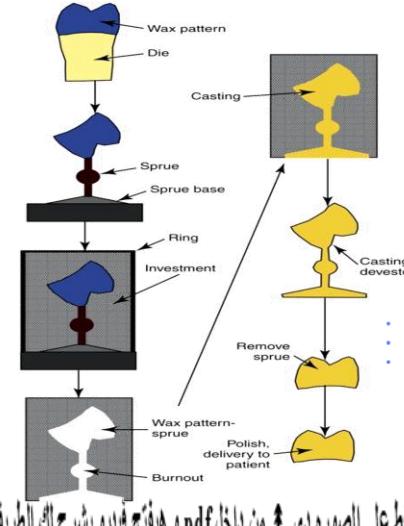




Definition

- A wax form that is the positive likeness of a crown to be fabricated



Methods of Fabricating a Wax Pattern

Technique	Description
Direct Technique 	Pattern is waxed on the prepared tooth in the patient's mouth.
Indirect Technique  (Most popular)	Pattern is waxed on a stone cast made from an accurate impression of the prepared tooth.
Indirect-Direct Technique 	Pattern is constructed outside the mouth then adjusted inside the mouth.

Advantages of Indirect Technique

- ❖ Less chair-side time
- ⌚ Better visualization of the restoration
- 🎯 Ready access to waxing margins



Inlay Wax

Inlay casting wax is used for all wax patterns.



Composition of Inlay Wax

- 1 Paraffin (40%–60%)
- 2 Dammar resin to reduce flaking
- 3 Carnauba resin, ceresin, candelilla wax to raise the melting temperature
- 4 Dyes to provide color contrast 



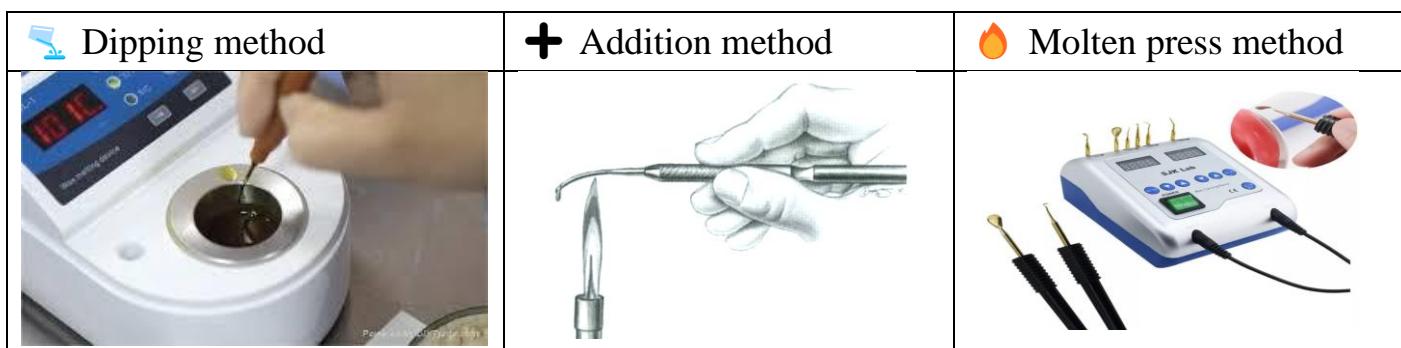
◆ Types of Inlay Wax (Easy Comparison)

Feature	Type I Wax	Type II Wax
Use	Formulated for making intraoral wax patterns	Formulated for making extraoral wax patterns
Hardness	Medium hardness wax	Softer wax, slightly lower melting point
Flow	Resist flow at mouth temperature	Resist flow at room temperature

◆ Requirements of Good Inlay Wax

- 🔥 Flows readily when heated without chipping or flaking
- ❄️ Rigid when cooled
- pencil Can be carved precisely without distortion or smearing
- 🎨 Distinguishable color from the stone die
- 💨 Completely vaporized without leaving any debris
- ⚠️ Minimum stress relaxation after carving and before investing to prevent distortion

