Composites in posterior teeth

All pit and fissure restorations.

They are assigned in to three groups.
R. on occlusal surface of premolars and molars

R. in foramina coeca – usually on occlusal two thirds of the facial and lingual surfaces of molars.

R.on lingual surface of maxillary incisors.

Longevity of fillings

Trvanlivost

Indications

- Moderate to large restorations
- Restorations that are not in highly aesthetics areas
- Restorations that have heavy occlusal contacts
- Restorations that cannot be well isolated
- Restorations that extend onto the root surface
- Foundations
- Abutmjent teeth for removable partioal dentures
- Temporary or caries control restorations.

Contraindications

- Aesthetically prominent areas of posterior teeth
- Small moderate classes I. that can be well isolated

Materials: Amalgam, composite.

Amalgam:

Pertinent material qualities and propeties

Strength

Longevity

Ease of use

Clinically proven sucess

Clinical technique

- From the occlusal surface using the fissure bur (or diamond burs, see below).

Outline

- Ideal outline includes all occlusal pits and fissures. If crista transversa od obliqua are no affected, it is recommended not to prepare them.

Resistance principles

- Keep the facial and lingual margin extensionsas minimal as possible between the central groove and the cusp tips.
- Extending the outline to include fissures, thereby placing the margins on relatively smooth sopund tooth structure.
- Minimally extending into the marginal ridge without removing dentinal support.
- Eliminating a weak wall of enamel by joining teo outlines that come close together
- Enamel.
  - Nevel leave the enamel undermined
- All corners are round, the bottom smooth.

Retention principles

- Prepare the box – the bottom is in dentin
- Undercuts can be prepared, the proximal ridges must not be weakened!

Removal of carious, infected, dentin and remaining defective enamel.

- Spoon excavator or a slowly revolving , round carbid bur of appropriate size.

Indications

- Aesthetically prominent areas of posterior teeth
- Small - moderate classes I. that can be well isolated
- Good level of oral hygiene is necessary

Contraindications

- Moderate to large restorations
- Restorations that are not in highly aesthetics areas
- Restorations that have heavy occlusal contacts
- Restorations that cannot be well isolated
- Restorations that extend onto the root surface
- Abutment teeth for removable partioal dentures
- Temporary or caries control restorations.

Materials: Amalgam, composite.

Amalgam:

Pertinent material qualities and propeties

Strength

Longevity

Ease of use

Clinically proven sucess

Clinical technique

- From the occlusal surface using the fissure bur (or diamond burs)

Outline

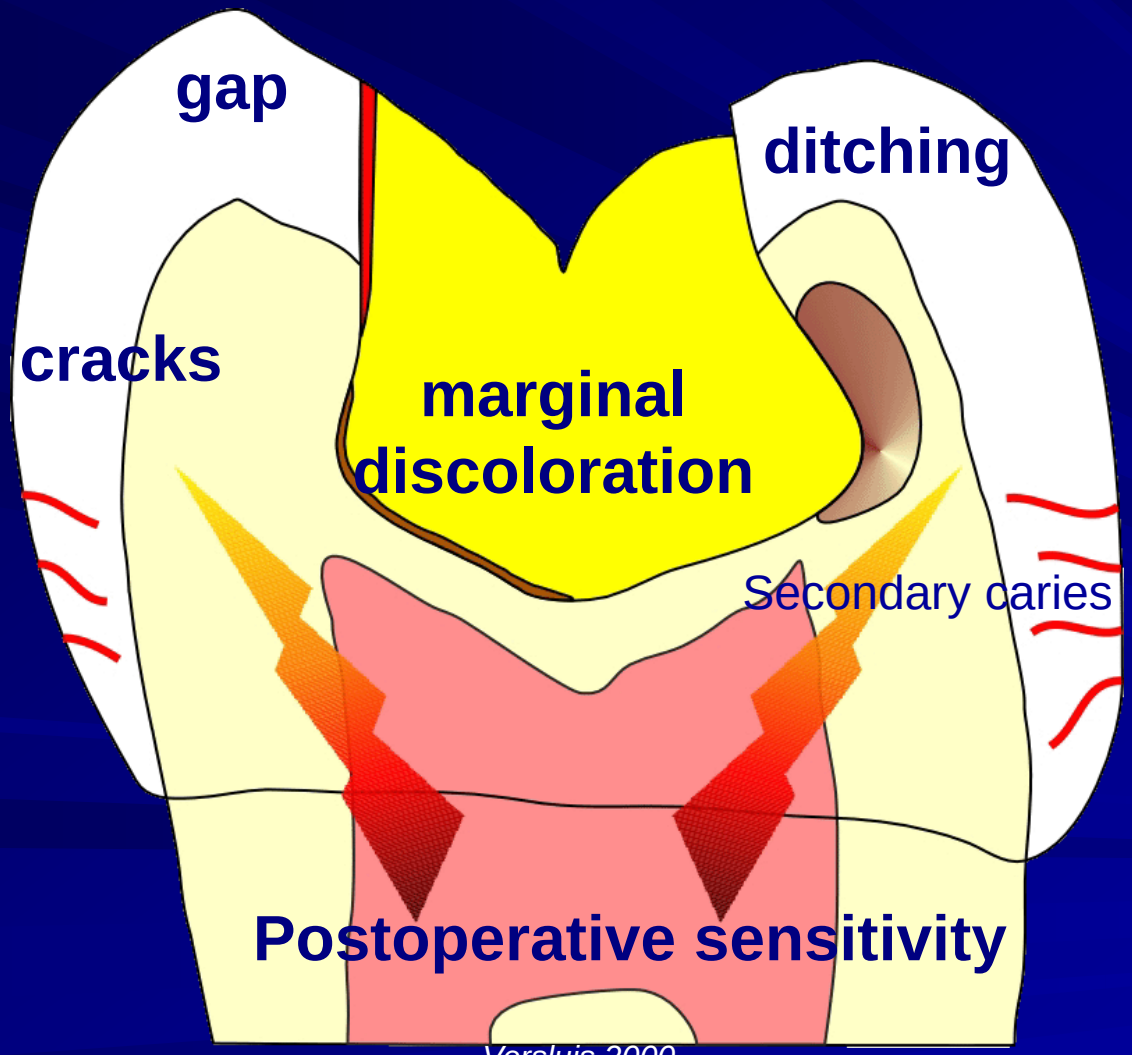
- Outline includes the caries lesion only

Retention principles

- Prepare the box or deep dish – the bottom is in dentin
- Do not prepare any undercuts!
- Do not bevel enamel, finish the border with diamond bur inly.

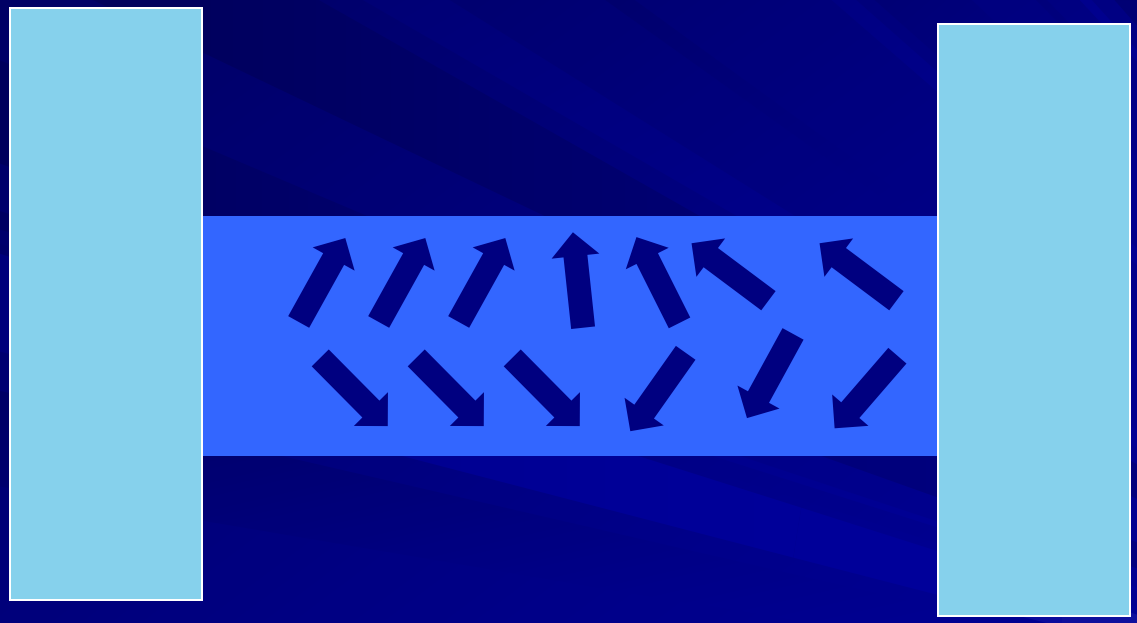
Removal of carious, infected, dentin and remaining defective enamel.

- Spoon excavator or a slowly revolving , round carbid bur of appropriate size.

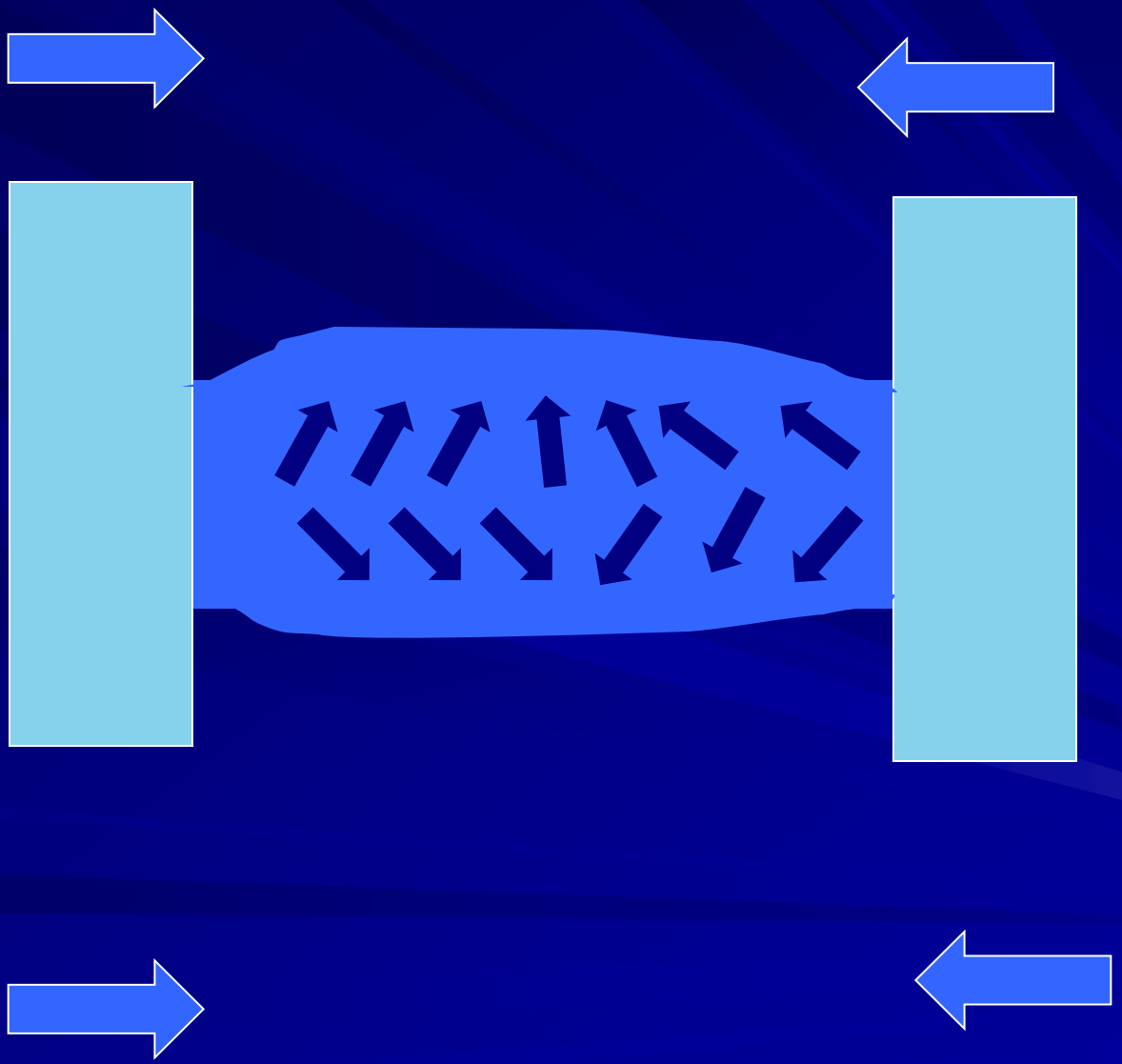


Versluis 2000

Polymerization shrinkage

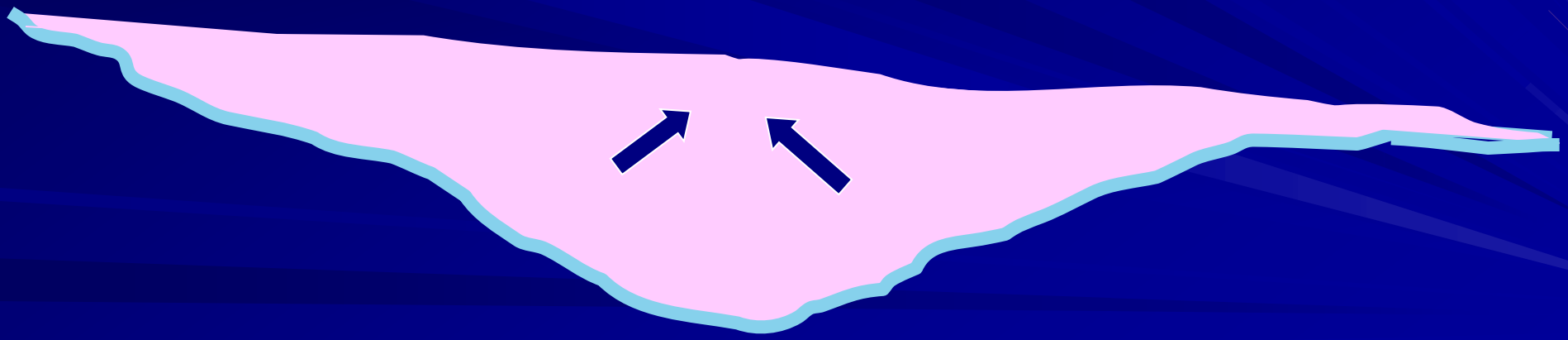


Polymerization shrinkage



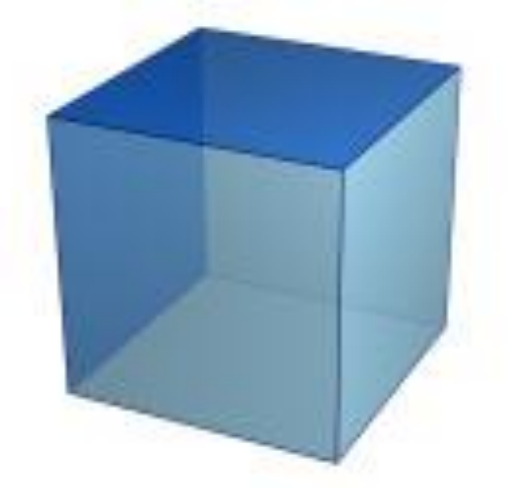
C - factor

Surface of adhesion/free surface of the filling



1/1 and less is optimal

5



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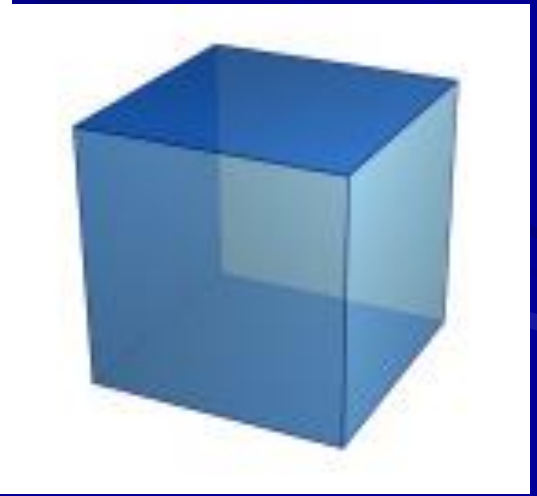

