Processing of the denture

First: Flasking

Flasking of the denture: is the process of investing the cast with the waxed denture in a flask to make a two sectional mold used to form the acrylic resin denture base.

The flask: is a metal case or tube used in investing procedures or can defined as a sectional metal case in which a sectional mold is made of artificial stone or plaster of Paris for the purpose of compressing and processing dentures or other resinous restorations

The flask is consists of:

1. Lower half that contains the cast.
2. Upper half.
3. The cover or lid.



Flasking techniques:

1- Compression technique (open- pack method).

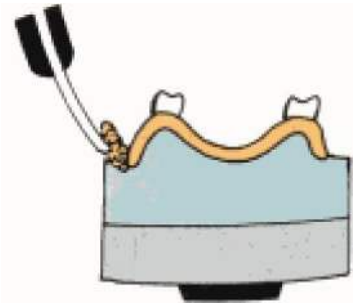
The master cast with the waxed-trial denture invested in the lower half of the flask with gypsum investment material. Then the upper half of the flask put in place and gypsum poured to the occlusal surfaces of the teeth. The top portion of the flask poured with another layer of plaster or stone and the cover placed on the flask.

2- Injection molding technique:

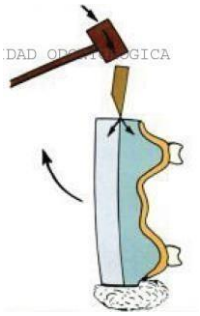
It is a complicated procedure required special flask and equipment .In this technique the wax pattern is sprued and the material injected into the mold. This process allows injection of further material during polymerization to compensate for the polymerization shrinkage.

The procedure of processing the denture in compression technique:

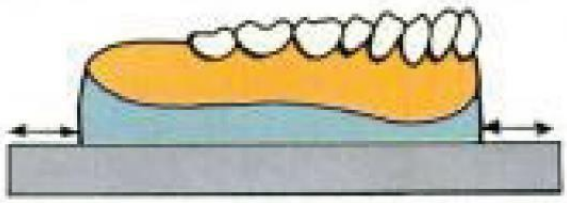
1. Sealing of the upper and lower trial dentures all over the border until the margin of the cast whiles the casts on the articulator.



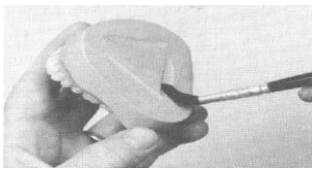
2. Soak the cast and the mounting plaster in water a few minute to separate the cast from the mounting plaster, save the plaster mounting, as it will be used to reposition the cast on the articulator after the dentures are processed.



3. Make sure that there is enough space between the incisal and occlusal surface of the teeth and the top of the **upper ring about 3-6 mm**, if there is no space then the cast **must be reduced in thickness.**



4. Adapt a layer of tinfoil to the base of the casts, slightly overlapping the edges to insure clean removal from the investment, apply separating medium to the cast and flask.



5. ***Invest the lower half of the flask first:***

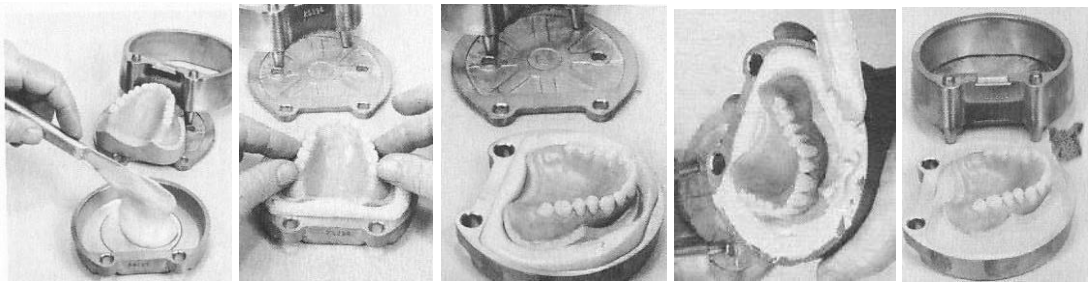
a. Use a mixture of plaster or stone and placed in the base of the flask.

b. Center the cast in the lower half of the flask and pushed to place until the bottom of the cast touches the base of the flask. Note that the posterior portion of the cast is level with the edge of the flask.

c. Remove any undercuts in the plaster. Undercuts will prevent the separation of the upper ring from the lower portions of the flask.

d. The plaster smoothed even with the base of the cast and allows the plaster to set.

e. After the final setting of plaster has occurred, it will be coated with separating medium.



