



BROWN METALS COMPANY

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ALLOY TECHNICAL DATA SHEET

C17200 BERYLLIUM COPPER

Age-Hardenable Copper Alloy (Beryllco® 25) · UNS C17200

GENERAL PROPERTIES

C17200 (Beryllco® 25 / Alloy 25) beryllium copper reaches the highest strength and hardness of any commercial copper alloy while keeping useful electrical and thermal conductivity. Strip is supplied in age-hardenable tempers, which are formed and then heat treated to full strength, or in mill hardened tempers, which are heat treated by the mill and ready to form and use as supplied.

It offers excellent spring properties, fatigue strength and resistance to stress relaxation, and is non-magnetic and non-sparking. Typical uses include electrical contacts and connectors, precision springs, switch and relay parts, EMI/RFI shielding and non-sparking components.

CHEMICAL COMPOSITION

Percent by weight — Beryllco® 25 (NGK Metals)

Element	C17200
Beryllium	1.80–2.00
Nickel + Cobalt	0.20 min.
Nickel + Cobalt + Iron	0.60 max.
Copper + Be + Ni + Co + Fe	99.5 min.

TEMPER DESIGNATIONS

Beryllco® 25 strip is supplied in three groups of tempers. Each temper has an ASTM designation and a common name.

- Age-hardenable tempers — TB00 (A), TD01 (¼H), TD02 (½H), TD04 (H). Formed or stamped first, then heat treated, which roughly doubles the strength.
- Heat treated tempers — TF00 (AT), TH01 (¼HT), TH02 (½HT), TH04 (HT). The strength reached after the matching age-hardenable temper is given the producer's recommended heat treatment.
- Mill hardened tempers — TM00 (AM), TM01 (¼HM), TM02 (½HM), TM04 (HM), TM05 (SHM), TM06 (XHM), TM08 (XHMS). Heat treated by the mill to a strength between the age-hardenable and heat treated tempers, and usually formed and used as supplied.

MECHANICAL PROPERTIES

Beryllco® 25 strip by temper (NGK Metals)

Temper	Heat treat	Tensile, ksi	Yield, ksi	Elong., %	Rockwell
TB00 (A)	None	60–78	28–60	35–65	B45–78
TD01 (¼H)	None	75–88	60–80	15–40	B68–90
TD02 (½H)	None	85–100	75–95	9–30	B88–96
TD04 (H)	None	100–130	90–112	2–18	B96–104
TF00 (AT)	600 °F/3 hr	165–195	140–175	3–15	C36 min.
TH01 (¼HT)	600 °F/2 hr	175–205	150–185	3–10	C36 min.
TH02 (½HT)	600 °F/2 hr	185–215	160–195	1–8	C38 min.
TH04 (HT)	600 °F/2 hr	190–220	165–205	1–6	C38 min.
TM00 (AM)	Mill	100 min.	70–95	16–30	B95 min.
TM01 (¼HM)	Mill	110 min.	80–110	15–25	C20 min.
TM02 (½HM)	Mill	120 min.	95–125	12–22	C23 min.
TM04 (HM)	Mill	135 min.	110–135	9–20	C28 min.
TM05 (SHM)	Mill	150 min.	125–140	9–18	C31 min.
TM06 (XHM)	Mill	155 min.	135–165	4–15	C32 min.
TM08 (XHMS)	Mill	175 min.	150–180	3–12	C33 min.

Ranges and minimums as published by NGK Metals for Beryllco® 25 strip. Yield is 0.2% offset; elongation is in 2". Heat treated (TF00/TH) values apply after the heat treatment shown. Mill = mill hardened.

HEAT TREATMENT

NGK Metals lists 600 °F (315 °C) for 3 hours to bring TB00 (A) to TF00 (AT), and 600 °F for 2 hours to bring TD01, TD02 and TD04 to TH01, TH02 and TH04. Mill hardened (TM) tempers are already heat treated by the mill. Follow the producer's recommendations for your application.

PHYSICAL PROPERTIES

Density	0.298 lb/in ³ (8.25 g/cm ³)
Modulus of elasticity	18.5 × 10 ⁶ psi (128 GPa)
Electrical conductivity	22% IACS
Thermal conductivity	60 Btu/hr-ft-°F (104 W/m-K)
Thermal expansion, 68–390 °F	9.7 × 10 ⁻⁶ in/in/°F (17.5 × 10 ⁻⁶ cm/cm/°C)
Specific heat	0.10 Btu/lb-°F (420 J/kg-K)
Magnetic	Non-magnetic

Typical values at 68 °F, as published by NGK Metals.

SAFE HANDLING

Beryllium copper in solid form poses no known health risk. Operations that create airborne dust, fumes or mist — such as grinding, welding or machining without coolant — require appropriate controls. Refer to the producer's Safety Data Sheet (SDS) for handling guidance.

Values are typical or specification minimums as noted, provided for information only, and should not be used as design limits or as a guarantee of properties for any particular lot or application. Certified test reports are supplied with each order. Beryllco® is a registered trademark of NGK Metals.

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