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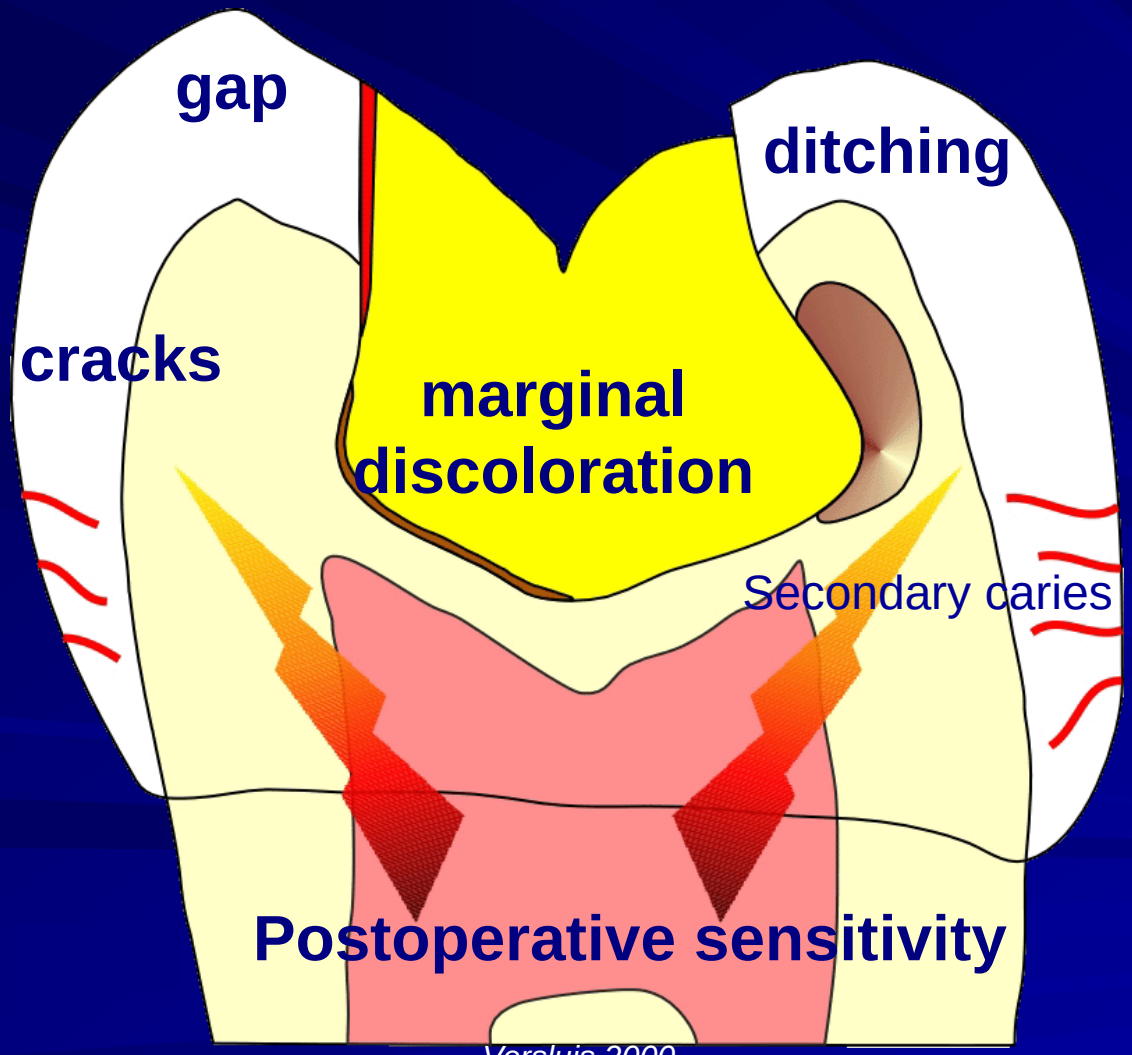
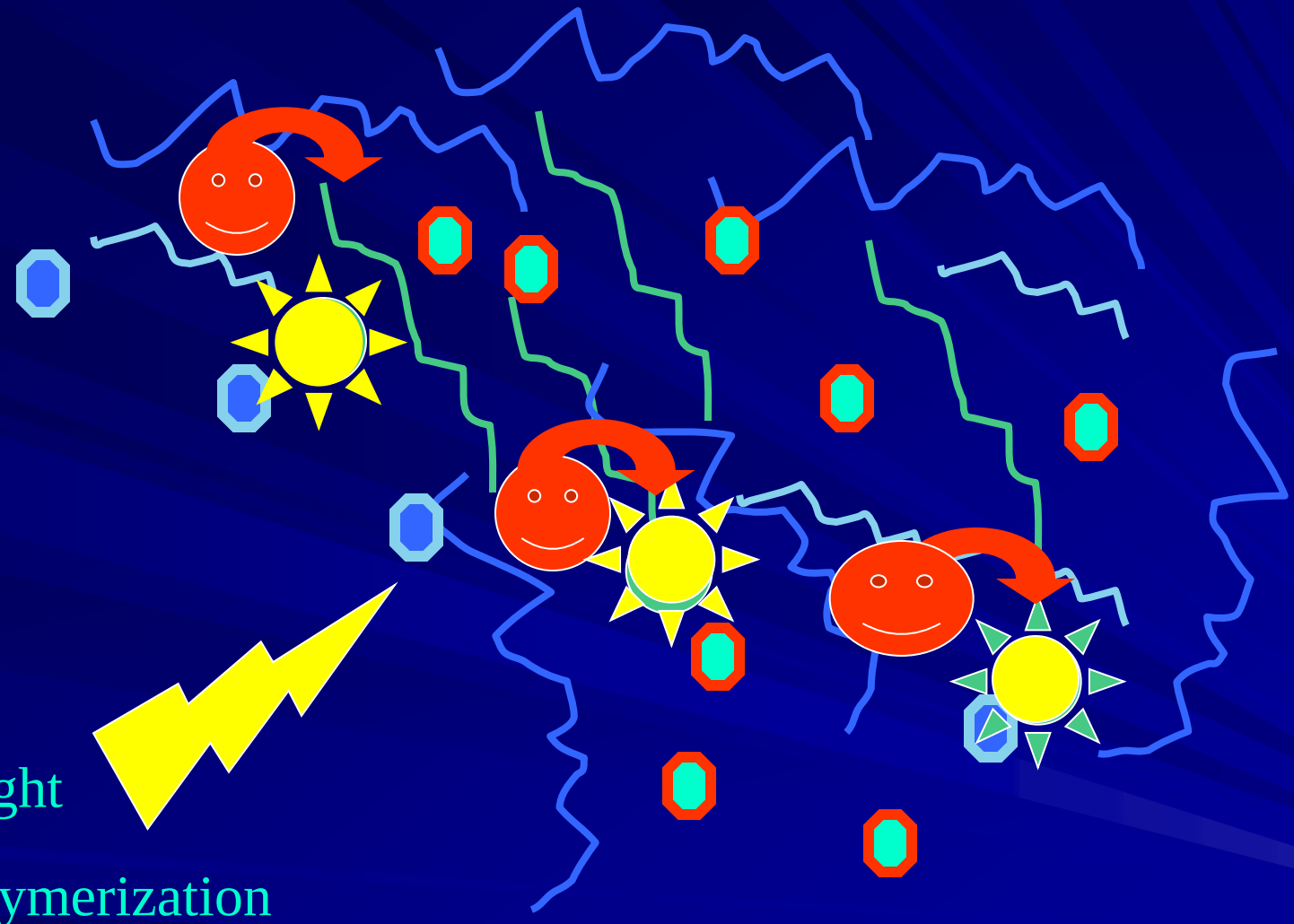
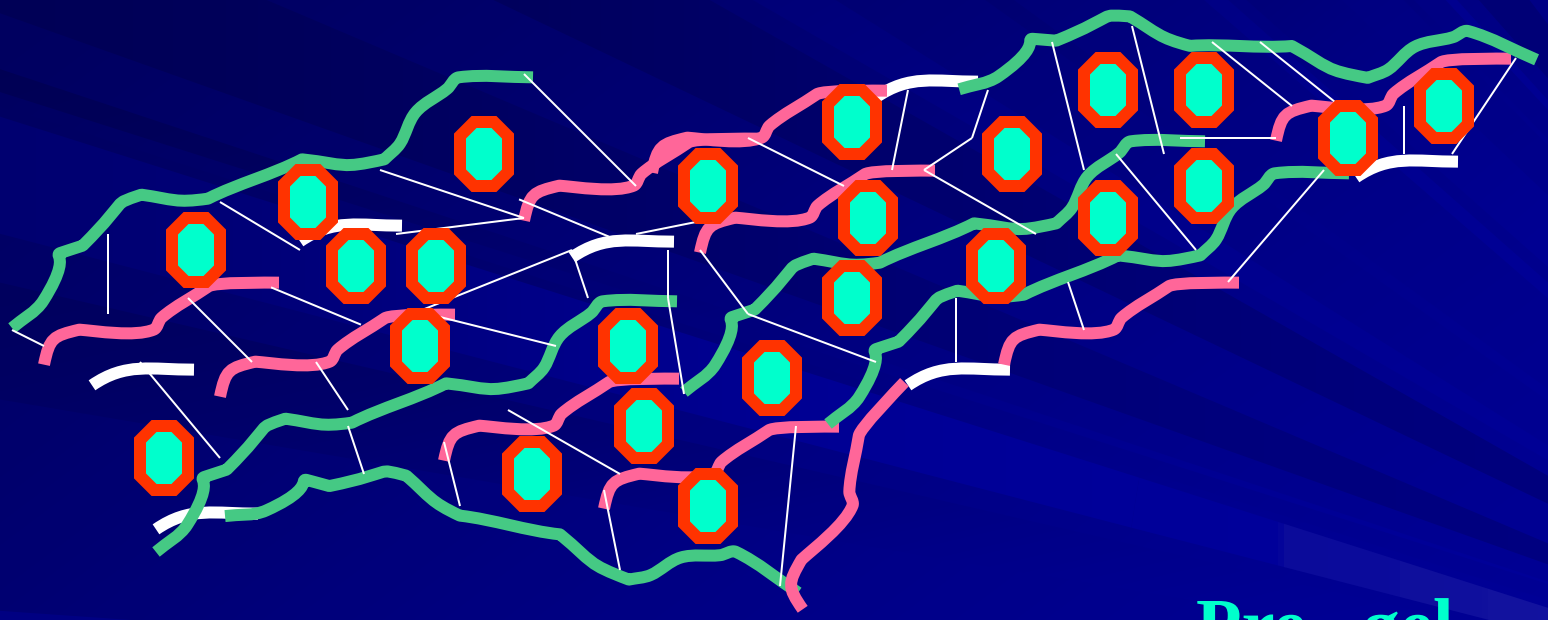


Versluis 2000



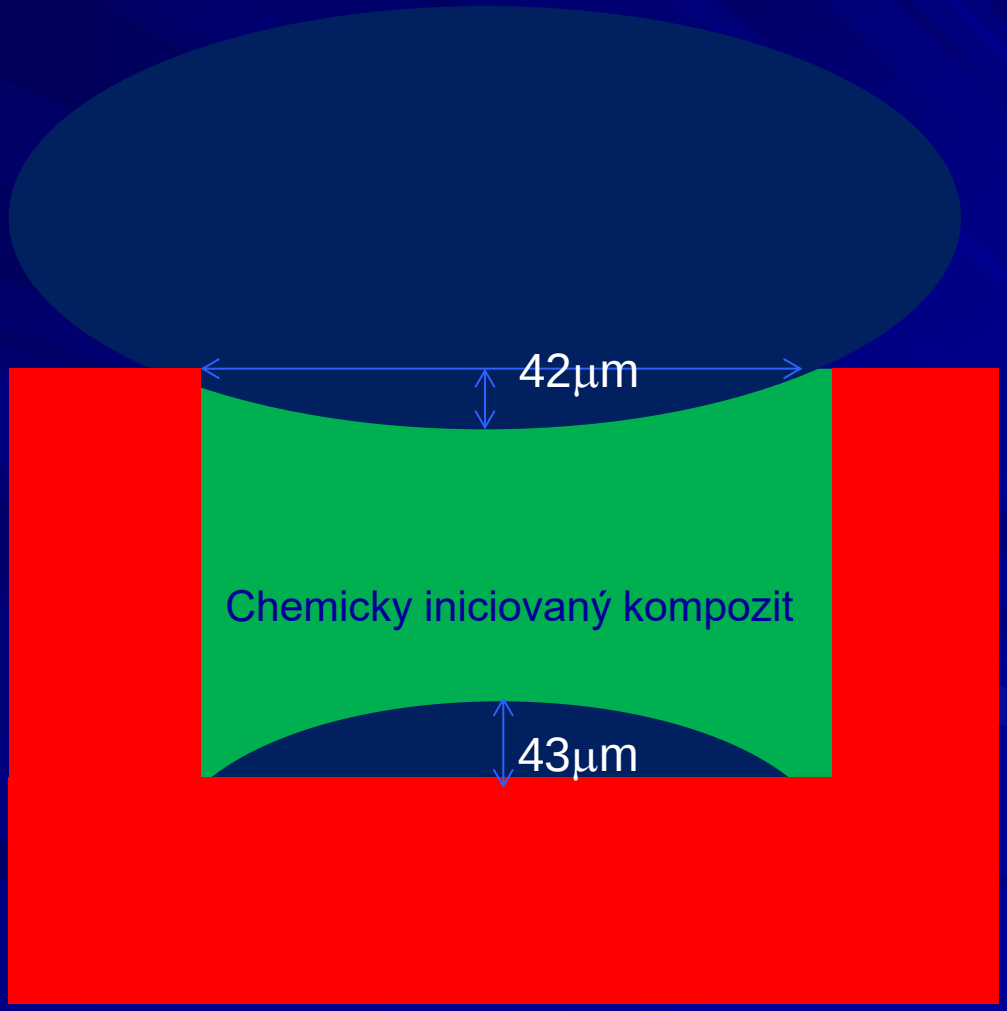
Monomer → Polymer

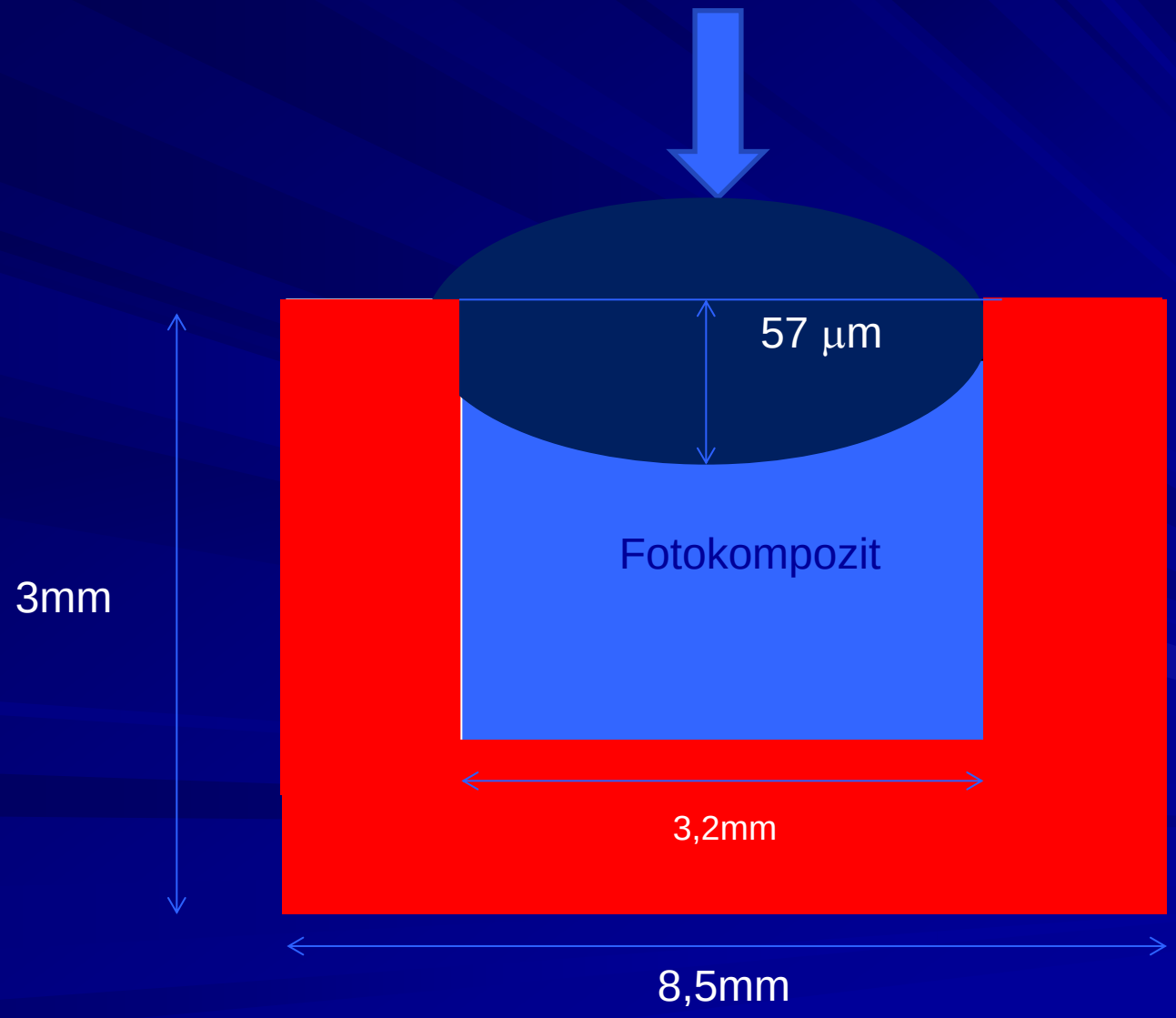
Polymerní síť

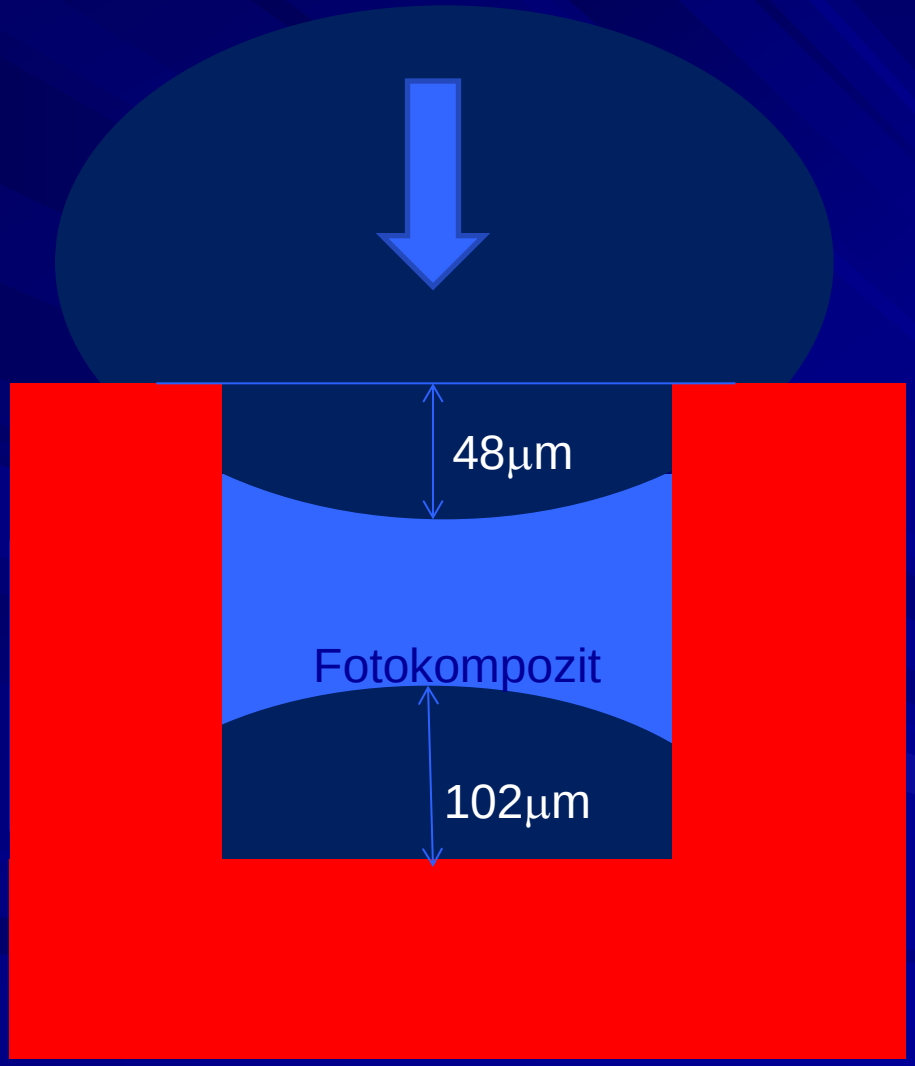


-

Pre –gel
Gel point
Post -gel


42μm
Chemicky iniciovaný kompozit
43μm


57 μm
Fotokompozit
3mm
3,2mm
8,5mm


48μm
Fotokompozit
102μm

Forces of polymerization shrinkage depend on

- Composite material (content of filler)
- Geometry of the cavity (C-factor)
- Placement of the composite
- Mode of polymerization

Forces of polymerization shrinkage depend on (polymerization stress)

Composite material (content of filler)

