

## Technical Data

High conductivity

# 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

High electrical and thermal conductivity.

By adding a small amount of Zirconium, strength, stress relaxation resistance, are improving to pure copper.

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
--	----	----

## 4 Physical properties

Table 2 Physical Properties of NKE010

		Temper	
		SH	ESH
Electrical conductivity	%IACS	<b>93</b>	<b>85</b>
Specific Resistance	n m 20	<b>18.6</b>	<b>20.3</b>
Thermal Conductivity	W/(m K	<b>363</b>	<b>337</b>
Coefficient of Thermal Expansion	$\times 10^{-6}/K$ 20 300	<b>17.7</b>	
Density	$g/cm^3$	<b>8.90</b>	
Poisson s ratio		<b>0.33</b>	
Modulus of elasticity	GPa	<b>123</b>	<b>113</b>

## 5 Mechanical properties

Table 3 Mechanical Properties of NKE010

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

## 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
<b>NKE010</b>	<b>SH</b>	0.6	0.5	0.5
	<b>ESH</b>	0.2	0.5	1.0

Temper	R/t	Surface	Bad way
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.

# 8. Stress – Strain curve

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

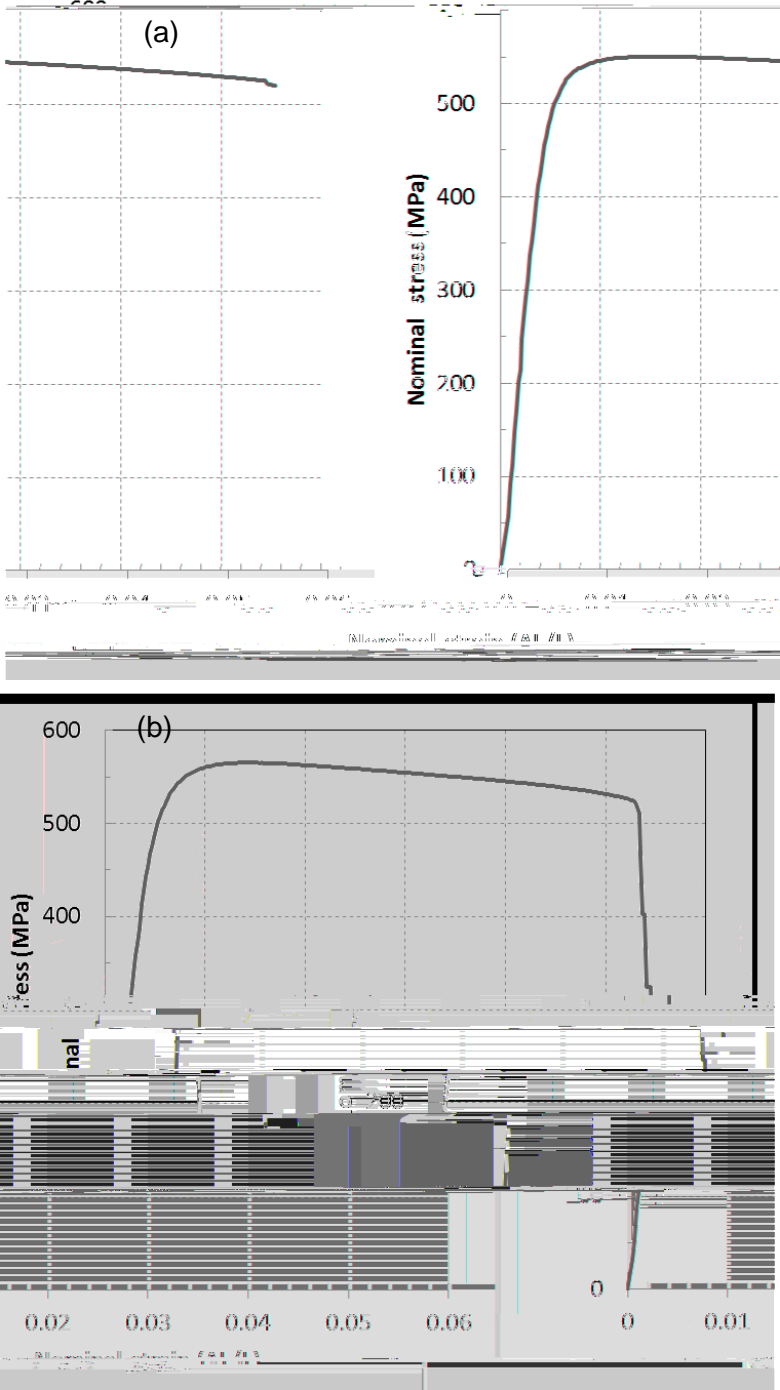


Fig.4-1 Stress-Strain curves for NKE010-ESH  
(a) longitudinal and (b) transverse directions.



## Further Information

JX Nippon Mining & Metals Corporation  
Electronic Materials Group  
Functional Material Division  
Rolled & Fabricated Products Dept.  
1-2, Otemachi 1-chome, Chiyoda-ku, Tokyo 100-8164 JAPAN  
Phone  
Fax

Ver.1.2 1.Jan.2016