

Milling technique: Dentures without clasps

Part 7: One-piece casting

By Frieder Galura



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If an attachment is made of CoCr based alloys, it is obvious to cast the secondary parts and the cast partial denture together in one piece - the so called *one-piece casting*. This process saves a lot of time, energy and material. There is no need to cast the secondary crowns separately and to join the double crowns together with the cast partial by soldering, laser-welding or bonding. A further advantage is the biological compatibility due to the usage of only one alloy for all metal parts of the denture.

However, you have to get the discrepancy between the single fit of the telescopic crown and the fit in span of the complete prosthetic work under control. This is a matter of controlling the casting expansion and can be managed by well-regulated use of different investment concentrations. As described in the previous chapter about “bars” (*eLaborate July/August 2008*), the one-piece cast technique is not exclusively limited to double crowns. The procedure is explained in Figure 1-34.

About the author

Frieder Galura was trained as a dental technician at the University Dental Hospital in Heidelberg, Germany. He has worked in many dental practices and labs in Germany, concentrating on ceramics, milling and attachment techniques. He commenced working for Dentaurum as dental technician in 2002 and has lectured and run training programmes for them both in Germany and throughout the world. Since 1995, he has been widely published in Germany, France, Spain, Italy and Japan.



Figure 1. Initial situation with shoulder preparation.



Figure 2. Wax crowns after milling.



Figure 3. Primary crowns cast with remanium star after milling.



Figure 4. Preparing the model for silicone duplication.



Figure 5. Preparing the model in the margin area of the telescopic crowns. A wax-wire of diameter 0.8mm applied in the transition zone between crown and retention serves as a place holder in the area of the papilla.



Figure 6. The base thickness of the refractory model should be a minimum of 15mm for a sufficient expansion in the area of the transversal connector, which is a precondition for a gap-free fit of the latter after the cast.



Figure 7. Silicone duplication. Use a high quality silicone with a low Shore-Hardness, such as rema®Sil.



Figure 8. Chart for the correct concentration of the special tooth-arch concentrate.



Figure 9. Stirring with Airvac vacuum mixer (30 seconds).



Figure 10. Pouring out the primary crowns inside the silicone mould with rema dynamic S and 70% of the special tooth-arch concentrate for a higher chemical expansion.



Figure 11. rema dynamic S (powder and liquid).

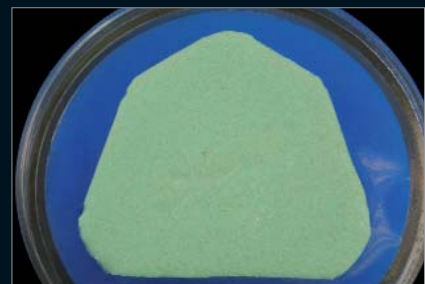


Figure 12. Completed filling of the mould.



Figure 13. Refractory model before...



Figure 14. ...and after drying.



Figure 15. Removal of the adjacent teeth with a stone cutter.



Figure 16. Uncovering the crown margins with a ball-shaped TC cutter.



Figure 17. Marking the crown margins and the transverse bar.

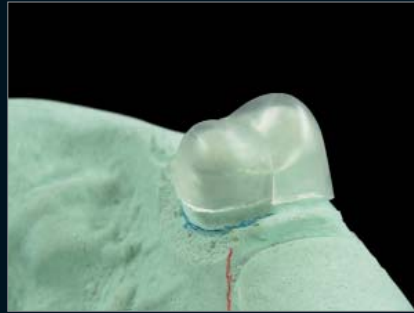


Figure 18. Putting on a thermoforming cap helps to get an equal wall-thickness on the secondary crown. A slit from two sides makes it easier to position the cap.



Figure 19. Wax-up of the crown margins with cervical wax.



Figure 20. Finished modelling.



Figure 21. Main sprues with diameter 3.5mm.

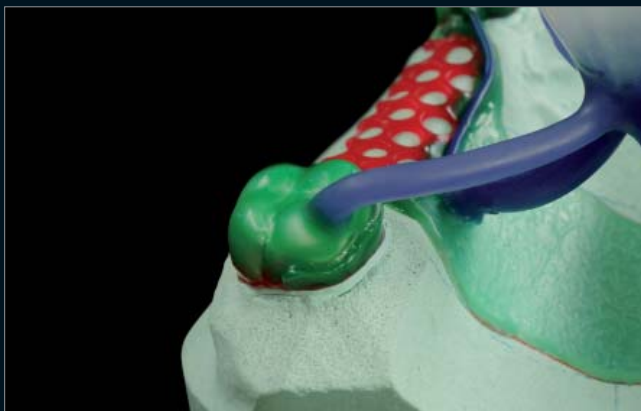


Figure 22. Auxiliary sprues with diameter 2.5mm for the secondary crowns.

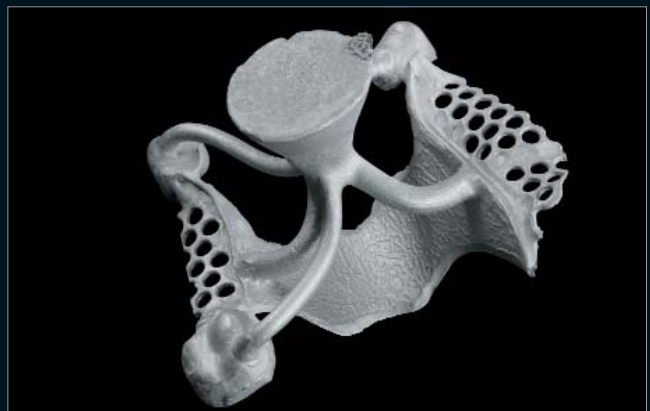


Figure 23. The secondary construction cast with remanium GM 800+. Controlled cooling the furnace down to 600°C avoids stress inside the cast.

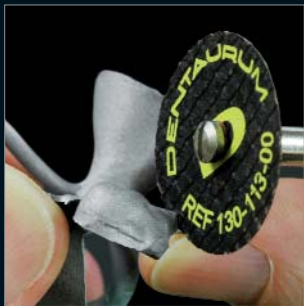


Figure 24. Cutting off the sprues with a Supercut-separating disc.



Figure 25. Crown margin after casting.



Figure 26. Processed crown margin.



Figure 27. Fitting the secondary crowns with a thin TC bur (1mm).



Figure 28. Fine-fitting the secondary crowns with a pointed brush and Tiger brilliant polishing paste.



Figure 29. Secondary crown (premolar). NB: fit of the margin.



Figure 30. Gap-free fit of the transverse bar.



Figure 31. Telescopic crowns with attached Dent Attach V attachments prepared for duplication. Working with D.A. attachments the secondary crowns may have a loose fit after casting.



Figure 32. Processed cast partial with D.A. attachments.



Figure 33. Secondary crown (molar). NB: fit of the margin.



Figure 34. Basal view with inserted males.