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Effect of Heat-treatment, Especially of Multiplex Heat-treatment on the Elasticity of Cold-rolled Copper Alloys*

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Abstract

The change in elastic modulus brought about by heat-treatment, especially by the "multiplex heat-treatment", was investigated into of the several cold-rolled copper alloys, including pure copper, 80/20 brass, 60/40 brass, phosphor-bronze, nickel-silver and copper-beryllium alloy.

The present results were compared with the data previously reported on 70/30 brass, and were discussed from the standpoint of the practical usage. Pure copper easily tends to be recrystallized by heat-treatment, though the elastic modulus slightly increases unless recrystallization begins during annealing. A considerable increase in the modulus value, as shown in the previous work, could also be recognized when the multiplex heat-treatment was applied to brasses and phosphor-bronze. In the first heat-treatment of nickel-silver, the increase of elastic modulus in the temperature range higher than about 250°C is so remarkable that even the further increase of the modulus value upon secondary treatment at lower temperature is made inconspicuous. As to copper-beryllium alloys, a similar conclusion can be drawn from the effect of precipitation at high temperature range.

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