

Composites in posterior teeth

All pit and fissure restorations.

They are assigned in to three groups.

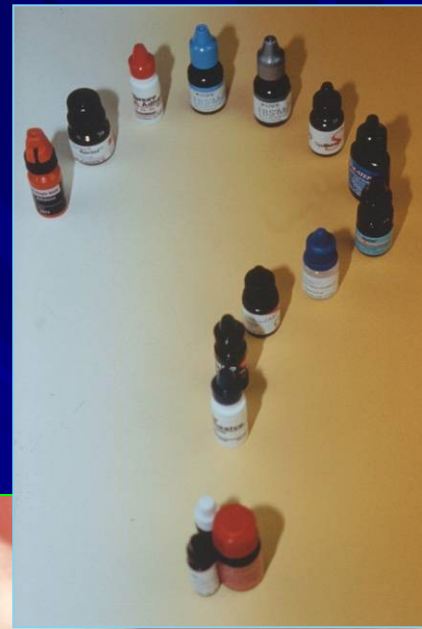
R. on occlusal surface of premolars and molars

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
- Abutment teeth for removable partial 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 properties

Strength

Longevity

Ease of use

Clinically proven success

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 or obliqua are not affected, it is recommended not to prepare them.

Resistance principles

- Keep the facial and lingual margin extensions as minimal as possible between the central groove and the cusp tips.
- Extending the outline to include fissures, thereby placing the margins on relatively smooth sound tooth structure.
- Minimally extending into the marginal ridge without removing dentinal support.
- Eliminating a weak wall of enamel by joining two outlines that come close together
- Enamel.
 - Never 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 partial dentures
- Temporary or caries control restorations.

Materials: Amalgam, composite.

Amalgam:

Pertinent material qualities and properties

Strength

Longevity

Ease of use

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Clinical technique

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

Outline

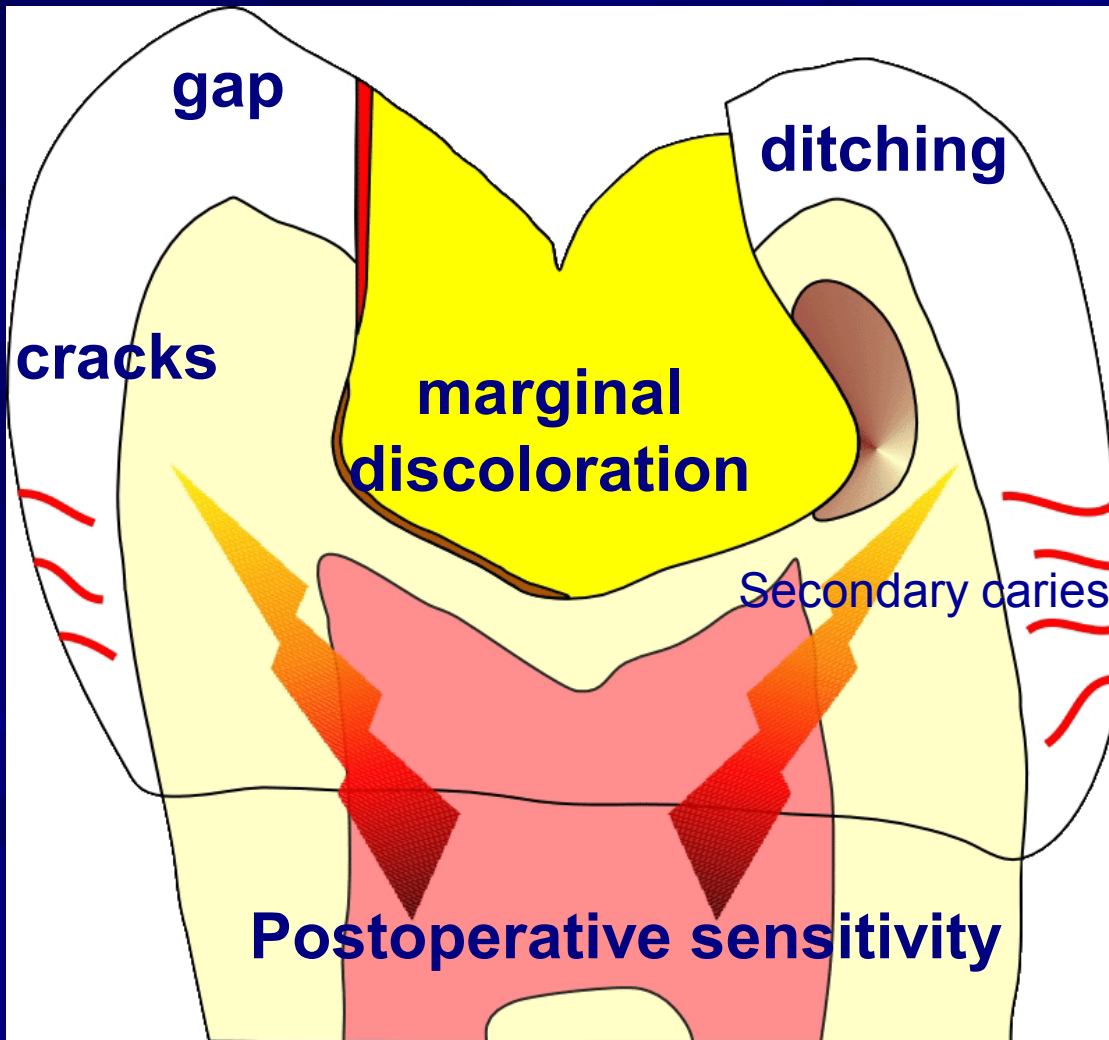
- Outline includes the caries lesion only

Retention principles

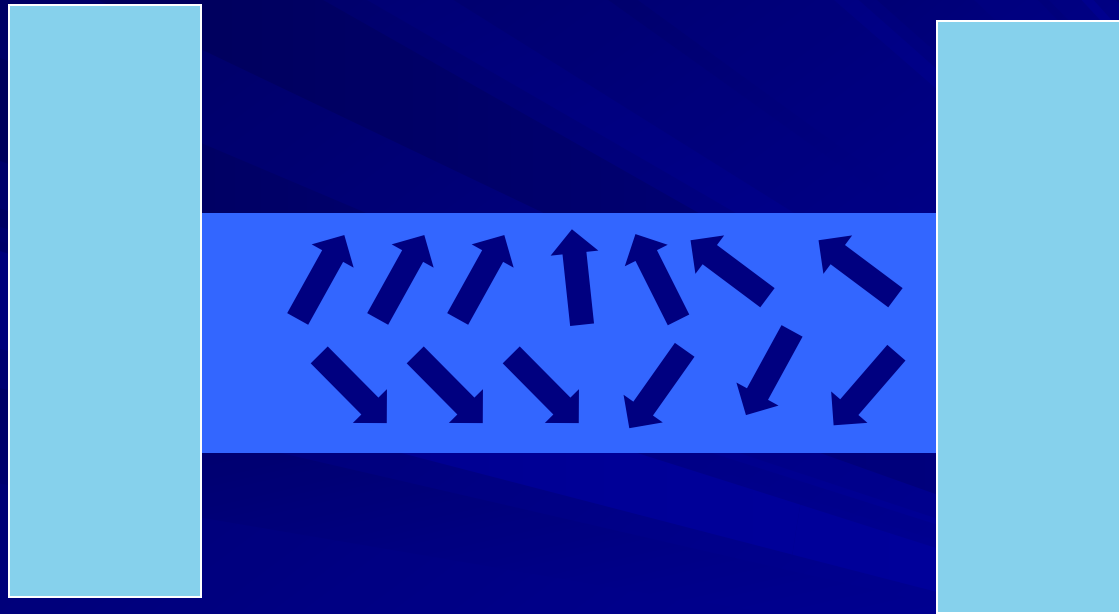
- Prepare the box or deep dish – the bottom is in dentin
- Do not prepare any undercuts!
- Do not bevel enamel, finish the border with diamond bur inly.

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

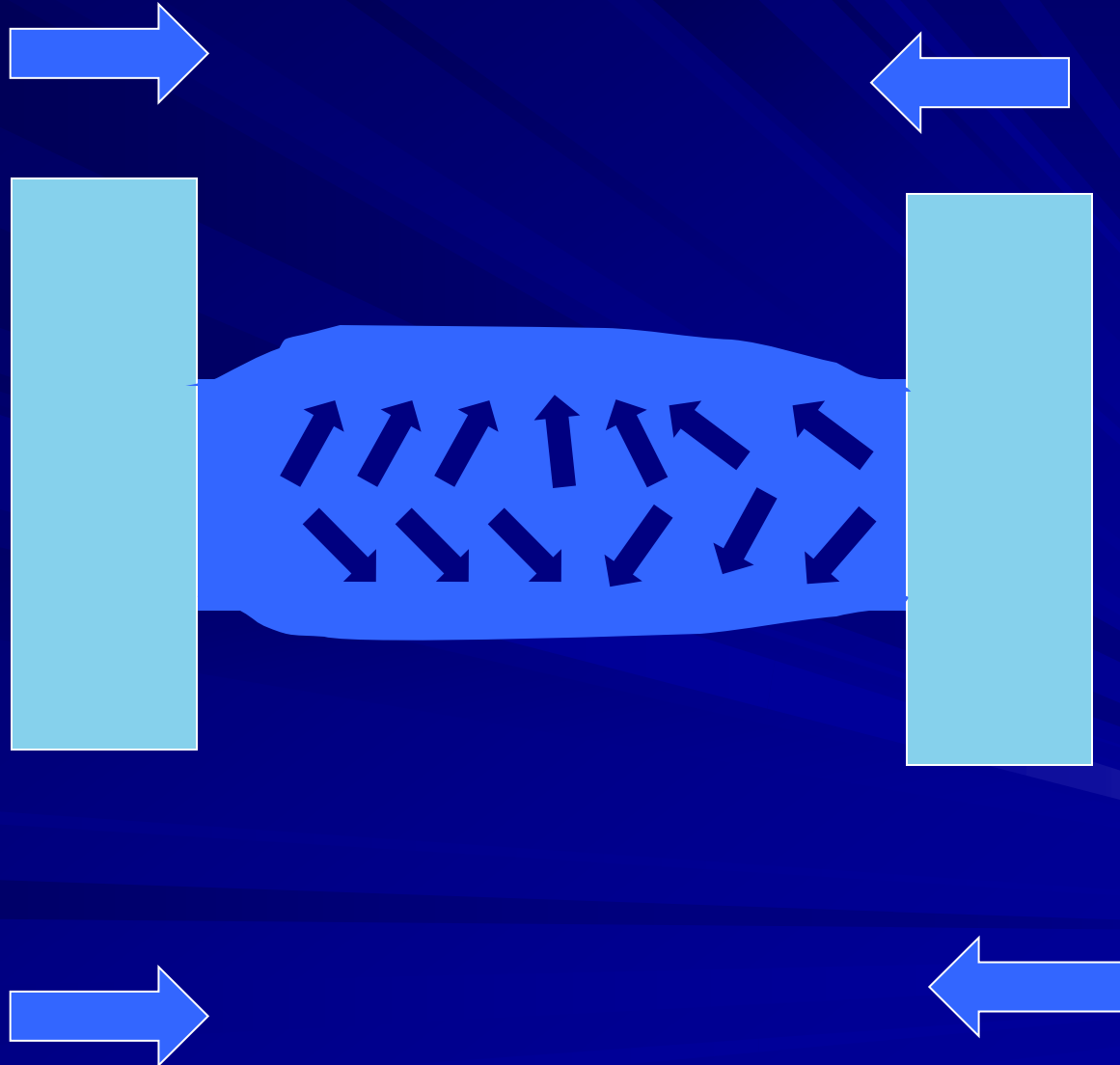
- Spoon excavator or a slowly revolving , round carbid bur of appropriate size.



Polymerization shrinkage

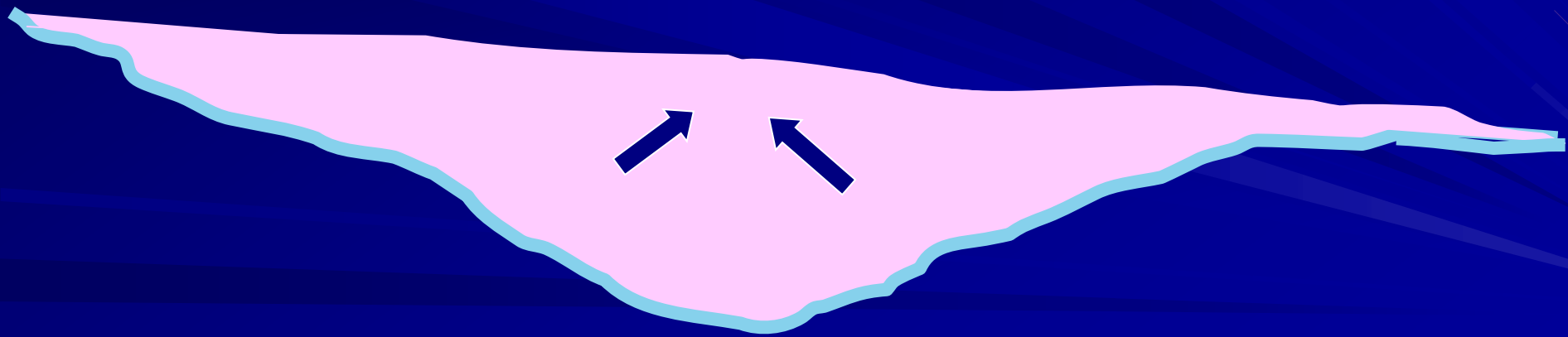


Polymerization shrinkage

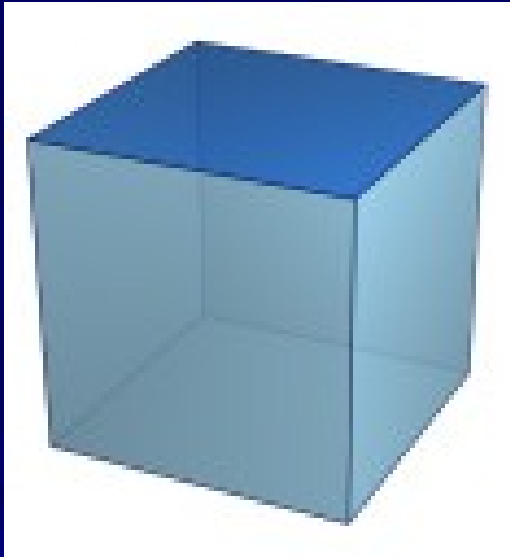


C - factor

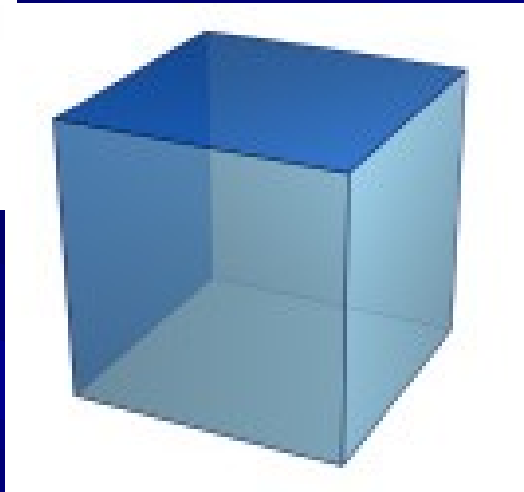
Surface of adhesion/free surface of the filling



