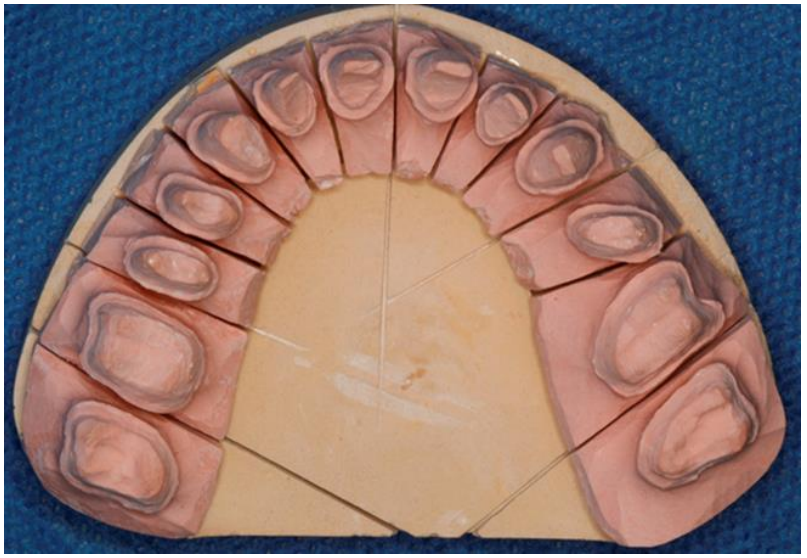
TISSUE MANAGEMET AND IMPRESSION MAKING

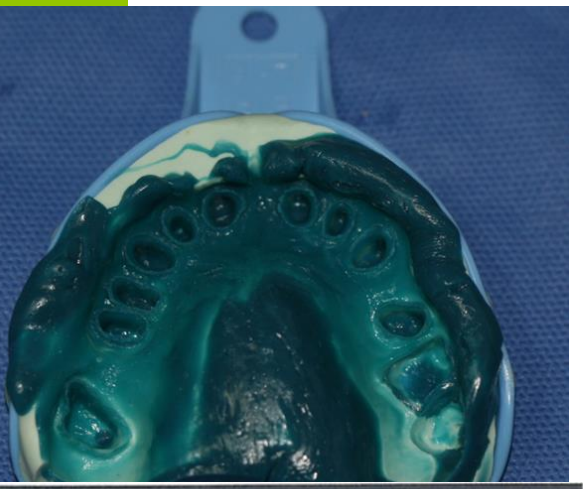
To fabricate a single crown (SC) or multiunit fixed dental prosthesis (FDP),

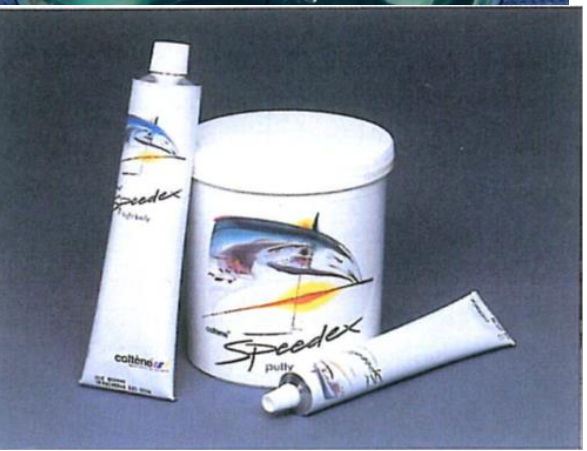
- an accurate cast is required

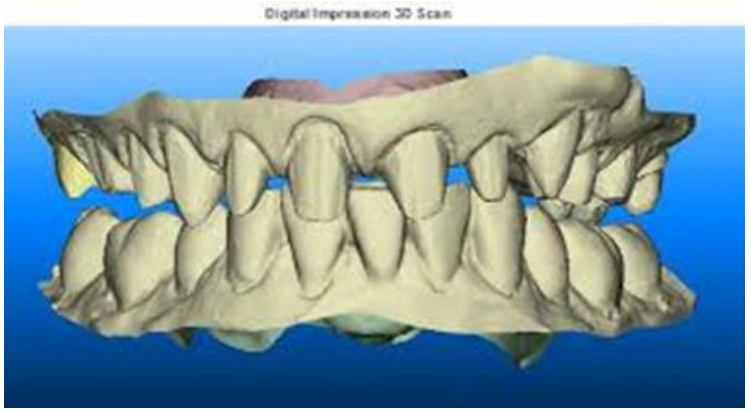


digital or conventional impression techniques

- can be achieved with either digital or conventional impression techniques.

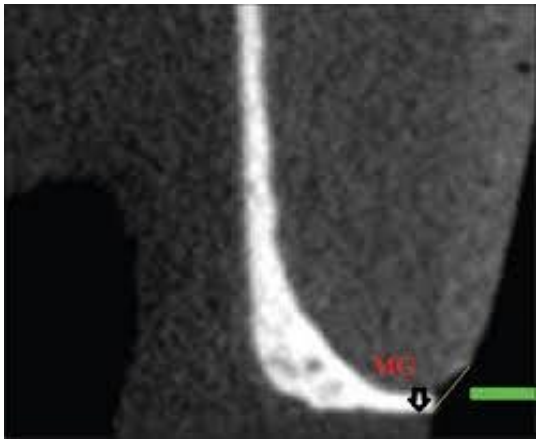






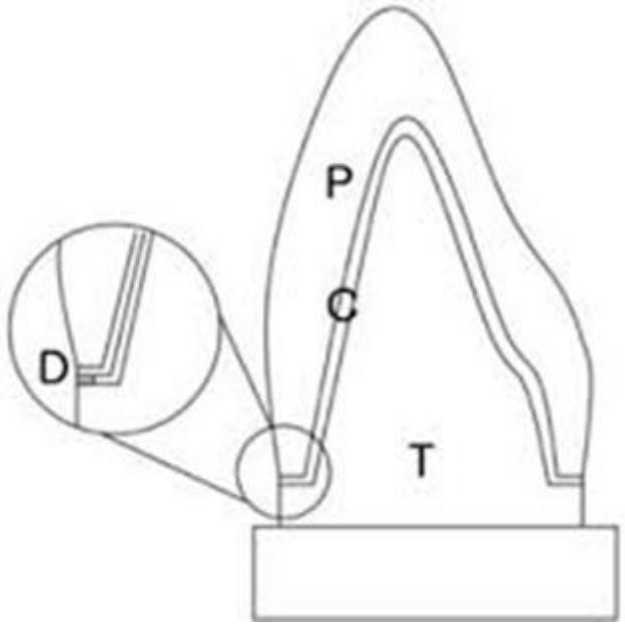
quality assessment of fixed restorations

- Internal and marginal fit are 2 main clinical factors used for quality assessment of fixed restorations.



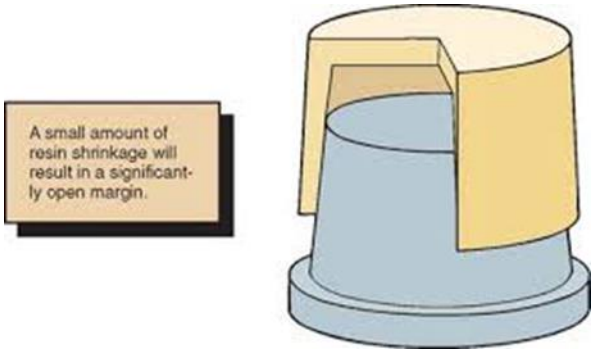
clinical quality and success of fixed restorations

- **Marginal fit** is considered an important criterion for clinical quality and success of fixed restorations
- 34 to 119 mm,



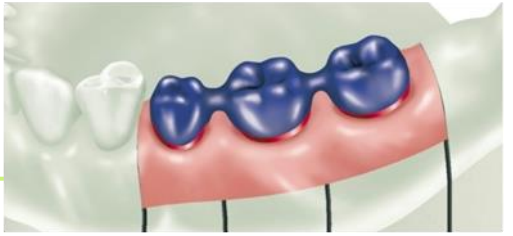
internal fit

- a 25-mm-thick die spacer has been shown to improve the seating of a crown and increase the retention of the restoration by 25%

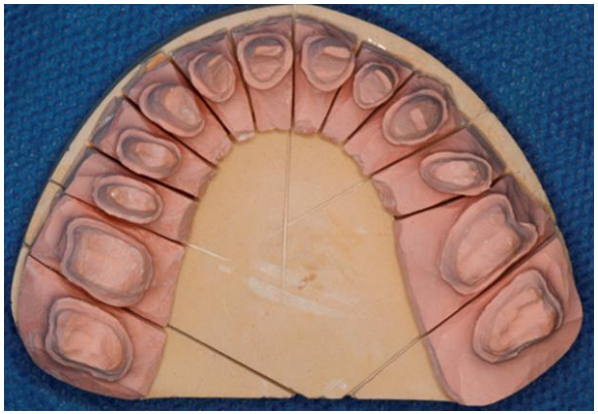


- increasing cement thickness was shown to decrease the fracture resistance of the ceramic restorations

fit of the definitive restoration

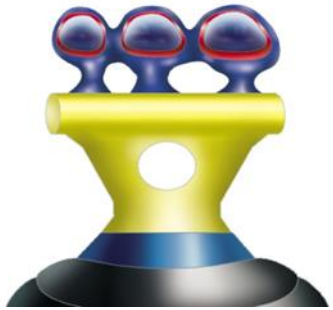


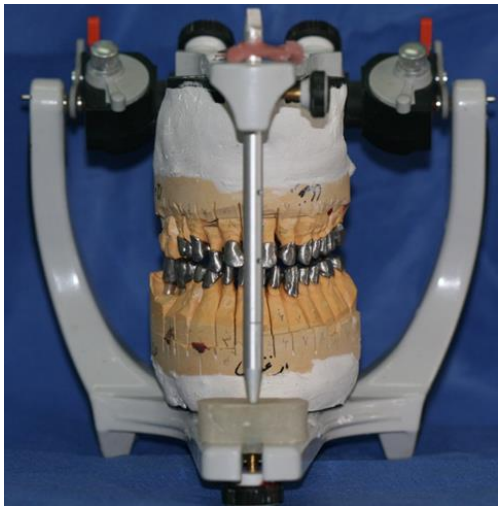
- variation in **temperature**,
- length of **time** between impression making and pouring,
- surface wettability of the gypsum product,
- disinfection procedures

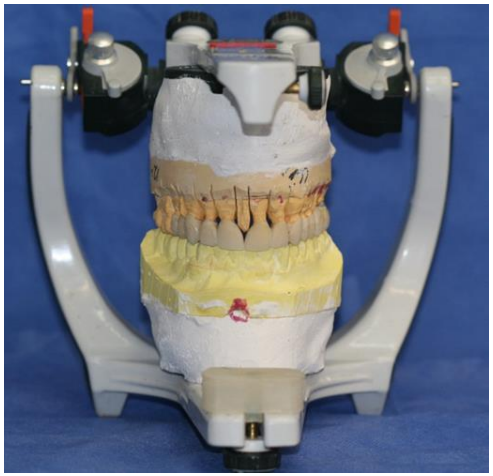


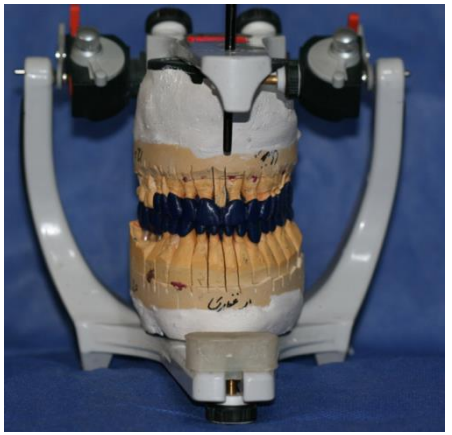
fit of the definitive restoration

- **die hardener and die spacer**,
- laboratory steps for prosthesis fabrication such as **waxing, investing, casting, or pressing process**, may introduce dimensional error and affect the fit of the definitive restoration



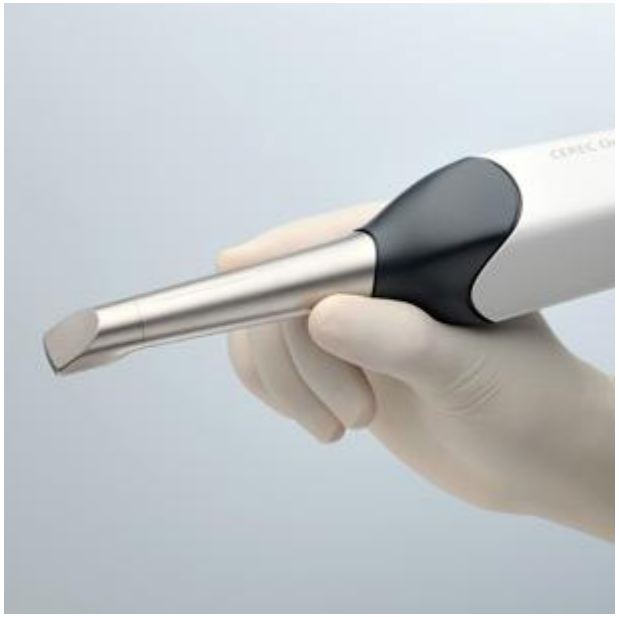






digital impression

- Recent advances in technology have introduced digital impression and crown fabrication procedures,

