



A-Alpha Waveguide

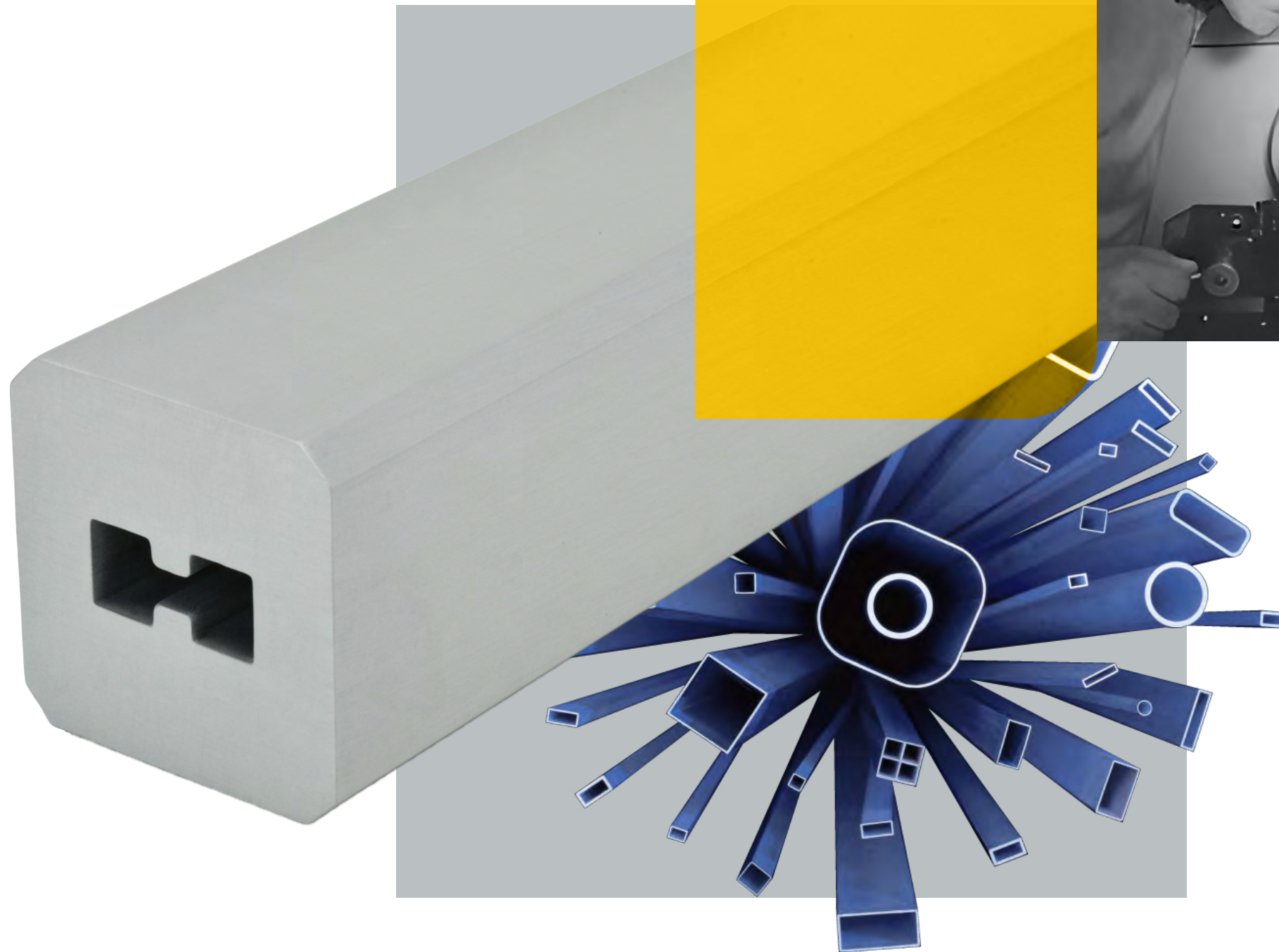
A PRODUCT LINE OF

**QUINSTAR
TECHNOLOGY, INC.**

Manufacturer of Precision Cold Drawn Waveguide Tubing

All products manufactured in the U.S.A 

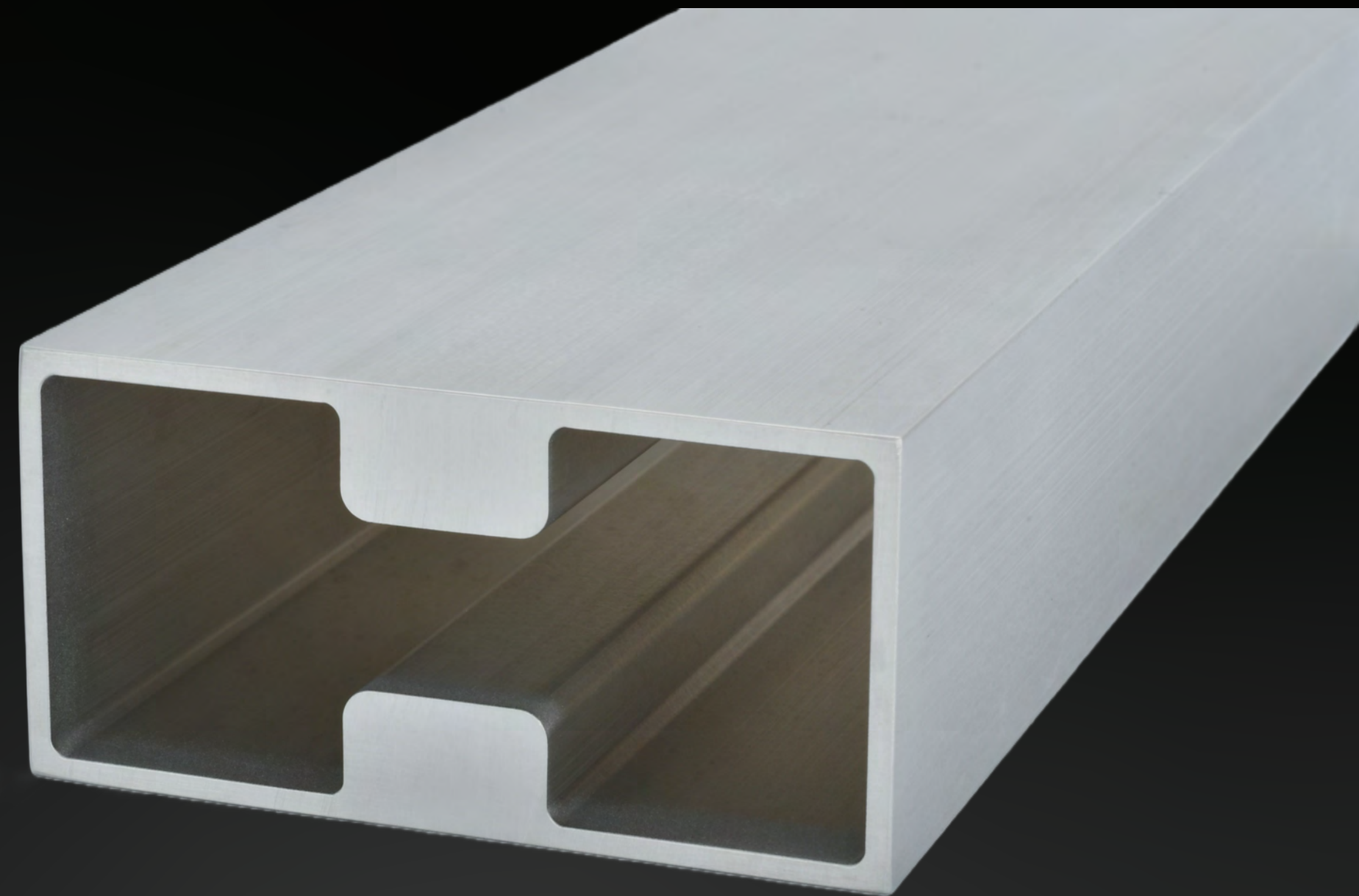
Certified ISO9001:2015 & AS9100D



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

What makes us an industry leader is staying committed to maintain 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.

