
Technical Data

High conductivity and heat resistance copper alloy

NKE010

(CDA No.C15100)



JX Metals Corporation

1. Introduction

High conductivity heat resistance copper alloy NKE010(CDA No. C15100) has small amount of Zirconium in chemical compositions. This combination of properties lends the alloy to be used in a wide variety of applications including automotive and electrical connectors.

This technical brochure provides the comprehensive data of high performance copper alloy NKE010 and should help understand the alloy's features.

*This data included are nominal numbers.

2. Features

- (1) High electrical and thermal conductivity.
- (2) By adding a small amount of Zirconium, strength, stress relaxation resistance, are improving to pure copper.
- (3) Good bend formability

3. Chemical composition

NKE010 have small amount of Zr due to strength improvement.

Table 1 Chemical Composition of NKE010 (mass%)

	Cu	Zr
NKE010	Bal.	0.1 (0.05~0.15)

※ Not used cadmium(Cd) , lead(Pb) , mercury(Hg) , six value chrome(Cr⁺⁶) , polybrominated biphenyl (PBB) , Polybrominated biphenyl ether (PBDE) restricted with RoHS etc.

4. Physical properties

Table 2 Physical Properties of NKE010

		Temper	
		SH	ESH
Electrical conductivity	[%IACS]	93	85
Specific Resistance	[nΩ·m]@20°C	18.6	20.3
Thermal Conductivity	[W/(m·K)]	363	337
Coefficient of Thermal Expansion	[×10 ⁻⁶ /K] (20 ~ 300°C)	17.7	
Density	[g/cm ³]	8.90	
Poisson's ratio		0.33	
Modulus of elasticity	[GPa]	123	113

5. Mechanical properties

Table 3 Mechanical Properties of NKE010

	Temper	Tensile strength [MPa]	0.2% yield strength [MPa]	Elongation [%]	Hv
NKE010	SH	470 (400~540)	450 (380~530)	10 (Min. 2.0)	140 (Min. 125)
	ESH	550 (480~620)	530 (460~600)	8	150

6. Bend formability

Table4 Minimum bend radius / thickness (MBR/t) for W-type bend test
(specimen width : 10mm)

	Temper	Thickness (mm)	W-type bend	
			Good Way	Bad Way
NKE010	SH	0.6	0.5	0.5
	ESH	0.2	0.5	1.0

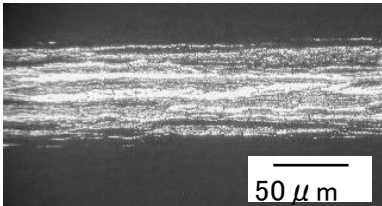
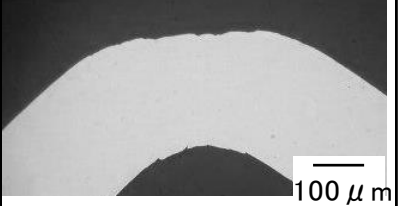
Temper	R/t	Bad way	
		Surface	Cross section
ESH	1.0		

Fig.1 Surface and Cross-section after W-bend test of NKE010-ESH
(thickness:0.2mm, width:10mm)

7. Stress relaxation resistance

NKE010 provides higher stress relaxation resistance than pure copper C1020, brass C2600, and Phosphor bronze C5210.