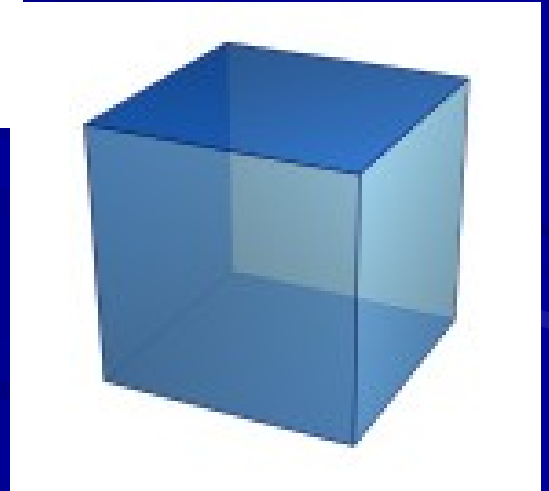
1/1 and less is optimal



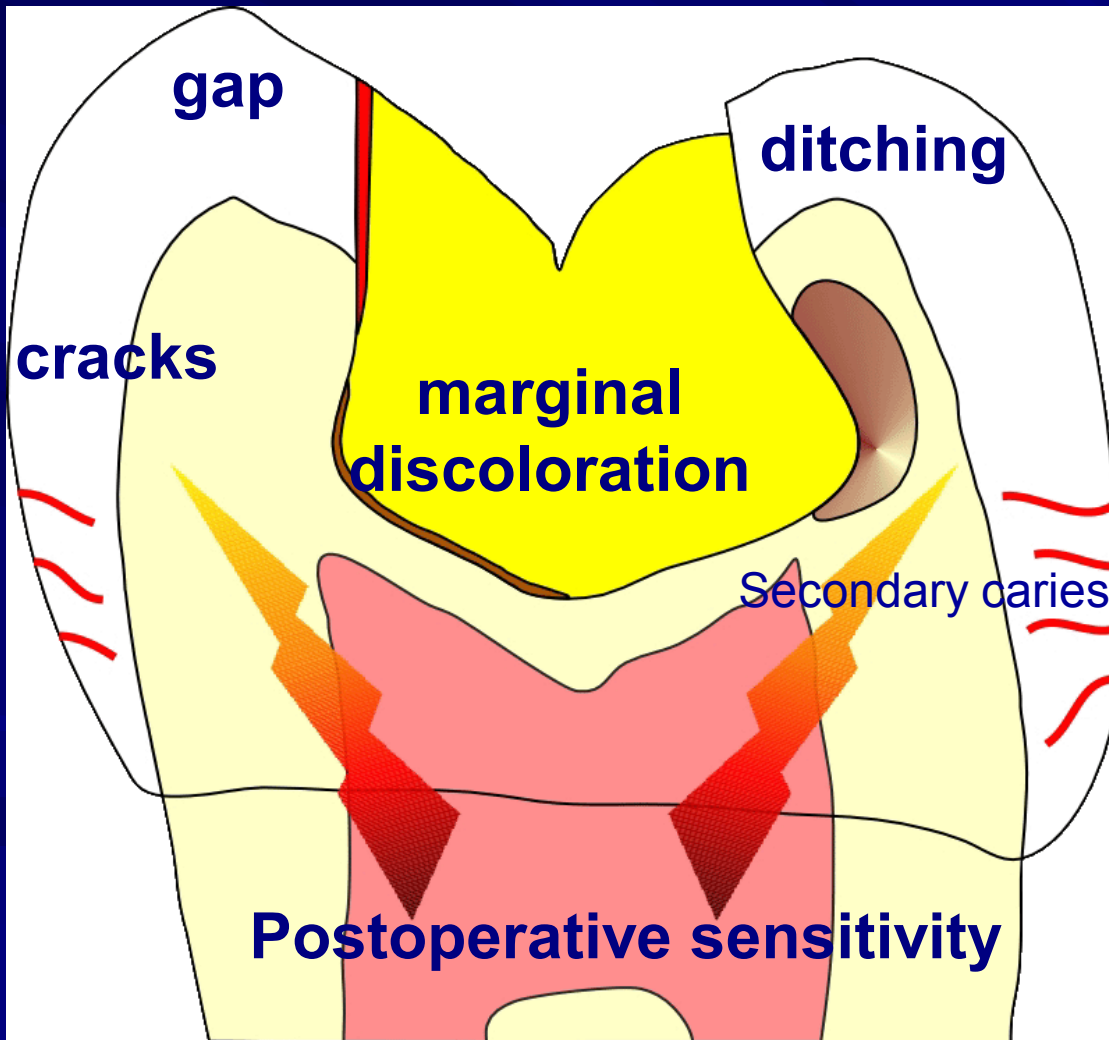
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2



1



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)

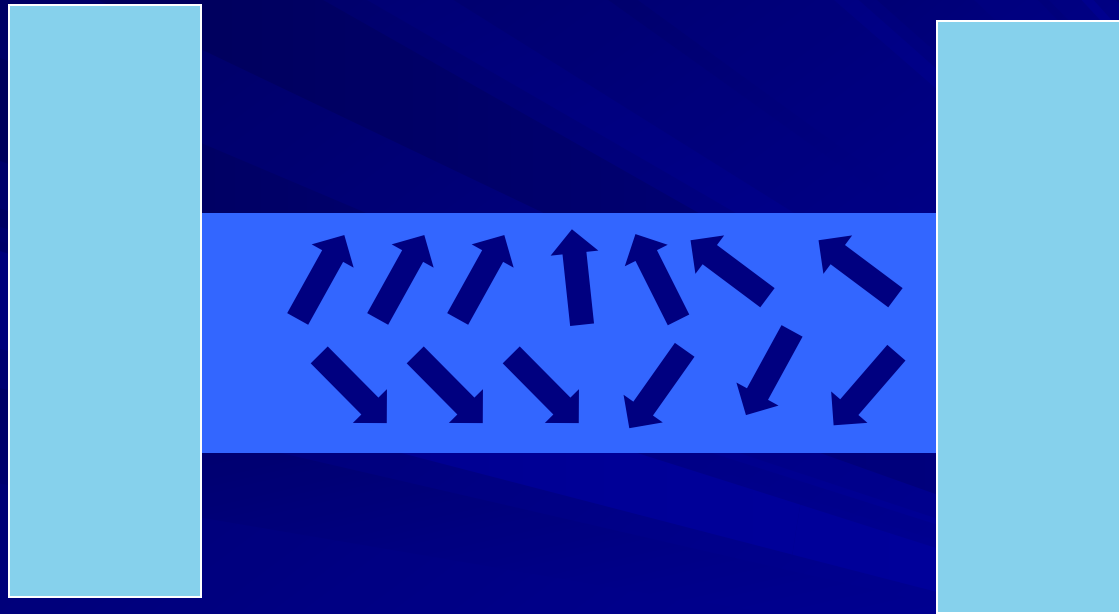
High content of the filler causes bigger stress

Flowable composites – low stress

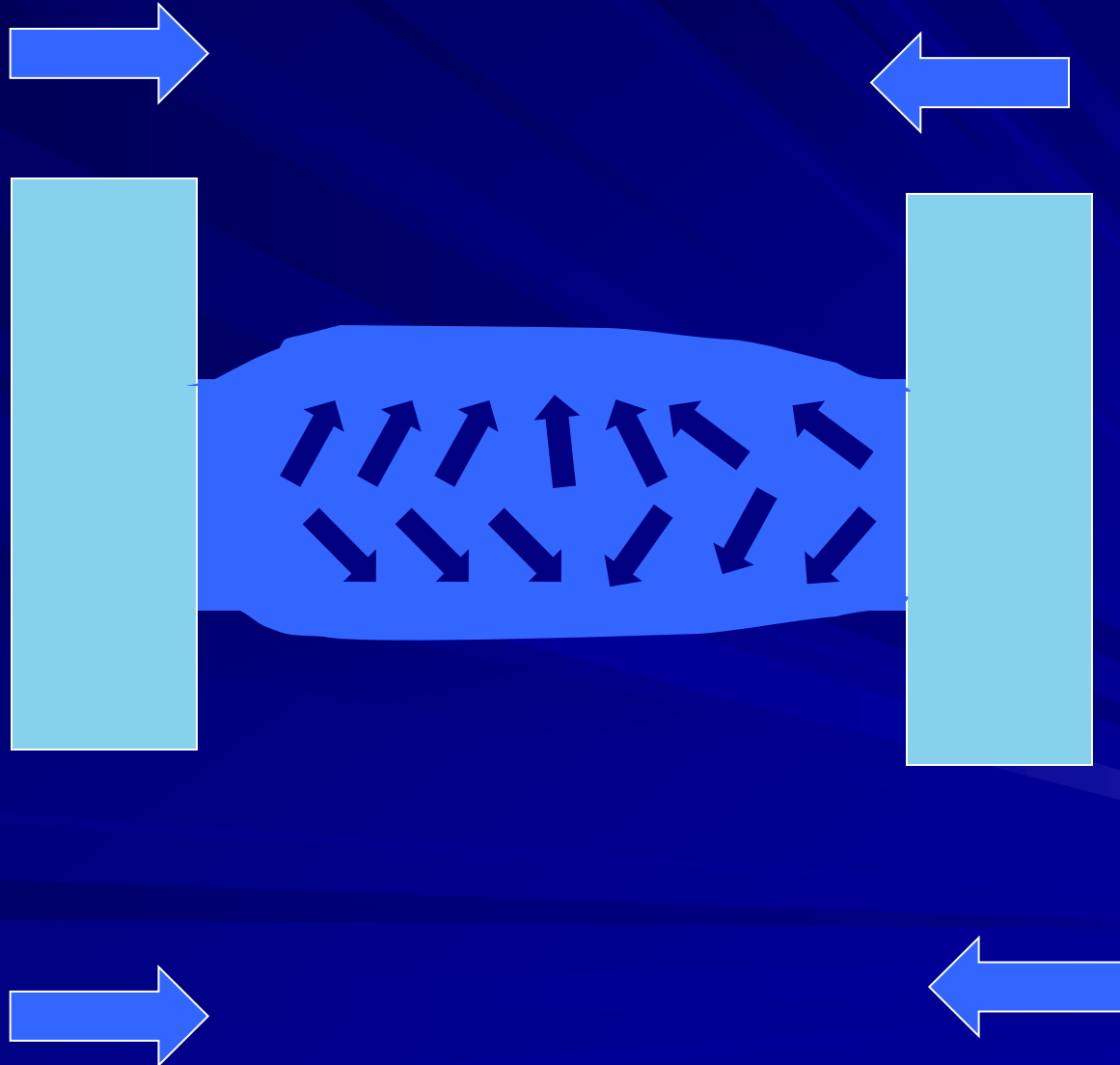
Forces of polymerization shrinkage
depend on

Geometry of the cavity (C-factor)

Polymerization shrinkage

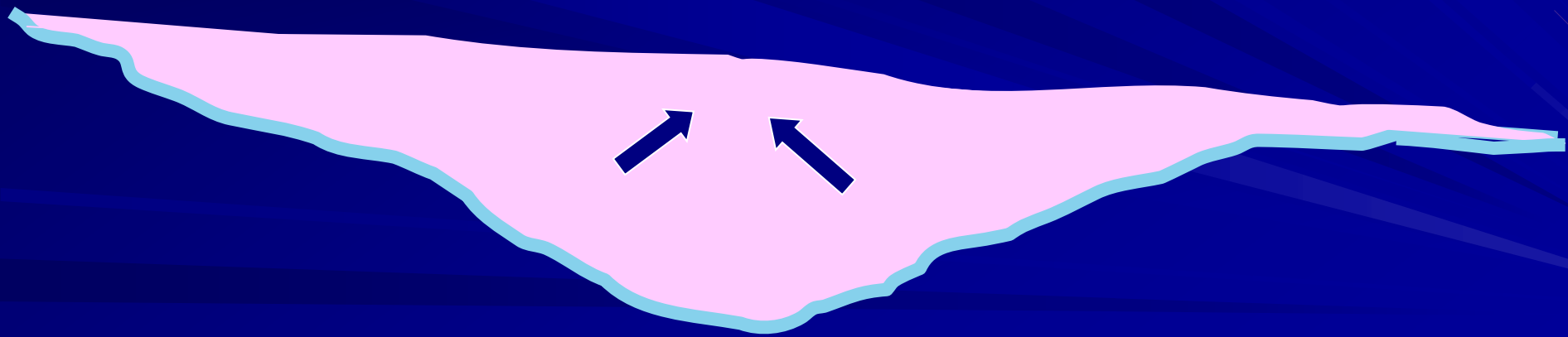


Polymerization shrinkage

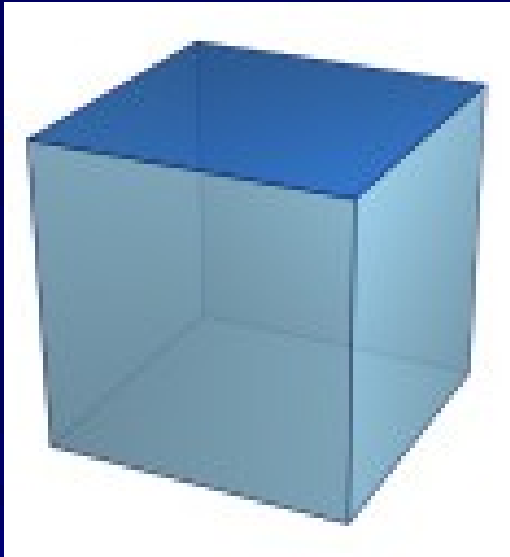


C - factor

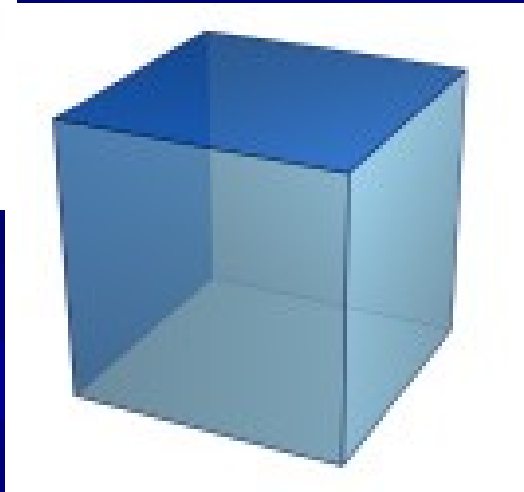
Surface of adhesion/free surface of the filling



