Alternative metal

With a stable price, a simple production process and excellent biocompatibility, titanium copings are a viable alternative to noble metals.

We in the dental community have all been concerned for some time about the high price of gold in the London market. We are directly affected by these prices because of the uncertain economy and the metal supplies necessary to fabricate our crown and bridge work.

Fortunately, in using the newest technology possible to fabricate titanium copings, there is an exciting and cost-effective solution to the high cost of metal. Titanium is ADA approved and has been assigned code number 2794 for insurance purposes as a porcelain to titanium crown.

CASE STUDY

This article will deal with the technical aspects of creating a single porcelain to titanium crown, beautifully layered to mimic the same esthetics as a porcelain to metal restoration.

01 With the Nobel Biocare NobelProcera CAD/CAM scanning system (Fig. A), our lab first scans the model. The titanium coping is then milled by Nobel Biocare and returned to us two days later. In the laboratory, the technician can then design the restoration as it was prescribed by the clinician.

02 The titanium coping from Nobel Biocare is ready to be ground with a KOMET carbide burr (Fig. B) in order to ensure that its lines are smooth. When grinding a titanium coping, the technician should use the carbide burr and move in only one direction in order to create a flat line, as demonstrated on the right side of Figure C.

03 The next step is to sandblast the coping, done here using a Renfert Sand Blaster at 2-4 bar speed (Fig. D). Please note: sandblasting is very important between steps for this type of restoration.
**Introduction**

We in the dental community have all been concerned for some time about the high price of gold in the London market. We are directly affected by these prices because of the uncertain economy and the metal supplies necessary to fabricate our crown and bridge work.

Fortunately, we’re being offered an exciting and cost-effective solution to the high cost of metal, utilizing the newest technology possible in order to fabricate titanium copings. This material is ADA approved and has been assigned code number 2794 for insurance purposes as a porcelain to titanium crown.

This article will deal with the technical aspects of creating a single porcelain to titanium crown, beautifully layered to mimic the same esthetics as a porcelain to metal restoration.

**Product Report**

With the Nobel Biocare NobelProcera CAD/CAM scanning system (fig. 1) our lab first scans the model. The titanium coping is then milled by Nobel Biocare and returned to us two days later. In the laboratory, the technician can then design the restoration as it was prescribed by the clinician.

The titanium coping from Nobel Biocare is ready to be ground with a KOMET carbide burr (fig. 2) in order to ensure that its lines are smooth. When grinding a titanium coping, the technician should use the carbide burr and move in only one direction in order to create a flat line, as demonstrated on the right side of (fig. 3). The next step is to sandblast the coping, done here using a Renfert Sand Blaster at 2-4 bar speed (fig. 4). (Please note: sandblasting is very important between steps for this type of restoration.) After sandblasting the coping, the technician should place it in an ultra sonic with distilled water (fig. 5) as the author did here, cleaning the coping for 5 minutes.
By carefully following the GC Initial Titanium (GC Initial Ti™) low fusing porcelain system chart guidelines (fig. 6), the author ensured his final results. First, the instructions indicate that a titanium bonder must be applied in a thin coat, appearing like that of the right view in (fig. 7). Following normal opaque procedures, GC Titanium Opaque was applied onto the coping, as seen here with shade A-4 (fig. 8). After baking twice, it will have this appearance. GC Initial Ti™ porcelain is offered in a full range of colors (fig. 9). Several applications of porcelain build-up were layered onto the coping, utilizing this particular range of nine different colors (fig. 10).

In the final restoration, note the beautiful effects and the natural tooth morphology (fig. 11). The mirrored image in (fig. 12) gives an occlusal view as well as a side-by-side image in (fig. 13).

**Conclusion**

It is exciting to be able to announce this groundbreaking material option to our colleagues! Lately, when we purchase high noble metal for the lab, the cost is very expensive. In turn, we have to pass this on to the clinician which drives up the price of our restorations.

The good news is that we can all now offer our clients this titanium option; with very light weight, excellent biocompatibility, and an easier process for fabrication because the waxing, investing, casting and divesting steps are all eliminated. After testing a single unit in the laboratory, we found the results to be fantastic! However, with a long-span bridge, we noticed that we have to control cooling times and temperatures in order to get the best results. Please stay tuned for a product report on that type of restoration in an upcoming issue, after further research and experimentation.
Fig. 1) Utilizing the Nobel Biocare NobelProcera™ CAD/CAM system allows us to scan our model, have the coping milled and then receive it from Nobel Biocare two days later.

Fig. 2) A titanium coping from Nobel Biocare is ready to grind with a KOMET carbide burr for perfect smoothness.

Fig. 3) Grind the coping in one direction only.

Fig. 4) The next step is sandblasting the coping with a Renfert Sandblaster.

Fig. 5) After sandblasting, the coping is placed in the Renfert Ultra Sonic for 5 minutes in distilled water for cleaning.

Fig. 6) For perfect porcelain to titanium restorations, the author followed the GC Initial Tit™ low fusing porcelain system chart directions. For instance, degassing is not necessary, which is included in the instructions.
Fig. 7) Application of a thin coat of titanium bonder appearance is demonstrated.

Fig. 8) Second time application of opaque will have this appearance after baking.

Fig. 9) GC Initial titanium porcelain colors are offered in a full range of possibilities.

Fig. 10) An application of porcelain build-up, utilizing all of the nine colors shown here, were layered together to form an esthetic appearance.

Fig. 11) Note the perfect tooth morphology in the final restoration.

Fig. 12) A mirrored image of the restoration.
Fig. 13) The last mirrored view demonstrates the secondary anatomy