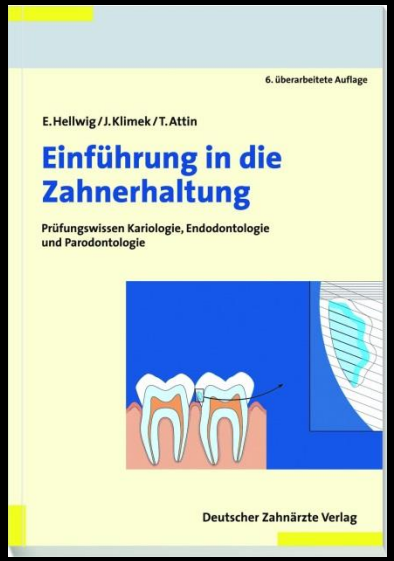
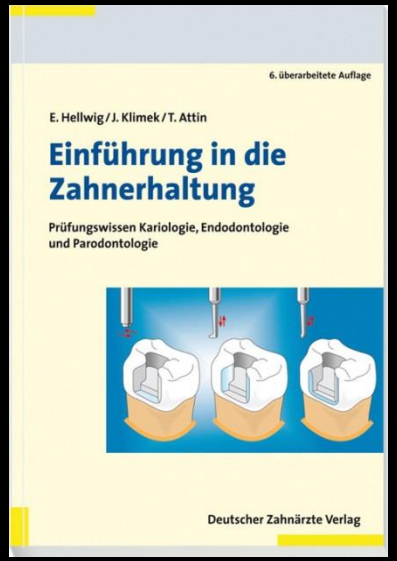
Direct composite restorations in the posterior region

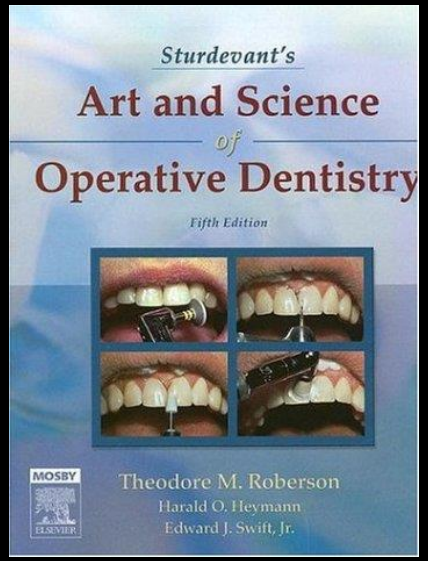
Dr. Komora Péter

Konzerváló Fogászati Klinika

- E. Hellwig/J.Klimek/T.Attin – Einführung in die Zahnerhaltungskunde
- Fazekas Árpád – Megtartó fogászat és endodoncia
- Sturdevant’s Art and Science of Operative Dentistry







Adhesive filling therapy

- Preparation technique- Minimal invazive
- Surface conditioning/etching
- Adhesive material use
- Hybridization
- Layering

QR- code

Mobile phone prepare

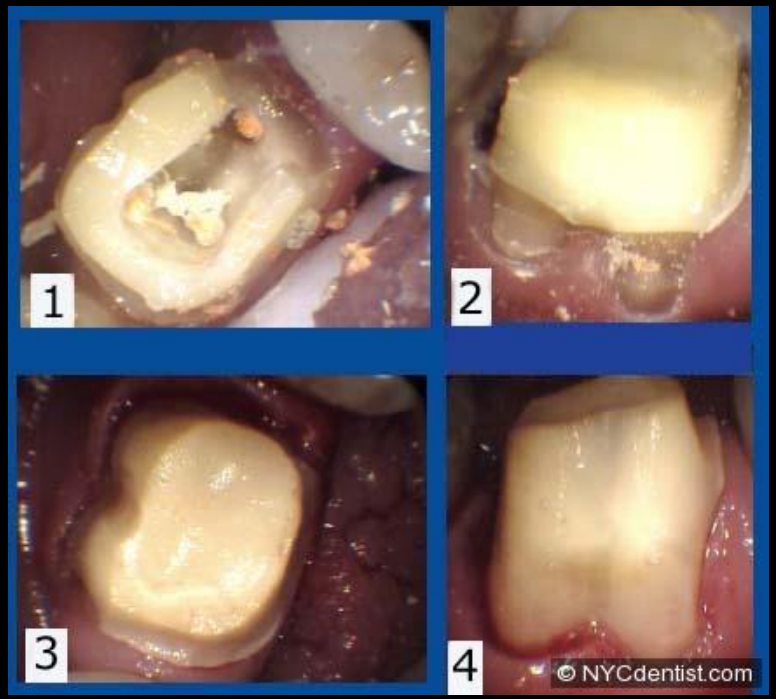
25 seconds

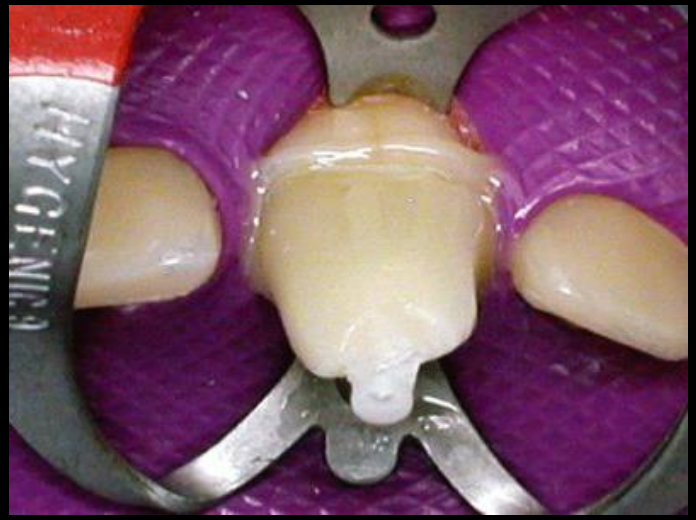
Indications (Composite)

