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

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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

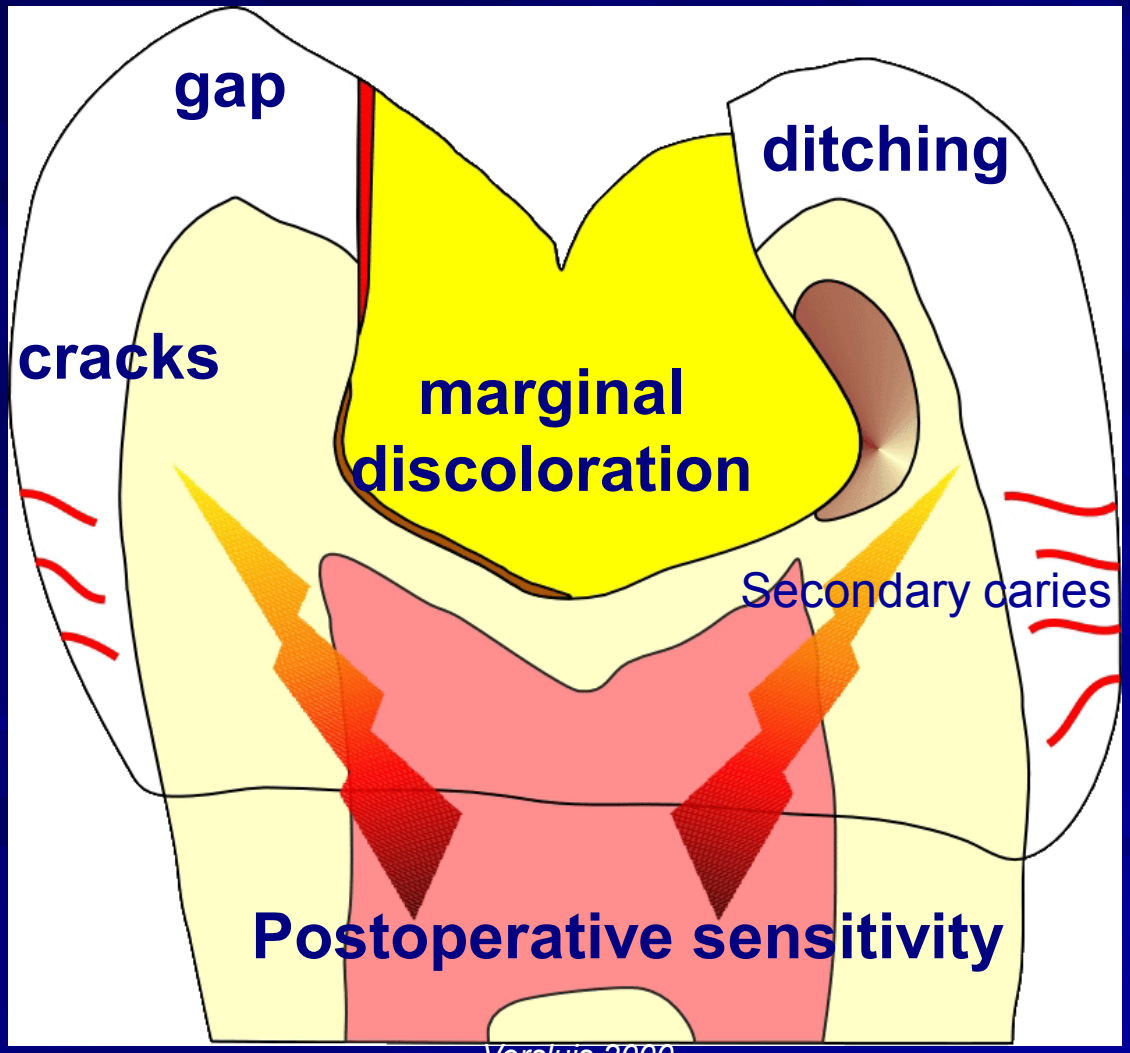
- Outline includes the caries lesion only

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.

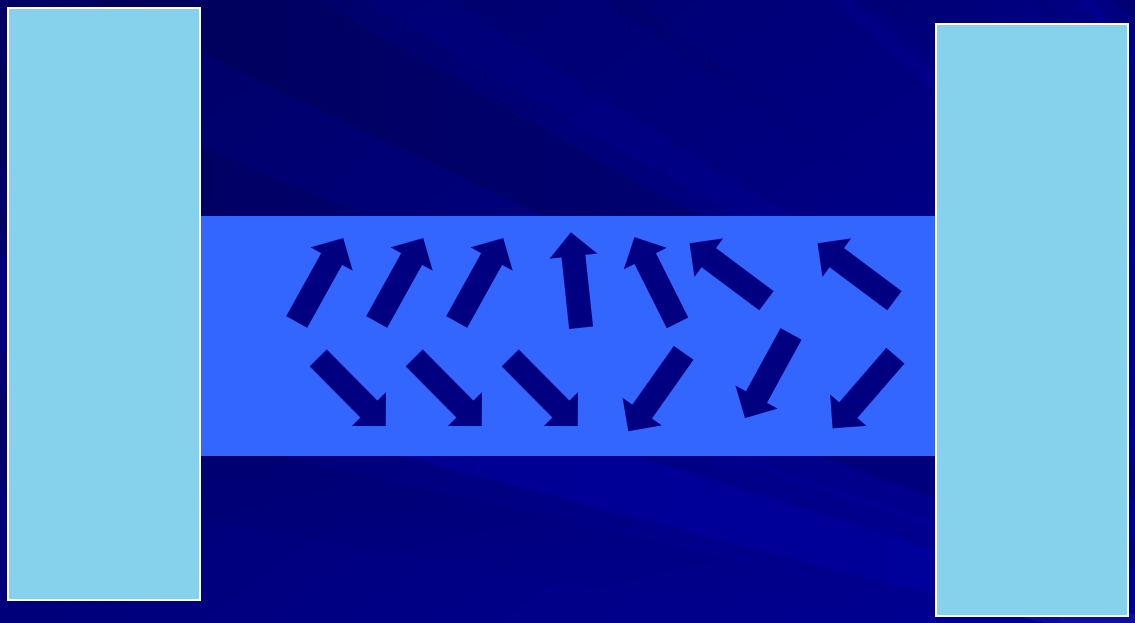
Removal of carious, infected, dentin and remaining defective enamel.

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

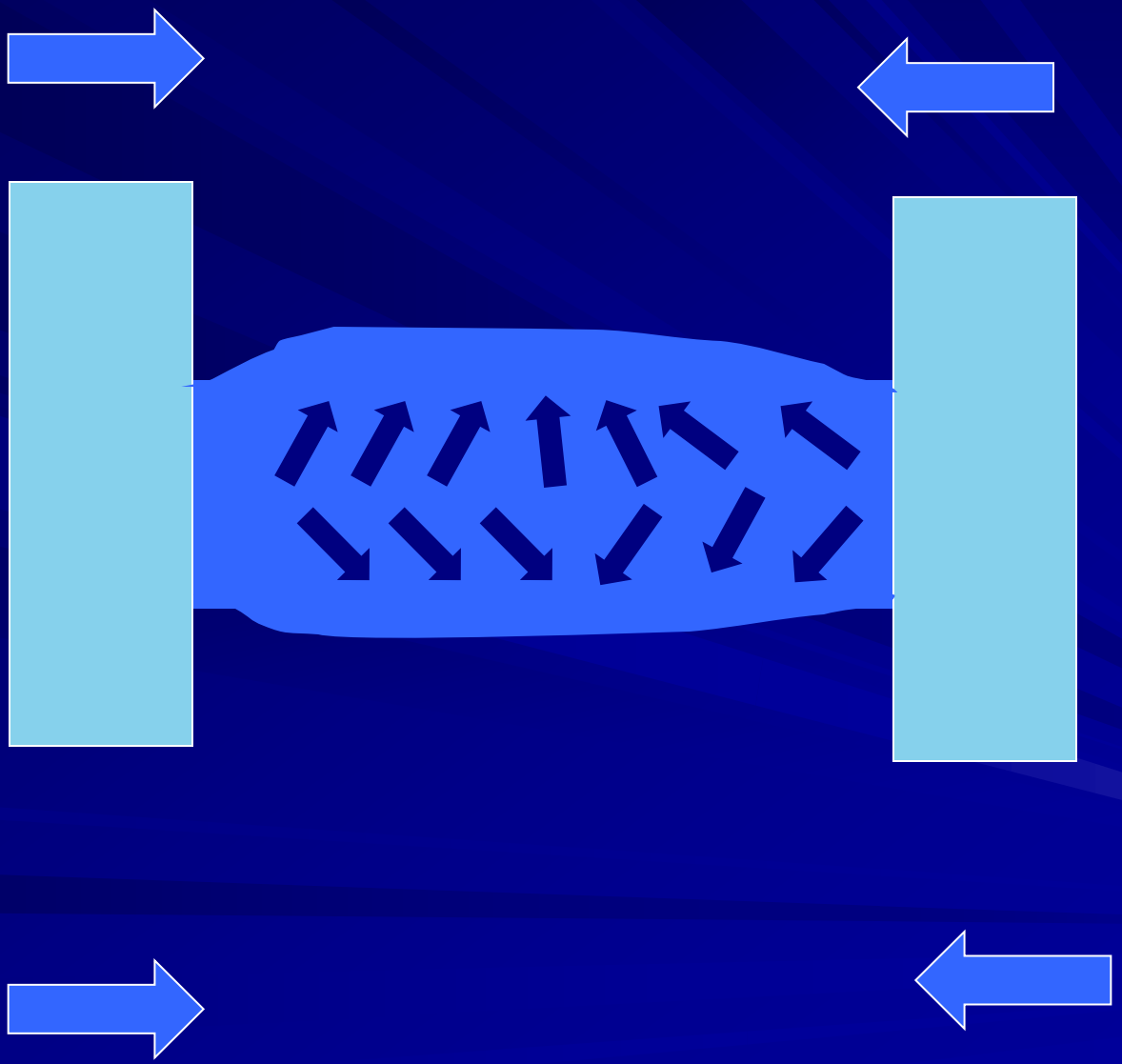


Versluis 2000

Polymerization shrinkage

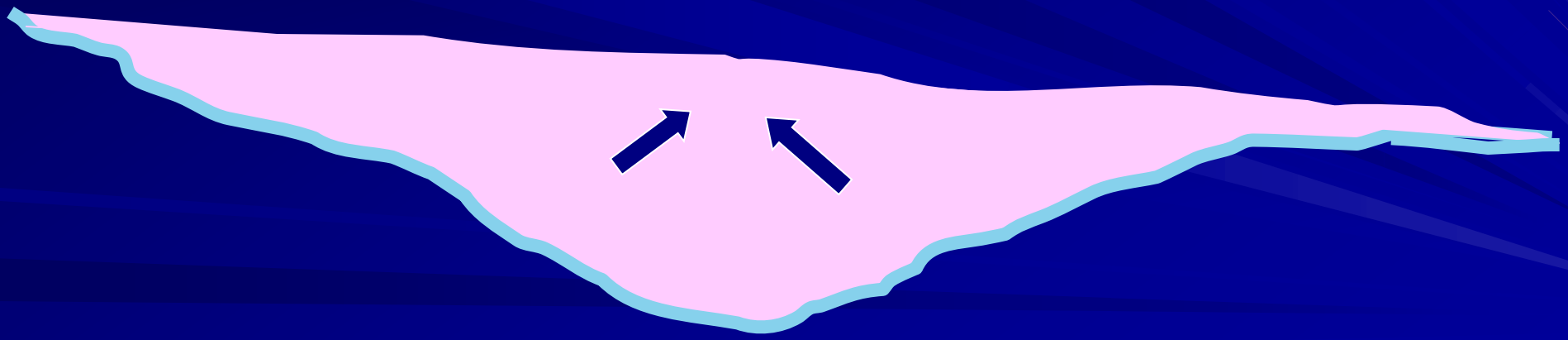


Polymerization shrinkage

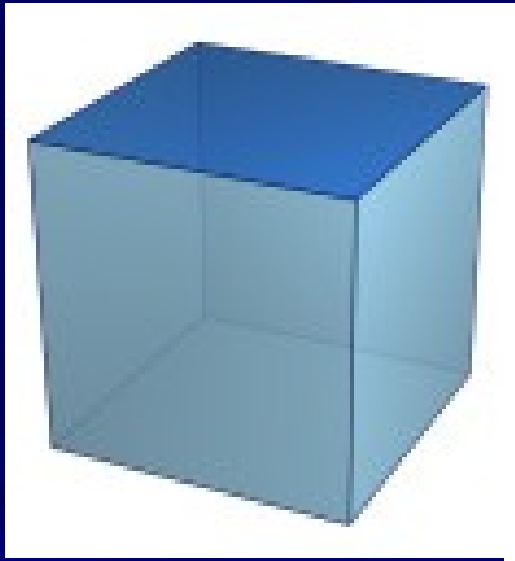


C - factor

Surface of adhesion/free surface of the filling



1/1 and less is optimal



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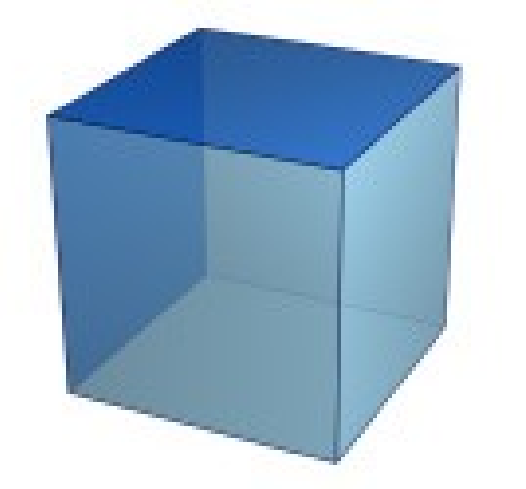

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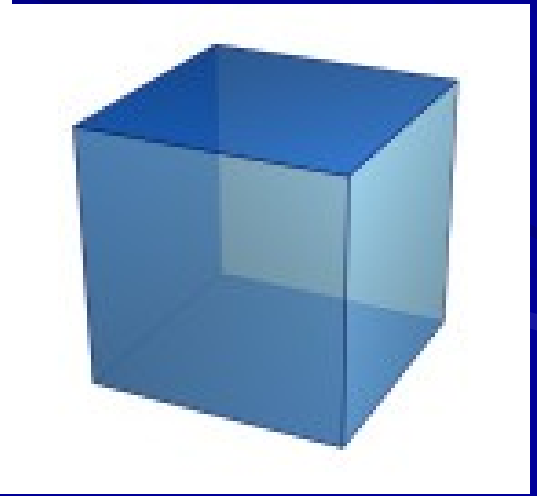

