



CASTING WITH HEAT TREATABLE PLATINUM (Pt950HTA®)



Imperial's **Platinum HTA®** is a proprietary alloy formulated for special applications that require a 95% platinum content, low weight, high strength and a scratch resistant finish compared to other platinum alloys. Typically, casting with Platinum HTA® is used in four prongs or filigree settings where high strength in a delicate design is required. Platinum HTA® offers faster and easier finishing, yielding a hard and durable finish. 95Pt-5HTA exhibits virtually double the hardness and strength of 95Pt-5Ir or 95Pt-5Ru.



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

Melting Range: 1550°C / 2822°F – 1650°C / 3002°F
Density: 19.23 g/cm³ (lighter than Pt-5Ru @ 20.67 gr/cm³)

2. Material & Equipment Requirement:

- Platinum casting investment & ceramic crucibles
- Oxy-fuel torch heat or electric induction power
- Centrifugal force preferred to assist filling
- Electric kiln to heat ceramic flask from 760°C/1400°F for thick items to 875°C/1600°F for thin items
- Protective goggles and heat resistant clothing used for regular Pt casting



3. Techniques & Methods:

- Special care and attention should be given to the feed characteristics of molten metal into the casting. The broader melting range can make feeding more sluggish than regular alloys, but this is avoided by attaining sufficient temperature at the time of casting.
- Casting temperature should vary by section thickness. Thin items should receive 200-300°C (392-572°F) superheat to cast at 1850-1950°C (3362-3542°F). Thick sections can be cast with minimal superheat at around 1700°C (3092°F).
- The surface of the as-cast article will be frosted, indicative of surface oxidation that is completely and permanently removed by applying standard finishing techniques.
- Normal finishing procedures can be accomplished more rapidly than with conventional materials, due to the harder metal.
- The material can be recycled extensively without deterioration of physical properties or surface discoloration.

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.

5. Response to Heat Treatment:

	Hardness (Hv)	Tensile Strength (psi)	Yield Strength (psi)	Wear Resistance
Platinum HTA® as cast	240	112,000	92,000	High
Platinum HTA® aged 1 hour at 700°C	280	125,000	104,000	High

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.
- Sizing of cast rings is NOT recommended for Platinum HTA®

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

We are always interested in hearing your opinion of how our products have performed for your application. Also, contact us should you have any questions, comments or require information regarding Imperial's wide range of gold, silver and platinum products.

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