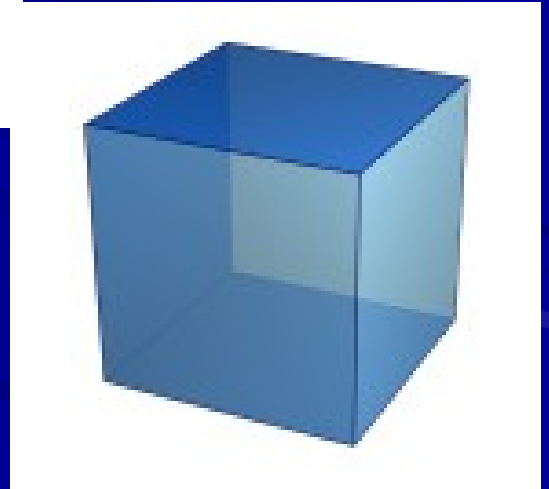
1/1 and less is optimal



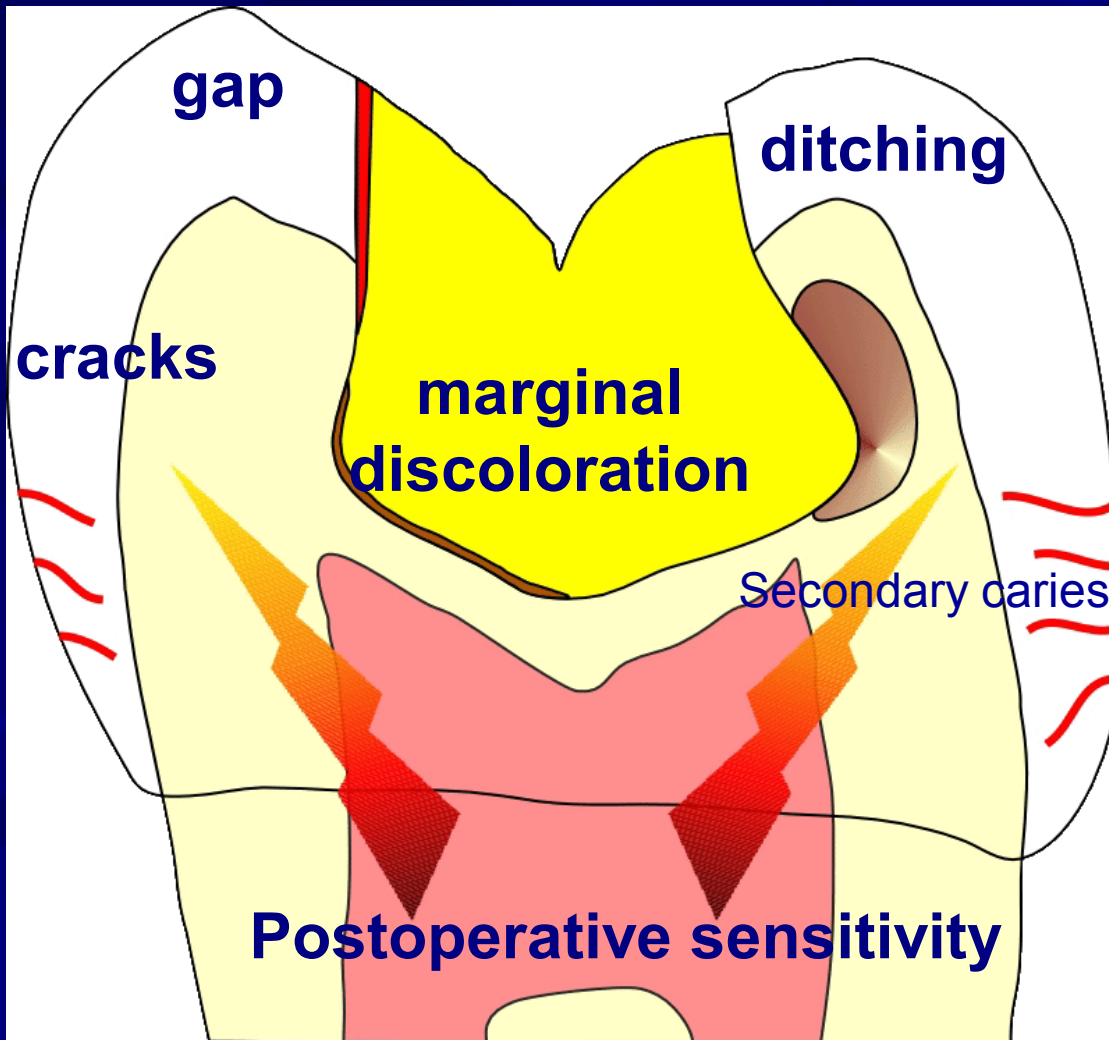
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2



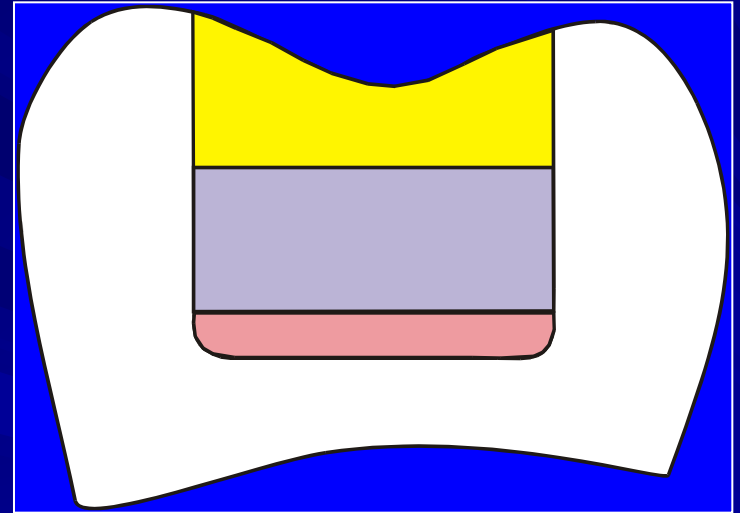
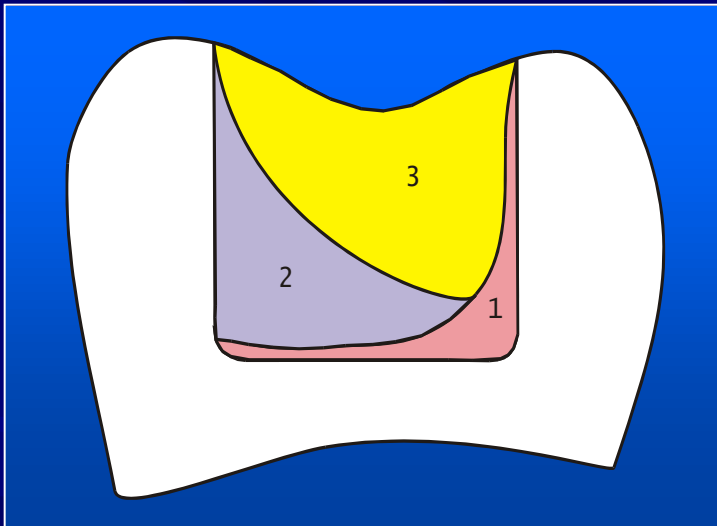
1



