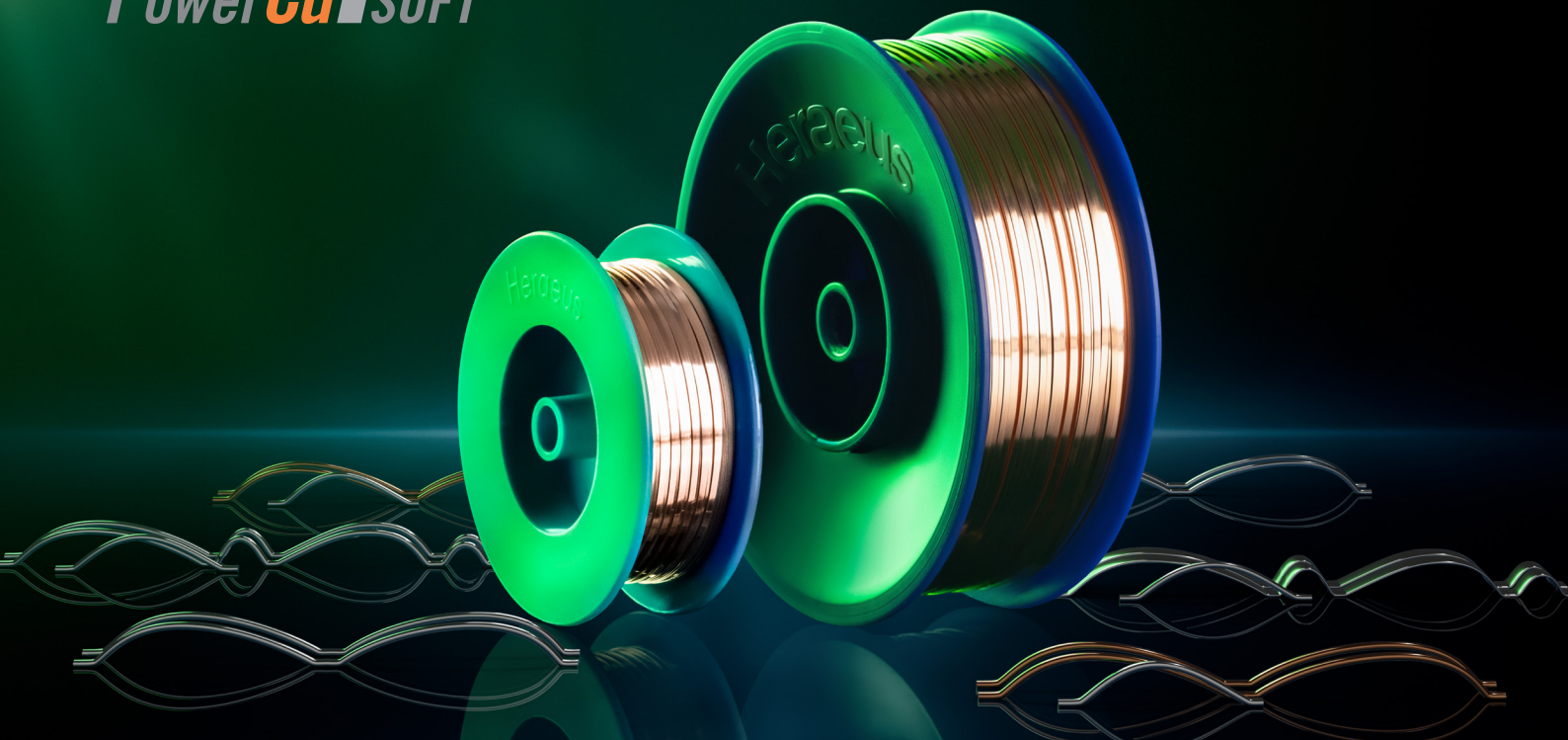


**PowerCu** SOFT

## PowerCu SOFT Bonding Ribbons

### Thick Copper Bonding Ribbons of Superior Softness

**PowerCu SOFT** bonding ribbons are designed for the next generation of power devices, targeting operating temperatures up to 250 °C. At Heraeus Electronics, special processing steps achieve the very soft copper material. It offers superior electrical conductivity, increased fusing current values, and provides 10 – 30 times higher cycle numbers in lifetime tests for wedge/wedge applications compared to standard aluminum bonding ribbons. This makes it the ideal choice for advanced packaging of modules in high-temperature and high-robustness applications.