- I.,II.,III.,IV.,V.,VI. Class cavities
- Core build up
- Fissure sealing
- Esthetic interventions
  - partial veneer (direct)
  - total veneer (direct)
  - diastema closure
  - tooth recontour
- Cementation of indirect restorations
- Temporary restoration
- Splinting of periodontally weakened teeth

Filling therapy

Core build up




HYGENICA

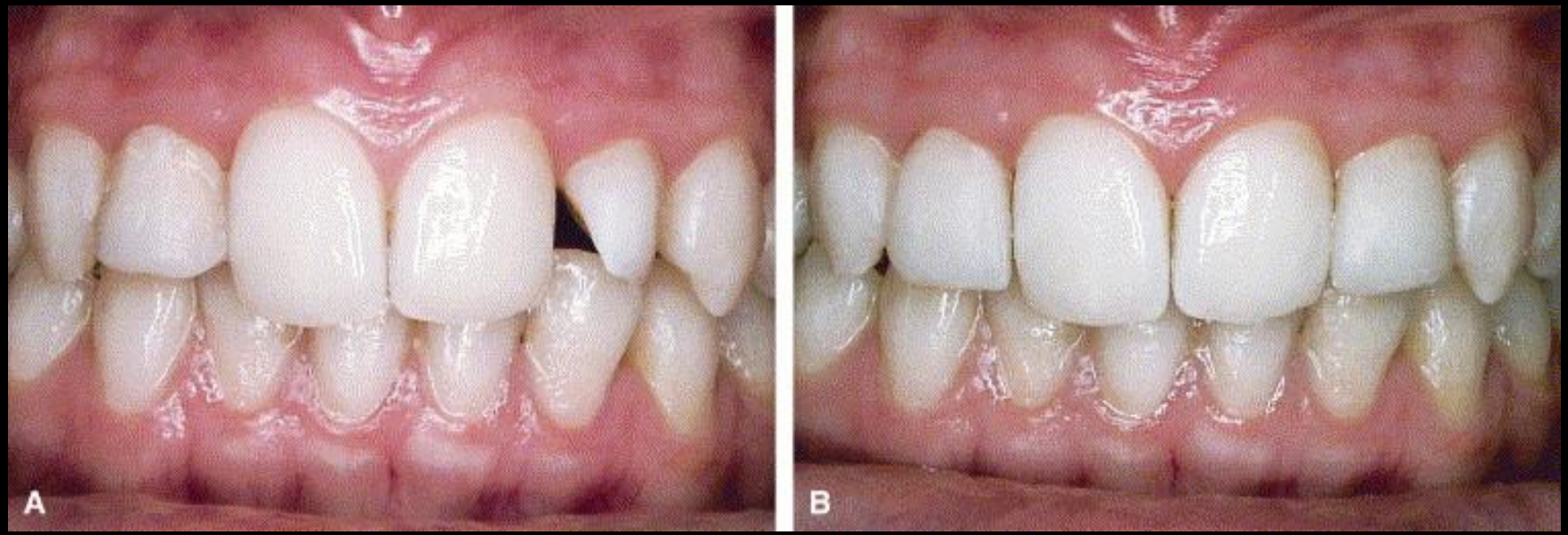
Fissure sealing

Before

After

Esthetic interventions

Esthetic interventions



Splinting

Contraindications

- Insufficient isolation
  - rubber dam
- Strong occlusal load
  - Bruxism
  - entire occlusal surface covering
- Composite filling requires greater theoretical and practical skills from the dentist

Advantages

- Esthetic
- Less tooth hard tissue loss
- "Easier" Preparation
- Micro-mechanical adhesion
  - good retention
  - low microleakage (in case of right filling technique)
- Repairable

Disadvantages

- Polymerization shrinkage
- The filling process is more complicated, more time consuming and more expensive
- Technology is sensitive

Clinical steps

- First clinical steps
  - clinical examination
  - diagnosis
  - treatment plan
- Local anesthesia
- Preparation of the surgical field
- Tooth color
- Preparation of the tooth
- Isolation, matrix
- Conditioning/acid etching
- Bond / Adhesive application
- Filling material application
- Polymerization
- Filling elaboration
  - contouring
  - finishing
  - polishing

Local anesthesia

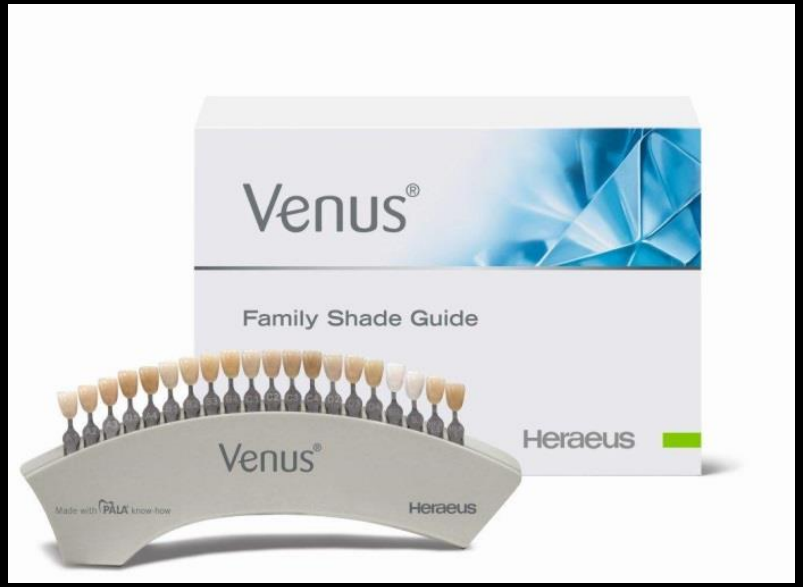
- Less saliva, less bleeding

Preparation of the surgical field

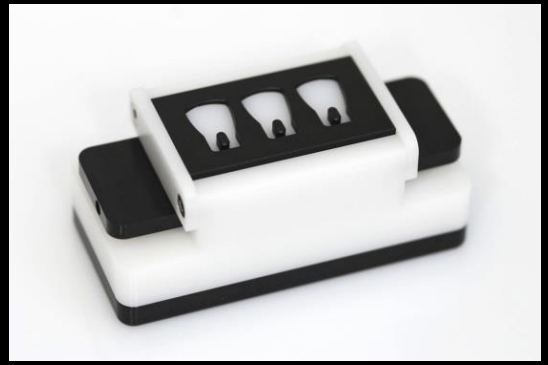
- Clean the working area
- Without plaque and tartar
- Ignore fluoride polishing paste