E Methods of Wax Pattern Construction



🎒 Armamentarium (Instruments Used)

- 🔧 PKT waxing instruments (No 1,2,3,4,5)
- 勺 Wax spatula
- pencil No 2 pencil
- Knife Laboratory knife
- 🔥 Bunsen burner
- 蠟 Inlay casting wax
- 油 Die lubricant
- 🌡 Electric heating instrument (precise temperature control)





Instrument Functions

- No 1,2: Wax addition instrument
- No 3: Burnisher for refining occlusal anatomy
- No 4,5: Wax carvers

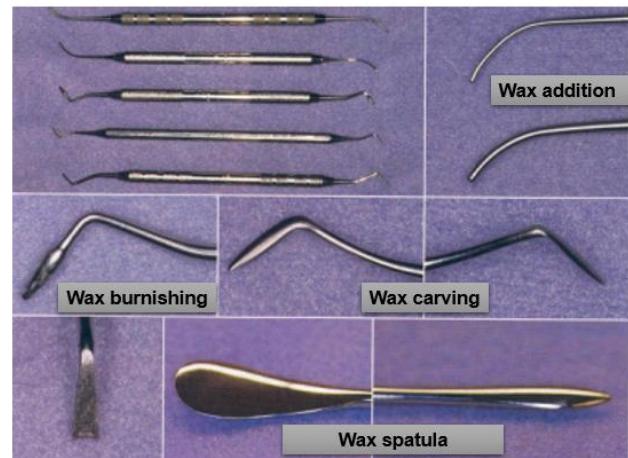


Waxing Instruments Actions

1. Wax Carvers



2. Manual (PKT Instruments)



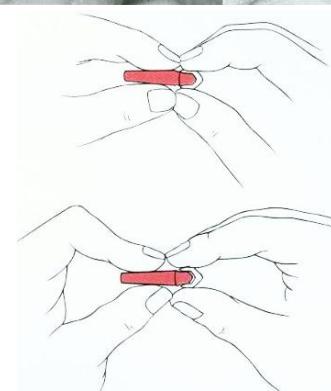
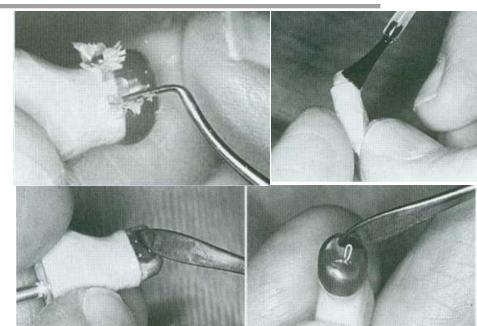
- 🔥 Heat the instrument in the bunsen flame
- 蠟 Touch it in wax and quickly reheat its shank in flame
- 勺 Wax spatula used for adding large amount of wax

Wax Pattern Construction Steps (Step by Step)

Internal surface → Proximal surfaces → Axial surfaces → Occlusal surfaces → Margin finishing
 → Wax pattern removal and evaluation

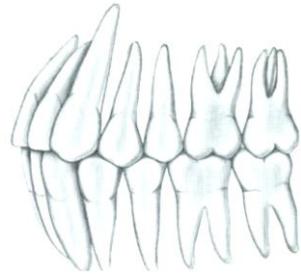
Internal Surface

- 🧴 Die lubricant
- 🔥 Flow wax onto die from well heated large waxing instrument
- 🧱 Initial layer
- 🕒 Sufficient wax-coping without breakage
- ⚖️ Proximal areas extra bulk – grip and prevent distortion
- ✂ Trim wax
- ⬆️ Wax pattern removal



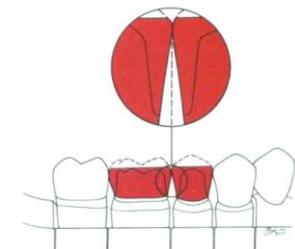
Proximal Surfaces

-  Flat or slightly concave from contact area to CEJ (emergence profile)
-  Overcontouring → Periodontal problem
-  Undercontouring → flossing ineffective