In addition, cost optimization within production (UPH improvement) can be achieved by upgrading wires to ribbons. One **PowerCu SOFT** ribbon (0.3 x 2mm) is able to replace up to three 500µm Cu wires.

As the industry shifts towards silicon carbide (SiC) and gallium nitride (GaN) technologies, **PowerCu SOFT** bonding ribbons support larger currents and higher temperatures in electronic system modules. Copper wire paves the way for advancements in hybrid and electric vehicle technologies.

#### Key Features

- Superior softness
- Excellent bondability
- Low deformation resistance
- Extended lifespan
- High thermal stability
- Low electrical resistance
- Replaces up to 3 single Cu wires

Heraeus Electronics' Die Top System (DTS®) offers a solution for customers' latest requirements for high performance. DTS® enables copper wire bonding on today's standard chips.

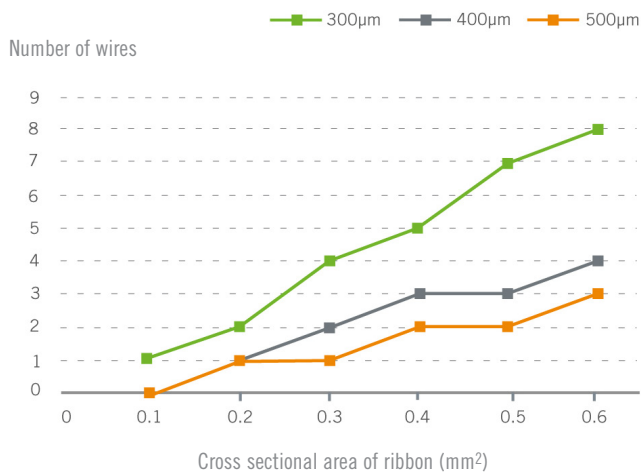
### Fine grained and homogeneous texture of Cu ribbons



### Cross section of PowerCu SOFT ribbon with natural rounded and burr-free edge



### Substitution Matrix: Wires By Ribbons



### Material Characteristics (\*)

Melting point	1083 °C
Modulus of rigidity	48 GPa
Thermal conductivity at 20 °C	399 W/m * K
Linear expansion coefficient (20 °C – 30 °C)	116.8 * 10 <sup>-6</sup> K <sup>-1</sup>
Electrical Resistivity at 20 °C	1.8 µΩ * cm
Temperature coefficient of electrical resistance (0 °C – 300 °C)	3.9 * 10 <sup>-3</sup> * K <sup>-1</sup>
Density	8.933 kg/dm <sup>3</sup>

\* Theoretical bulk material properties

### Technical Parameters (\*)

Diameter / Type		Elongation (%)	Breaking Load (cN)
mm	mil		
0.1 x 1	4 x 40	> 10	2100 – 2700
0.2 x 1	8 x 40	> 10	4200 – 5400
0.3 x 1	12 x 40	> 10	6300 – 8100
0.1 x 1.5	4 x 60	> 10	3100 – 4100
0.2 x 1.5	8 x 60	> 10	6300 – 8100
0.3 x 1.5	12 x 60	> 10	9500 – 12100
0.1 x 2	4 x 80	> 10	4200 – 5400
0.2 x 2	8 x 80	> 10	8400 – 10800
0.3 x 2	12 x 80	> 10	12600 – 16200

For other diameters, please contact Heraeus Electronics Product Management.

\* 1mil ≈ 25µm

1cN ≈ 1g

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