Tooth color


VITA
VITAPAN® classical
für die VITAPAN® Farben A1-D4
VITAPAN® classical
VITA
VITA


Venus®
Family Shade Guide
Heraeus
Venus®
Made with PALA know-how
Heraeus


Charisma® Diamond
Heraeus



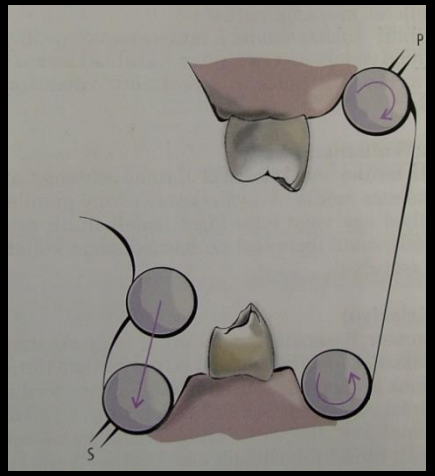
Preparation

Adhesive / Minimally invasive

Microretention

Isolation

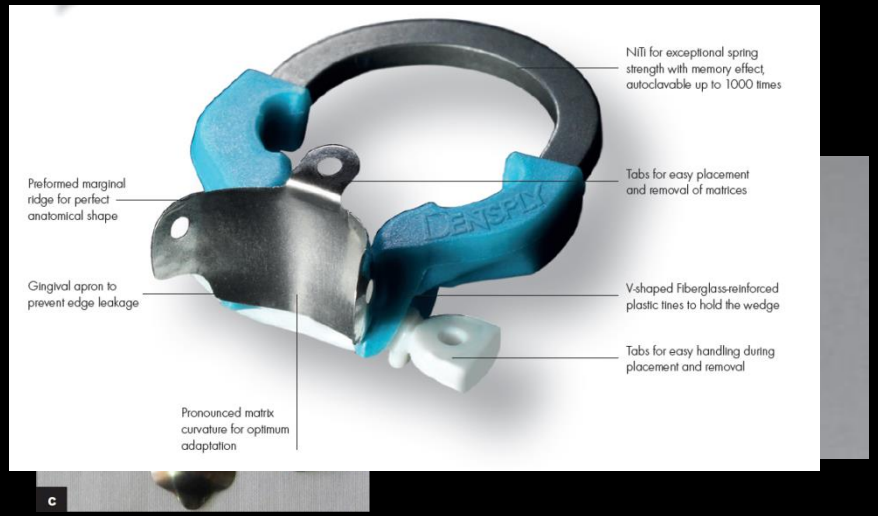
- Relative



- Absolute (Rubber dam)

Matrices

- External tooth shape and contact point
- Types :
  - Metal
    - Tofflemire (körkörös)
    - Ivory (félkörös)
    - Sectional matrix (szekcionált)
  - Plastic – polyester strip



PALODENT® PLUS

Tofflemire

Sectional

Tofflemire

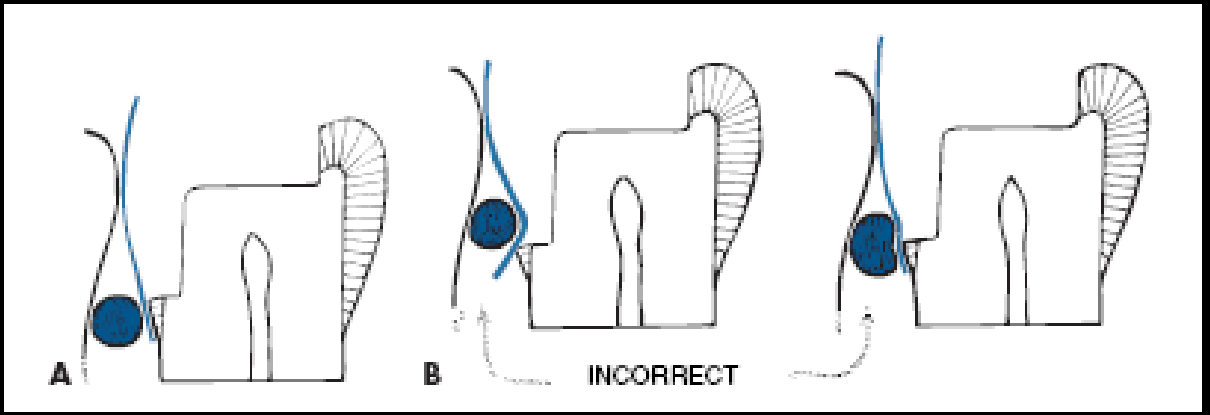
Teil

Tofflemire

Teil

Matrices adaptation

- Matrices "overdimension„



- Wedge
- Wood, plastic

Conditioning/Acid Etching
Adhesives / Bond

Adhesive / Bond Materials

Types of Adhesives / Bonds (Van Meerbeck)

- Total-etch / etch and rinse
  - Two steps (One-Bottle)
  - Three steps
- Self-etch
  - Two steps / two bottles
  - All-in one
- Resin-modified glass ionomer adhesives
- Multi-Bond/Universal Bond