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

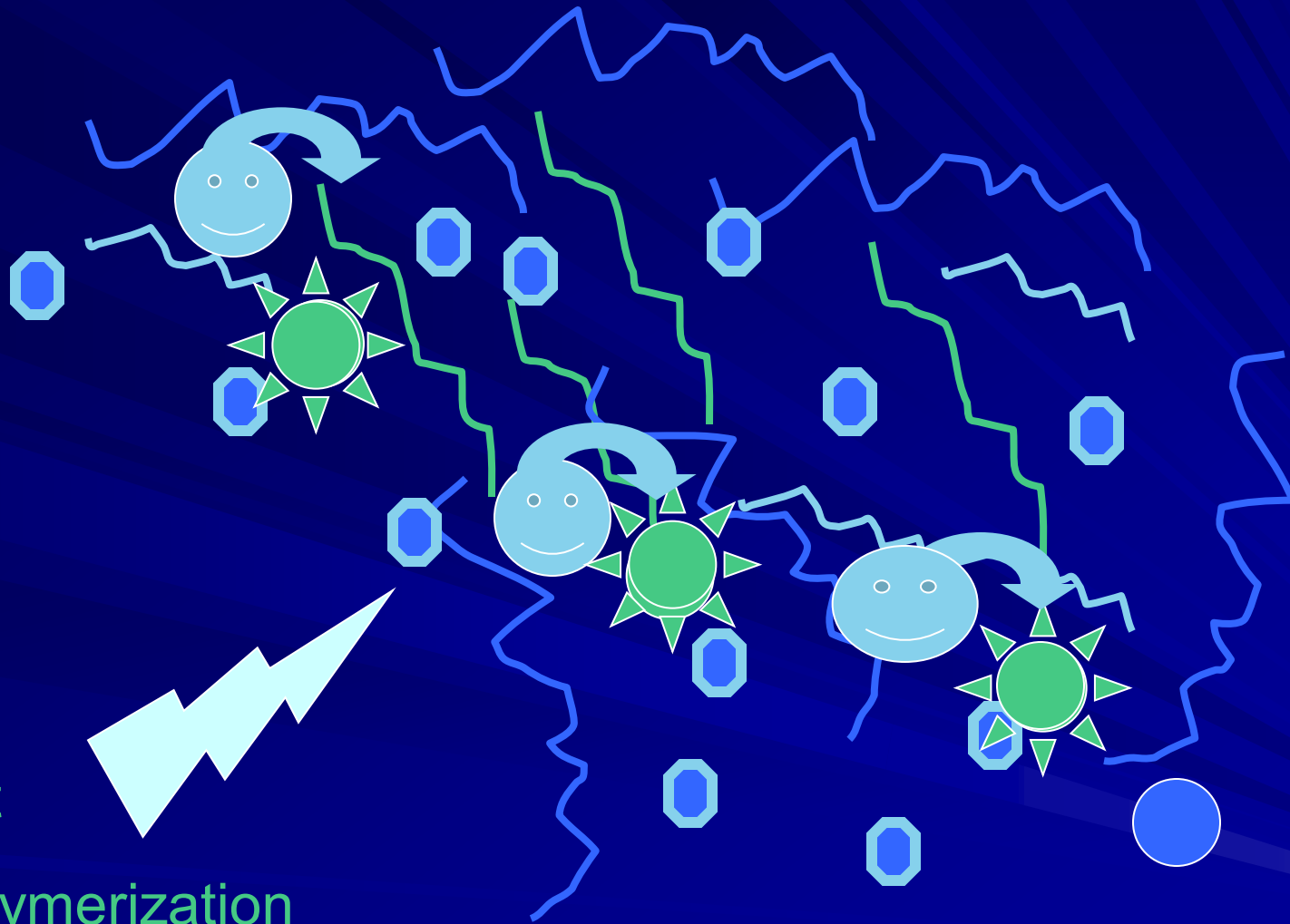


Forces of polymerization shrinkage depend on

- Mode of polymerization

Phases

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

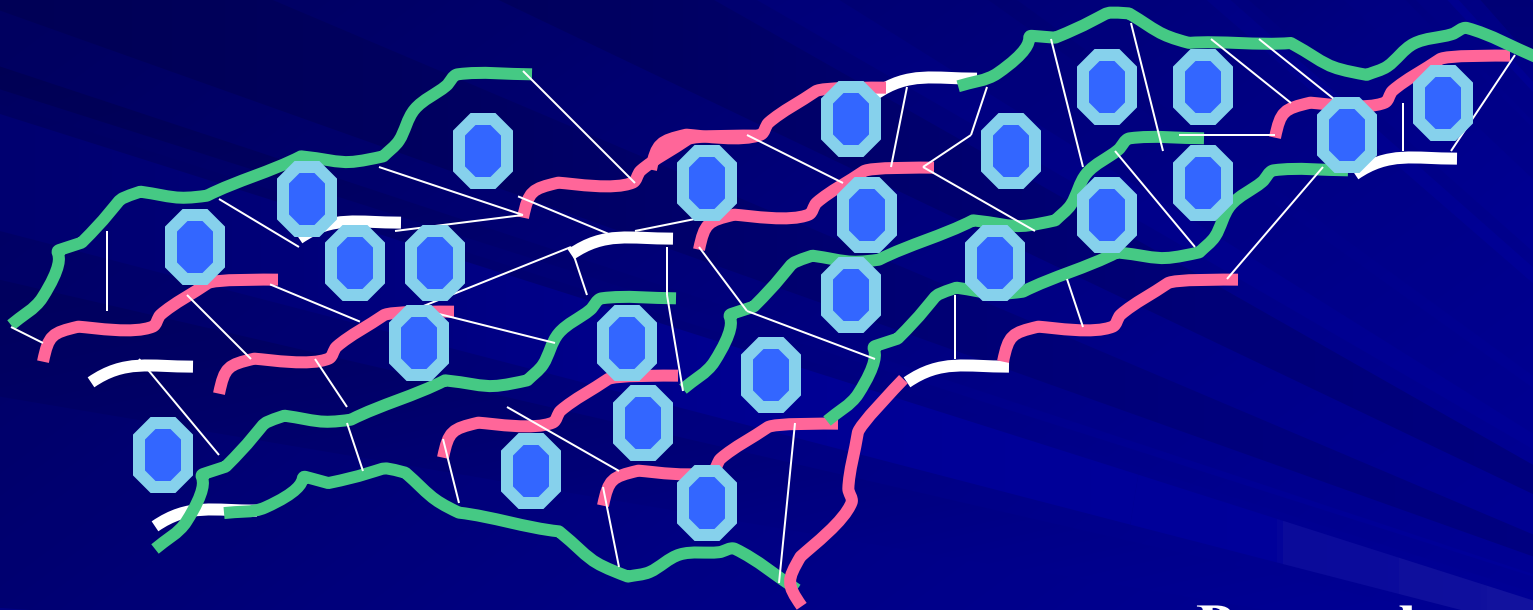


Light

Polymerization

Monomer → Polymer

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



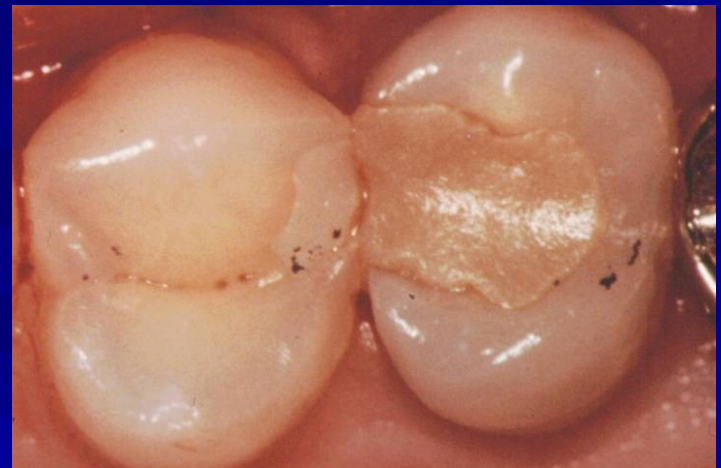
Pre -gel

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**

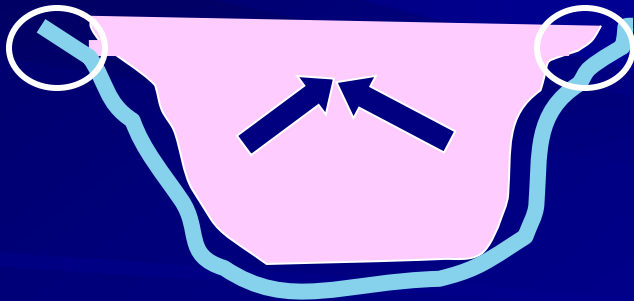


Temperovaný kompozit

C-faktor

= konfigurační faktor

Plocha adheze / volný povrch výplně