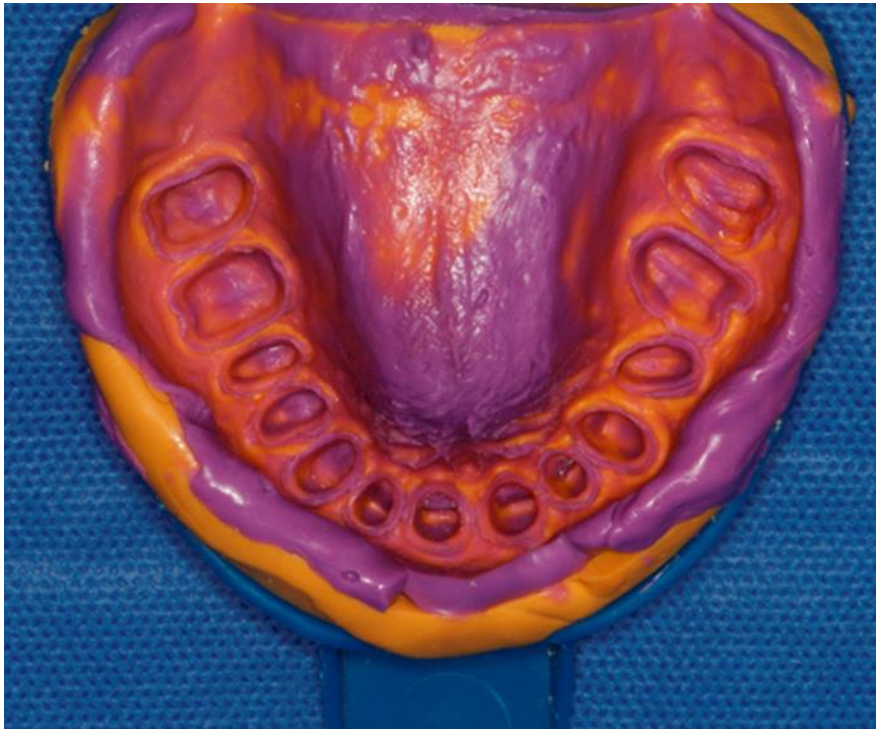


Digital impressions have several advantages

- elimination of laboratory production steps that may cause misfit,
- lessened transport time between clinic and dental laboratory,
- reduced patient discomfort

conventional impressions

- conventional impressions have shown **high detail accuracy** and are currently routinely and successfully used.

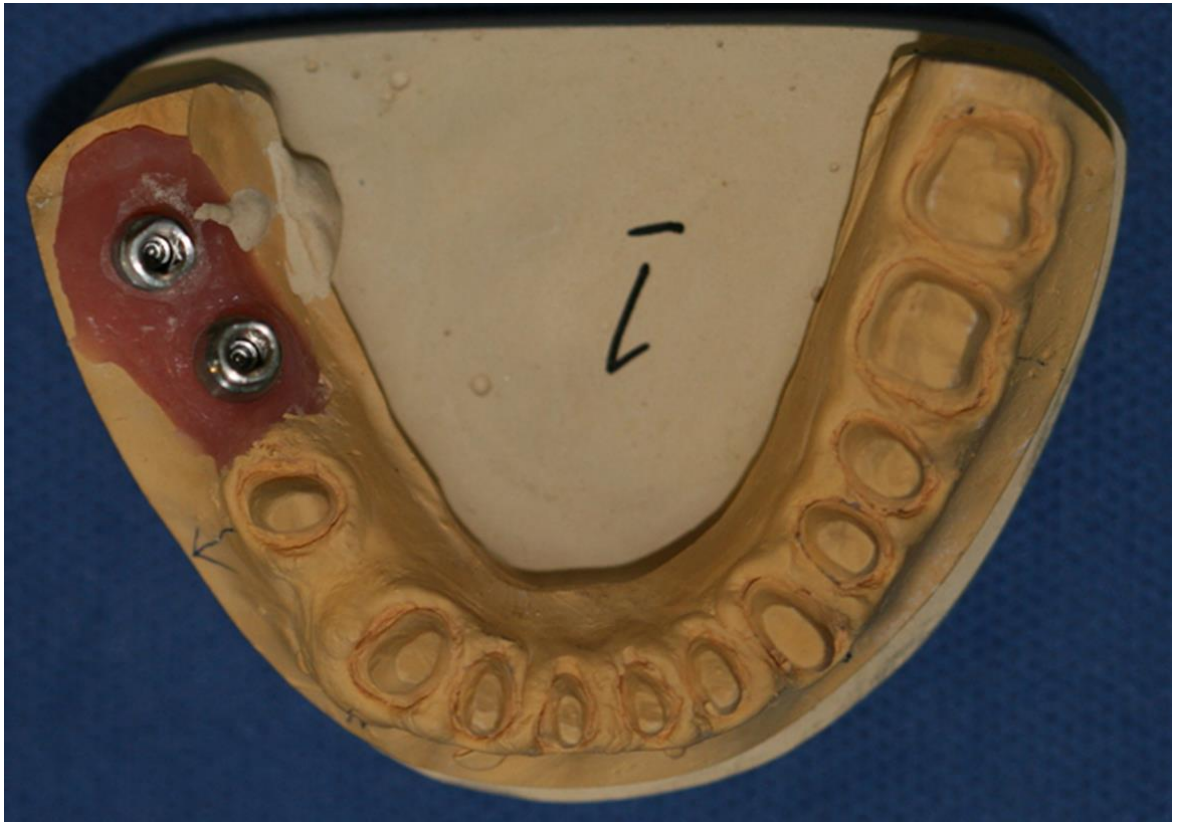


impression

- An impression is an imprint or negative likeness
- made by placing some soft, semi-fluid material in the mouth and allowing the material to set.
- hard or elastic
- The impression materials most frequently used for **cast restoration**s are **elastic**

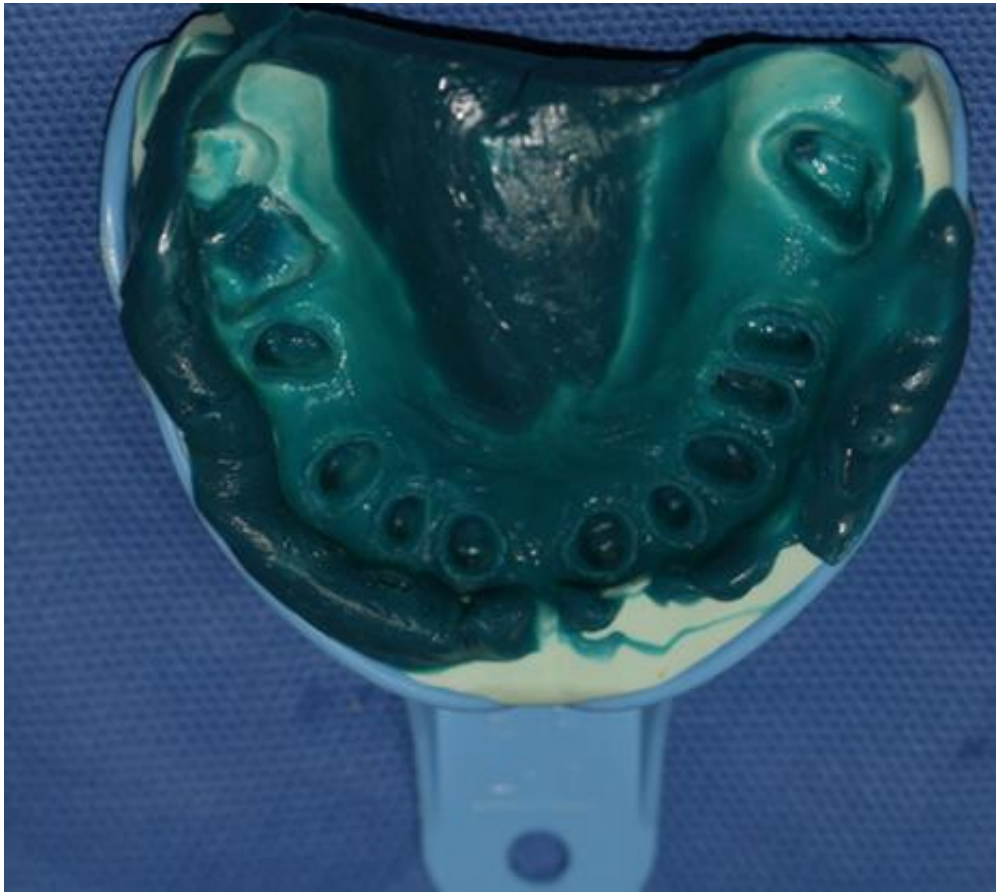
cast

- From this negative form of the teeth and surrounding structures, a positive reproduction, or cast, is made.



Requirement for an Impressions

- Exact duplication
- Other teeth
- Free of bubbles



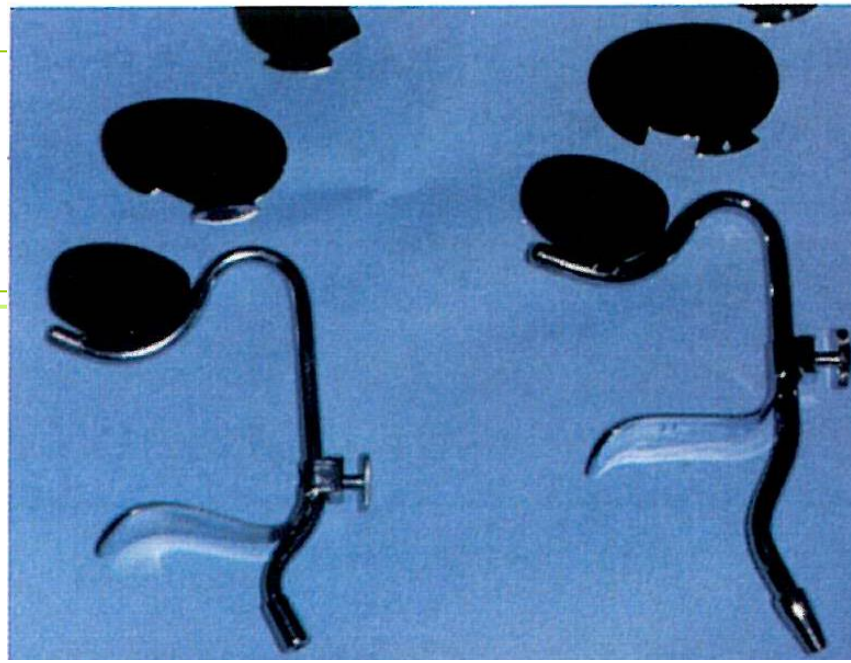
The patient's mouth is a challenging environment in which to make an accurate impression.

- Mouth
- Moisture
- bleeding
- adjacent gingival tissues

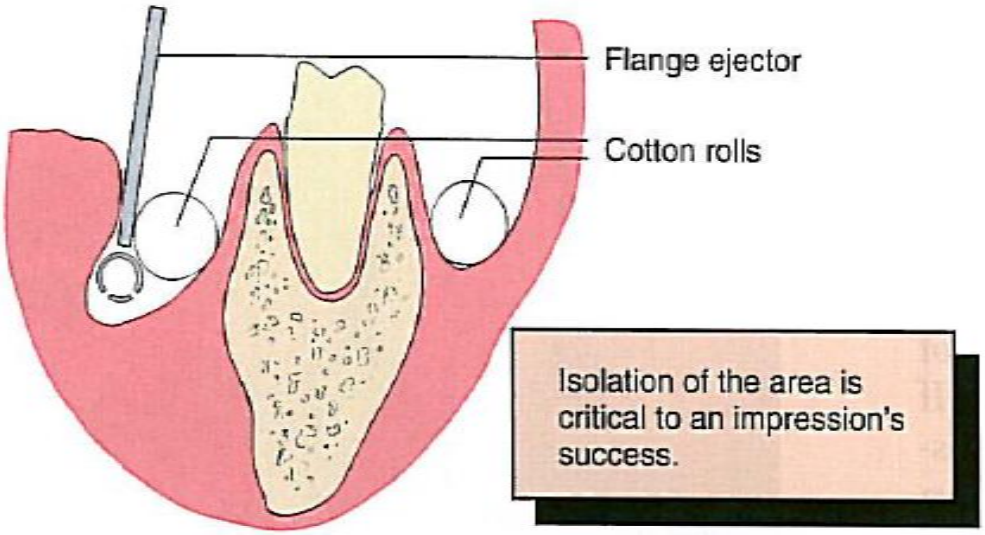
Tissue Health

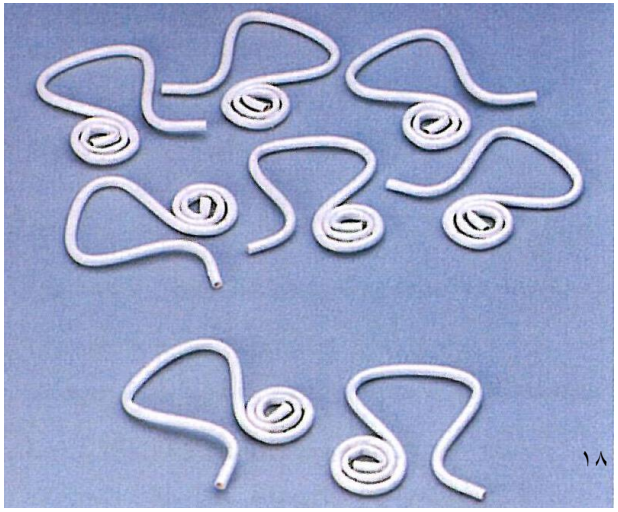
- Careful preparation
- interim restoration
- health of the surrounding soft tissues
- minimal tissue damage
- periodontal disease
- defective restoration
- well-contoured polished interim restoration

Saliva Control



- Evacuator
- cotton roll
- Expa-s
- **Svedopter and Spejector saliva evacuator**





anticholinergics (drugs that inhibit parasrmpathetic innervation)

heart disease
Glaucoma
hypertension

Brand name	Active ingredient	Dosage
Pro-Banthine	Propantheline bromide	7.5-15 mg
Robinul (Robinul Forte)	Glycopyrrolate	1-2 mg
Sal-Tropine	Atropine sulfate	0.4 mg
Antipas, Bentyl	Dicyclomine HCl	10-20 mg

*Given 30-60 minutes before drying effect is required.