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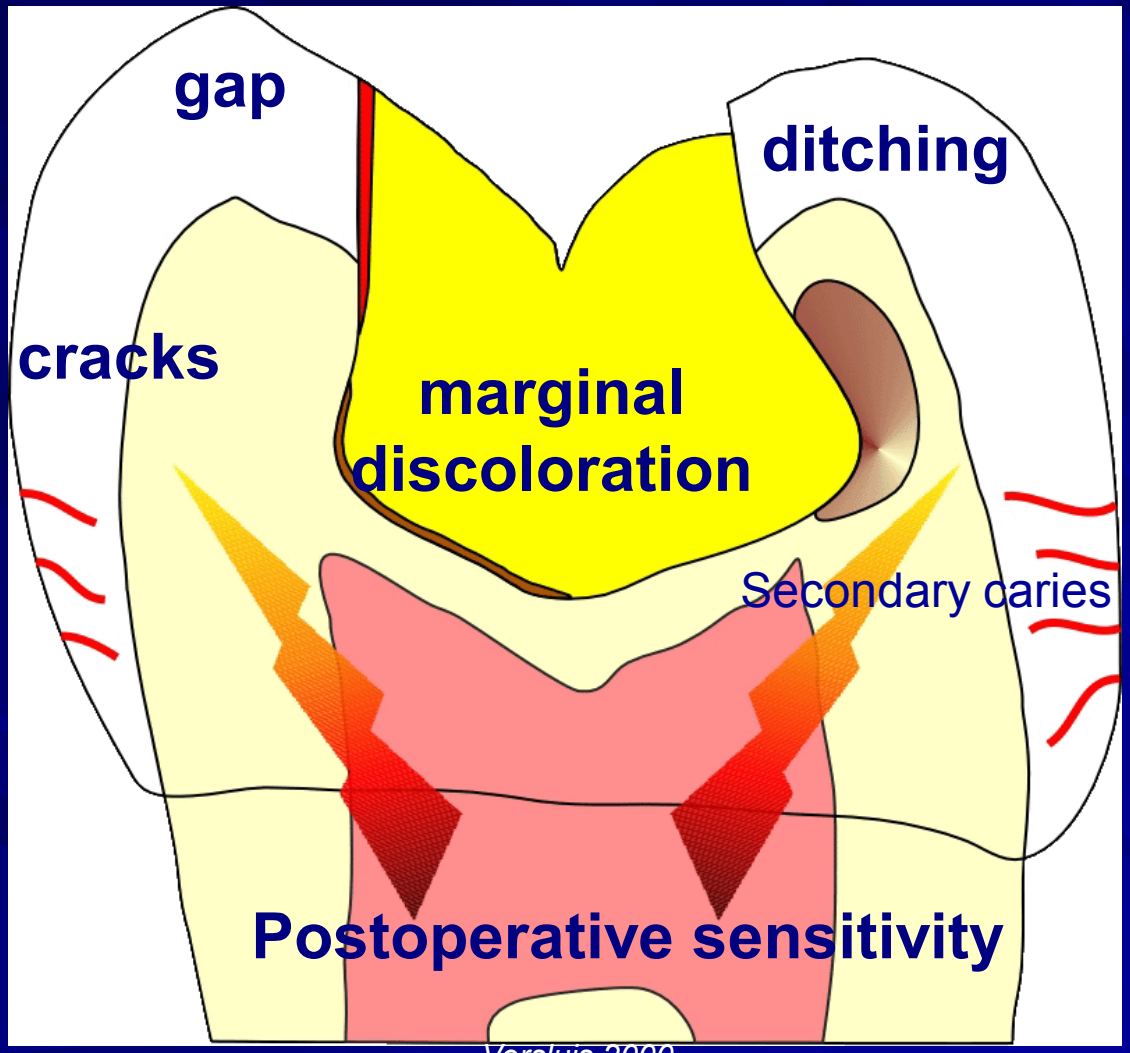
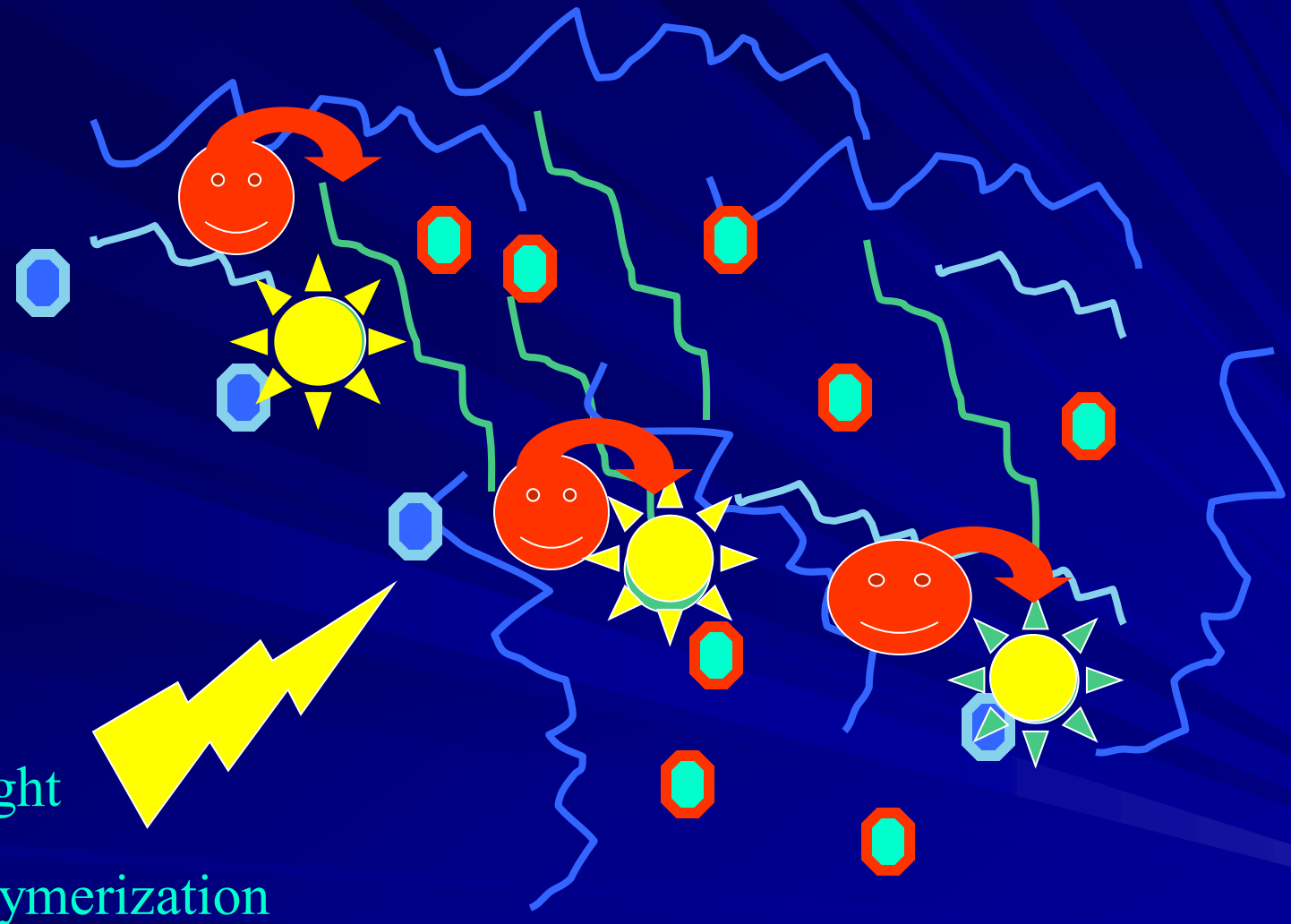
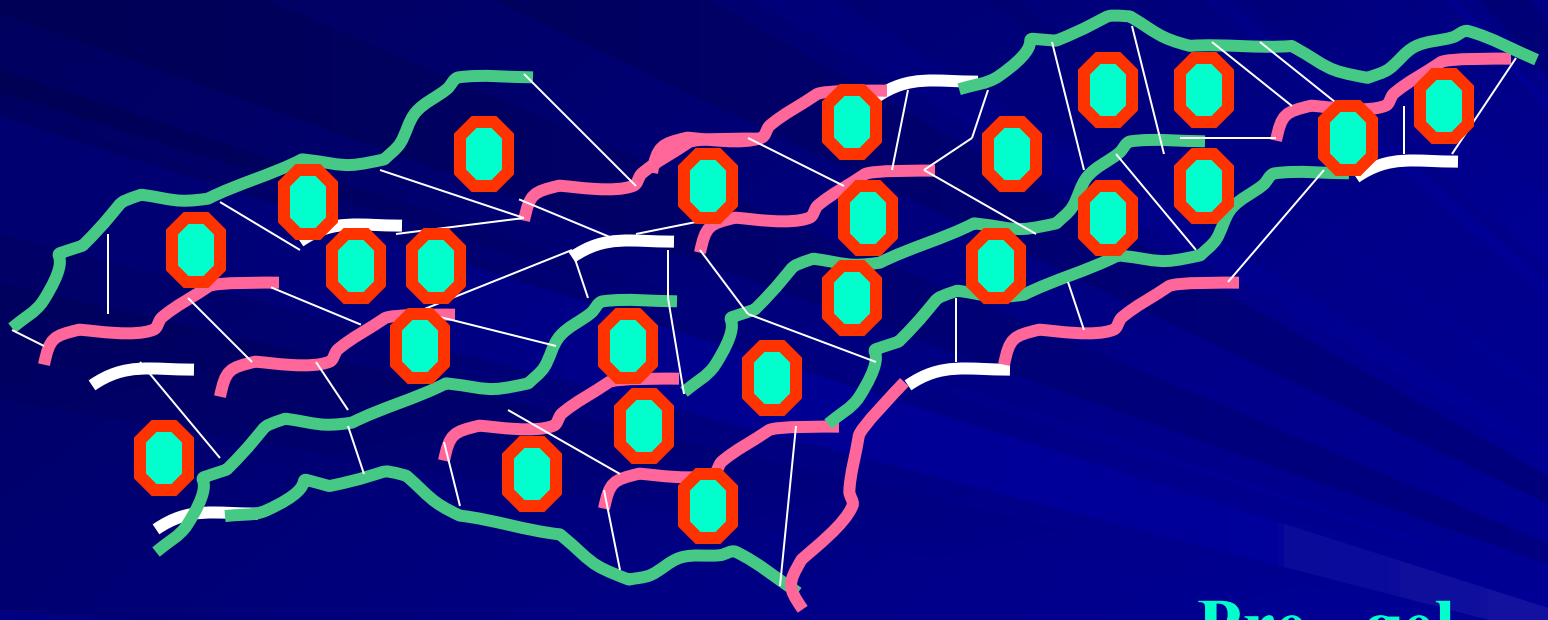


Versluis 2000



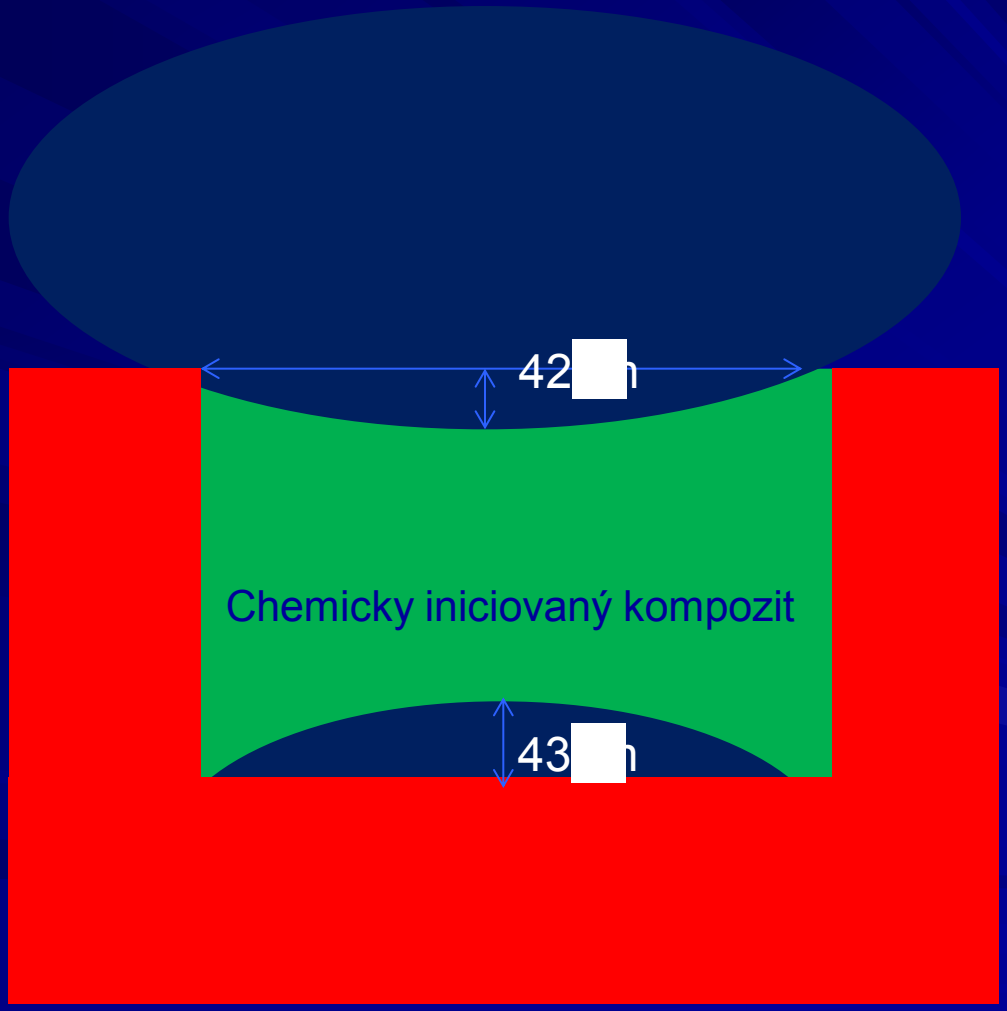
Monomer → Polymer

Polymerní síť



-

Pre –gel
Gel point
Post -gel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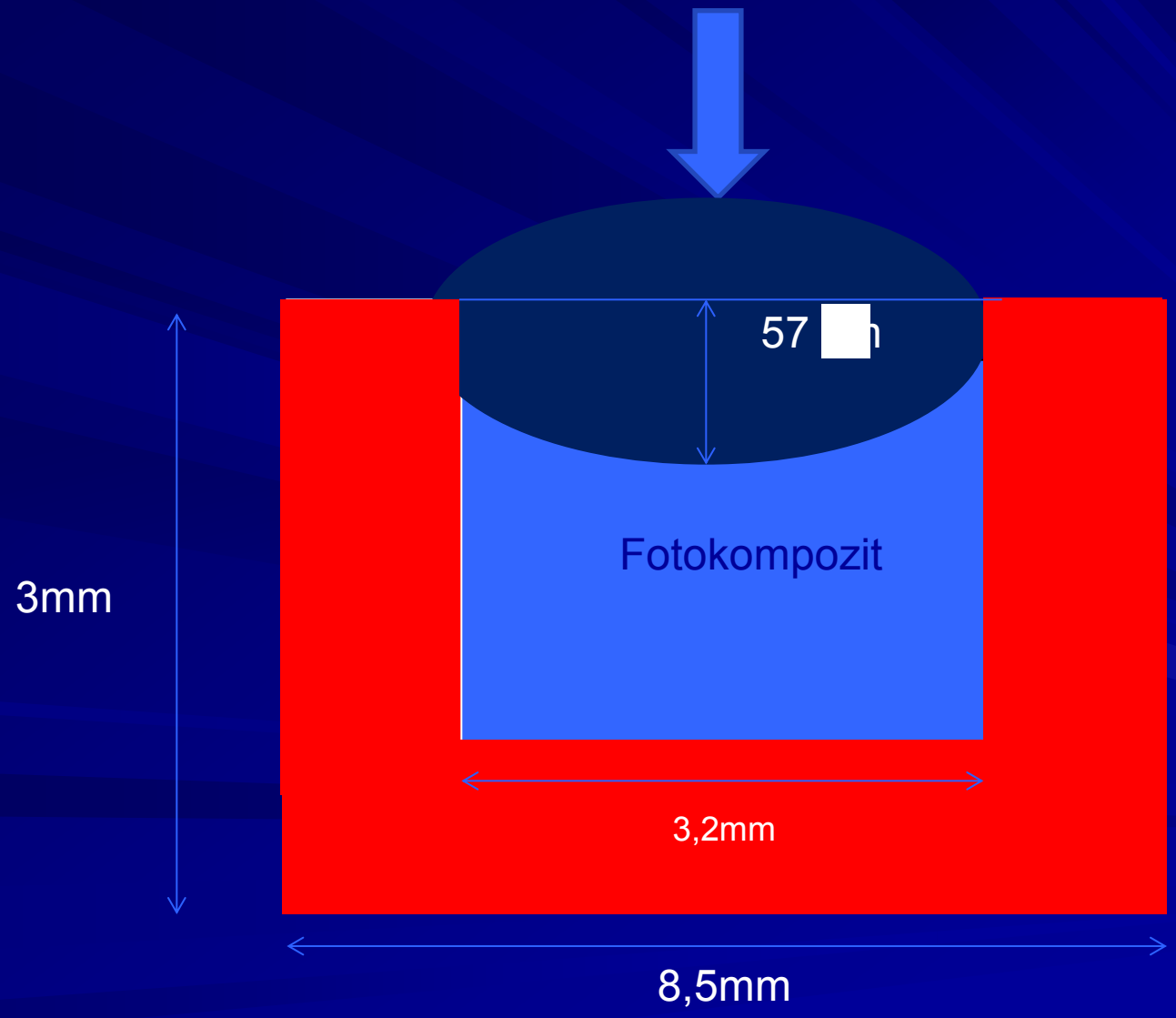
Chemicky iniciovaný kompozit
43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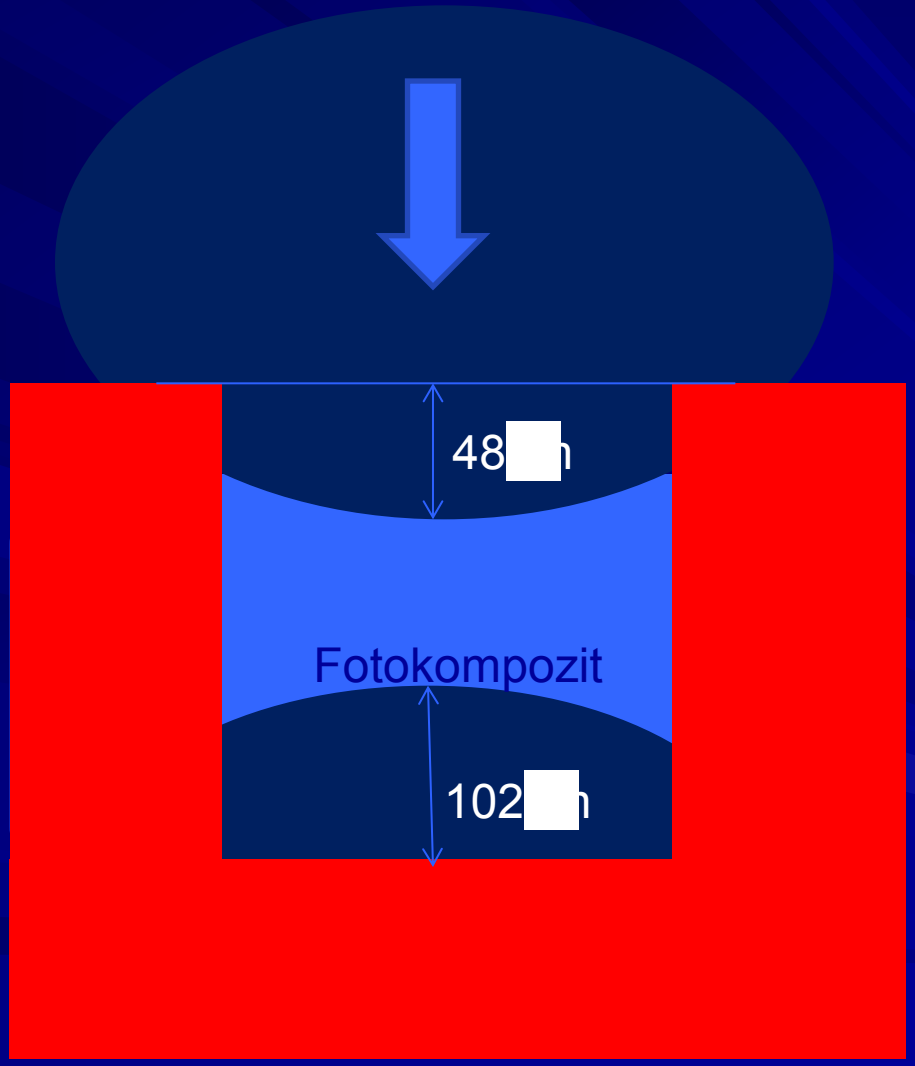
Fotokompozit
3mm
3,2mm
8,5mm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Fotokompozit
102

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)

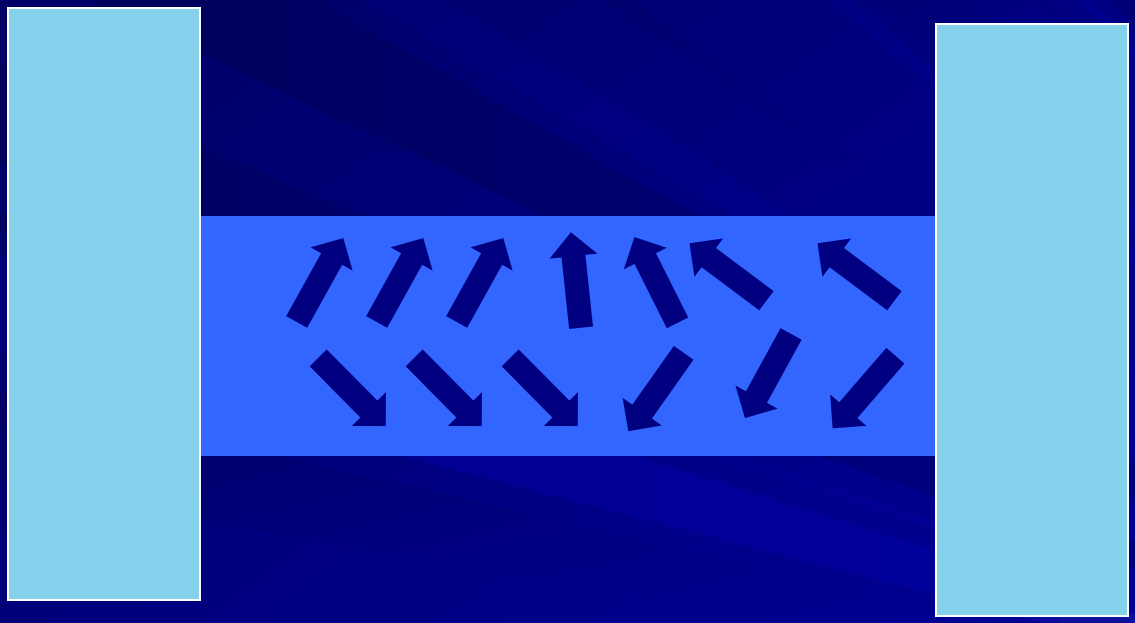
High content of the filler causes bigger stress

