MATERION

PRODUCT BRIEF

ENGINEERED TO PROVIDE HIGH STRENGTH AND HIGH CONDUCTIVITY

ALLOYS THAT DELIVER SOLUTIONS

Utilizing Lean Six Sigma methodology, Materion has made process breakthroughs that make it possible to produce an alloy that has both **high strength and high conductivity.** Our Alloy 390 combines the best attributes of two separate families of commercial copper beryllium alloys – the strength of the "high strength" alloy C17200 with the conductivity of "high conductivity" alloys C17410 and C17510. In addition to the combination of high strength and conductivity, Alloy 390 has excellent stress relaxation resistance at elevated temperatures. In applications where durability is important (burn-in and test sockets, board to board connectors, power connectors, relays, etc.), the excellent fatigue strength of Alloy 390 extends the product life, providing better utility, that translates into cost savings.

KEY PRODUCT ATTRIBUTES

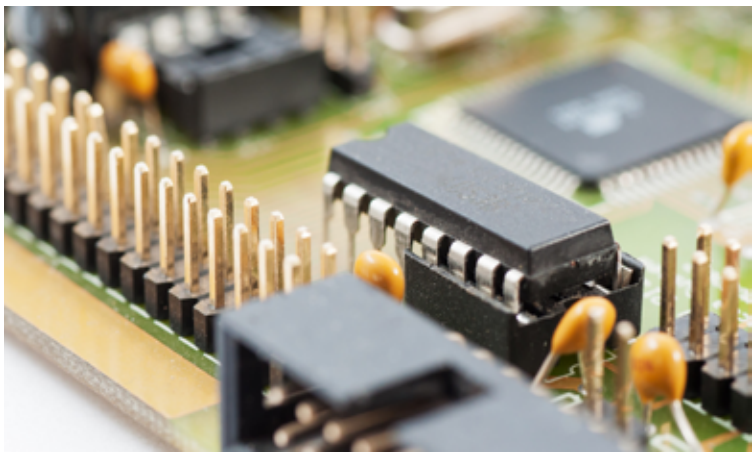
High Conductivity – Maintains flow of electrical and thermal energy, reducing device operating temperatures and improving device battery life.

Excellent Stress Relaxation Performance – Retains contact force at elevated temperatures for high reliability.

Excellent Resilience – Tolerates large displacements without permanently deforming.

Excellent Fatigue Strength – Enables high cycle life without degradation of contact force.

Potential uses of copper-nickel-beryllium Alloy 390 include computer burn-in and test sockets (BiTS), production sockets, power connectors, switch, relay, automotive power applications, as well as other hand held and portable electronic contact applications.



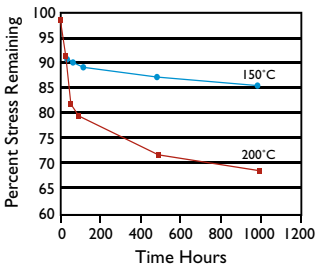
PRODUCT BRIEF

Alloy 390 was specifically designed for high power applications, providing a unique combination of high strength and high conductivity. Increasing power requirements are driving the need for lower conductor resistance to reduce joule heating. Higher thermal conductivity is critical to thermal management. Higher power requirements are creating harsh environments and higher operating temperatures. Alloy 390 provides excellent stress relaxation resistance at elevated temperatures which increases electrical contact reliability.

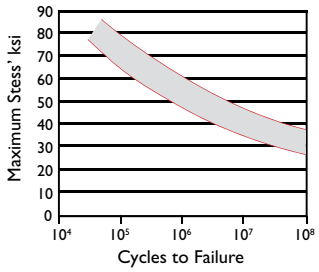
Chemical Composition

UNS C17460	Weight Percent
Beryllium (Be)	0.15-0.50
Nickel (Ni)	1.0-1.4
Copper (Cu)	Balance

Stress Relaxation Behavior



Flexural Fatigue Strength Fully Reversed Bendng R=-1



Mechanical and Physical Properties

YIELD STRENGTH	TENSILE STRENGTH	ELONGATION	FORMABILITY 90° (R/t)	ELECTRICAL CONDUCTIVITY	ELASTIC MODULUS	DENSITY	HARDNESS
130-153 ksi	138-158 ksi	1% min.	2.0 Long.*	44% IACS min.	20 x 106 psi	0.318 lb/in^3	280-340 HV
930-1055 N/mm^2	950-1090 N/mm^2		2.0 Trans.*		138 kN/mm^2	8.80 g/cm^3	
95-108 kg/mm^2	97-111 kg/mm^2				14.1 kg/mm^2		

*Formability is applicable in the thickness range of 0.002" - 0.004".
For formability information outside of this range, please contact your local Materion representative.

RoHS COMPLIANT

Alloy Comparisons

ALLOY	TEMPER	YIELD STRENGTH		ELECTRICAL CONDUCTIVITY % IACS	ELONGATION % MIN	FORMABILITY 90 BEND (R/t)		ELASTIC MODULUS	HARDNESS
		ksi	N/mm2			Long.	Trans.	106 psi	HV
Alloy 390	HT	130-153	931-1055	17	1	*2.0	*2.0	20	280-340
Alloy 190	XHM	135-170	931-1172	17	4	4.0	5.0	19	317-378
Brush 60®	HT	105-125	720-860	50	10	1.5	1.5	20	230-290
7025	TM03	95-120	655-825	40	5	2.5	2	19	200-250
7026	S	95	655	40	6	0.5	1	19	200
725	XS	95	655	11	1 max.	2	3	20	190-240
YCuT-F	EH	148	1020	10	1	-	7	18	310-360
K55	R690	95-120	655-825	40	5	2	2	19	220-260
688	H	101	696	18	4	2	2	17	255
654	XH	109	751	7	4	2	3.5	17	213-235

Alloy 390 is available in strip form ranging from 0.0015" to 0.010" thick.
For additional product specification information, please contact your local Materion representative.

ABOUT MATERION

Materion Corporation is a global leader in advanced material solutions and services that improve the world. We serve customers in more than 50 countries with operating, service center and major office locations throughout North America, Europe and Asia. Materion Corporation common stock trades on the New York Stock Exchange under the symbol MTRN.

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HEALTH & SAFETY NOTE: Handling copper beryllium in solid form poses no special health risk. Like many industrial materials, beryllium-containing materials may pose a health risk if recommended safe handling practices are not followed. Inhalation of airborne beryllium may cause a serious lung disorder in susceptible individuals. The Occupational Safety and Health Administration (OSHA) has set mandatory limits on occupational respiratory exposures. Read and follow the guidance in the Material Safety Data Sheet (MSDS) before working with this material.

For additional information on safe handling practices or technical data on copper beryllium, contact Materion, technical service department at 800.375.4205.

Alloy 390 is a registered trademark of Materion Brush Inc.

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