

Dental Impression

An imprint or negative likeness of the teeth and /or edentulous area & adjacent tissue.

Complete denture impression: a negative registration of the entire denture bearing, stabilizing & seal area of the edentulous maxilla or mandible.

We make an impression; we do NOT take an impression. To make an impression we measure with our eyes and fingers the anatomic limits in the oral cavity, the impression material is shaped and molded into a negative likeness of the supporting area. A knowledge of the origins of the muscles of facial expression and of these anatomic landmarks is essential. If one knows the oral anatomy, both gross and histologic, one can readily decide how to make the impression, what material to use, and how to position the tissues when the impressions are made.

Objectives of impression making

Complete denture impression procedures must provide five objectives:

1. Preservation of the residual alveolar ridge & soft tissue.
2. Retention
3. Stability
4. Support
5. Esthetic

Preservation: Preservation of the remaining residual ridge and other natural tissues. It is physiologically accepted that with the loss of the stimulation of the natural teeth the alveolar ridge will atrophy or resorb. Prosthodontist should keep in mind the effect of impression material & technique on the denture base & the effect of the denture base on the continued health of both the soft & hard tissues of the jaws. Pressure in the impression technique is reflected as pressure in the denture base and results in soft tissue damage and bone resorption.

Retention: The resistance in the movement of a denture away from its tissue foundation especially in a vertical direction.

Stability: Is the quality of prosthesis to be firm, steady or constant to resist displacement by functional horizontal or rotational movement.

Support: the resistance of a prosthesis to vertical forces directed towards their supporting structures (like the forces of occlusion).

Esthetics: Border thickness should be varied with the need of each patient in accordance with extent of residual ridge loss. The vestibular fornix should be filled, but not overfilled, to restore facial contour.

Preliminary “primary” impression: made for the purpose of diagnosis, treatment planning & construction of special tray. It is the first impression made for the patient and from which the study cast was produced. These impressions are obtained by a stock tray.

- For the upper stock tray, the posterior border of the tray should cover the maxillary tuberosity & hamular notch, anteriorly should include the anterior alveolar ridge. The upper impression should include the hamular notches, fovea palatinae entire buccal vestibule, frenum attachments, palate and entire labial vestibule.
- For the lower stock tray posteriorly should cover the whole area of retromolar pad area & anteriorly include the alveolar ridge. The lower impression should include the retromolar pads, the buccal shelf areas, the external oblique ridges, frenum attachments, sublingual space, retromylohyoid space, the posterior mucous membrane floor of the mouth to include and be below the mylohyoid line and the entire labial and buccal vestibule.

Materials used for making primary impression:

- 1- Impression compound.
- 2- Irreversible hydrocolloids "Alginate".
- 3- Reversible hydrocolloids "Agar-agar".
- 4- Rubber base impression material.

Production of study cast (primary cast):

The primary impression is poured or casted in plaster (after beading and boxing) to get the primary cast or study model, which is the positive reproduction of the oral tissues. The **plaster** mixed with water by the **saturation method** in the rubber bowl. When the plaster become hard, the cast is separated from the impression by the use of hot water (55°C-60°C). When using very hot water, the impression compound will be sticky and it will be difficult to remove from the cast. The special tray will be constructed on the primary or study cast, which is used to make final impression. After construction of special tray, it is tried in the patient mouth and checked for proper extension and adaptation on the alveolar ridge. As a correct special tray is a primary fact in obtaining a good working impression.

Final or Secondary impression:

It is a negative likeness or registration of the entire denture bearing, stabilizing area and border seal area of the mandible & maxilla for fabricating a prosthesis.

Final impression in general: The impression that represents the completion of the registration of the surface or object. The final impression is made with special tray and it is used for making master cast, which must be poured with stone material.

Master cast (definitive or final cast): A replica of the tooth surfaces, residual ridge areas and \or other parts of the dental arch and \or facial structures used to fabricate a dental restoration or prosthesis.

**Materials used for final impression**

- 1- Zinc- Oxide Eugenol impression material.
- 2- Alginate impression material
- 3- Impression plaster
- 4- Waxes
- 5- Elastomers impression material:
 - a- Polysulphide (Rubber base).
 - b- Poly ether.
 - c- Silicon based.