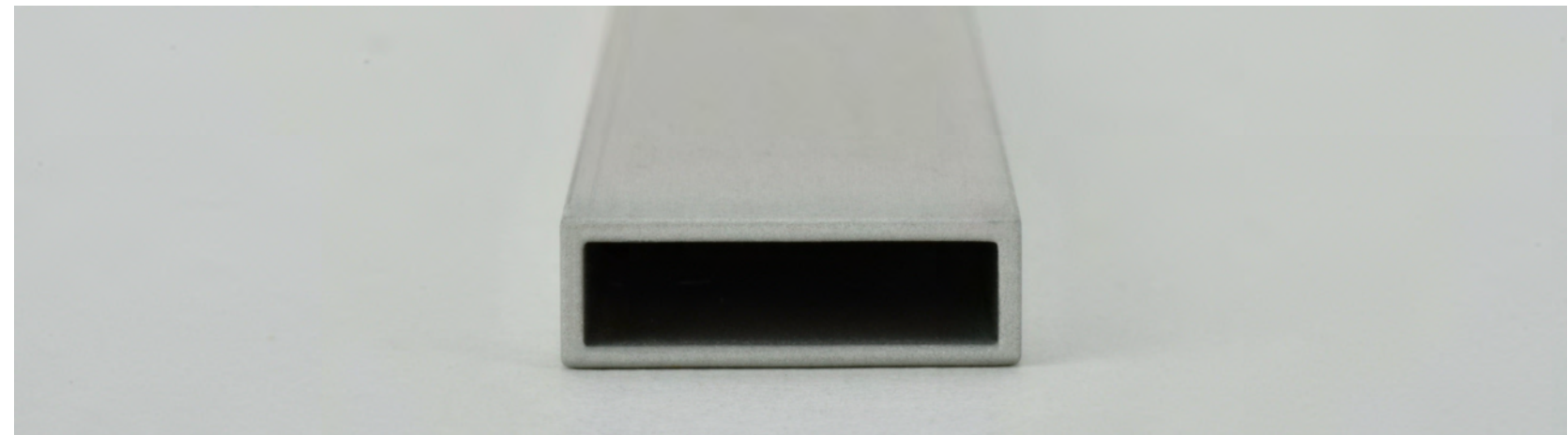




OUR TOOLING IS MANUFACTURED IN-HOUSE TO ENSURE MAXIMUM CONTROL OF DELIVERY DATES.

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).