6. Investing the upper half of the flask:

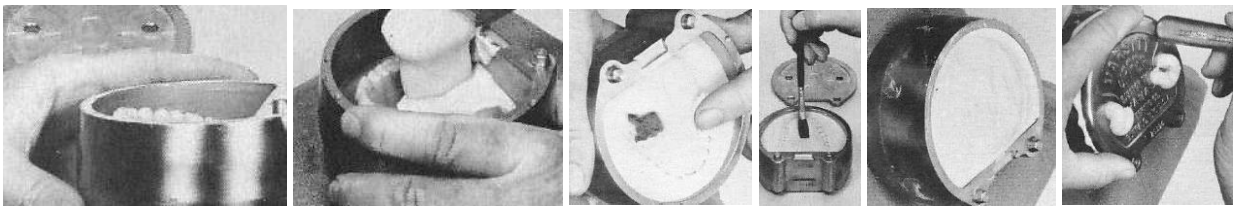
a. Reposition the ring (upper portion) of the flask.

b. Mixing of stone or plaster done, pouring of the plaster to flow and reach all surfaces of teeth without any air bubbles by putting the flask on the vibrator, the plaster or stone must reach the incisal edge and occlusal surface of teeth.

c. Separating medium painted on the second layer of plaster after setting and smoothing of plaster.

d. A third mixing of stone done and pouring it until the flask is filled with stone and the flask is covered and some stone enter through the holes in the cover and around the edges, it is essential to have metal-to-metal contact.

e. The stone left to set completely for about 45 minutes.



Second: Wax elimination

After the complete set of the gypsum, the flask is ready for the next step which is "Wax elimination":

a. Place the flask on a ladle and lower it into boiling water for 5 minutes. This will soften the waxed denture base, which can easily remove from the mold when the flask opened.

b. After five min., remove the flask from the boiling water and gently open it, insert a wax knife between the lower and upper half and gently separate them.

c. Remove the semisolid pieces of the waxed denture base. All the teeth should remain in the top half of the flask. Using more hot (boiling) water to flush out all the remaining wax.

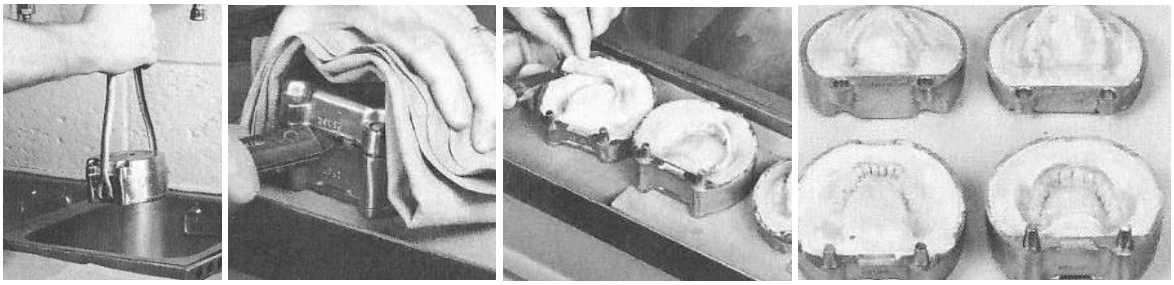
d. Wax solvent can be used with stiff brush to remove any remaining wax on teeth.

e. As soon as possible, flush the mold with clean hot water to which a detergent has been added. The detergent will be flush out the wax residue from area that cannot

reached with the wax solvent. Immediately flush the mold with hot water to remove all traces of the detergent solution.

f. It is essential to remove all wax residue. Acrylic resin will not adhere to a surface coated with wax.

g. Stand the flask on its side and allow it to drain, dried and cooled.



Third: Packing

a. Separating medium used on plaster or stone, care should be taken not to painting the teeth with separating medium.

b. The flask is left to dry and another coat is painted on the flask and left to dry.

c. Hot or heat cure acrylic is used polymer/ monomer mixed according to manufacture instruction, after mixing of the material on clean jar and reach dough stage, it's ready for packing.

d. Pack the material in the upper half of the flask, being sure to press it well into the area around the teeth. Use enough material to insure over-packing on the first closure using nylon sheet. At least two trial closures done and before the final closure, a thin layer-separating medium applied on the cast and the nylon pressure by bench **hydraulic press of about 100 kg/cm2**. Then the flask is put in spring clamp sheet is removed and then the two halves of the flask are closed and the clamp is closed tightly, it is essential to have metal-to-metal contact.







Fourth: Curing

It is the process of polymerization of acrylic resin by heat, the amount of heat must controlled while processing acrylic resin**.**

Types of curing cycle:

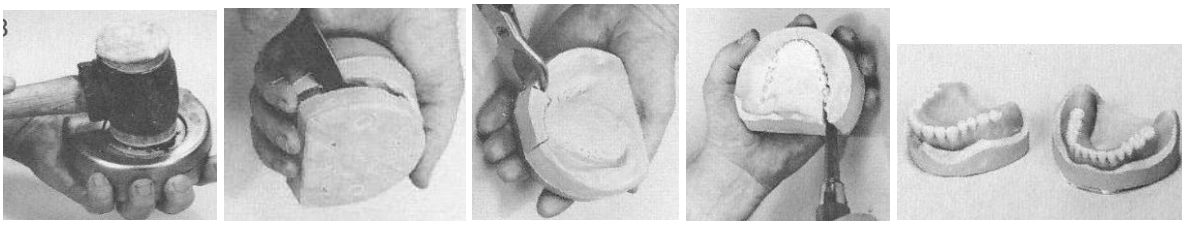
A. *Slow curing cycle:* The flask is heat to 70ºC for 7 hours then 100 ºC for 3 hours (the total 10 hours).

