

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

Clinically proven success

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 and its consequences

- Forces during polymerization



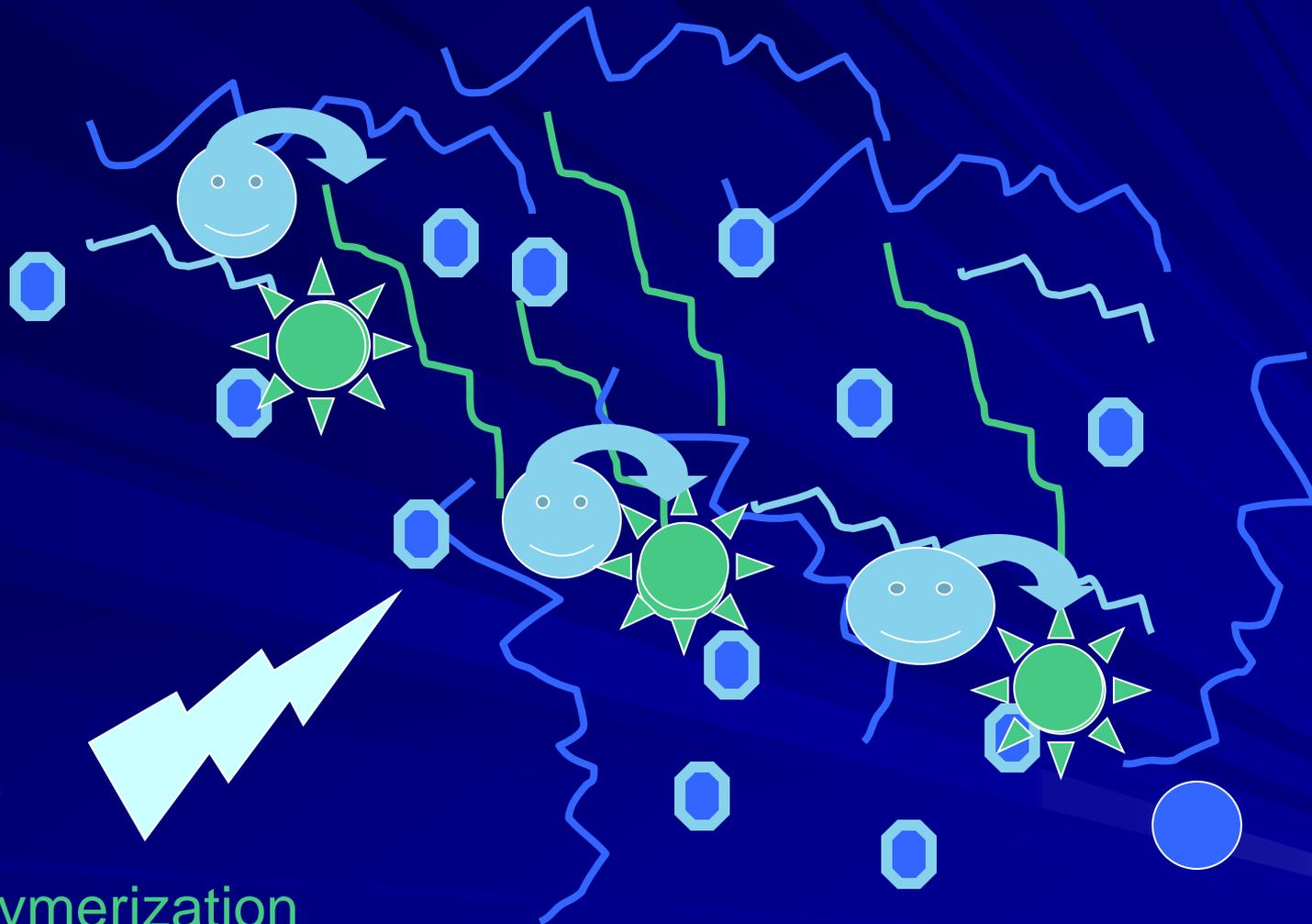
- Polymerization stress

Polymerization – light curing composites

- Mode of polymerization

Phases

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



Light

Polymerization

Monomer → Polymer

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

Composite material (content of filler)

