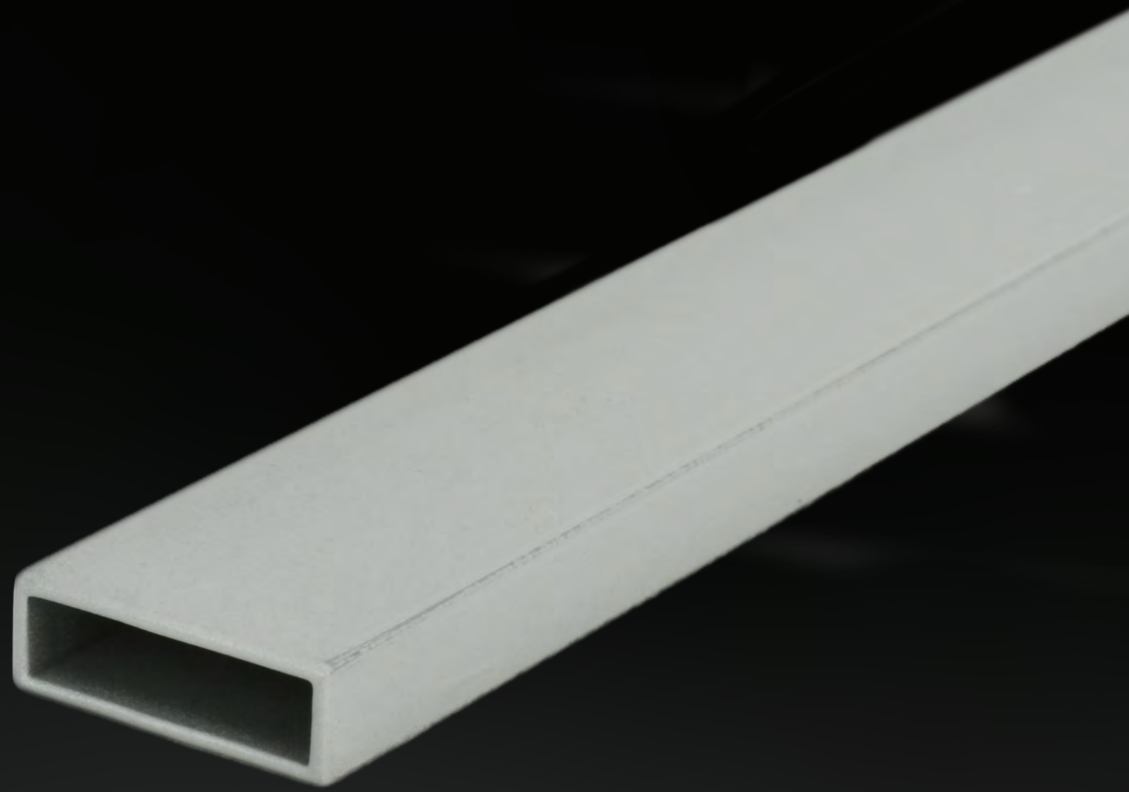


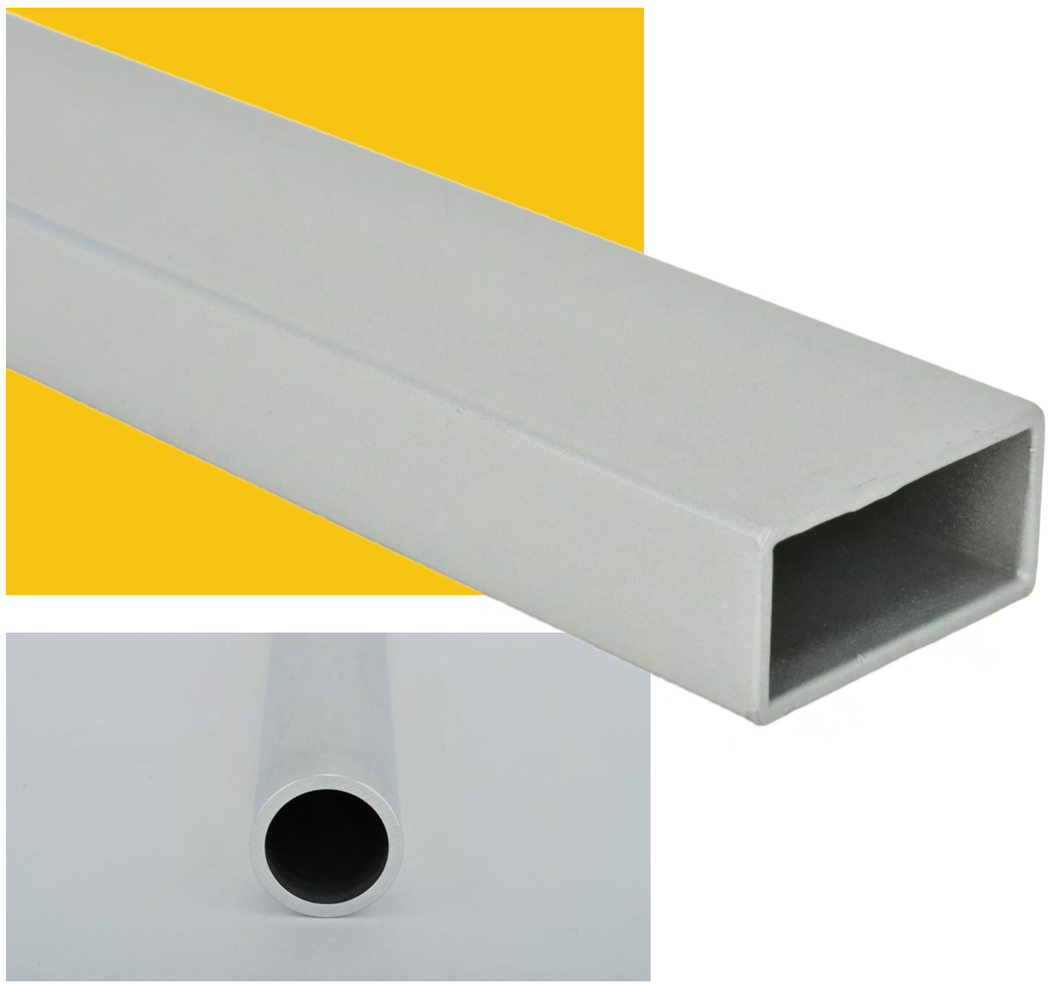
COLD DRAWN **TUBING**

There are two types of tubing processes extrusion and cold drawing.

In the extrusion process, the aluminum billet is heated to at least 800°, pushed through a die, and then flooded with cool air. This drastic temperature change causes the shape to react with non-symmetrical shrinkage and the sidewall to belly in.

At A-Alpha Waveguide, we utilize cold drawing, in which the tubing is pulled through a hardened steel die at room temperature, **allowing for very close tolerances and a higher quality product.**





COLD DRAWNING HAS 2 MAJOR BENEFITS

1 The grain structure of the material is refined, creating a uniform composition. This allows us to flawlessly hold the shape and tolerances each time. The tube is more malleable and can be flanged, pierced or formed more radically without splitting. This process also induces fewer internal stresses and the tubing is therefore affected far less by any stress relieving function, such as asymmetrical machining or piercing.

This characteristic saves money since other methods require reworking parts after fabrication to meet the drawing specifications.

