
Hi-Performance Alloy Series
Technical Data

Extremely High Strength 3%-Titanium Copper

Hyper Titanium Copper (C1990HP)
(Temper : GSH)

1.Introduction

JX Nippon Mining & Metals has successfully developed a titanium copper alloy(C1990HP) having the world's highest tensile strength for a copper alloy at 1400MPa.

This technical brochure should help you understanding of C1990HP-GSH .

*This data included are nominal numbers.

2.Features

- (1)Extremely high strength at 1400MPa.
- (2) Higher thickness precision than conventional materials.

3.Chemical Composition

Table 1. Typical chemical composition of C1990HP-GSH

	Ti	Cu+Ti
Typical	2.9~3.5%	≥99.5%

4.Physical Properties

Table 2. Physical Properties of C1990HP-GSH

Electric Conductivity	10	%IACS(@20°C)
Specific Resistance	172	nΩ·m(@20°C)
Thermal Conductivity	47	W/mK
Young's Modulus	127	kN/mm ²
Density	8.70	g/cm ³

5.Mechanical Properties

Table 3. Mechanical Properties of C1990HP-GSH

Temper	Tensile Strength (N/mm ²)	0.2% offset Yield Strength (N/mm ²)	Elongation (%)	Vickers hardness
GSH	1400 (1300-1600)	1390 (---)	0.5 (---)	400 (350-450)

Upper numbers: Typical mechanical properties.

Lower numbers: Range

6. Thickness precision

Higher thickness precision than conventional materials is achieved by optimization of the manufacturing processes. Product thickness with high accuracy improves the stability of spring properties. Fig. 1 shows histogram of thickness distribution in the rolling direction. Fig.2 shows thickness distribution in the width direction.

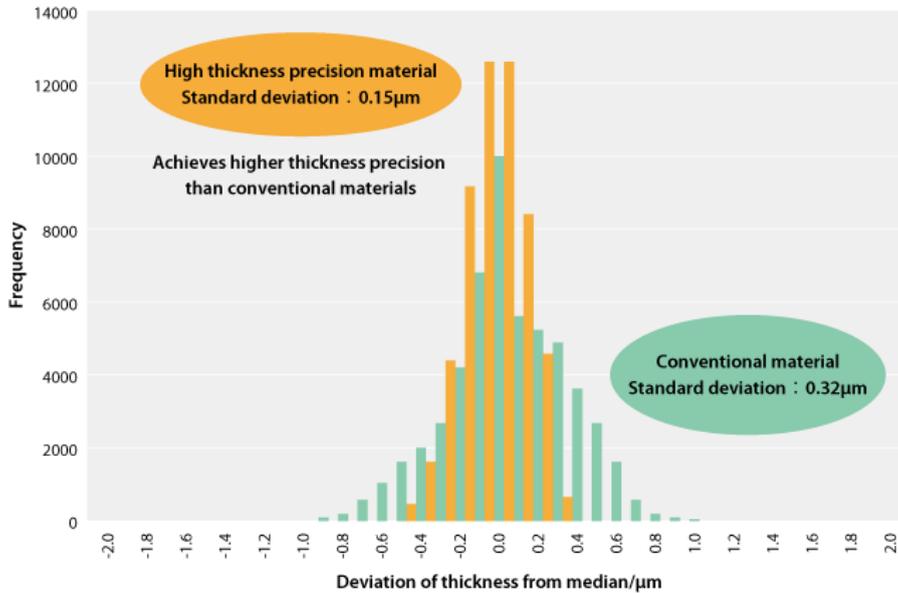


Fig.1 Histogram of thickness distribution in the rolling direction (high thickness precision material compared to conventional material; thickness $30\mu\text{m}$)

*Data obtained by X-ray measurements of thickness at the center of the width direction of the mother coil, taken every 0.01 seconds for approximately 1,000 meters.

*The values shown are typical values and not intended as specifications.