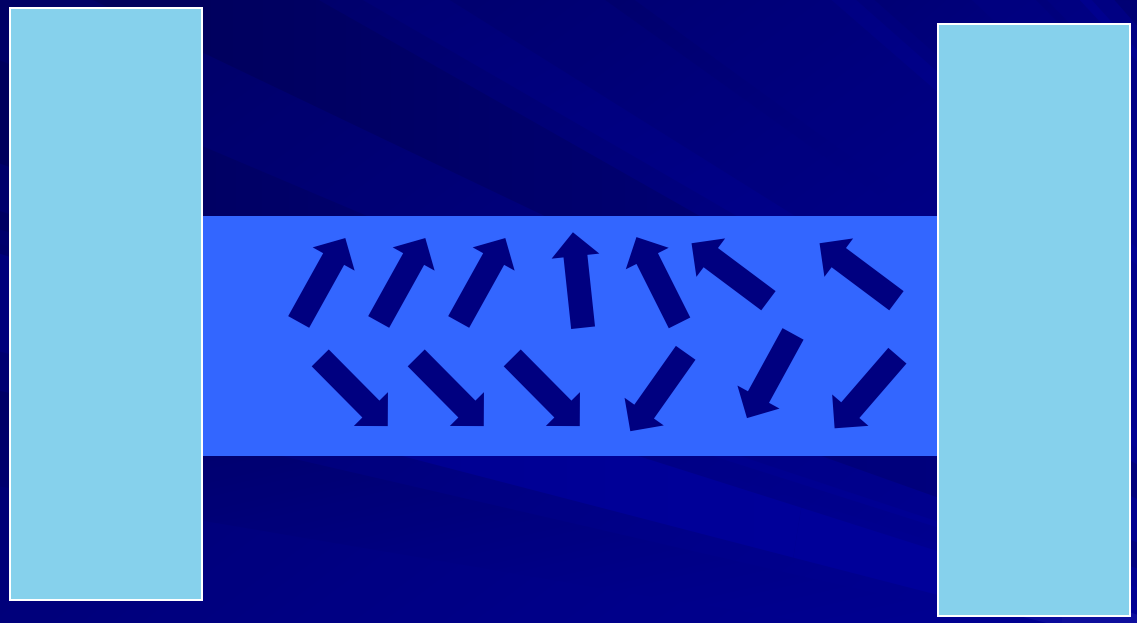
High content of the filler causes bigger stress

Flowable composites – low stress

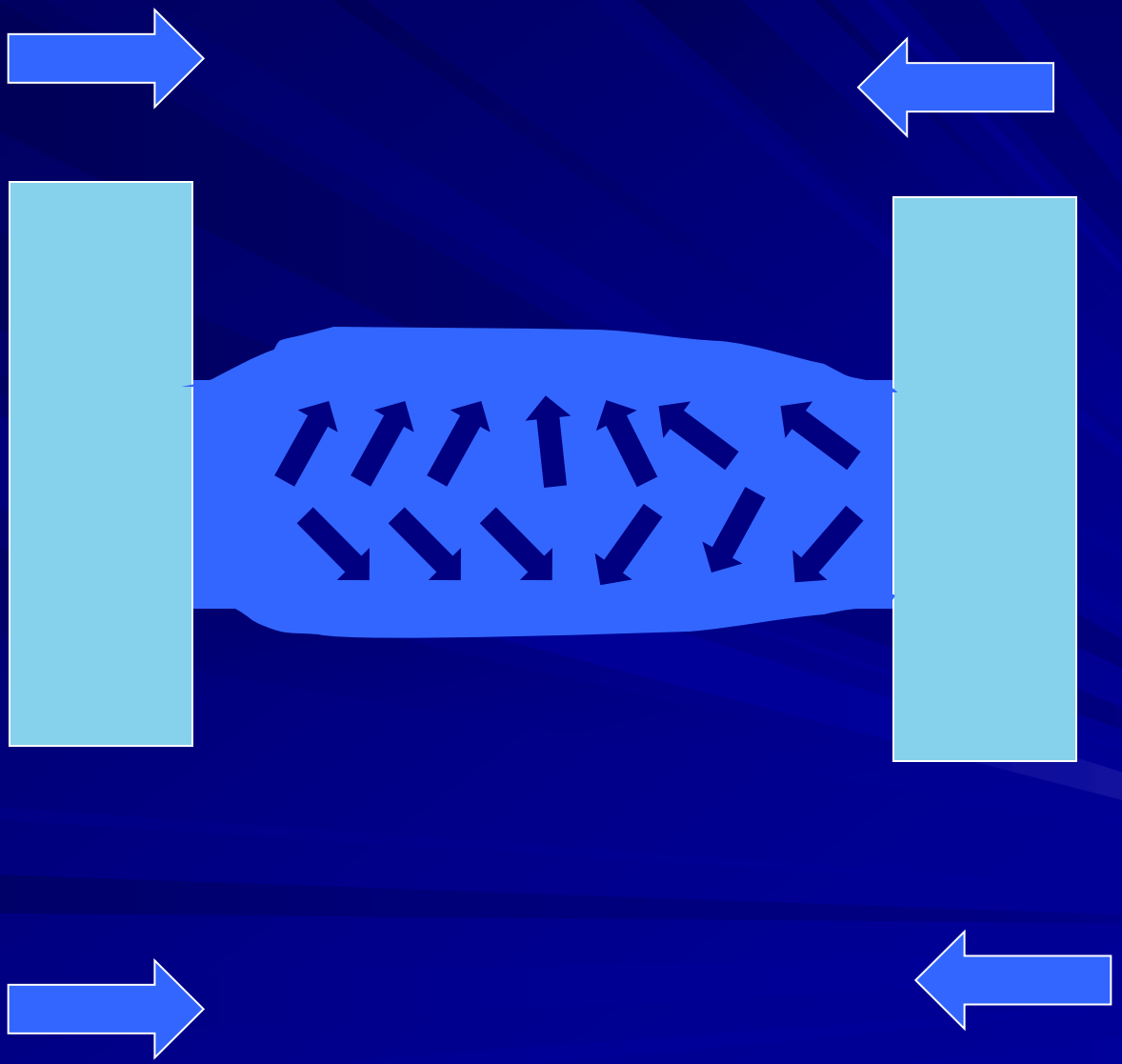
Forces of polymerization shrinkage depend on

Geometry of the cavity (C-factor)

Polymerization shrinkage

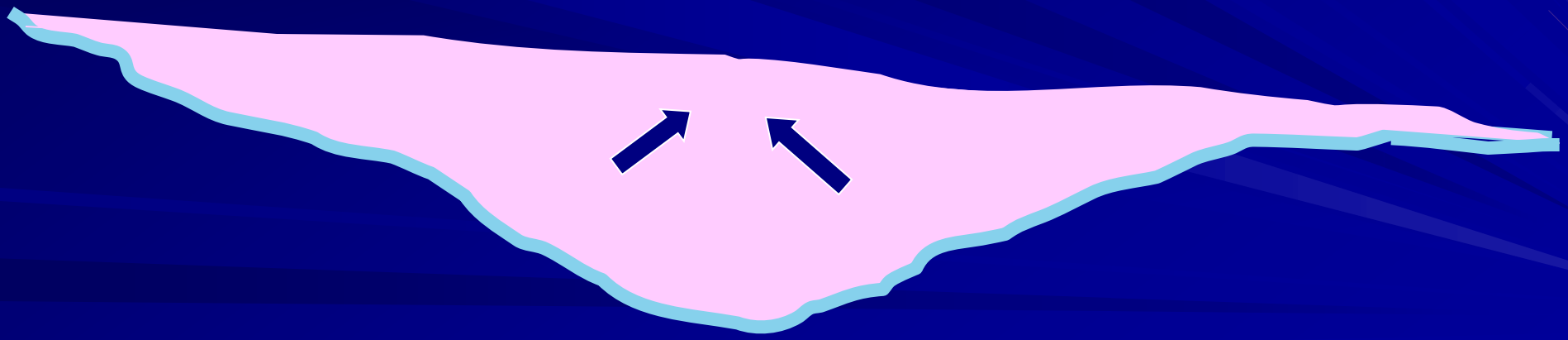


Polymerization shrinkage



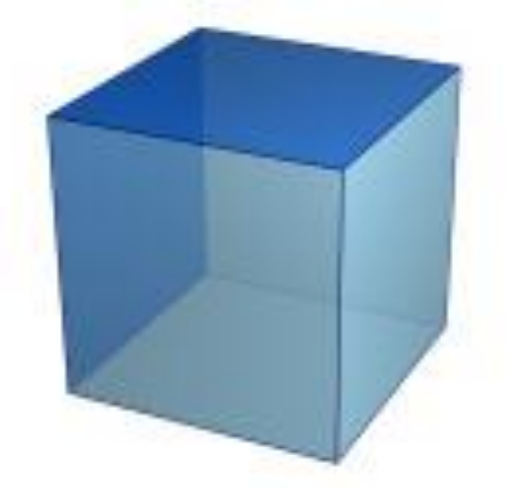
C - factor

Surface of adhesion/free surface of the filling



1/1 and less is optimal

5



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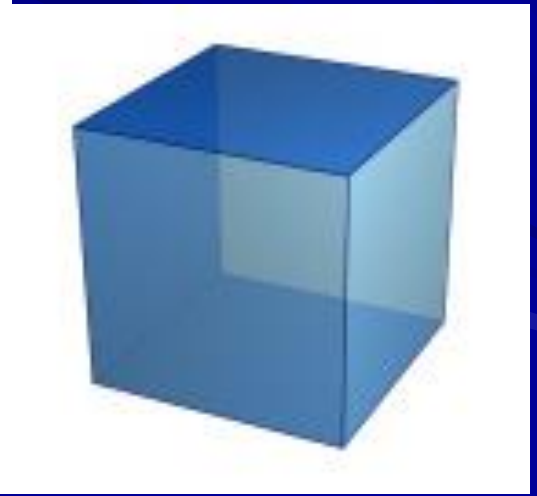

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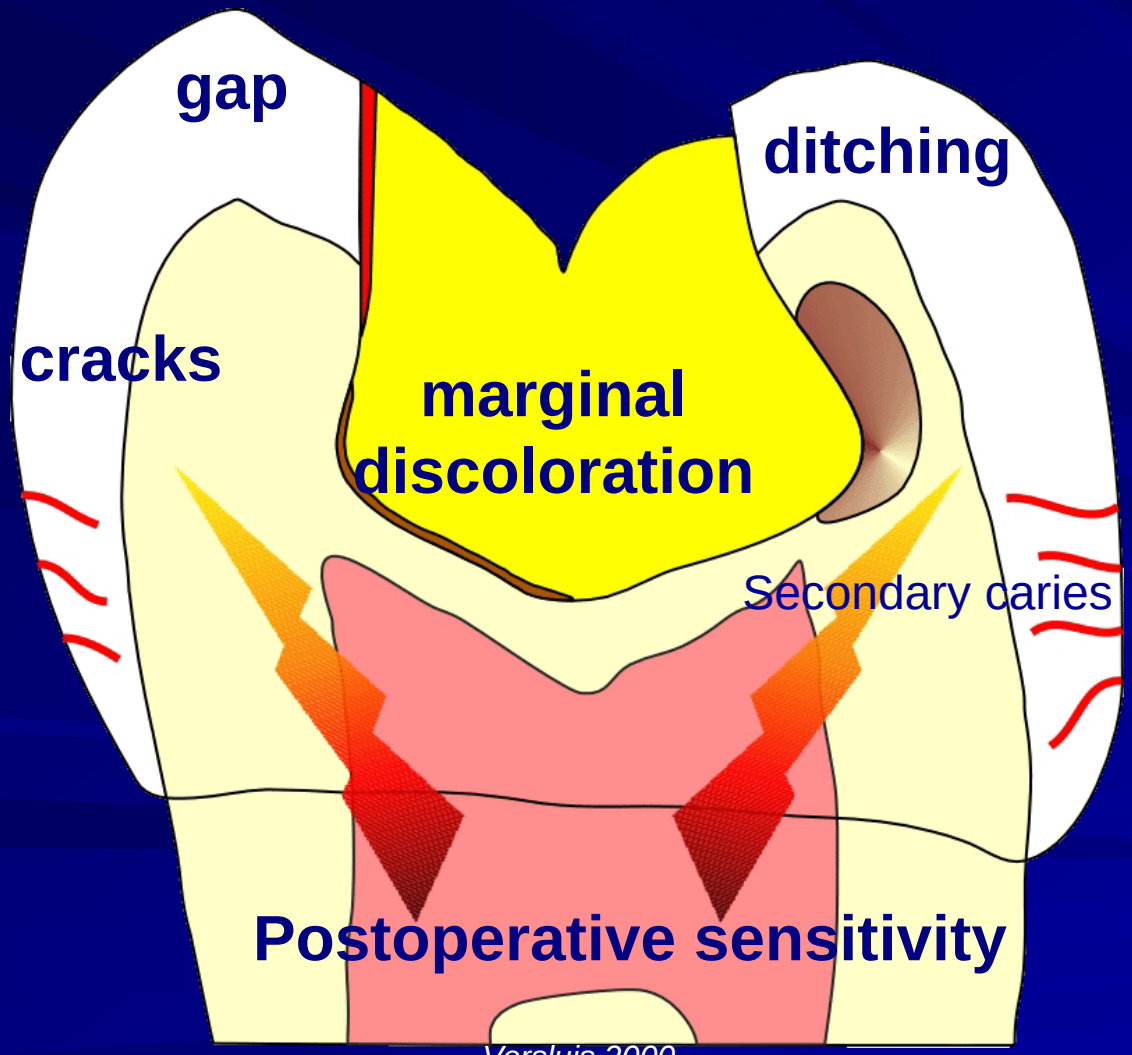


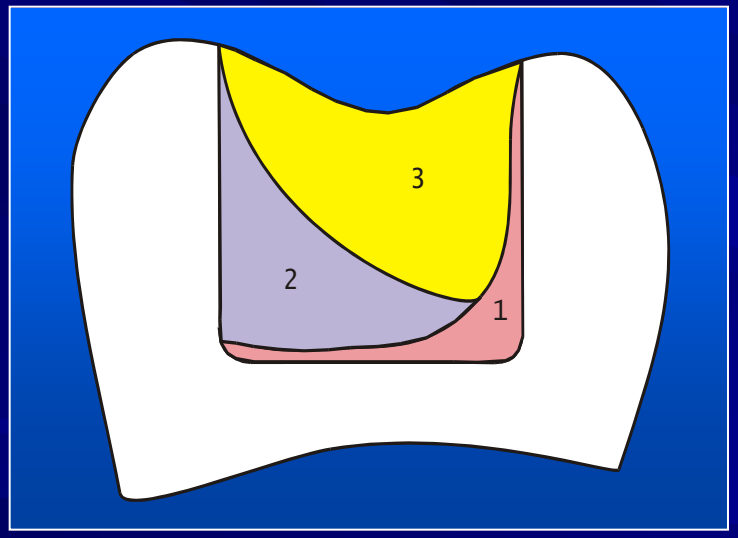
Versluis 2000

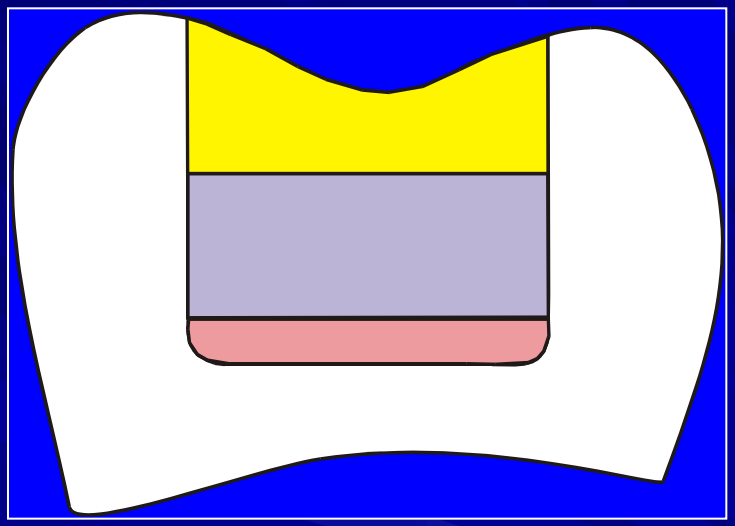
Forces of polymerization shrinkage depend on

- Placement of the composite:

- *Create the first layer thin, flowable can be used*
- *Place th material in increments with respect of the C-factor of each layer*