2 The dimensions are firmly set. At room temperature, there is no heat related contraction to affect dimensions.

COLD DRAWN RIGID WAVEGUIDE DATA

WR	RG	MIL-W-85 MIL-DTL-85H	MATERIAL	EST. WT PER FOOT	FREQUENCY RANGE GHz	INSIDE DIMENSION	TOL. ± STD.	OUTSIDE DIMENSION	TOL. ± STD.	WALL THICKNESS
WR 3	- RG 279/U -	- - -	COPPER BRONZE COIN SILVER	.0258 .0255 .44 OZ	220.00 - 325.00	.034 x .017	.001	.094 x .077	.002	.030
WR 4	- RG 277/U -	- - -	COPPER BRONZE COIN SILVER	.0289 .0286 .50 OZ	170.00 - 260.00	.043 x .0215	.001	.103 x .0815	.002	.030
WR 5	- RG 275/U -	- - -	COPPER BRONZE COIN SILVER	.0317 .0314 .54 OZ	140.00 - 220.00	.051 x .0255	.001	.111 x .0855	.002	.030
WR 7	- RG 276/U -	- - -	COPPER BRONZE COIN SILVER	.0366 .0362 .62 OZ	110.00 - 170.00	.065 x .0325	.001	.125 x .0925	.002	.030
WR 8	- RG 278/U -	- - -	COPPER BRONZE COIN SILVER	.0419 .0414 .71 OZ	90.00 - 140.00	.080 x .040	.001	.140 x .100	.002	.030
WR 10	- RG 359/U -	3-024 - 3-023	COPPER BRONZE COIN SILVER	.0710 .0700 1.21 OZ	75.00 - 110.00	.100 x .050	.001	.180 x .130	.002	.040
WR 12	- RG 274/U RG 99/U	3-021 - 3-020	COPPER BRONZE COIN SILVER	.0816 .0807 1.38 OZ	60.00 - 90.00	.122 x .061	.001	.202 x .141	.002	.040
WR 15	RG 273/U - RG 98/U	3-018 - 3-017	COPPER BRONZE COIN SILVER	.0937 .0927 1.59 OZ	50.00 - 75.00	.148 x .074	.001	.228 x .154	.002	.040
WR 19	RG 358/U RG 358/U -	3-015 WR19 90/10 3-014	COPPER BRONZE COIN SILVER	.1120 .1110 1.91 OZ	40.00 - 60.00	.188 x .094	.001	.268 x .174	.002	.040
WR 22	RG 272/U RG 272/U RG 97/U -	3-011 3-012 3-010 3-013	COPPER BRONZE COIN SILVER 6061 AL	.1290 .1278 2.19 OZ .039	33.00 - 50.00	.224 x .112	.001	.304 x .192	.002	.040
WR 28	RG 271/U RG 271/U - - RG 96/U	3-007 3-008 3-009 - 3-006	COPPER BRONZE 6061 AL 6061 AL COIN SILVER	.1552 .1536 .044 .022 2.64 OZ	26.50 - 40.00	.280 x .140	.001	.360 x .220 .320 x .180 .360 x .220	.002	.040 .020 .040
WR 34	RG 354/U RG 354/U RG 355/U -	1-107 1-109 1-111 -	COPPER BRONZE 6061 AL 6061 AL	.1830 .1810 .0552 .026	22.00 - 33.00	.340 x .170	.001	.420 x .250 .380 x .210	.002	.040 .020
WR 42	RG 53/U RG 53/U RG 66/U RG 121/U -	1-100 1-102 1-106 1-104 -	COPPER BRONZE COIN SILVER 6061 AL 6061 AL	.2017 .2050 3.53 OZ .0627 .029	18.00 - 26.50	.420 x .170	.001	.500 x .250 .460 x .210	.002	.040 .020
WR 51	RG 352/U RG 353/U RG 351/U -	1-094 1-096 1-098 -	COPPER BRONZE 6061 AL 6061 AL	.2620 .2590 .0790 .039	15.00 - 22.00	.510 x .255	.001	.590 x .335 .550 X .295	.002	.040 .020
