

HEAT TREATABLE PLATINUM

HOW TO COLD WORK OR FORM HEAT TREATABLE PLATINUM

PROPERTIES:

COMPOSITION: 95.2% PLATINUM 4.8% OTHER ELEMENTS

MELTING RANGE: LIQUIDUS: **1650 C / 3002 F** SOLIDUS : **1550 C / 2822 F**

CIELAB COLOUR COORDINATES: 83.1L* -0.1 a* 4.6b* DENSITY: 19.30 g/cm³

Alloy/ Treatment	Hardness (HV)	Tensile Strength (psi)	Yield Strength (psi)
95%Pt-5% HTA/Annealed @ 1100 C with Quench	185	115,000	83,000
95% Pt - 5% Ru /Annealed @ 1100 C	130	70,000	50,000
95% Pt - 5% HTA/ Aged @ 700 C after anneal	350	145,000	117,000
95% Pt - 5% Ru Cold worked 75% by area	255	116,000	115,000
95%Pt-5% HTA Cold worked 50%	350	159,000	157,000
95%Pt-5%HTA aged @ 700 C after50%cold work	425	183,000	174,000

APPLICATIONS:

- Stamped items such as clips and earnuts
- Formed wire shapes such as omega clips and post wire.
- Any assembly that requires superior spring properties with 95% Pt content requirement.

MATERIALS & EQUIPMENT REQUIRED:

- Mechanically driven flat or shaped forming roll mill
- Mechanically driven wire draw bench with carbide dies
- Conventional press and die configurations will accomplish stamping polish and chrome plate dies if possible.

TECHNIQUES & METHODS:

- Yield strength must be exceeded to plastically deform the metal. Stiffness is the same as other platinum alloys.
- Work hardening occurs quickly. Maximum thickness reduction prior to anneal is approx. 60%
- Full anneal must involve heating to **1000-1100C / 1832 - 2012F** followed by quench in water.
- The cycle of cold work and anneal can be repeated several times. Never use a slow cool from an atmosphere furnace prior to cold working. This hardens the material and limits ductility.

HEAT TREATMENT HARDENING

- **FOR BENCH WORK:** Heat the platinum piece to a medium orange color and allow it to slowly cool in air. Repeat the procedure a second time. Do not quench if any visible color remains in the piece.
- **FURNACE PROCESSING:** Regular atmospheres are suitable. Furnace dwell time and fixturing should be adjusted to allow the piece to attain **700C / 1292F** for 15-30 minutes. Slow air cooling should follow heating.
- If further cold work or shaping adjustment is required, reheat the item to bright yellow (**1000-1100C/ 1832-2012F**) and quickly quench to restore softness and ductility. The heat treatment process is reversible.
- Heat treatment after cold working provides maximum strength and hardness obtainable (HV425)

TECHNICAL ASSISTANCE Always available... Call 1-800-999-3463 / 1-800-999-FINE
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