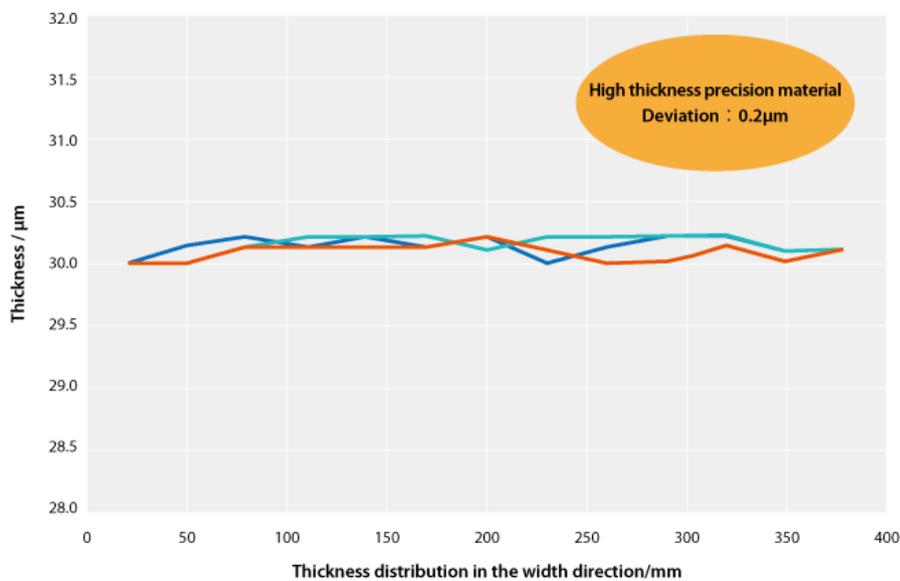


Fig.2 Thickness distribution in the width direction (high thickness precision material; N=3, thickness $30\mu\text{m}$)

*Thickness distribution was measured in the width direction using a direct contact thickness gauge.

*The values shown are typical values and not intended as specifications.

7. Stress-Strain Curve

Fig. 3, 4 show stress-strain curves of C1990HP-GSH.

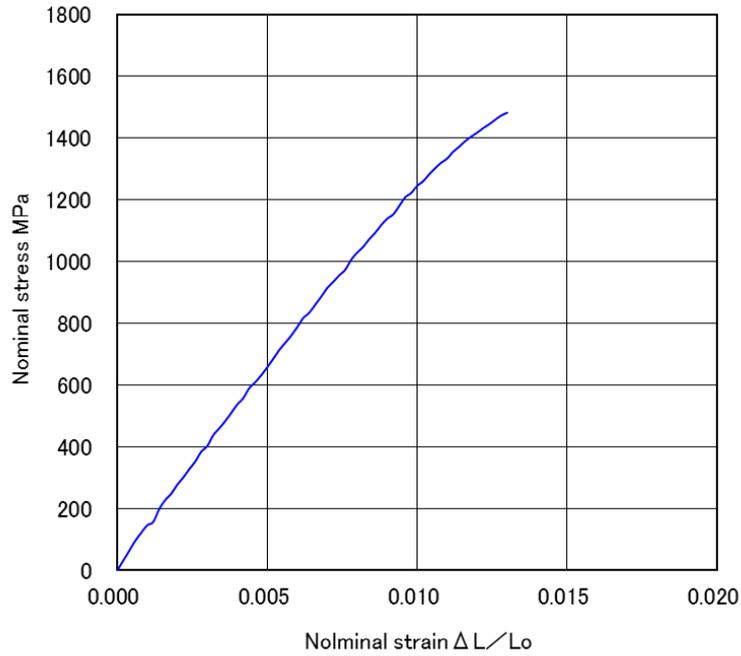


Fig.3 Stress-Strain curve of C1990HP-GSH (Longitudinal direction)

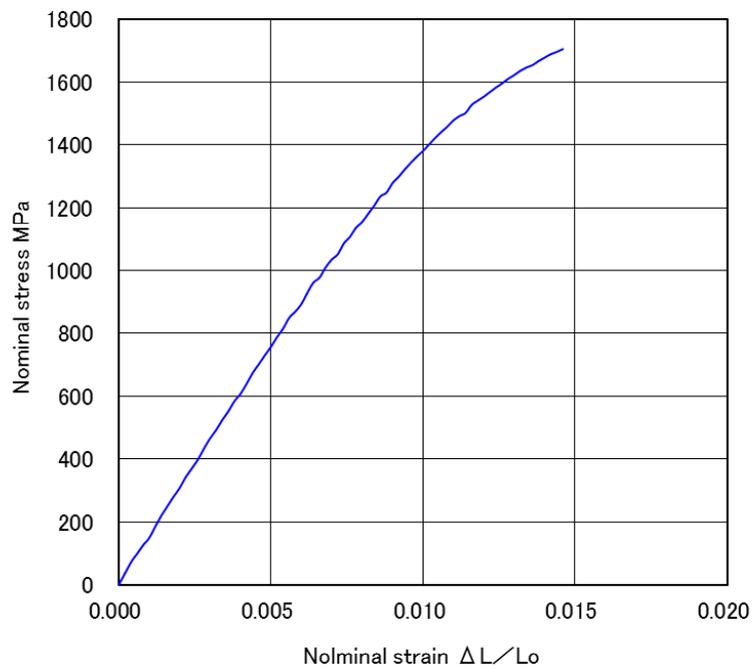


Fig.4 Stress-Strain curve of C1990HP-GSH (Transverse direction)

<Further Information>

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