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Castings: Minimizing Finishing

and Maximizing Retentive Fit and Marginal Integrity

Once of the most delicate and important tasks of a dental technician is to ensure a passive, controlled fit of castings with excellent marginal fit. Poor fitting restorations can result in compromised aesthetics, oral hygiene problems and even reduced longevity of the restoration. Many factors can exacerbate fit problems, including undercuts, minimum space, shrinkage of wax, limitations of casting materials, and the need to 'clean, finish and polish' the final alloy pattern.

Developing the product

While our laboratory has tested several products designed to address these problems by smoothing the surface of the wax pattern prior to investing in order to make it even, they have all shared a similar disadvantage: they add to the dimension of the pattern (much like a lacquer).
This in turn does not necessarily facilitate the creation of an ideal fit surface.

I decided to turn the problem on its head; Instead of 'painting over' an irregular pattern surface, wouldn't it be simpler to remove, or 'strip-away' unwanted wax? I approached Dental Ventures of America with my idea around 4 months ago and they agreed to develop it. We did intial trials to perfect the formula, and then they had it tested by various labs until they were satisfied. As far as I know it is the only product that reduces wax (fig. 1).

I developed the product in collaboration with DVA

Case Demonstration

I will demonstrate the application of this product via a 3 unit posterior inlay / onlay case (fig. 2).
An impression is taken.
The model is fabricated and a wax pattern is made.

The teeth have been prepared

Product application

Prior to investing, castings are treated with liquid stripper to eliminate any irregularities of the inner surface of the wax pattern and then brushed on the outer areas of the pattern (fig. 3) to prepare a smooth, clean surface minimizing the amount of grinding and finishing required to finalize the completed cast restoration. Application is simple: a brush is dipped into the stripper liquid, and then gently brushed over the uneven surface. All carved, functional occlusal anatomy is easily maintained with precise detail after having modelled the smooth, finished contour desired. (fig. 4).

Passive fit

This technique of 'stripping away' allows absolute control of the passivity of fit, as well as the 'painting away' of any undercuts, wax shavings or other anomalies, as shown in fig 5.

Undercuts

Stripper was used to treat the undercut shown on the axial wall indicated by the arrow (fig. 6). A precise stripping application on the internal walls of the wax pattern simply eliminated the potential interference, and allowed a controlled, passive, but retentive fit of the casting. Resealing of the margins after treatment secured the establishment of excellent marginal adaptation (fig. 7).

Casting and finishing

Once you are satisfied with the wax pattern, you can proceed to invest as usual. After casting and sprue removal, the casting only requires a minimal amount of grinding and finishing to finalize the completed cast restoration. Naturally, minimal finishing results in minimal impact on the margins. Then just 'touch-up' the casting with a hard, micro-fine rubber tip.

Precautions for use

The product is gentle and non-flammable, but it is obviously possible to over-apply it. This is quickly overcome as it is easy to develop a 'feel' for the product. After use it is essential to ensure the margins are resealed as this could alter integrity.

The end result

The finished casting is checked on the model (fig. 8) then sent to the clinician for cementing in-situ (fig. 9). The finished result is highly satisfactory (fig. 10).

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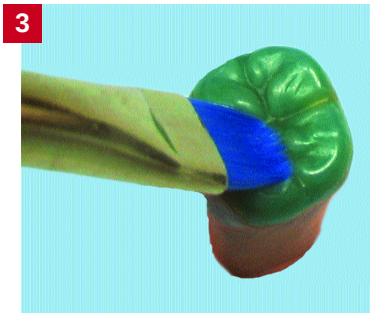

Occlusal application

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Occlusal wax-up after application: the fine detail is preserved

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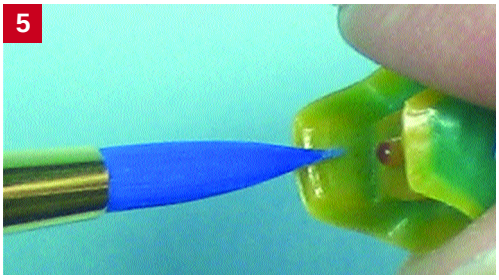