High content of the filler causes bigger stress

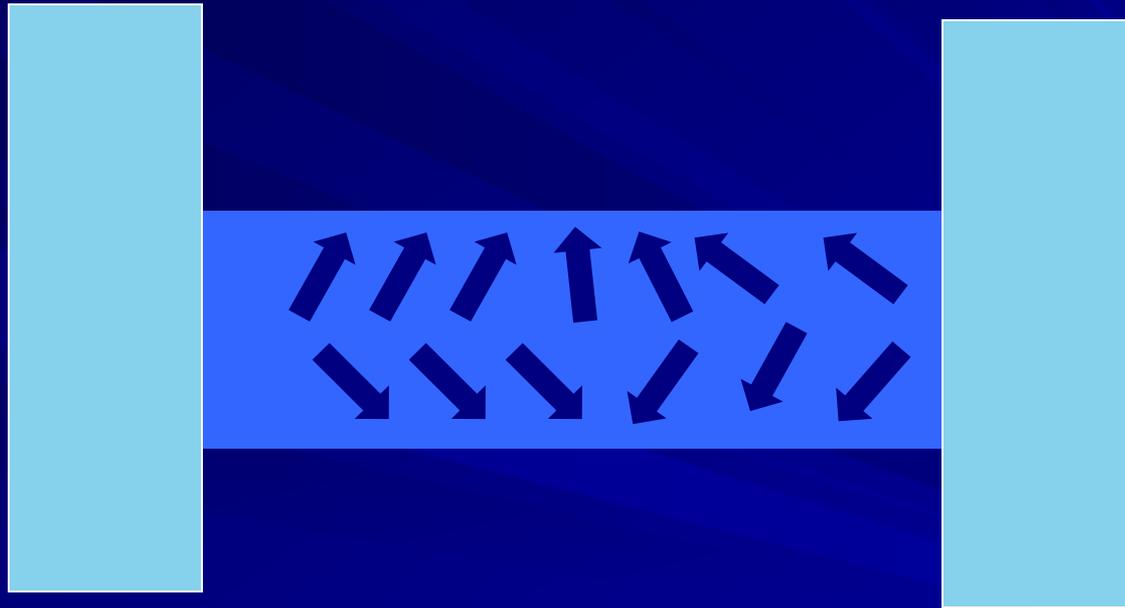
Flowable composites – low stress

Forces of polymerization shrinkage
depend on

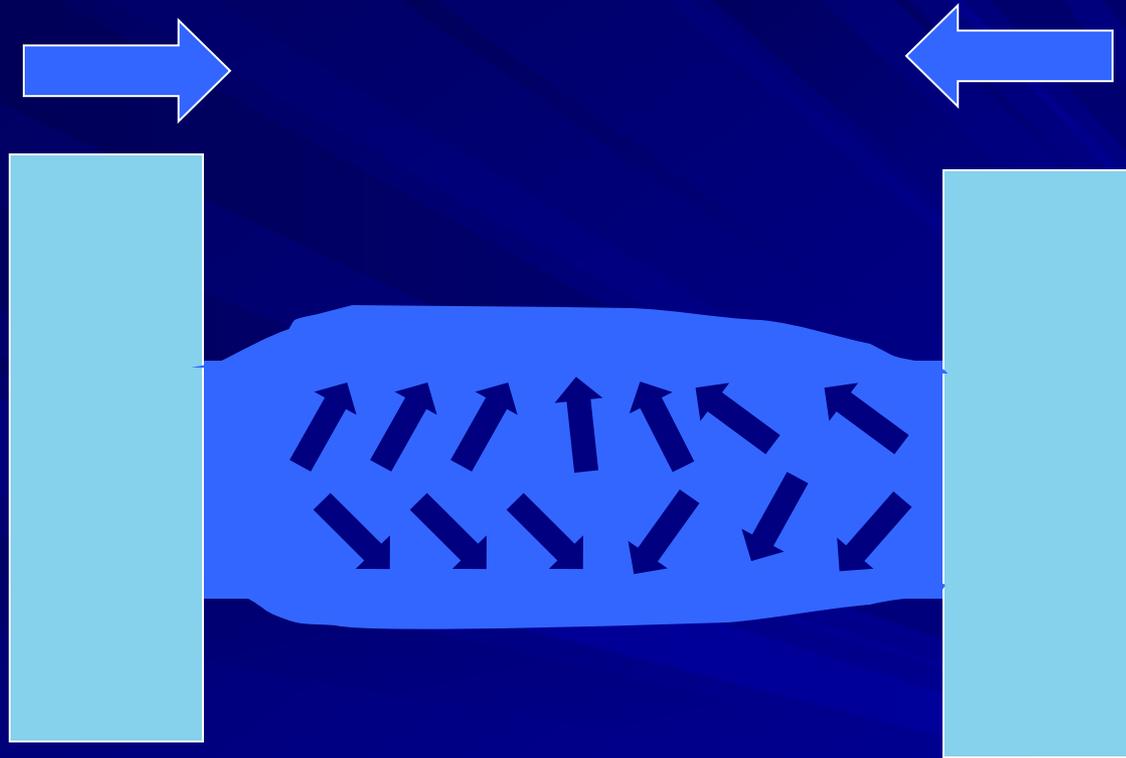
Geometry of the cavity (C-factor)