WR 62	RG 91/U RG 91/U RG 349/U RG 349/U -	1-087 1-089 1-090 1-091 -	COPPER BRONZE 1100 AL 6061 AL 6061 AL	.3140 .3110 .0948 .0948 .047	12.40 - 18.00	.622 x .311	.001	.702 x .391 .662 X .351	.002	.040 .020
WR 75	RG 346/U RG 346/U RG 347/U - -	1-081 1-085 1-084 - -	COPPER BRONZE 6061 AL 6061 AL 6061 AL	.4750 .4700 .1430 .056	10.00 - 15.00	.750 x .375	.001	.850 x .475 .790 X .415	.002	.050 .020 .025
WR 90	RG 52/U RG 52/U RG 67/U RG 67/U -	1-075 1-079 1-077 1-078 -	COPPER BRONZE 1100 AL 6061 AL 6061 AL	.5430 .5370 .1638 .1638 .063	8.20 - 12.40	.900 x .400	.002	1.000 x .500 .940 X .440	.003	.050 .020
WR 102	- RG 320/U -	1-156 1-155 1-158	COPPER BRONZE 6061 AL	.8235 .8100 .2480	7.00 - 11.00	1.020 x .510	.002	1.148 x .638	.005	.064
WR 112	RG 51/U RG 51/U RG 68/U RG 68/U -	1-069 1-073 1-071 1-072 -	COPPER BRONZE 1100 AL 6061 AL 6061 AL	.8670 .8580 .2600 .2600 .080 .129	7.05 - 10.00	1.122 x .497	.002	1.250 x .625 1.162 x .537 1.186 x .561	.004	.064 .020 .032
WR 137	RG 50/U RG 50/U RG 106/U -	1-063 1-067 1-066 -	COPPER BRONZE 6061 AL 6061 AL	1.053 1.043 .3170 .099 .154	5.85 - 8.20	1.372 x .622	.002	1.500 x .750 1.142 x .662 1.436 x .68	.004	.064 .020 .032
WR 159	RG 343/U RG 343/U RG 344/U	1-057 1-061 1-060	COPPER BRONZE 6061 AL	1.248 1.235 .3760	4.90 - 7.05	1.590 x .795	.004	1.718 x .923	.004	.064
WR 187	RG 49/U RG 49/U RG 95/U RG 95/U	1-051 1-055 1-054 1-053	COPPER BRONZE 6061 AL 1100 AL	1.426 1.411 .4300 .4300	3.95 - 5.85	1.872 x .872	.005	2.000 x 1.000	.005	.064
WR 229	RG 340/U RG 340/U RG 341/U	1-045 1-049 1-048	COPPER BRONZE 6061 AL	1.769 1.751 .5335	3.30 - 4.90	2.290 x 1.145	.005	2.418 x 1.273	.005	.064
WR 284	RG 48/U RG 48/U RG 75/U RG 75/U	1-039 1-043 1-042 1-041	COPPER BRONZE 6061 AL 1100 AL	2.694 2.666 .8120 .8120	2.60 - 3.95	2.840 x 1.340	.005	3.000 x 1.500	.005	.080
WR 340	RG 112/U RG 112/U RG 113/U	1-033 1-037 1-036	COPPER BRONZE 6061 AL	3.265 3.231 .9800	2.10 - 3.00	3.400 x 1.700	.005	3.560 x 1.860	.005	.080
WR 430	RG 104/U RG 104/U RG 105/U	1-027 1-031 1-030	COPPER BRONZE 6061 AL	4.103 4.061 1.237	1.70 - 2.60	4.300 x 2.150	.008	4.460 x 2.310	.008	.080
WR 510	RG 337/U RG 338/U	1-021 1-026	COPPER 6061 AL	4.848 1.462	1.45 - 2.20	5.100 x 2.550	.008	5.260 x 2.710	.008	.080
WR 650	- RG 103/U	1-015 1-019	COPPER 6061 AL	1.902	1.12 - 1.70	6.500 x 3.250	.008	6.660 x 3.410	.008	.080

