# Wieland-B18 SUPRALLOY®

CuSn8 | C52100 | CW453K

Wieland-B18 SUPRALLOY® is the fine-grain variant of the standard CuSn8 bronze with identical chemical composition and the same UNS designation. The fine-grained microstructure provides enhanced formability. This allows connector designers to increase connector spring forces by maintaining the forming operations. Thus, B18 SUPRALLOY® is a prime candidate for miniaturized signal connectors which require high spring forces. An additional advantage of the fine-grain variant is its improved resistance against high cycle fatigue and vibrations.

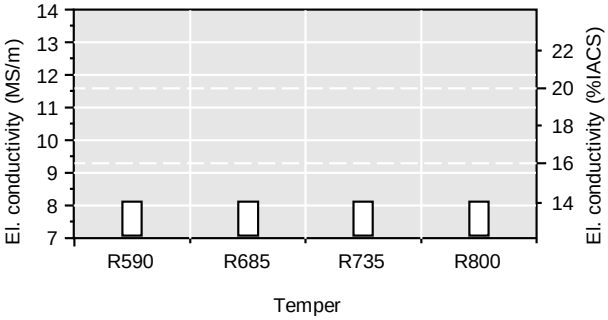
| **Chemical composition** (Reference) | |
|---|---|
| Sn | 8 % |
| Cu | remainder |

| **Physical properties** (Reference values at room temperature) | | | | |
|---|---|---|---|---|
| Electrical conductivity | 7.5 | MS/m | 13 | %IACS |
| Thermal conductivity | 62 | W/(m·K) | 36 | Btu·ft/(ft²·h·℉) |
| Coefficient of electrical resistance* | 0.7 | $10^{-3}$/K | 0.4 | $10^{-3}$/℉ |
| Coefficient of thermal expansion* | 18.2 | $10^{-6}$/K | 10.1 | $10^{-6}$/℉ |
| Density | 8.80 | g/cm³ | 0.318 | lb/in³ |
| Modulus of elasticity | 110 | GPa | 16,000 | ksi |
| Specific heat | 0.377 | J/(g·K) | 0.090 | Btu/(lb·℉) |
| Poisson´s ratio | 0.34 | | 0.34 | |

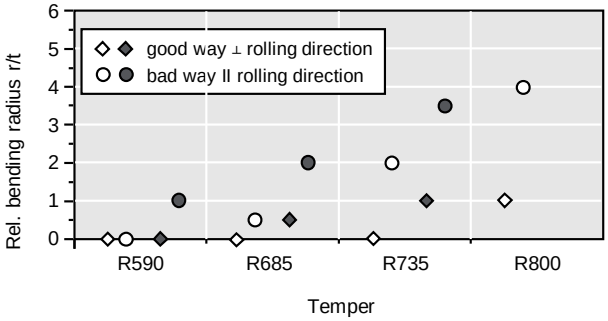
* Between 0 and 300 ℃

| **Mechanical properties (values in brackets are for information only)** | | | | | | |
|---|---|---|---|---|---|---|
| **Temper** | **Tensile strength $R_m$** | | **Yield strength $R_{p0.2}$** | | **Elongation $A_{50}$** | **Hardness HV** |
| | **MPa** | **ksi** | **MPa** | **ksi** | **%** | |
| R590 | 590-705 | 86-102 | ≥ 540 | ≥ 78 | ≥ 20 | (185-235) |
| R685 | 685-785 | 99-114 | ≥ 650 | ≥ 94 | ≥ 15 | (210-260) |
| R735 | 735-835 | 107-121 | ≥ 700 | ≥ 102 | ≥ 9 | (230-270) |
| R800 | 800-900 | 116-131 | ≥ 775 | ≥ 112 | ≥ 5 | (250-290) |

**Electrical conductivity**




**Bendability (Strip thickness t ≤ 0.5 mm)** ◇○ 90° ◆● 180°



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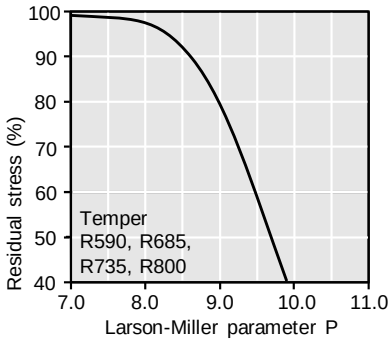
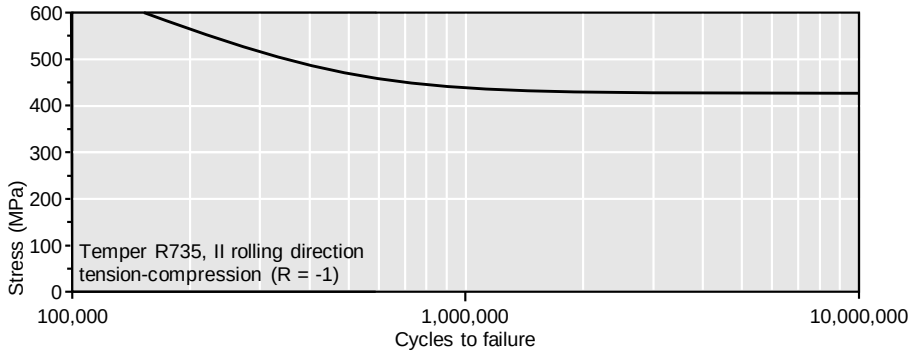
## Thermal stress relaxation




Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
P = (20 + log(t))*(T + 273)*0.001.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress relief annealed specimens parallel to rolling direction.
Total stress relaxation depends on the applied stress level.
Furthermore, it is increased to some extent by cold deformation.

## Fatigue strength(for information only)




The fatigue strength is defined as the maximum bending stress amplitude which a material withstands for $10^7$ load cycles under symmetrical alternate load without breaking.

## Types and formats available

- Standard coils with outside diameters up to 1,400 mm
- Traverse-wound coils with drum weights up to 1.5 t
- Multicoil up to 5 t
- Hot-dip tinned strip
- Contour-milled strip

## Dimensions available

- Strip thickness from 0.10-0.64 mm, R800: 0.10-0.40 mm, thinner gauges on request
- Strip width from 7 mm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