Polymerization shrinkage

C (configuration factor)
explanation



Polymerization shrinkage

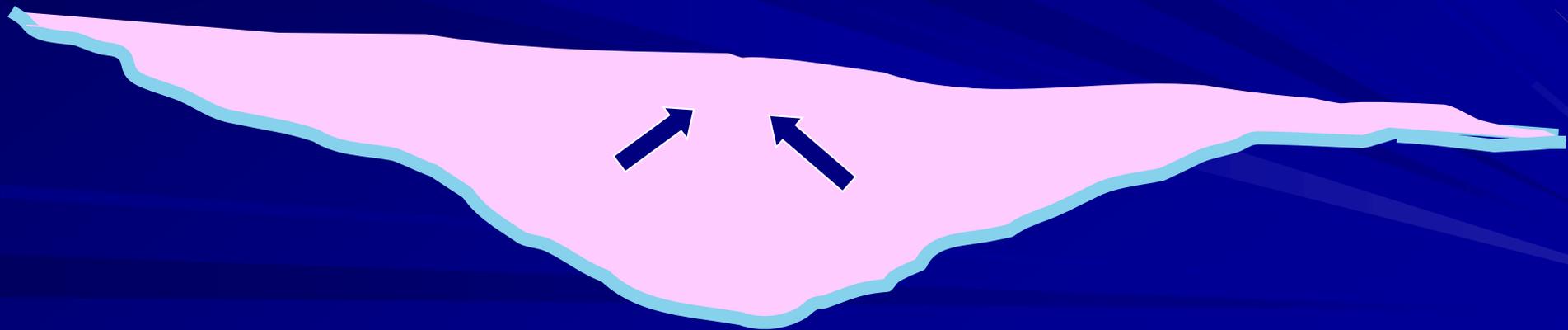


C (configuration factor)
explanation



C - factor

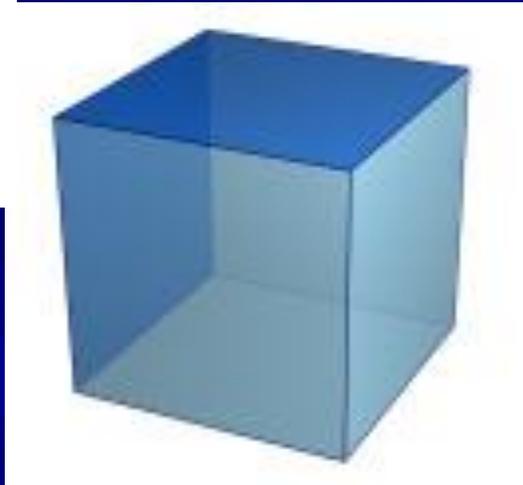
Surface of adhesion/free surface of the filling