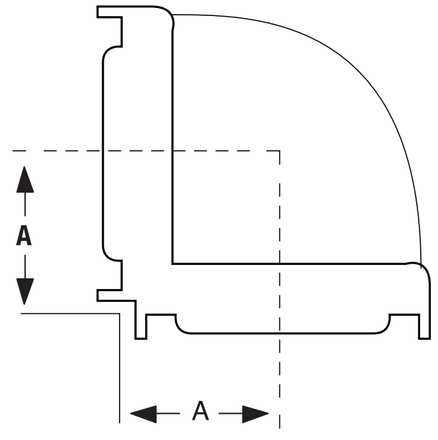
CAST BENDS

In Silicon Bronze and Aluminum.

DESCRIPTION	90	60	45	30
WR28H	WR2801 .208		WR2805	
WR28E	WR2802 .140		WR2806	
WR34H	WR3401 .255		WR3405	
WR34E	WR3402 .170		WR3406	
WR42H	WR4201 .300		WR4205 .304	
WR42E	WR4202 .170		WR4206 .179	
WR51H	WR5101 .312		WR5105 .900	WR5107 .407
WR51E	WR5102 .187		WR5106 .241	WR5108 .282
WR62H	WR6201 .368	WR6203 .396	WR6205 .396	WR6207 .396
WR62E	WR6202 .250	WR6204 .625	WR6206 .240	WR6208 .240
WR75H	WR7501 .484		WR7505 .800	WR7507 .625
WR75E	WR7502 .325		WR7506 .376	WR7508
WR90H	WR9001 .575	WR9003 .750	WR9005 .750	WR9007 .750
WR90E	WR9002 .325	WR9004 .453	WR9006 .453	WR9008 .453
WR112H	WR11201 .656		WR11205 1.187	WR11207 1.187
WR112E	WR11202 .344		WR11206 .594	WR11208 .594

DESCRIPTION	90	60	45	30
WR137H	WR13701 .828		WR13705 .811	WR13707 .842
WR137E	WR13702 .438		WR13706 .437	WR13708 .467
WR159H	WR15901 1.000			
WR159E	WR15902 .550			
WR187H	WR18701 1.062		WR18705 2.187	
WR187E	WR18702 .593		WR18706 1.062	
WR229H	WR22901 1.234		WR22905 1.750	
WR229E	WR22902 .700		WR22906 1.500	
WR284H	WR28401 1.531		WR28405 1.677	
WR284E	WR28402 .781		WR28406 .927	

90° E and H Plane

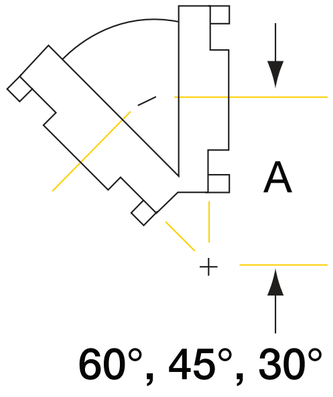


*When ordering, put “A” (for Aluminum) or “B” (for Bronze) after part number.

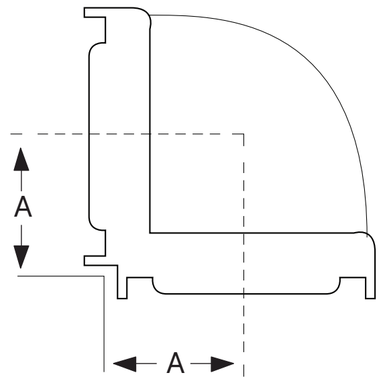
THIN WALL CAST BENDS

In Aluminum only. Part numbers/Measurement A in inches.

DESCRIPTION	90	60	45	30
WR28H	TWR2801 .208		TWR2805 .140	
WR28E	TWR2802 .140		TWR2806 .100	
WR34H	TWR3401 .252	TWR3403 .210	TWR3405 .210	TWR3407 .160
WR34E	TWR3402 .170	TWR3404 .160	TWR3406 .173	TWR3408 .160
WR51H	TWR5101 .334	TWR5103 .410	TWR5105 .476	TWR5107 .735
WR51E	TWR5102 .206	TWR5104 .273	TWR5106 .380	TWR5108 .588
WR62H	TWR6201 .437	TWR6203 .637	TWR6205 .630	TWR6207 .768
WR62E	TWR6202 .280	TWR6204 .630	TWR6206 .689	TWR6208 .630
WR75H	TWR7501 .500	TWR7503 .630	TWR7505 .630	TWR7507 .748
WR75E	TWR7502 .310	TWR7504 .393	TWR7506 .520	TWR7508 .787
WR90H	TWR9001 .575			
WR90E	TWR9002 .325			
WR112H	TWR11201 .660		TWR11205 1.187	
WR112E	TWR11202 .340		TWR11208 .594	
WR137H	TWR13701 .828	TWR13703	TWR13705 .811	TWR13707
WR137E	TWR13702 .438	TWR13704	TWR13706 .437	TWR13708
WR229H	TWR22901 1.234			
WR229E	TWR22902 .700			

