boway 51100

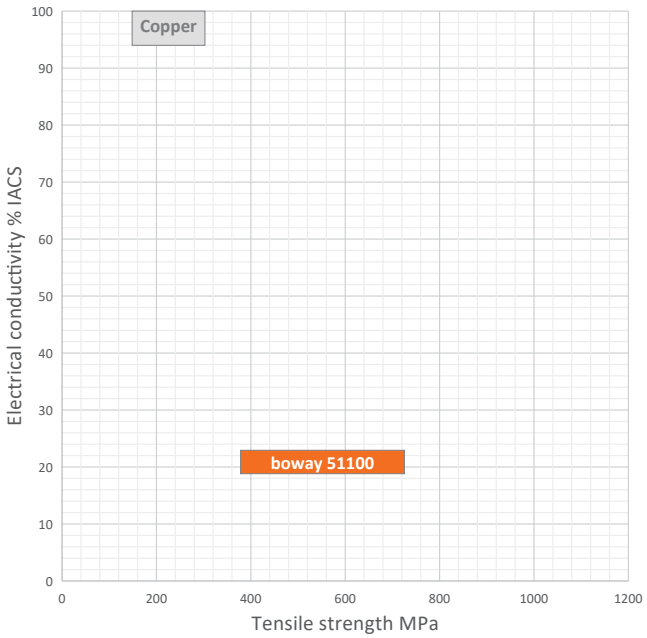
Material Designation

Boway Designation	boway 51100
UNS	C51100
EN	CuSn4
JIS	C5111
GB(China)	QSn4-0.3

Chemical Composition*

Sn	4	%
P	0.03-0.35	%
Cu	Rem.	

* Nominal composition



Application Target

Signal connector	Suitable
Power connector	Not recommended
Miniaturized connector	Suitable
Switch/Relay	Suitable
Semiconductor	Not recommended

Characteristics

Excellent formability and medium/high strength combined with low sensitivity to stress corrosion cracking.
Very good corrosion resistance as well as excellent solderability.

Fabrication Properties

Cold forming	Very good
Machining	Average
Electroplating	Very good
Hot dip tinning	Very good
Laser welding	Good
Resistance welding	Good
Soft soldering	Very good

Physical Properties*

Density	8.8	g/cm^3
Electrical conductivity@20°C	19	% IACS
	11	MS/m
Thermal conductivity@20°C	100	W/(m·K)
Specific heat capacity	0.377	J/(g·K)
Modulus of elasticity	120	GPa
Poisson's ratio	0.33	
Coefficient of thermal expansion**	17.8	10^{-6}/K

* Typical values at room temperature for reference
** Average value between 20-300°C

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Mechanical Properties (Values Underlined Are For Reference Only)

Temper	Tensile strength		Yield strength	Elongation	Hardness
	MPa	ksi	MPa	A50 %	HV
R380(1/2H)	380–485	55–70	≥290	≥12	110–160
R460(3/4H)	460–565	67–82	≥440	≥6	150–190
R495(H)	495–600	72–87	≥485	≥2	160–200
R580(EH)	580–685	84–99	≥560	≥1	190–230
R625(SH)	625–725	91–105	≥605	≥1	200–240
Annealed*	315–370	46–54	≥110	≥45	
H01*	315–400	46–58	≥140	≥25	
H02*	380–485	55–70	≥290	≥12	
H03*	460–565	67–82	≥440	≥6	
H04*	495–600	72–87	≥485	≥2	
H06*	580–685	84–99	≥560	≥1	
H08*	625–725	91–105	≥605	≥1	
H10*	660–750	96–109	≥635	≥1	

*According to ASTM B888

Bendability Bending thickness ≤ 0.5 mm; Bending width: 10 mm

Temper	90° R/T		180° R/T	
	Good Way	Bad Way	Good Way	Bad Way
R380	0	0	0	0
R460	0	0	0	1
R495	0	0.5	0	1.5
R580	0.5	1.5	1	2
R625	1.5	2.5	2	3.5

90° bend test according to EN ISO7438, 180° bend test according to ASTM B820, shown values might show orange-peel, however no crack.

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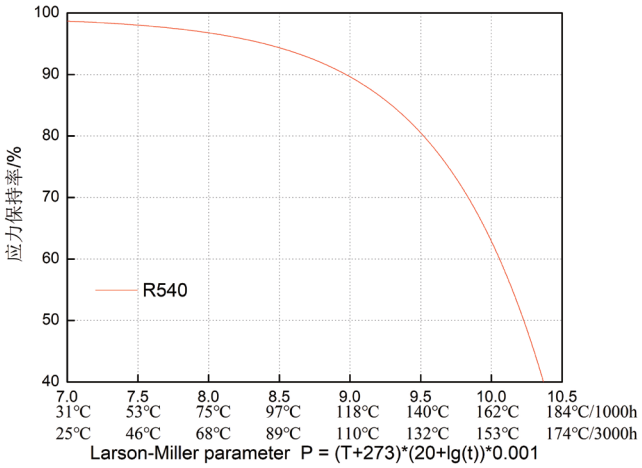
Thermal Stress Relaxation



P=Larson Miller parameter
T=temperature(℃)
t=time(h)
Example:
Application conditions: Maintain for 1000 hours at 125°C.
Formula substitution: T＝125, t＝1000

$$P=(125+273)\times(20+\lg(1000))\times 0.001=9.154$$

Graph reference: When P＝9.154, the stress retention rate is approximately 88%.
Conclusion: Under the conditions of 125°C /1000h, the remaining stress of this material is close to 88%.

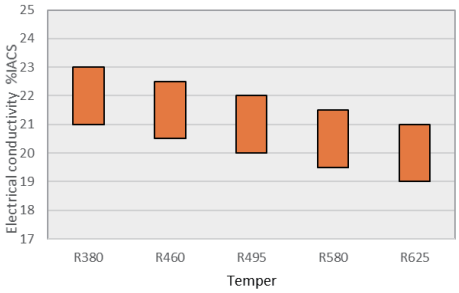
Packaging

Standard coils with outside diameter up to 1300 mm.
Traverse-wound coils with drum weight up to 500 kg.
Multiple-coil up to 3 tons.

Dimensions Available

Strip thickness 0.08–3.0 mm, other gauges on request.
Strip width from 8.5 mm.
Electroplated and Hot-dip tinned strip available.

Electrical Conductivity



Fatigue Strength

The fatigue strength is defined as the maximum bending stress amplitude which a material withstands for 10.000.000 load cycles under symmetrical alternate load without breaking. It depends on the temper selected and can be estimated typically by 1/3 of tensile strength.

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