

Complete denture impressions

Dental Impression: a negative imprint of an oral structure used to produce a positive replica of the structure to be used as a permanent record or in the production of a dental restoration or prosthesis.

Complete denture impression: it's a negative registration of the entire denture bearing, stabilizing and seal area of either the maxilla or the mandible.

Objectives of impression making:

Complete denture impression procedures must provide five objectives:

1. Retention
2. Stability
3. Support for denture
4. Aesthetic
5. Preservation of the residual alveolar ridge and soft tissue

Retention: Is the resistance of the denture to remove from the mouth by resisting displacement forces at right angle to the occlusal plane.

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

*Retention is the constant relation of the denture base to underlying soft tissues, while stability is the relation of the denture base to underlying bone. These relations may be constantly changing.

*Retention must hold the denture in its position when it is set at rest.

*Stability must resist displacement by rocking when a force is applied to teeth over a limited area.

Support: Is the quality of prosthesis to resist displacement from the denture supporting foundation; therefore, the greater the amount of area covered the greater the support.

*The best support for denture is the compact bone covered with fibrous connective tissue.

* Retention = Denture base + Soft tissue.

* Stability = Denture base + Bone.

* Support = Denture base + Bone + Soft tissue.

Aesthetics: 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.

Preservation of the residual alveolar ridge and soft tissue: preservation of the remaining residual ridge 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 and technique on the denture base and the effect of the denture base on the continued health of both the soft and hard tissues of the jaws.

Primary impression

Primary impression: it is a negative likeness made for the purpose of diagnosis, treatment planning, or the fabrication of a tray. It is the first impression made for the patient and from which the study cast was produced. This impression is obtained by a stock tray.

* For the upper stock tray, the posterior border of the tray should cover the maxillary tuberosity and hamular notch, anteriorly should include the antero- alveolar ridge.

* For the lower stock tray posteriorly should cover the whole area of retromolar pad area and anteriorly include the alveolar ridge.

Materials used for making primary impression:

1. Impression compound.
2. Alginate impression material.
3. Rubber base impression material (heavy body).

Primary cast (study model or diagnostic cast): a cast formed from a preliminary impression for use in diagnosis or the fabrication of an impression tray.

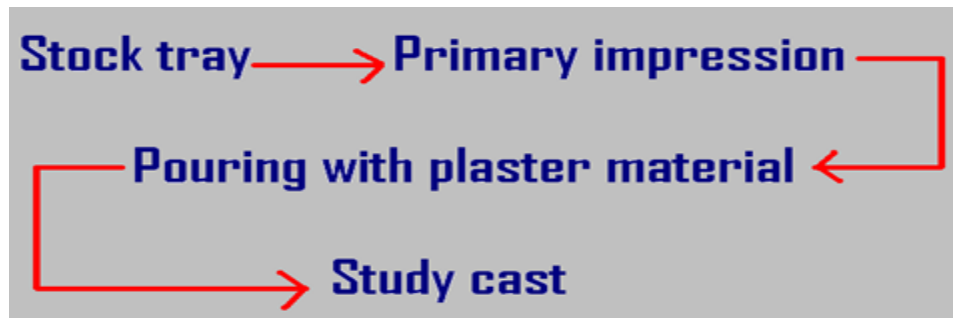
Production of study cast (primary cast):

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 became hard, the cast is separated from the impression by the use of hot water (55-60 °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 good impression cannot be obtained unless this step is made. So a correct special tray is a primary fact in obtaining a good working impression.



Production of study cast (primary cast)

Final or secondary impression

Final impression in general: The impression that represents the completion of the registration of the surface or object.

Final or secondary impression (for edentulous patient that use for complete denture construction): It is a negative likeness or registration of the entire denture bearing, stabilizing area and border seal area of the mandible and maxilla for the purpose of fabricating a prosthesis.

The final impression is made with special tray and it is used for making master cast which must be poured with stone material.