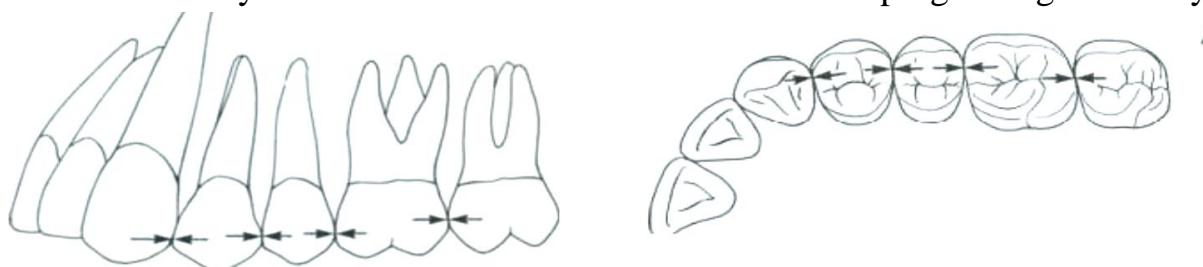


Contact Areas (Very Important Clinically)

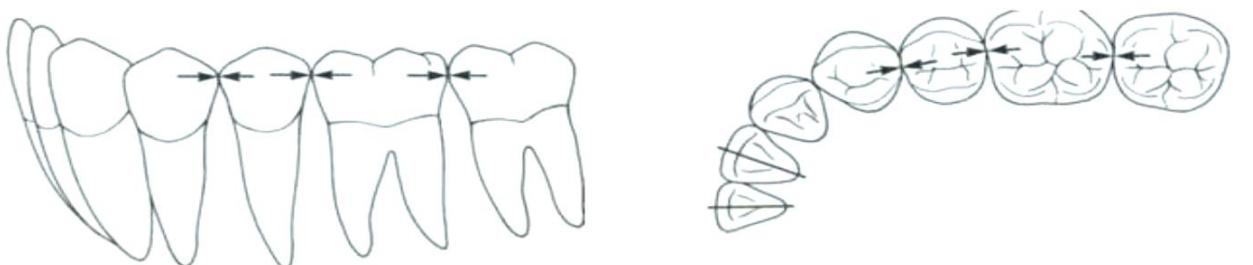
- ◆ Anterior contact areas: narrow and incisally
- ◆ Posterior contact areas: broad and centrally
- ◆ Lingual embrasures wider than buccal embrasures to allow food deflection
- ◆ Gingival embrasures: symmetric



Contacts in maxillary teeth are more occlusal and buccal when progressing anteriorly



Contacts in mandibular posterior teeth are more centrally located



-  Too narrow contact → wedging of fibrous food between teeth
-  Too broad contact → food impaction and no deflection



Buccal & Lingual Surfaces

 Shaped similarly to the adjacent tooth

 Buccal height of contour:

- Anterior: 0.5 mm from the CEJ
- Premolars: 0.75 mm
- Molars: 1 mm

 Lingual height of contour:

Premolars and molars – middle 1/3 of the lingual surface

 Overcontouring → food impaction & gingival inflammation

 Undercontouring → food trauma & gingival recession

Occlusal Surfaces

Nonfunctional cusps form a rim to:

-  Protect buccal mucosa and tongue from functional cusps
-  Prevent food escape

Occlusal Anatomy Build-up Sequence

- 1 Cone placement
- 2 Cuspal ridges
- 3 Cones, cuspal and triangular ridges
- 4 Secondary and marginal ridges



Wax Added Technique

- ◆ Cusp cones
- ◆ Marginal and cusp ridges
- ◆ Facial and lingual contour
- ◆ Triangular ridges

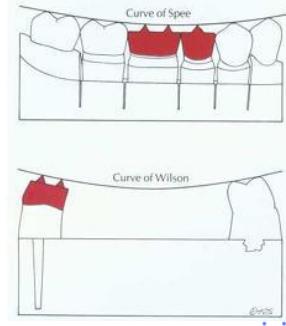
 Contacts should occur on the sides of the cone near the tip and NOT on the tip itself → decrease wear of cusp