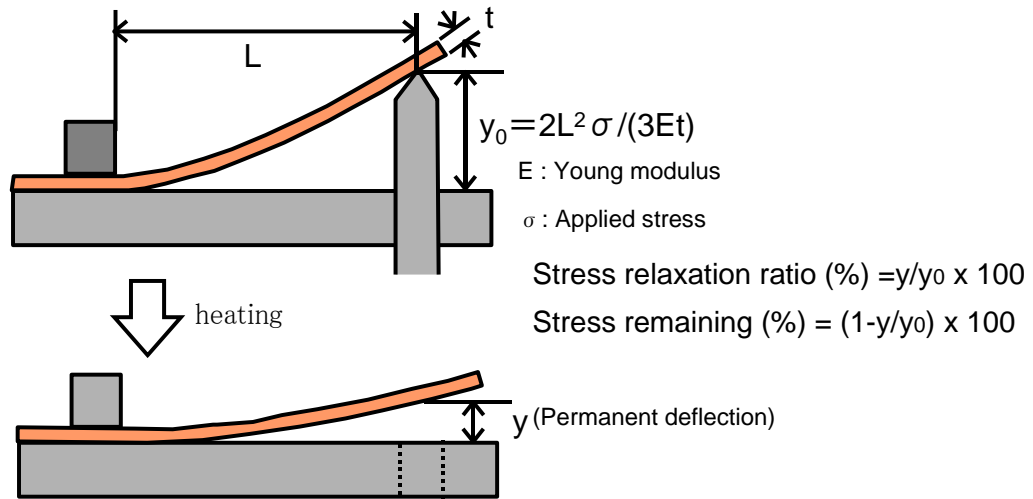


Fig.2 Experimental procedure of stress relaxation

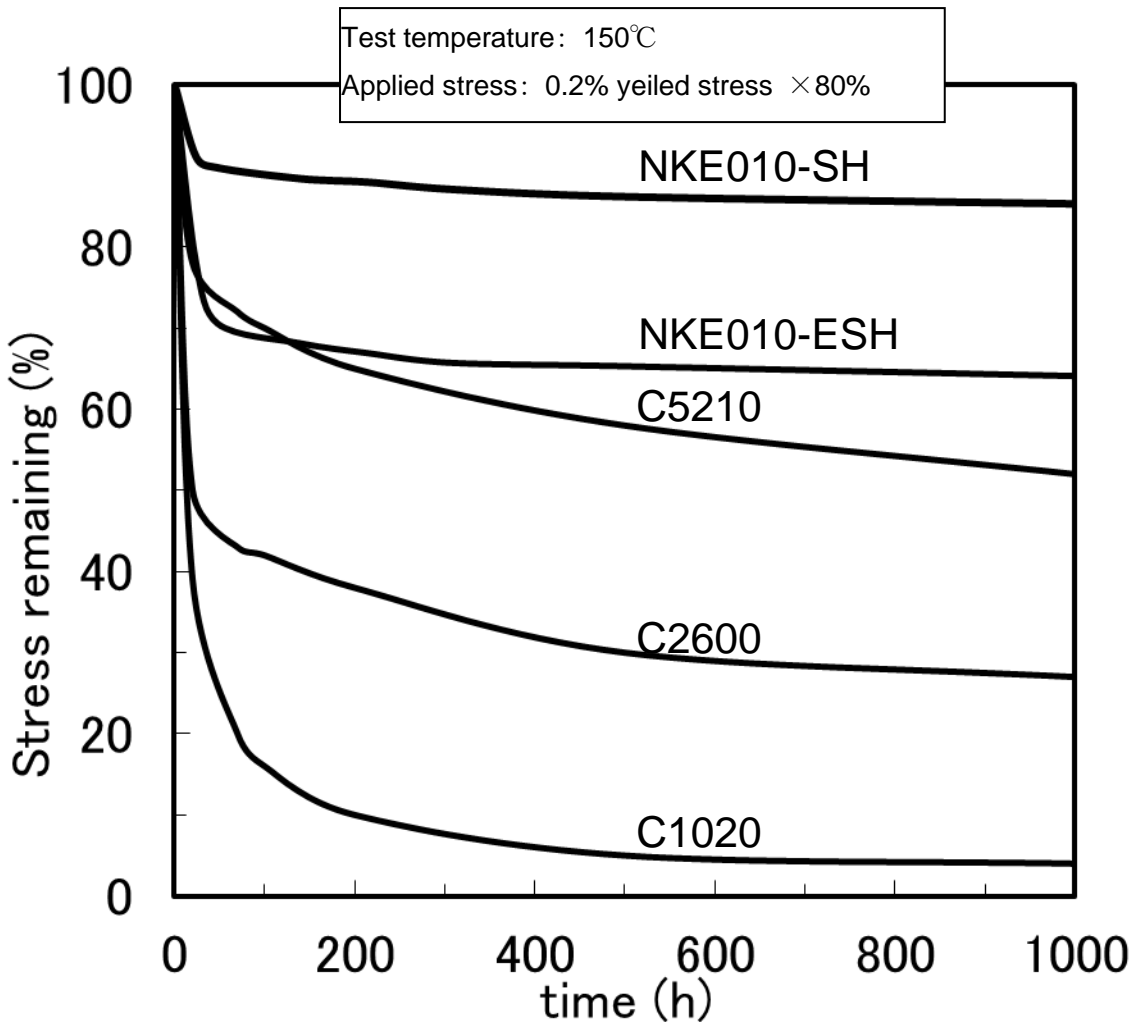


Fig.3 Stress relaxation of NKE010 and other alloys.

8. Stress - Strain curve

Fig.4-1~4-2 shows the Stress-Strain curves for NKE010.