Displacement of Gingival Tissues

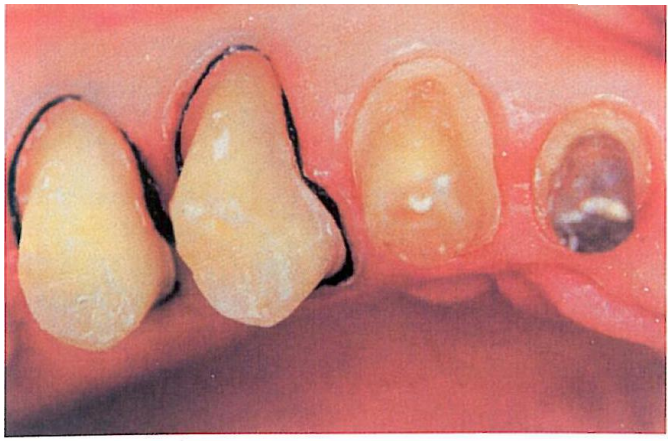
Tissue displacement is commonly needed to obtain adequate access to the **prepared tooth** to expose all necessary surfaces, **both prepared and not prepared**

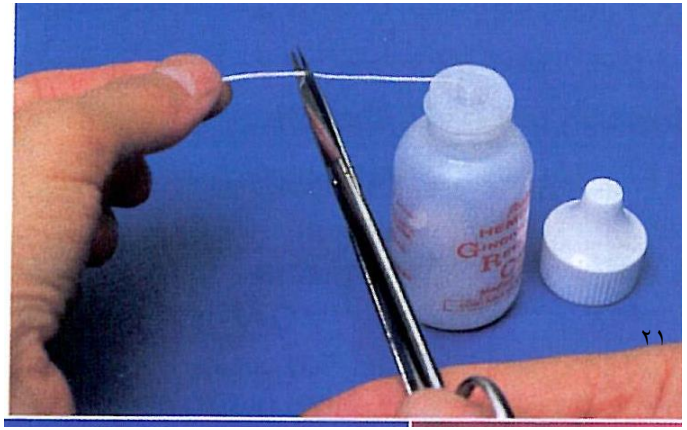
This can be achieved by

- mechanical,
- chemical,
- surgical means

Mechanical displacement

- a cord (generally impregnated with a chemical agent).
- paste systems (can be used, often in conjunction with directed pressure.)





Chemicals

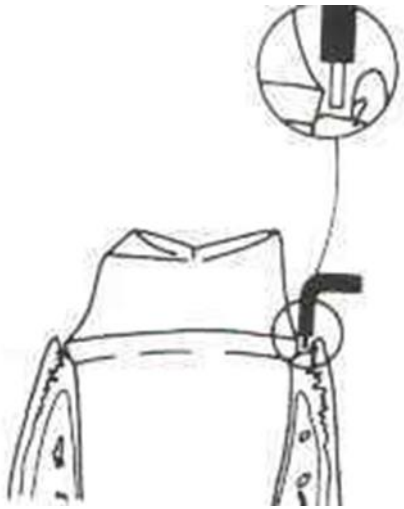
- such as **aluminum sulfate** or **epinephrine** cause localized shrinkage

Surgical tissue removal

.

can be accomplished through

- curettage,
- excision with ascalpel
- electrosurg

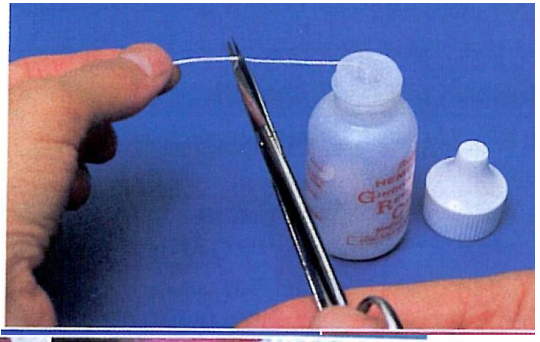


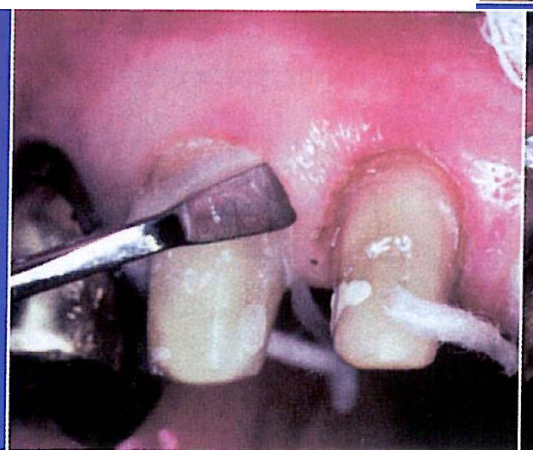
Displacement cord

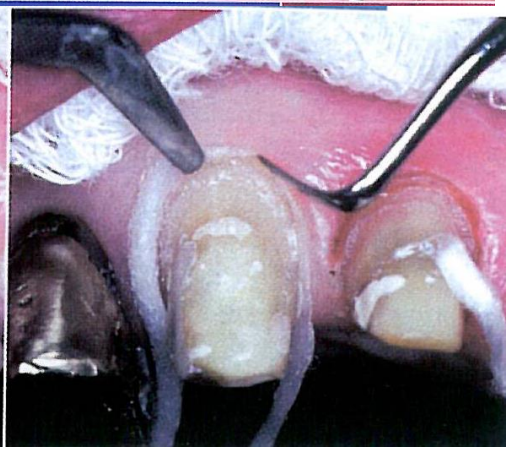
- placing a cord and leaving it in place for a sufficient length of time
- Better sulcus enlargement can be achieved with a chemically impregnated cord or by dipping the cord in an astringent(e.g.,Hemodent)
- aluminum or iron salts
- Even so, the sulcus closes quickly (less than 30 seconds) after the cord is removed
- A nonacidic hemostatic agent can be used as an alternative.
- tachycardia

Step-by-step procedure

- Isolate the prepared teeth with cotton rolls
- Cut a length of cord sufficient to encircle the tooth
- Dip the cord in astringent solution and squeeze out
- Loop the cord around the tooth
- It is best to start in the interproximal area
- Overpacking should be avoided



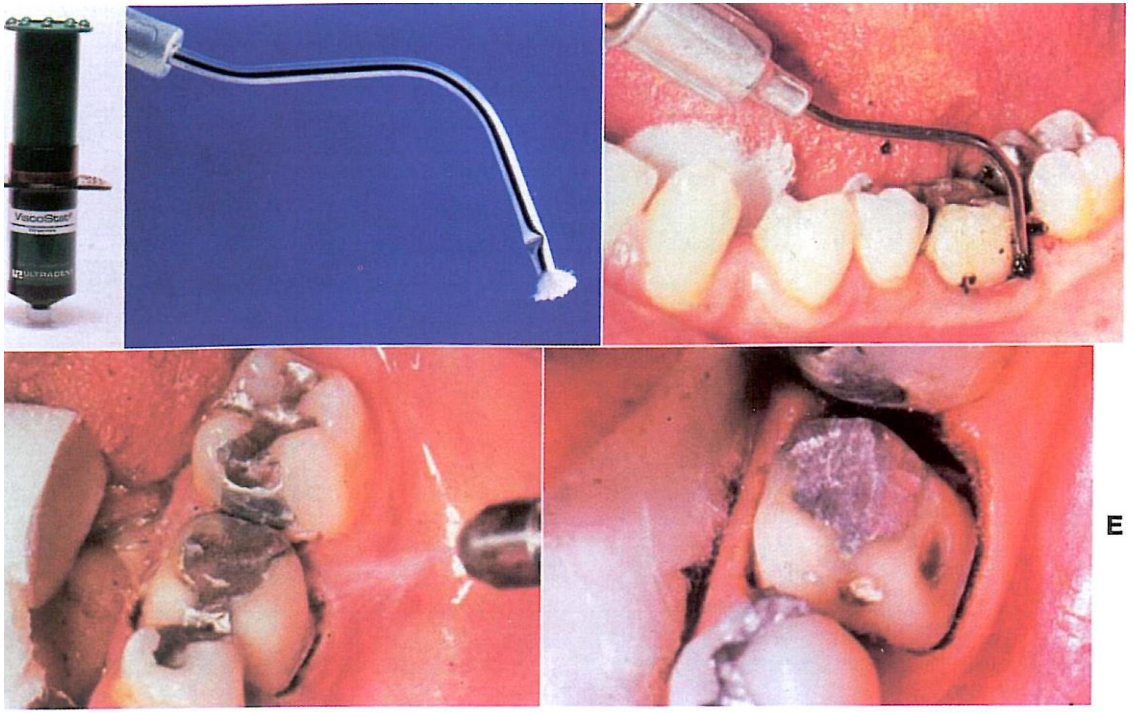




double-cord technique

Hemorrhage control

- astringent*
- **infiltrating a local anesthetic directly into the adjacent gingival papillae**
- **with an infusor syringe**