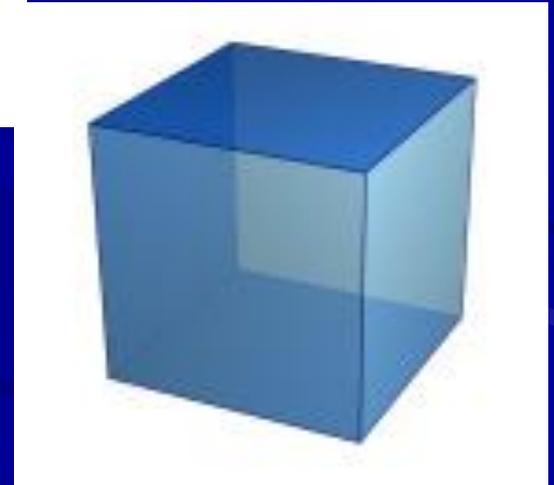
1/1 and less is optimal



5



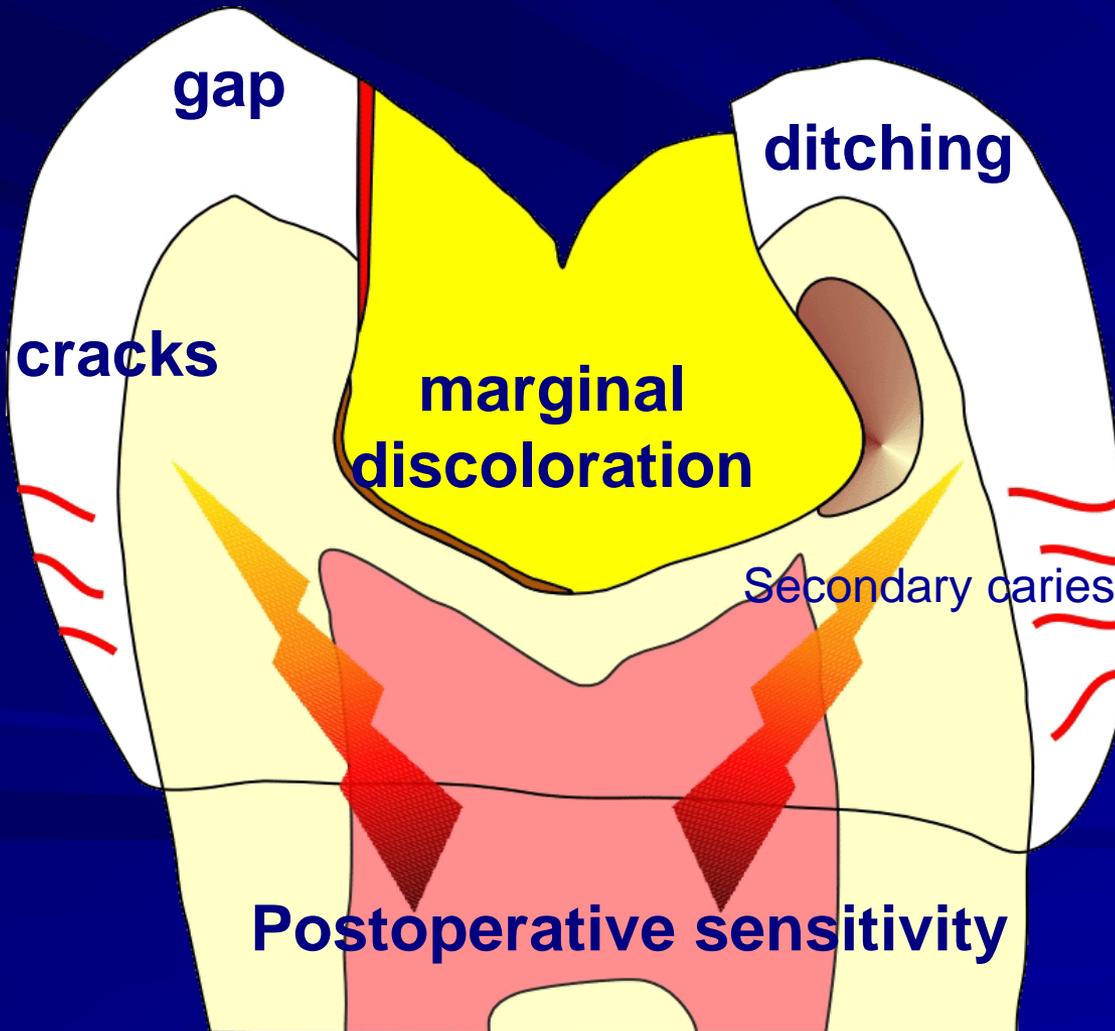
2



1

C (configuration factor)
explanation

Possible problems that can occur by improper handling



Forces of polymerization shrinkage depend on

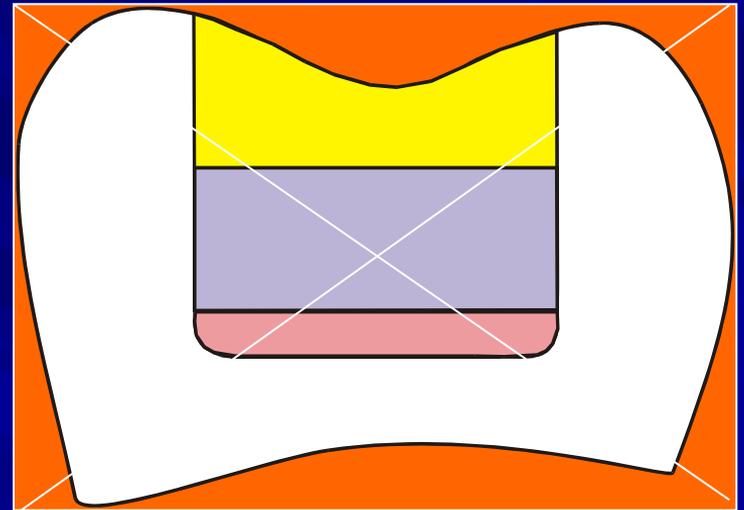
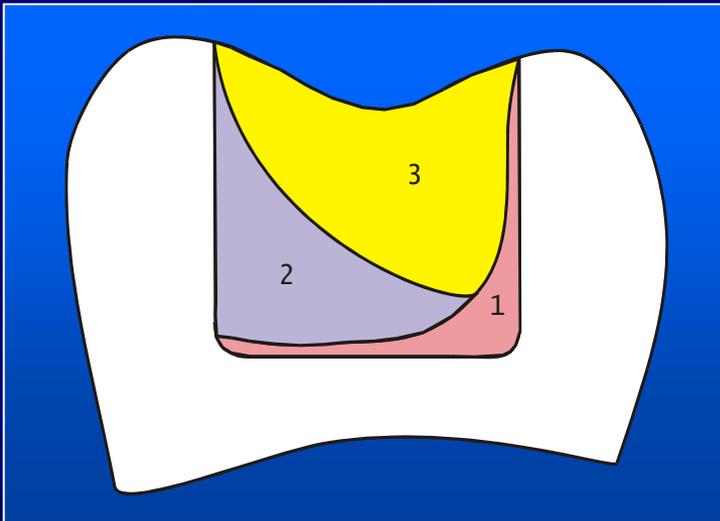
- Placement of the composite:
- *Create the first layer thin, flowable can be used*
- *Place th material in increments with respect of the C-factor of each layer*