neprůzračný C-faktor

Adhesives

- Acid etching technique
- Selfetching adhesive systems

Adhesives

■ Acid etching technique

Etching

Washing

Priming Bonding

Adhesives

■ Selfetching adhesive systems

Priming

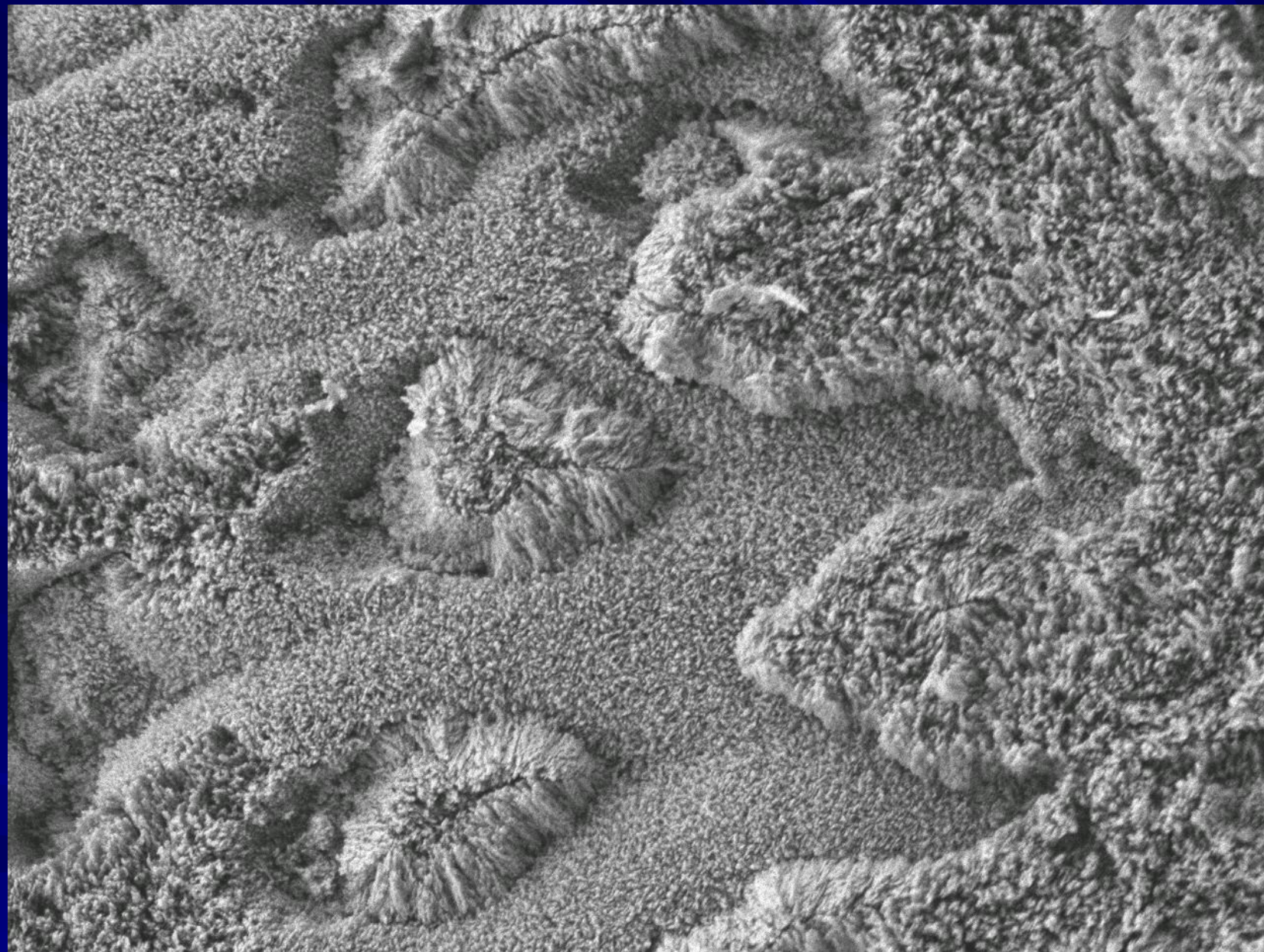
Bonding

Adhesives

- Active and passive bonding

Active – rubbing with microbrush

Passive – without any rubbing



ISI

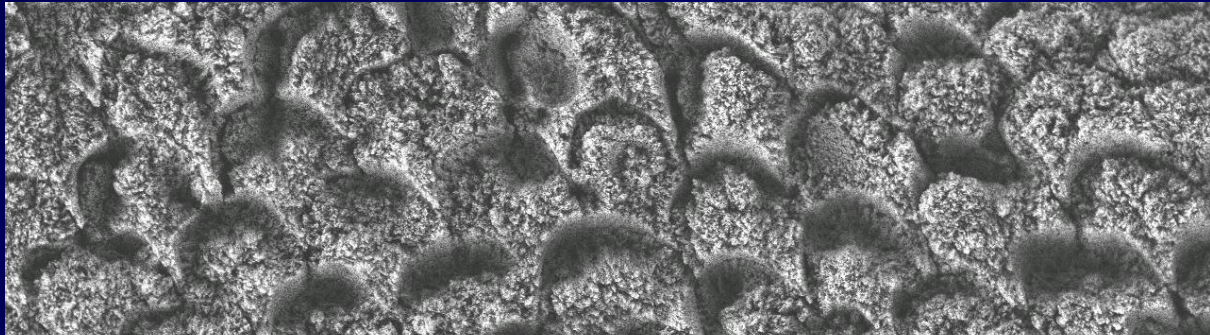
LEI

5.0kV

X5,000

1 μ m

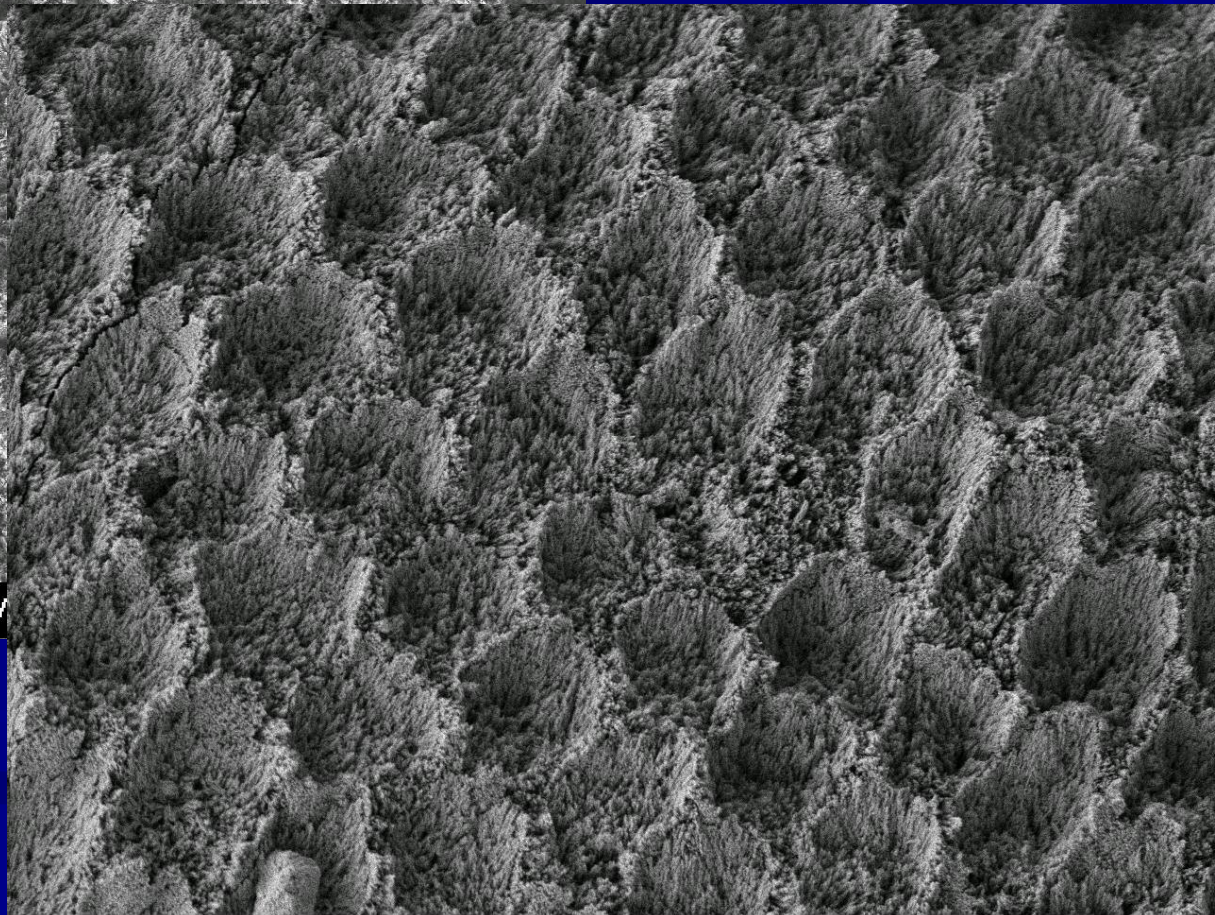
WD 7.7mm



ISI

LEI

5.0kV



ISI

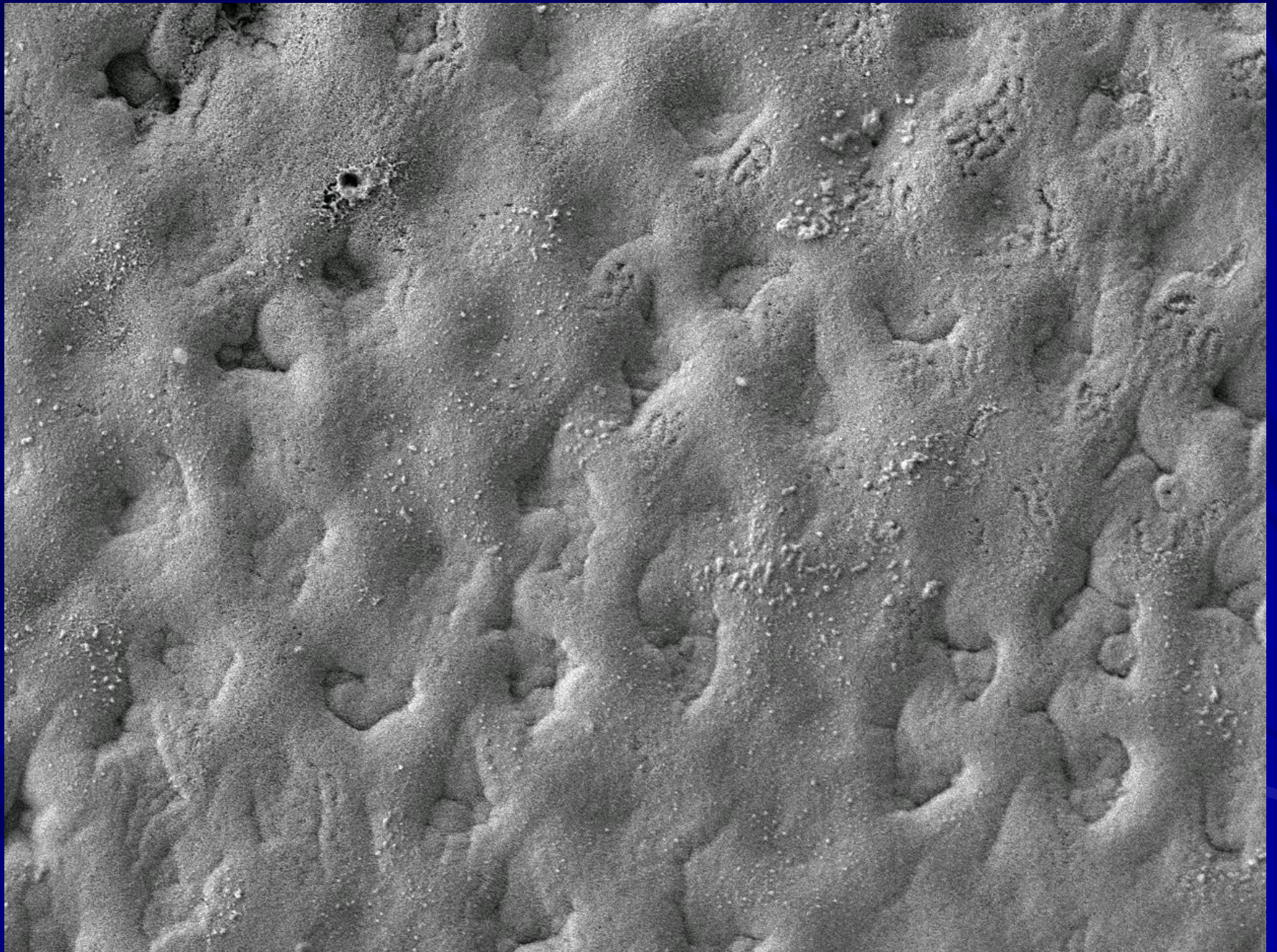
LEI

5.0kV

X2,000

10μm

WD 7.9mm



ISI

