



## HEAT TREATABLE PLATINUM (Pt 950 HTA®) Wrought / fabricated product



Imperial's **Platinum HTA®** is a proprietary alloy formulated for special applications that require a 95% platinum content, high strength and a scratch resistant finish. Typically, **Platinum HTA®** is used for high tension ear nuts, light weight and high strength wire or strip and seamless wedding bands.



### 1. Properties (95% Pt / 5% In + Ga):

**Melting Range:** 1550°C / 2822°F – 1650°C / 3002°F  
**Density:** 19.23 g/cm<sup>3</sup> (lighter than Pt-5Ru @ 20.67 gr/cm<sup>3</sup>)

### 2. Material & Equipment Requirement:

- Oxy-hydrogen bench torch apparatus
- Tungsten carbide working tools to minimize contamination
- Mechanically driven flat or shaped forming roll mill/wire draw bench with carbide dies
- Conventional press and die configurations will accomplish stamping operations



### 3. Techniques & Methods:

- Work hardening occurs quickly; more force is required to plastically deform **Platinum HTA®** than Pt-5Ru
- Any cold forming operation should not exceed 60% reduction between anneals
- The cycle of cold work and annealing can be repeated several times
- Soldering can be carried out using normal procedures with "platinum" solders (use 1400°C or 1500°C solders)
- Welding is preferred and will produce an invisible bond; use thin foil of Platinum HTA® fitted between joints
- Soldering and welding should be done in a "reducing flame", without flux and the piece should be quenched immediately after joining\*\*

**CAUTION:** Please note that Platinum HTA® has a liquidus that is 150°C (302°F) lower than Pt-5Ru. Any high temperature repair, including soldering and welding, must take this lower temperature into account.

### 4. Heat Treatment Techniques:

**Platinum HTA®** will naturally form a slight grayish surface oxide following exposure to heat (especially when air cooled). This oxide layer can be easily and permanently removed using standard polishing techniques. Polishing **Platinum HTA®** is faster than Pt-5Ru.

**To soften:** Torch heat to a bright yellow color (1000°C / 1832°F) and quench in pickle or cold water.

**To harden:** Heat to a minimum orange color (700°C / 1292°F) for at least one minute and then slowly cool in air until no color is visible. The piece can then be quenched.

### 5. Response to Heat Treatment:

	Hardness (Hv)	Tensile Strength (psi)	Yield Strength (psi)
<b>Platinum HTA®</b> / Annealed @ 1000°C (1832°F) and quench	220	110,000	75,000
<b>Platinum HTA®</b> / Cold worked 60% reduction	360	185,000	180,000
<b>Platinum HTA®</b> / Annealed and aged @ 700°C (1292°F)	340	160,000	125,000
<b>Platinum HTA®</b> / Cold worked 60% reduction and aged @ 700°C	380	190,000	175,000

### 6. Special notes:

- Aging Platinum HTA® should preferably be done in a controlled furnace followed by slow cooling in air until all yellow/orange-red color is gone. Then immediately cool in water.
- The time required at temperature for heat treating will vary with the mass and profile of the article.

**Platinum HTA®** is a registered trademark of Imperial Smelting-Articles may be stamped "Pt 950 HTA®" (under license only)

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