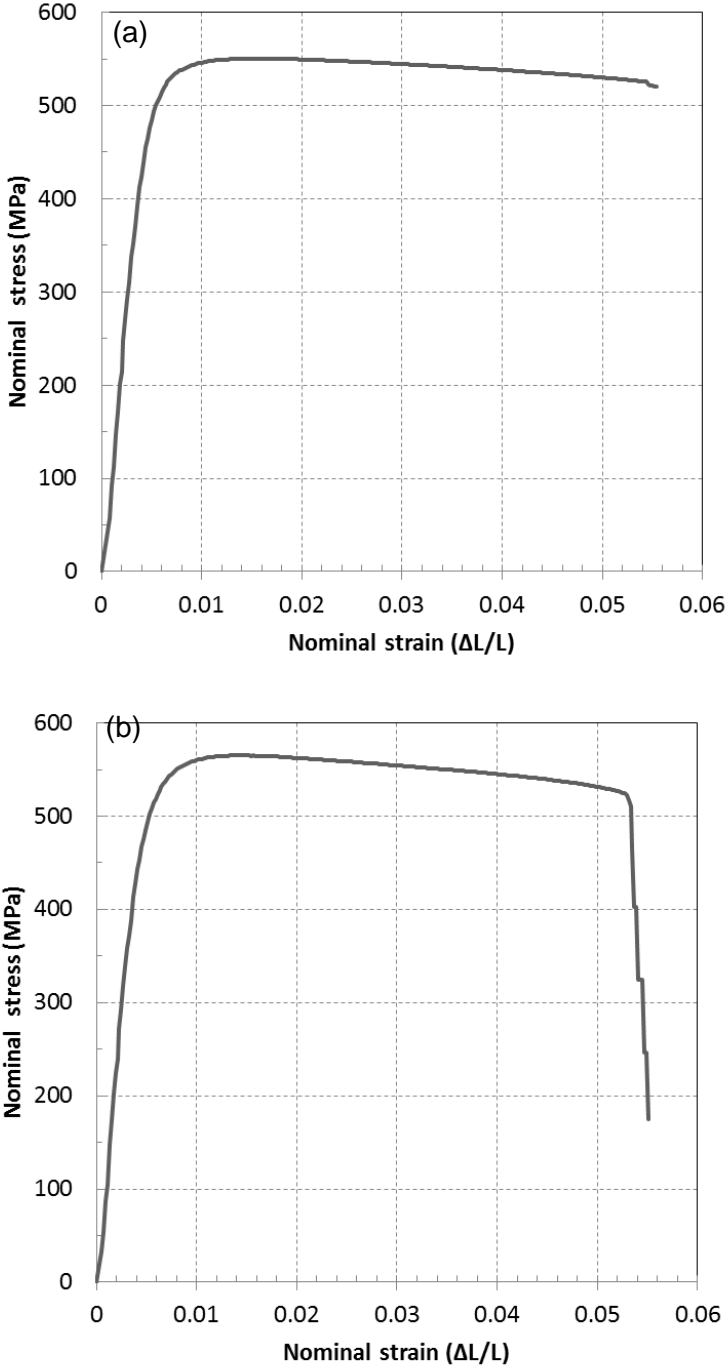


Fig.4-1 Stress-Strain curves for NKE010-ESH

(a) longitudinal and (b) transverse directions.

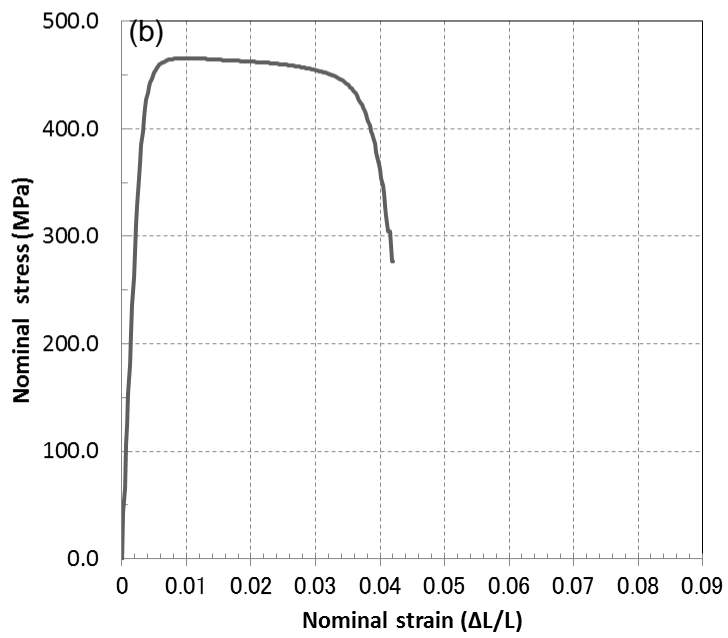
