

Jewellery

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The mettle of metals

Cutting corners doesn't always pay

By Miroslaw Kruszynski

Inflation is a global concern. With the high cost of gas, oil, overseas imports, food, gold, and other raw materials, jewellers are apt to look for money-saving techniques to compensate. One such avenue is the use of certain materials and alloys in design. However, while popular opinion may be that doing so can lower production costs, some would argue this tactic is more likely to achieve the opposite effect. More often than not, the final product can be of poorer quality or difficult for engravers and setters to work with, resulting in increased labour fees, decreased profits, a greater risk of damage, and ultimately, higher consumer prices. Therefore, choosing the right material is of utmost importance.

Scratching the surface of alloys

All metals scratch. Contrary to popular belief, this is true even of platinum where the degree of scratching is dependent on the other metal with which it is mixed. For example, Pt950/Cobalt (Pt950/Co) or Pt950/Ruthenium (Pt950/Ru) both have a Vickers hardness (HV) of 135, which is equivalent to 64,000 to 66,000 psi. These materials are much harder and therefore more difficult to scratch than Pt950/Iridium (Pt950/Ir), which has an HV of 80 (40,000 psi). Although Pt950/Ir is a viable option for fabrication and die striking when used in mass production, its low scratch resistance may be problematic in certain high-priced jewellery, particularly in cases where the designer, manufacturer, or end user falsely assume all platinum alloys are equally strong.



All photos courtesy Mirko Engraving

“While some alloys may be difficult to work with, they can offer certain cost-saving benefits that may not be apparent on first inspection.”

For example, an engagement ring is undoubtedly an important and costly purchase. The groom-to-be invests a considerable amount of money and effort into selecting or designing a ring to symbolize his love and devotion, which his fiancée then excitedly wears on her hand, showing it off for all to see. The problem is it is made from a very soft alloy that damages quickly and easily, giving it a matte finish criss-crossed with scratches. Whether the ring is engraved with deep cuts or not, its 'like new' appearance is gone forever, disappointing the couple who may lose all confidence in your service.



The ring on the left shows porosity, which can arise when casting with reused white gold. On the right is how engraving can help camouflage this problem.

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The more times a casting metal is reused, the duller it gets, and the more brittle and porous it becomes. This affects not only the end product's appearance, but price as well.



Some believe the use of certain materials and alloys in design can help lower production costs. However, this is not always the case. Choosing the right material is imperative to keeping labour fees down and increasing profits.

Casting call

While some alloys may be difficult to work with, they can offer certain cost-saving benefits that may not be apparent on first inspection. Many jewellers often shy away from casting metals made with high-palladium alloys, such as 950 Pd/Ru (ruthenium), as they can be difficult to cast, and therefore, more expensive to work with. However, unlike some alloys, metals combined with a palladium mix do not require rhodium plating to achieve the crisp white colour needed for white gold. Second, palladium alloys are more malleable and easier to work with, therefore decreasing engraving and stone-setting costs, which, in the end, can be far greater than the initial price of casting.

Another way jewellers may try to decrease costs is by using previously cast white gold to create new jewellery. While reused metal is a viable option for solid, plain designs, it is not ideal when the piece is to be engraved or set with stones. The more times a casting metal is reused, the duller it gets, and the more brittle and porous it becomes. This not only affects the end product's appearance, but it also makes it more difficult to work with and therefore, more expensive.

Given that the metal is reused and more porous in texture as a result, engravers are likely to have a difficult time cutting into the material. In addition, brittle metal is apt to crack, requiring very expensive laser welding to solder. Either way, it takes more time to engrave reused metal due to the greater degree of precision and caution needed when working with this material. Likewise, a setter will also have more difficulty working with reused metal and the piece will most likely require laser welding.

In the know

Proper annealing (*i.e.* immediate quenching in water, a pickling solution, or methyl alcohol) is also important to keep in mind when trying to decrease the cost of jewellery production. While all types of steel are cooled very slowly to soften, all non-ferrous metals (*e.g.* copper, brass, silver, and gold) must be quenched immediately after heating to a low red heat to become soft and more malleable.

More often than not, jewellers make the mistake of not immediately quenching the metal, applying instead the process for hardening steel. What they fail to recognize is that gold and all coloured metals actually get harder as they cool down slowly. The result is they become more difficult to work with, increasing production time of both engraving and stone setting and therefore adding more expense.

In addition to the metal employed, creating a piece with a thinner design can also affect your bottom line. When a ring's band or shank is thin (*i.e.* 2 mm or less), adding engraving can become very difficult, given the piece's smaller size and fragility. Also, since the metal can bend easily, the engraver is unable to use a ring holder, as the force applied to the device may stretch the ring or alter its design and proportion. To get around this problem, the ring must be supported manually, which slows the process down, increases the difficulty of the engraving job, and results in higher engraving fees. In the end, it is probably less expensive to design a thicker band with a greater weight and density when the piece is to be engraved.

Although the temptation may be to save money in all possible areas, a business-minded jeweller is one who knows which techniques can minimize costs and what facets of design should not be compromised. ♦

Miroslaw Kruszynski owns Mirko Engraving in Toronto. He is a master engraver with more than 30 years of experience and has trained under some of the world's most esteemed hand engravers. Kruszynski can be contacted via e-mail at unique@mirkoengraving.ca.