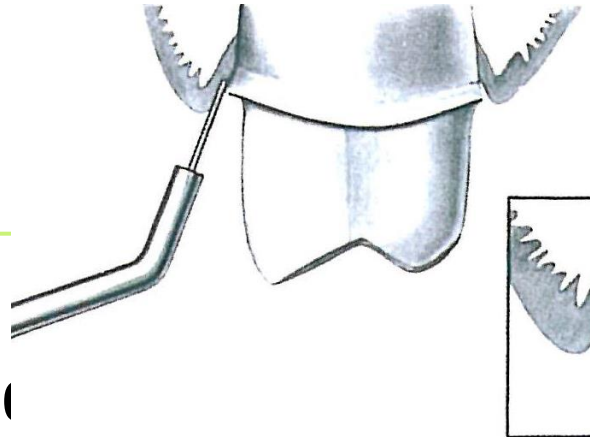


Displacement paste

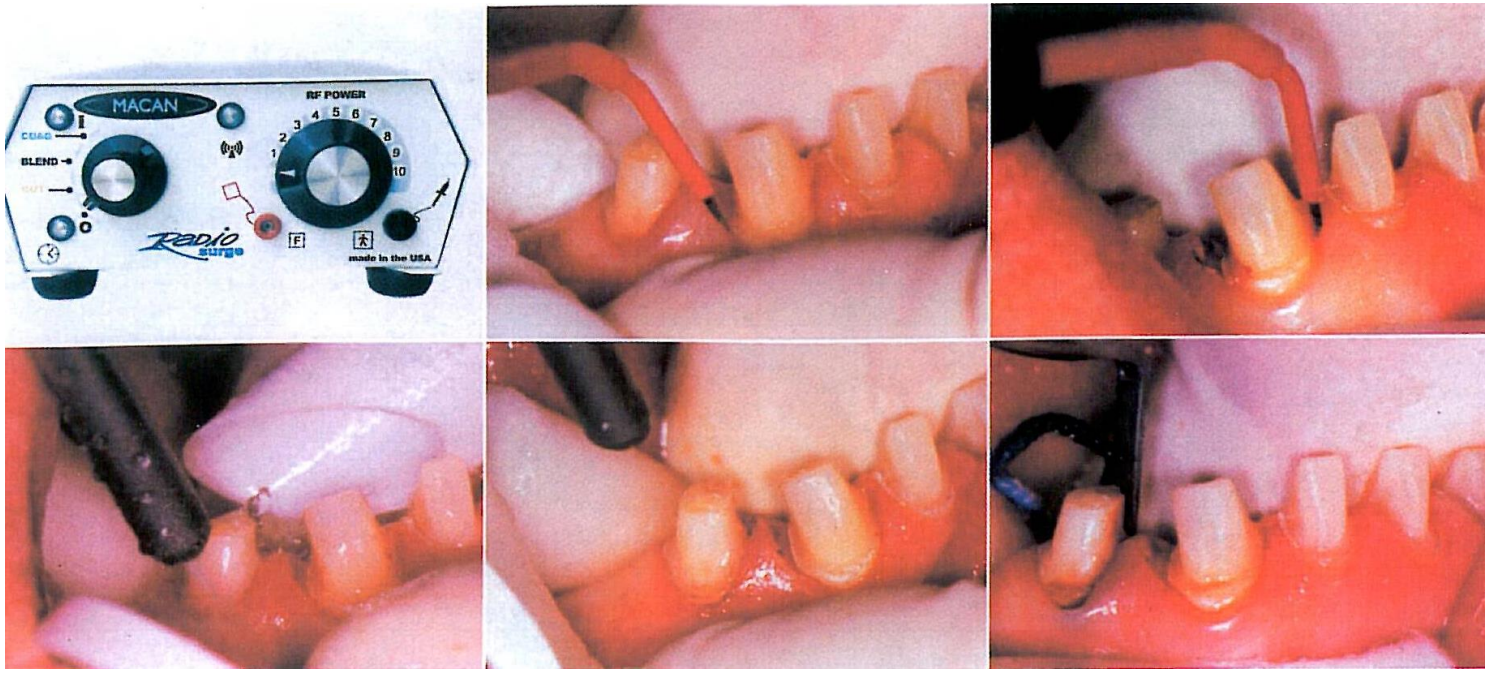
- aluminum chloride-containing paste

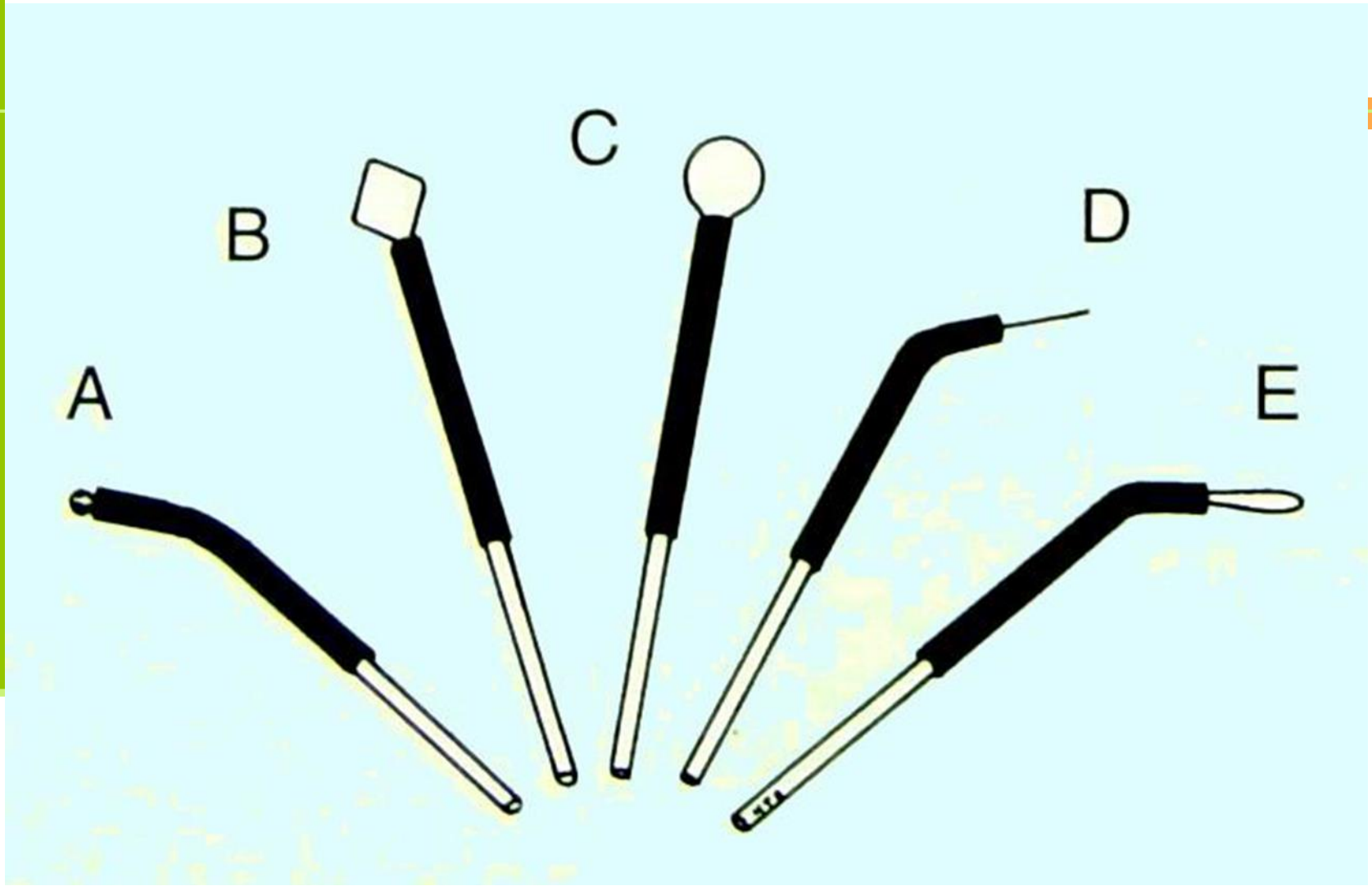
Electrosurgery

- minor tissue removal
- inner epithelial lining of the gingival sulcus is removed,
- potential for gingival tissue recession after treatment
- high frequency current (1 to 4 million Ht.)
- unmodulated alternating current
- cardiac pacemaker, transcutaneous electrical nerve stimulation [TENS] unit, insulin pump
- It is not suitable on thin attached gingivae (e.g., the labial tissue of maxillary canines)
- electric shock. (Plastic mirrors and evacuation tubes are avaizable.)
- soft tissue anesthesia
- Athin wire electrode is best for sulcular enlargement. Gingival contouring is usually performed with a loop electrode



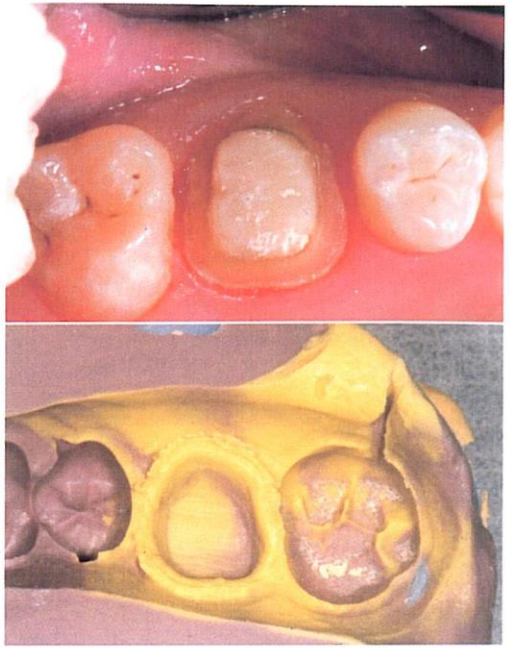
- A cutting stroke shoul n 5 second




A
B
C
D
E

Soft tissue laser

removing a controlled amount of tissue before impression making.2a
They are also useful for tissue contouring procedures.



Waterlase YSGG

Elastic lmpression Materials

- There is an extensive variety of materials for making a precision negative mold of soft and hard tissues

Elastic Impression Materials

- In order of their historical development, they are the following:
- 1. Reversible hydrocolloid.
- 2. Polysulfide polymer.
- 3. Condensation silicone.
- 4. Polyether.
- 5. Addition silicone.

Irreversible hydrocolloid

- Rapid set Straightforward technique
- Low cost
- Diagnostic casts
- Poor accuracy and surface detail
- Pour immediately
- Not suitable for definitive casts

Reversible hydrocolloid(agar)

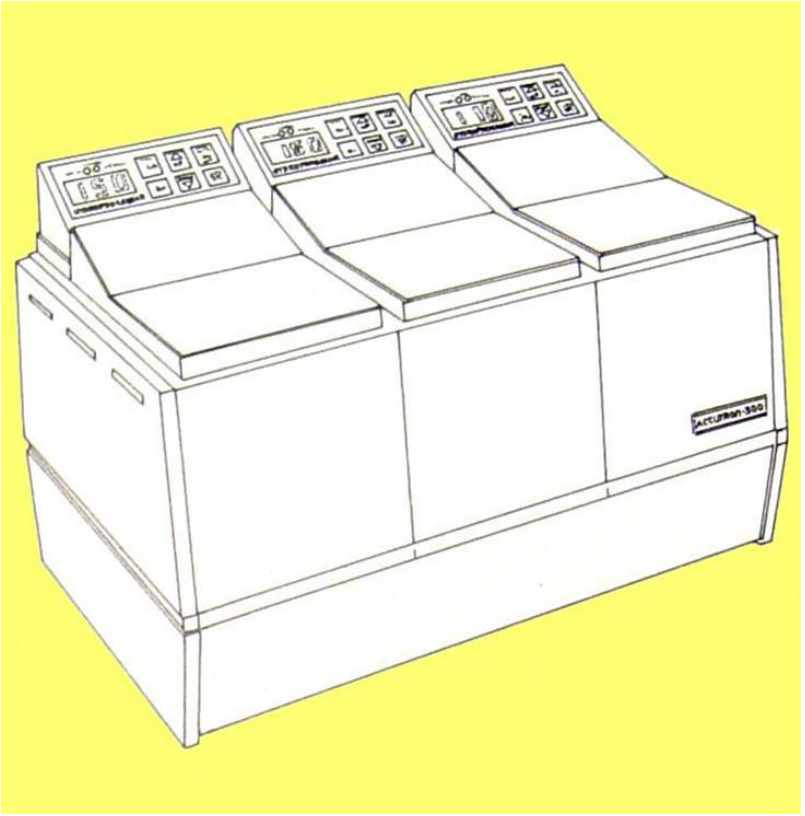
- Hydrophilic
- Long working time
- Low material cost
- No custom tray required

- Low tear resistance
- Low stability
- Equipment needed
- Multiple
- Preparations Problems with moisture
- Pour immediately

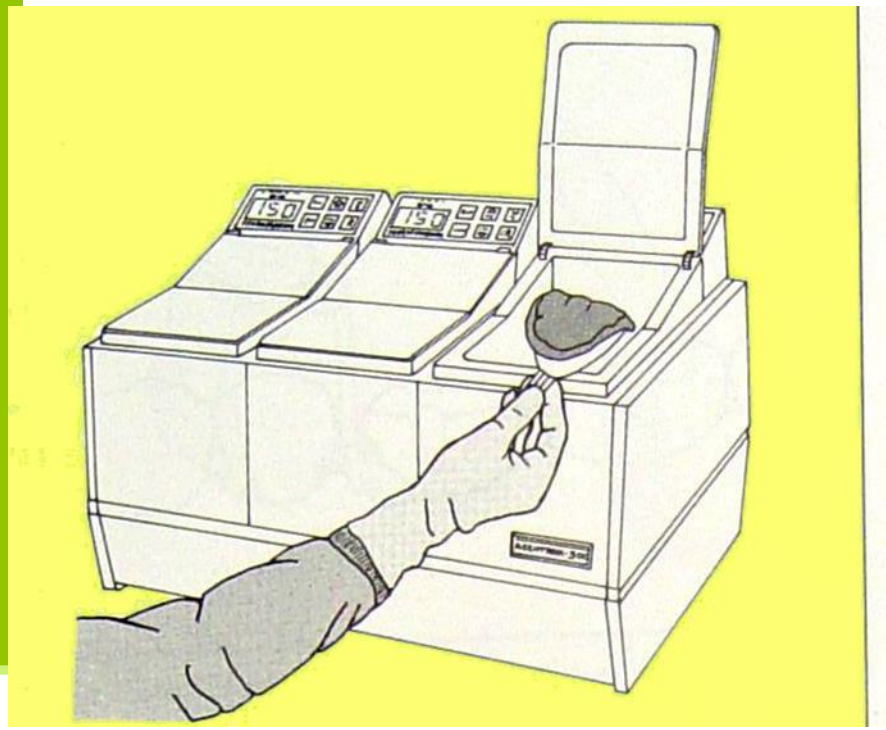
Jse only with stone

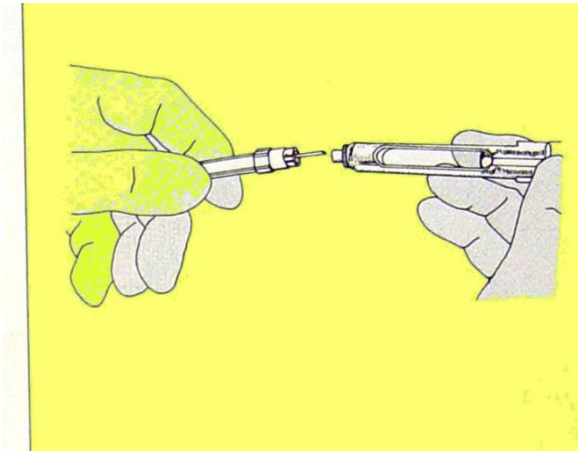
Impression making with Hydrocolloid

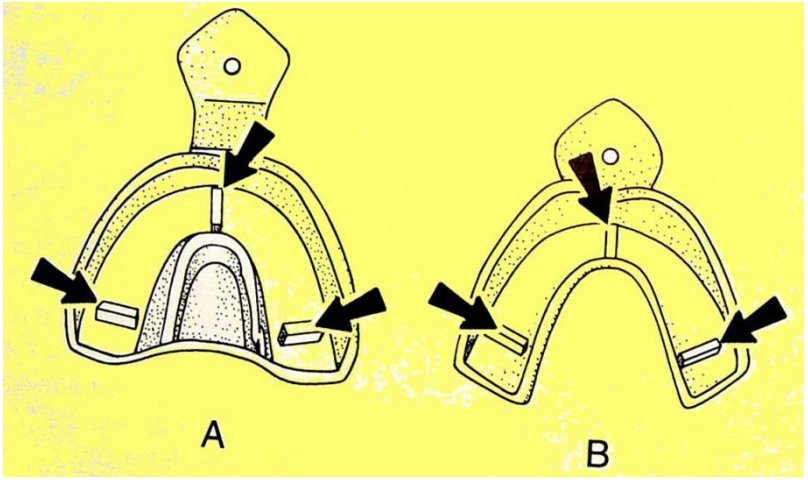
- Liquefying bath 10 min 212°F
- Storage bath 10 min 152°F
- Tempering bath 5-10 min 110-115°F

