

# Characteristics of Anomet's Copper Cored Glass-to-Metal Sealing Alloys

Characteristic	Description
Complete Metallurgical Bond	Provides complete hermetic sealing between the metals, excellent mechanical strength, ductility and greater reliability.
Copper Core	Permits simple electrical connections and greater conductivity which allows a smaller conductor than solid for the same power requirements.
Core Ratio	Unique processing allows any ratio of 446SS (Stainless), Alloy 52, Alloy 42-6, or Kovar® to copper can be made (i.e. diameter of glass sealing alloy to diameter of copper core).*
Custom Processing & Other Alloys	Temper, surface finish, and packaging may all be customized to your specific requirements. Other glass sealing alloys are available on request.

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## Typical Specifications

Typical Chemical Composition						
	Iron	Nickel	Chromium	Manganese	Silicon	Cobalt
Alloy 52	Bal.	50.50	----	.3 max.	.2 max.	----
Kovar®	Bal.	29	----	.3 max.	.2 max.	17
Alloy 42-6	Bal.	42.5	5.75	.50 max	.25 max.	----
446 SS	Bal.	----	23-27%	1.50 max.	1.0 max.	----

Copper	OFHC (Oxygen-Free High Conductivity) - 100% IACS Min. Conductivity
Ratio	2:1 and 3:1 (Alloy to Copper) standard. Other ratios available on special request.
Packaging	Coils can be supplied in any size up to 150 lbs. They can be supplied on spools, reels, or wrapped coils.
Temper	Any customer specified temper available.
Conductivity	14% IACS
Resistivity	12 microhm cm

Dimensional Tolerances	
Diameter	Tolerance
Below .040" (1mm)	+/- .0005" (+/- .01mm)
.040" to .080" (1mm-2mm)	+/- .0006" (+/- .015mm)
.080" to .156" (2mm-4mm)	+/- .0010" (+/- .025mm)
.156" to .250" (4mm-6mm)	+/- .0015" (+/- .04mm)

## Approximate Length/Weight Conversions

Diameter (inches)	FT/#				Diameter (mm)	M/Kg			
	Alloy 52	Alloy 42-6	446SS	Kovar®		Alloy 52	Alloy 42-6	446SS	Kovar®
.020	878	896	931	878	1	153	159	162	153
.030	390	398	414	390	1.5	68	70	73	68
.040	220	224	233	220	2	38	39	41	38
.050	140	143	149	140	2.5	25	24	25	25
.060	98	100	103	98	3	21	22	23	21
.070	72	73	76	72	3.5	17	18	19	17
.080	55	56	58	55	4	10	11	12	10
.090	43	44	46	43					
.125	22.5	23	24	22.5					
.156	14.5	15	15	14.5					
.187	10	10	11	10					
.250	6	6	6	6					

## Approximate Longitudinal Coefficients of Thermal Expansion (in/in °F x 10<sup>-6</sup>)

Temp. Range (°F)	Solid Kovar	3:1 Ratio Kovar	Solid 446 Stainless Steel	3:1 Ratio 446 Stainless Steel	Solid Alloy 52	3:1 Ratio Alloy 52	Solid Alloy 42-6	3:1 Ratio Alloy 42-6
50-100			5.6	5.7		5.5		3.2
50-200			5.6	5.8	4.8	5.5	3.64	3.7
50-300			5.6	5.8	5.0	5.5	3.75	3.9
50-400			6.0	5.9	5.2	5.5	3.94	4.0
50-500			6.0	6.0	5.2	5.6	4.34	4.0
50-600			6.0	6.1	5.3	5.6	4.73	4.5
50-700			6.0	6.1	5.4	5.6	5.29	5.1
50-800			6.0	6.2	5.4	5.6	5.73	5.6
50-900			6.1	6.2	5.5	5.6	6.15	6.0
50-1000			6.2	6.3	5.5	5.7	6.56	6.3
50-1100			6.2	6.3	5.8	5.9	6.99	6.6
50-1200			6.3	6.4	6.2	6.1	7.22	7.0
50-1300			6.3	6.5	6.5	6.4	7.45	7.3
50-1400			6.4	6.6	6.7	6.6	7.56	7.6

Note: Because the Copper Cored/Clad composite inherently is not fully reversable, accurate theoretical calculations are impossible. Therefore, these values are only approximate and are offered only as a guideline.

\*Other alloys also available. Copper Cored Hastelloy® is also available. Hastelloy® B2, Hastelloy® C276, Cu Cored Hastelloy®, Hastelloy Clad Copper. ®Hastelloy is a registered trademark of Haynes International.