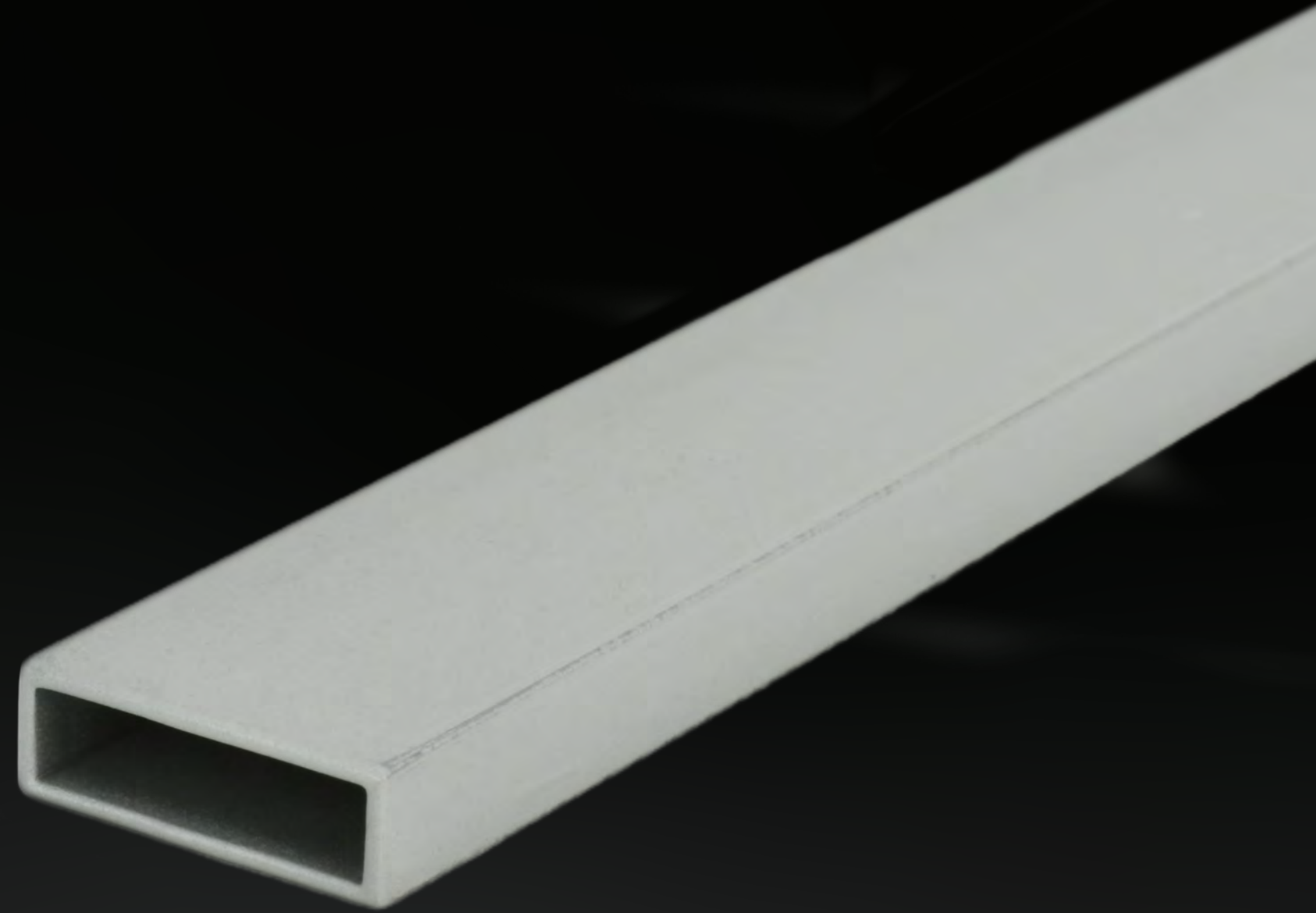


COLD DRAWN TUBING

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

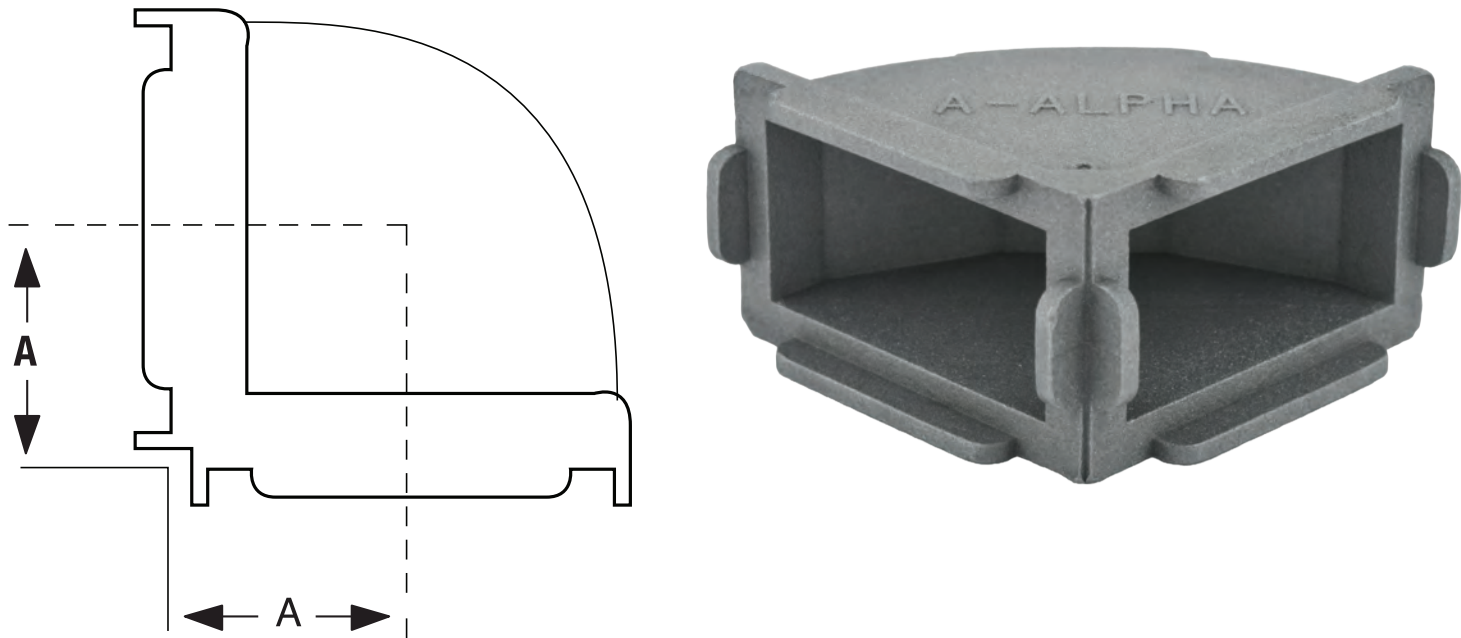
CAST BENDS