Placement of the material



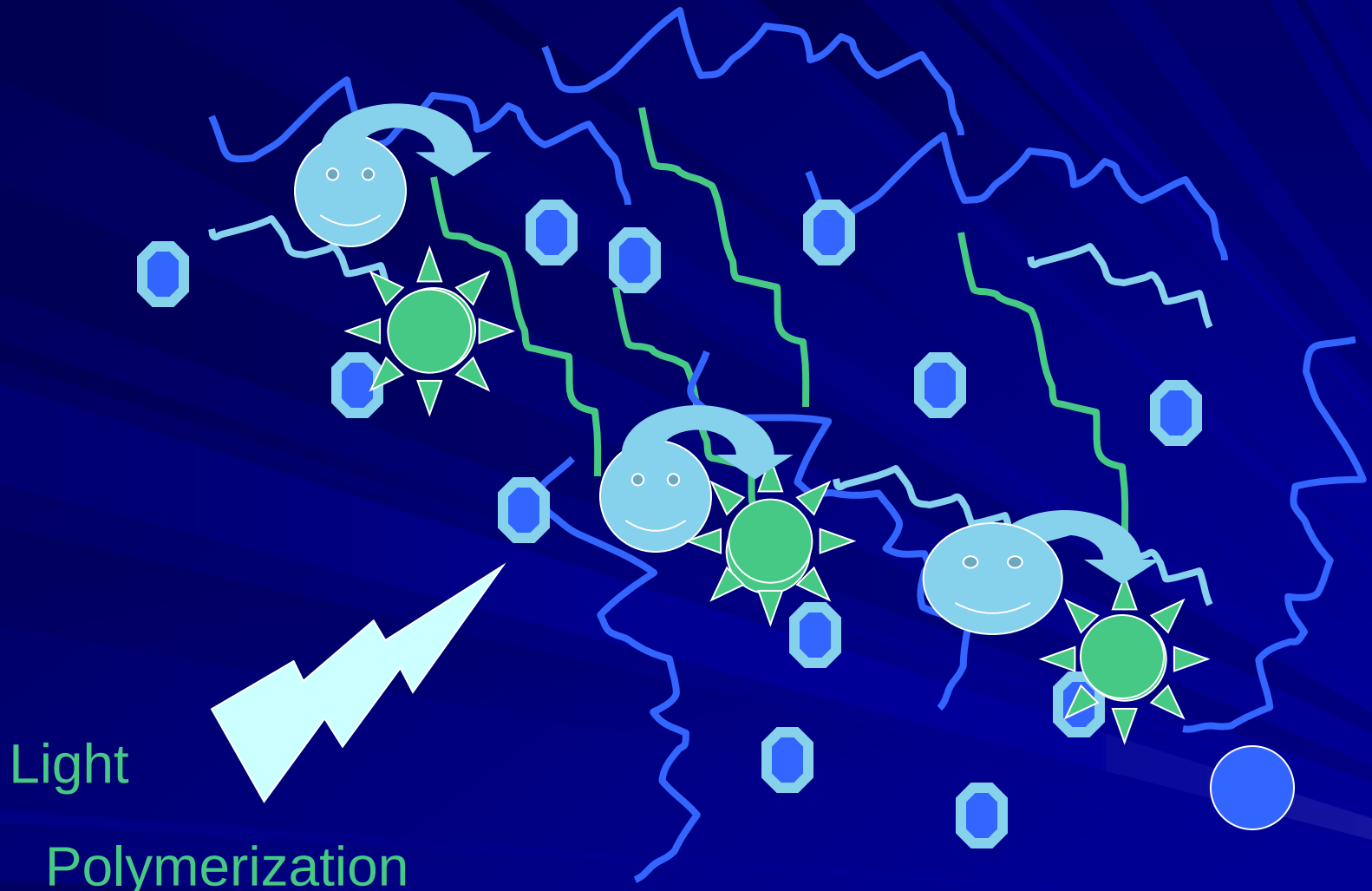


Forces of polymerization shrinkage depend on

- Mode of polymerization

Phases

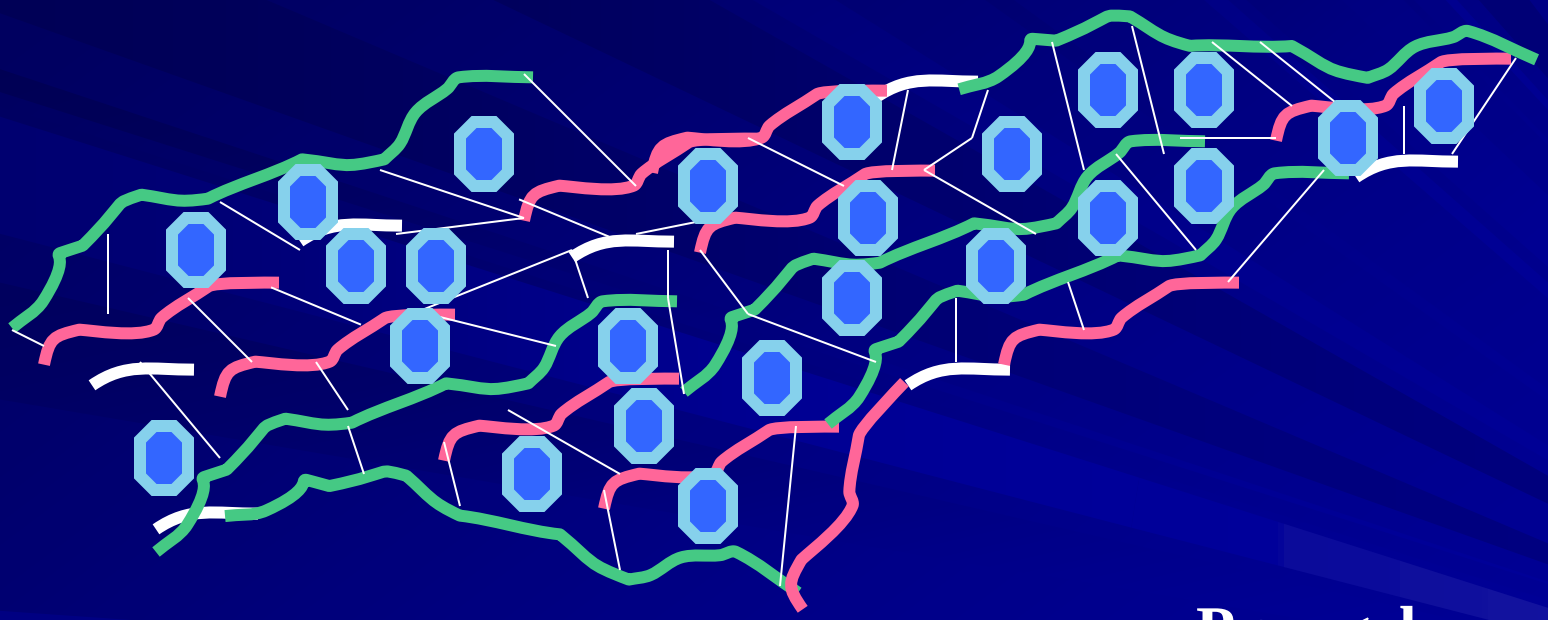
- Pre-gel
- G-point
- Post -gel



Polymerization

Monomer ⟶ Polymer

Pre gel phase should be long – soft start !!!!



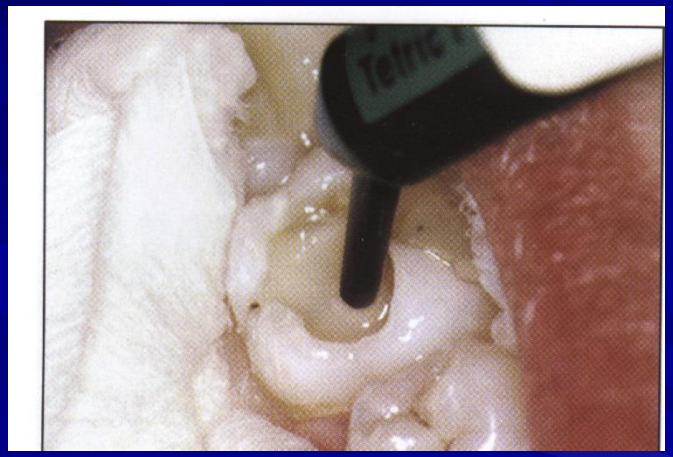
Pre –gel
Gel
Post -gel

Marginal adaptation

- Placement of composite material
- Dry operating field
- Adhesive systems

Flow materiály - význam

1. **Vyrovnání zátěže** (protistresové vlastnosti)
2. **Vyblokování podsekřivin**
3. **Adaptace ke stěnám**
4. **Estetické důvody**
5. **Ochrana adheziva**