Forces of polymerization shrinkage depend on

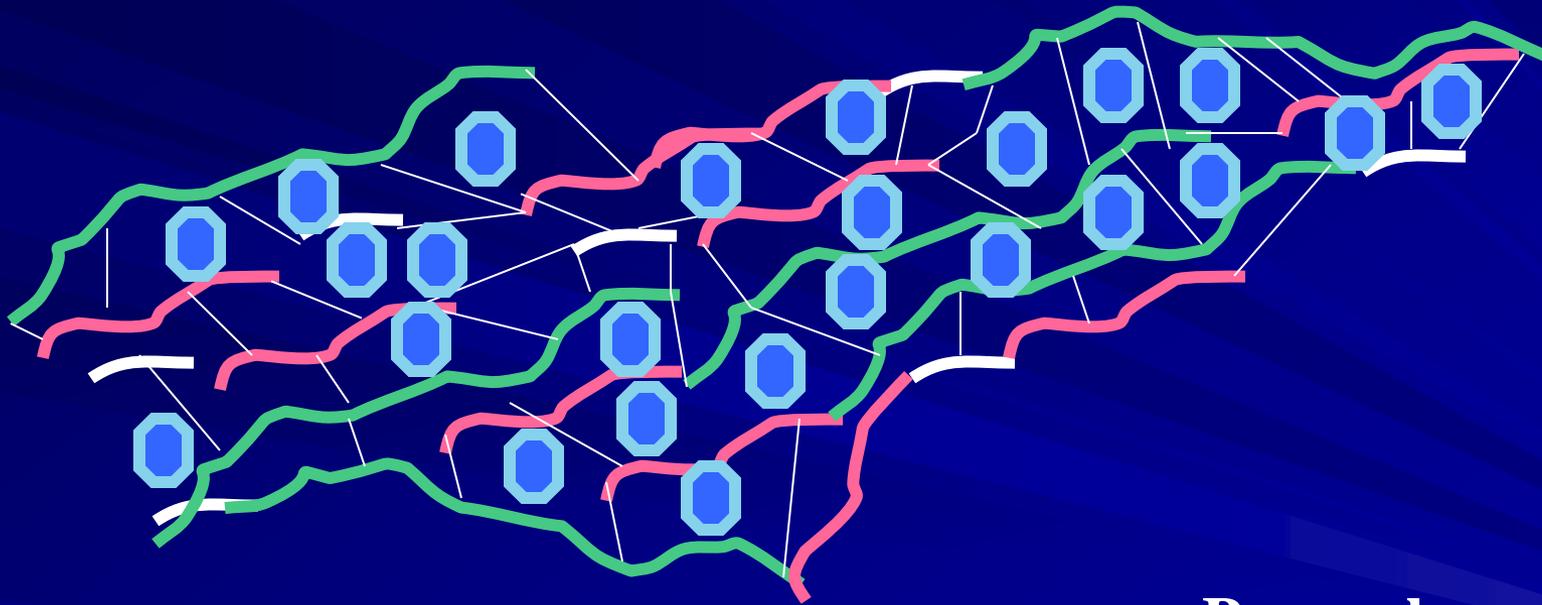
- Composite material (content of filler)
- Geometry of the cavity (C-factor)
- Placement of the composite
- Mode of polymerization

Placement of the material

Correct



Pre gel phase should be long – soft start



Pre -gel

Gel

Post -gel

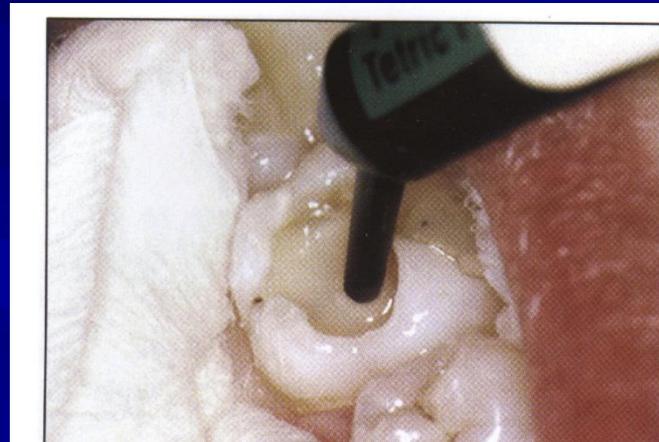
Marginal adaptation depends on

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



Flow materials - importance

1. Stress braker
2. Block out of the undercuts
3. Adaptation to the marginal walls
4. Aesthetic reasons
5. Protection of adhesives