Flowable composites – low stress

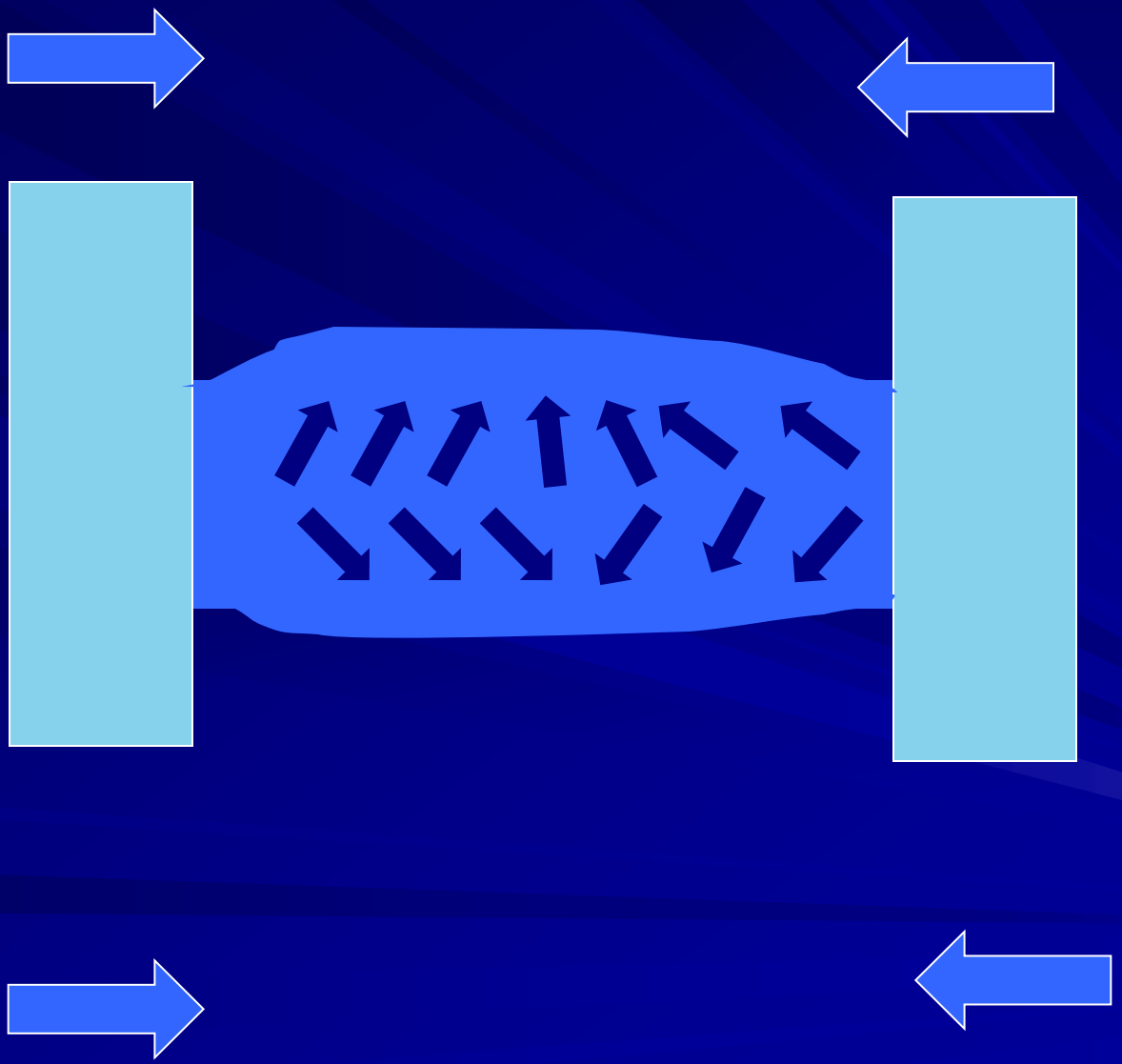
Forces of polymerization shrinkage depend on

Geometry of the cavity (C-factor)

Polymerization shrinkage

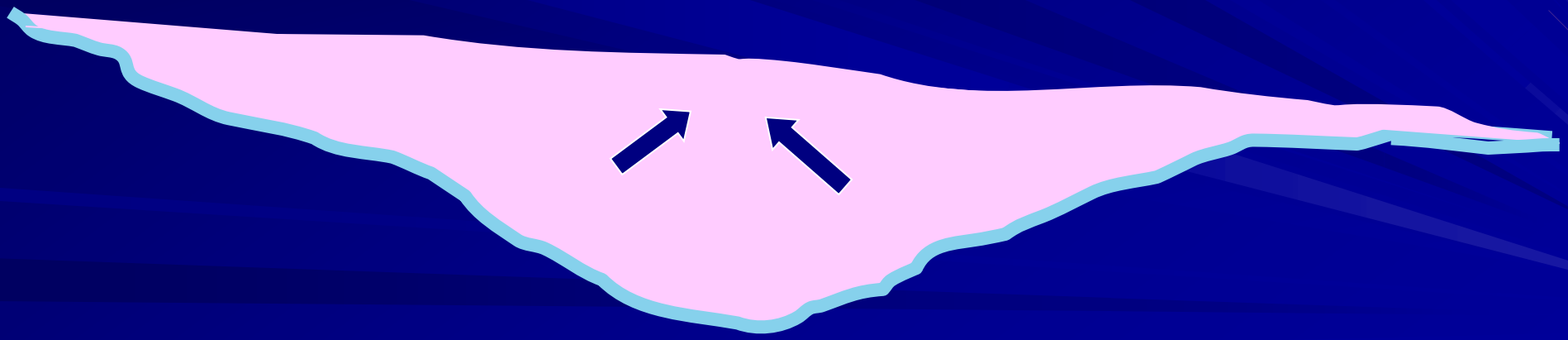


Polymerization shrinkage

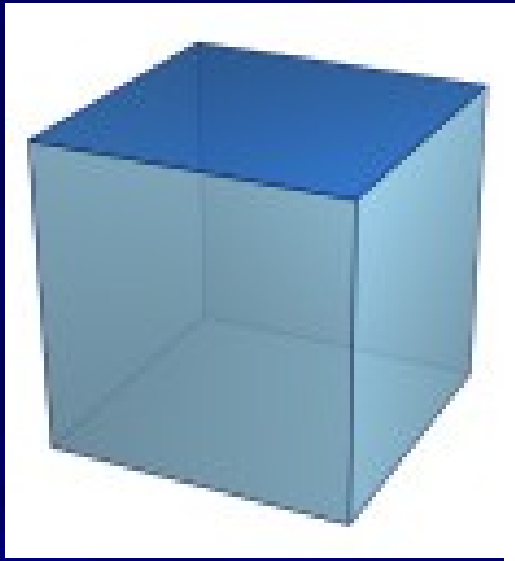


C - factor

Surface of adhesion/free surface of the filling



1/1 and less is optimal



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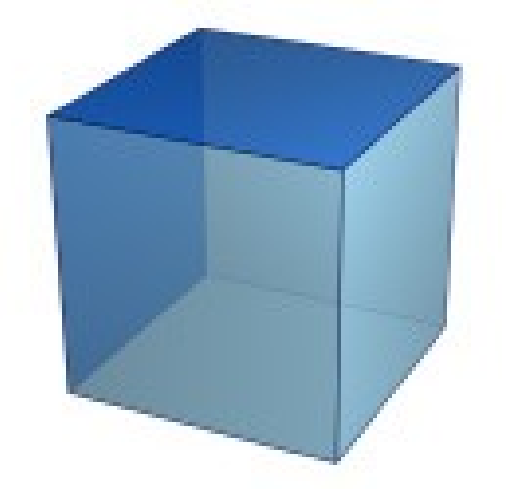

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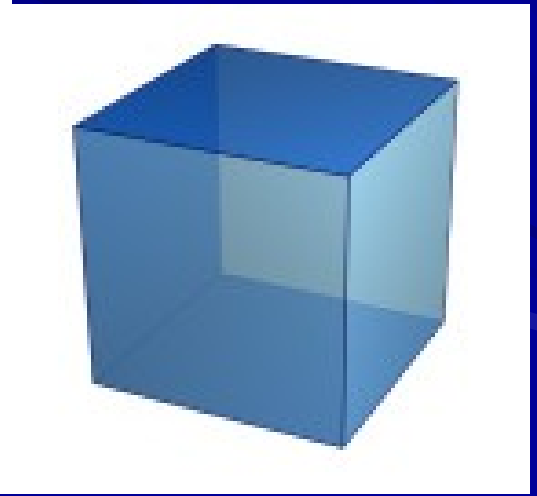

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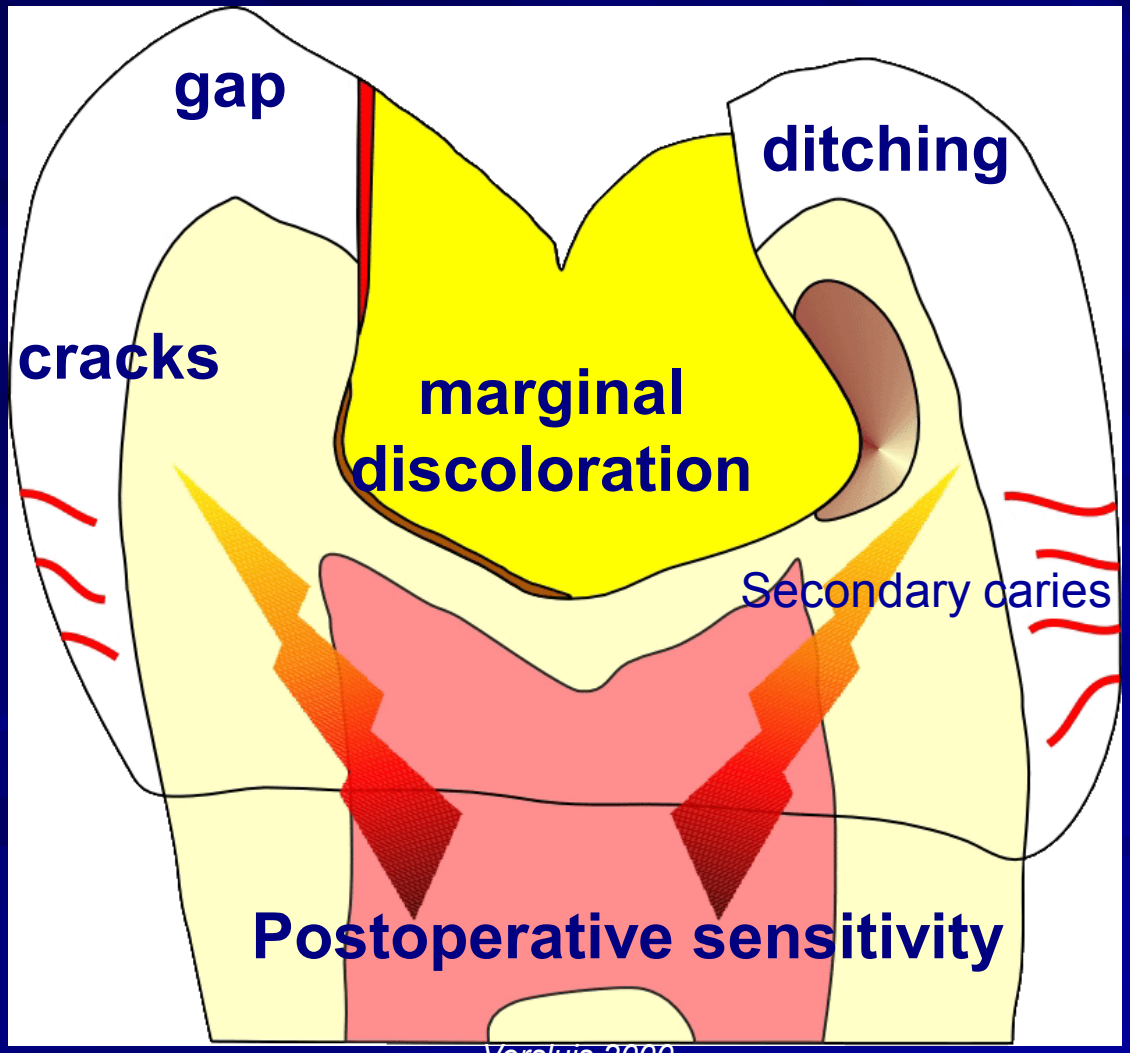


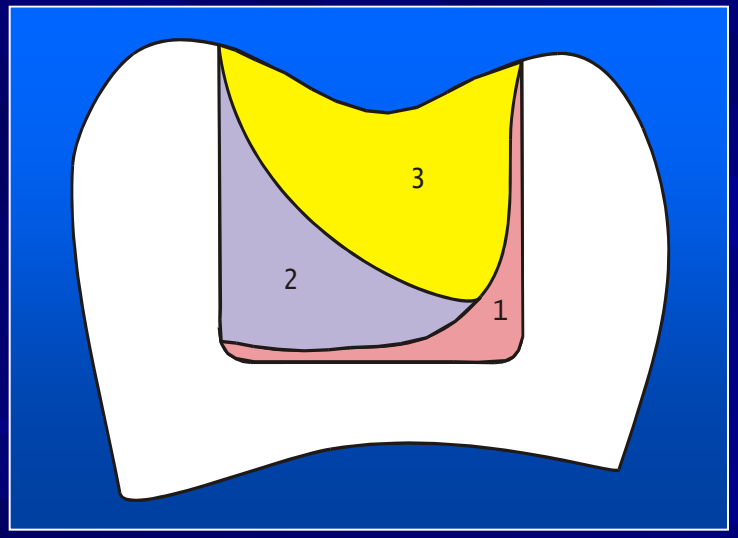
Versluis 2000

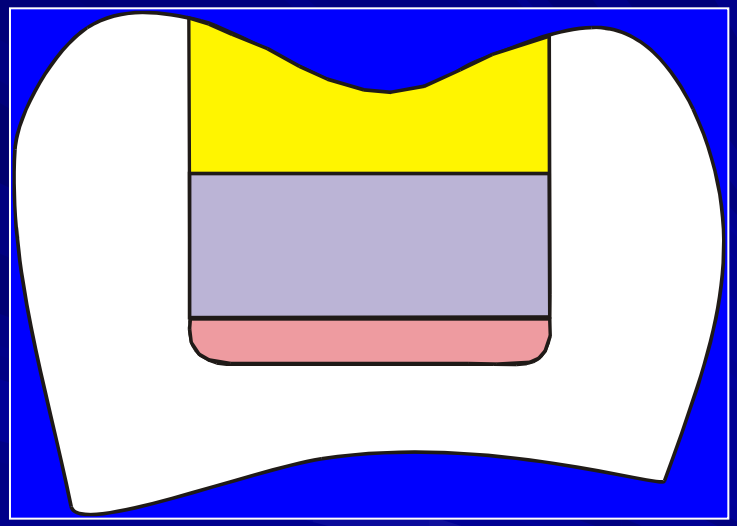
Forces of polymerization shrinkage depend on