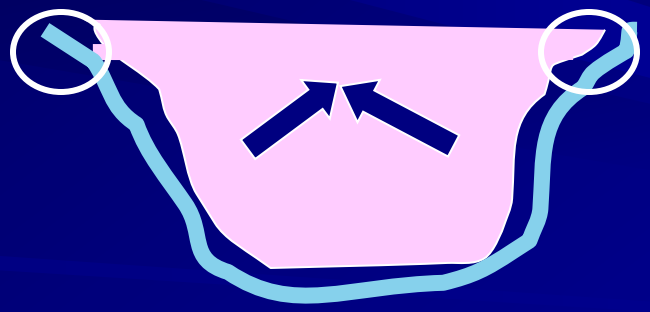


Temperovaný kompozit

C-faktor

= konfigurační faktor

Plocha adheze / volný povrch výplně



nepříznivý C-faktor

Adhesives

- Acid etching technique
- Selfetching adhesive systems

Adhesives

- Acid etching technique

Etching
Washing
Priming Bonding

Adhesives

- Selfetching adhesive systems

Priming

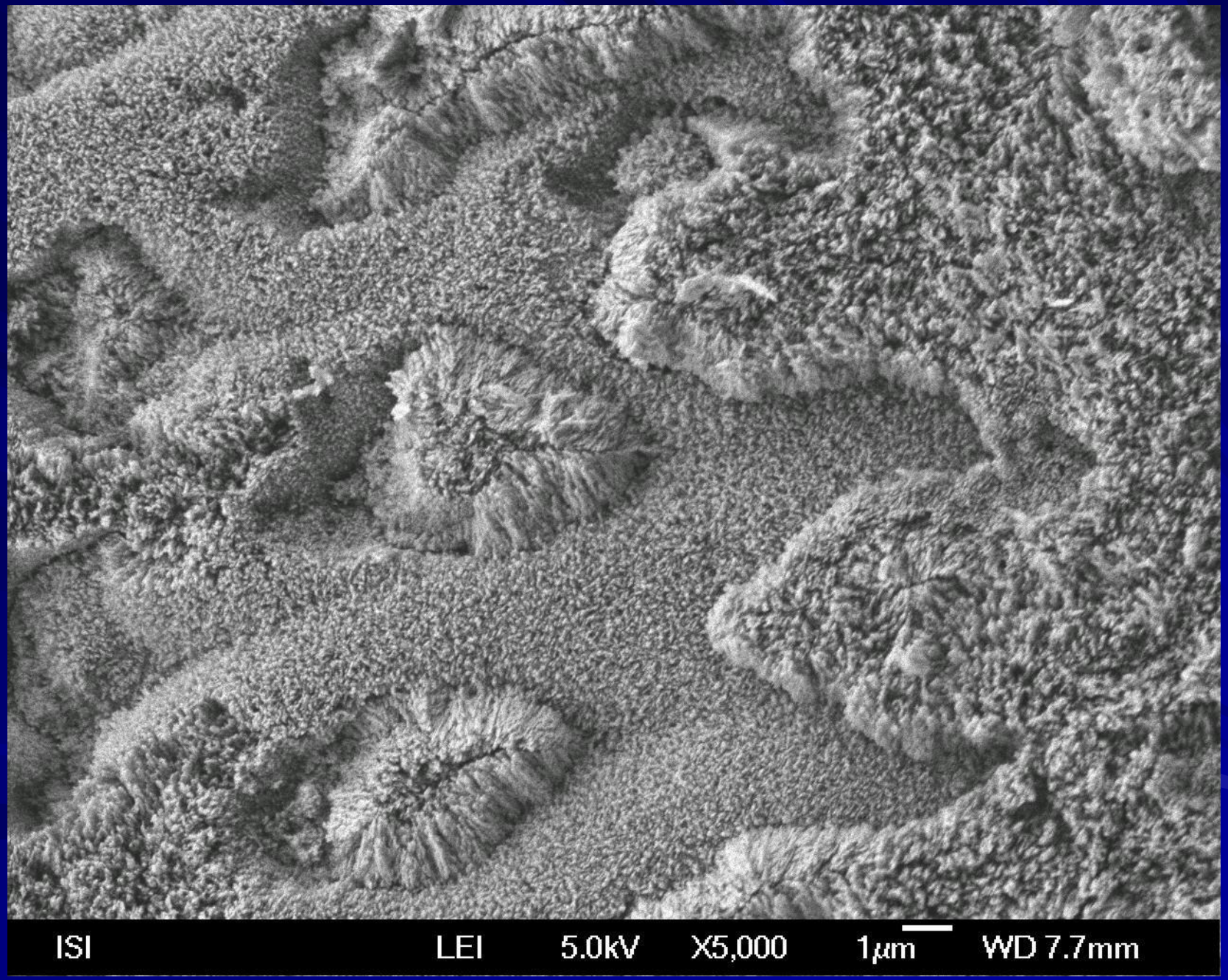
Bonding

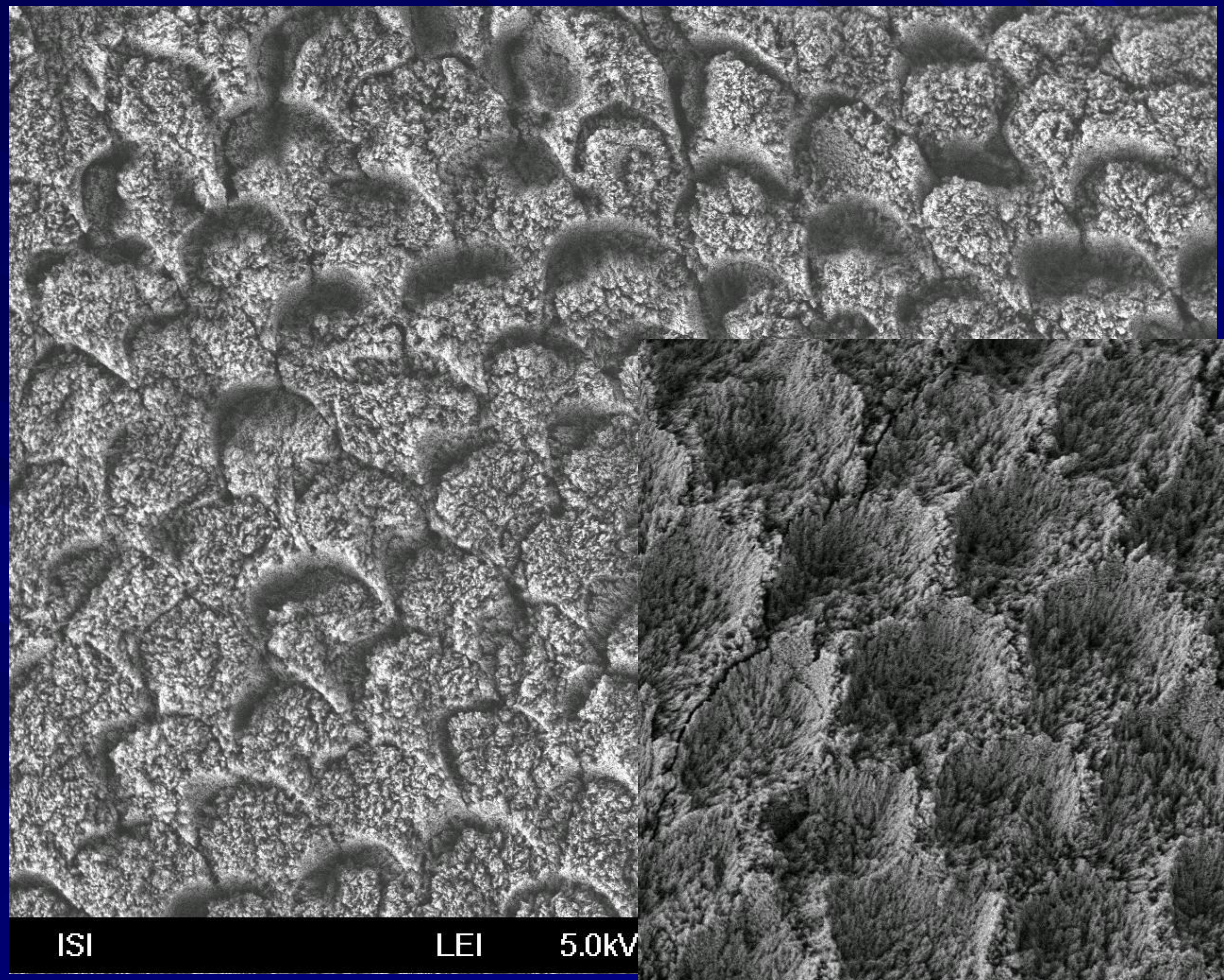
Adhesives

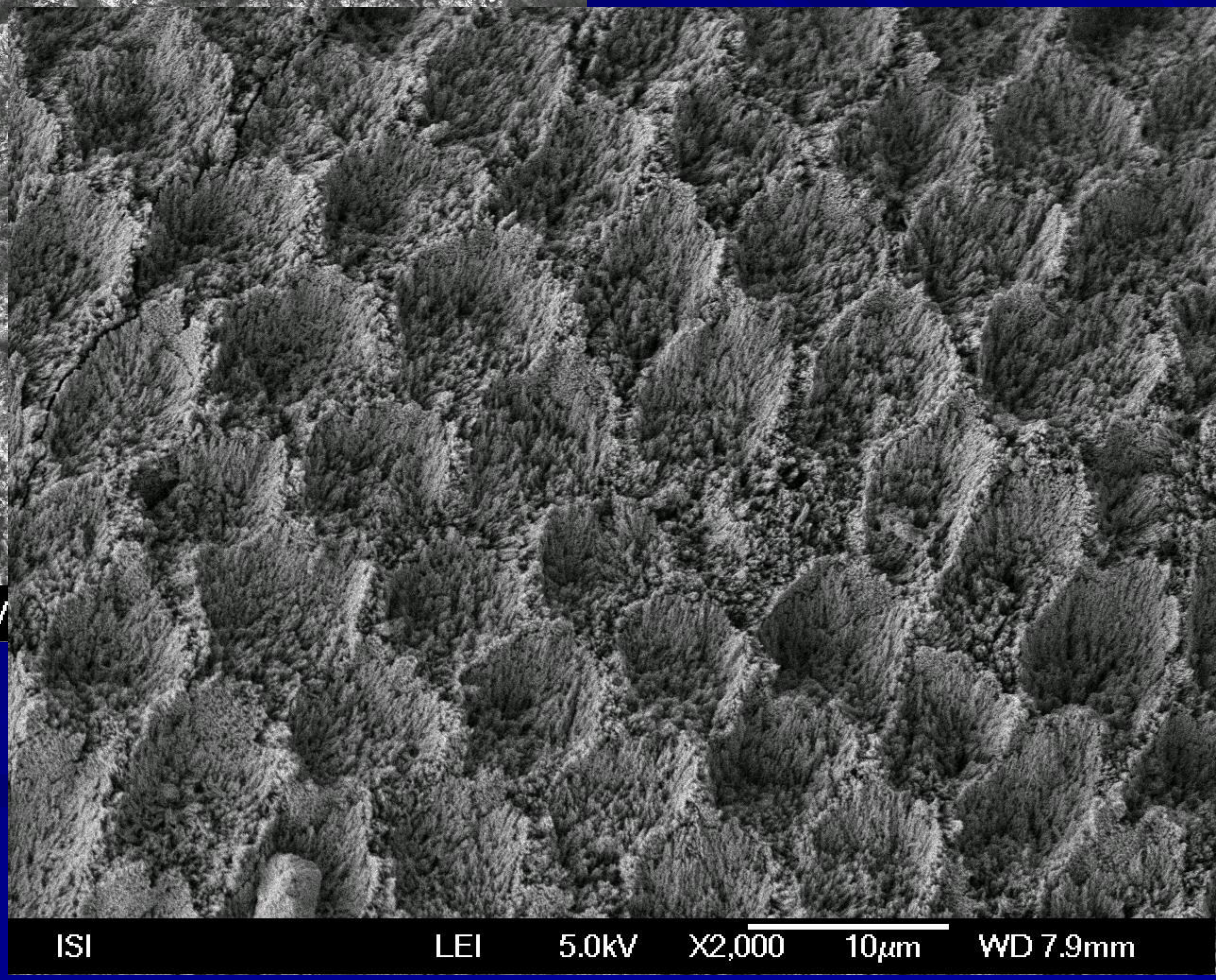
- Active and passive bonding

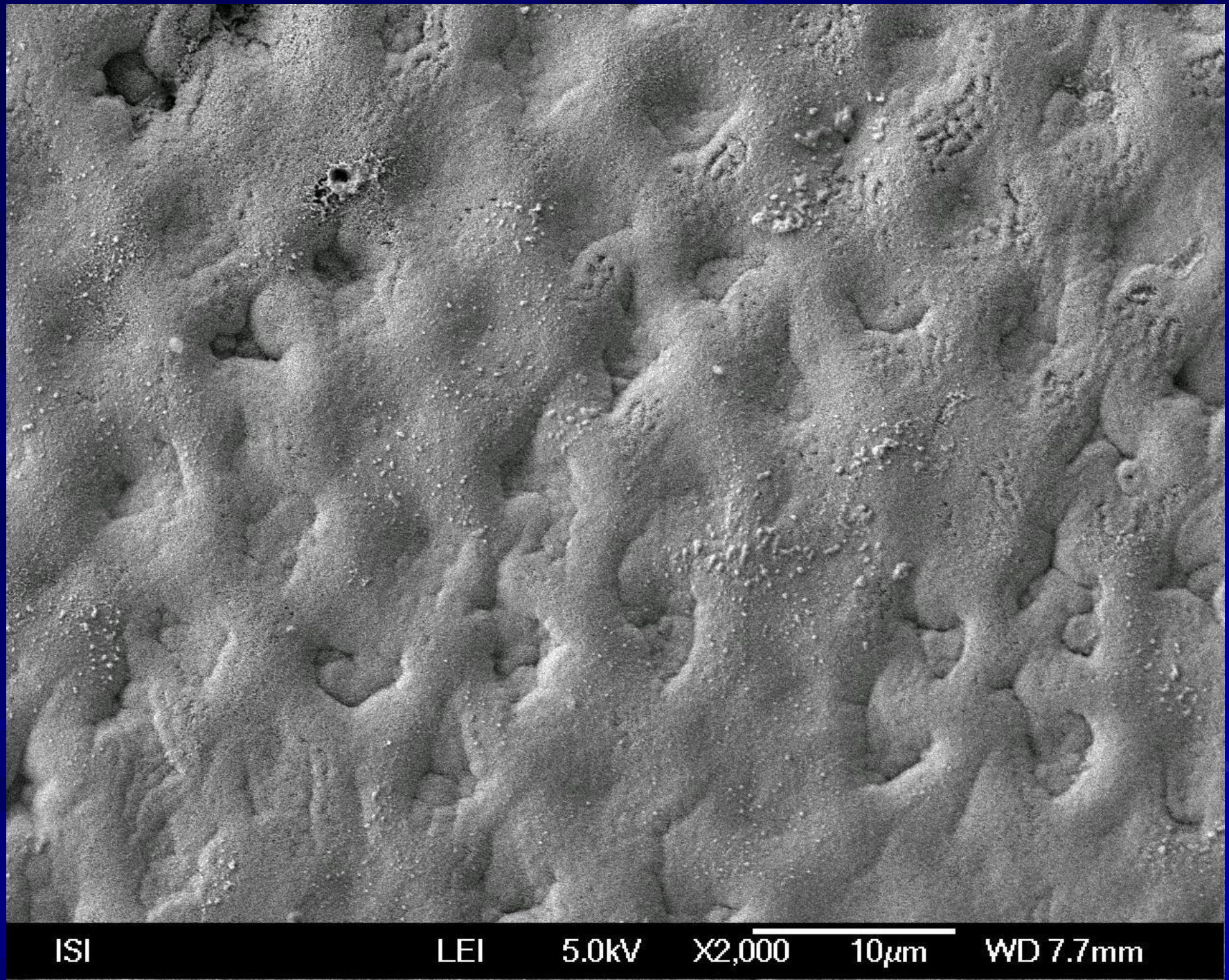
Active – rubbing with microbrush

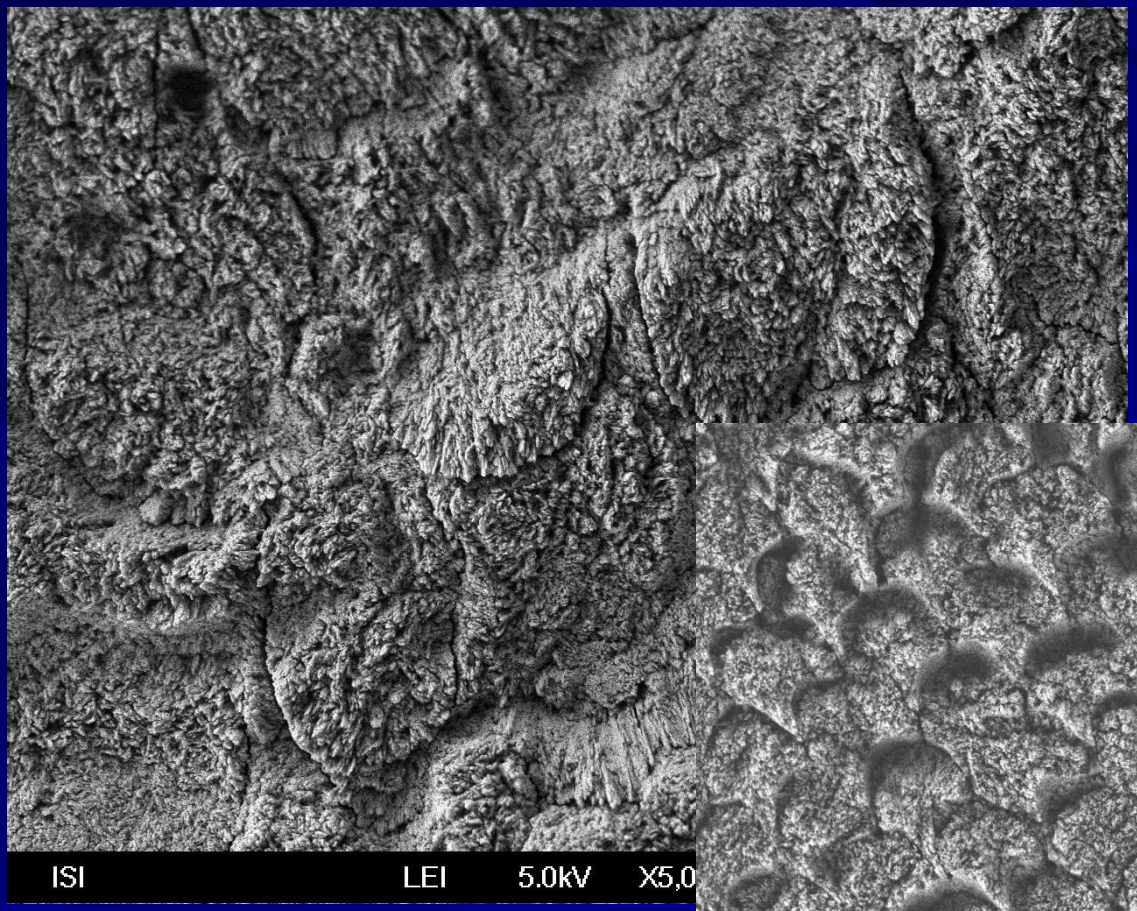
Passive – without any rubbing

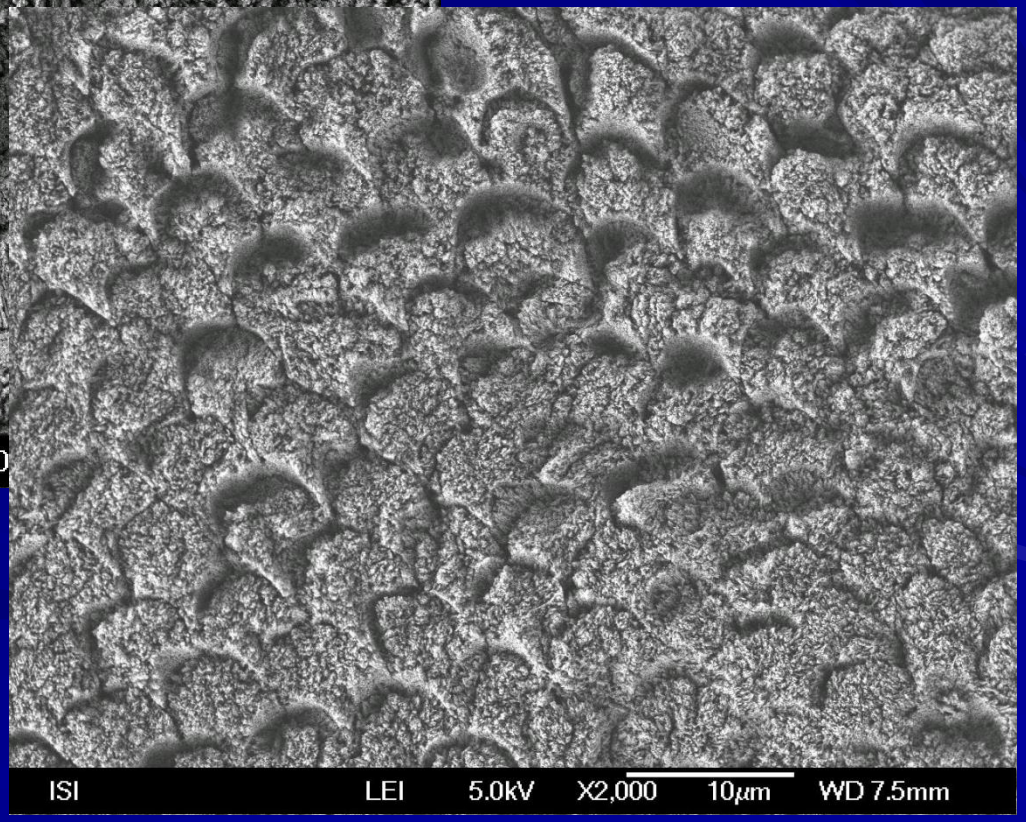

ISI
LEI
5.0kV
X5,000
1μm
WD 7.7mm