Total-etch

Total-etch adhesives – etch&rinse system

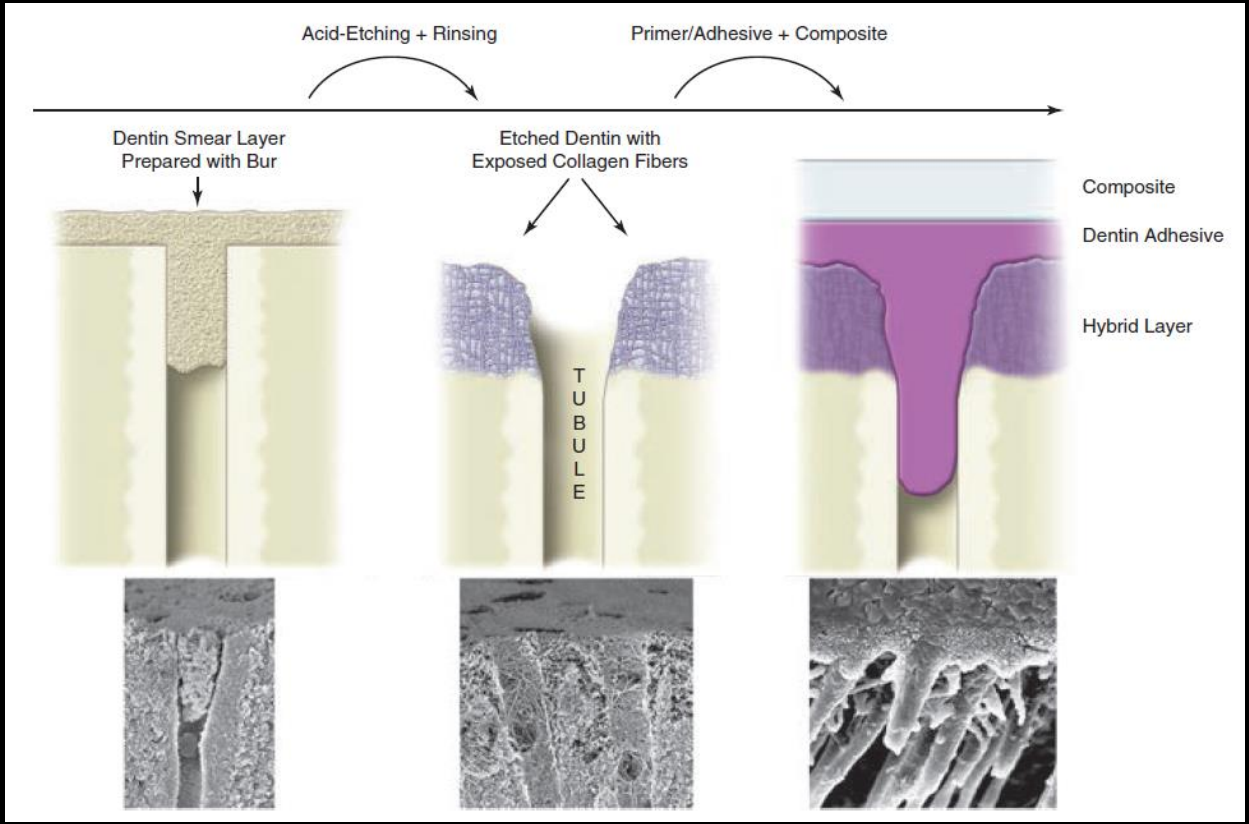
- Etch&rinse :
  - Application of conditioning material
    - Enamel : 30 sec
    - Dentin : 15 sec

