

Creating a Palladium Diamond Ring

by Daniel Ballard

Of late, many manufacturers and retailers looking for a white precious metal have been weighing the benefits of 950 palladium. A Platinum Group Metal, palladium offers a lower price point, does not require rhodium plating (as does white gold), and is relatively lightweight. However, although the manufacturing procedures for palladium and platinum are similar, there are a few differences that jewelers should know. In this Tech Sheet, Daniel Ballard of Los Angeles-based Precious Metals West/Fine Gold takes a step-by-step approach to creating 950 palladium diamond rings to show how best to approach this increasingly popular white metal.

Melting Palladium

The first step in this project is to cast the shank of the ring—and casting palladium can be tricky. Palladium casts at a lower temperature than platinum: around 1,350°C/2,462°F to 1,400°C/2,552°F or so, depending on the alloy you're using, compared to platinum's 1,700°C/3,092°F. However, it requires very accurate temperature control. With palladium, if the temperature runs



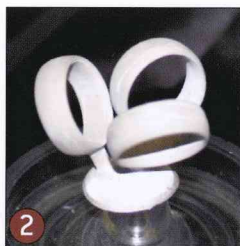
too high, the metal will overheat and become contaminated with silicon from the crucible. This is why you should use an induction casting machine (1), possibly under vacuum and an argon backfill. However, do not set the machine at maximum power, as you would with platinum.

Instead, use a lower power setting—say seven instead of ten. Dual-channel optical pyrometers will help you maintain a proper temperature.

If you do cast with a torch, do not use hydrogen: Palladium tends to absorb hydrogen if given a chance, which will lead to porosity as the metal cools. Propane works well for bar pours, as does compressed natural gas. [Propane also works well for soldering; more about that later.] If you do use a torch, be sure to use adequate eye and skin protection—at least a #10 tint lens and ultraviolet protection for your skin.

Casting the Shank

Two more things to be aware of before beginning your cast. First, palladium does not fill as well as some other metals, including platinum, so you should use generous sprues when constructing your casting tree (2). You may want to consider additional feeder gates and make sure the



sprues gently taper toward the pattern whenever possible; this will further increase your fill and avoid turbulence.

You also might want to stick to centrifugal casting (3); the lighter weight of palladium—it's 40% lighter than platinum—as well as its viscosity could cause



issues if you try vacuum casting. Use maximum torque and rpm to ensure the palladium flows as much as possible. Beyond these guidelines, you can cast as you normally would with platinum; when done, you should have shanks ready for soldering. (You

may get an "as cast" oxide layer, but it will be very thin, will not interfere with surface patterns or textures, and can be easily polished away.)

Soldering Palladium

Once you have your cast shank, the next step is to solder on the head, which is also made of 950Pd. For solder selection, you can use one of the new solders developed for palladium, or you can use platinum repair solders in the 1,000, 1,100, or 1,200 temperature grades. (These temperatures demand eye protection similar to that used when melting the metal.) As for a gas, propane works very well for soldering, as does natural gas (again, avoid using hydrogen).

When soldering, use an oxidizing flame and directly heat the joint as you would with platinum, with no flux required. Unlike platinum, though, 950 palladium will lose its polished luster when heated to soldering temperatures. If you're using easy solder to attach the head to the shank, you might have to repolish the area around the assembly once you're done. However, if you're using hard palladium solder and a high heat, you may experience a slight blue/purple surface discoloration. Mark Mann of Visual Communications Inc. in Corvallis, Montana, has noted in his experimentation with palladium that this surface discoloration is easily removed by heating the metal with a neutral flame for several seconds (4 & 5).

With the head and shank assembled, you're ready to set your diamond, and then pre-finish and polish the ring. Like platinum, 950 palladium is malleable and tough, but finishing this metal usually requires fewer steps. When you're finished, the color of the palladium will be similar to the color of platinum.



PHOTOS 4 AND 5 BY MARK MANN

See our Sponsor, PM West/Fine Gold, for the Latest Palladium Alloys and Supplies (over)



Precious Metals West / Fine Gold

608 South Hill St. #407, L.A. California 90014

Phone (213) 689-4872 Fax (213) 689-1654 TOLL FREE (800)999-PLAT

WWW.PMWEST.US THEKRAFTWERKS.COM 950PD.COM email Daniel@preciousmetalswest.com

ALABASTER 950 PALLADIUM

Palladium Jewelry has been on the jewelry scene for months now. Some of the largest retailers have been selling it.

P. M. WEST has been working on this material for the manufacturing jeweler and custom jeweler. Taking full advantage of the very latest metallurgical research and development-Precious Metals West announces availability of this breakthrough platinum family material for the manufacturer. Alabaster 950Pd looks very much like platinum.

The cost advantage is compelling. At a ounce of casting/rolling grain is only about per gram). This amounts to far less than even 14kt white gold. The ease of use will compared to white gold. Palladium means jewelry made in Alabaster will about half the weight of platinum

palladium market of \$304.00, the cost for an \$347.60, (\$17.38 per dwt, or just \$11.18 platinum and is in fact a bit less than save considerable labor costs as has a lower specific gravity which be lighter than 14k gold by about 10% and further reducing cost.

Our Alabaster lost wax induction casting /drawing processes. In fact it available and work well. available soon. We now solders for immediate



950Palladium is easily used for and bar pours for rolling fabricates easily. Solders are Wire and sizing stock will be have 95% Palladium grain and shipment.

Anyone who induction perfect position to use this new 1350 degrees Celsius or about 2460 enough that we do recommend using for platinum rather than gold. This temperature is well below that of platinum. The white color is much like platinum and a whole level whiter than any 14kt white gold available today. Rhodium is not needed! All the great color with none of the drawbacks.

casts with Platinum is in a material. It flows for casting at Fahrenheit. The flow point is high crucibles and investments designed

Because it is so "bench friendly", stones are set safely and securely. Sizing is straightforward. Alabaster 950Pd can be work hardened. We have a variety of formulas for particular manufacturing processes. All finishes can be applied easily. 950Pd is very durable when worn daily. 950Pd is non allergenic. Body jewelry makers should take note of this alternative white metal.