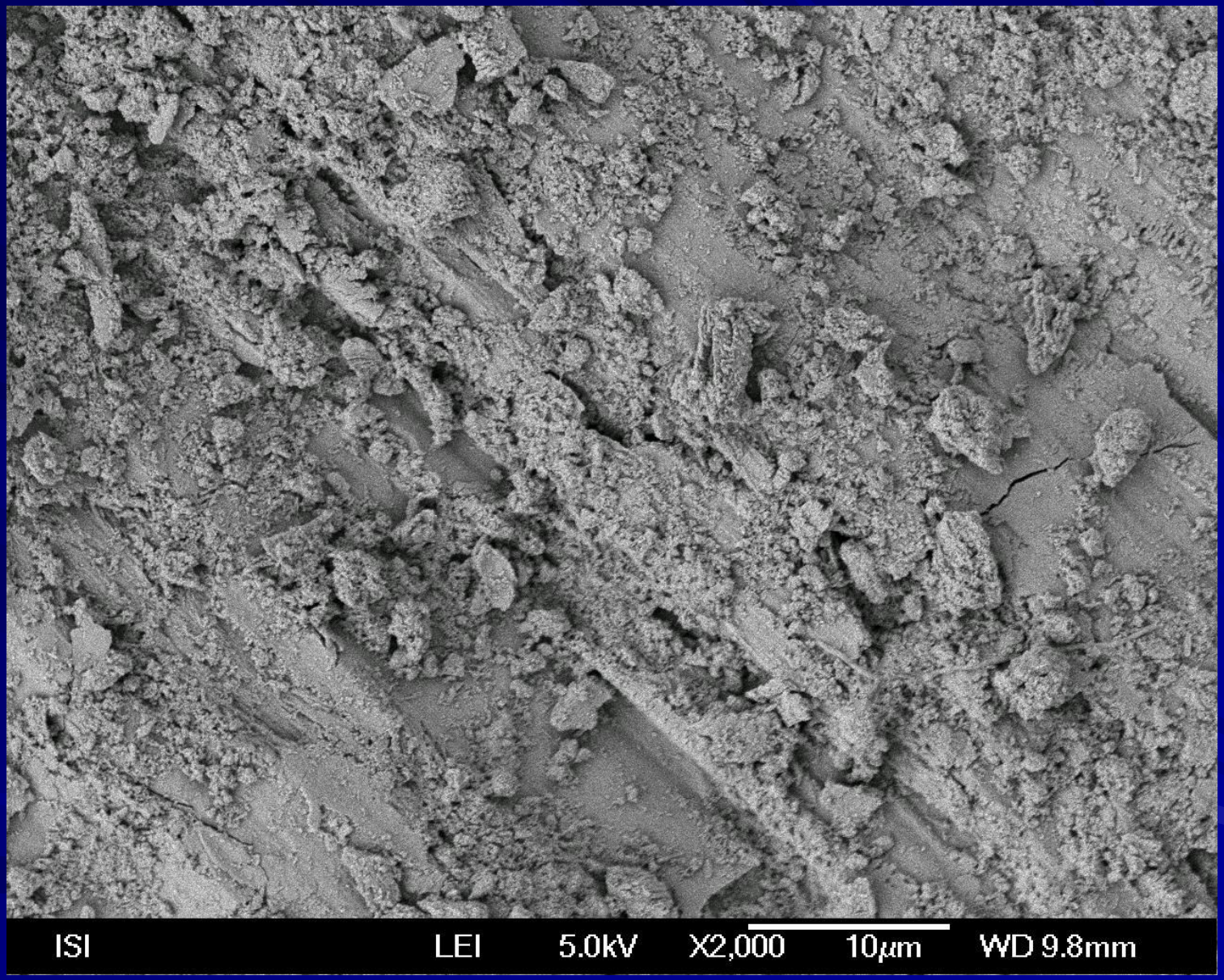

ISI
LEI
5.0kV

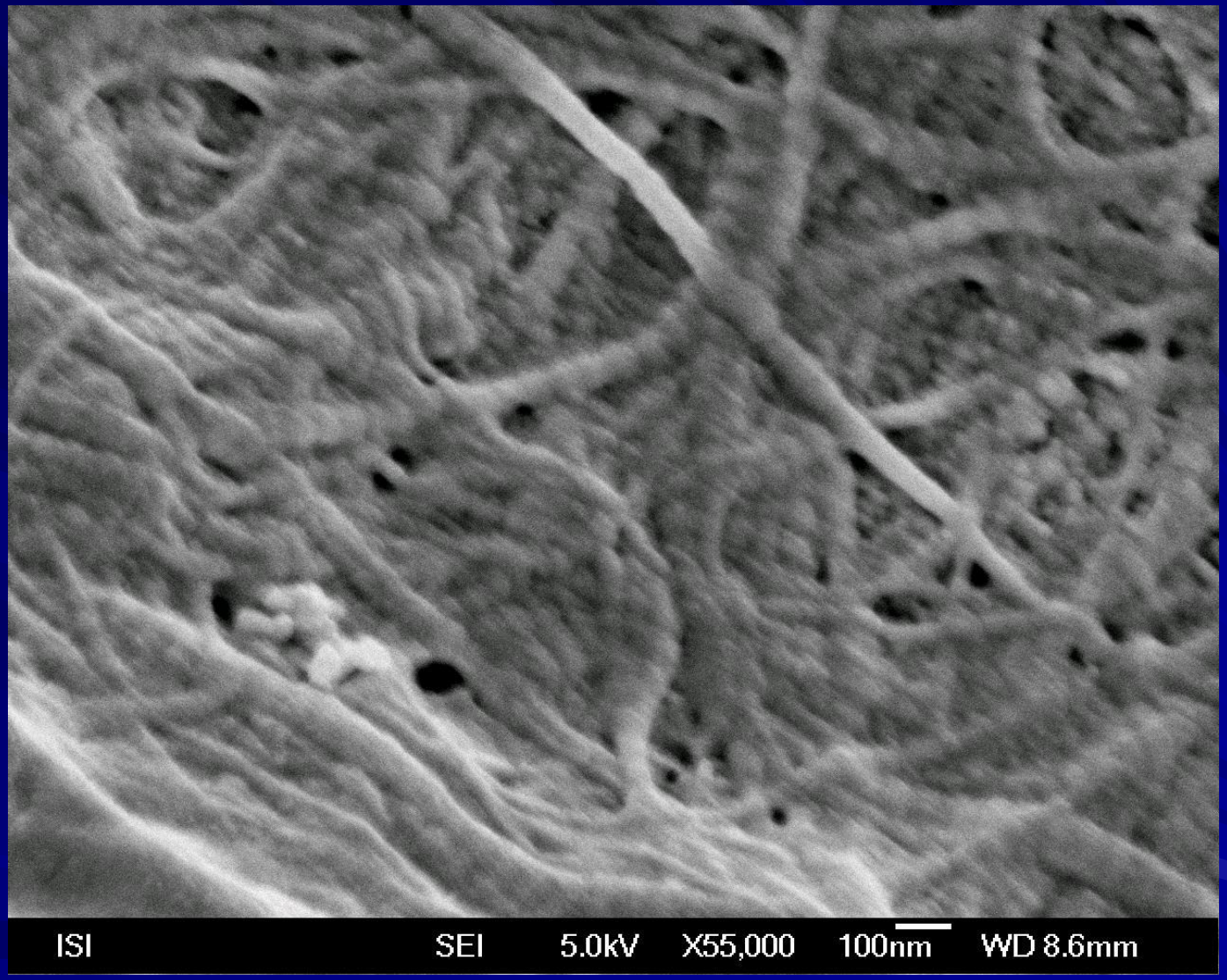

ISI
LEI
5.0kV
X2,000
10µm
WD 7.9mm

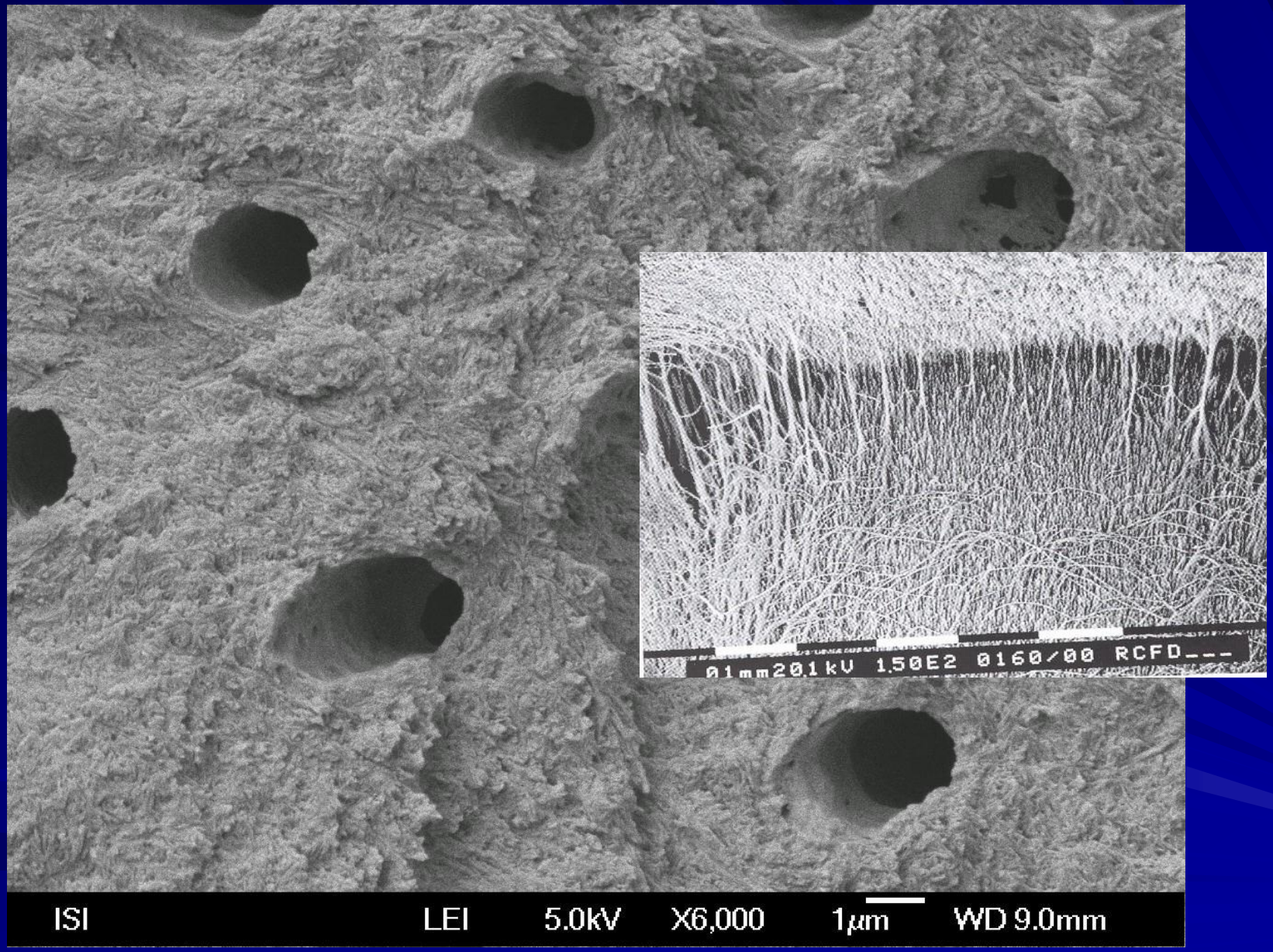

ISI
LEI
5.0kV
X2,000
10µm
WD 7.7mm

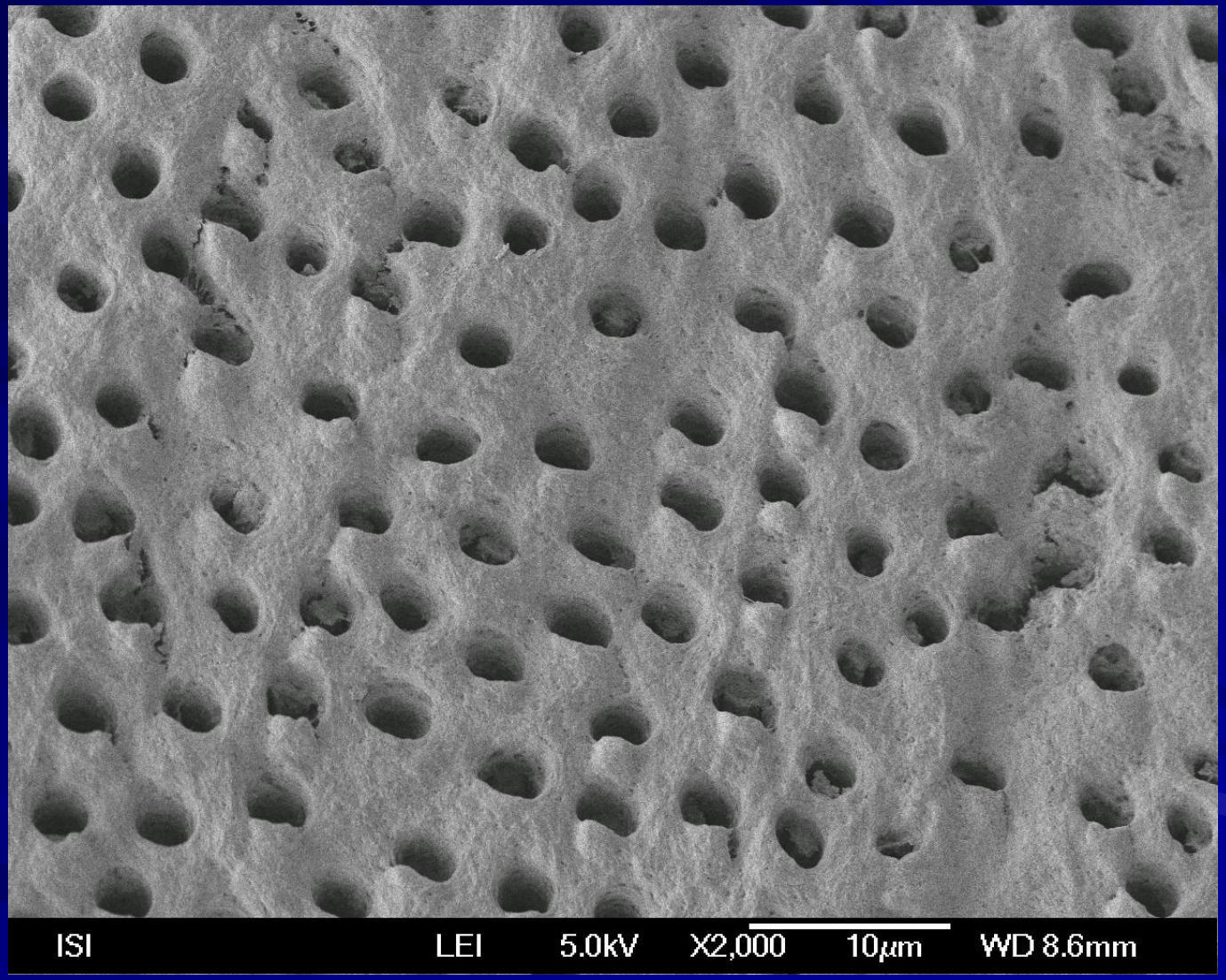

ISI
LEI
5.0kV
X5,0

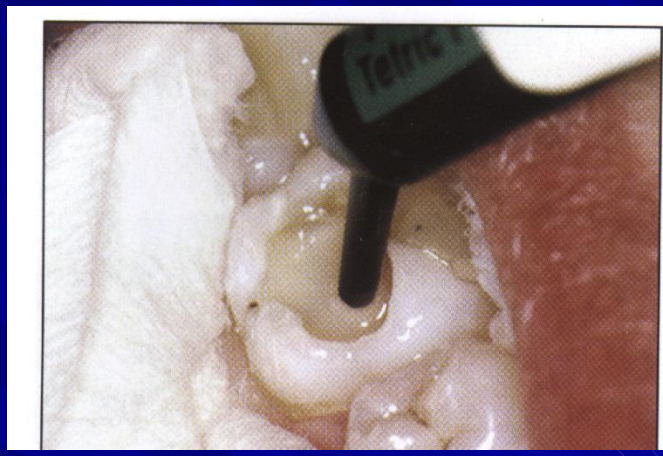

ISI
LEI
5.0kV
X2,000
10μm
WD 7.5mm

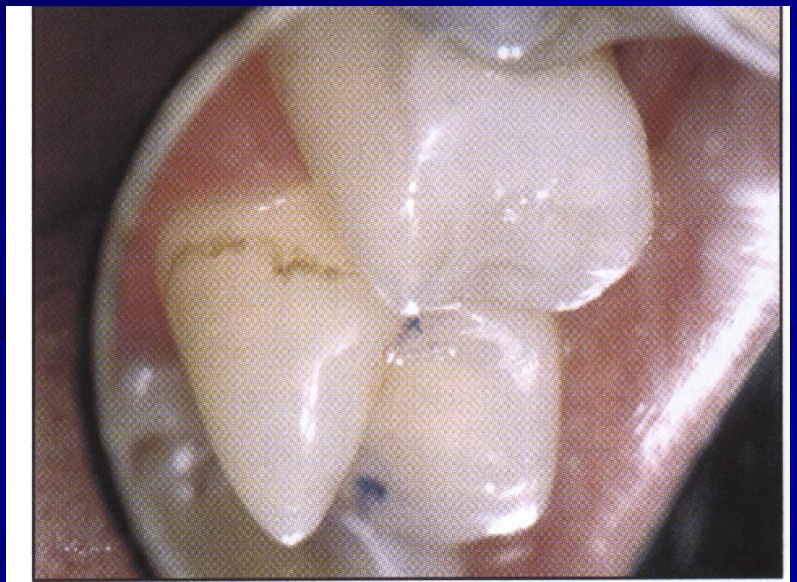

ISI
LEI
5.0kV
X2,000
10μm
WD 9.8mm

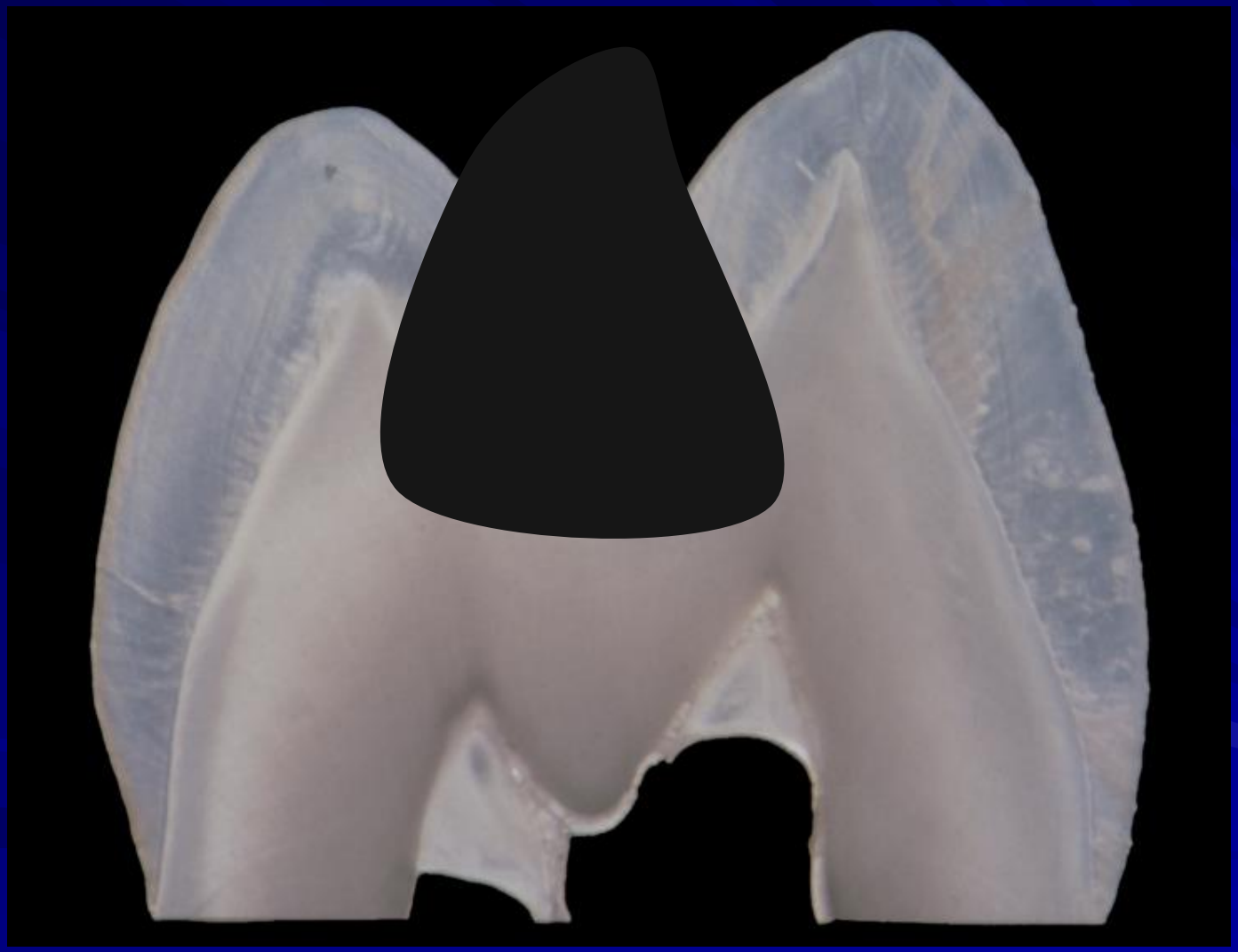

ISI
SEI
5.0kV
X55,000
100nm
WD 8.6mm

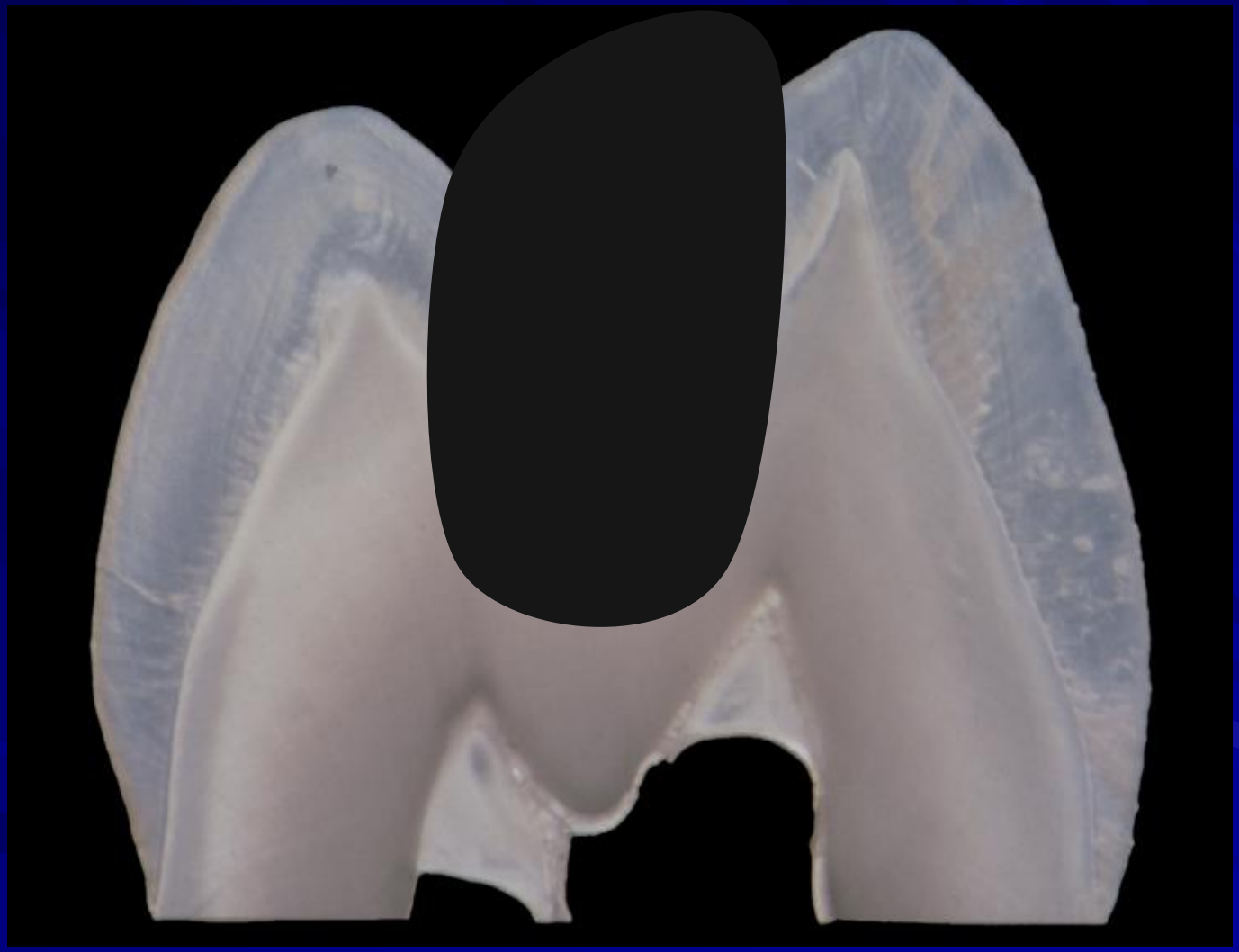

01mm20.1kV 1.50E2 0160/00 RCFD___
ISI LEI 5.0kV X6,000 1μm WD 9.0mm


ISI
LEI
5.0kV
X2,000
10μm
WD 8.6mm

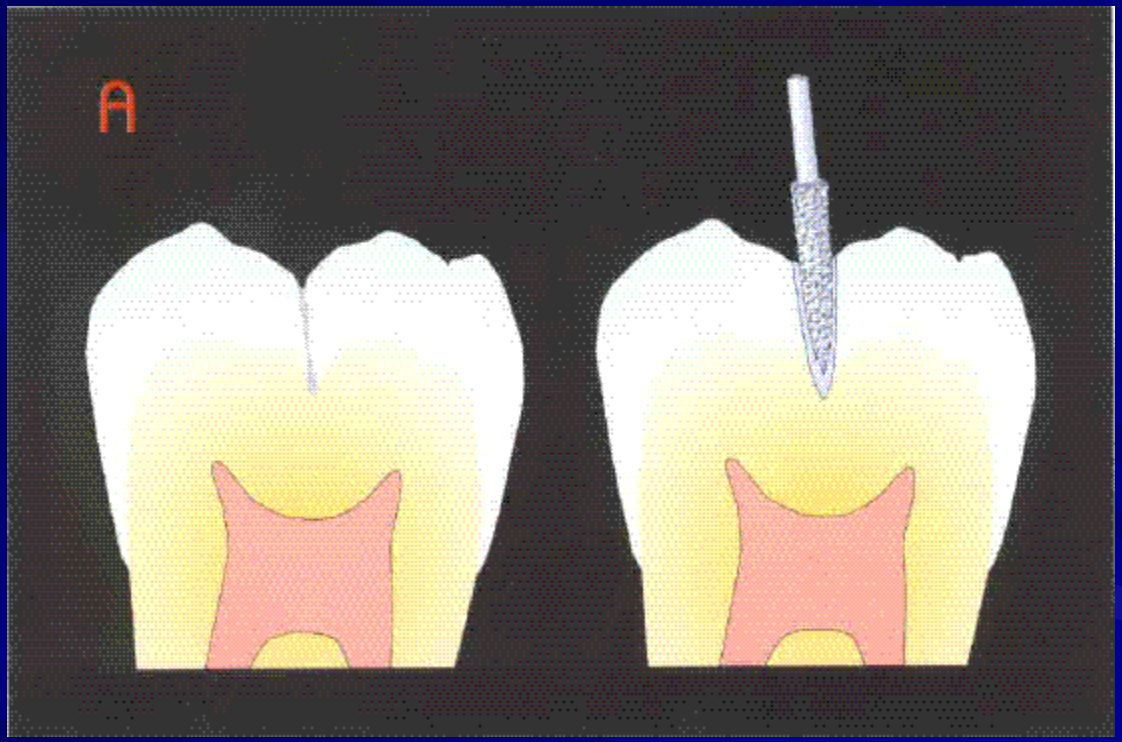




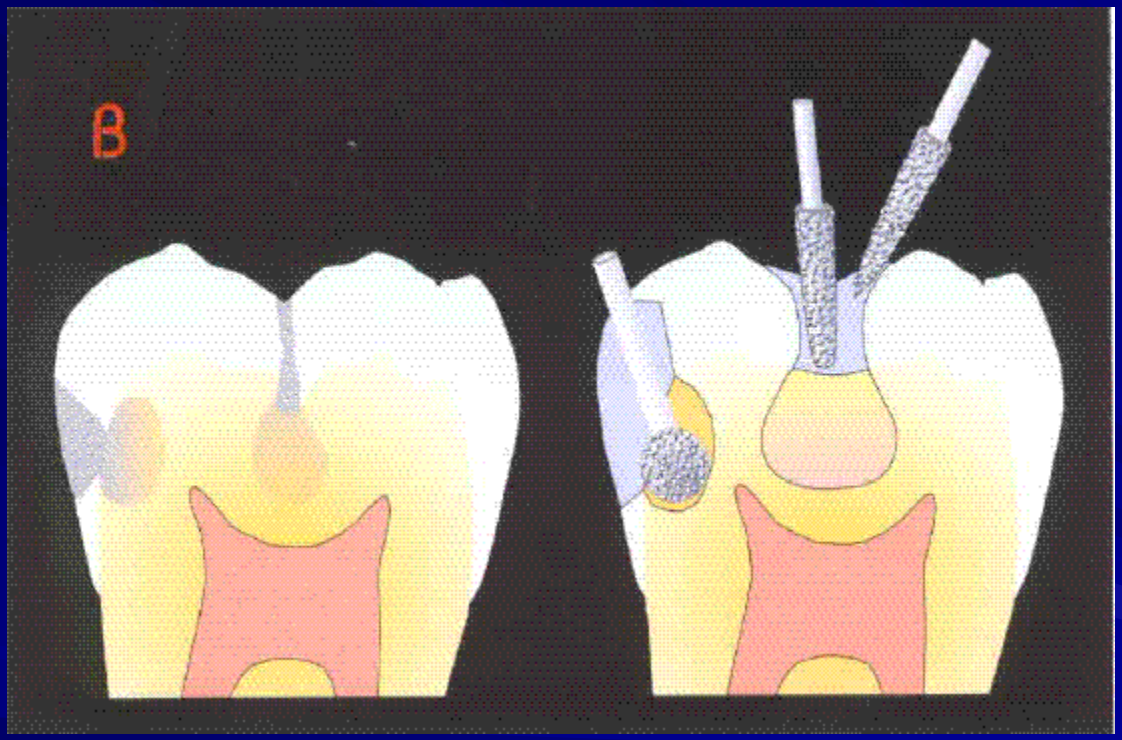




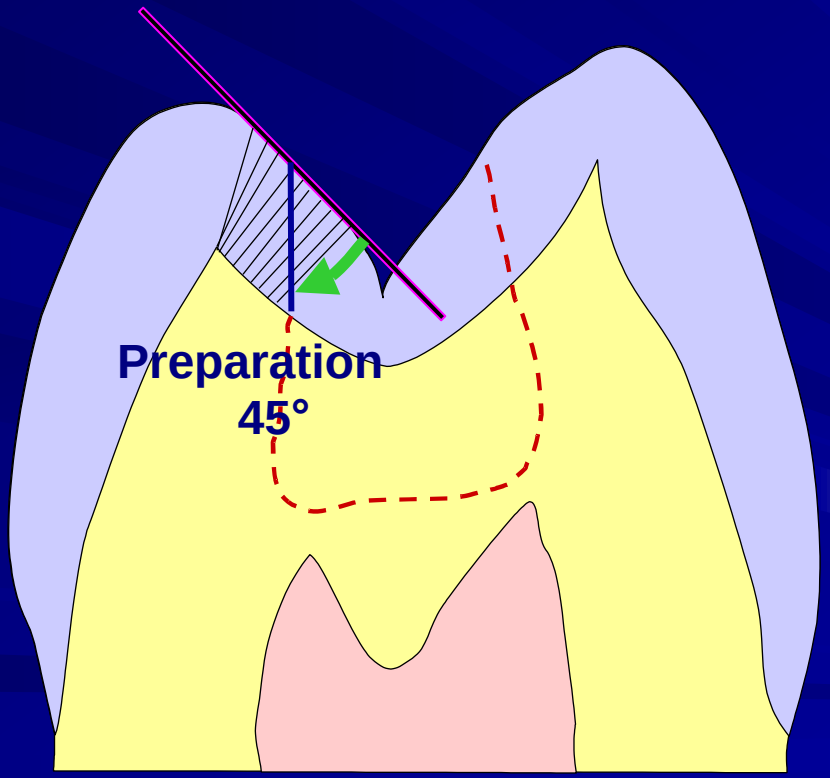