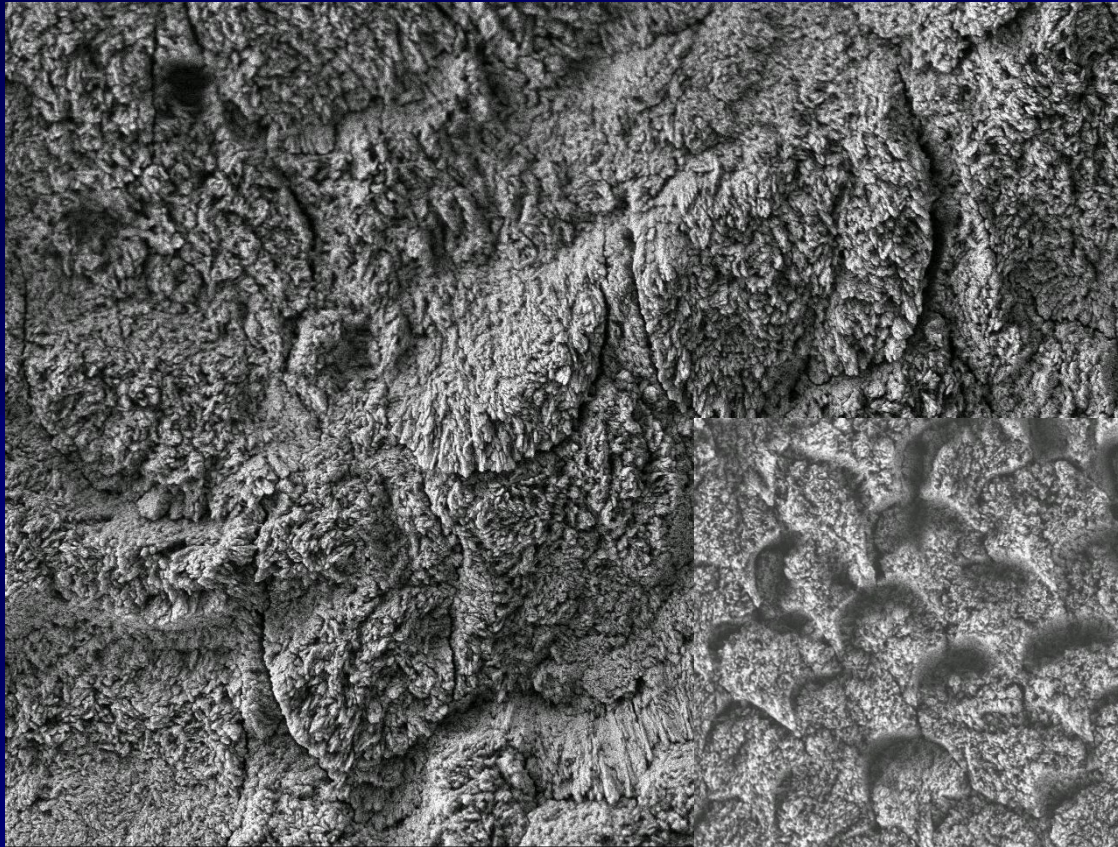
LEI

5.0kV

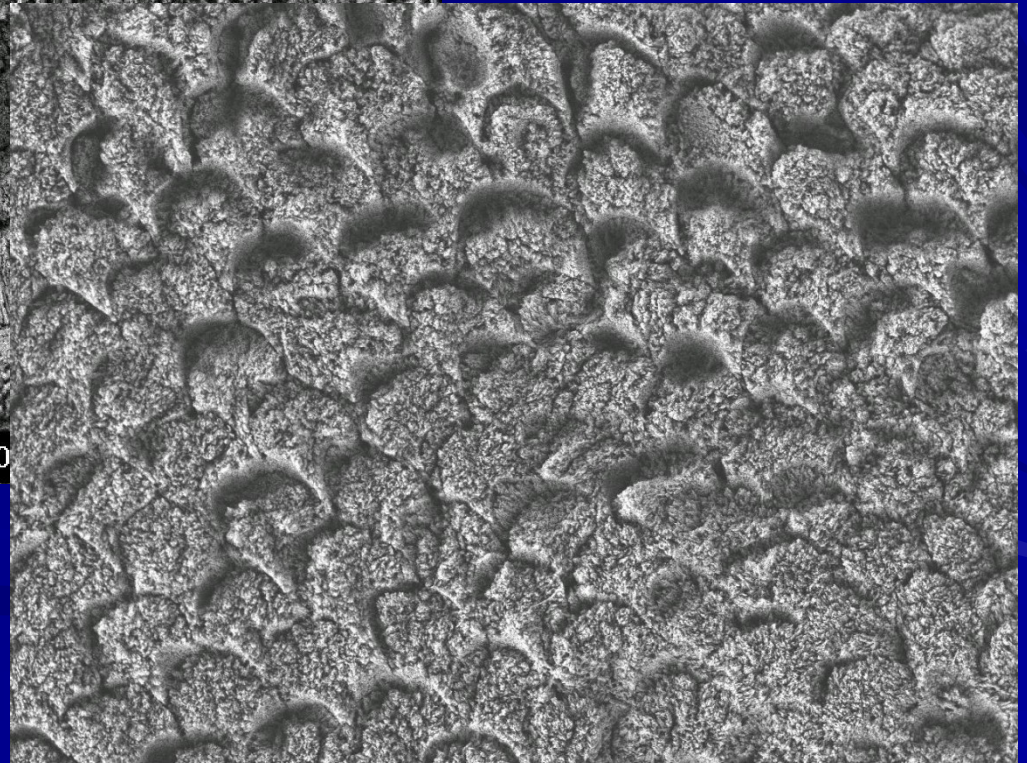
X2,000

10 μ m

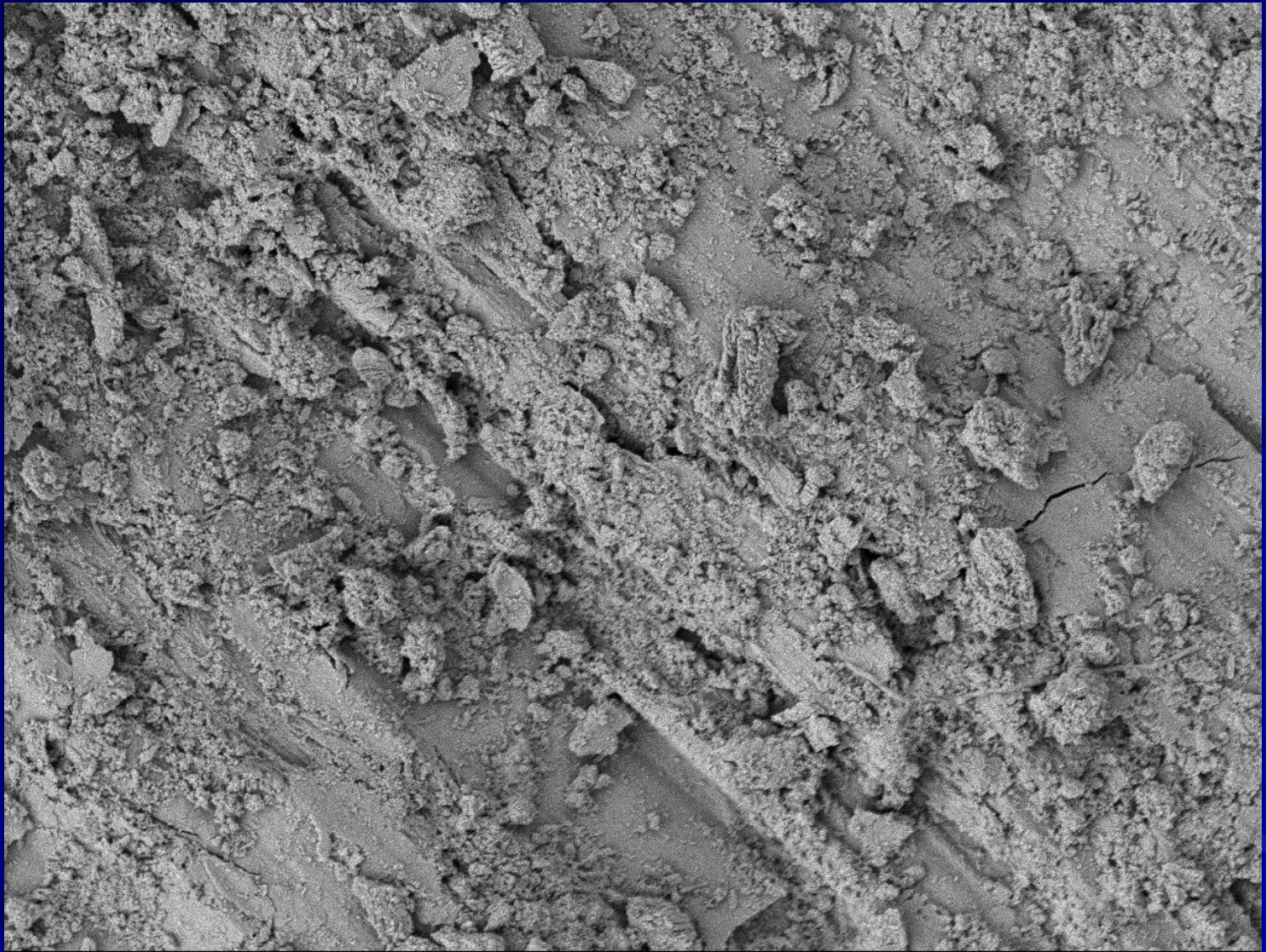
WD 7.7mm



ISI LEI 5.0kV X5,000



ISI LEI 5.0kV X2,000 10µm WD 7.5mm



ISI

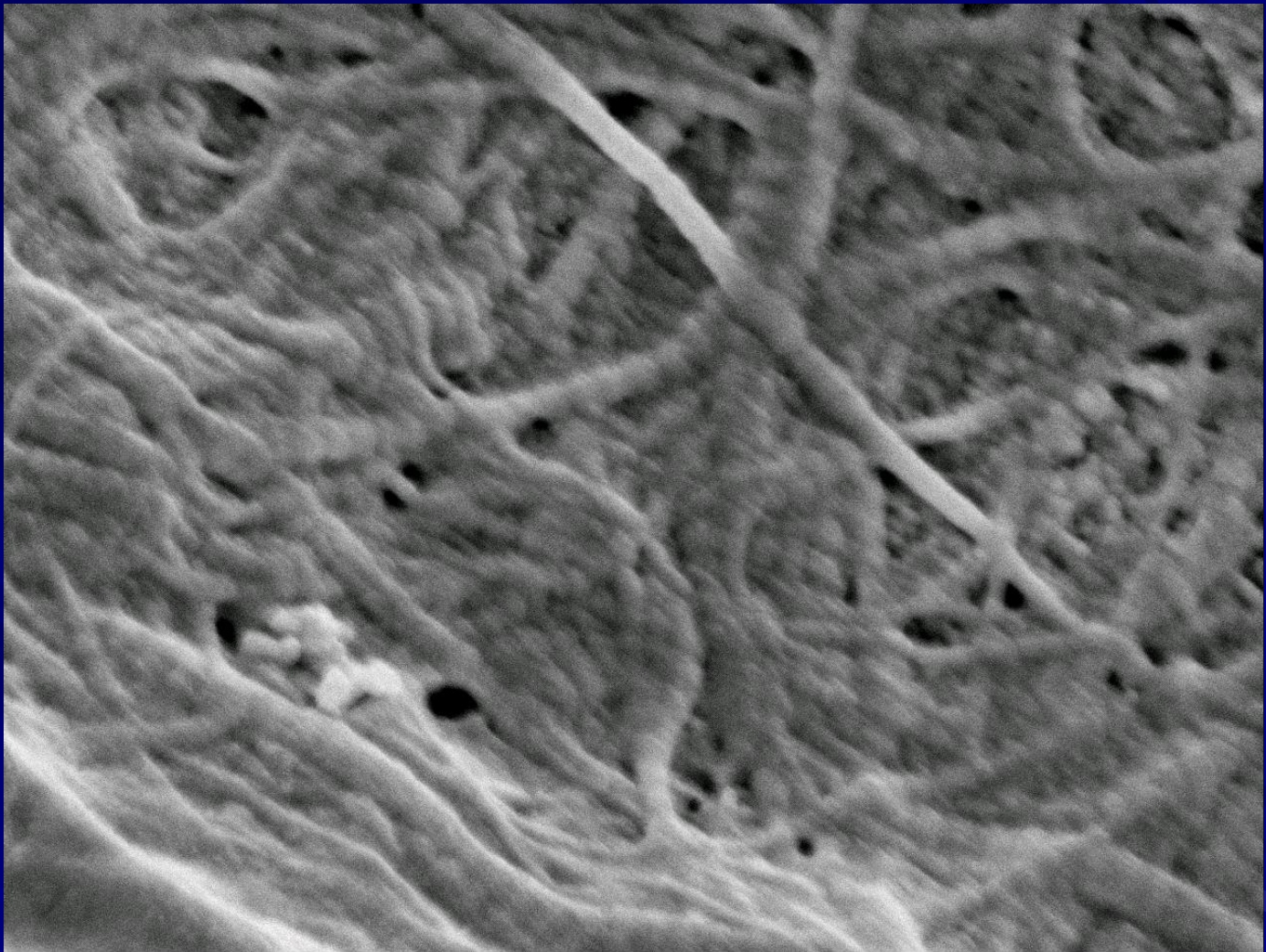
LEI

5.0kV

X2,000

10µm

WD 9.8mm



ISI

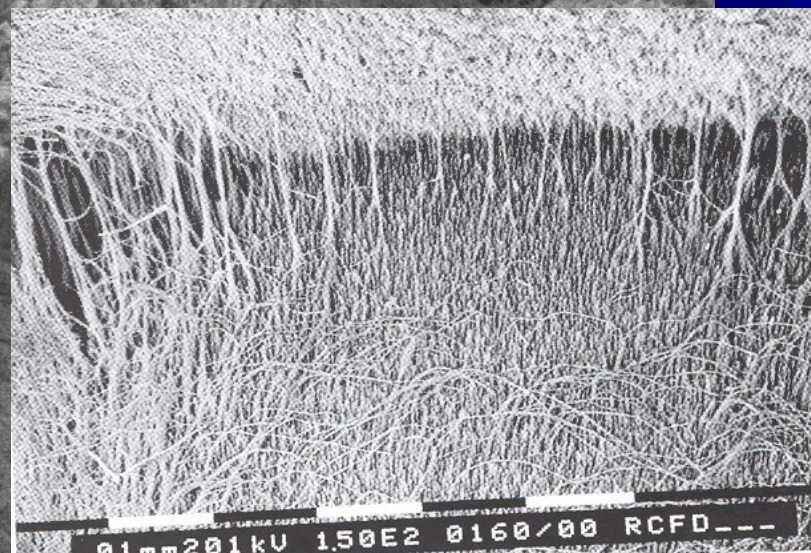
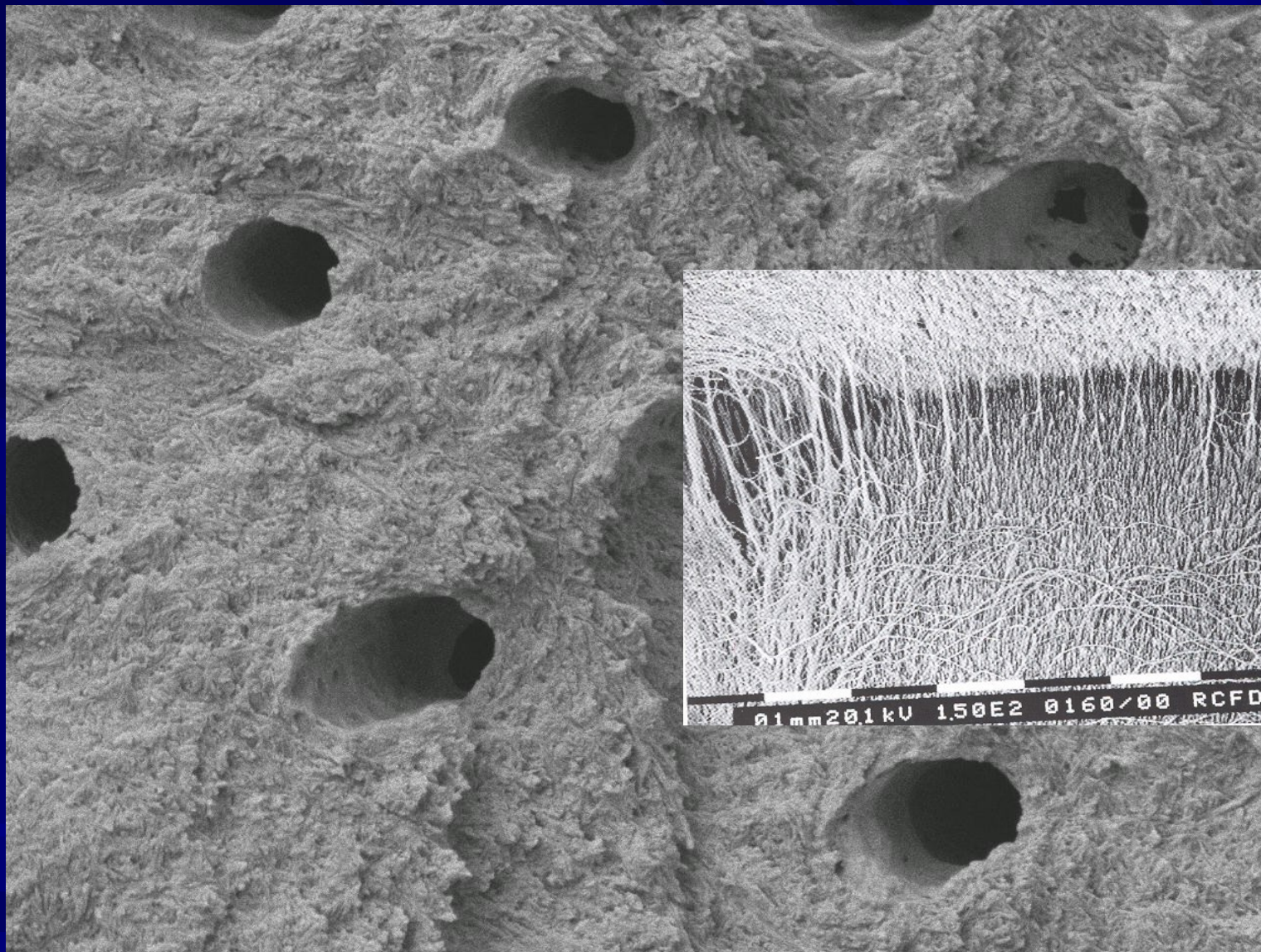
SEI

5.0kV

X55,000

100nm

WD 8.6mm



ISI

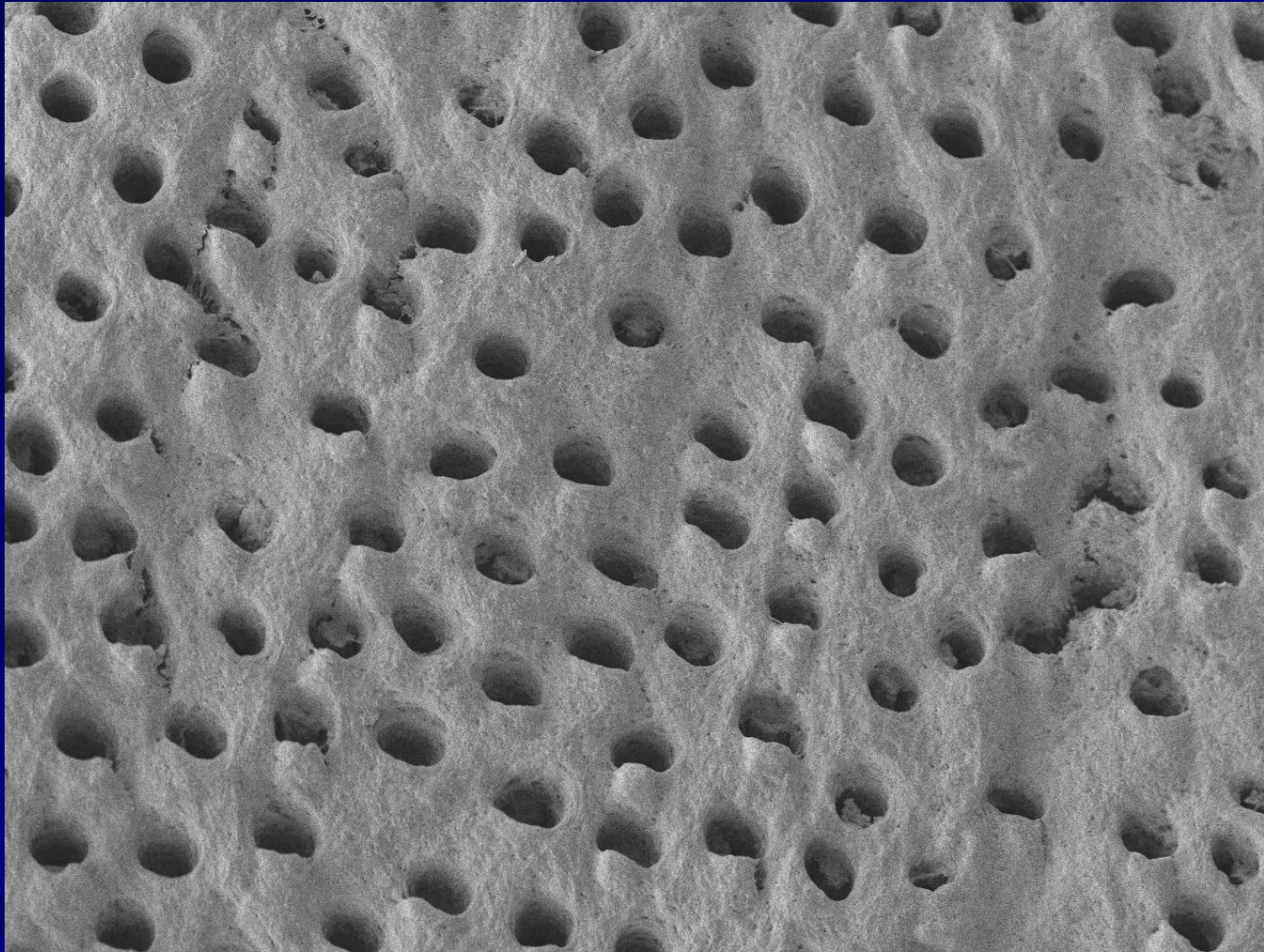
LEI

5.0kV

X6,000

1 μ m

WD 9.0mm



ISI

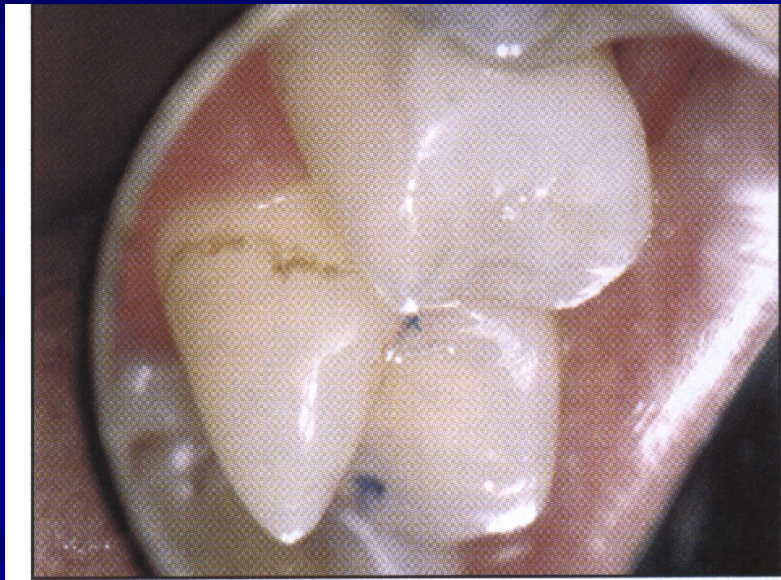
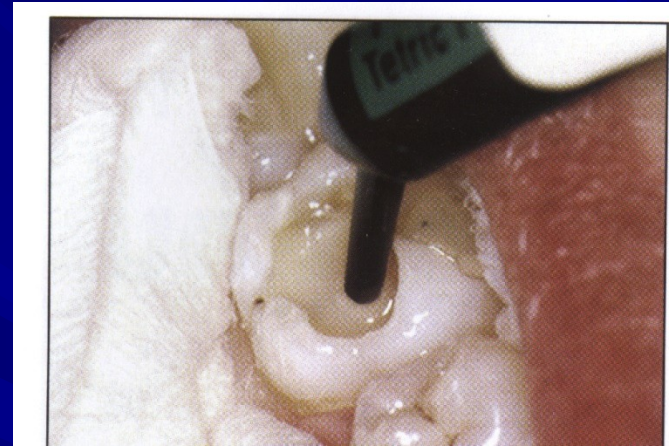
LEI