Temperovaný kompozit

Adhesives

- Adhesive systems using acid etching technique
- Selfetching adhesive systems

Adhesives

- Acid etching technique

Etching

Washing

Priming Bonding

Adhesives

- Selfetching adhesive systems

Priming

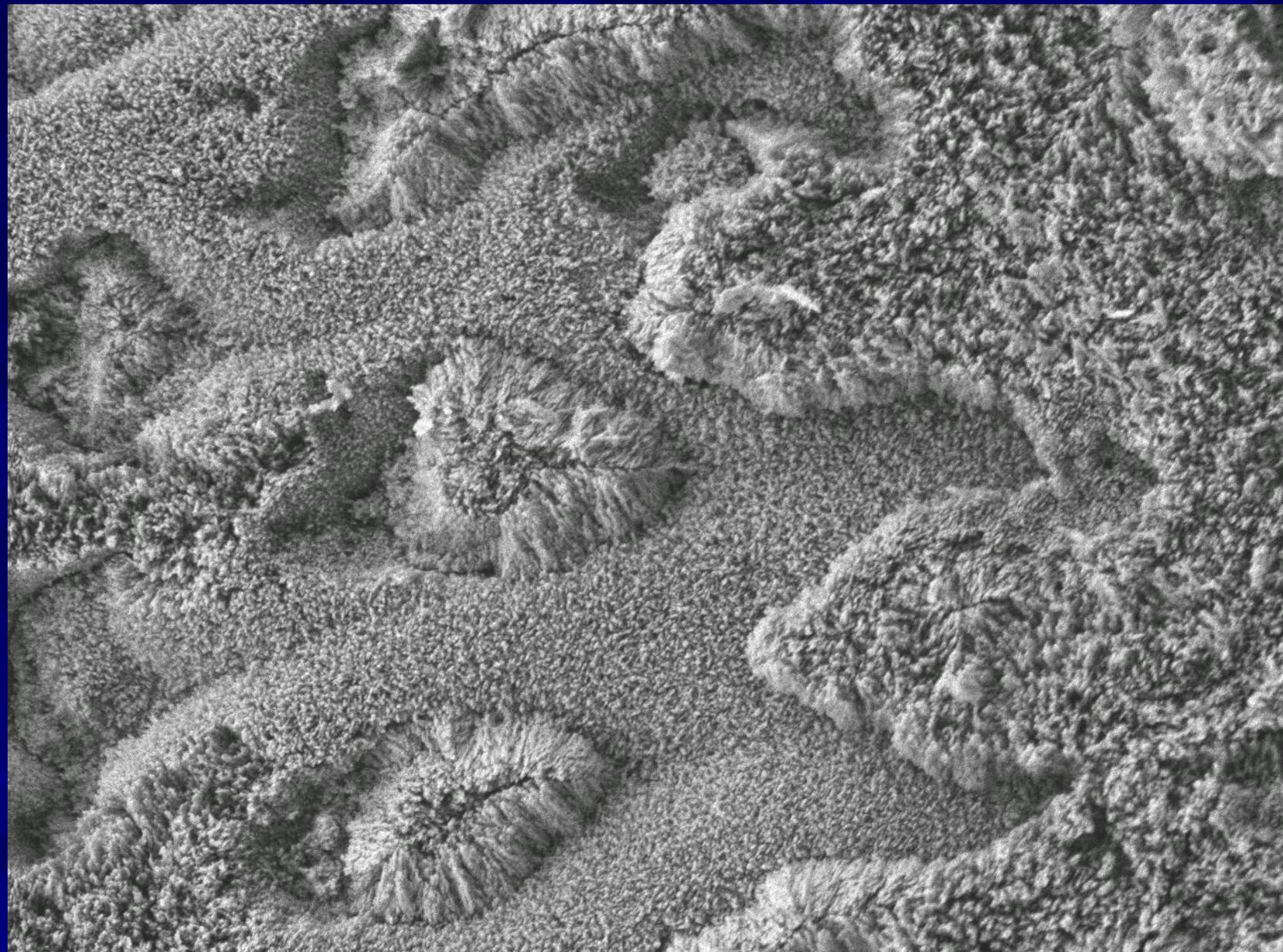
