



Luvata CuCrZr for scientific applications

Luvata KrK102 alloy is equivalent to ITER grade CuCrZr. It is manufactured to a precise chemical content and has tailored mechanical properties. Compared to non-alloyed Copper, it has superior high strength combined with high conductivity. These characteristics make it a perfect alloy for various scientific applications.

Luvata can produce CuCrZr in many product types and dimensions. Different manufacturing methods sometimes restrict achievable grain structures and size. Yet grain size requirements can vary for different applications. Luvata's advanced process development continues to tackle these restrictions. KrK102 is available as cast billets and cakes, premachined forgings, or machined components.

KrK102 has high conductivity and hardness up to 600°C and can be used at temperatures as low as 4,2 K. It can be applied in heat sinks, as its thermal conductivity is high across a wide temperature range. Such applications can be found in fusion reactor vessels, where the Blanket and Divertor components are cooled with CuCrZr heat sinks. In these applications CuCrZr is often joined with steel structure and the first wall materials.

About Luvata

Luvata is a world leader in metal solutions manufacturing and related engineering services to industries such as renewable energy, automotive, healthcare, and power generation and distribution. The company's continued success is attributed to its longevity, technological excellence and strategy of building partnerships beyond metals. Employing approximately 1,400 staff in 7 countries, Luvata works in partnership with customers such as ABB, CERN, Siemens and Toyota. Luvata is a group company of Mitsubishi Materials Corporation.

Chemical composition and corresponding standards:

Luvata Pori Oy alloy	Composition %	EN - CEN/TS 13388:2008	ASTM / USA
KrK102	Cr 0,60-0,90 Zr 0,07-0,15 Other >0,15	CW106C	C18150

Physical Properties:

Density kg/dm ³	Coefficient of linear expansion 1/K	Specific heat J/(kg x K)	Melting temperature °C
8.89	0.0000176	385	1075

Mechanical properties – typical values:

	Room temperature	250 °C	
Tensile strength	370	280	
0,2% yield strength	240	200	
Elongation	17	10	
Hardness	> 120 HV		
Grain size µm	ASTM E112	Average diameter interval	44.9 - 75.5

Electrical and thermal properties – typical values:

Electrical conductivity	vol	% IACS	78
	mass	% IACS	77.5
	MS/m		45
Electrical resistivity	vol	Ω mm ² /m	0.022
	mass	Ω g/m ²	0.198
Thermal conductivity (20 °C)	W / Km		320

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