Adhesive preparation in a fissure

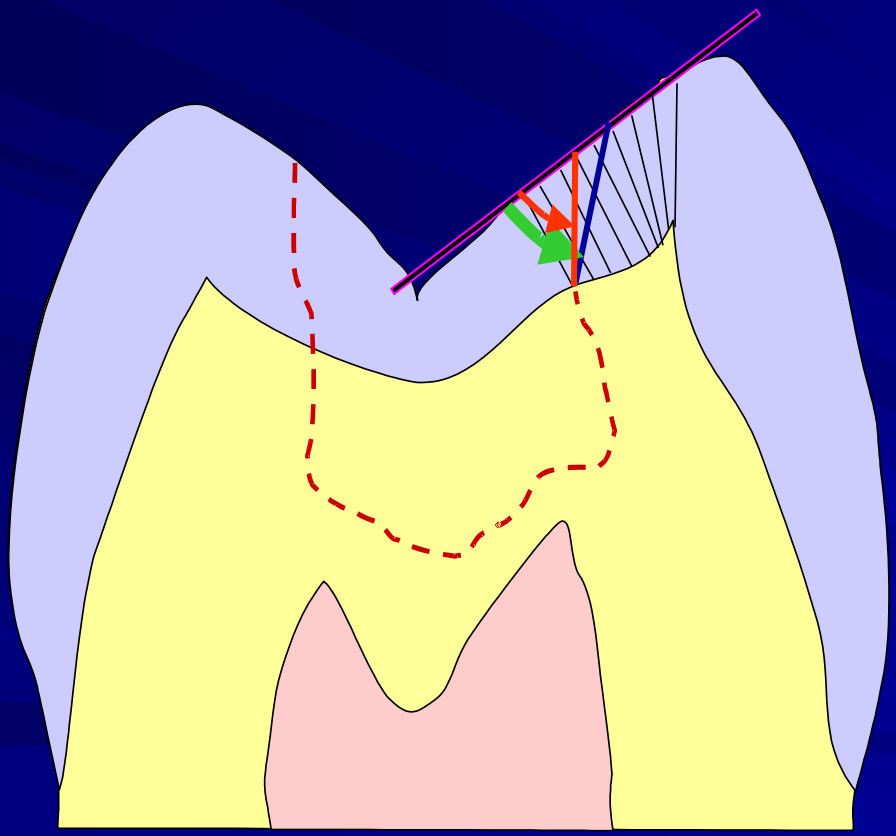


Adhesive preparation



Preparation of enamel borders

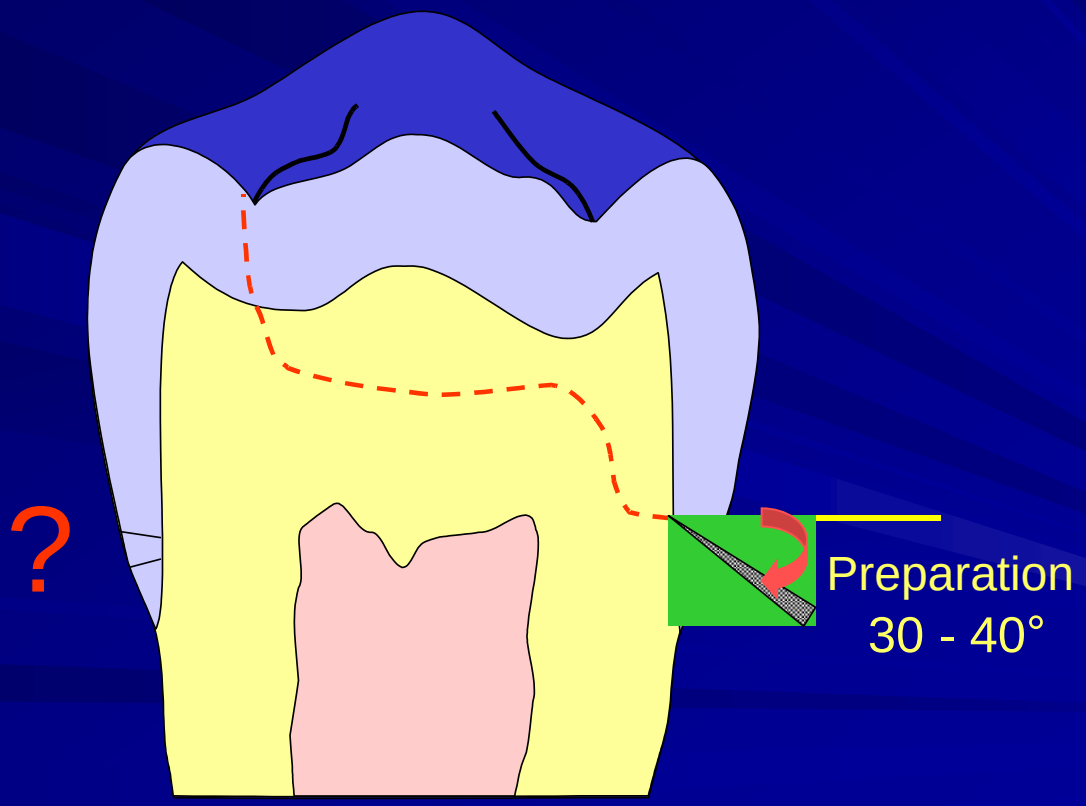




Next to cusp
50-60°,

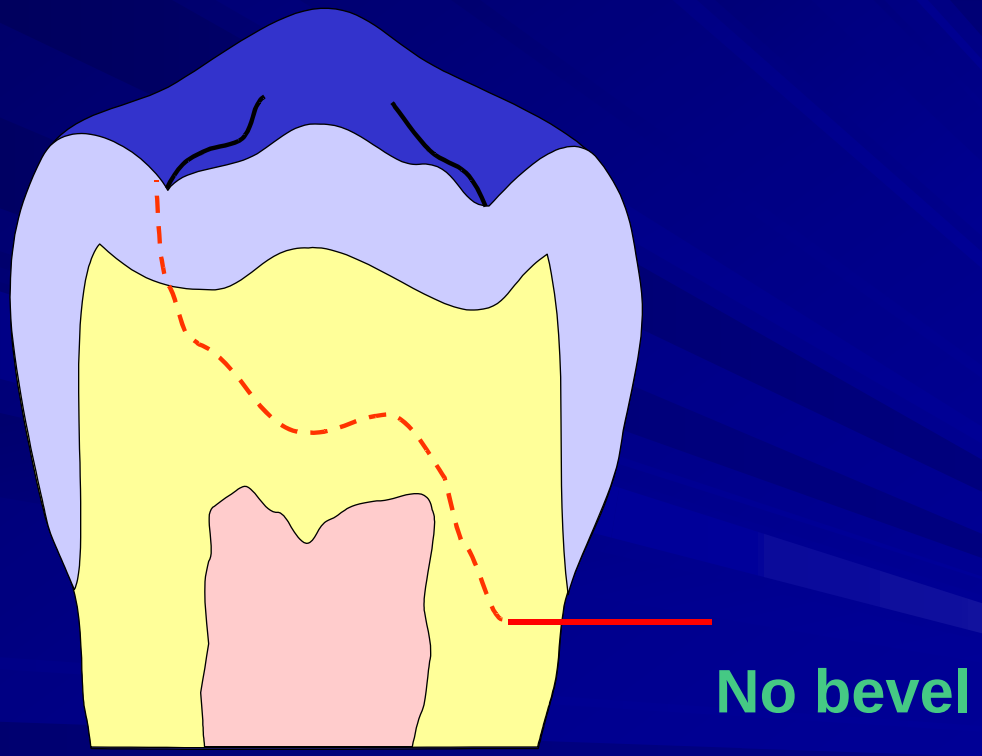
Cervical borders

In enamel

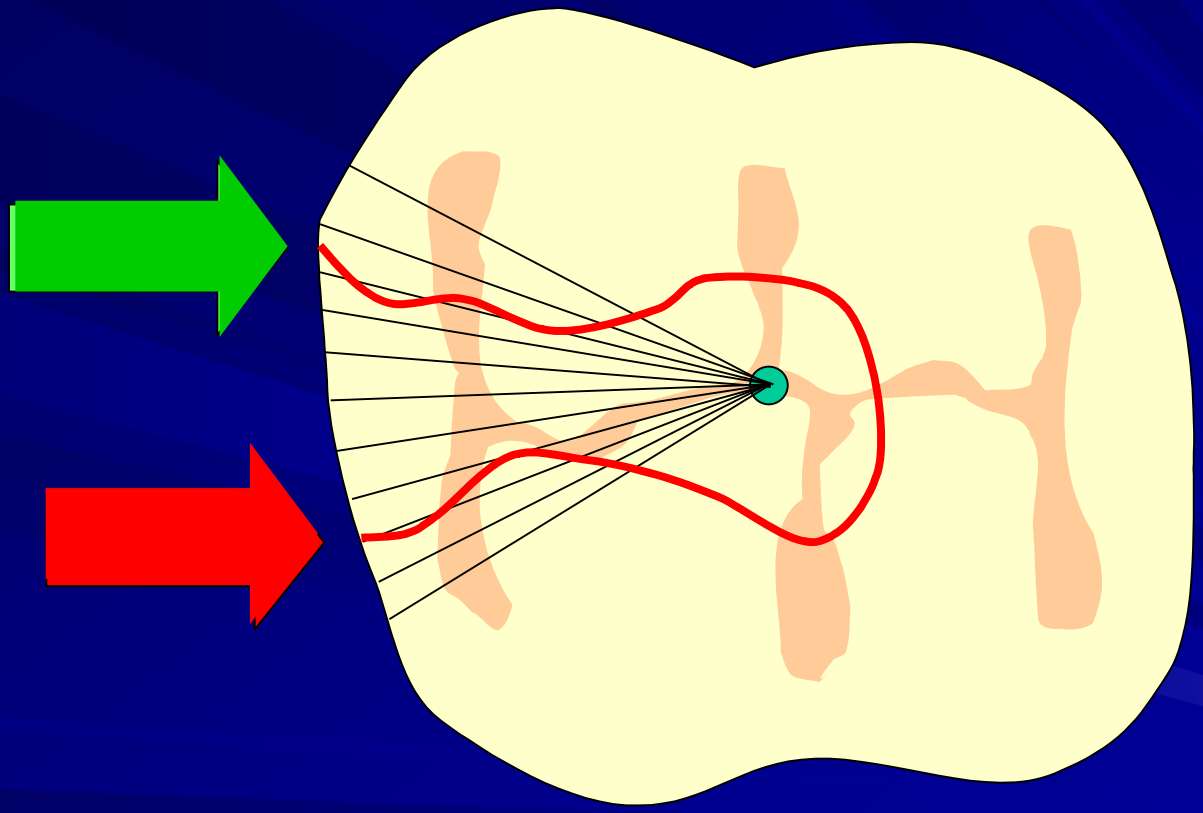


Cervical borders

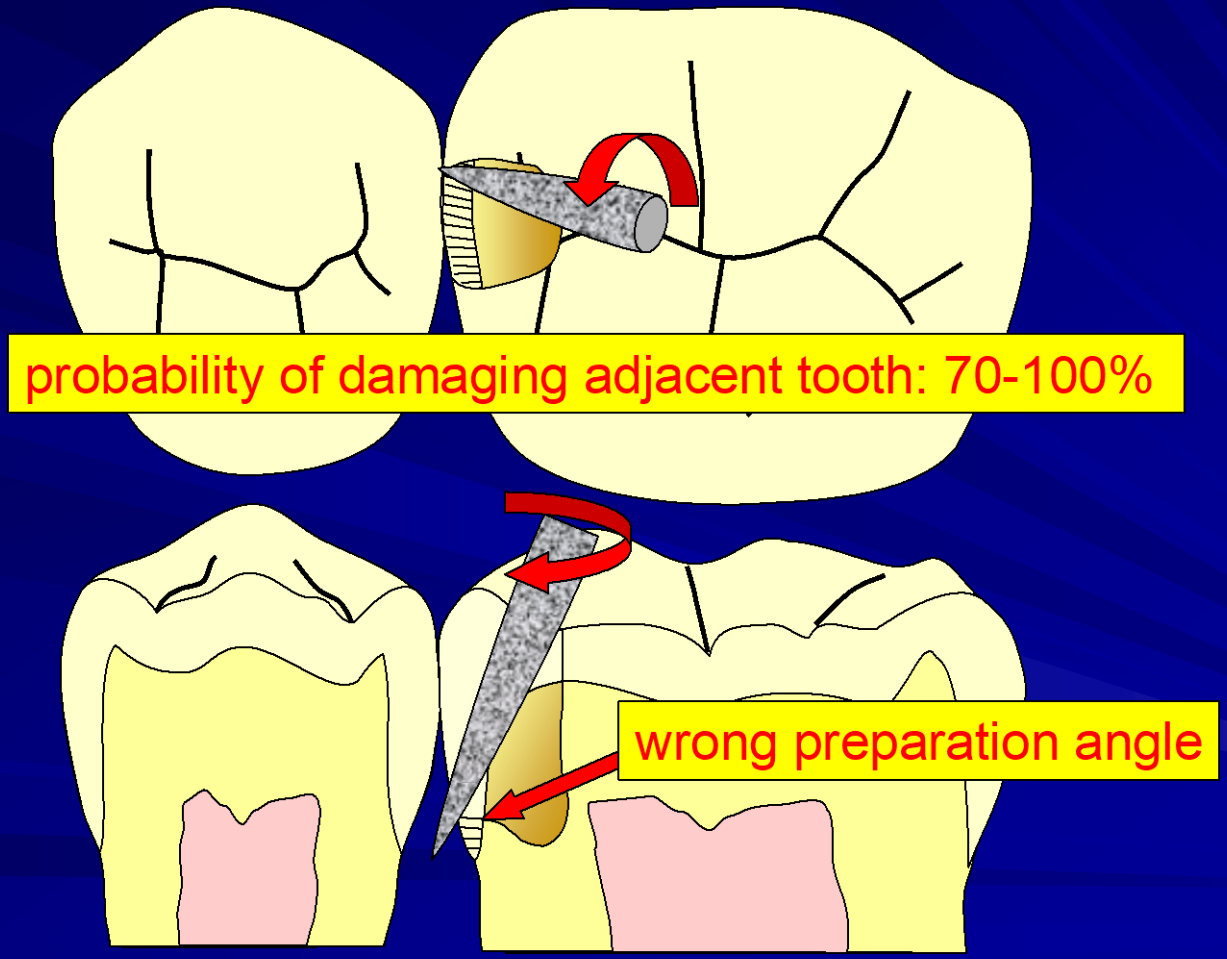
In dentin



Interproximal borders



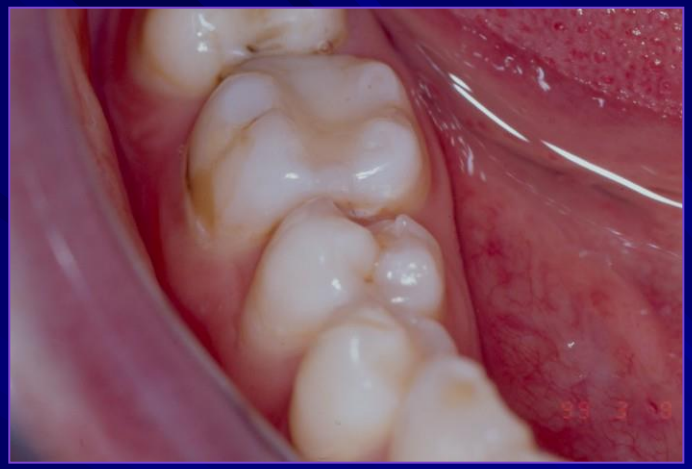
Preparation technique



Oscillating instruments

Composite filling class II. Contact point

Contact point
Contact area

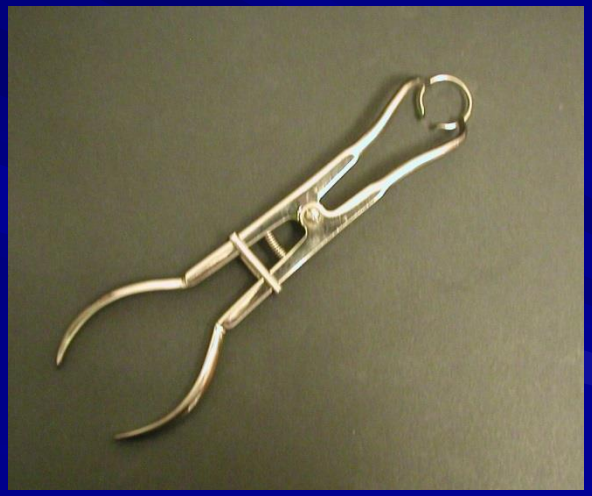


Class II. and contact point

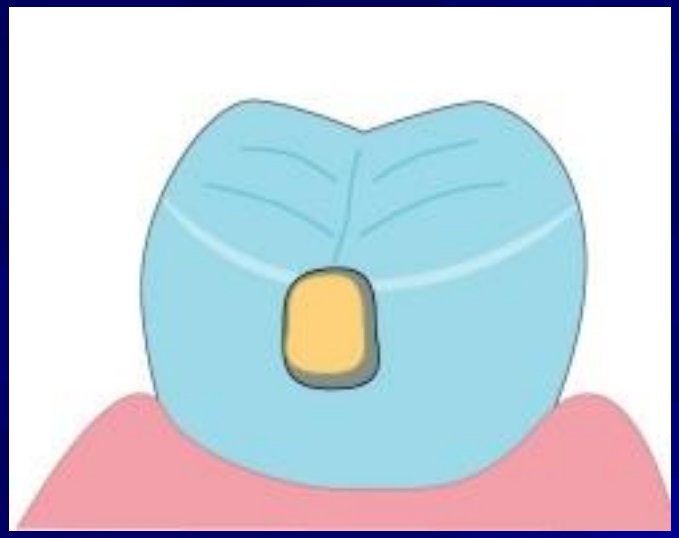
- Matrix band + matrix retainer
  - Metal band
  - Plastic band (polyester)