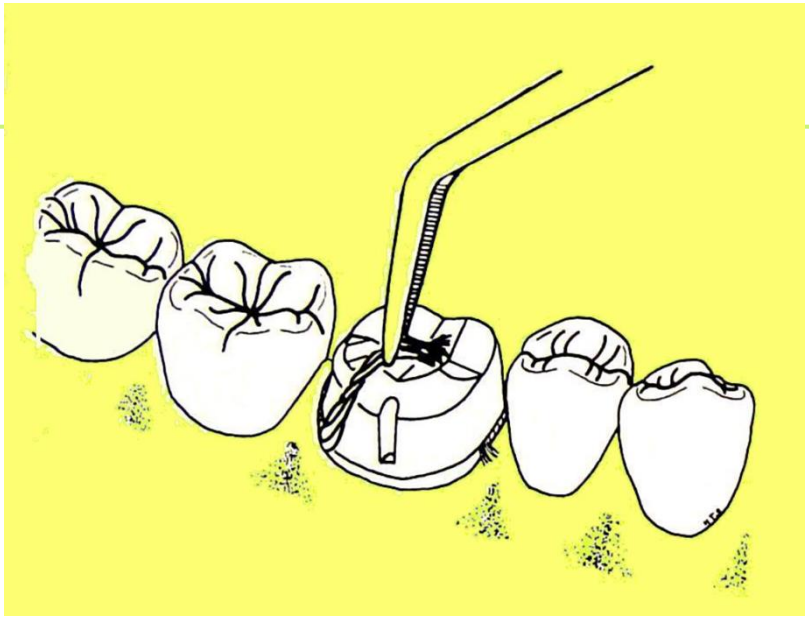


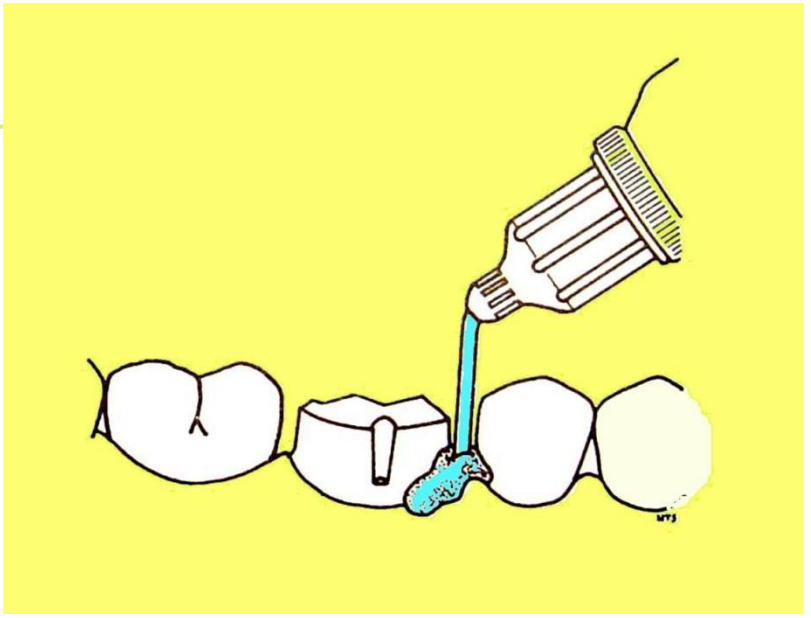
Impression making with Hydrocolloid

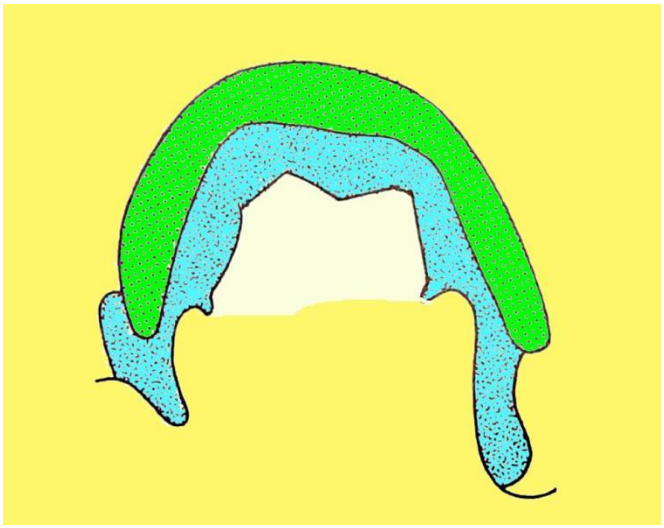










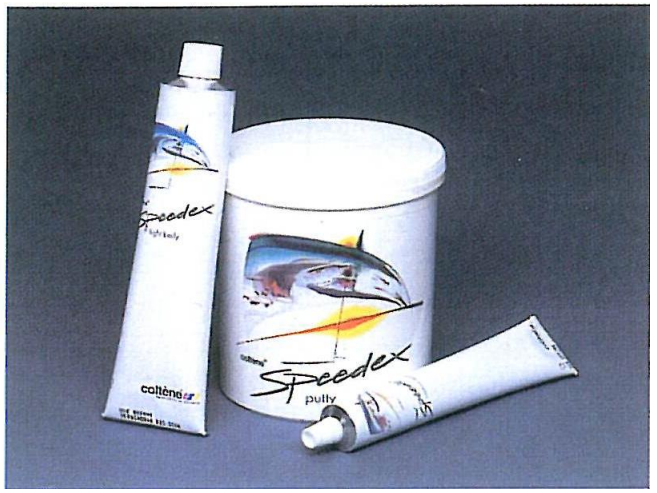


Polysulfide polymer

- High tear strength
- Easier to pour than other elastomers
- Most impressions
- Pour with in 1 hr; allow 10 min to set
- temperatures near 25'C (77"F) with humidity exceeding6Ooc create problems.
- custom impression

- Messy
- Unpleasant odor
- Long setting Time
- Stability only fair
- double-mixt echnique

Condensation silicone

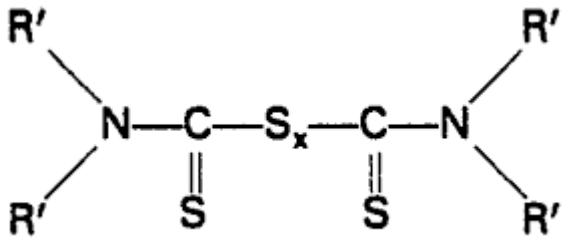


- Pleasant to use
  Short setting time
- Most impressions

- Hydrophobic
- Poor wetting
- Low stability
- Pour immediately
- Care to avoid bubbles when pouring

Silicone and polysulfide have a dimensional instability

- that results from their mode of polymerization.
- Both are condensation polymers,
- as a byproduct of their polymerization reactions, give off alcohol and water,.
- A s a result, evaporation from the set material causes dimensional contraction in both



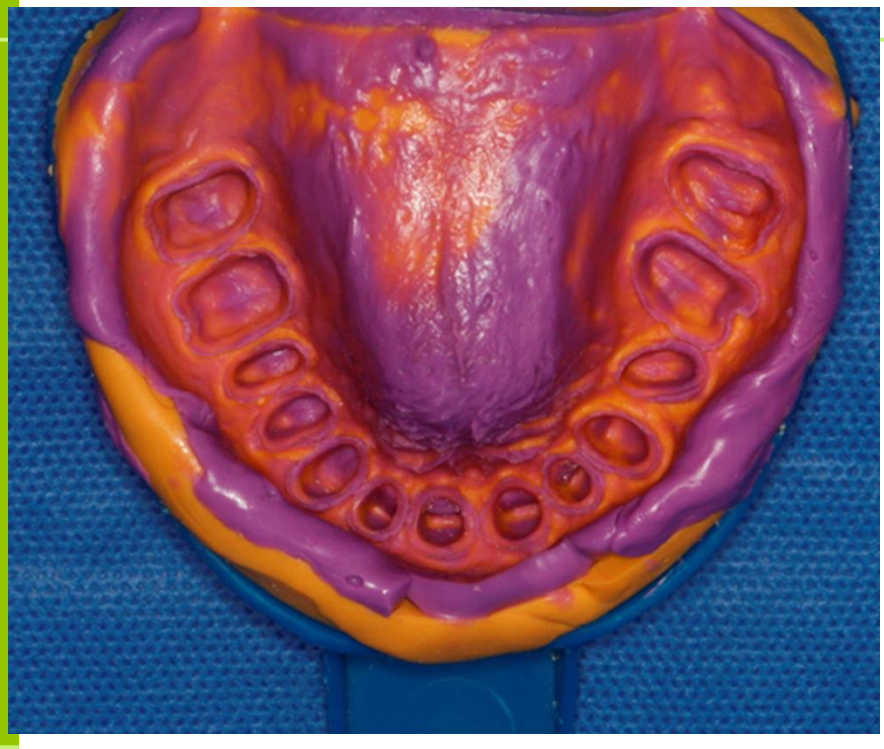
Polyether

- Dimensional stability
- Accuracy
- Short setting time(5)
- Automix available
- Most impressions

- Set material very stiff
- Imbibition
- Short working time
- Care not to break teeth when separating cast

Addition silicone

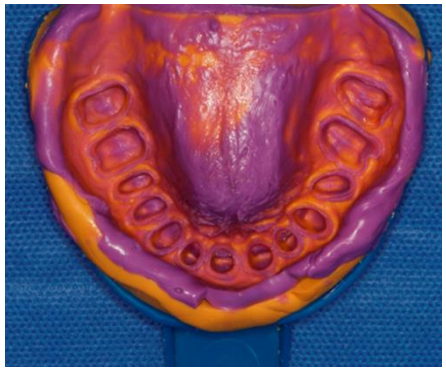
- Dimensional stability
- Pleasant to use
- Short setting time
- Automix available
- Most impressions
- Delay pour of some materials
- Care to avoid bubbles when pouring
- Hydrophobic
- Poor wetting
- Some materials release H2
- Hydrophilic formulations imbibe moisture
- gloves that do not interfere with setting should be selecte




EXAMIX NDS
EXAMIX NDS
EXAMIX NDS
EXAMIX NDS

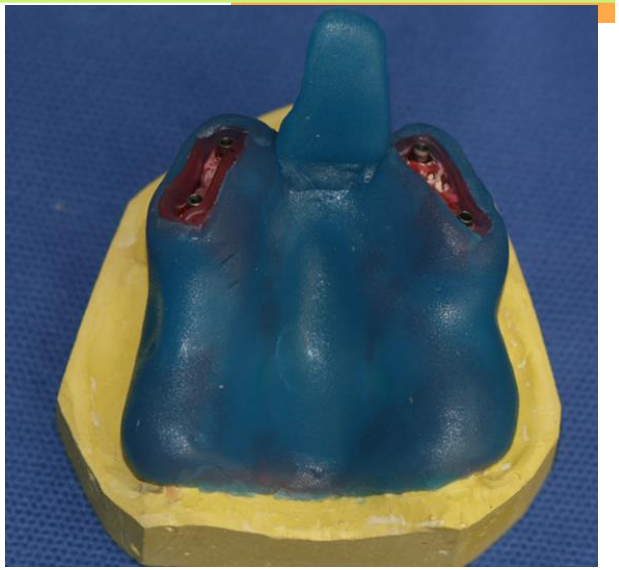
IMPRESSIONT RAYS

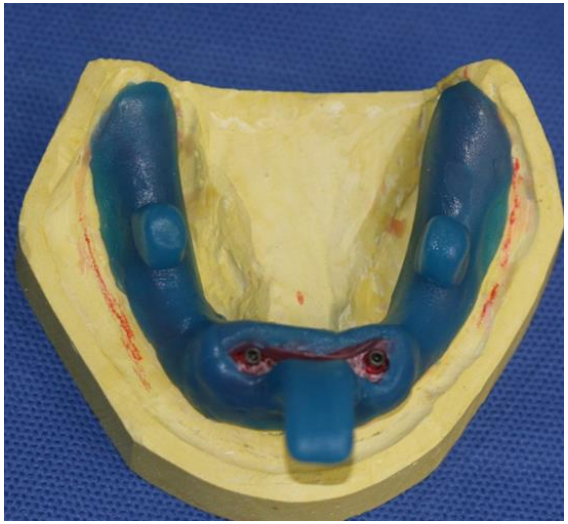
- The choice of impression material influences tray selection



CUSTOM TRAY FABRICATION

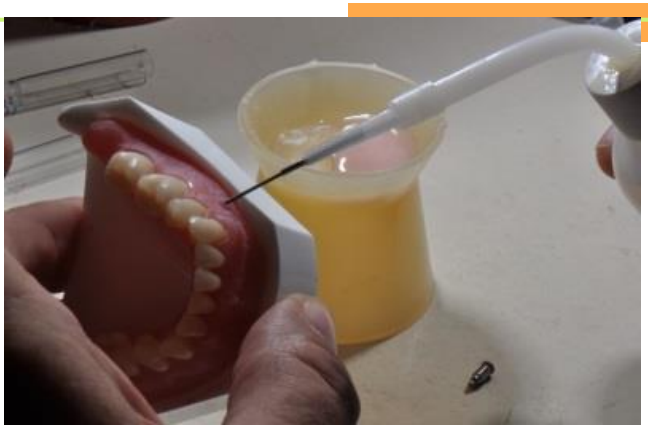
- Accuracy
- limiting the volume of the material,
- reducing two sources of error: stresses during removal and thermal contraction