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

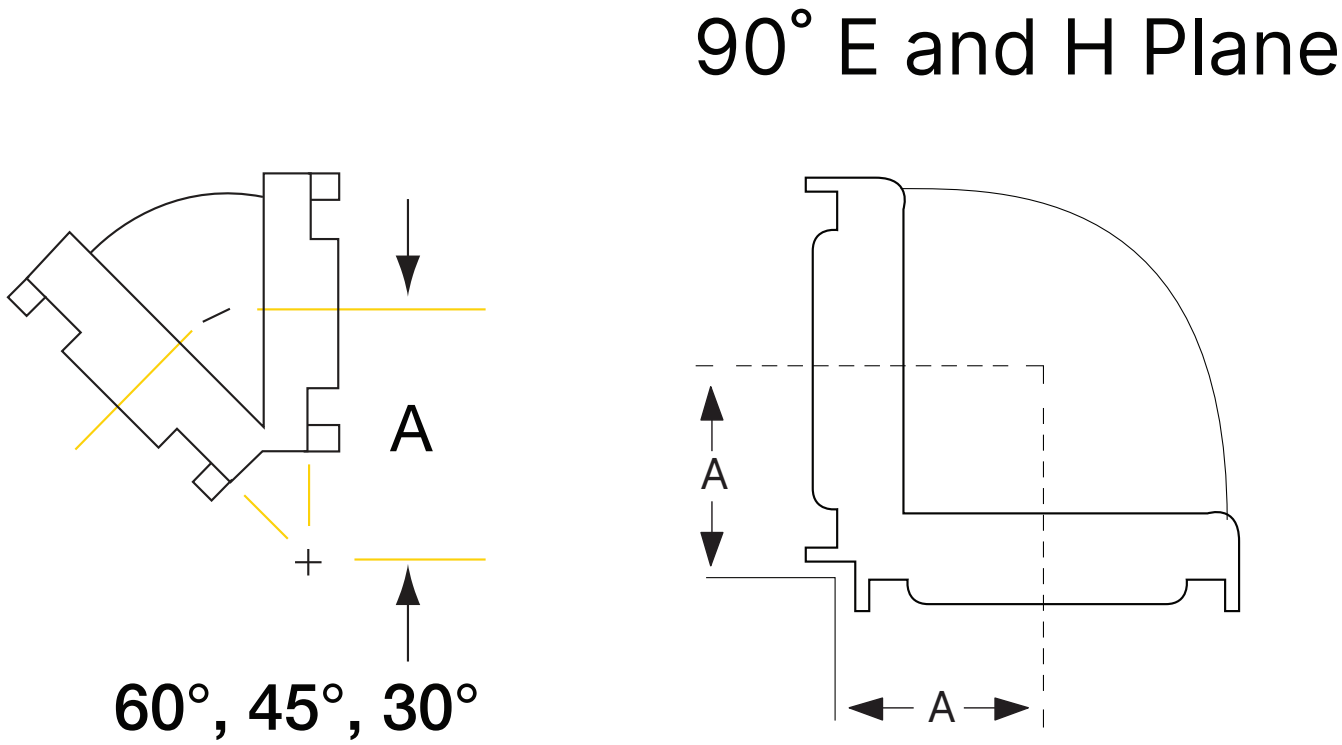


*When ordering, put “A” (for Aluminum) or “B” (for Bronze) after part number.