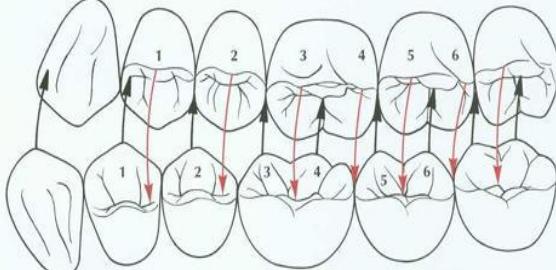
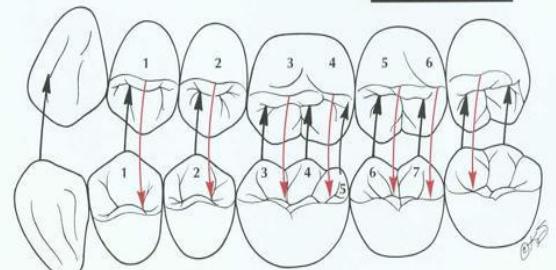
Cusp Height and Location

🌀 Curve of Spee: from mandibular canine till anterior border of the ramus
→ prevent protrusive interference

🌙 Curve of Wilson: between buccal cusp tips of right and left mandibular molars → prevent lateral interference



Occlusal Arrangement (Comparison)

Feature	Cusp–Marginal Ridge	Cusp–Fossa
Contact	Functional cusp contact opposing occlusal surfaces on marginal ridges or marginal fossa	Functional cusp into occlusal fossa of opposing teeth
Arrangement	One-tooth to two-teeth arrangement	Tooth to tooth arrangement
Frequency	Most commonly used occlusal relationship	Rarely used
Contact Points	—	Centric cusps contact occlusal fossa at three points
Development	—	Developed by waxing two opposing quadrants simultaneously
		

Advantages of cusp fossa arrangement

- Prevent food impaction
- Closure forces near the long axes of teeth
- Improved stability results from tripod contact for each functional cusp



📍 Location of occlusal contact on opposing teeth

Criteria	Tooth-to-tooth	Tooth-to-two-teeth
Contact area	Occlusal fossae only	Marginal ridges and marginal fossae
Forces	Parallel with long axis of teeth	Near the center of the teeth
Advantages	Very little stress on the teeth	Found in 90% of adults, can be used for single tooth restorations
Disadvantages	Rarely found in natural teeth	Food impaction, displacement of teeth if functional cusp wedge into lingual embrasure

📝 Marginal Finishing (Critical Step)

- 🔥 Reflow margins with well adapted 1 mm wide zone from margin to prepared surface
- 🕒 Return the pattern to the die
- 🖌️ Combination of melting, burnishing and carving



🎯 Objectives

- 1 Minimize dissolution of cement
- 2 Facilitate plaque control



💻 Digital Wax Pattern (Modern Dentistry)

A digital wax pattern is a virtual (computer-designed) version of the traditional wax pattern used in dentistry for crowns, bridges, inlays, onlays, veneers, and removable prostheses.

Instead of sculpting wax by hand on a stone model, the restoration is designed using CAD software.

⌚ Workflow of Digital Wax Pattern

- 💻 Digital Impression (intraoral scanner or lab scanner)
- 🎨 CAD Design (margins, occlusion, contacts, anatomy)
- 🔥 Casting (lost-wax casting for metal frameworks or ceramic pressing)



★ Advantages

- 🎯 High precision and marginal accuracy
- ⌚ Time-saving compared to manual waxing
- 🔄 Easy modifications and reproducibility
- 💾 Digital storage of design files
- 🤝 Improved communication between dentist and lab

⚖️ Conventional vs Digital Wax Pattern

❖ Feature	💡 Conventional	💻 Digital
Fabrication	Hand made	Computer designed
Technique	Technique sensitive	Software guided
Duplication	Difficult to duplicate	Easily reproducible
Storage	Physical storage	Digital file storage

❖ Thank you 