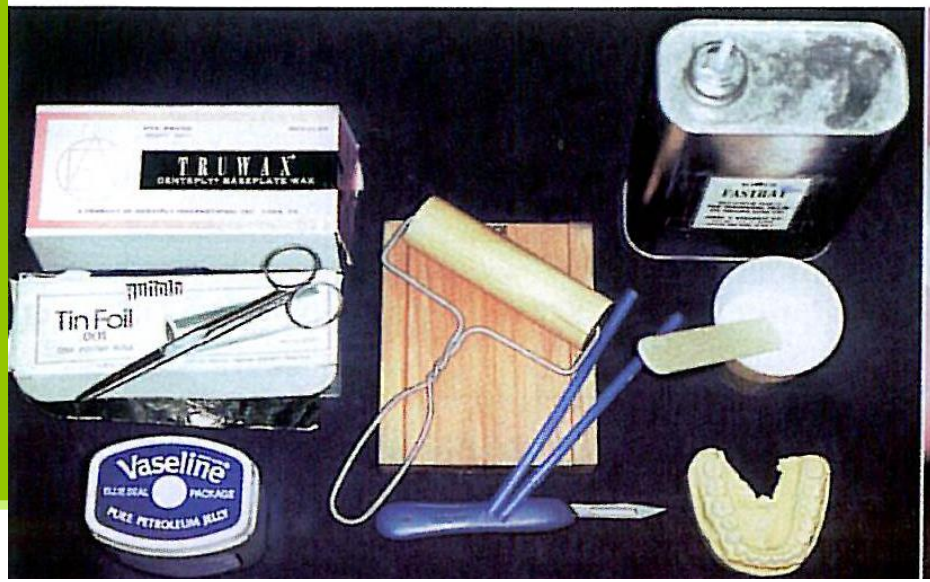


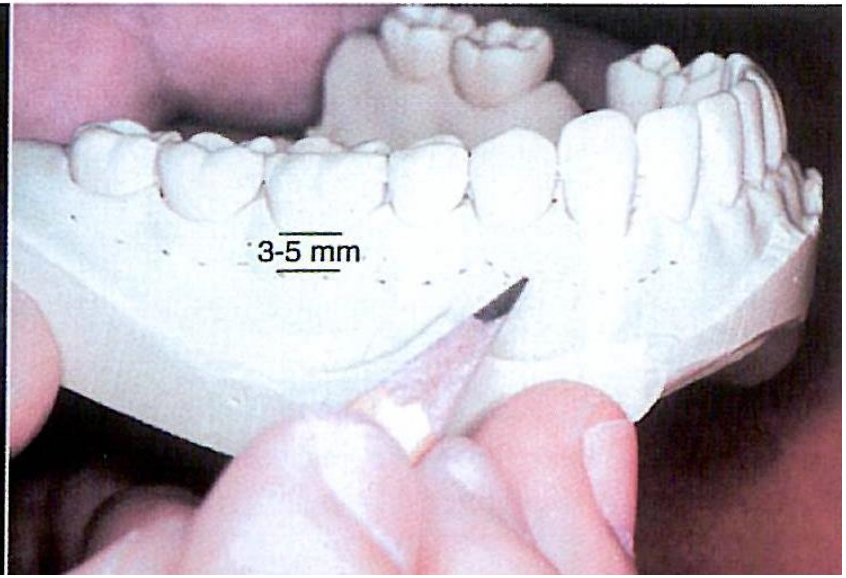
Custom trays can be made from

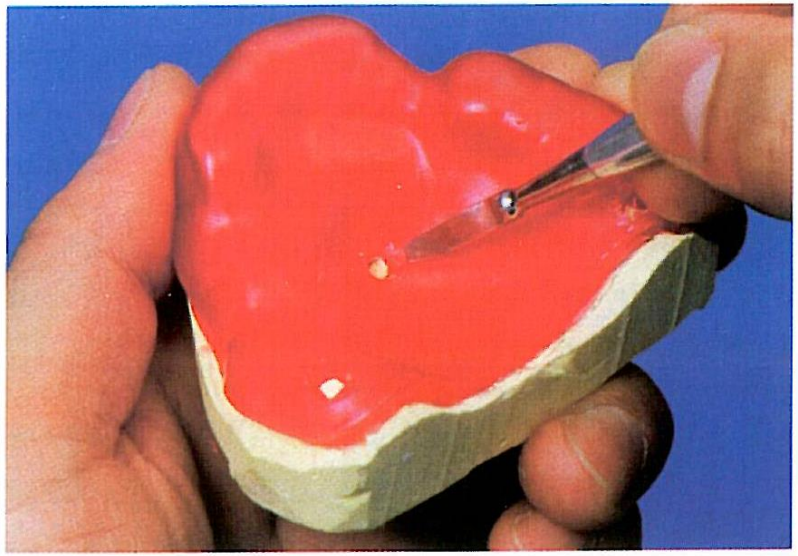
- Autopolymerizing acrylic resin
- thermoplastic resin,
- photopolimerized resins.



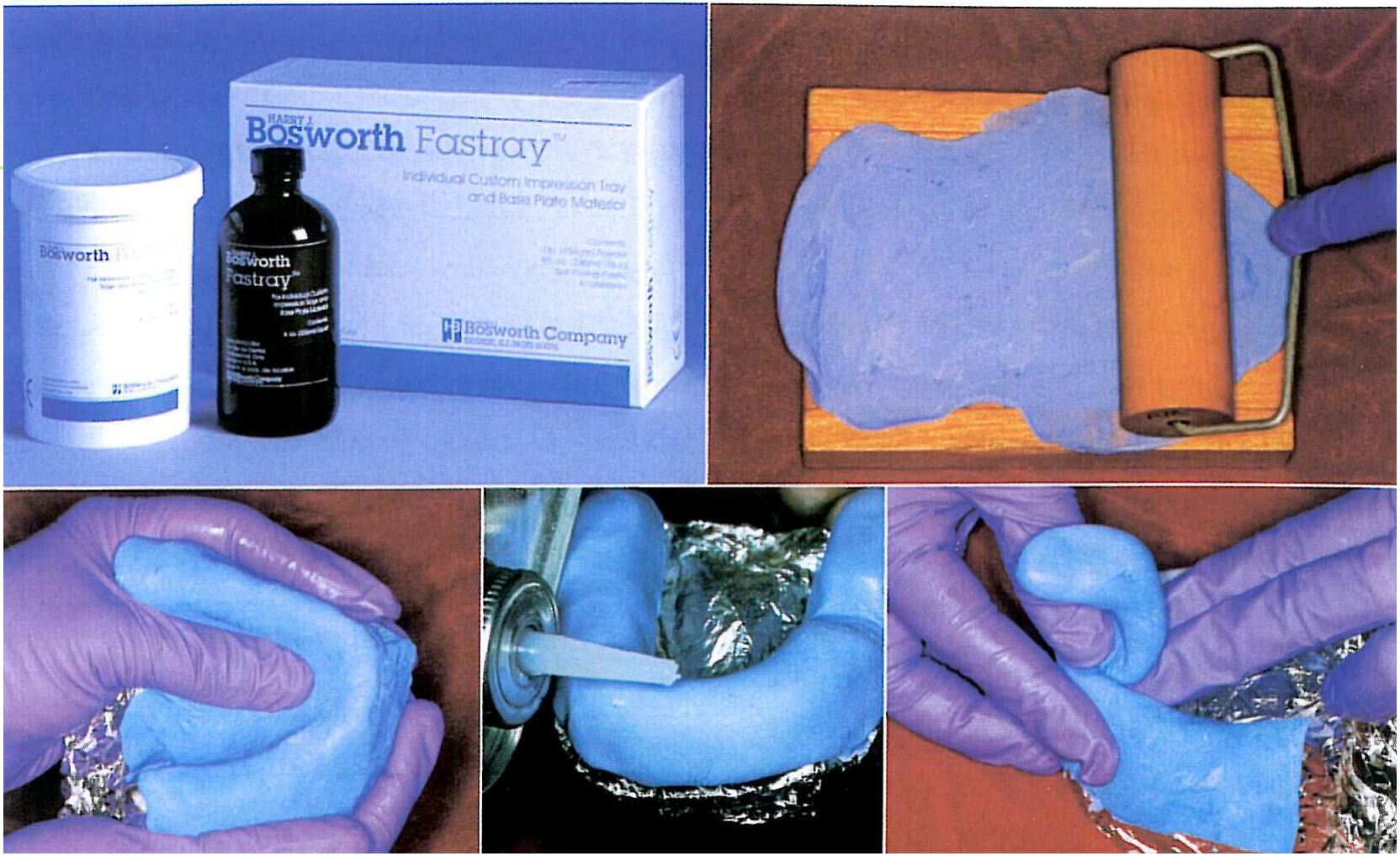
Custom tray fabrication



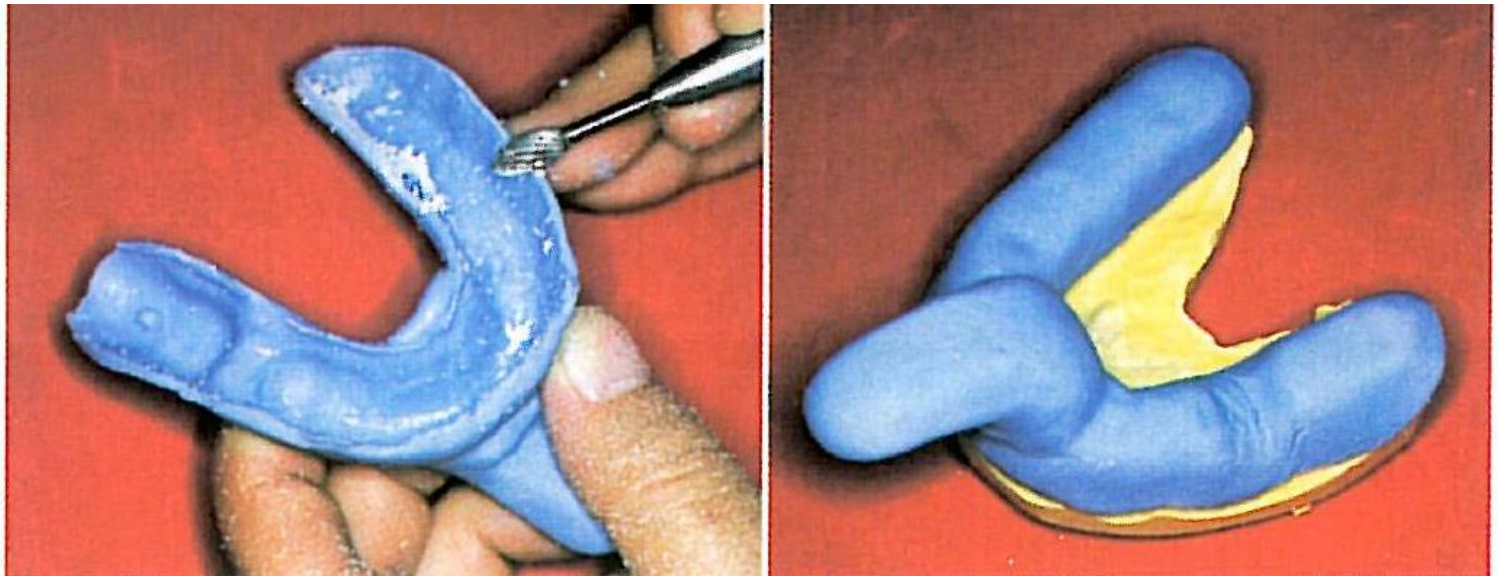




- If necessary, tray stop can be placed on the hard palate.

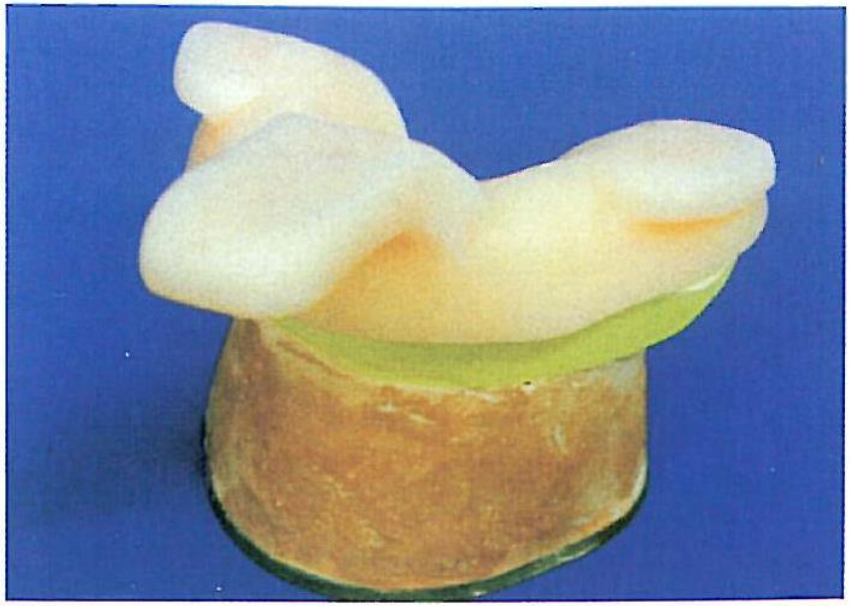

HARRY J
Bosworth Fastray™
Individual Custom Impression Tray
and Base Plate Material
Bosworth Company
Bosworth
Fastray™

- Resin thicknesses of 2 to 3 mm are needed for adequate rigidity.
- Clearance between the tray and the teeth should also be 2 to 3 mm;
- however, greater clearance is necessary for the more rigid polyether materials.