Bonding

Adhesives

- Active and passive bonding

Active – rubbing with microbrush

Passive – without any rubbing



ISI

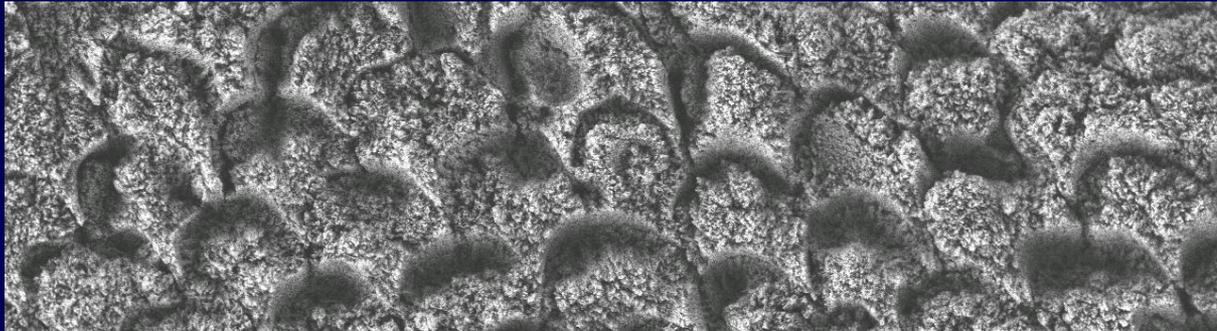
LEI

5.0kV

X5,000

1 μ m

WD 7.7mm



ISI

LEI

5.0kV



ISI