- 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



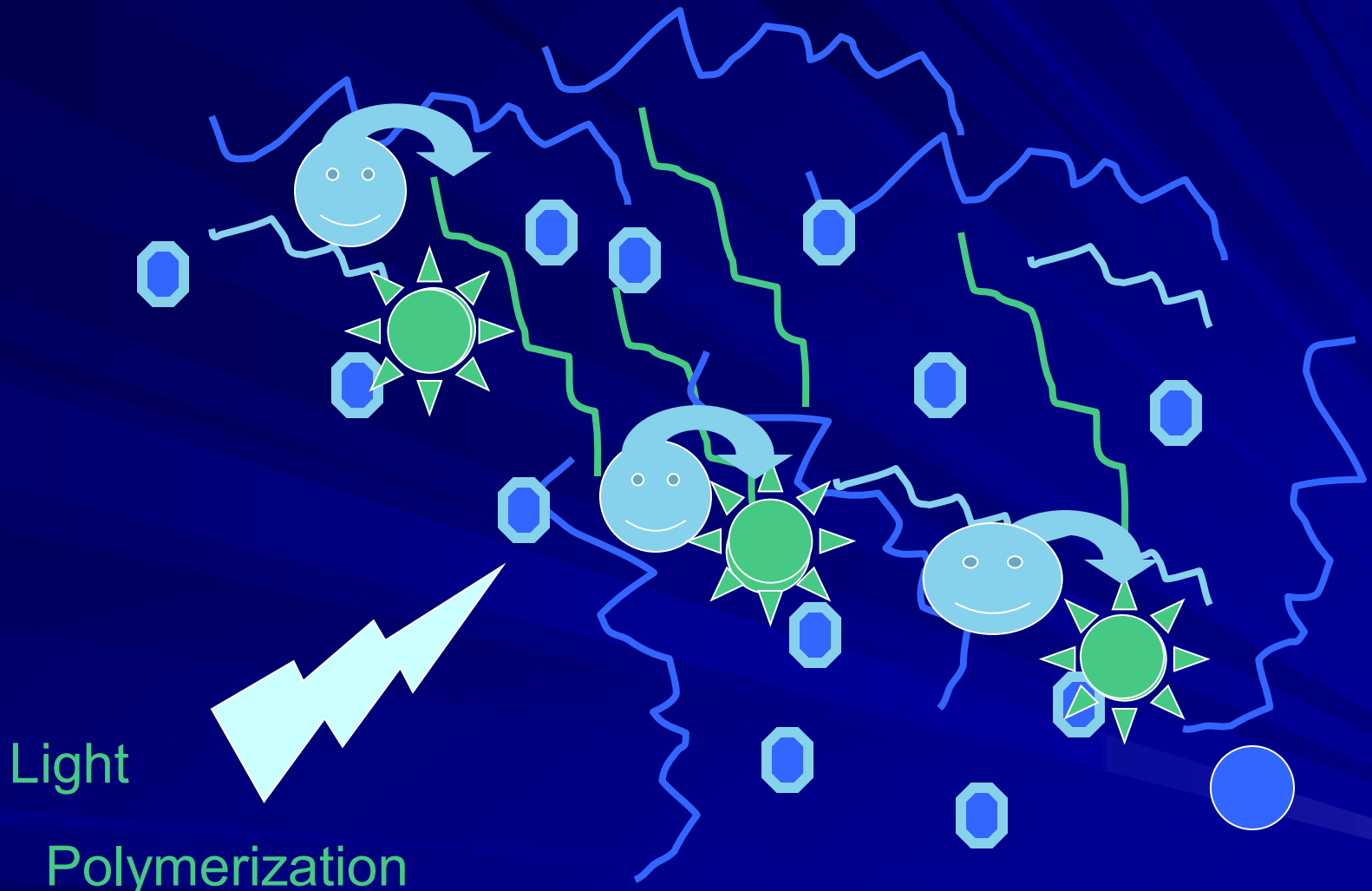


Forces of polymerization shrinkage depend on

- Mode of polymerization

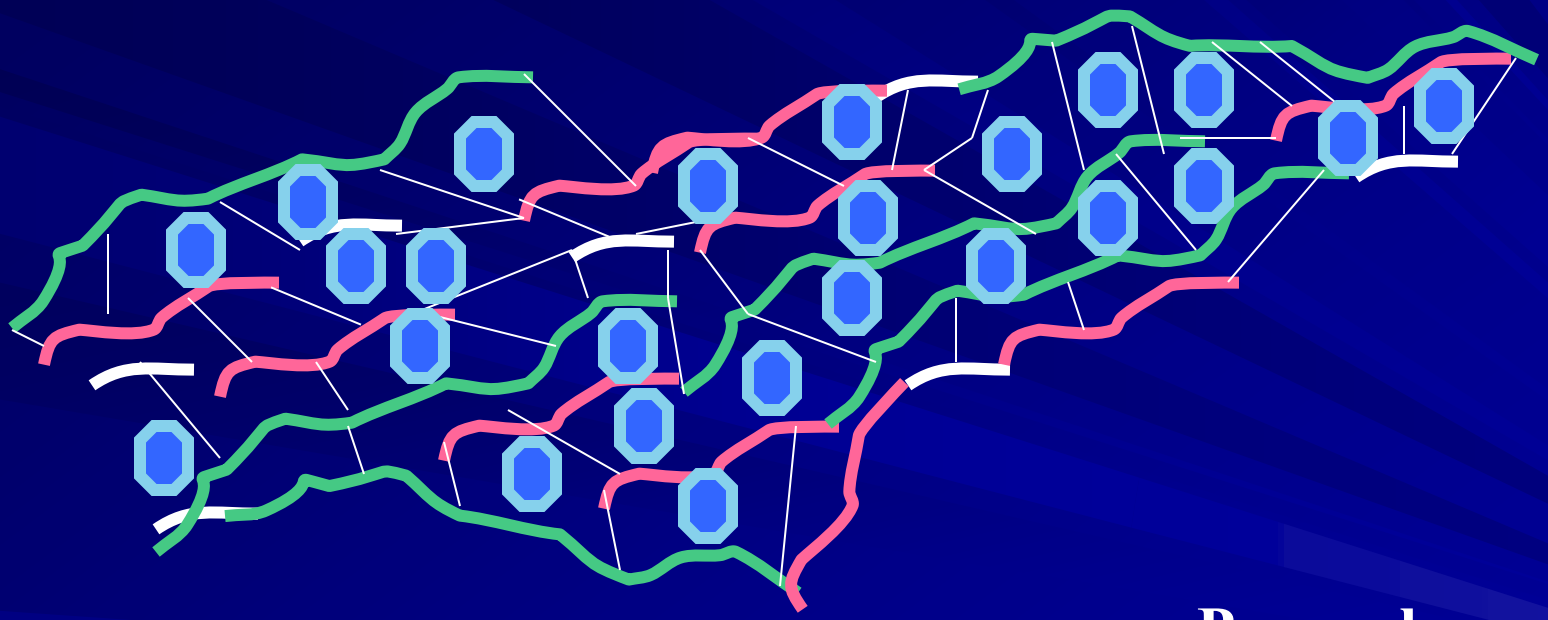
Phases

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



Monomer ⟶ Polymer

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



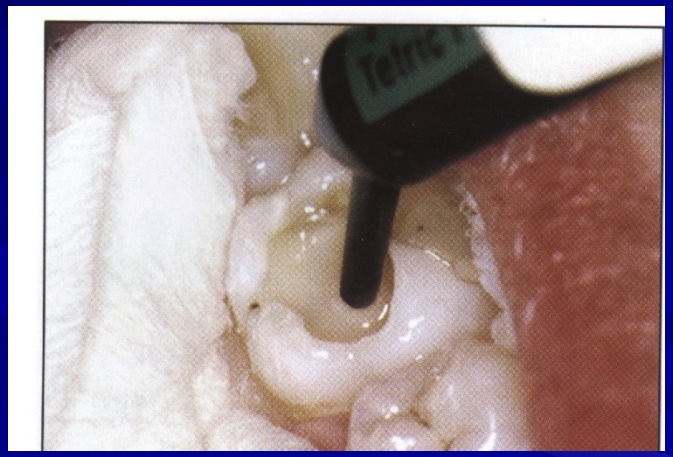
Pre –gel
Gel
Post -gel

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**

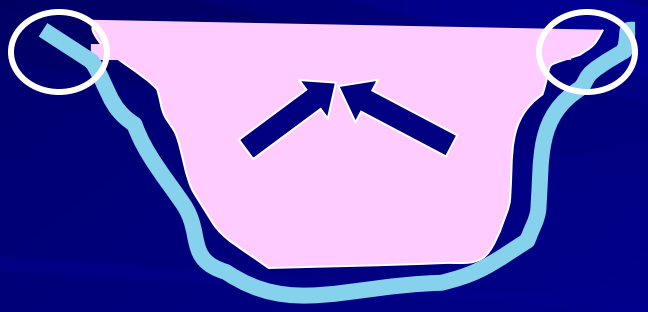


Temperovaný kompozit

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

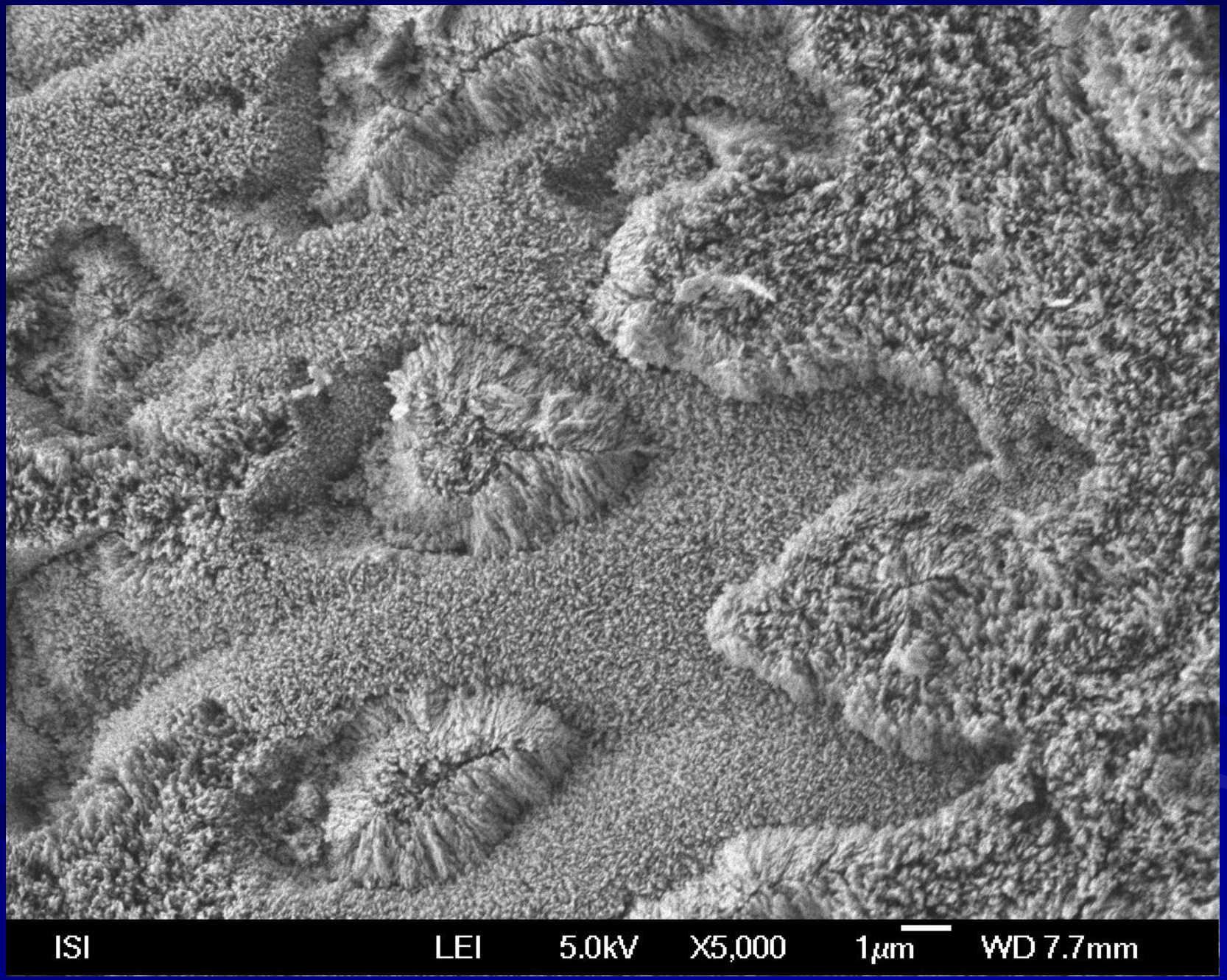
Priming
Bonding