- Surface drying

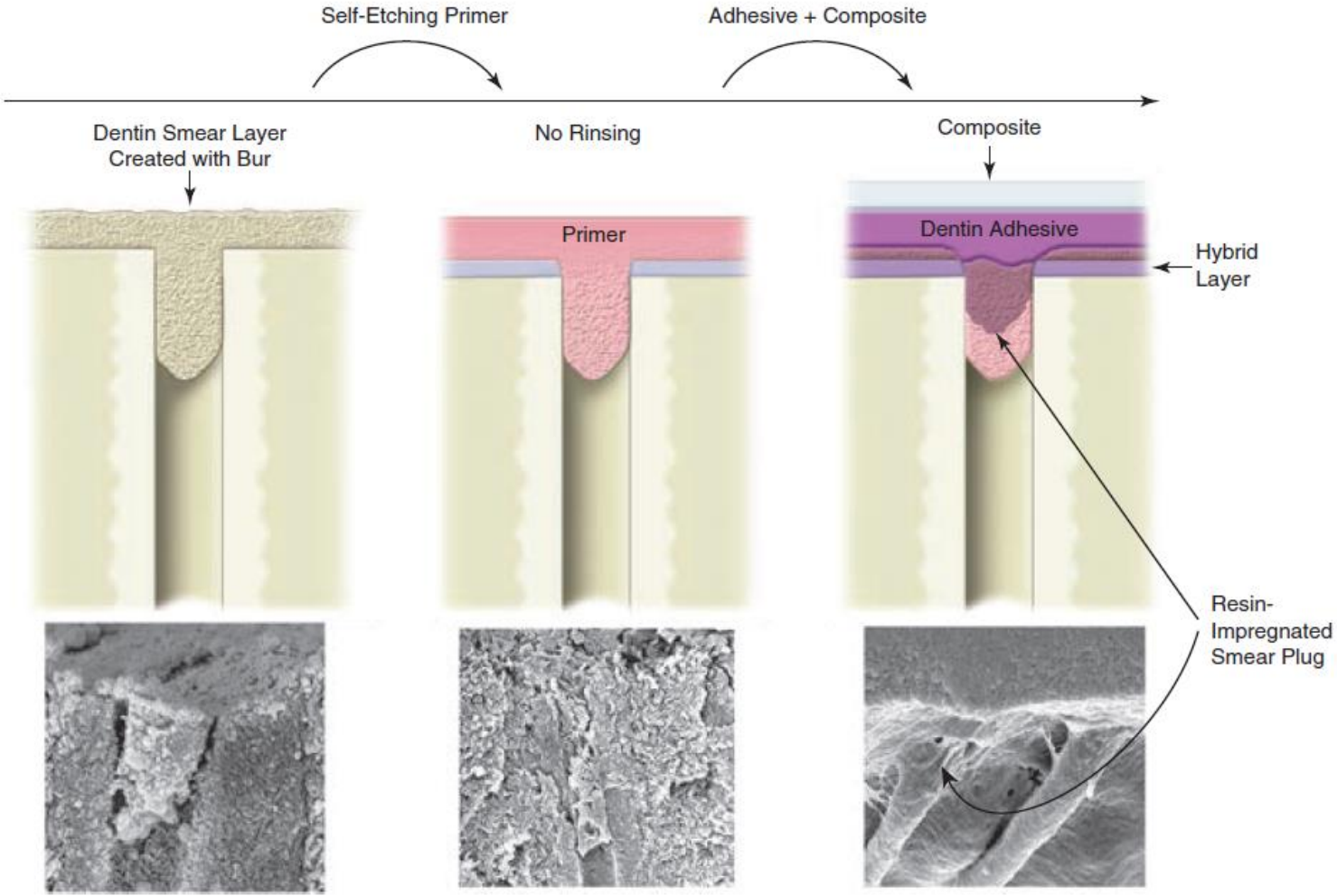
- Adhesive application

Hybrid Layer

Dentin Tag : 5-10µm



Self-etch Adhesives


Self-Etching Primer
Adhesive + Composite
Dentin Smear Layer
Created with Bur
No Rinsing
Composite
Primer
Dentin Adhesive
Hybrid
Layer
Resin-
Impregnated
Smear Plug

Consistency

- Flowable (Flowable, Flow)
  - Low amount of filler
  - Greater polymerization shrinkage
  - Physical properties are weaker
  - Underfilling, stress-breaking effect
- Packable
  - Higher amount of filler
  - Physical properties are appropriate

Polymerization of composites

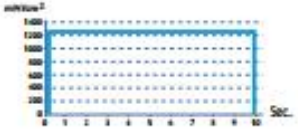
- Halogen lamps
  - 400-800 mW/cm2
- Plasma Lamps (PAC Plasma Arc Curing)
  - 2400-3200 mW/cm2
- Argon Laser-Lamps
- LED-Polymerisation (Lightdiode)
  - mono, poli-led – different photoinitiators
  - 1000-1400 mW/cm2

On/off button.

Choice of three modes for optimal curing of all types of composite

Normal mode

Emits at full power for 10 seconds (audible signal after five seconds).



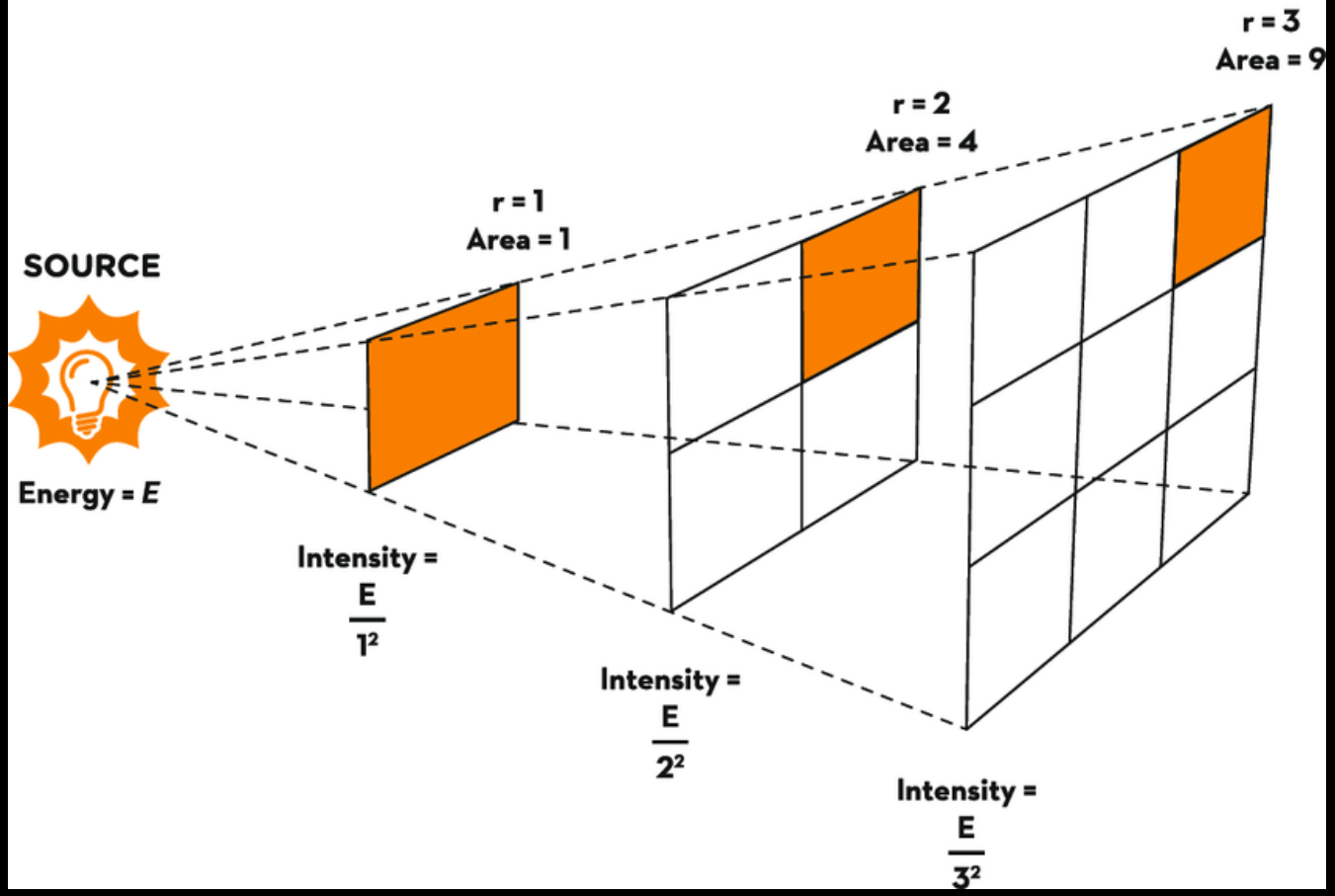
Pulse delay

Emits 10 successive one-second flashes at full power (audible signal after five flashes).