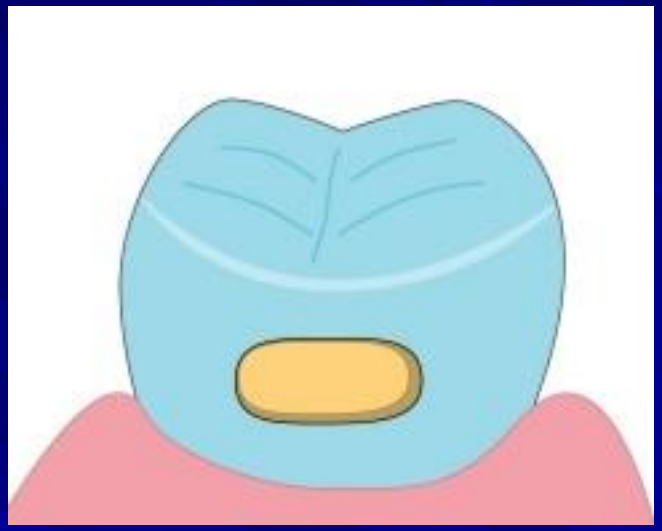
Without matrix retainer

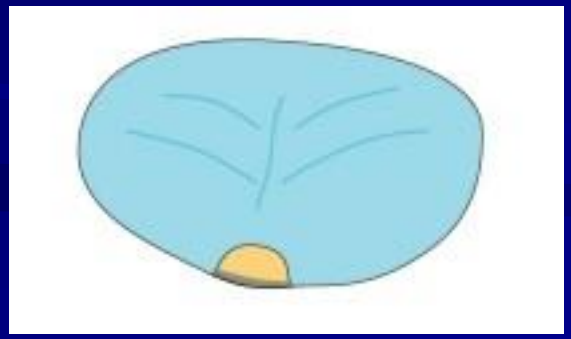
- Sectional matrices with separator

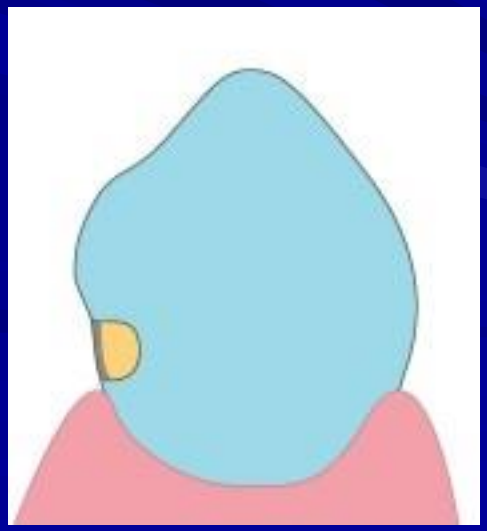


Adhezivní slotová preparace

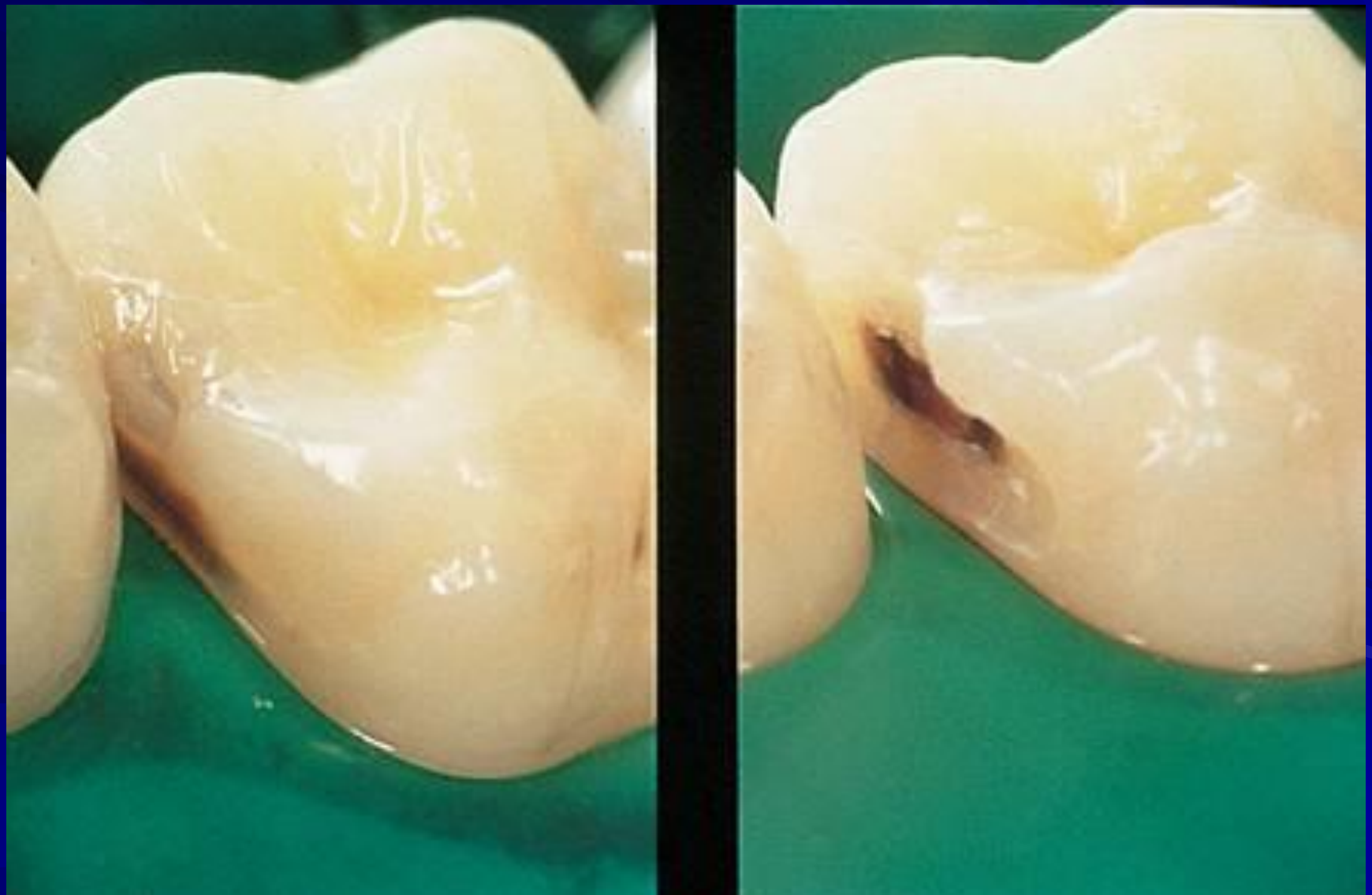




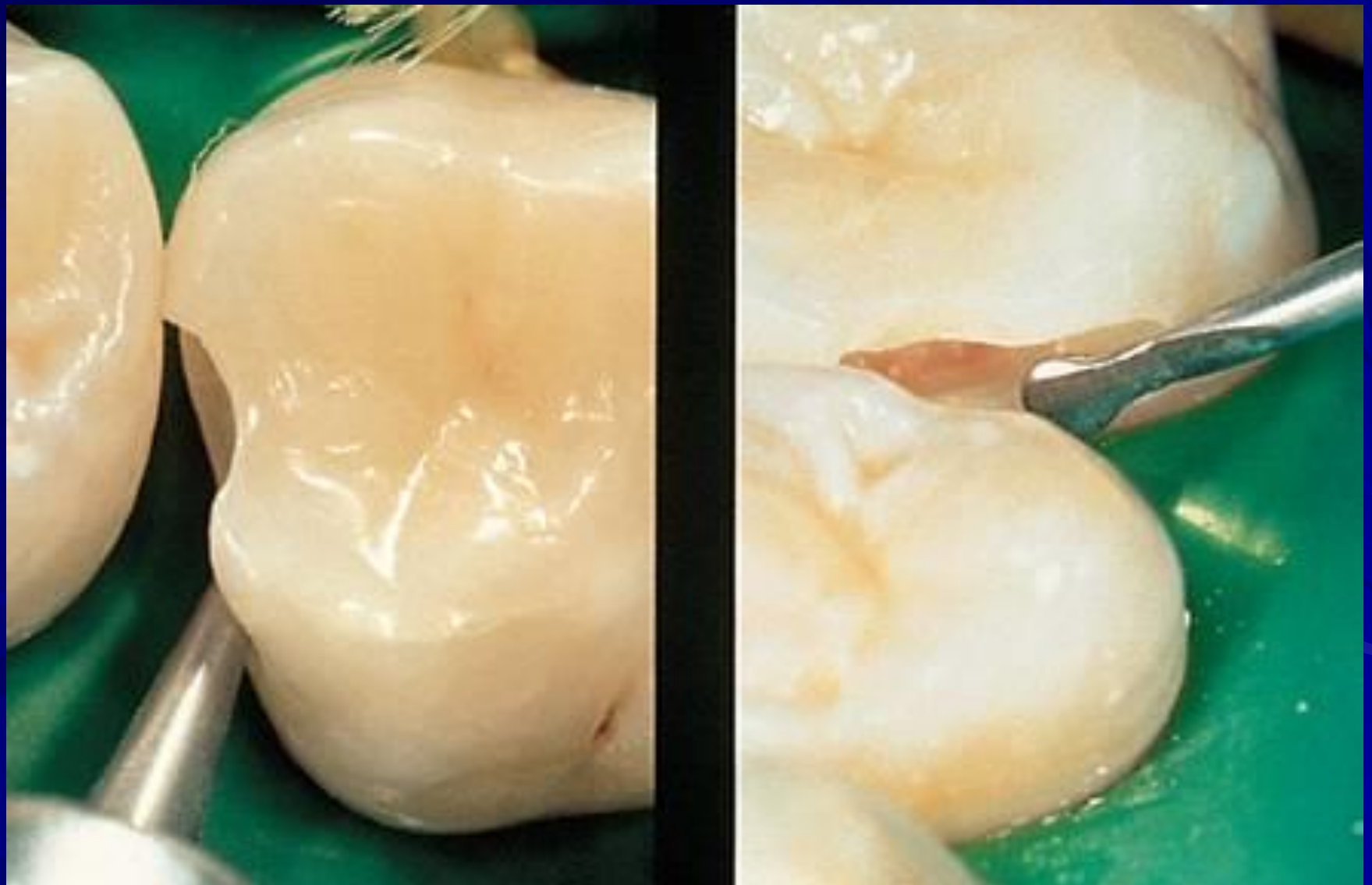


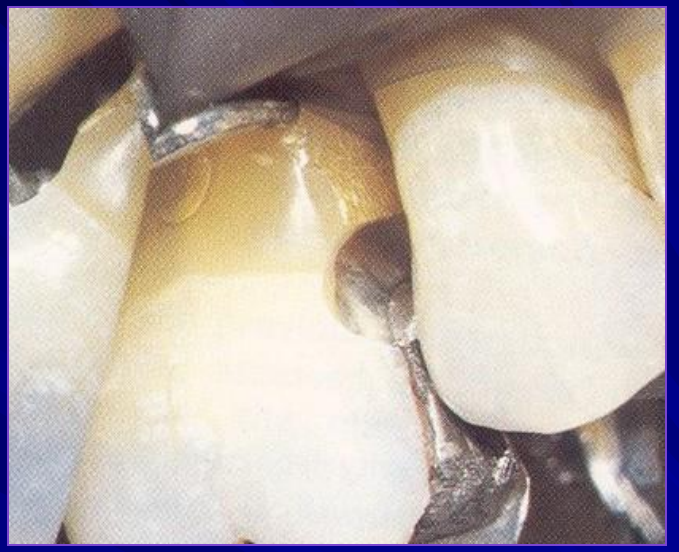


Approximal Caries

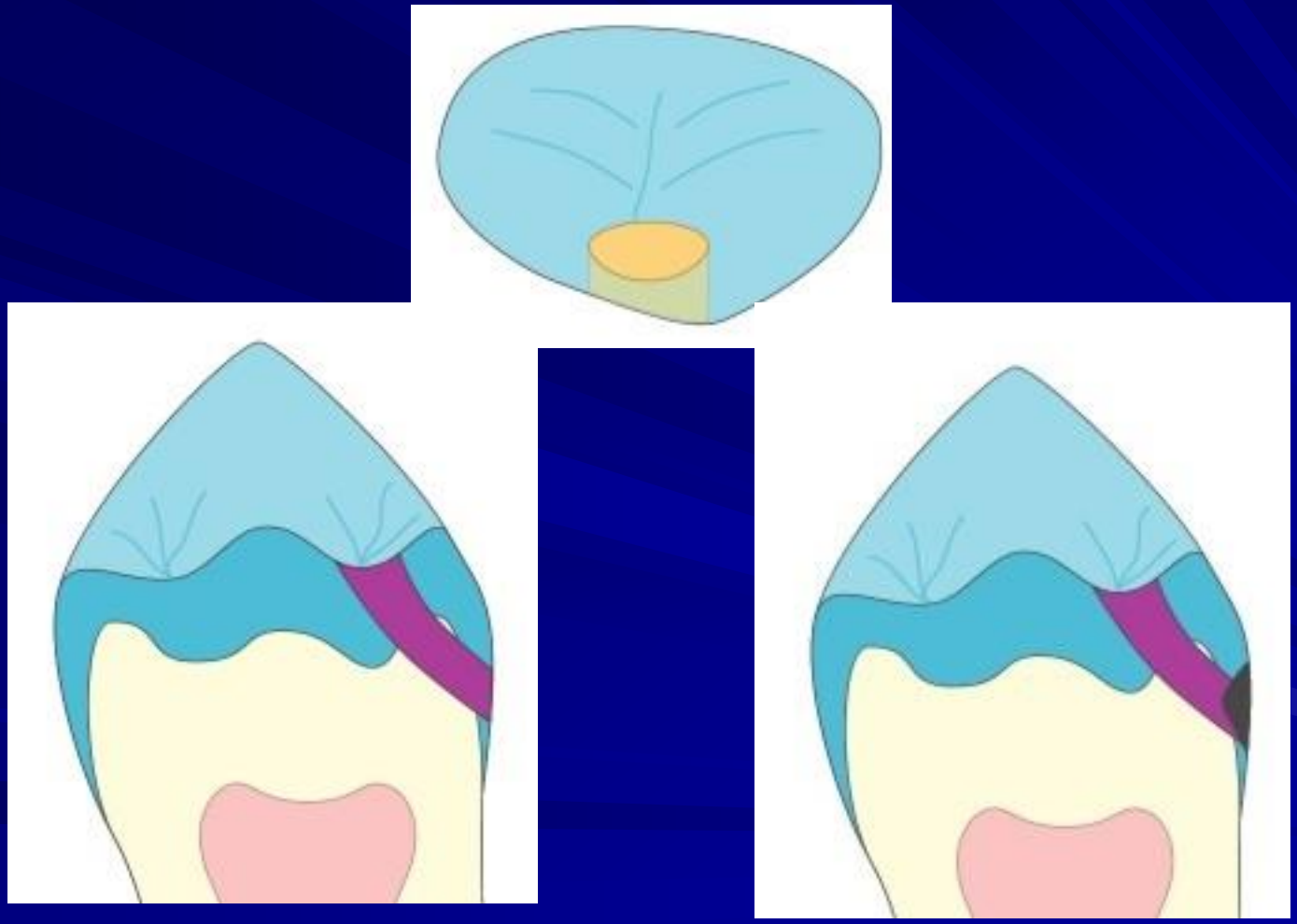


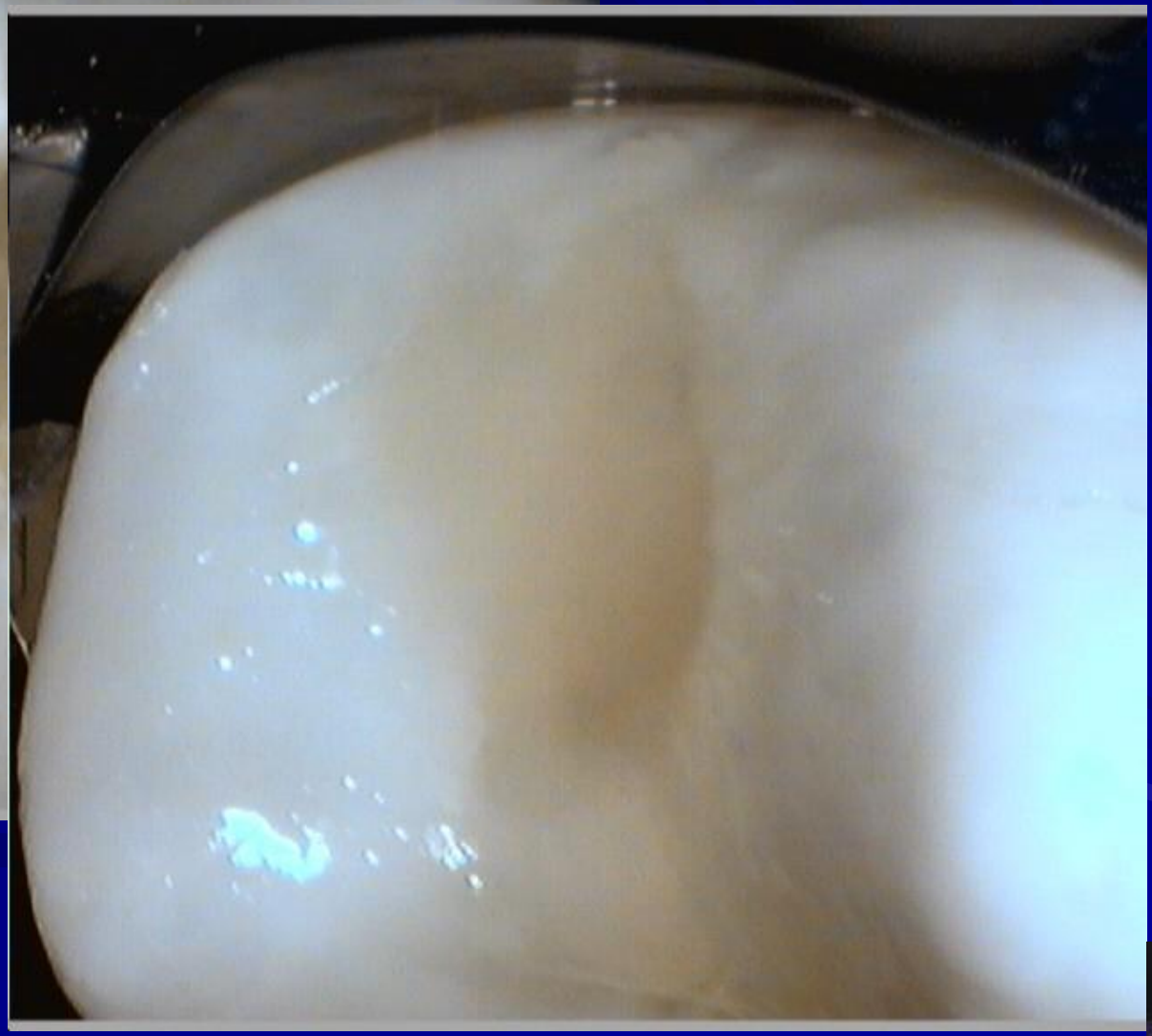
Approximal Caries





Tunnel preparation





Success?

Low caries risk
Special smal instruments
Magnification
BW post op