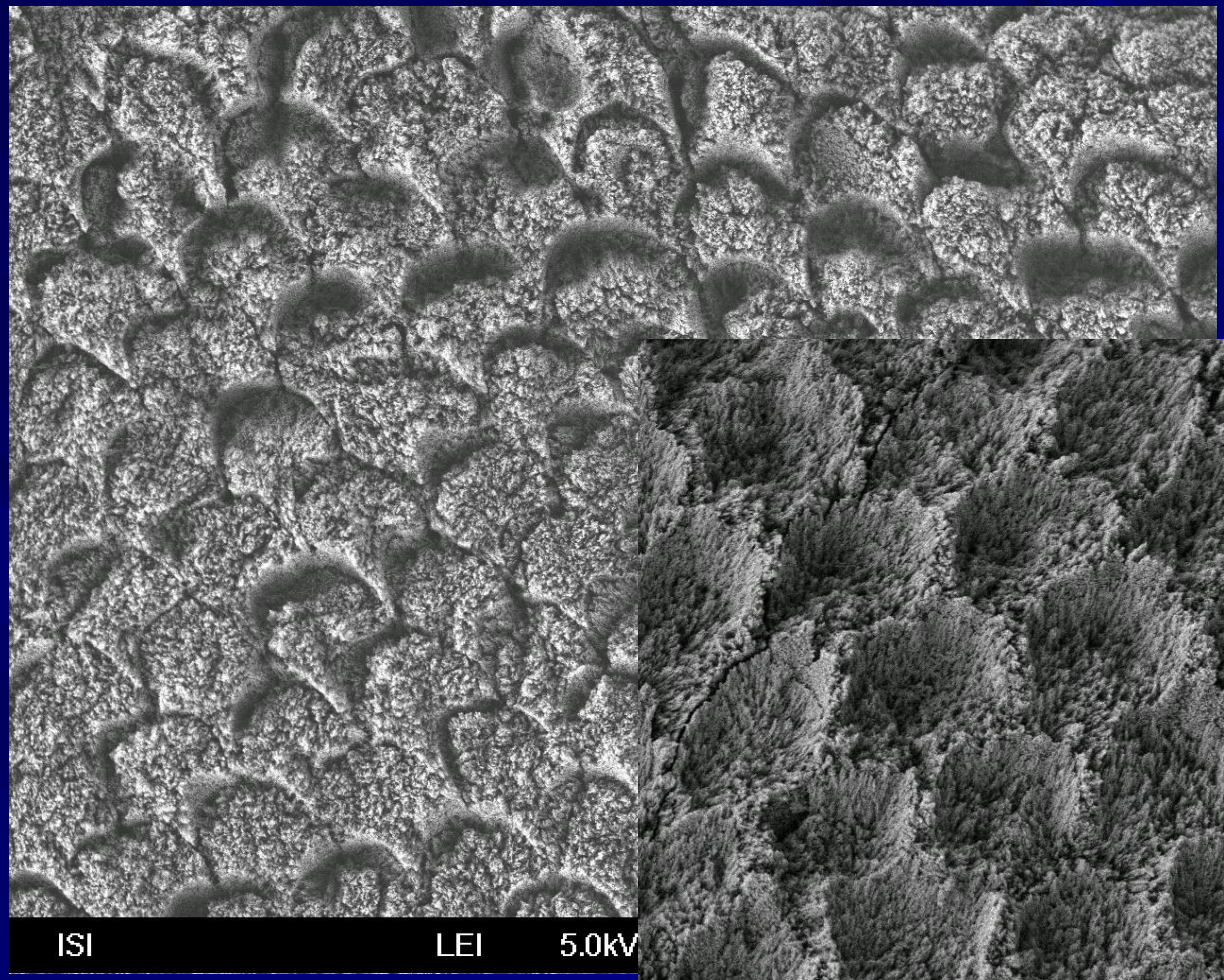
Adhesives

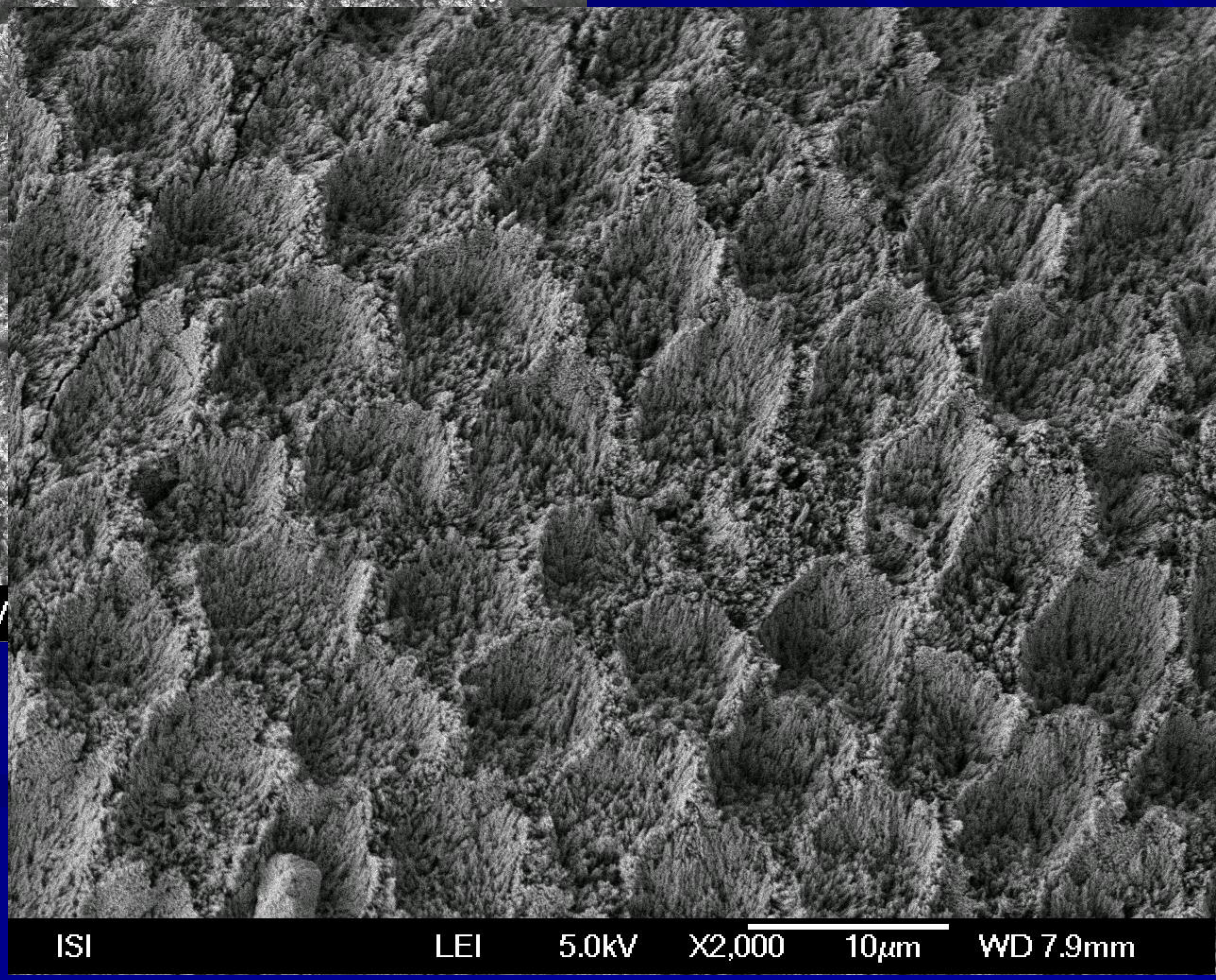
- Active and passive bonding

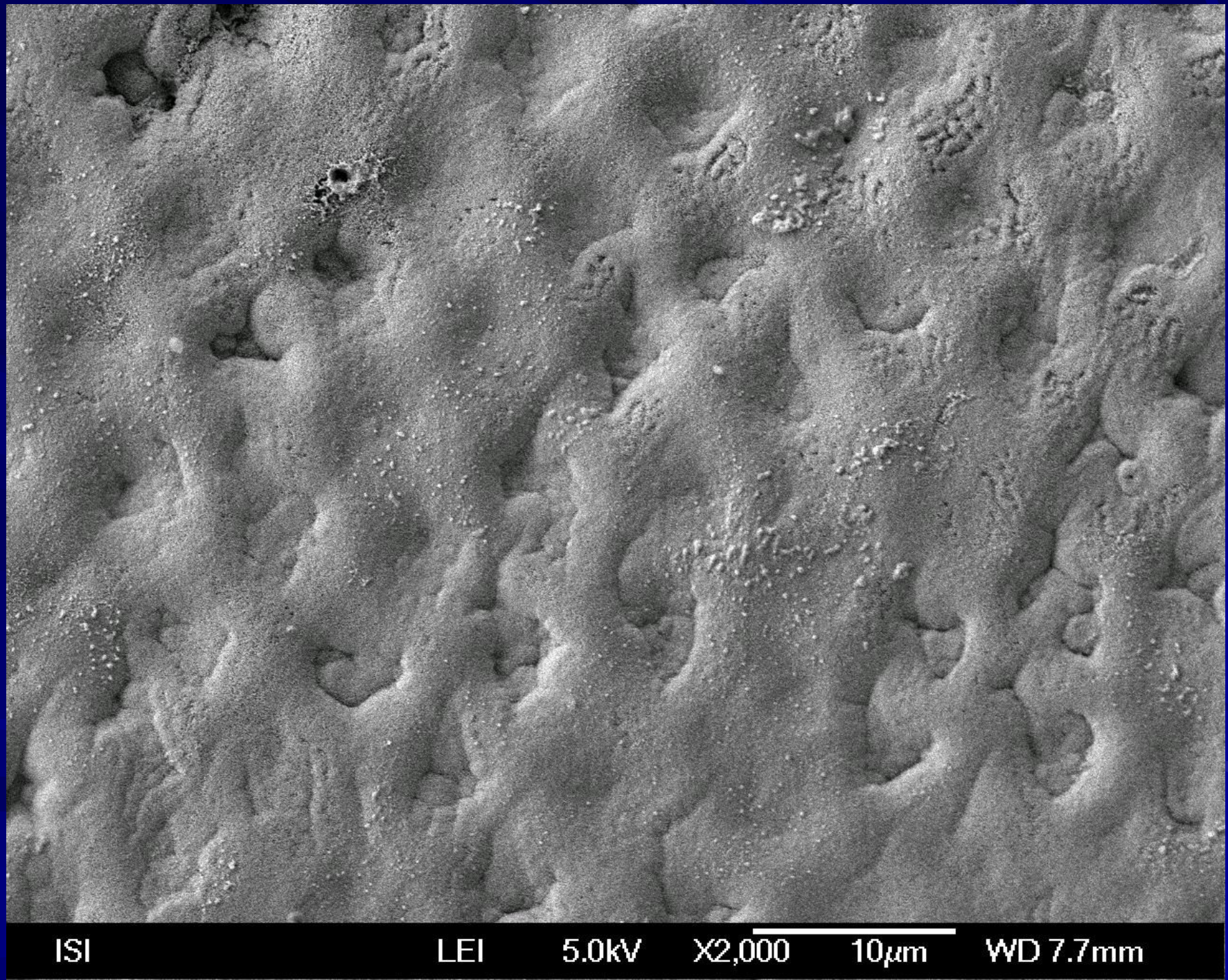
Active – rubbing with microbrush

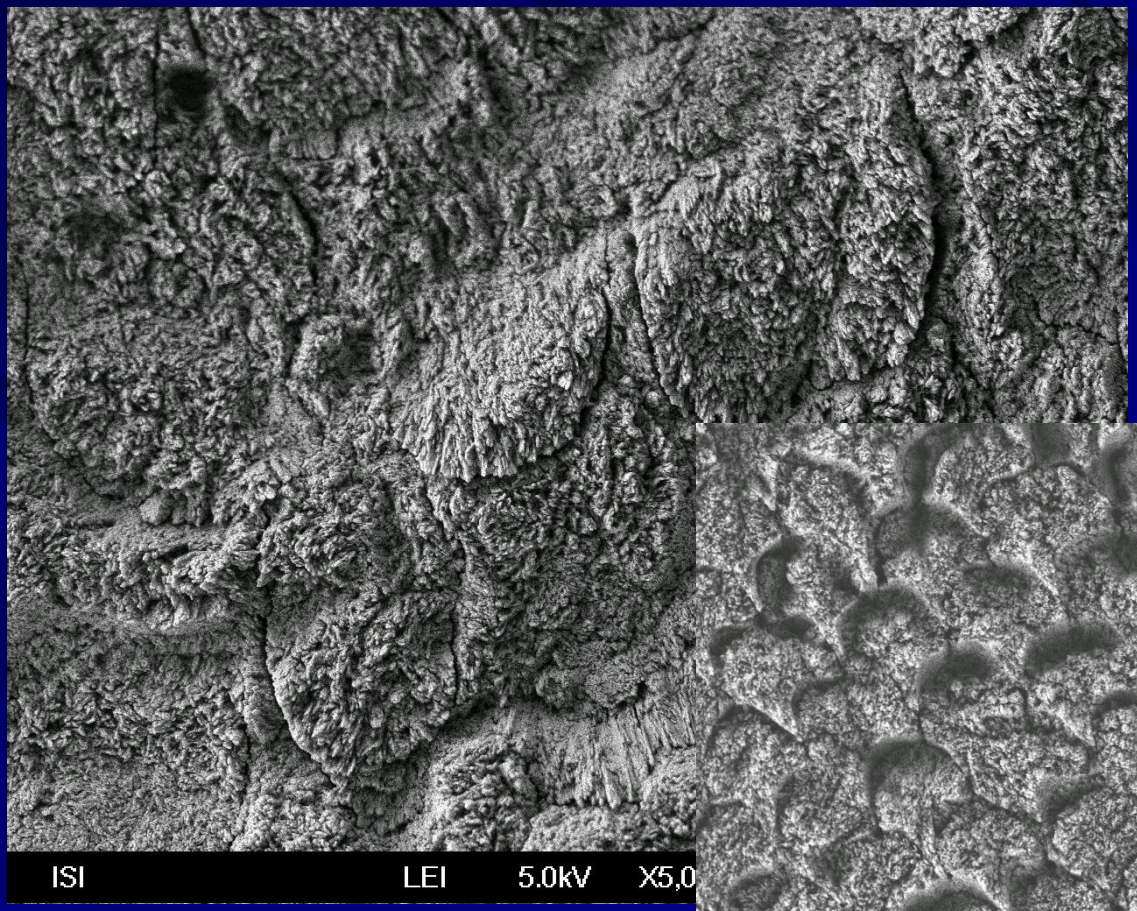
Passive – without any rubbing


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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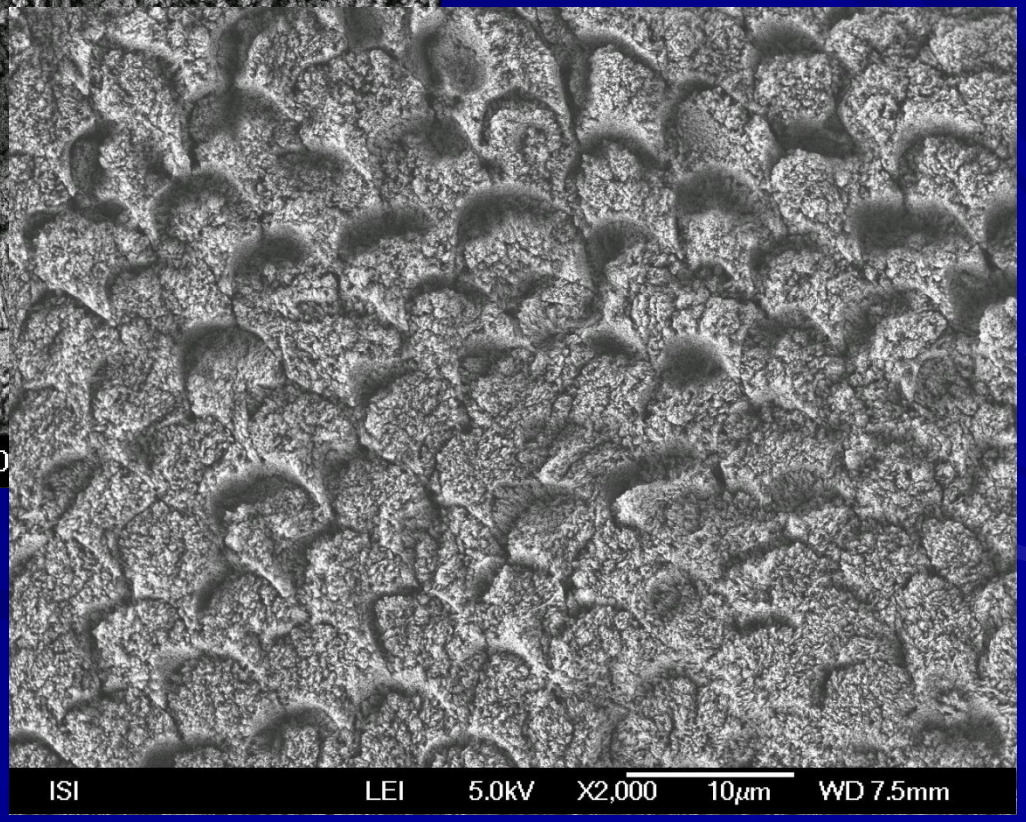
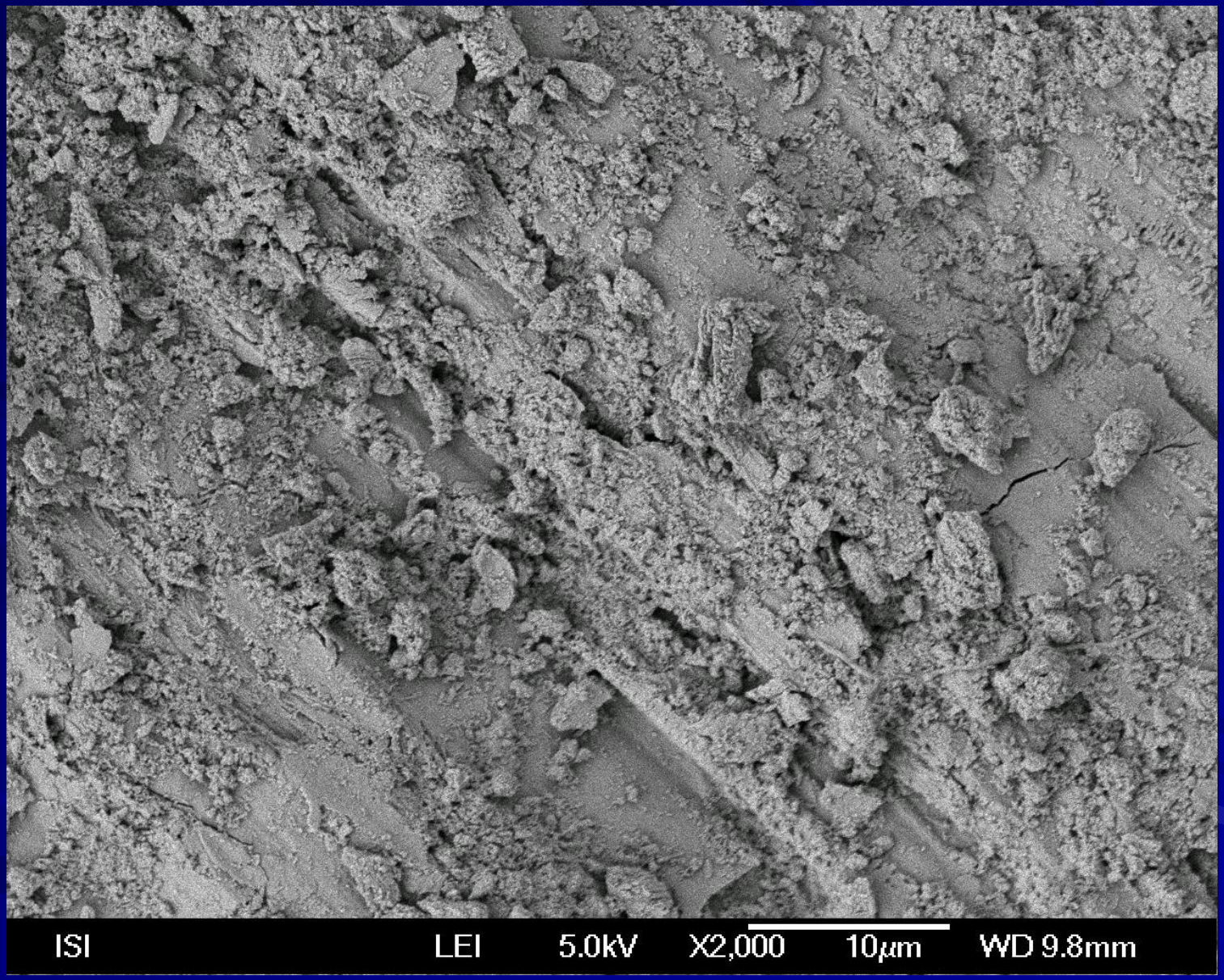
LEI
5.0kV
X5,0


ISI
LEI
5.0kV
X2,000
10μm
WD 7.5mm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LEI
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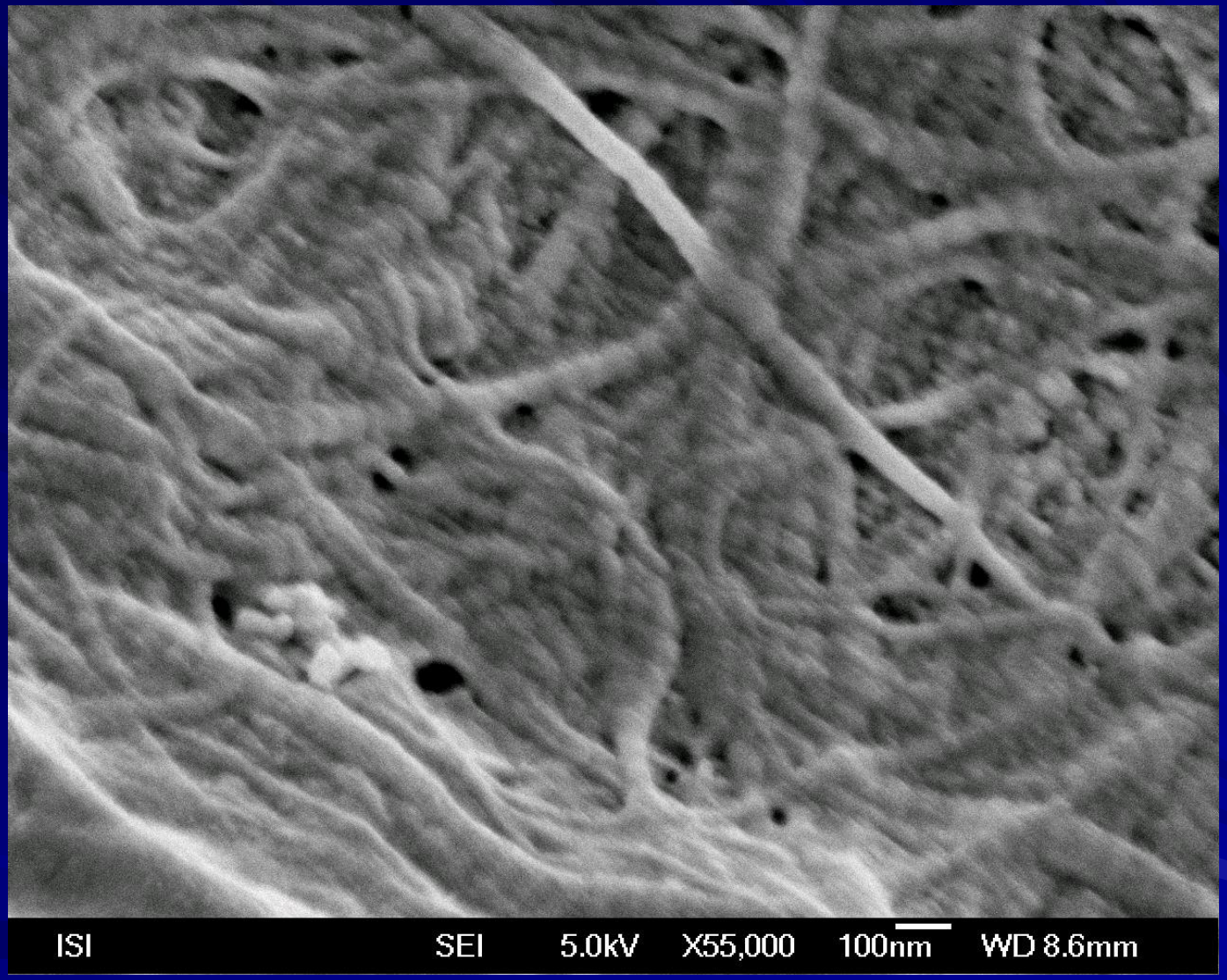
X2,000
10μm
WD 9.8mm


