

# USE OF INJECTION TECHNOLOGY FOR MANUFACTURE OF FLEXIBLE REMOVABLE DENTURES



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Dear colleagues,

We can see that interest to manufacture of removable dentures made of thermoplastic materials as a progressive technologic and aesthetic solution rises constantly in recent years. This is evidenced by numerous responses I have received from readers of my article published in the past issue of the Journal ( LAB #1 '08) that was dedicated to technology of tooth line restoration using flexible thermoplastic material **Flexi N512**.

We reviewed in the said article such stages of the process as obtaining impressions, analysis of situation, frame designing and duplicate model preparation.

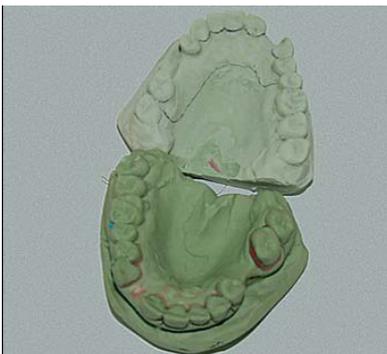
Now I bring to your notice report concerning next stages of manufacturing flexible dentures.

Among the responses I have received since the last publication, question of gelatin usage for producing a duplicate model was predominant. I want now to clear the matter.

The fact is that every process and its successfully resulted product require correct usage of suitable materials.

In case of materials of acetal group, the best-suited duplicating material is silicone. For so-called “flexible” materials, best of all is to make the duplicates from gelatin.

Important note: several types of gelatin are available on the dental market. Most widespread is gelatin for duplicate models used in production of frameworks and called «agar-agar». It is said in the appropriate manuals for its use that this gelatin is intended to be used as an investment material (packing mass for the frameworks). And this gelatin is not suitable for injection processing of “flexible dentures”. In the given case it is strongly recommended to use the gelatin that is good for work with plaster.



Thus, after duplicating stage is over, we have in our hands two plaster models: master and duplicate ones. From now on, all works will be executed on the duplicate model. It is very important to define the borders of future denture once again, this time for the duplicate model (see Photo 1).

**Photo 1**



**Photo 2**

**Photo 3**

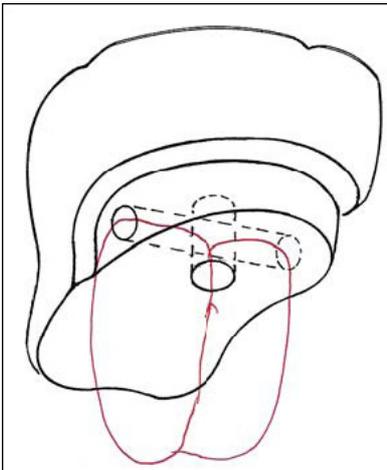
**Photo 4**

### **Teeth setup**

Teeth setup is carried out in a regular manner. Please turn your attention for the setup to be performed in accordance with jaw relationships (occlusion) gotten by the dentist. It is preferable that no less than one third of the tooth neck be inserted into modeling wax.

### **Dental retention and denture modeling**

Dental retention is shown schematically on Fig. 5. It's clear that not for every tooth such retention is possible.



**Figure 5**

If a tooth is very thin, the channels might be  $\Lambda$ -shaped. In parallel, the denture modeling is carried out. It is of very importance at this stage to work in careful and fine manner, being sure of no drops falling out the denture border. Even the thinnest layer of wax allows material to fall outside borders of your model which may seriously complicate further processing. It is necessarily to use soft, elastic shape wax, resistant to high temperatures. The wax should not be brittle. An operating tool should be carefully heated. This allows to apply wax evenly and makes easier subsequent processing and polishing (see Photos 2 - 4).

### **Preparation for "injection"**

Pay attention to the flask. It is recommended to use the flasks made of special aluminum alloy that is keeping temperature constant while injection.

Make sure that there is no residual plaster in the clasp leftover from previous works. For easy removal of plaster from the flask we recommend to smear the last with technical-grade Vaseline.

The duplicate model should be cut off with special saw or disk as close to the wax as possible; all undercut zones should be cut out with fraise. The cutout model should be placed as close as possible to the flask inlet opening. Observance of the above rules gives a number of advantages:

- saving of material;
- risk mitigation of material cooling down;
- the material economic consumption in case of several models simultaneous casting (Fig. 6).

Cover the model with plaster. We recommend to work with plaster of III-d class. To prevent the model deformation you should avoid contamination of the flask edges with plaster while investing.



**Photo 6**



**Photo 7**

Then we shall put in sprues (made of wax wire). Doing this you have to observe a number of rules:

- sprues should be straight as far as possible;
- a sprue shall become thinner at connection with connector (in order to create “bottle neck”);
- sprues should be installed in the middle of the connector (Photo 7).

Inlet opening of the flask should be carefully sealed with wax (Photo 8).



**Photo 8**



**Photo 9**



**Photo 10**

Then you have to close the flask using only two bolts that will allow to open it easily after dewaxing, and fill the flask with plaster. It is a good idea to use vibratory table while packing plaster inside the flask (see Photo 9)

The flask dewaxing is performed in regular manner (Photo 10).

We will continue consideration of manufacturing flexible dentures in the next issues of the Journal.

In the mean time, we will kindly answer all your questions that may arise and, if required, give additional explanations.

Please address your questions to [oferderey@hotmail.com](mailto:oferderey@hotmail.com)