The techniques used for making final impression:

- 1- Mucostatic impression technique (non- pressure technique)
- 2- Muco-compression or Functional impression technique (pressure or closed moth technique).
- 3- Selective pressure impression technique.

Boxing impression and making the casts:

Boxing: is the enclosure of an impression to produce the desired size & form of the base of the cast & to preserve desired details.

Boxing impression can be used for primary & final impression for complete denture. This procedure cannot usually be used on impression made from hydrocolloid materials (e.g. alginate) because the boxing wax will not adhere to the impression material & the impression material (alginate) will be distorted.

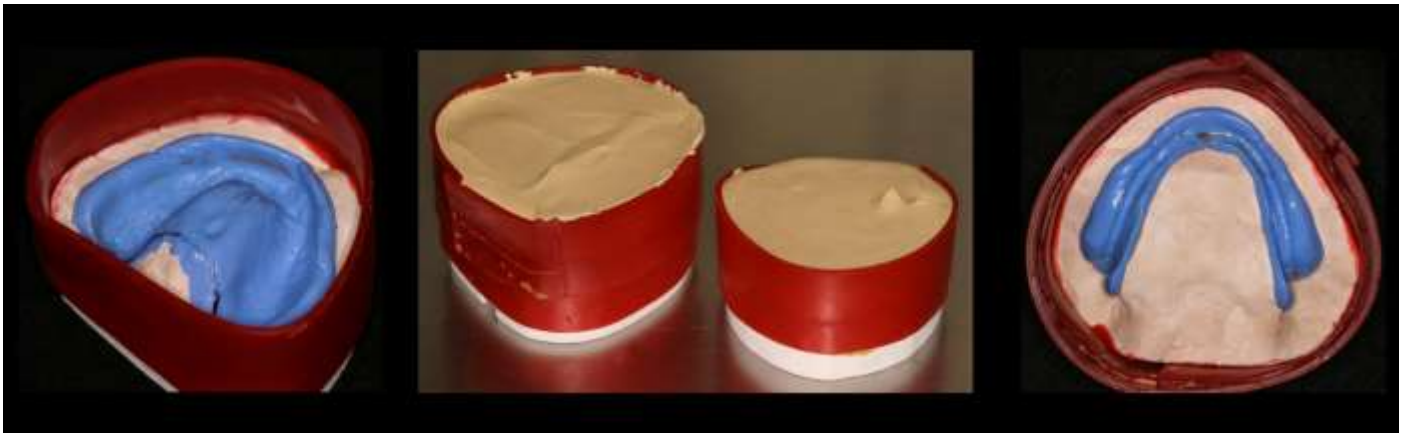
Advantages of boxing:

- 1- To facilitate pouring the impression with plaster or stone.
- 2- Produce the desired size & form of the base of the cast (adequate thickness of the cast).
- 3- Preserve desired details & borders of the impression
- 4- In the lower impression, reproduction of the lingual borders & tongue space easier.

Materials used for boxing impression:

- 1- **Beading wax:** a strip of wax is attached all the way around the outside of the impression approximately (1-2 mm) below the border & sealed to it with wax knife.
- 2- **Boxing wax :** a sheet of wax is used to make the vertical walls of the box & it is attached around the outside of the beading wax strip so that it does not alter the borders of the impression, the width of the boxing wax is about 10-15 mm.
- 3- **Base plate wax:** a sheet of wax can be used to fill the tongue space in the lower impression that is sealed just below the lingual border of the impression.

Artificial stone is mixed according to manufacturer's direction and sufficient stone is poured into the final impression so that the base of the cast will be from 10-15mm in thickness. The cast is called master cast.

**Common faults in impression making:**

- 1- Poor selection of the tray.
- 2- Insufficient material loaded in the tray.
- 3- Excessive material loaded in the tray.
- 4- Failure to press the tray completely to position (in- sufficient seating pressure or excessive seating pressure).
- 5- In correct position of the tray (poor centralization)
- 6- Obstruction of the proper flow of the material by lips, cheek or tongue.