ISI
SEI
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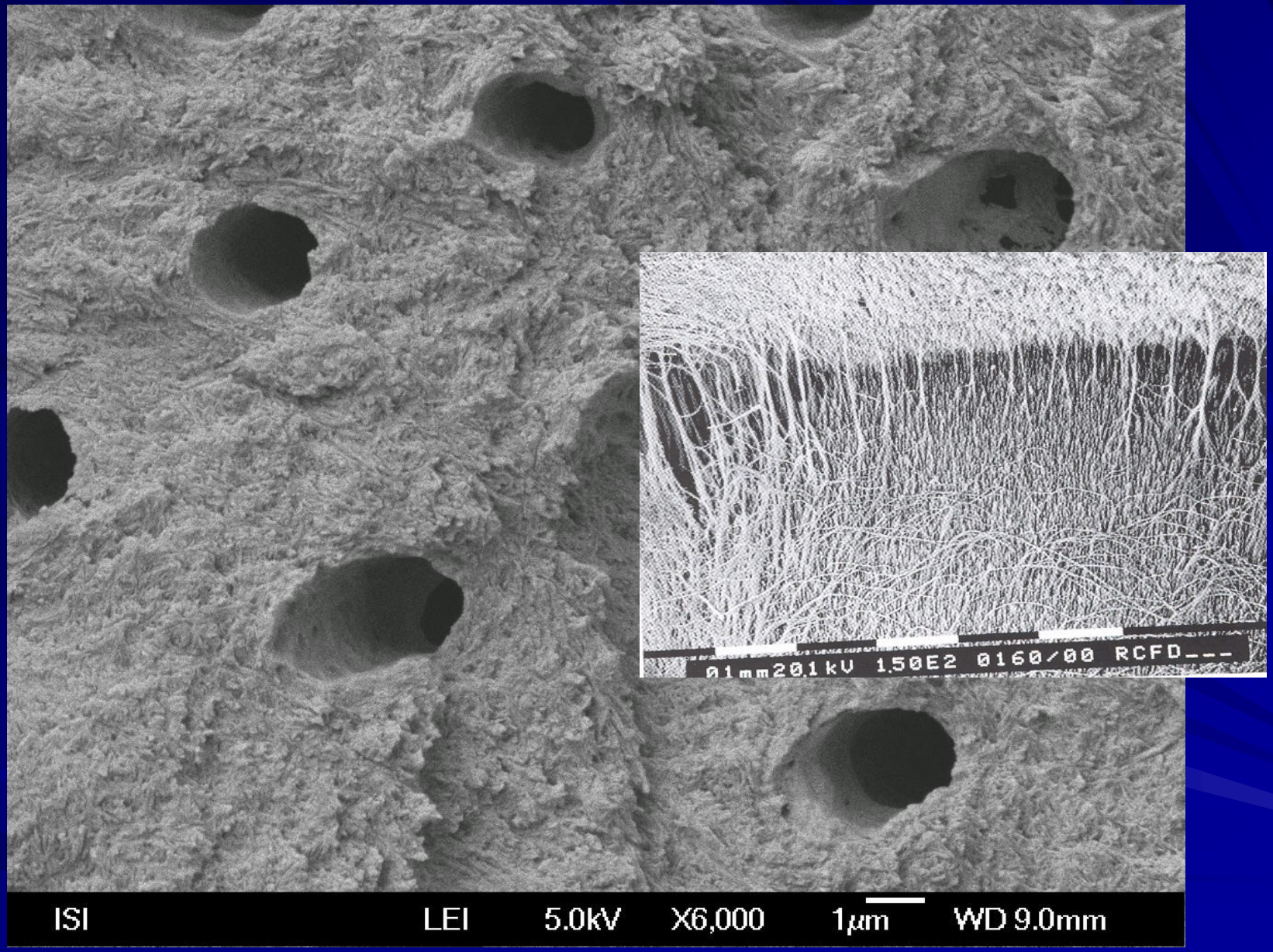
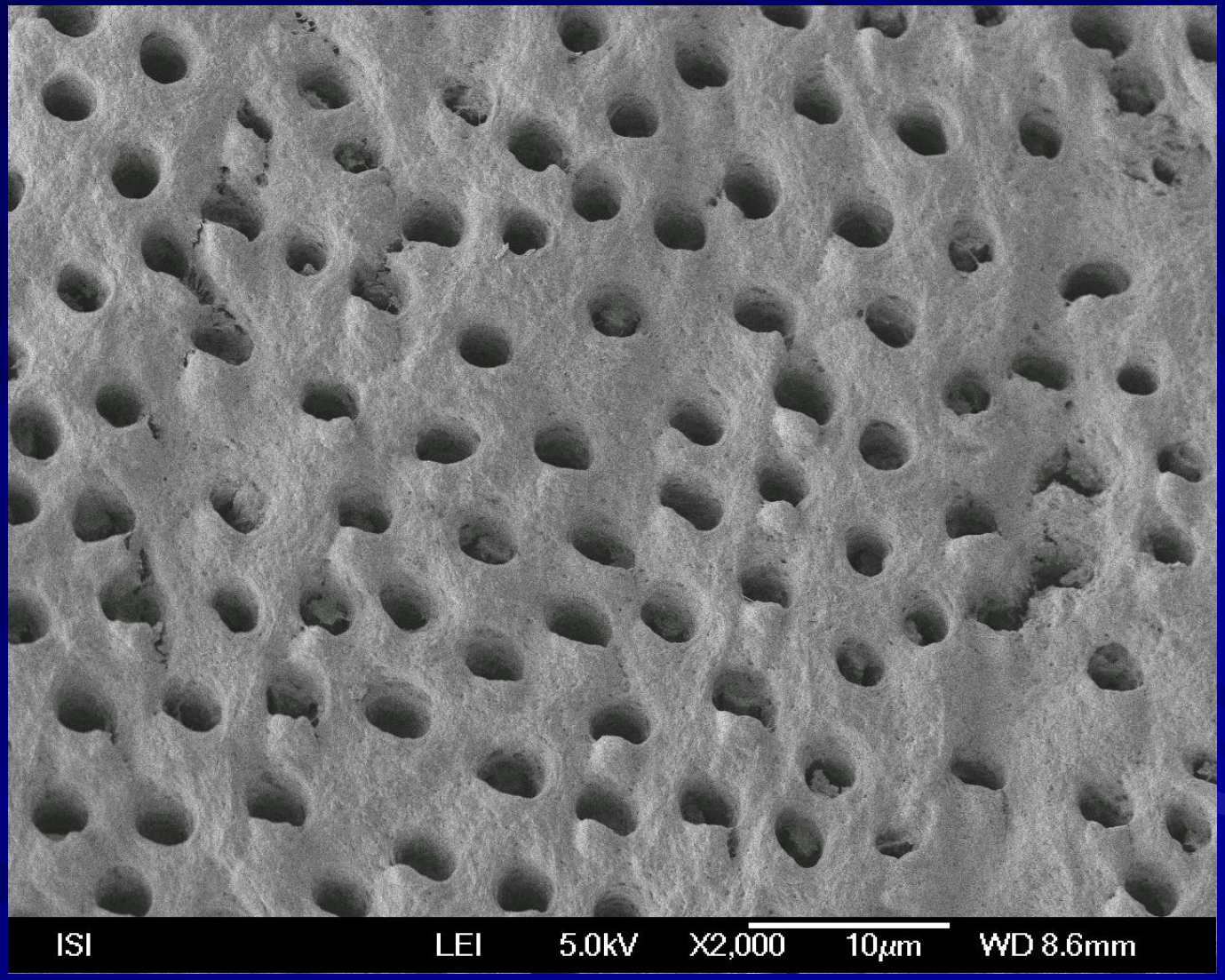
X55,000
100nm
WD 8.6mm


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


ISI
LEI
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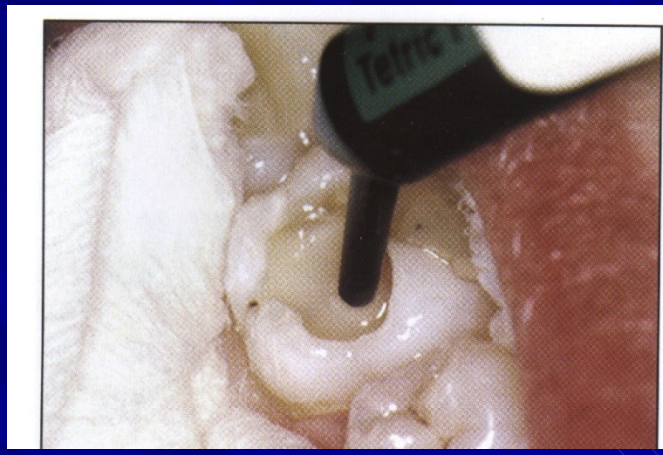
X2,000
10μm
WD 8.6mm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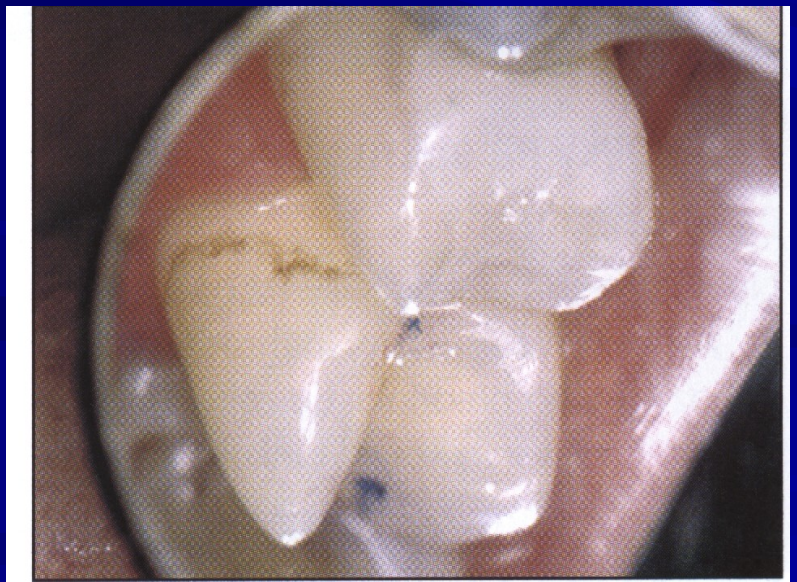
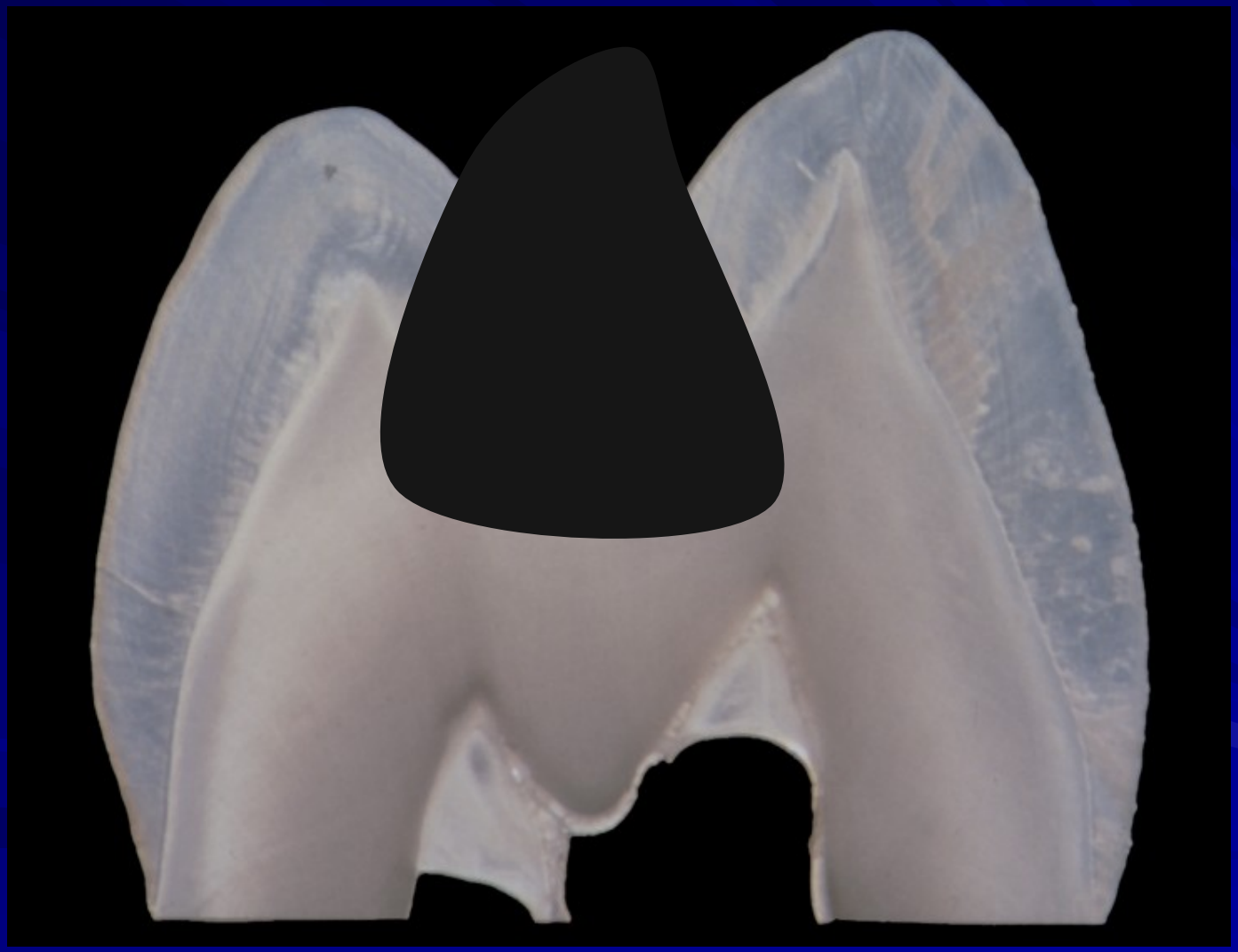
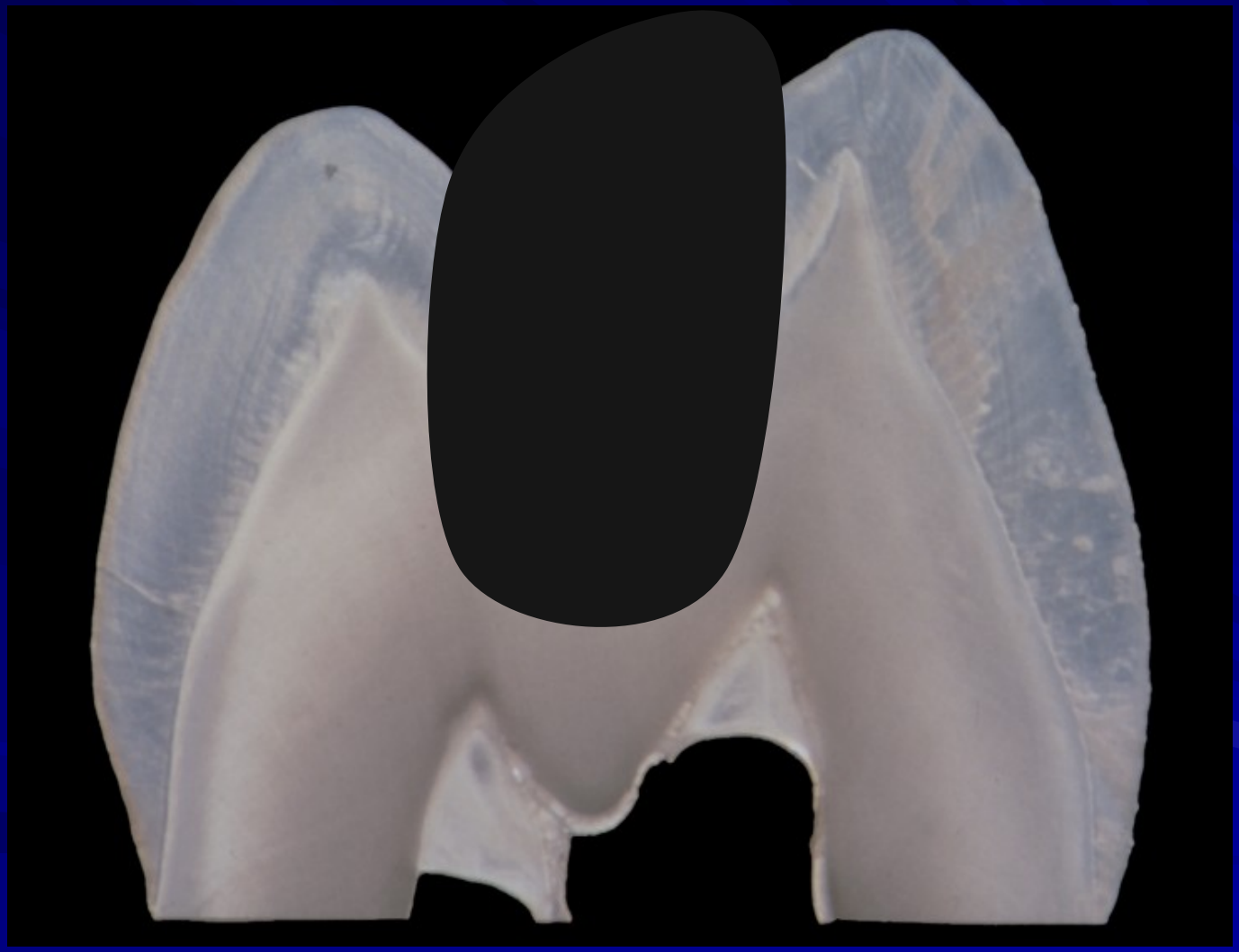
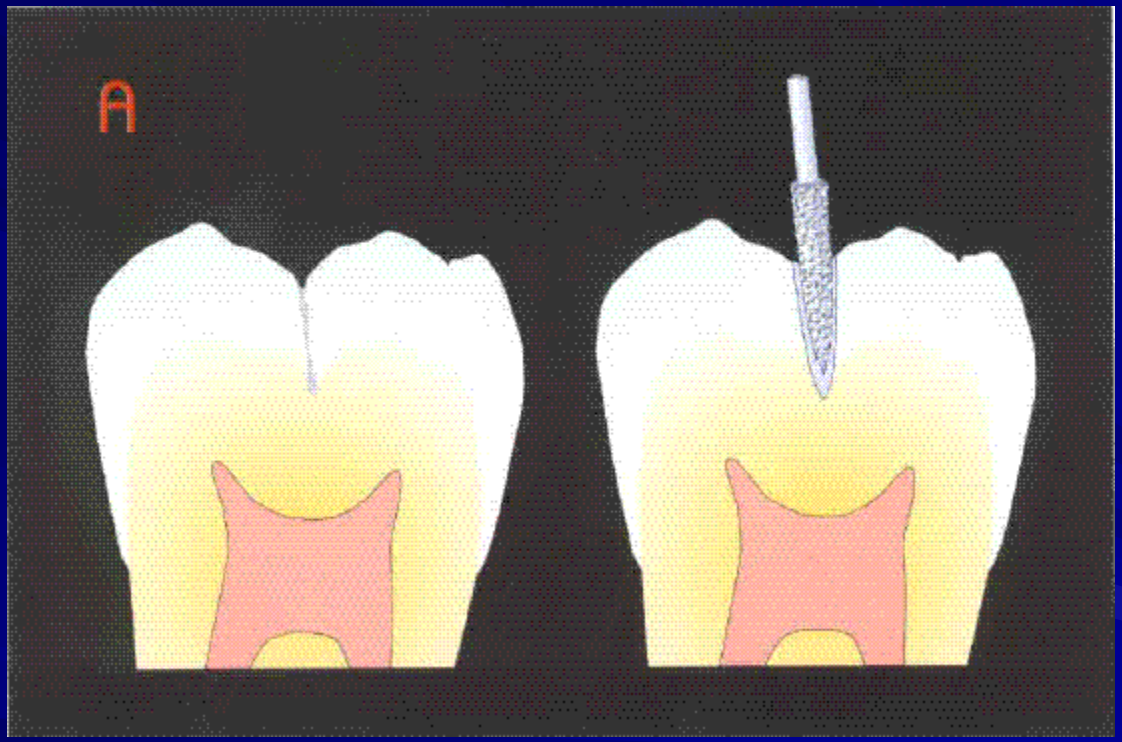