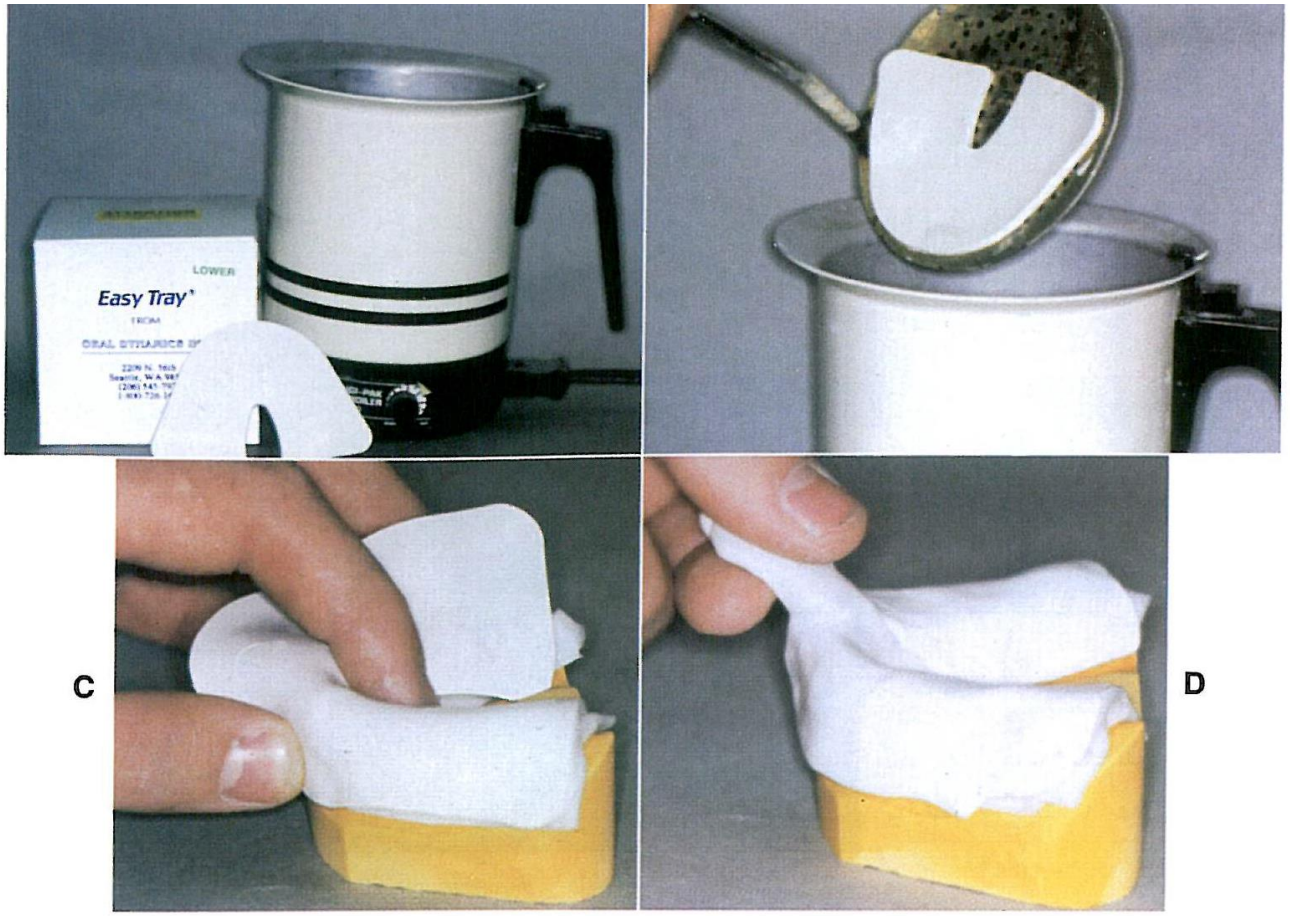
Evaluation

- rigid,
- thickness of 2 to 3 mm.
- 3 to 5 mm cervical to the gingival margins and
- should be shaped to allow muscle attachments.

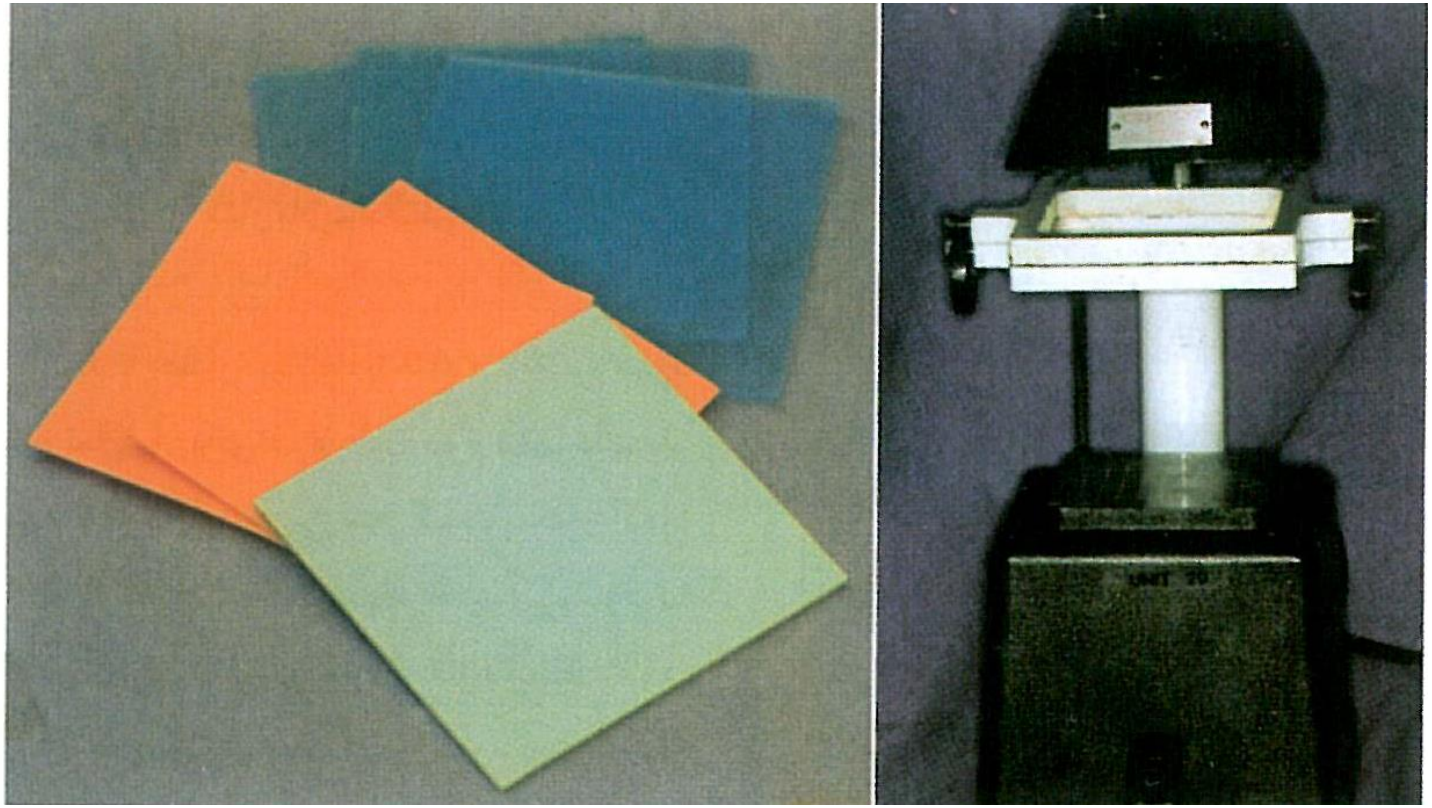


- It should be stable on the cast with stops that
- can maintain an impression thickness of 2 or 3 mm.
- The tray must be smooth, with no sharp edges.
- Finally, the handle should be sturdy and shaped to fit between the patient's lips

