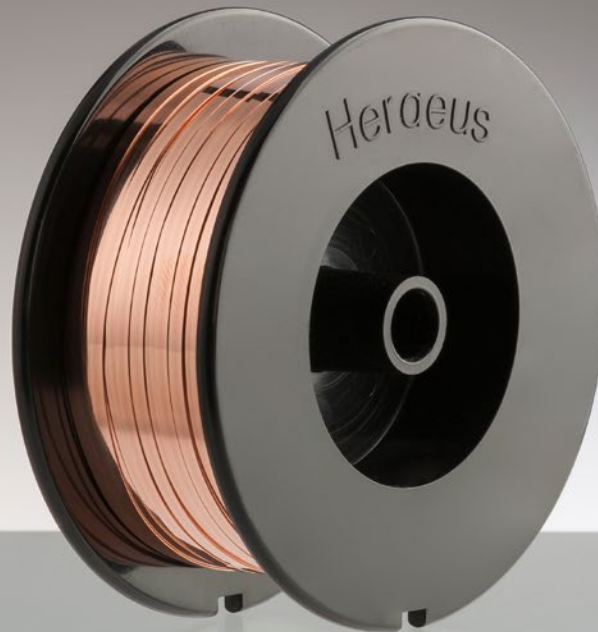


PowerCuSOFT

PowerCu-Soft Laser Ribbons (LRB)

Optimized Copper Ribbon for Laser Bonding

PowerCu-Soft LRB are Heraeus' preferred material for laser bonding application – enabling module operation temperature higher than 250°C and allows highest power density designs.

In comparison with standard copper bonding ribbons, PowerCu-Soft LRB comes along with a special one-sided roughening to guarantee a more reliable coupling of the laser beam into the high reflective Cu surface.

The roughening process allows a residual-free clean and homogeneous surface. The PowerCu-Soft LRB can be processed with all currently available laser bond equipments. It is favored in power devices and battery packages dedicated for high currents. In addition, cost optimization within production (UPH improvement) can be achieved by upgrading wires to ribbons. One PowerCu-Soft LRB (0.3x2mm) is able to replace up to three 500µm Cu wires.

Key Features

- Tailor-made surface
- Extreme softness
- Best thermal stability
- Uniform fine grain structure
- Advanced mechanical properties for optimized technologies
- Highest Cu purity for lowest electrical resistance
- Replaces up to 3 single Cu wires

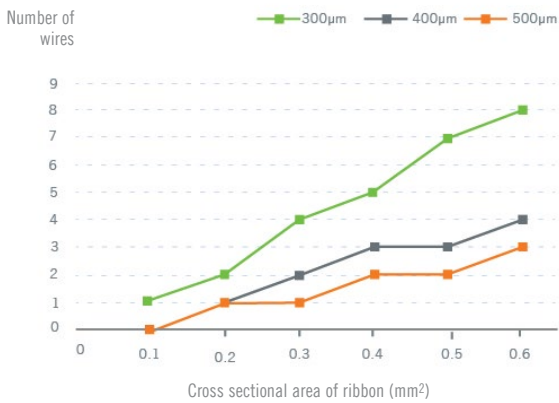
Recommended Dimension of PowerCu-Soft LRB

Dimension	mm	0.2 x 1	0.3 x 1	0.1 x 1.5	0.2 x 1.5	0.3 x 1.5	0.1 x 2	0.2 x 2	0.3 x 2
	mils *	8 x 40	4 x 60	4 x 60	8 x 60	12 x 60	4 x 80	8 x 80	12 x 80
Elongation	%	> 10							
Surface Roughness	Rz [μm]	3 - 10							
Breaking Load	cN	4200 -5400	6300 -8100	3100 -4100	6300 -8100	9500 -12100	4200 -5400	8400 -10800	12600 -16200

For other diameters, please contact Heraeus Electronics Product Management.

* 1mil \approx 25 μm

Substitution Matrix: Wires by Ribbons



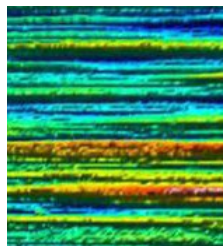
Characteristics of PowerCu-Soft LRB

Melting Point	1083	$^{\circ}\text{C}$
Modulus of rigidity	48	GPa
Thermal conductivity at 20 $^{\circ}\text{C}$	399	W/(m * K)
Linear expansion coefficient (20 $^{\circ}\text{C}$ – 30 $^{\circ}\text{C}$)	16.8	$10^{-6} * \text{K}^{-1}$
Electrical Resistivity at 20 $^{\circ}\text{C}$	1.8	$\mu\Omega * \text{cm}$
Temperature coefficient of electrical resistance (0 $^{\circ}\text{C}$ – 300 $^{\circ}\text{C}$)	3.9	$10^{-3} * \text{K}^{-1}$
Meter resistance at 0.2 x 1mm μm (20 $^{\circ}\text{C}$)	91.7	Ω/m
Density	8.933	Kg/dm^3

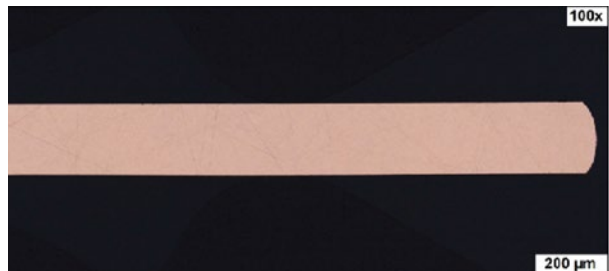
*Theoretical bulk material properties



Optical microscope



Confocal microscope



Cross section of PowerCu-Soft LRB with natural rounded and burr-free edge

Americas

Phone +1 610 825 6050

electronics.americas@heraeus.com

Asia Pacific

Phone +65 6571 7649

electronics.apac@heraeus.com

China

Phone +86 53 5815 9601

electronics.china@heraeus.com

Europe, Middle East and Africa

Phone +49 6181 35 4370

electronics.emea@heraeus.com

The descriptions and engineering data shown here have been compiled by Heraeus using commonly-accepted procedures, in conjunction with modern testing equipment, and have been compiled as according to the latest factual knowledge in our possession. The information was up-to date on the date this document was printed (latest versions can always be supplied upon request). Although the data is considered accurate, we cannot guarantee accuracy, the results obtained from its use, or any patent infringement resulting from its use (unless this is contractually and explicitly agreed in writing, in advance). The data is supplied on the condition that the user shall conduct tests to determine materials suitability for particular application. The Heraeus logo, Heraeus, Welco® and the Welco figurative mark are trademarks or registered trademarks of Heraeus Holding GmbH or its affiliates. All rights reserved.

Heraeus Electronics GmbH & Co.KG, 63450 Hanau, Germany
Web: www.heraeus-electronics.com

Document Number: HET16039ENG-0221-1 | Version: 2022