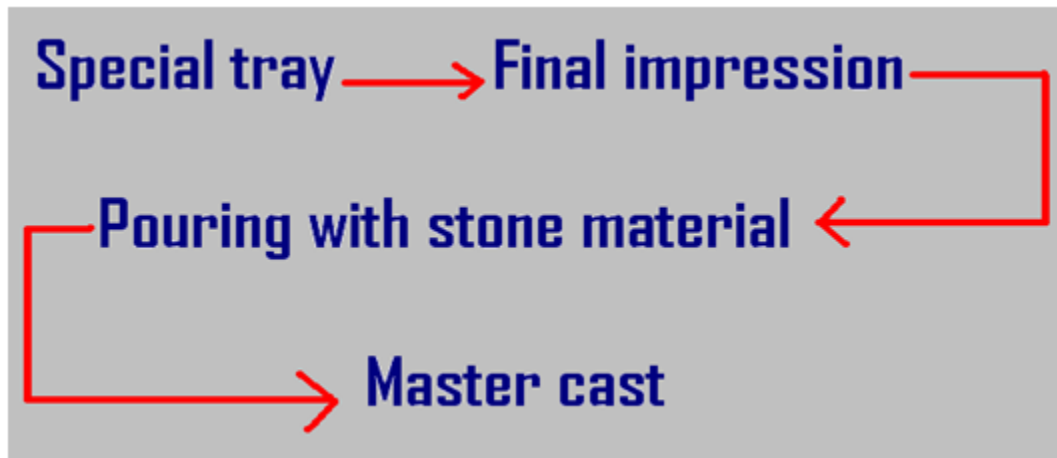
Master cast (definitive or final cast): A replica of the tooth surfaces, residual ridge areas and or other parts of the dental arch and or facial structures used to fabricate a dental restoration or prosthesis.

Materials used for final impression:

1. Zinc oxide eugenol impression material (ZOE).
2. Alginate impression material.
3. Impression plaster.
4. Elastomers impression material:
 - a- Polysulphide (rubber base).
 - b- Poly ether.
 - c- Silicon (light body).
5. Waxes.

The techniques used for making final impression:

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



Production of definitive or final cast (master cast)

Boxing an impression and making the casts

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

Boxing impression can be used for primary and 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 and 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 and form of the base of the cast.
3. Provide adequate thickness of cast.
4. Preserve desired details and borders of the impression.
5. In the lower impression, boxing makes the reproduction of the lingual borders and 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 (2-3 mm) below the border and sealed to it with wax knife.

2. Boxing wax: A sheet of wax is used to make the vertical walls of the box and 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 above the impression.

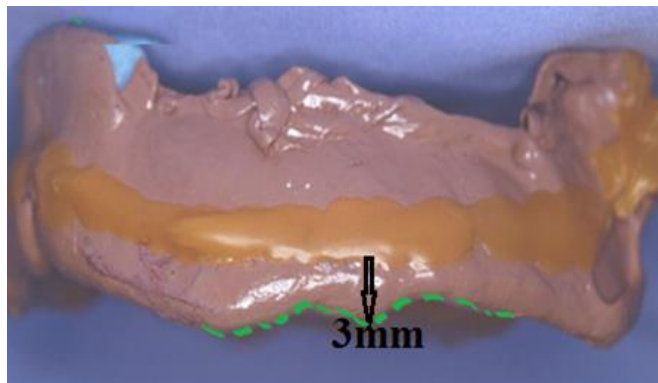
3. Base plate wax: A sheet of wax can be used to fill the tongue space in the lower impression that is sealed to lingual border of the impression and should be located just below the lingual border of the impression.

Dental 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.

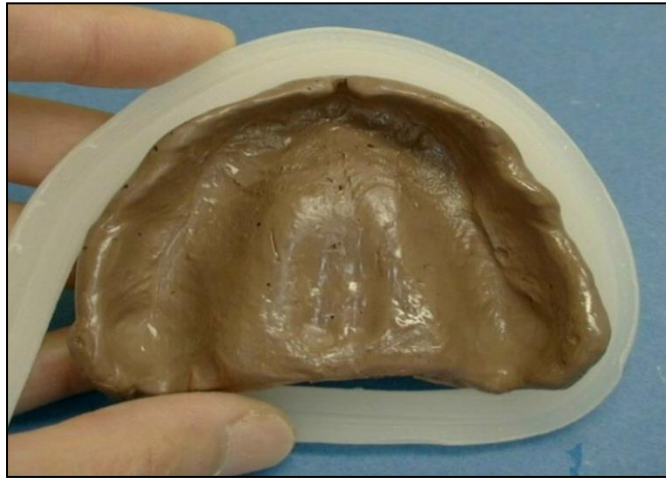
Common faults in impression making:

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 (insufficient seating pressure)
5. Excessive seating pressure.
6. Incorrect position of the tray before final seating it (Un centralization).
7. Obstruction of the proper flow of the material by lips, cheek or tongue.

Boxing upper final impression and making the master cast



Apply a layer of sticky wax around the impression 3 mm below the periphery as shown.



Soften the beading wax and apply it to the sticky wax to form the land area.

