

# INJECTION TECHNOLOGY FOR DENTURE PRODUCTION



*Ofer Darey,  
master-technician,  
consultant,  
Sun Rise Laboratories,  
Israel*

Interest to production of removable dentures from thermoplastic materials, which is considered as progressive and well-promising method of achievement of high aesthetic standards, is permanently high. The said technology is not only in demand by patients but popular among technicians as well. Such popularity may be explained, among others, by comparatively simple process of dentures production the technology is featured with.

In the last articles (LAB ## 1-3, 2008) we have discussed obtaining impressions, analysis of situation, frame designing, preparation of duplicate model and interrupted the report at the point of wax evaporation from the flask.

The present issue is referred to final stages of the procedure

Wax evaporation from the flask is followed by the process of flask preparation for injection. There are some nuances within this process we would like to turn your attention to.

1. While wax evaporating, the flask should be immersed into boiling water for not less than 15 minutes;
2. Then we open the flask and wash it with hot water. The question often arises on cases when teeth falling down from the flask while washing out flask from wax. It is worthy to be reminded that we noticed necessity of careful use of modeling wax in the section describing modeling process. If there is no residual wax at the teeth surface they'll never fall down.
3. Further, using a knife we remove sprues as well as all thin and weak walls in plaster which could chip off during injection and enter into the denture. It is necessarily to wash the flask with boiling water. It will be not excessive at this step to use a liquid soap in order to wash out residual wax oil from plaster (Photos 1, 2);
4. Now we are waiting for the flask cooling down. If the teeth fell down while wax washing out, carefully adhere them with glue.
5. Apply **Isoflex** insulation material (Photo 3). A few minutes are required for plaster to soak in the insulation.

Do not forget to verify that the flask's surfaces are not contaminated. Now close the flask, this time with all 4 bolts.



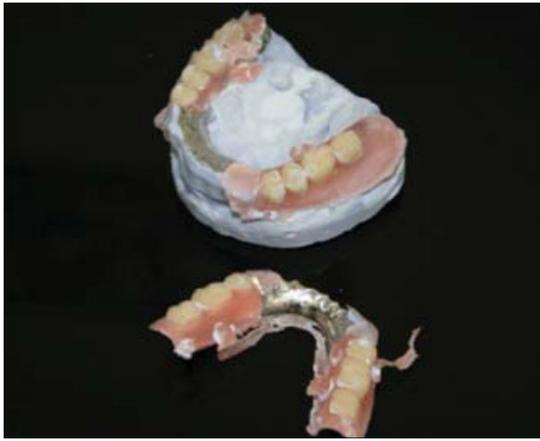
**Photo 1**



**Photo 2**



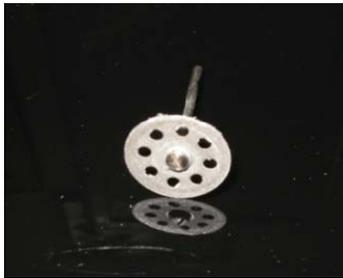
**Photo 3**



**Photo 4**



**Photo 5**



**Photo 6**



**Photo 7**



**Photo 8**



**Photo 9**



**Photo 10**



**Photo 12**



**Photo 14**



**Photo 11**



**Photo 13**

Now we would like to turn your attention to the injection molding press. Quality of the resulted product depends on press machine. Our laboratory has a wide experience in working with a number of thermo-injecting systems. At first glance, dentures produced by means of different presses look as being of same quality. But we are concerned in the proper cast density which increases durability of a denture. We are also concerned in appropriate pressure and rate of material injection, pressure maintaining after injection, flask conditions and its uniform heating during injection. The above requirements have led us to use the **Evox V8** equipment (product of **Evolon Ltd**).

Make sure that the program you set complies with the selected material and then run the press machine. Upon completion of the stages of injection and flask cooling down, we open the flask, safely knock plaster out of the flask and open the cast. Photos 4 and 5 show what the cast looks like after injection.

### **Processing and preparation of a denture for polishing**

First of all by means of disk tool we need to cut off the sprues (Fig. 7). Then with standard fraise used for acryl driven at low speed we cut off inequalities, pass over the denture's borders. Generally speaking, we perform now rough machining.

What makes material **Flexi N 512** exceptionally convenient for processing is that its machining requires neither special fraises nor diamond instruments. Surface grinding and smoothing take place in several steps. First, it is doing by means of green rubber abrasive wheels rotating 20,000 to 22,000 RPM (Photo 8).

Then we have to slow rotation speed of micromotor down to 15,000 RPM and continue surface grinding. It has to be noted that direction of the tool movement should not be changed while grinding and polishing. As early as at this step we start putting the work in hands on the master model. To smooth borders of the denture and process interdendum we should use the brown polisher (Photo 9). After having reached required surface smoothness, we go on to polishing.

### **Polishing**

Polishing is also carried out in several steps.

At the first step, polishing is being performed by means of three cloth lining brush (Photo 10) and **Pumi Top** material (Photo 11), with polishing motor rotating at high speed. Then we continue polishing using a **Cotton Buffer** (Photo 12).

The brush should be well wetted.

Then polishing should be continued with slowed-down rotation of polishing motor.

Note of very importance: Do not burn material away while polishing! To avoid this do not put excessive pressure on a denture!

### **Bright finish**

This may be achieved using cotton buffer with material **Shine Do** (Photo 13). At this stage you also should exercise caution to avoid the material and teeth burning away.

Polishing has being finished using material **Shine Do** with cotton puff on mandrel (Photo 14).



**Photo 15**



**Photo 16**



**Photo 17**



**Photo 18**



**Photo 19**



**Photo 20**



**Photo 21**



**Photo 22**

## **Denture cleaning**

Yet, my dear colleagues, I have to remind that removable dentures made of thermoplastic materials should not be cleaned using any brushes. Instead they are recommended to be carefully rinsed prior and after treatment in solution of special cleaning powder. We may bindingly recommend to use for this purpose material **D-Cleaner 306** (produced by the company **Evolon Ltd**) developed with taking into account special physical and chemical properties of dental thermoplastics (Photo 23).

Solution of the said material prevents degradation of a polymer, cleans it in active manner, removes foul smell, dental calculus and pigmentation from removable dentures, trays, mouthguards and orthodontic structures. Our patients are strongly recommended to clean their dentures using this solution, because in such a way they will keep original aesthetic level of the denture, its color specificity and transparency of material. You may see in Photos 24 and 25 the partial denture that was not cleaned by a patient within almost a year. In the picture to the right you can see the same denture after cleaning within 15 minutes using stationary ultrasound cleaner in the clinic. As a matter of convenience, patients may purchase portable US cleaner for domestic purposes.

By the way, with view to personal hygiene or as preventive treatment of a denture, we clean in D-Cleaner 306 solution every denture prior repair or relin, notwithstanding whether it made of thermoplastics or acryl.



**Photo 23**



**Photo 24**



**Photo 25**

Dear colleagues, I was happy to meet you on pages of LAB journal and share with you some details of technique we use to produce dentures from flexible thermoplastic materials that are increasingly among prosthetic solutions we offer to our clients.

Maybe, I let slip something in my narration. In any case, I'll be glad to answer your questions and give additional explanations upon your requests addressed to: [oferderey@hotmail.com](mailto:oferderey@hotmail.com).