Soft start

Emits 20 seconds progressively up to full power (audible signal every five seconds).

Inverse Square Law



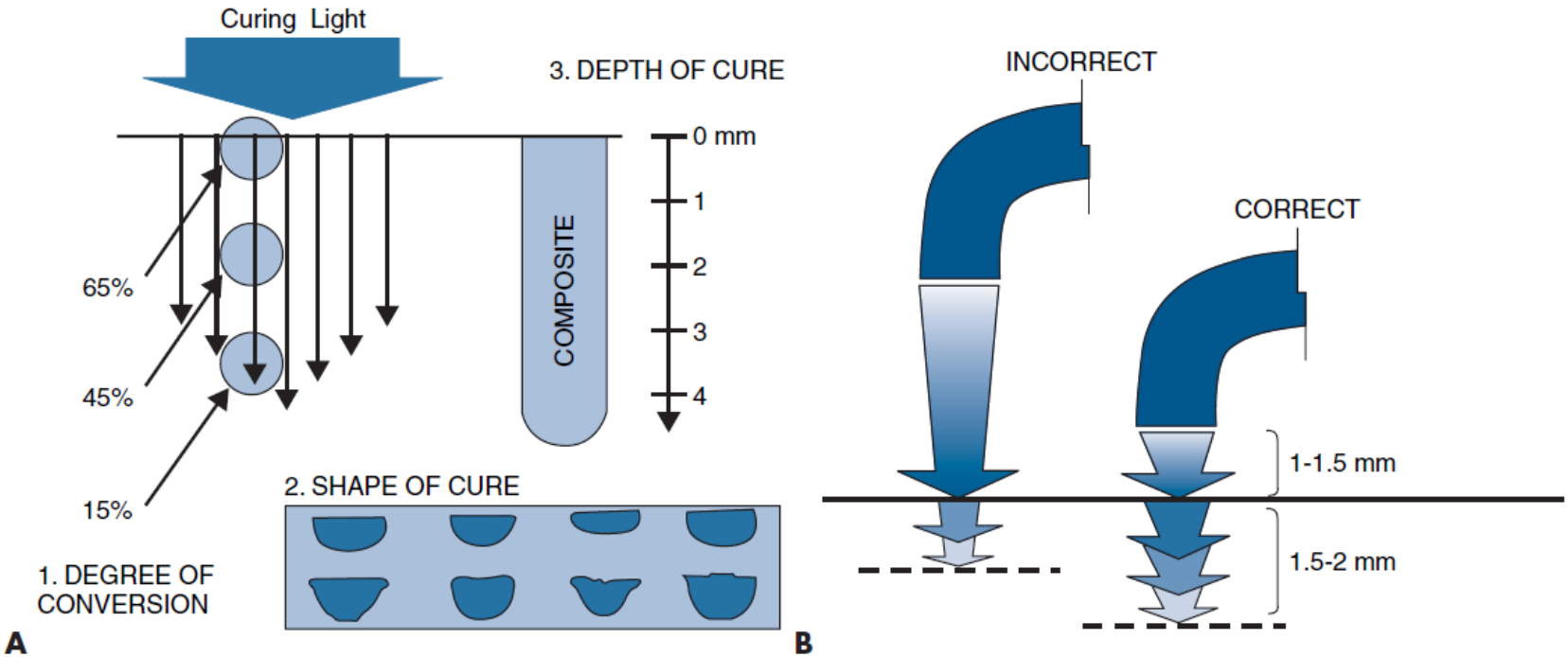
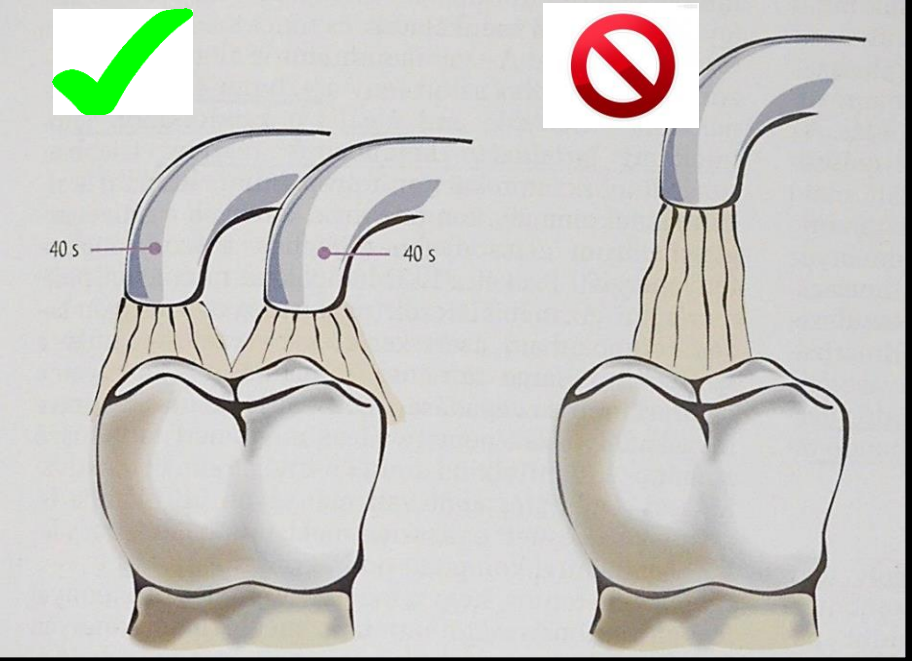
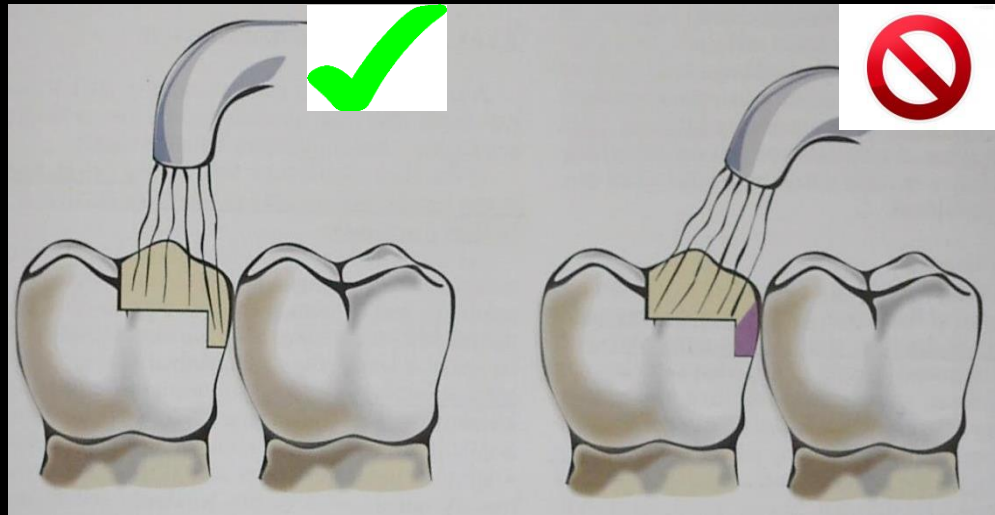