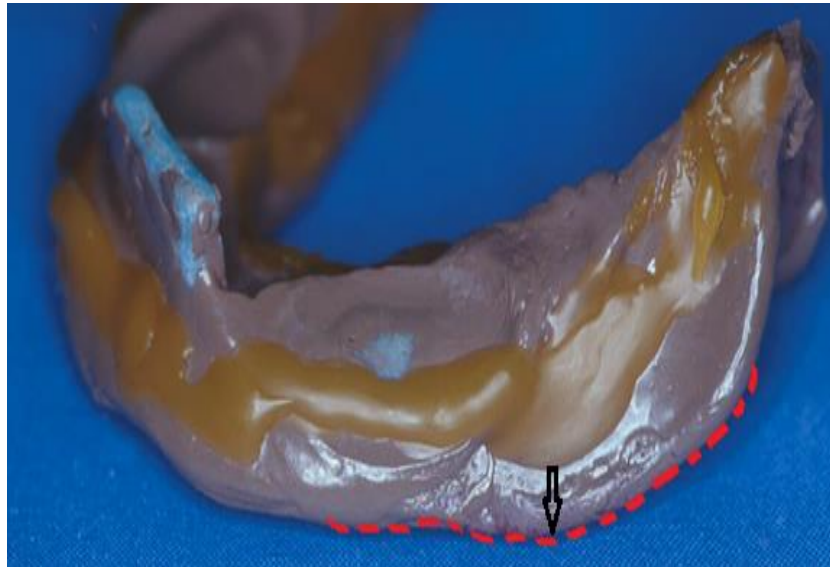


Wrap a sheet of red boxing wax around the beading wax to form a container. All joints must be sealed with hot wax to prevent stone from leaking through.

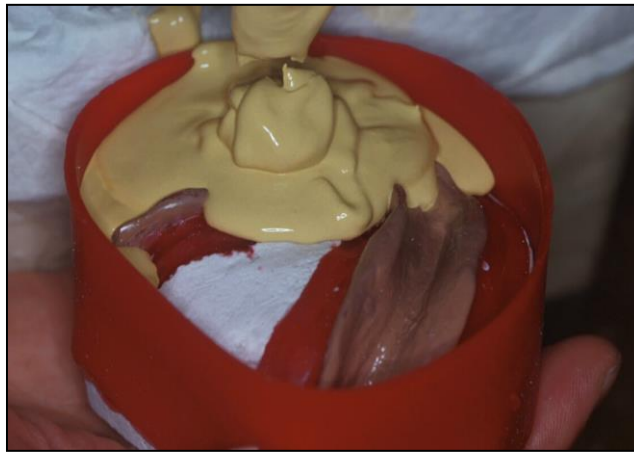
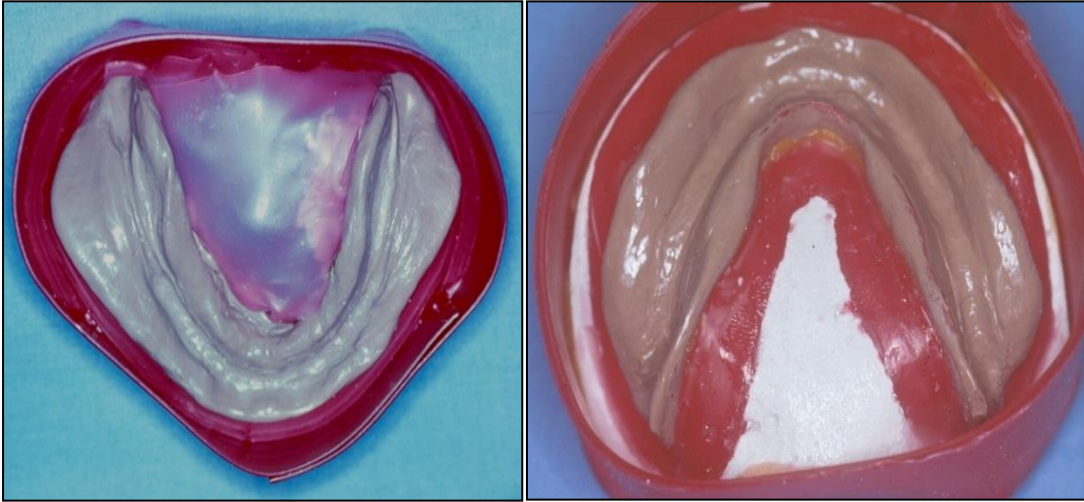


Note: The palatal shelf should be oriented parallel to the bench top and approximately 15-20 mm below the superior periphery of the boxing wax. Prepare a dense mix of yellow stone using your vacuum mixer and gently vibrate the stone into the boxed impression. Be careful to avoid entrapment of air bubbles.

Boxing lower impression and making the master cast



Apply a layer of rubber base adhesive or hot sticky wax to the impression as shown. This layer should be about 3 mm above the height of the border of the impression.



Apply a strip of red beading wax to the sticky wax layer to form the land of the cast. Close the lingual tongue area of the impression with a sheet of wax or with pumice and plaster.