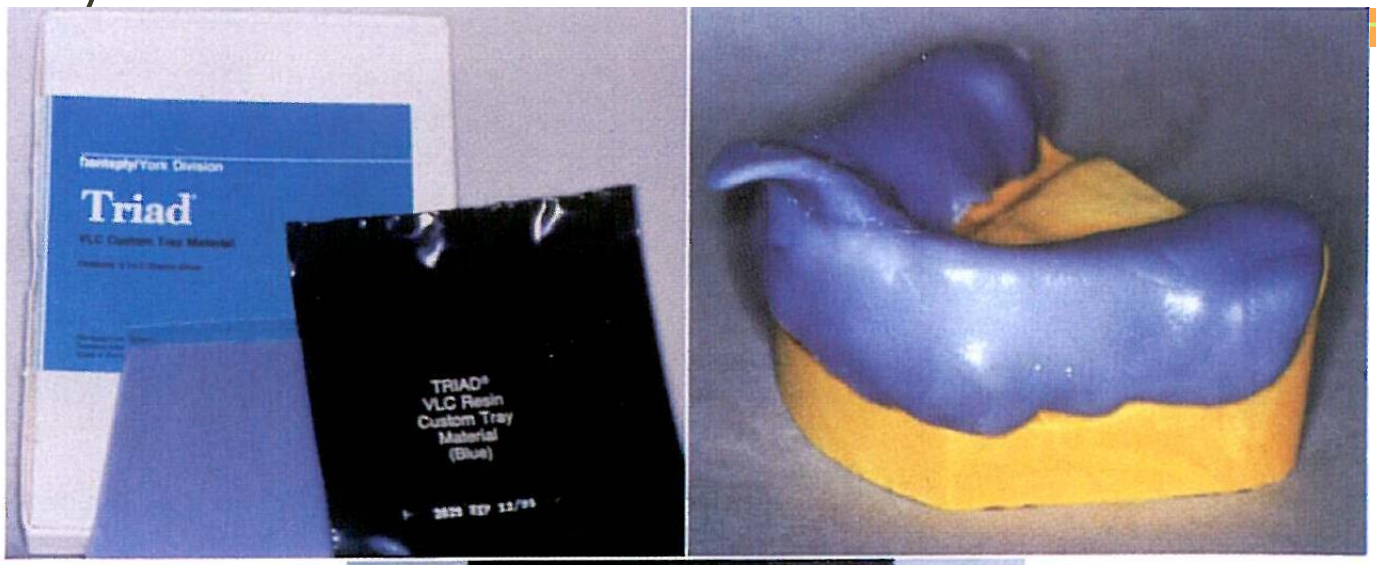
Thermoplastic custom tray materia

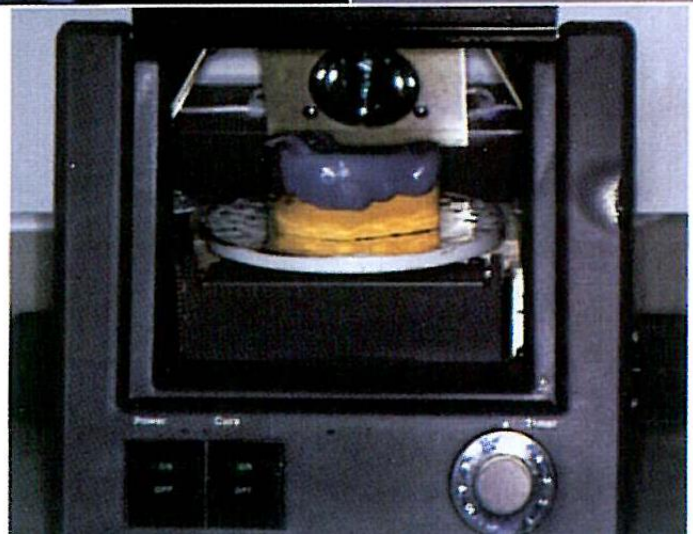


Vacuum-formed custom tray material



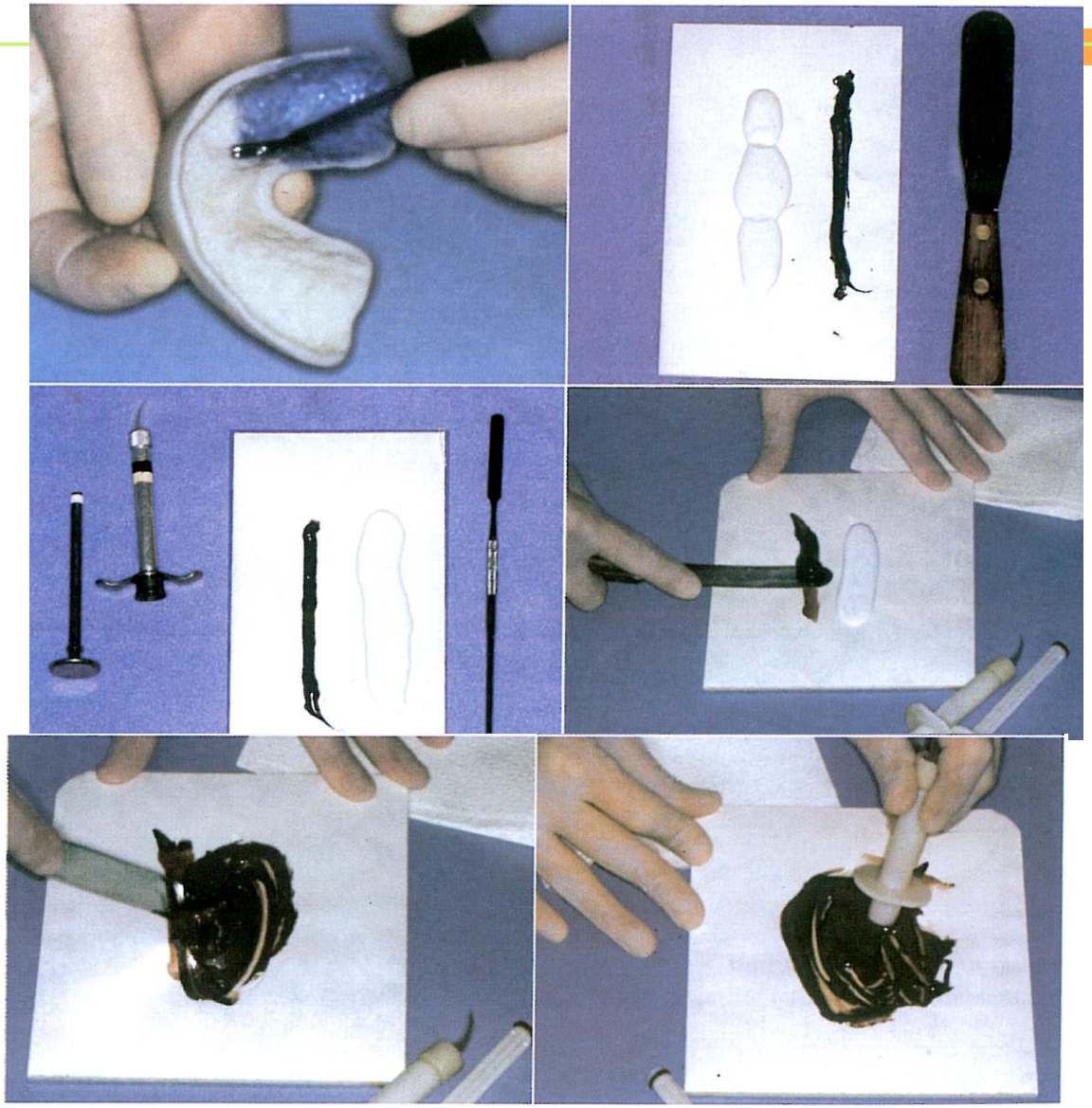
Visible light-polymerized custom tray material

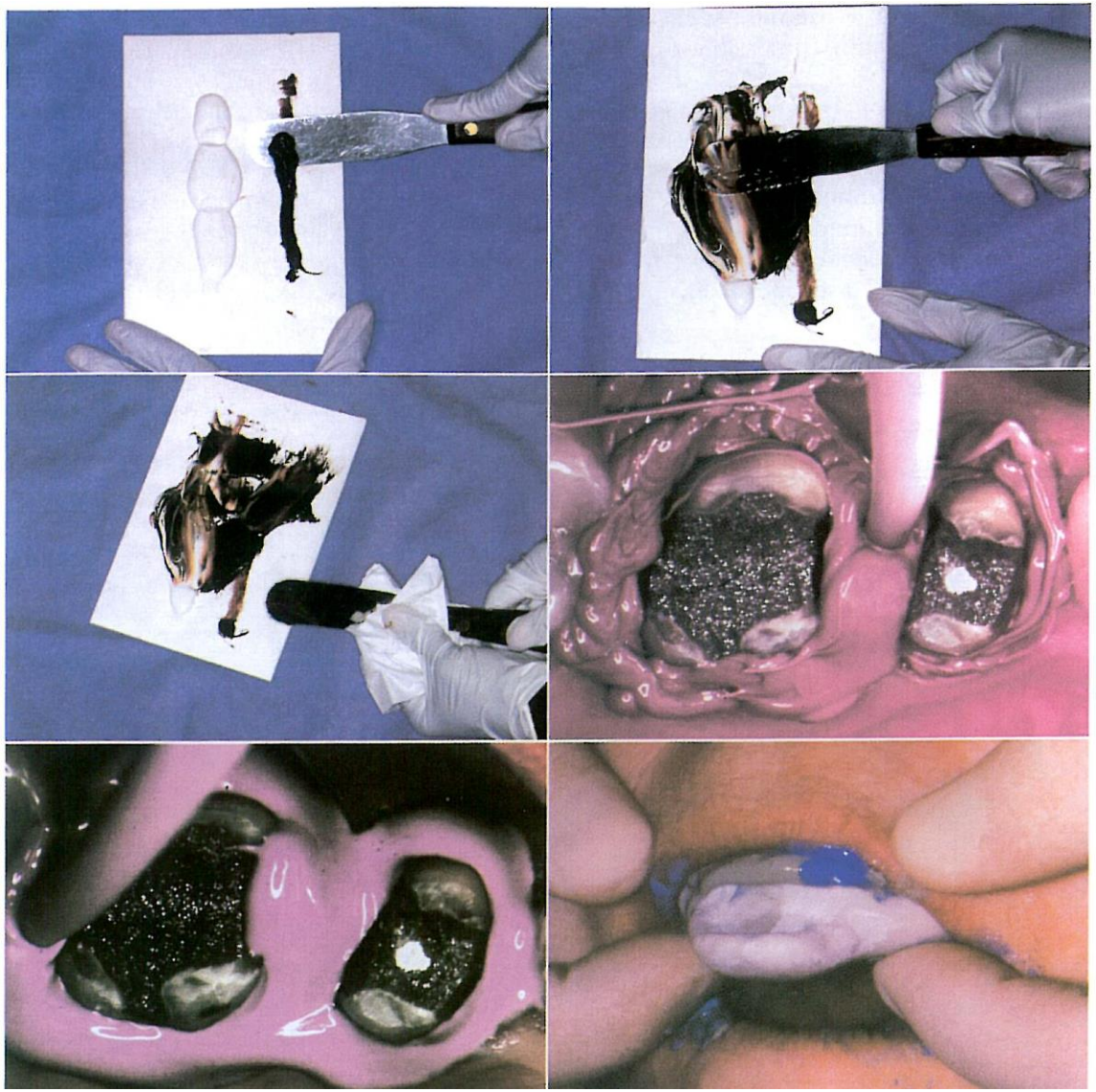




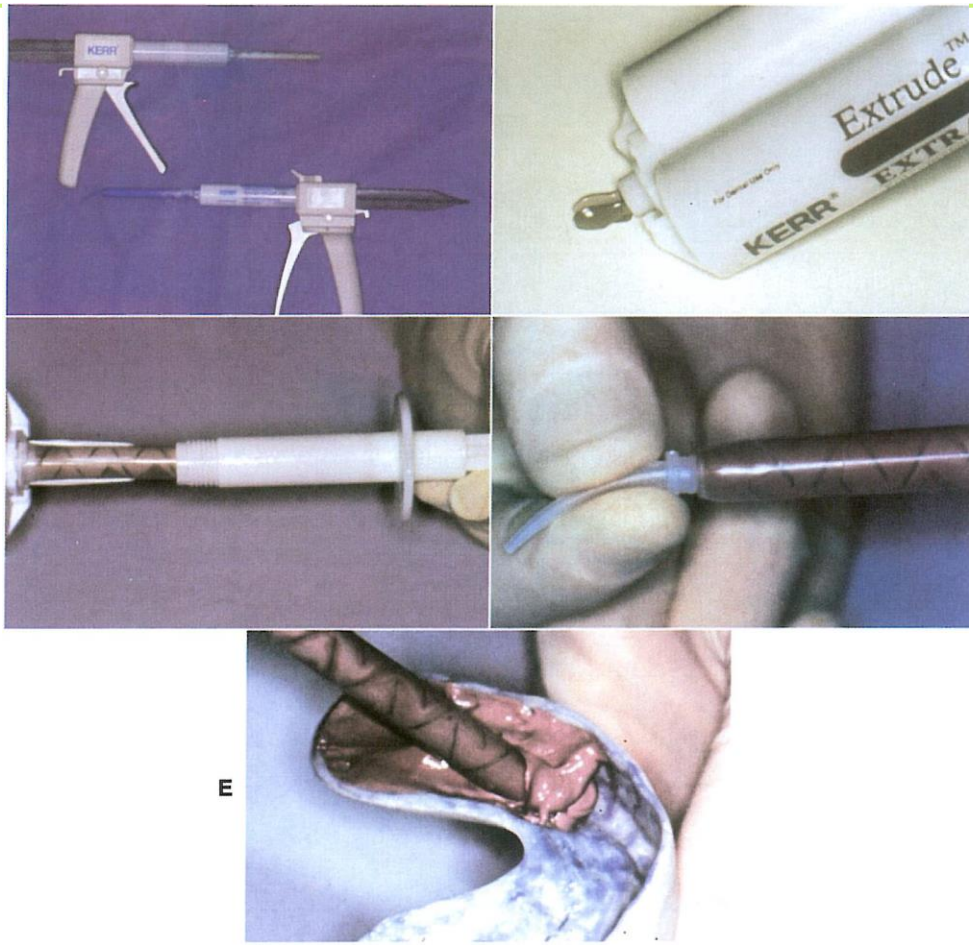
C

Heavy body-light body combination



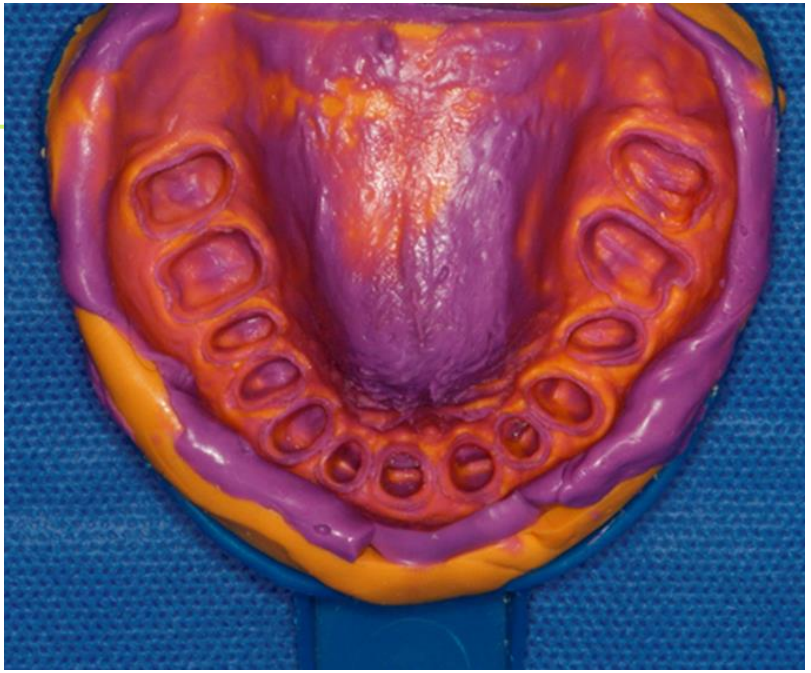


AutoMix technique

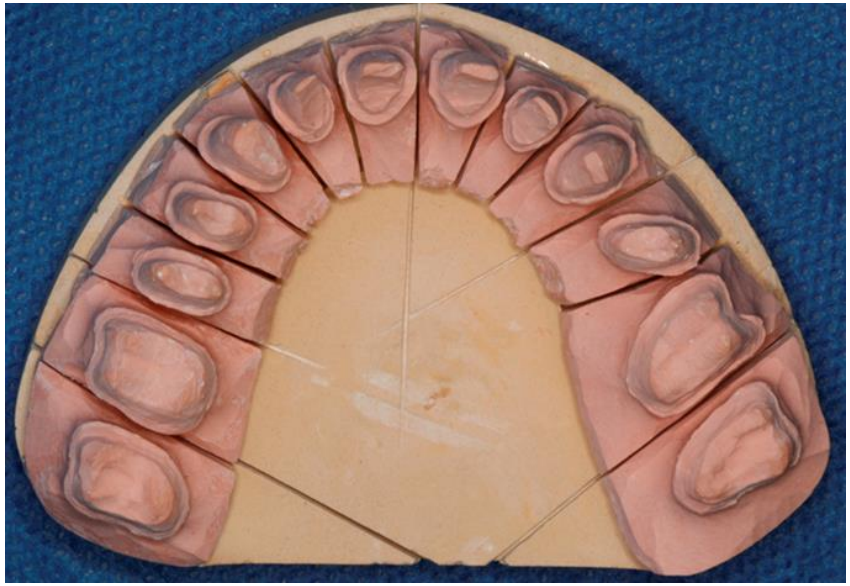


Evaluation

- (Magnification is helpful.)
- If bubbles or voids appear in the margin,
- An intact uninterrupted cuff of impression material should be present beyond every margin
- Streaks of base or catalyst material



If the impression passes all these tests, it can then be disinfected and poured to obtain a die and definitive cast



- The most common conventional impression materials used for definitive impressions in fixed prosthodontics are polyether (PE), and polyvinyl siloxane (PVS).
- These materials exhibit excellent dimensional stability and precision and have been successfully used in fixed prosthodontics for many decades.