
**# 51 HEAT-TREATABLE , ALL - PURPOSE YELLOW ALLOY FOR 10 K
& 14 K YELLOW GOLD SHEET, PLATE, AND WIRE FABRICATION**

United # 51 Yellow Alloys are formulated for **10 K to 14 Karat** Yellow Gold **sheet, plate and wire fabrication** giving a **Yellow color**. The # 51 Yellow Alloy can also be used for Investment Casting if desired.

MELTING

Alloy # 51 Yellow Alloy and fine gold should be melted together in a clean crucible. Put alloy in the bottom of the crucible and fine gold on top. Initial melting temperature should be **1040° C to 1050 C / 1904 ° F to 1922 ° F**. Drop temperature somewhat before pouring as listed below. Boric acid flux may be used to keep the metal clean during the melting process. The metal should be mixed well with a stirring rod before pouring to assure a good mix.

**POURING TEMP
FOR INGOTS
POURING**

10 K - **980° C - 990° C**
1796° F - 1814° F
14 K - **950° C - 960° C**
1742° F - 1760° F

Metal should be poured into a preheated, vertical graphite or lightly lubricated iron mold. A steady even pouring motion should be used slowing down at the end of the pour to prevent shrinkage in the top of the ingot. Use a round rod mold for wire and a 2 piece L shaped mold for plate and sheet.

QUENCHING

The metal ingot should be removed from the mold and quenched immediately in pickle solution or water. For heavy ingots a one-minute cool down before quenching prevents quench cracking.

FABRICATION

The metal ingot should be cleaned of all adhering oxide or fluxes before rolling. The ingot should be rolled or drawn to a 50% reduction in size before annealing. After annealing continue the reduction at 50% before annealing again. Clean the ingot after each anneal. Keep rolls, dies and metal clean to prevent defects in the finished stock.

ANNEALING

Annealing temperature **675° C / 1250° F** for **20 minutes (depending on the thickness of ingot)**. Quench immediately in water or pickle solution. A boric acid fire coat should be applied before annealing in open atmosphere ovens to protect the metal from heavy oxidation. Avoid over-annealing wire or plate stock as this can cause excessive grain growth creating orange peel effect on the surface of finished goods.

HARDENING

Fabricated parts from annealed wire or sheets may be hardened again by heating the parts at about **371° C / 700° F** for about one hour in an atmosphere oven to achieve the right hardness. If an atmosphere oven is not available, then it is strongly recommended to coat the parts with a solution of boric acid or any commercially available oxidation preventing solution. The parts may be then finished as normal.

REMELTING

Use 50% scrap to fresh mix when re-melting to prevent oxide build up in the metal.

**TECHNICAL
ASSISTANCE**

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