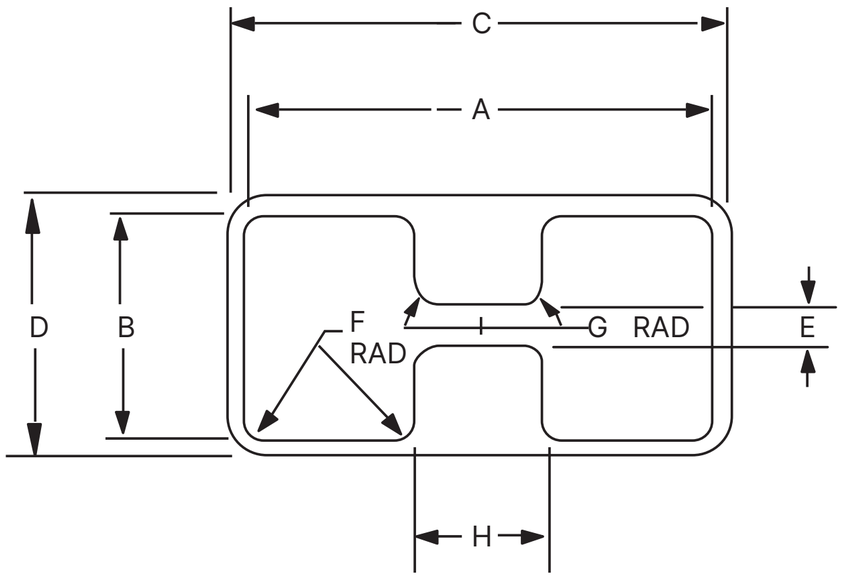


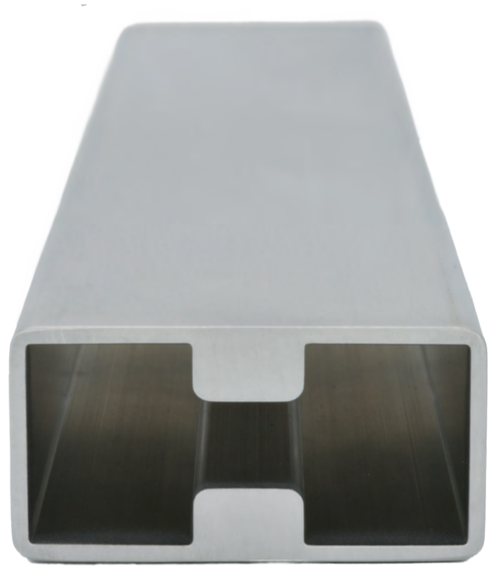
90° E and H Plane



ALUMINIUM DOUBLE RIDGED WAVEGUIDE

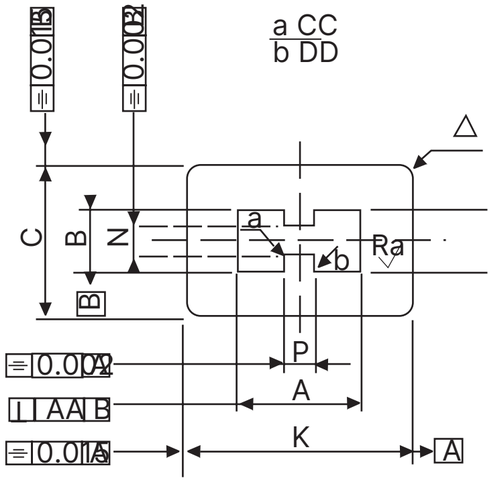
WRD	Suggested FrequencyRange TE_{10}Mode	A	B	C	D	E	F	G	H
750	7.50 - 18.00	.691” ± .004” 17.551 ± .102	.321” ± .004” 8.153 ± .102	.791” ± .004” 20.091 ± .102	.421” ± .004” 10.693 ± .102	.136” ± .003” 3.959 ± .076	.020” .508	.027” .686	.173” ± .002” 4.394 ± .051
650	6.50 -	.720” ± .004” 18.288 ± .102	.321” ± .004” 8.153 ± .102	.820” ± .004” 20.828 ± .102	.421” ± .004” 10.693 ± .102	.101” ± .003” 2.565 ± .076	.010” .254	.022” .559	.173” ± .002” 4.394 ± .051
580	5.80 - 16.00	.780” ± .004” 19.812 ± .102	.370” ± .004” 9.398 ± .102	.880” ± .004” 22.352 ± .102	.470” ± .004” 11.938 ± .102	.120” ± .003” 3.048 ± .076	.020” .508	.043” 1.092	.200” ± .002” 5.080 ± .051
475	4.75 - 11.00	1.09” ± .004” 27.686 ± .102	.506” ± .004” 12.852 ± .102	1.190” ± .004” 12.852 ± .102	.606” ± .004” 15.392 ± .102	.215” ± .003” 5.961 ± .076	.030” .762	.043” 1.092	.272” ± .002” 6.909 ± .051