THIN WALL CAST BENDS

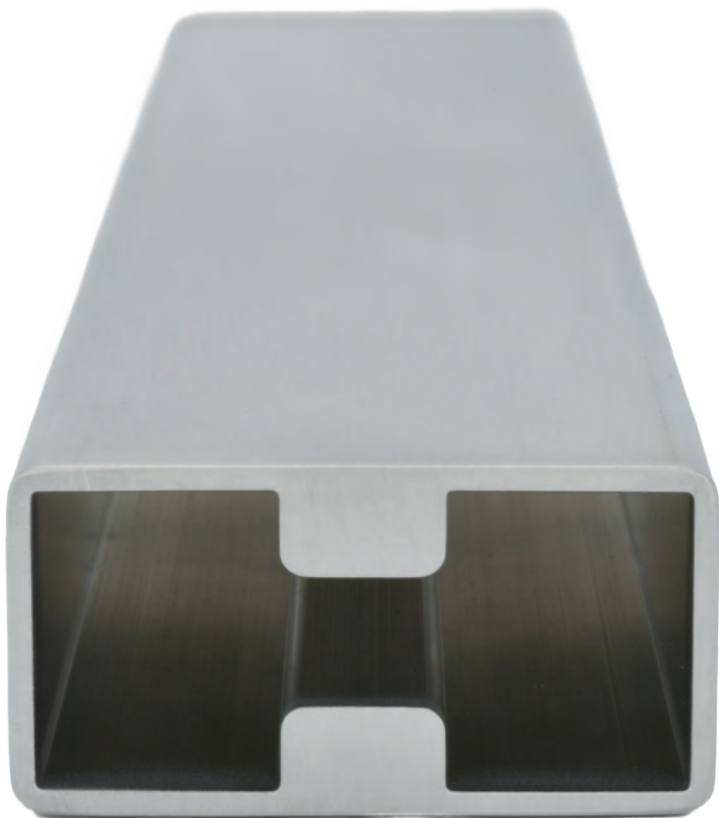
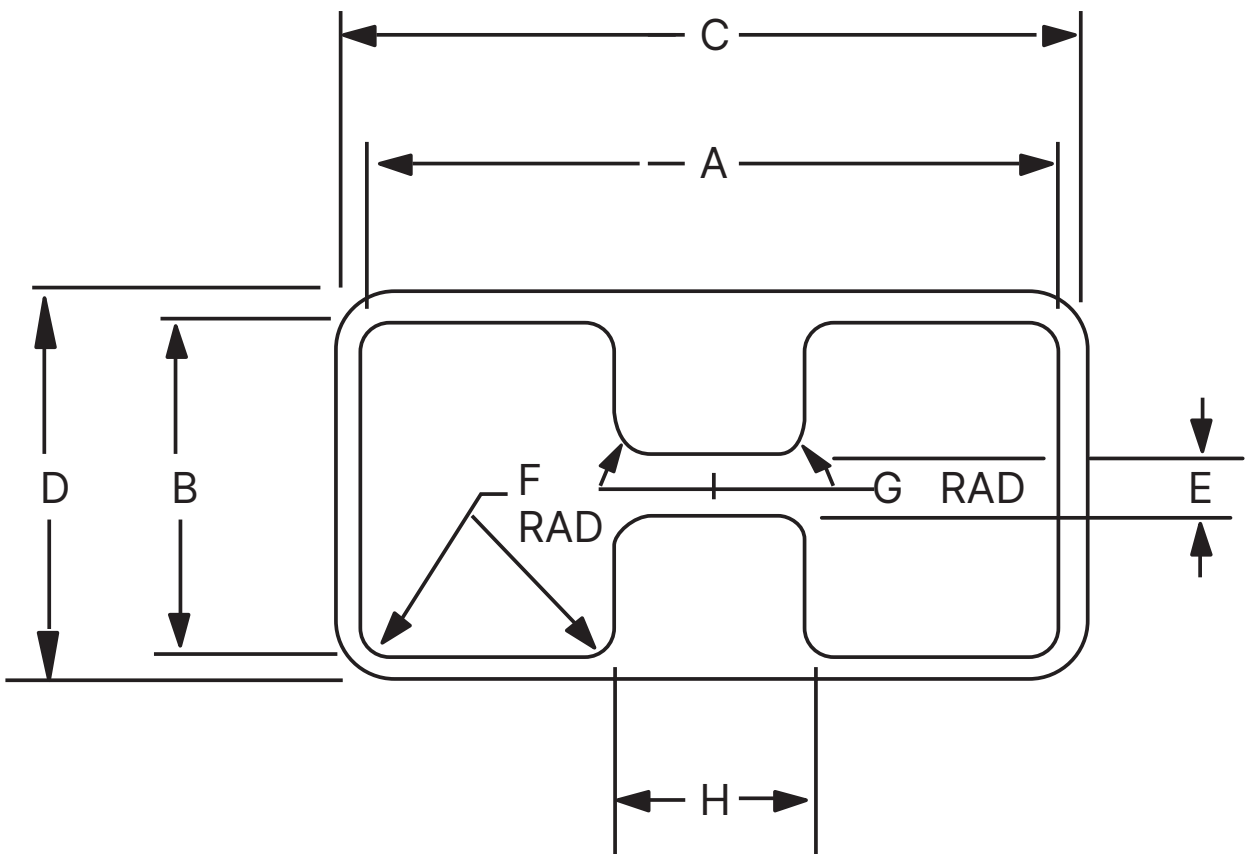
In Aluminum only. Part numbers/Measurement A in inches.