FIGURE 4-76 Light intensity influences on polymerization zone. A, Varying light intensity with width and depth affects the degree of conversion of monomer to polymer, shape of cure, and depth of cure. **B,** Proximity of curing light to the surface affects the depth of penetration of light into the surface.

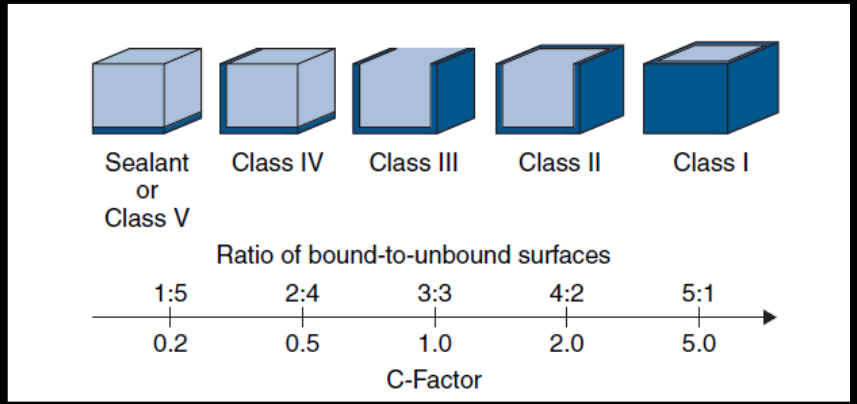

40 s
40 s

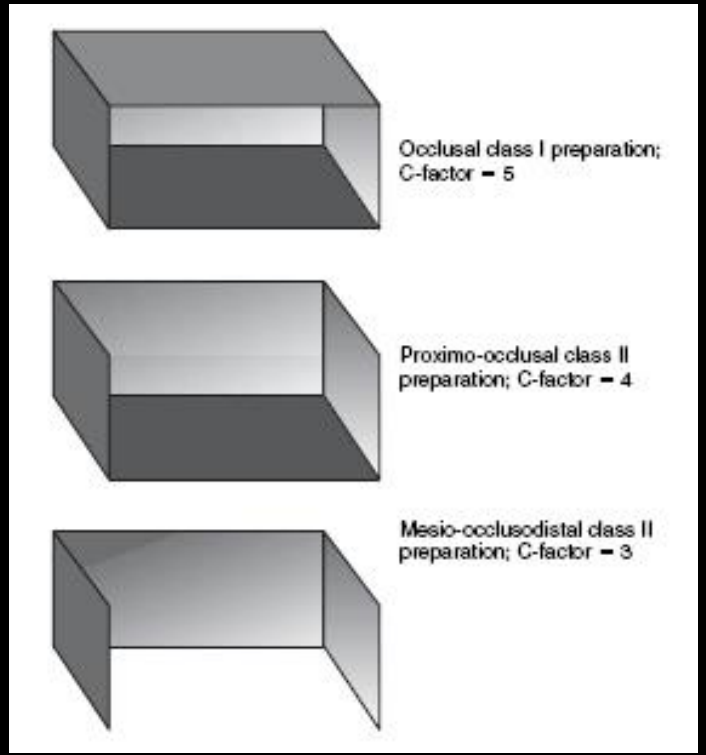


C-faktor/Configuration factor

<u>Bound Surfaces</u>

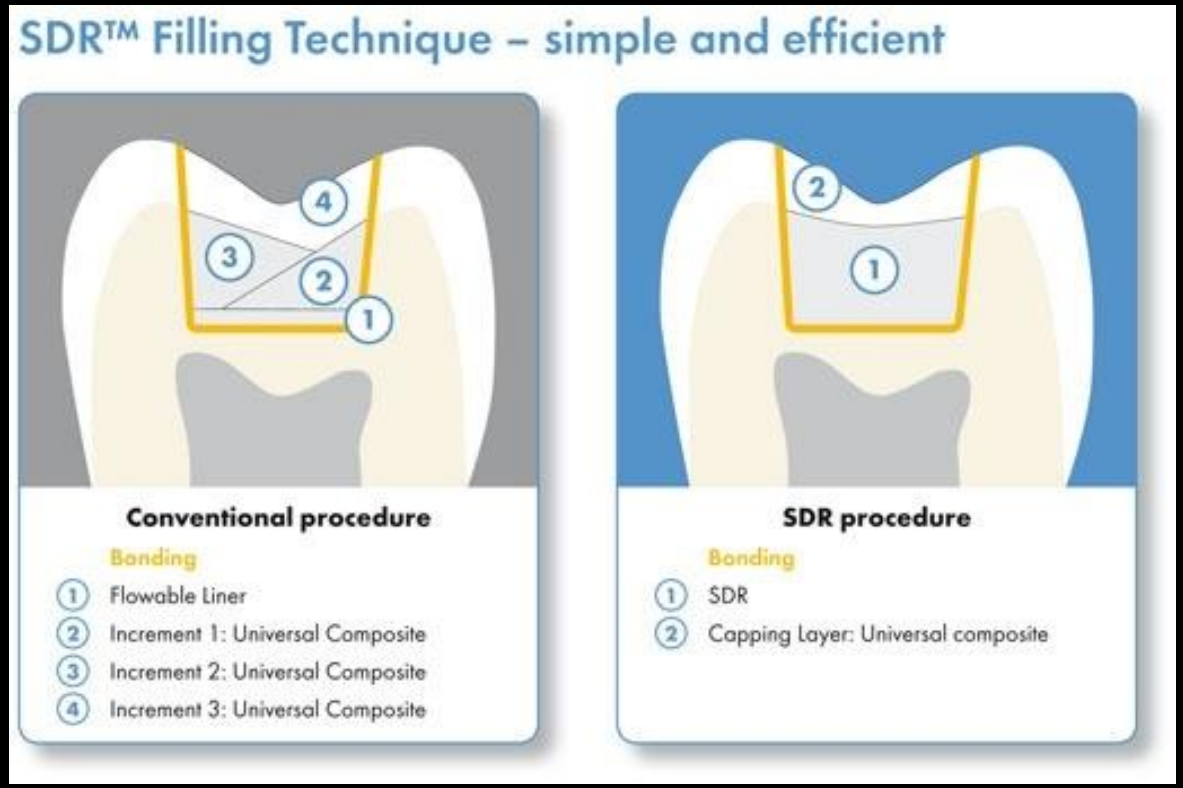
Unbound Surfaces