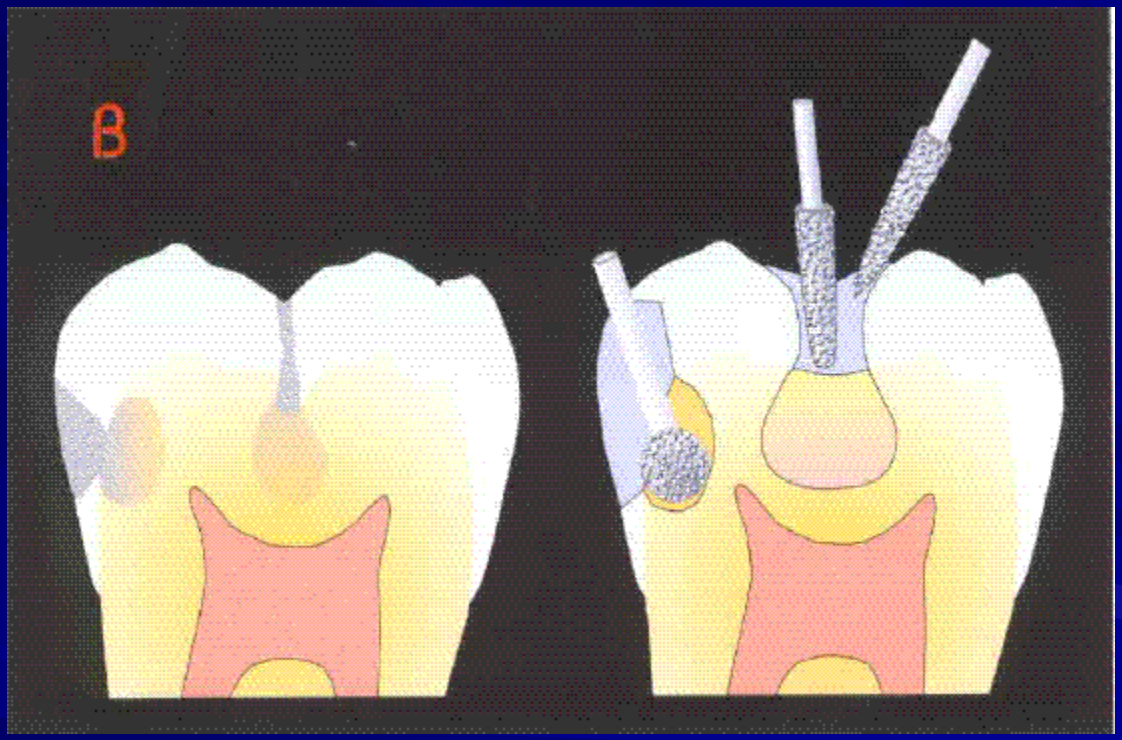




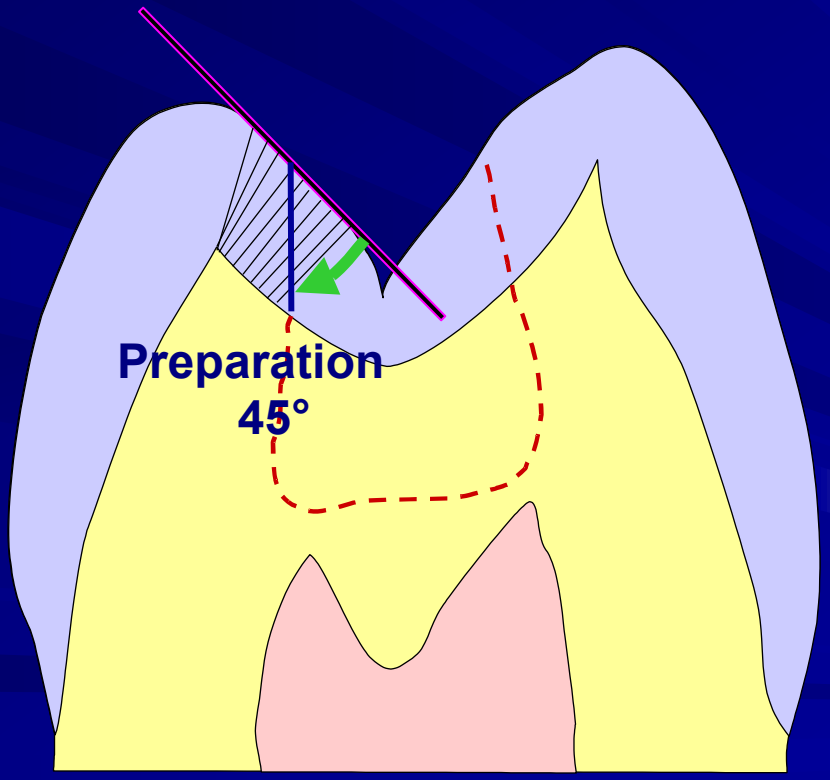
Adhesive preparation in a fissure

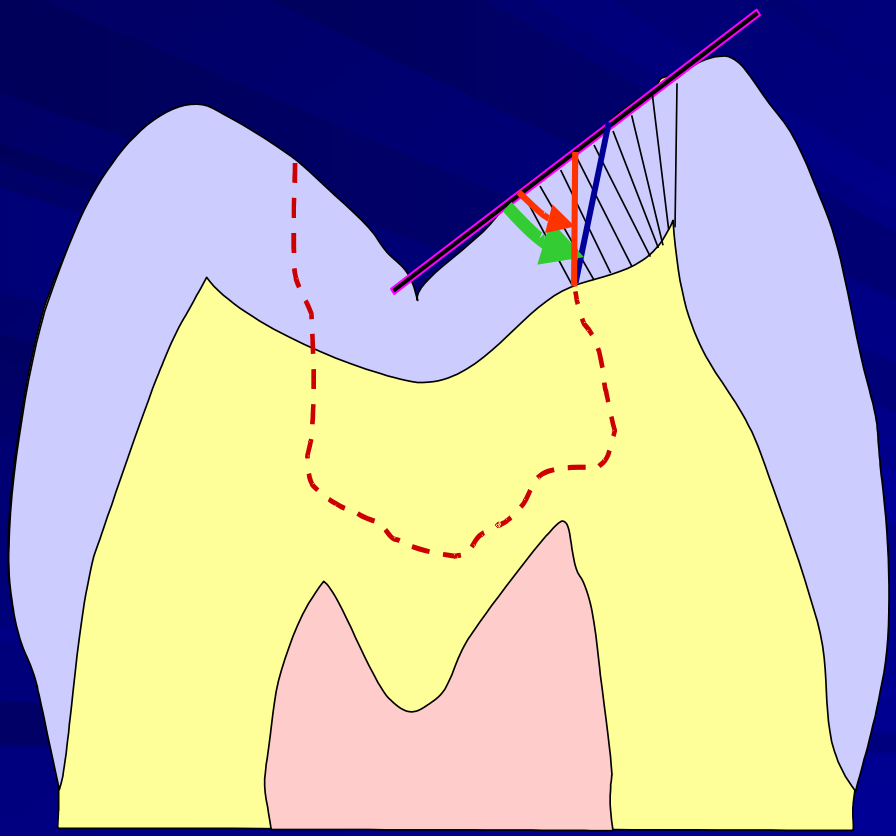


Adhesive preparation



Preparation of enamel borders

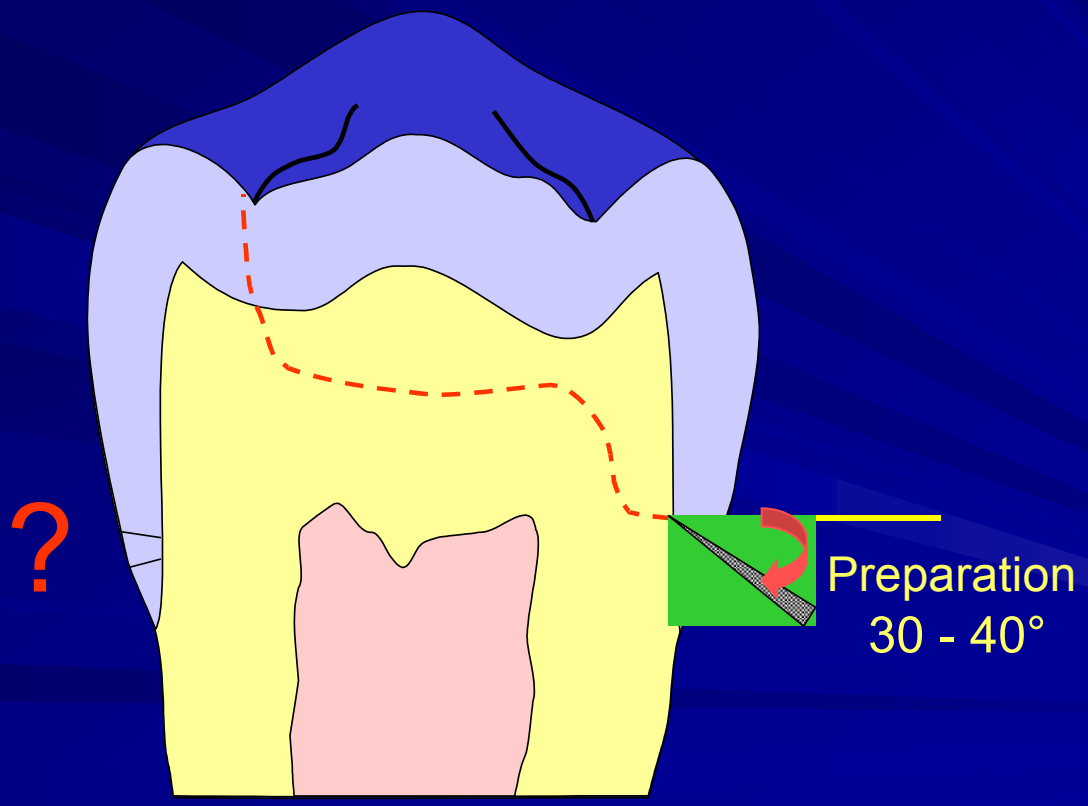




Next to cusp
50-60°,

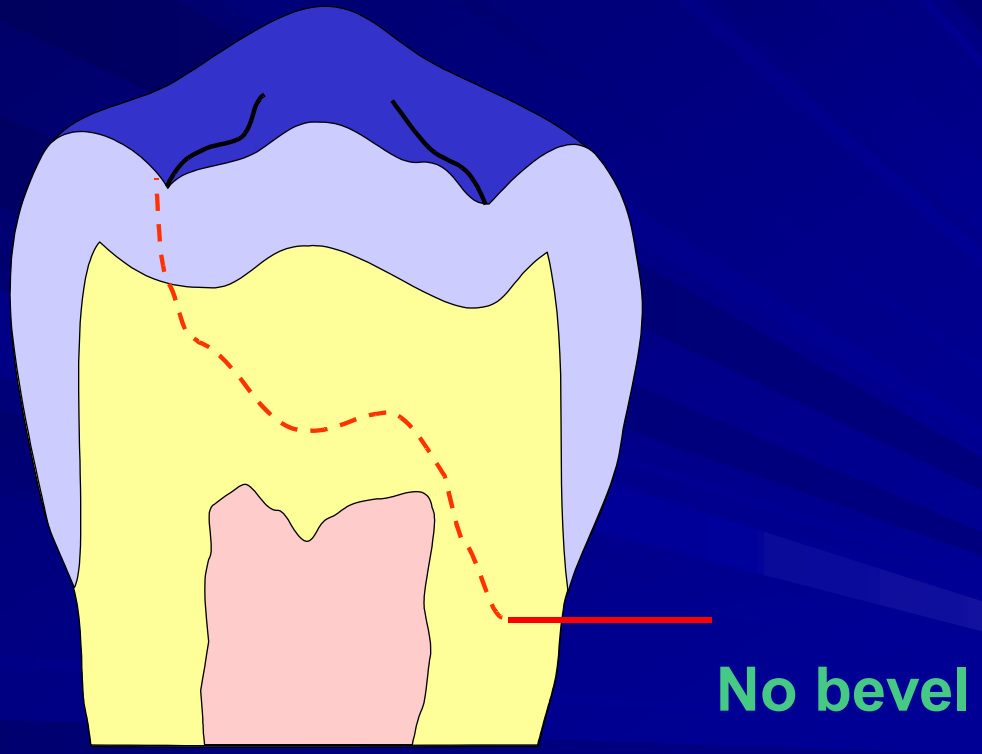
Cervical borders

In enamel

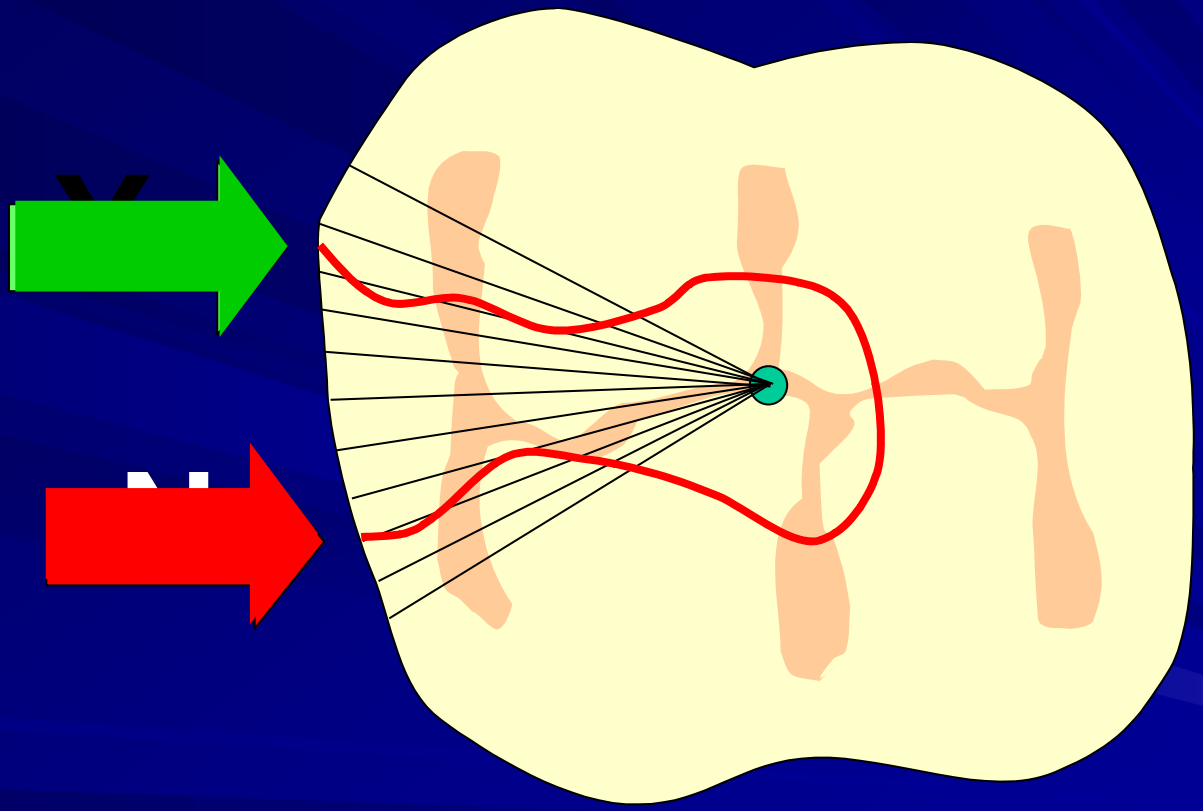


Cervical borders

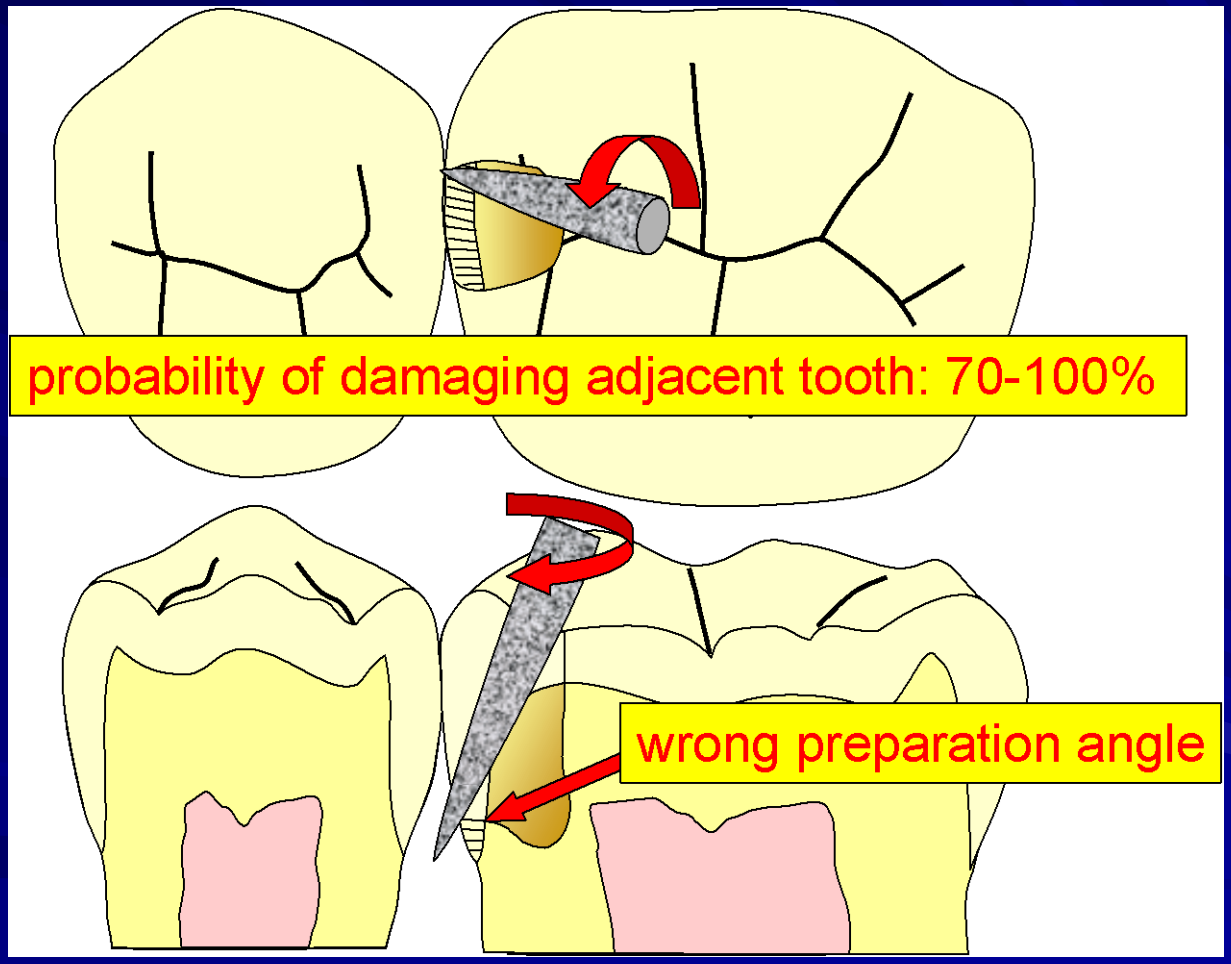
In dentin



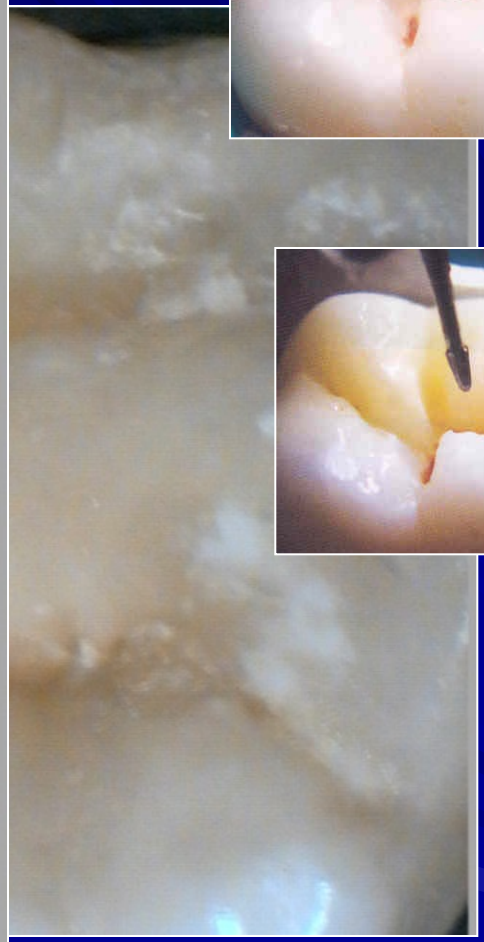
Interproximal borders



Preparation technique

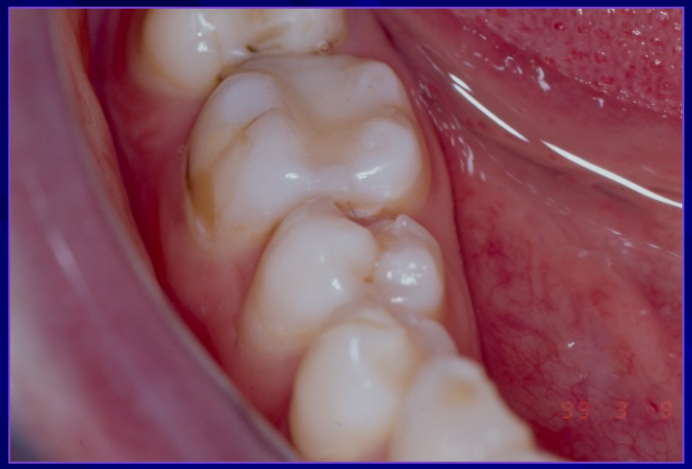


Oscillating instruments



Composite filling class II. Contact point

Contact point