5.0kV

X2,000

10 μ m

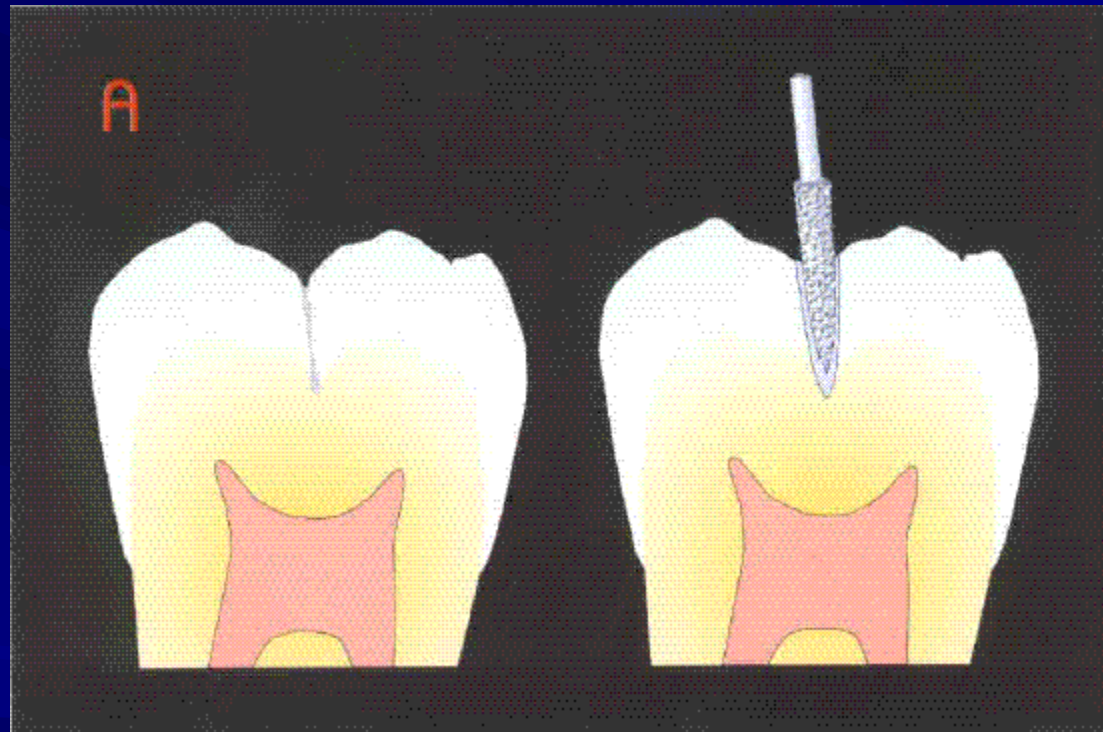
WD 8.6mm



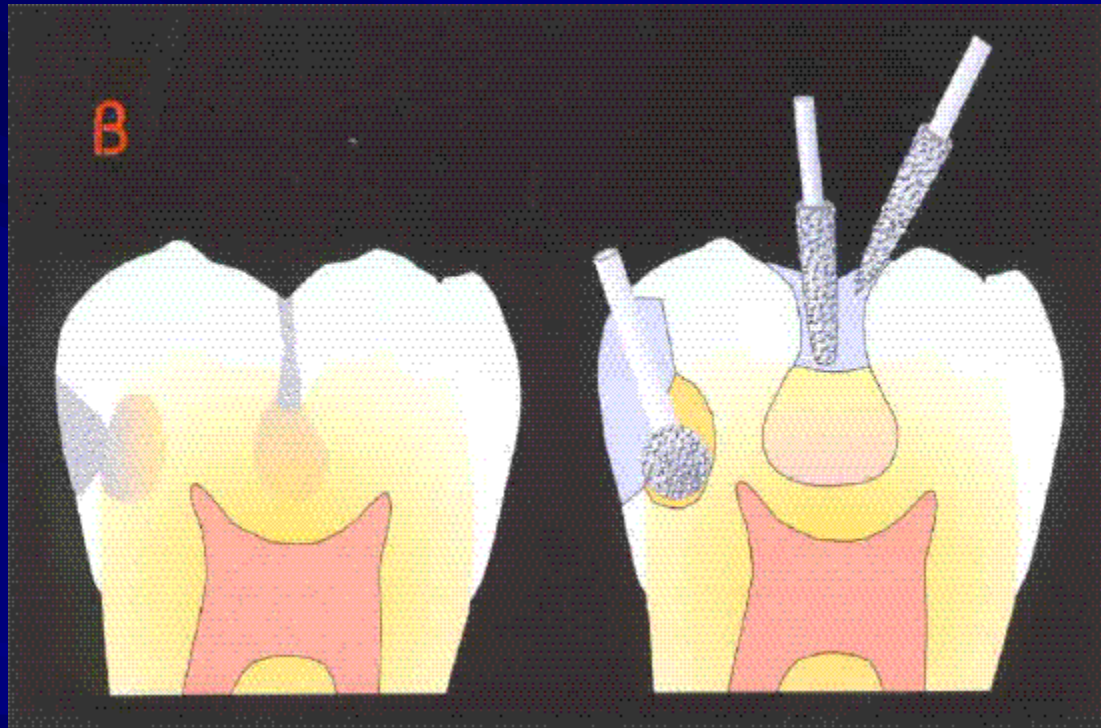




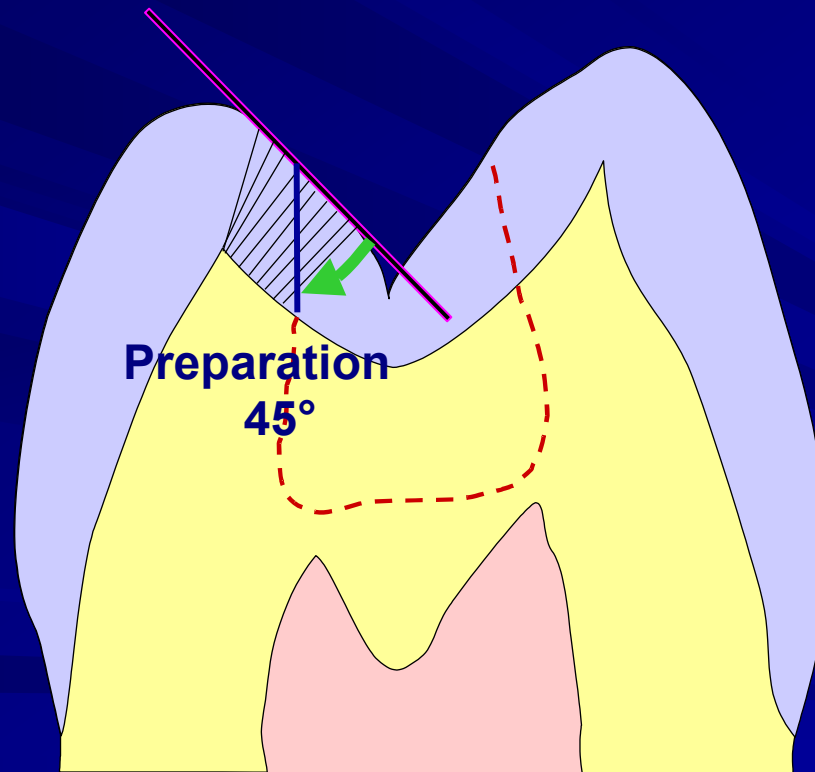
Adhesive preparation in a fissure

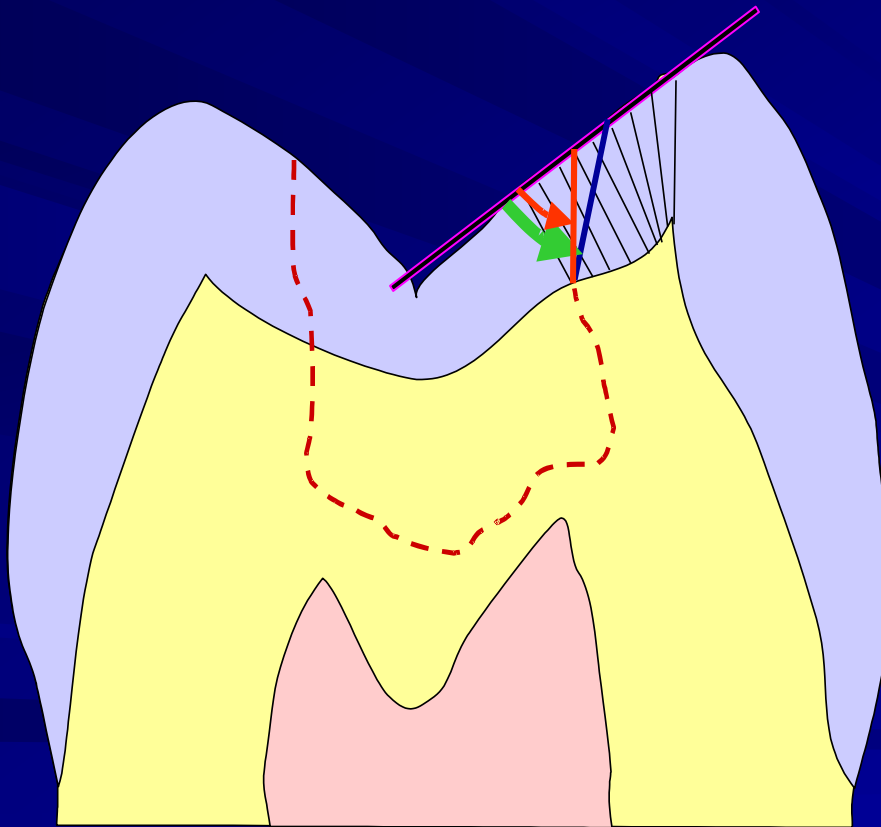


Adhesive preparation



Preparation of enamel borders

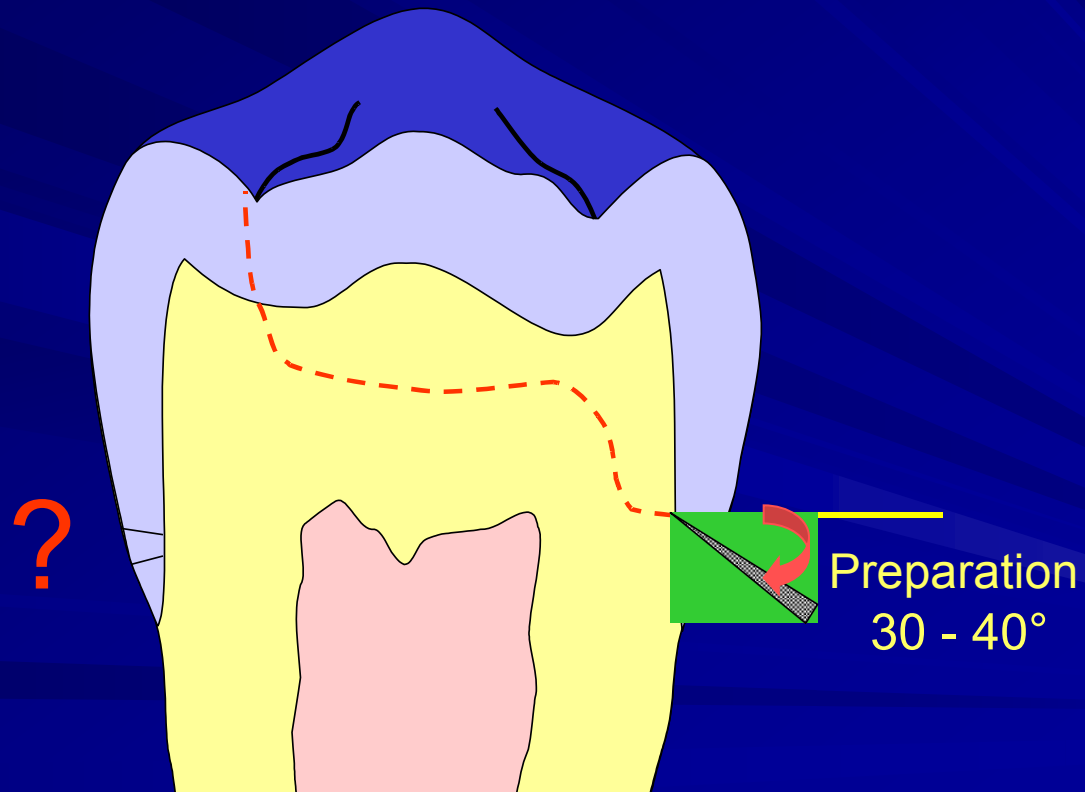




Next to cusp
50-60°,

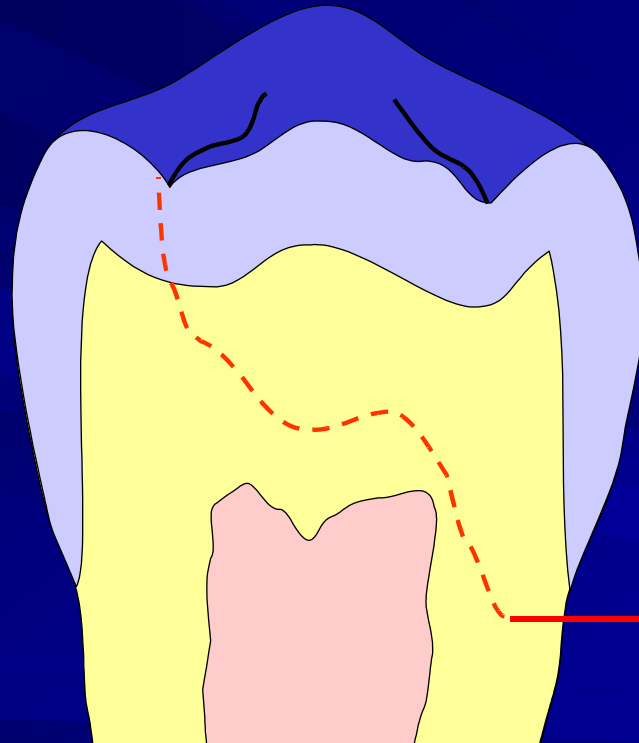
Cervical borders

In enamel



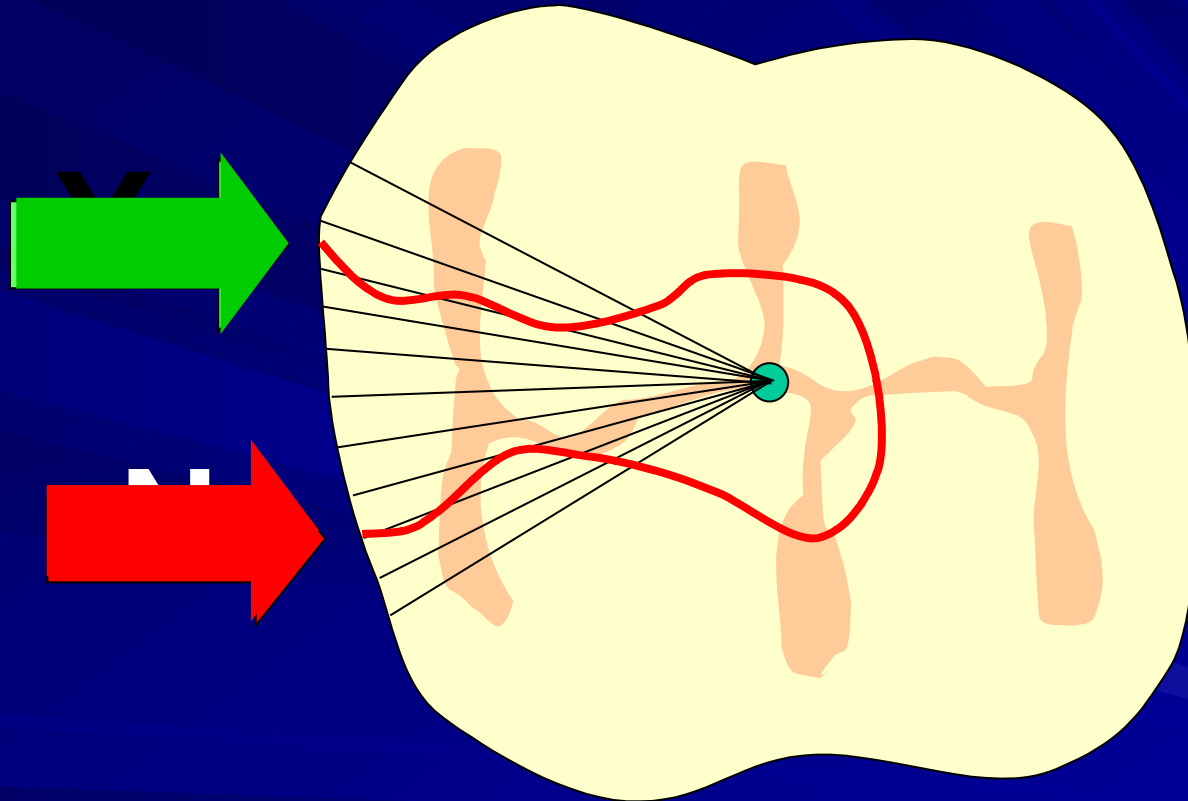
Cervical borders

In dentin

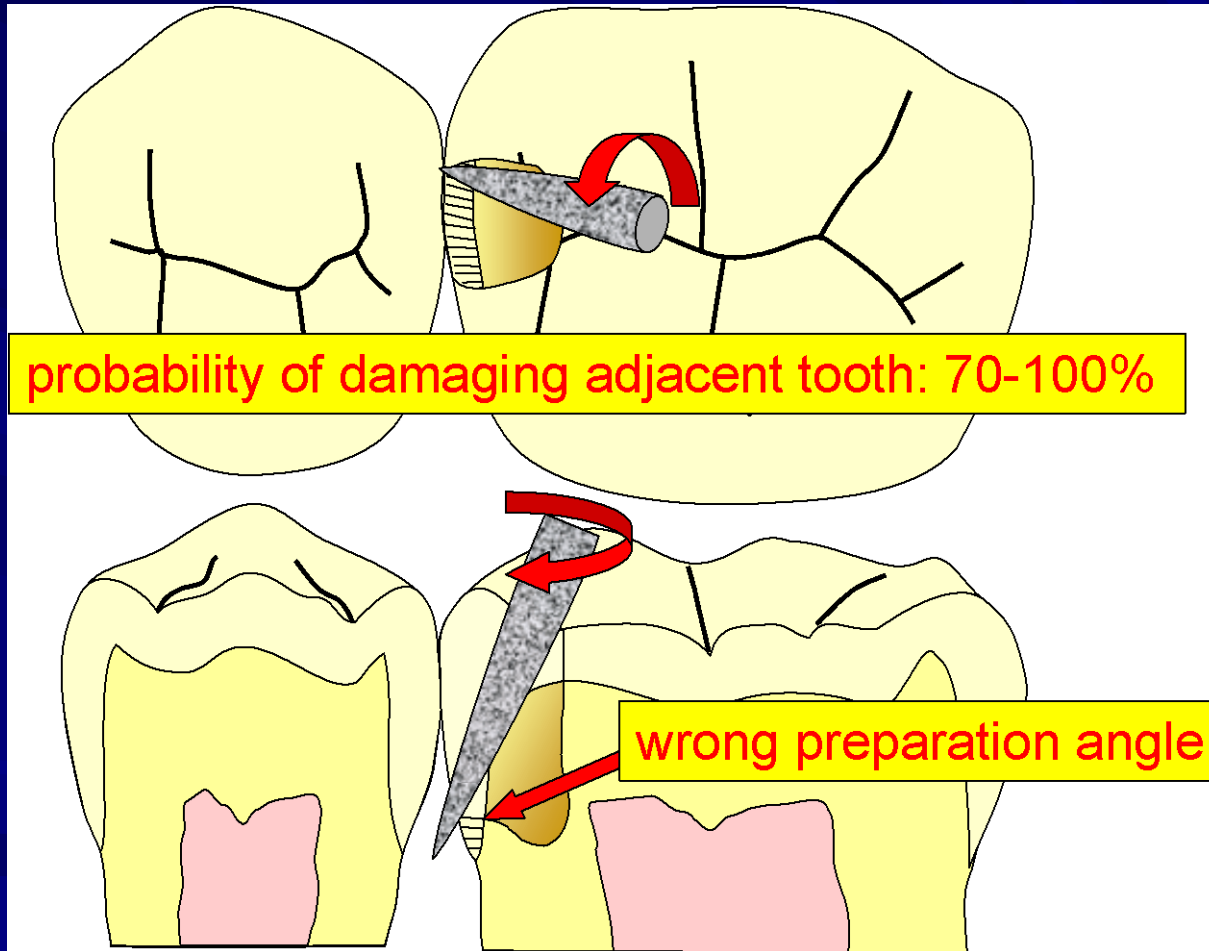


No bevel

Interproximal borders



Preparation technique



Oscillating instruments

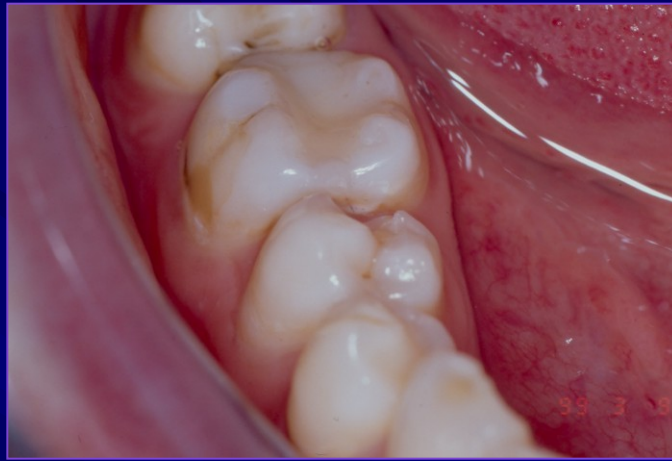