B. *Rapid curing cycle:* The flask is heated to 140 ºC for10 minutes with 40 P.S.I. pressure.

The best curing cycle is the slow curing cycle because most of the conversion of monomer to polymer occurs during the period at 70 ºC and the rapid cycle method may induce greater dimensional changes in the dentures than slow – cure

Fifth: Deflasking method.

It is the removal of the mold from the flask and separating of the mold from the denture and the cast. The flask removed from the mold using a flask ejector, which used to separate the flask from the mold after removing of the cover. By using a saw, longitudinal and horizontal cuts carefully made through the plaster or stone and the pieces gently removed. The cured dentures and their casts have been removed from the mold.



Laboratory Remounting:

Artificial teeth move about to a minor degree during denture festooning and while the wax denture base is being converted into resin.

This teeth movement due to dimensional changes in the wax denture base, dimensional changes in the investing material "setting expansion of the stone", slight movement of the teeth due to excessive or improper pressure during packing, and dimensional changes in the denture base resin during processing.

In general, if all the steps are performed scientifically, errors resulted will be small and their corrections will be simple. The processing errors are then removed by **selective grinding in the laboratory remounting procedure.**

Purpose of laboratory remounting:

1. To correct errors in occlusion that have occurred during processing

2. To return dentures to the correct vertical dimension of occlusion

3. To restore centric and bilateral balanced occlusion

The processed dentures are removed from the flasks. Reposition the stone casts on the original plaster mountings.

Carefully inspect the plaster mountings and the underside of the casts. Remove any stone particles or debris before joining the two together. Place each cast on its plaster mounting and check that it goes into place exactly. If the casts do not seat on the mountings properly look for particles of plaster which may be adhering to the mounting or the cast.

The master cast with the polymerized denture must be effectively secured to the articulator mountings. Begin by placing notches in both the mounting and the master cast with an acrylic bur. Soak the cast and mountings in water for 5 minutes and place a plaster around the junction between the cast and the plaster mount. Plaster maintains a better bond and is quicker and easier to use than sticky wax.



Selective Grinding:

Is defined as modification of occlusal surfaces of the teeth by grinding at selected places marked by spots made by articulating paper, this procedure done to correct minor errors and establish proper smooth occlusion during centric and eccentric relations.

The portions of the teeth maintaining centric occlusion will not be destroyed. Some dentists prefer to do corrections of occlusal errors in the clinic at the time of denture

insertion ***(clinical remount this is done after the dentures are polished)***, this is also correct, but it might take time and some patients may think that these errors could be due to work, therefore it is advisable to do correction in the laboratory on the articulator ***(laboratory remounting this is done before the denture are polished)***, and if further adjustments are required, dentist can do it in the clinic.

Now the casts and their plaster mounts are returned to the articulator close the articulator and check the amount of pin opening that has occurred secondary to processing and when the dentures are remounted.

Usually there will be 1 to 1/2 mm of opening, if the proper techniques have been followed throughout the investing and packing procedures.

Excessive pin opening is an indication that the flasks were not closed before the dentures were processed. If the pin touches, the dentures may have under packed. After closing the articulator, if the incisal pin does not touch the incisal table, this mean that the occlusal vertical dimension has been altered and must be reestablished. A piece of articulating paper is inserted between the teeth and they are tapped tighter gently but firmly. This repeated on both sides. Establish the occlusal vertical dimension by removing the occlusal prematurities until the pin is closed against the incisal guide table.



Finishing and polishing of the denture

All dental restorations must be smooth to promote comfort and cleanliness. After the selective grinding and milling are completed, the casts are removed from the dentures piece by piece so that the cast may be removed from the denture without breaking the denture or causing distortion. The finishing of dentures consists of perfecting the final form of the denture by removing any flash of acrylic resin at the denture border, any flash and stone remaining around the teeth, and any nodules of acrylic resin on the surfaces of the tissue side of the dentures resulting from processing with a small sharp

instrument or with a brush wheel. If the denture was packed carefully, there will be a minimum of flash.

The flash: is the acrylic resin that was forced out between the two halves of the flask by pressure applied during the processing procedure.

Trim all gross excess acrylic, being careful to preserve and not to remove the following:

- Buccal, facial and lingual fold contour.
- Post-dam area.
- Gingival festooning around the teeth.
- Surface contour and root eminences.



Inspect the tissue side of the dentures for any nodules due to voids in the casts, and if they are present, carefully remove them with small stone or with acrylic carbide burs that are made for denture finishing.