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			



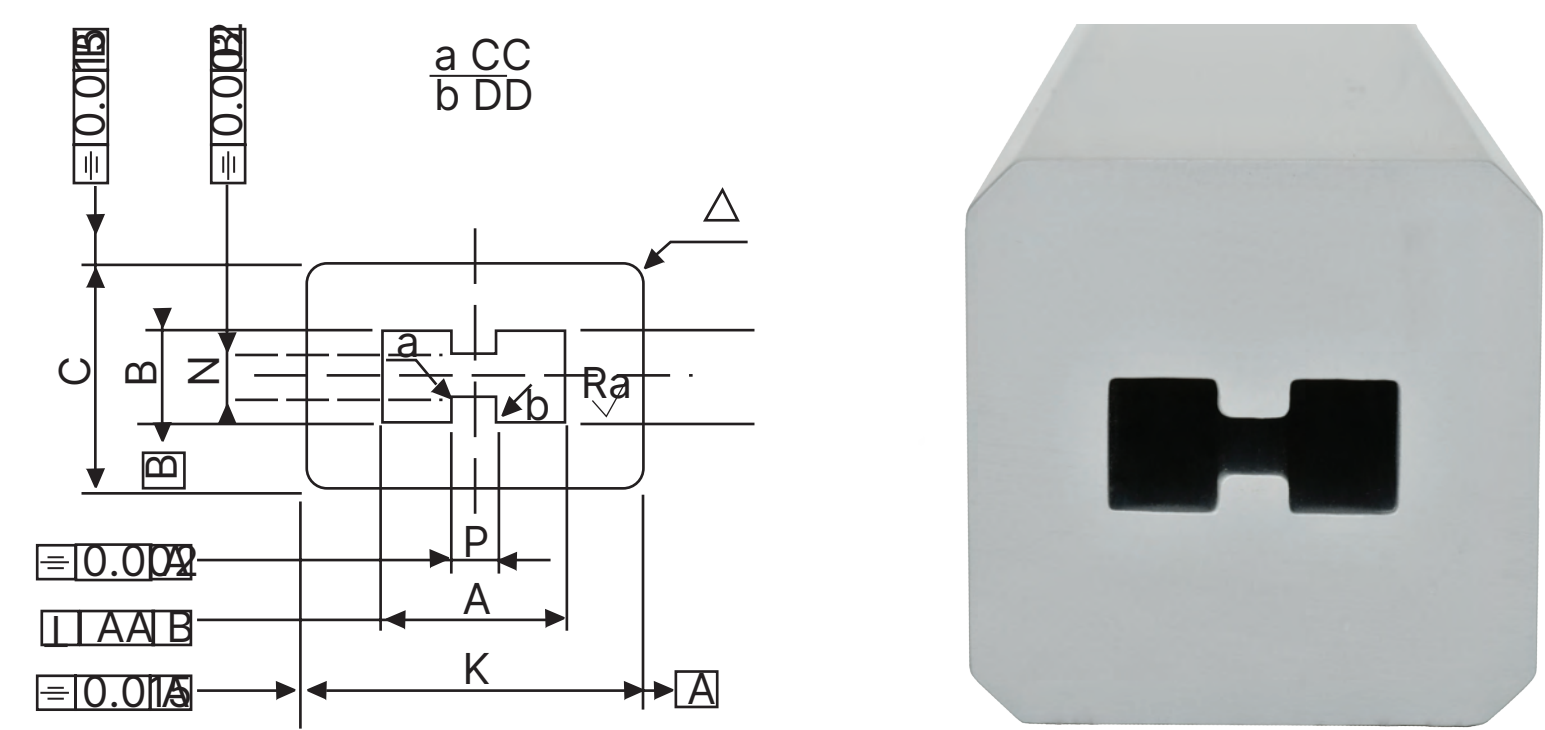
ALUMINIUM DOUBLE RIDGED WAVEGUIDE

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