Composite filling class II. Contact point



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























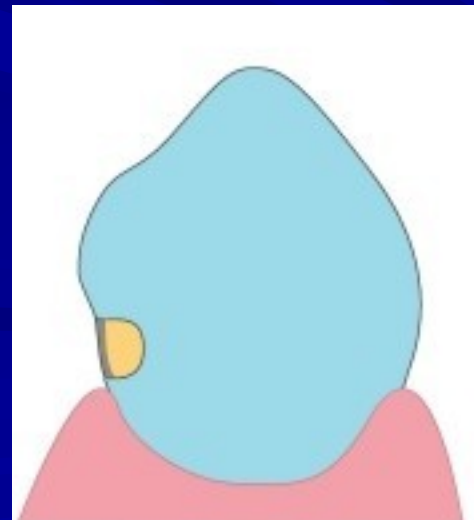
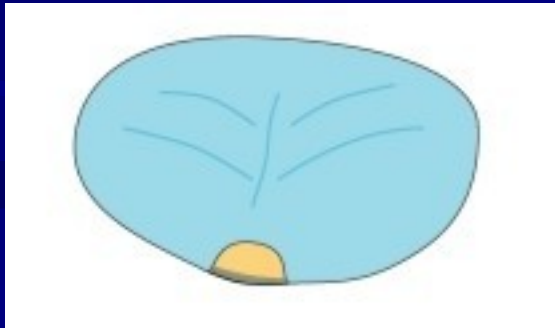
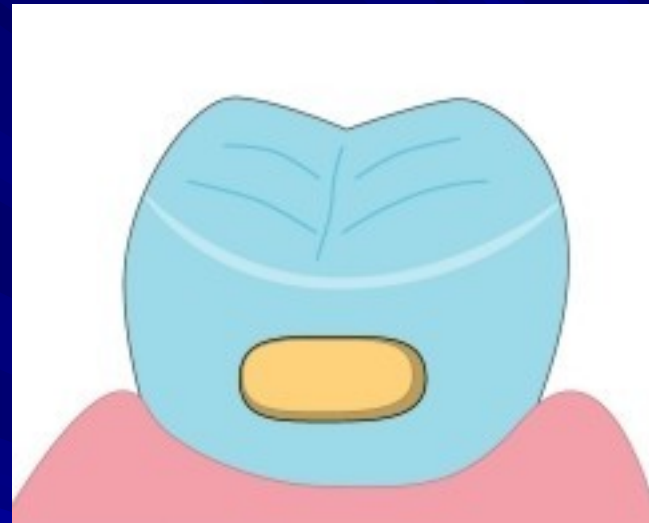
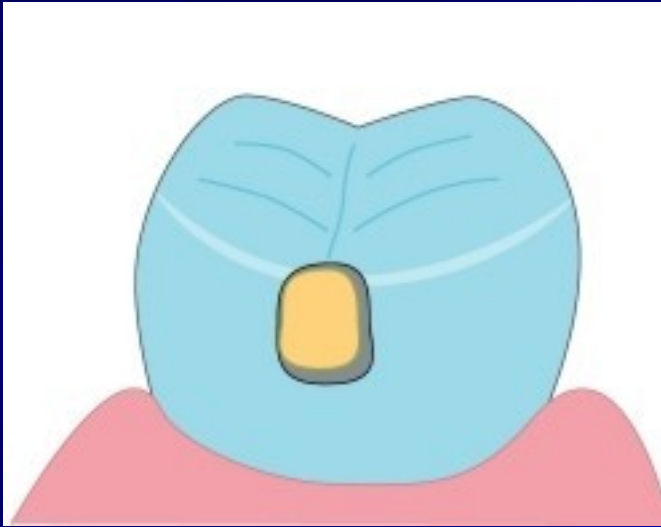








Adhezivní slotová preparace

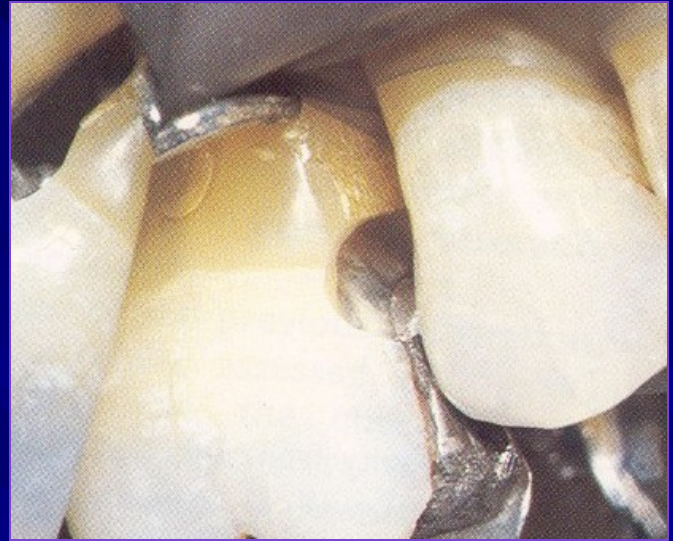


Approximal Caries

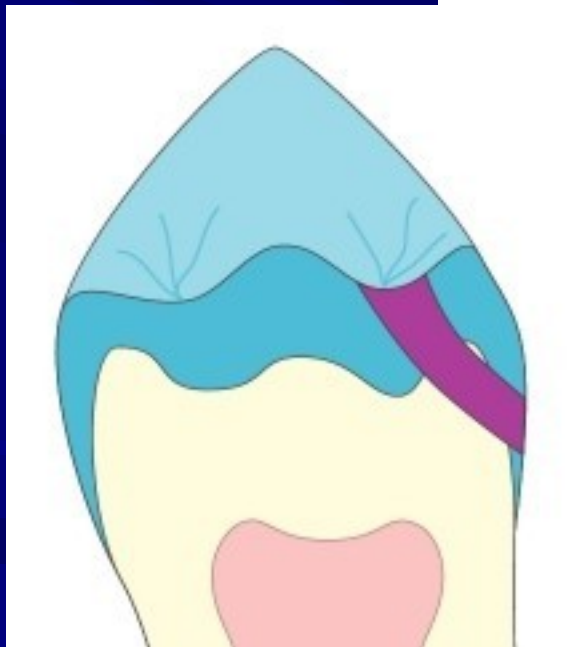


Approximal Caries

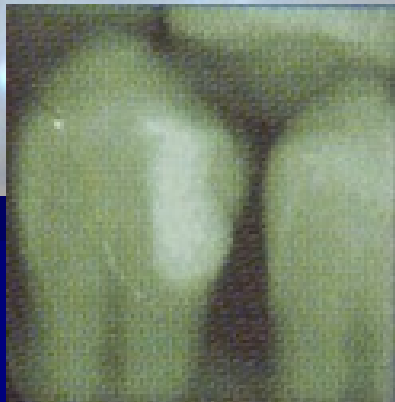
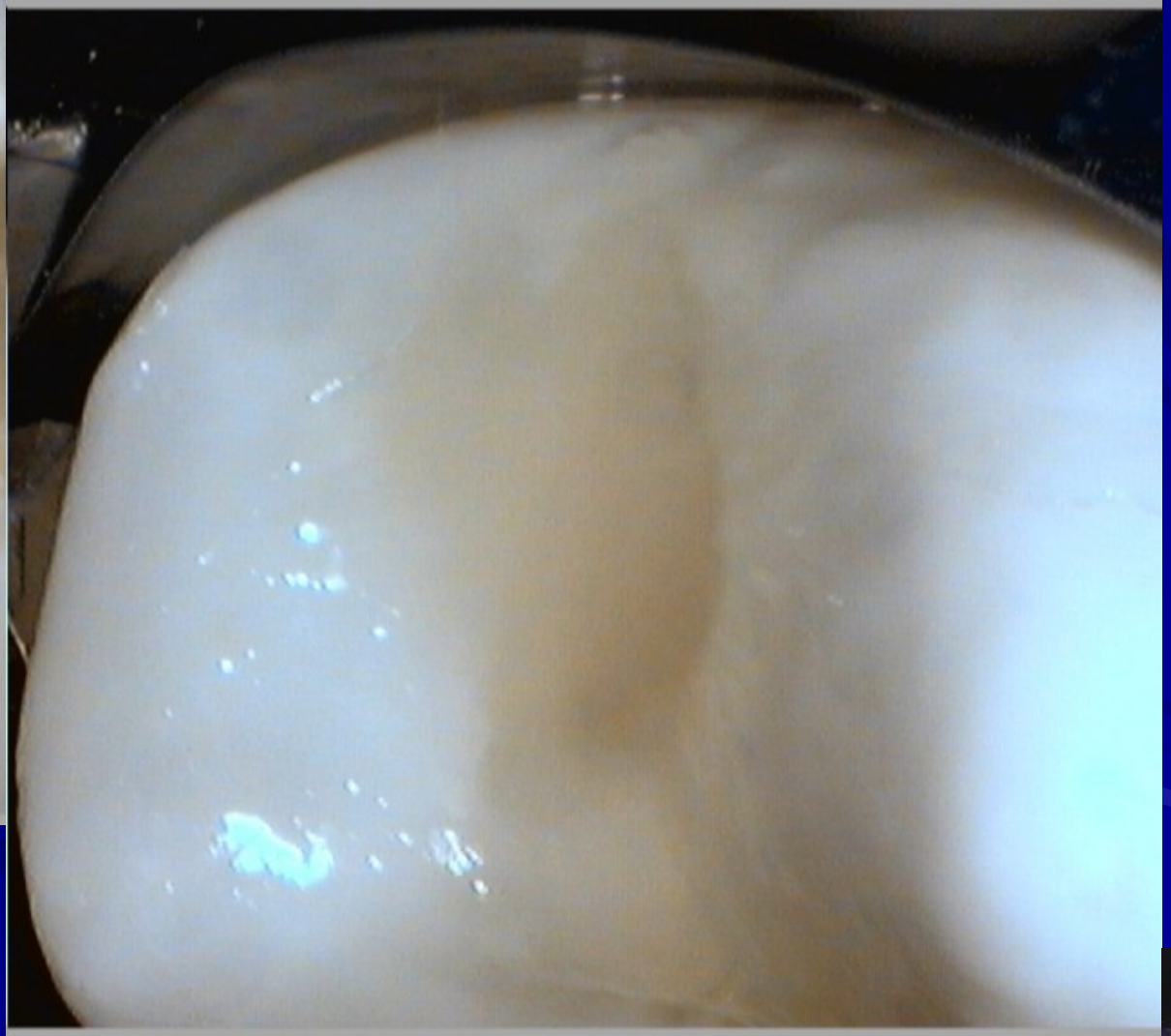




Tunnel preparation









Success?



Low caries risk
Special small instruments
Magnification
BW post op