350	3.50 - 8.20	1.480” ± .004” 35.56 ± .102	.688” ± .004” 17.475 ± .102	1.608” ± .005” 40.843 ± .127	.816” ± .005” 20.726 ± .127	.292” ± .003” 7.417 ± .076	.030” .762	.058” 1.473	.370” ± .002” 9.398 ± .051
250	2.60 - 7.80	1.655” ± .010” 42.037 ± .254	.715” ± .005” 18.161 ± .127	2.000” ± .005” 50.800 ± .127	1.000” ± .005” 25.400 ± .127	.150” ± .003” 3.810 ± .076	.020” .508	.092” 2.337	.440” ± .002” 11.176 ± .051
200	2.00 - 4 .80	2.590” ± .005” 50.08 ± .127	1.205” ± .007” 31.75 ± .178	2.750” ± .010” 50.08 ± .254	1.365” ± .010” 34.671 ± .254	.512” ± .005” 13.005 ± .127	.050” 1.27	.102” 2.591	.648” ± .004” 18.999 ± .102
180	18.00 - 40.00	.288” ± .004” 7.135 ± .102	.134” ± .004” 3.404 ± .102	.368” ± .004” 9.347 ± .102	.214” ± .004” 5.436 ± .102	.057” ± .003” 1.448 ± .076	.015” .381	.011” .380	.072” ± .002” 1.829 ± .051
110	11.00 - 26.50	.471” ± .004” 1.196 ± .102	.219” ± .004” 5.563 ± .102	.551” ± .004” 13.995 ± .102	.299” ± .004” 7.595 ± .102	.093” ± .003” 2.362 ± .076	.015” .381	.019” .481	.118” ± .002” 2.997 ± .051