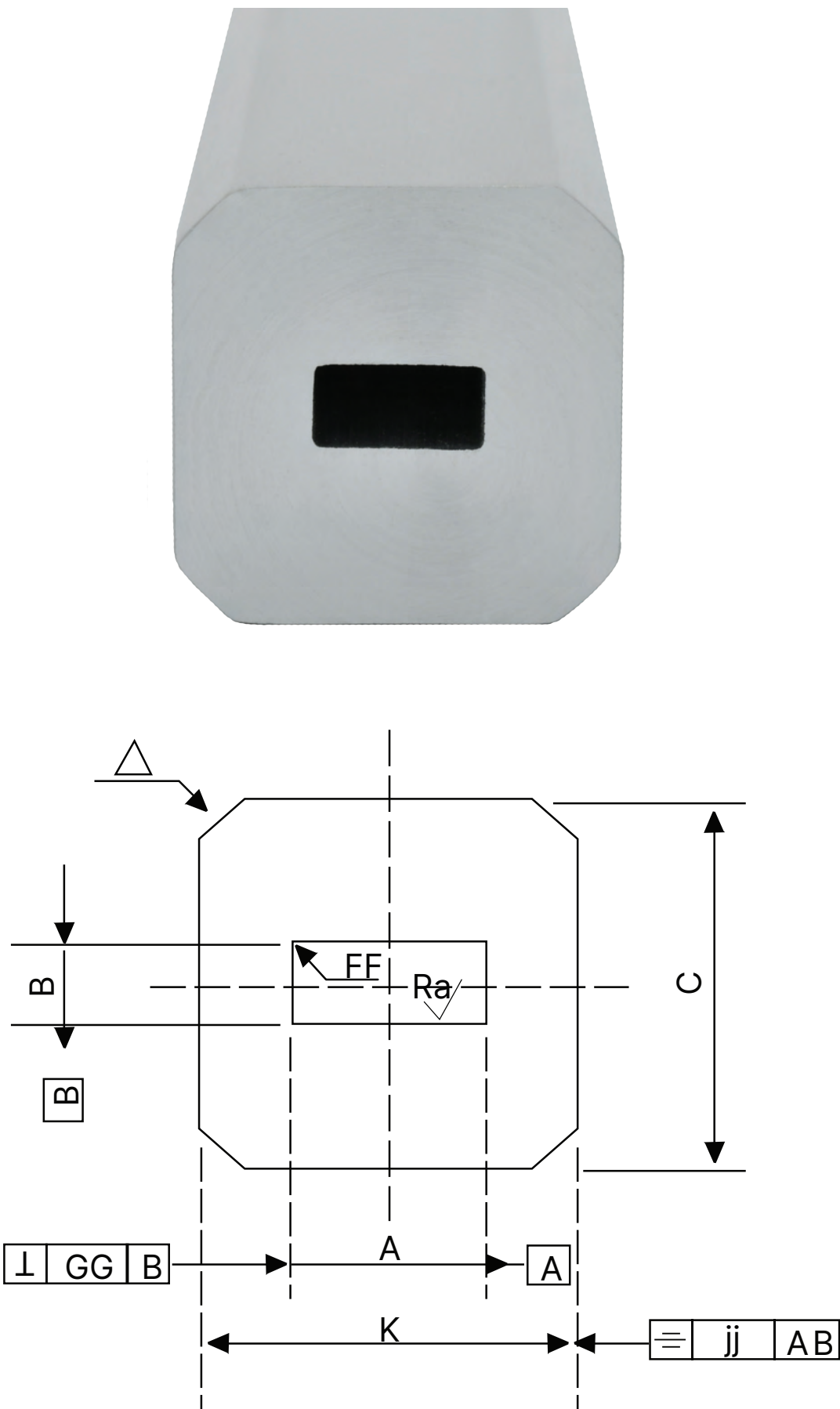
DOUBLE-RIDGE FLANGE STOCK

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

24085 Garnier St.
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