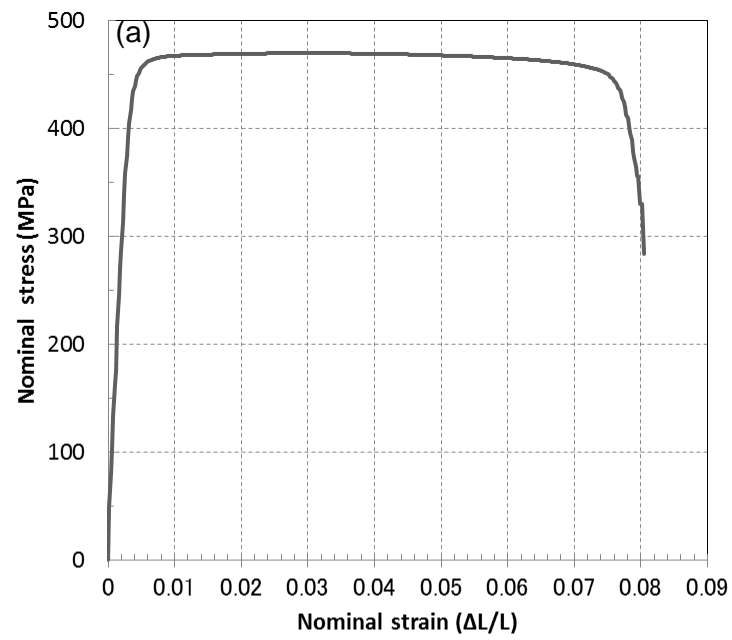


Fig.4-2 Stress-Strain curves for NKE010-SH

(a) longitudinal and (b) transverse directions.

<Further Information>

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