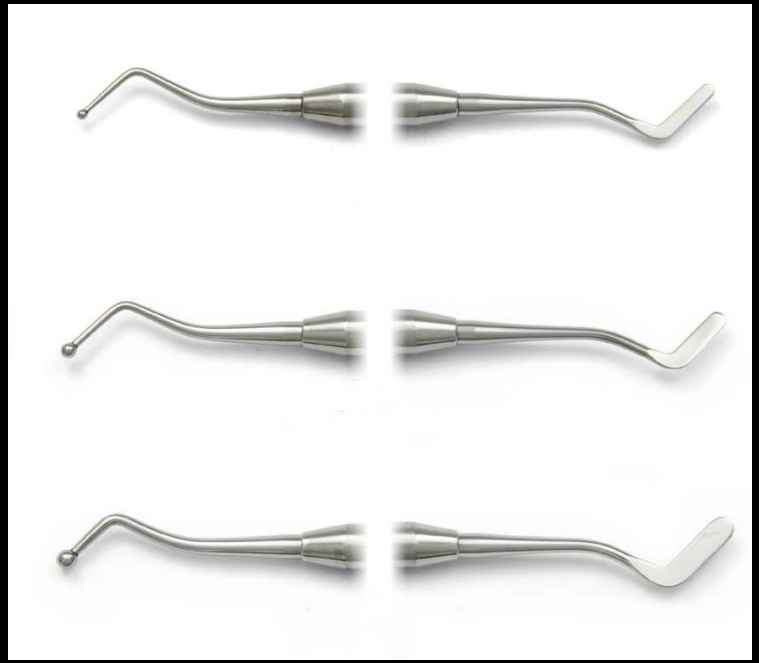


Composite layering techniques

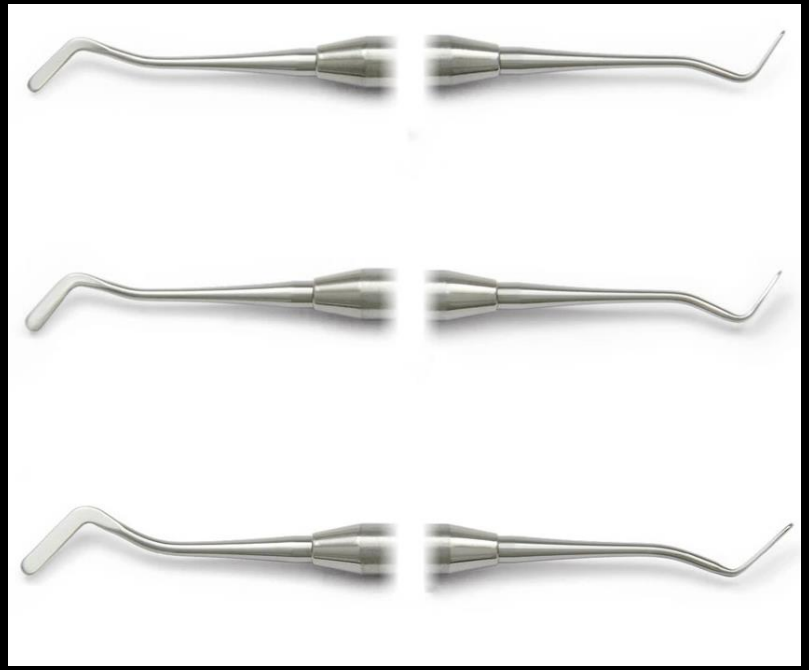
- Oblique
- Bulk filling



Instruments



Cement condense



Flaggs/Heidemann Spatula

Thomas

Normal

Teflon (X-Shadeline® – Deppeler)

Titanium-Nitride

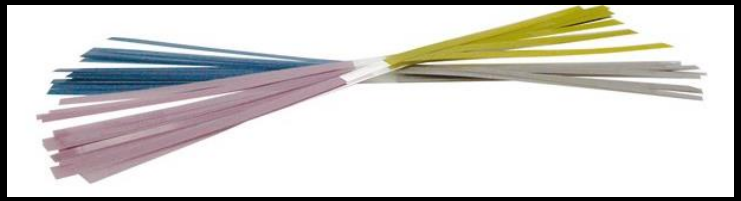
Contouring, Finishing

- Diamond, Hard-metal (red-yellow-white)

- Occlusion control

Polishing

- Polishing-disk
- Rubber polishers
- Polishing-Strip
- Polishing-Brush and Paste

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