Internal application

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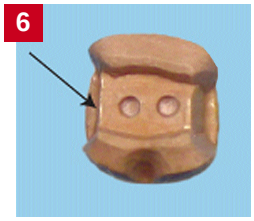


The undercut will be treated

7

Interproximal wax up

8

Finished casting on the model

Conclusion

I developed this product to resolve recurring challenges encountered in the lab, and its application to wax-ups has certainly done a lot to resolve these problems. It is fast and easy use, as well as inexpensive, and is a real aid in the production restorations with precise fit and function.

OTHER APPLICATIONS

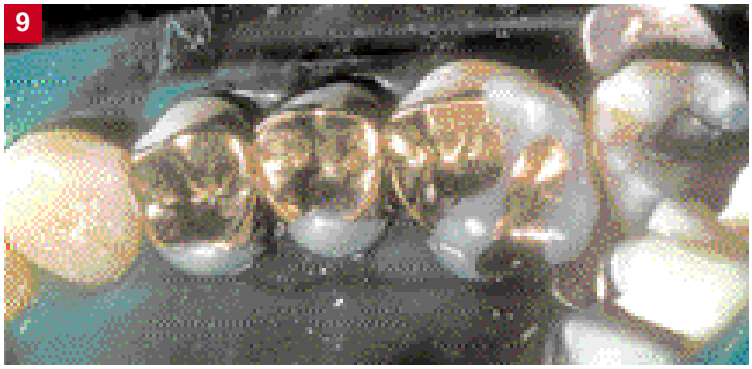
To further demonstrate the possibilities inherent to this new, effective product, the two photos below depict how a wax pattern with extreme carving marks can be quickly and easily transformed into a smooth, groove-free surface (figs. A and B).

This product is also effective when used to reduce post and core patterns to decrease the fitting difficulty offered by this type of restoration.

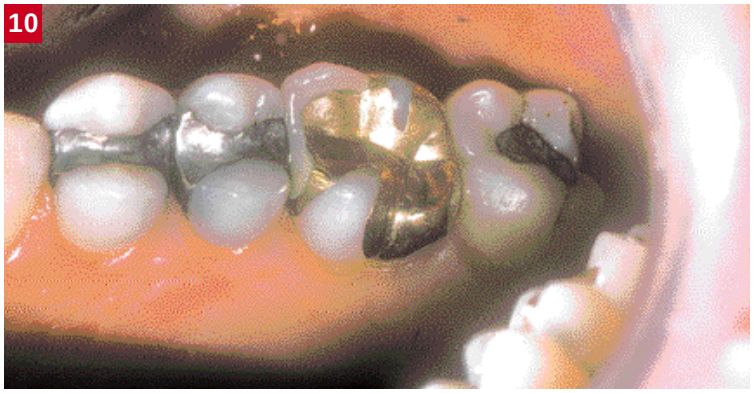
I paint all of my sprue-forming patterns with stripper; I find this helpful as it appears to increase the efficiency of metal flow and enhances the homogeneity of our laboratory's castings.

A *The wax is rough before application*

B *Smooth finish after application*



9 *Cementing in the mouth*



10 *Finished restoration in situ, the result is highly satisfactory*

About the author

Mr. Boris Grunberg

Mr. Boris Grunberg qualified as a Registered Dental Technician in Canada in 1974, and has been associated with the Dr. Richard V. Tucker Gold Castings Study Club for over twenty years. He has served on the supporting staff of the University of British Columbia Gold Casting Course for over eight years. His articles on model construction, waxing and casting techniques have been published in the Canadian Journal of Dental Technology and the Quintessence of Dental Technology. His intensive study of occlusion and precision dental technology techniques are ongoing.