Contact area



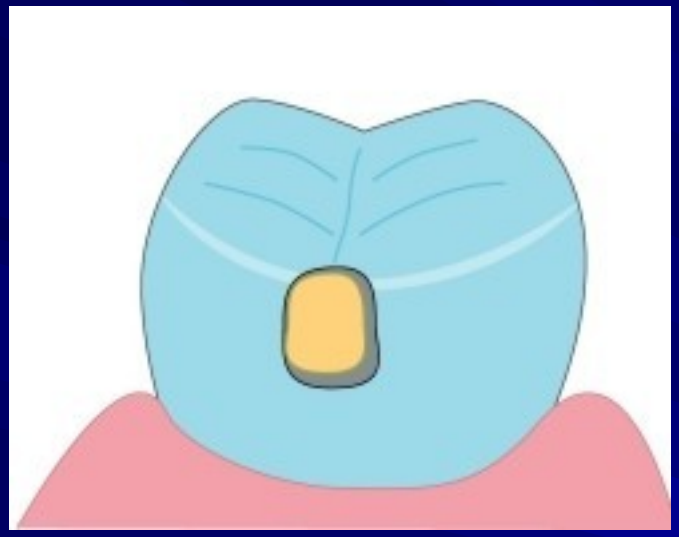
Class II. and contact point

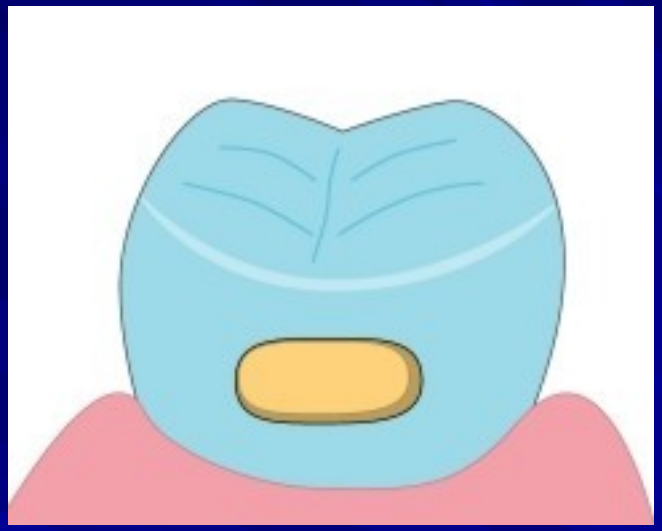
- Matrix band + matrix retainer
  - Metal band
  - Plastic band (polyester)

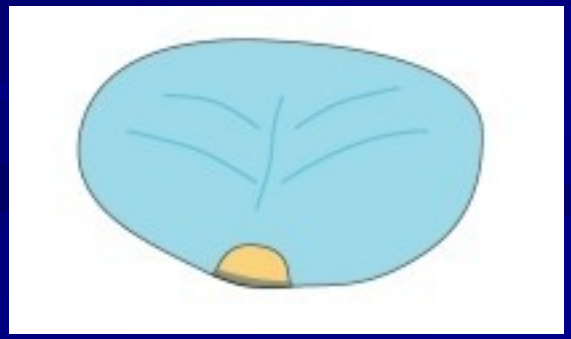
Without matrix retainer

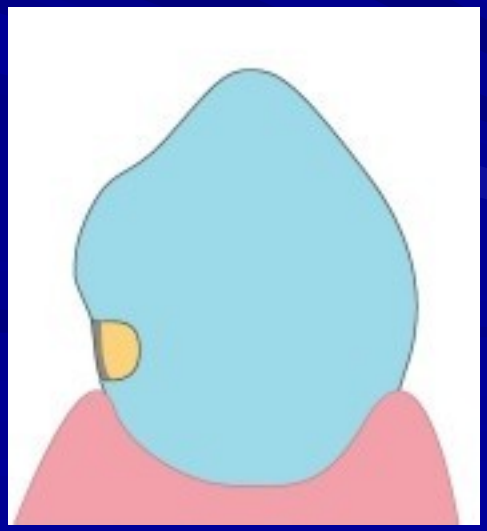
- Sectional matrices with separator

Adhezivní slotová preparace

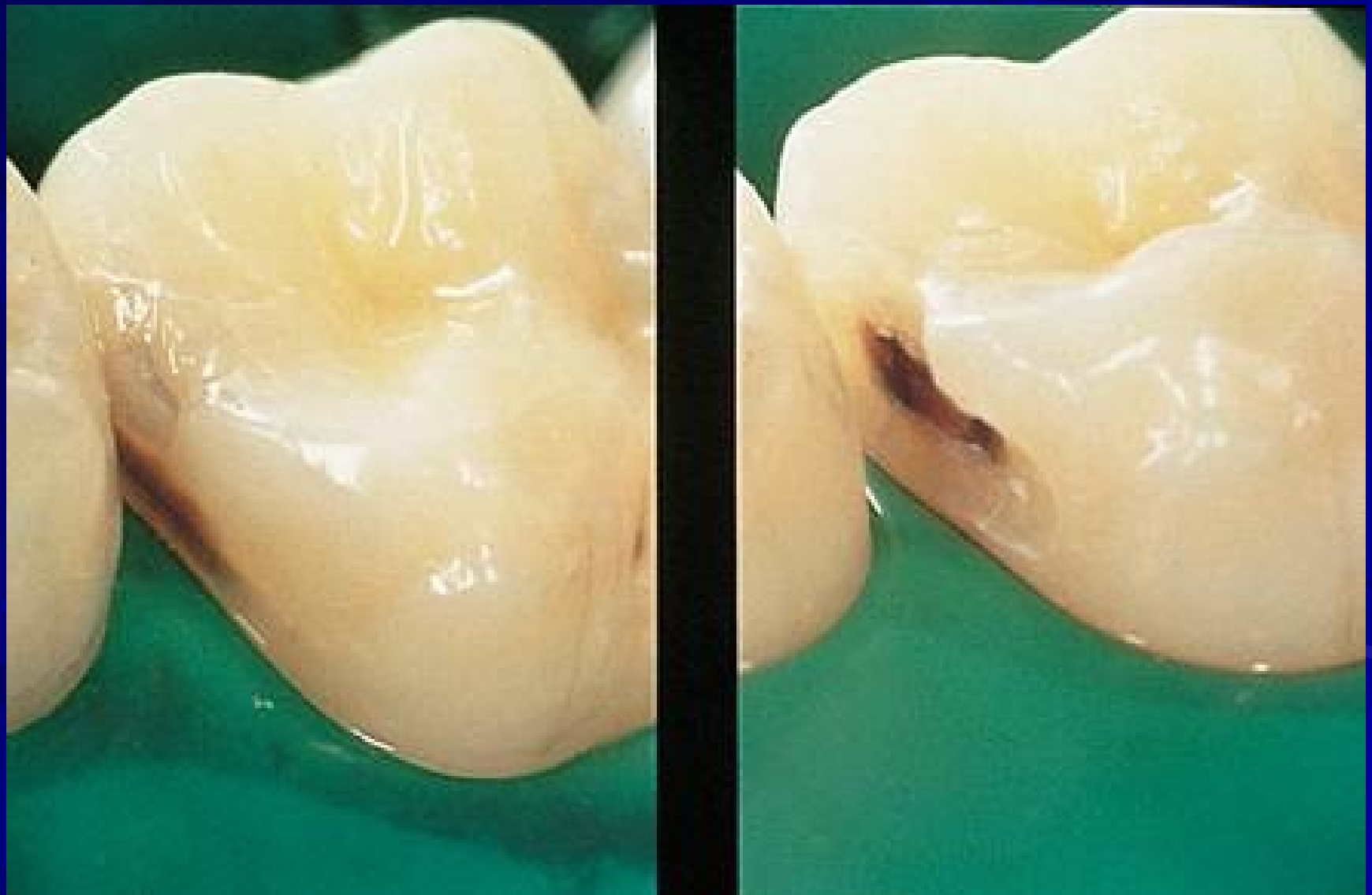




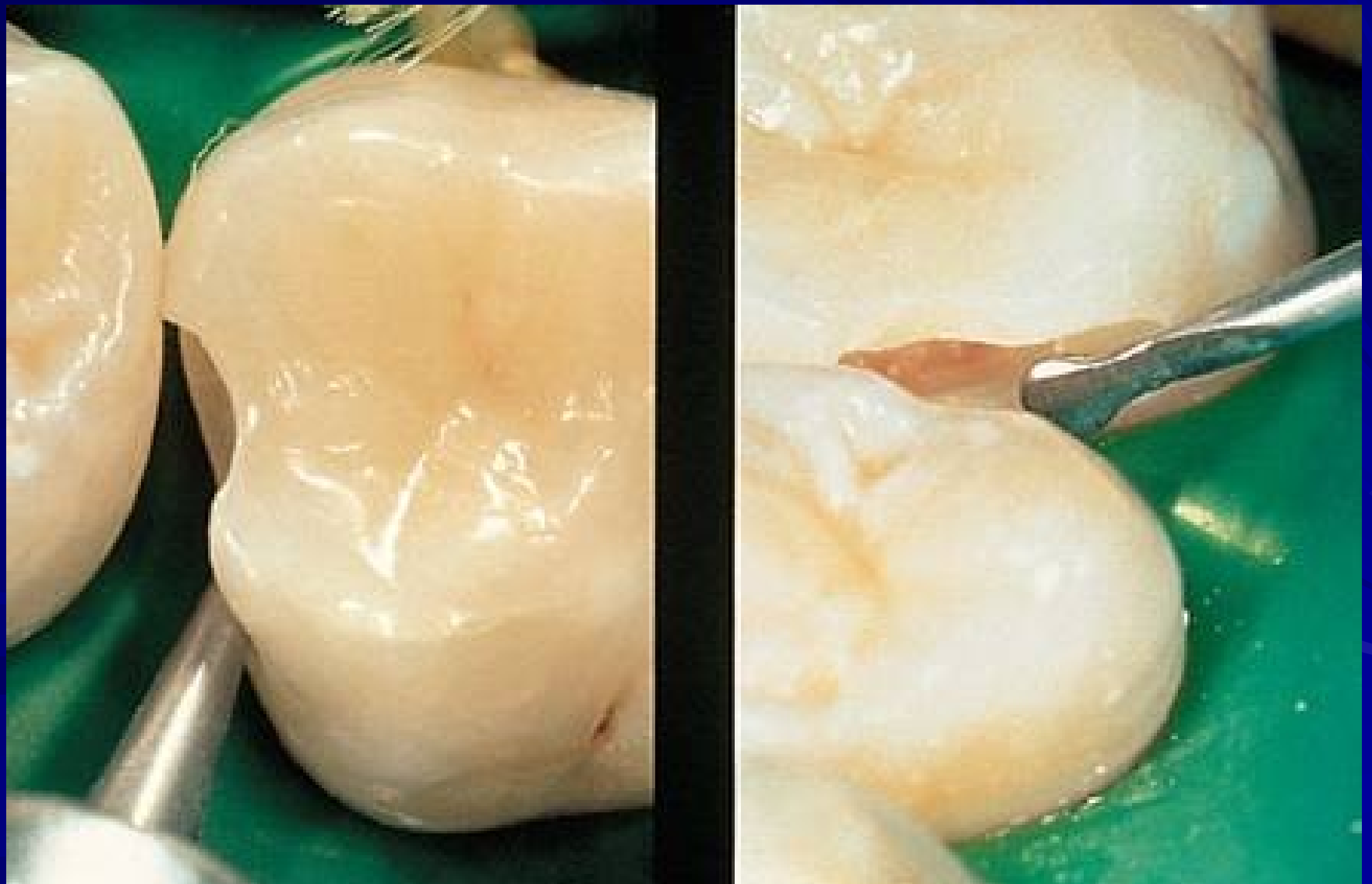


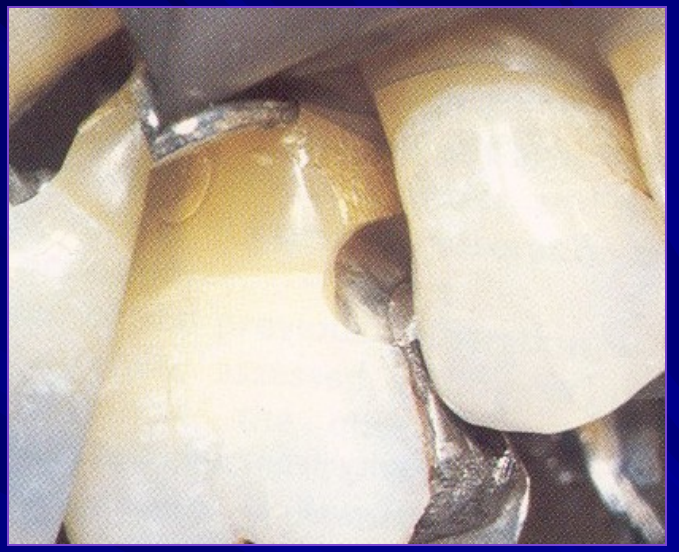


Approximal Caries

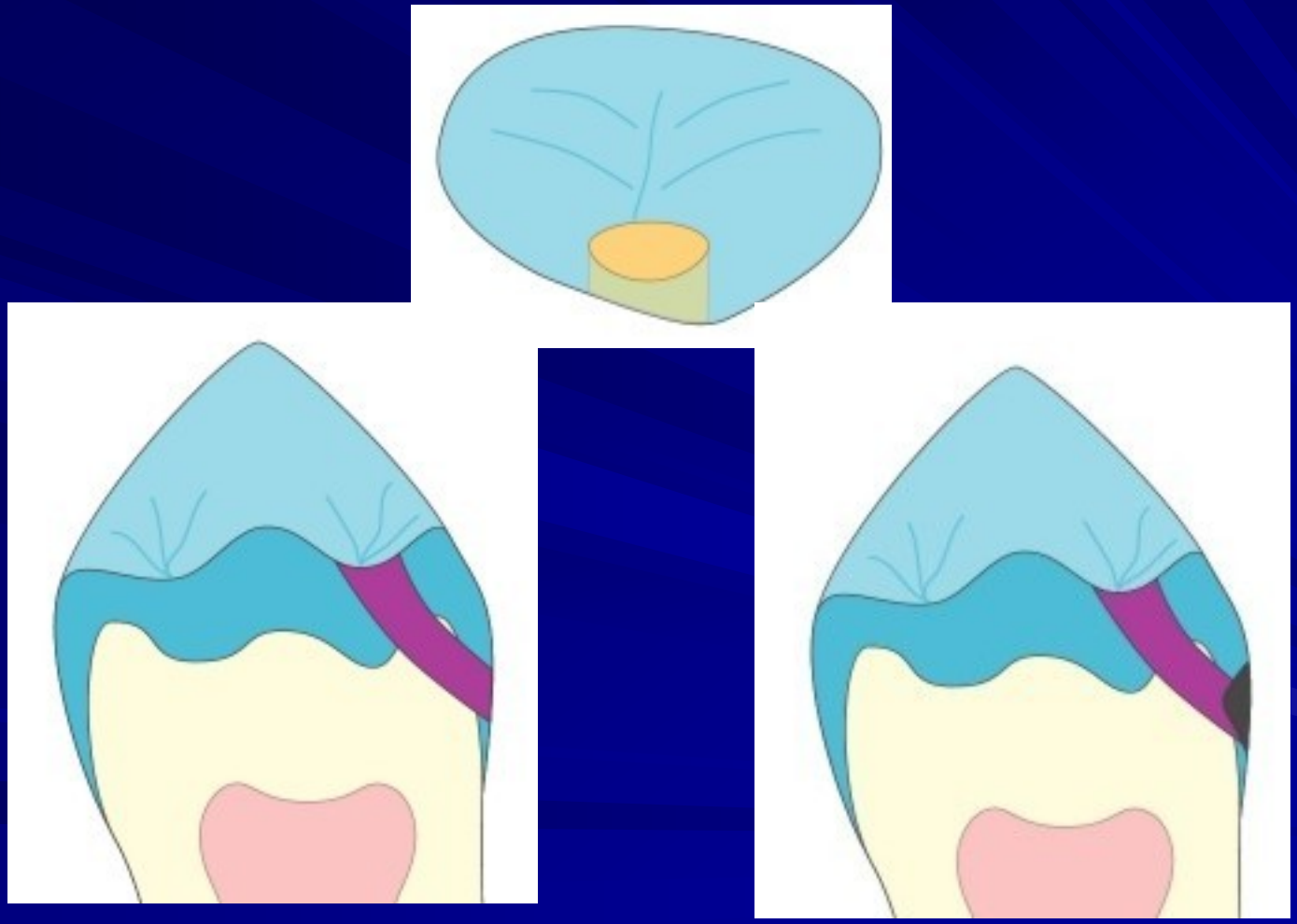


Approximal Caries





Tunnel preparation



Success?

Low caries risk
Special smal instruments
Magnification
BW post op