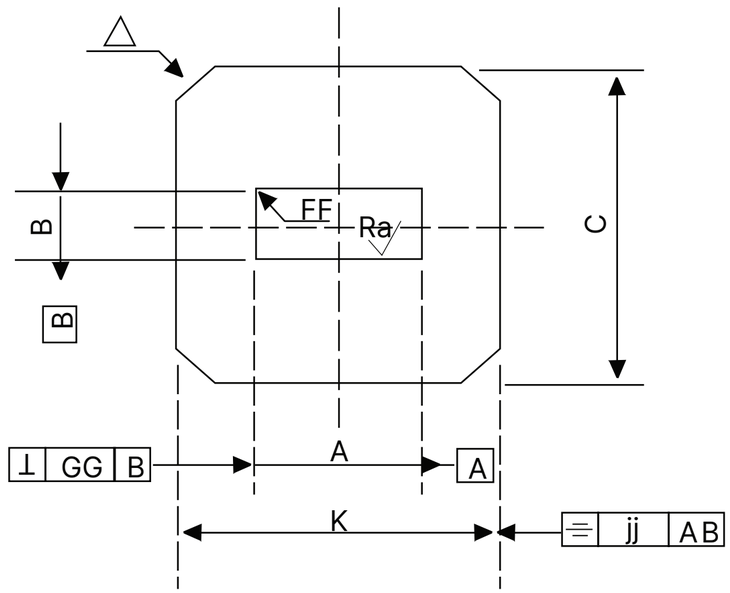
DOUBLE-RIDGE FLANGE STOCK

WRD FLANGE STOCK	Dimensions							± 10%	(max)	4 places	µ inch / µ m
	A	B	C	K	N	P	AA	CC	DD	△	Ra
	inches/mm	inches/mm	inches/mm	inches/mm	inches/mm	inches/mm					
475	1.090 ± .003 27.686 ± .076	.506 ± .003 12.852 ± .076	1.391 ± .015 35.331 ± .381	1.969 ± .015 50.013 ± .381	.215 ± .002 5.461 ± .051	.272 ± .002 6.909 ± .051	.003 .076	.043 1.092	.030 .762	.24 6.096	40
580	.78 ± .003 19.812 ± .076	.370 ± .003 9.398 ± .076	1.375 ± .015 34.925 ± .381	1.375 ± .015 34.925 ± .381	.120 ± .001 3.048 ± .025	.20 ± .001 5.08 ± .025	.003 .076	.043 1.092	.020 .508	.125 x 45° 3.175	40
650	.72 ± .003 18.288 ± .076	.321 ± .003 8.153 ± .076	1.375 ± .015 34.925 ± .381	1.375 ± .015 34.925 ± .381	.101 ± .001 2.565 ± .025	.173 ± .001 4.394 ± .025	.003 .076	.022 .559	.020 .508	.125 x 45° 3.175	40
750	.691 ± .003 17.551 ± .076	.321 ± .003 8.153 ± .076	1.375 ± .015 34.925 ± .381	1.375 ± .015 34.925 ± .381	.136 ± .001 3.454 ± .025	.173 ± .002 4.394 ± .051	.003 .076	.027 .686	.020 .508	.125 x 45° 3.175	40
180	.288 ± .003 7.315 ± .076	.134 ± .003 3.404 ± .076	.875 ± .015 22.225 ± .381	.875 ± .015 22.225 ± .381	.057 ± .002 1.448 ± .051	.072 ± .002 1.829 ± .051	.001 .025	.011 .279	.015 .381	.125 3.175	40



DOUBLE-RIDGE FLANGE STOCK

Waveguide size	Dimensions								
WR	A	B	C	K	FF	GG	JJ	△
			min	min	max.	max.		
137	1.372 ± .002 34.849 ± .051	0.622 ± .002 15.799 ± .051	1.94 49.276	2.69 68.326	0.030 .762	0.002 .051	0.008 .203	.150R
112	1.122 ± .002 28.499 ± .051	0.497 ± .002 12.624 ± .051	1.88 47.752	1.88 47.752	0.030 .762	0.002 .051	0.004 .102	.125 x 45°
90	0.900 ± .002 22.860 ± .051	0.400 ± .002 10.160 ± .051	1.63 41.402	1.63 41.402	0.030 .762	0.002 .051	0.004 .102	.125 x 45°
75	0.750 ± .002 19.050 ± .051	0.375 ± .002 9.525 ± .051	1.5 38.100	1.5 38.100	0.030 .762	0.002 .051	0.004 .102	.125 x 45°
62	0.622 ± .002 15.799 ± .051	0.311 ± .002 7.899 ± .051	1.31 33.274	1.31 33.274	0.016 .406	0.002 .051	0.004 .102	.125 x 45°
51	0.510 ± .002 12.934 ± .051	0.255 ± .002 6.477 ± .051	1.31 33.274	1.31 33.274	0.016 .406	0.002 .051	0.004 .102	.125 x 45°
42	0.420 ± .002 10.668 ± .051	0.170 ± .002 4.318 ± .051	0.875 22.225	0.875 22.225	0.016 .406	0.002 .051	0.004 .102	.125 x 45°
34	0.340 ± .002 8.636 ± .051	0.170 ± .002 4.318 ± .051	0.875 22.225	0.875 22.225	0.016 .406	0.002 .051	0.002 .051	.125 x 45°
28	0.280 ± .002 7.112 ± .051	0.140 ± .002 4.318 ± .051	0.750 19.050	0.750 19.050	0.016 .406	0.002 .051	0.002 .051	.125 x 45°
22	0.224 ± .002 5.690 ± .051	0.112 ± .002 2.845 ± .051	0.750 19.050	0.750 19.050	0.016 .406	0.002 .051	0.002 .051	.175 x 45°



A-Alpha Waveguide

1217 East El Segundo Blvd.
El Segundo, CA 90245

Phone: +1 310.322.3487
Fax: 1+ 310.322.0088
Email: sales@a-alphawaveguide.com
Web: A-AlphaWaveguide.com

A product line of QUINSTAR TECHNOLOGY