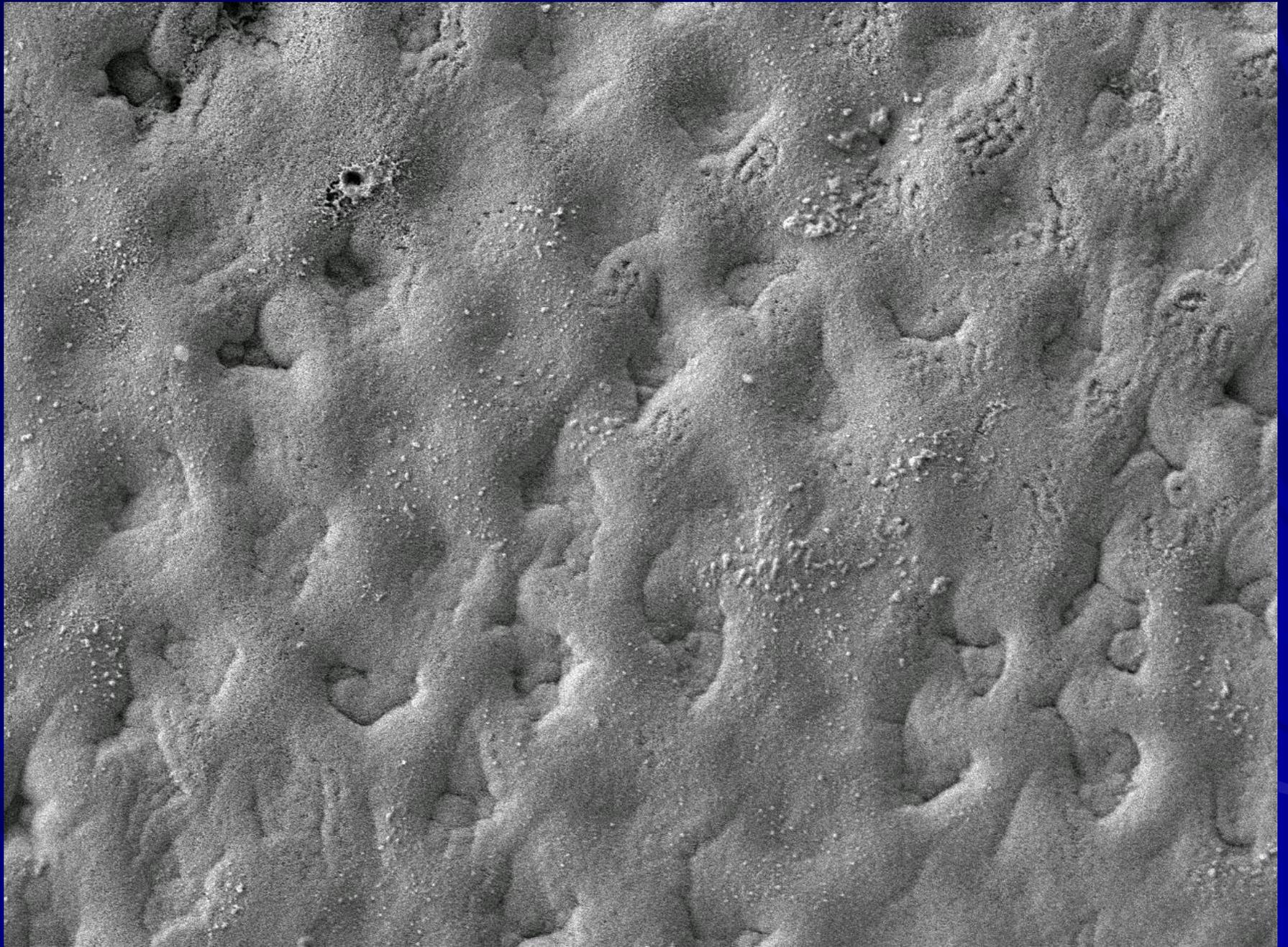
LEI

5.0kV

X2,000

10μm

WD 7.9mm



ISI

LEI

5.0kV

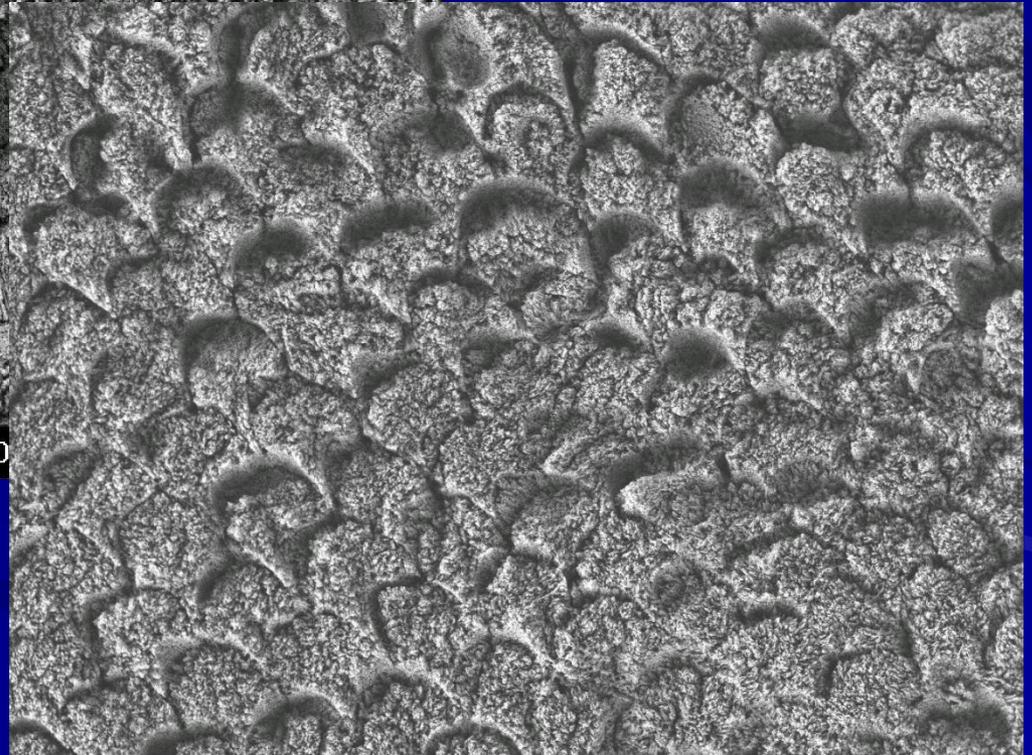
X2,000

10 μ m

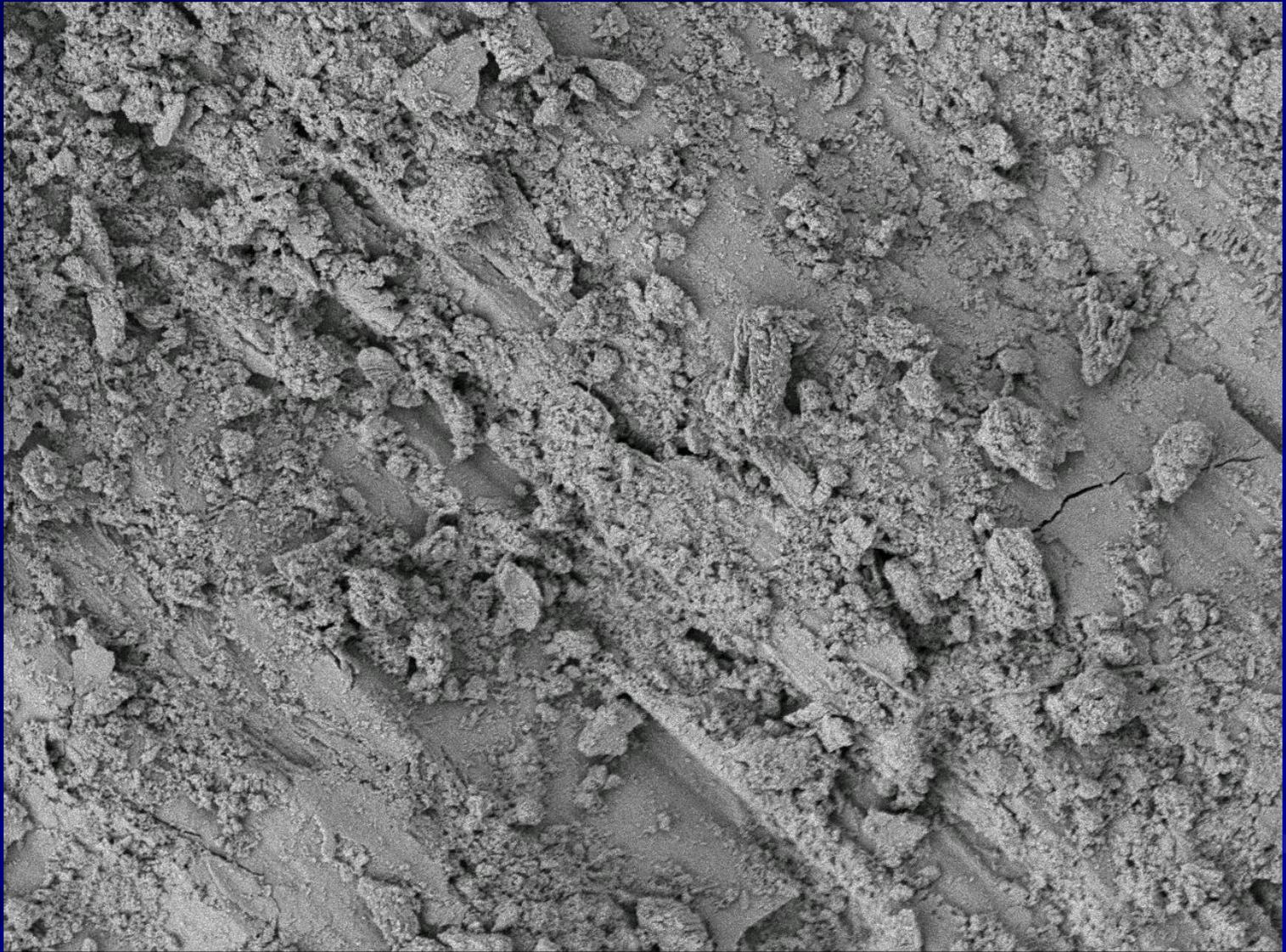
WD 7.7mm



ISI LEI 5.0kV X5,000



ISI LEI 5.0kV X2,000 10µm WD 7.5mm



ISI

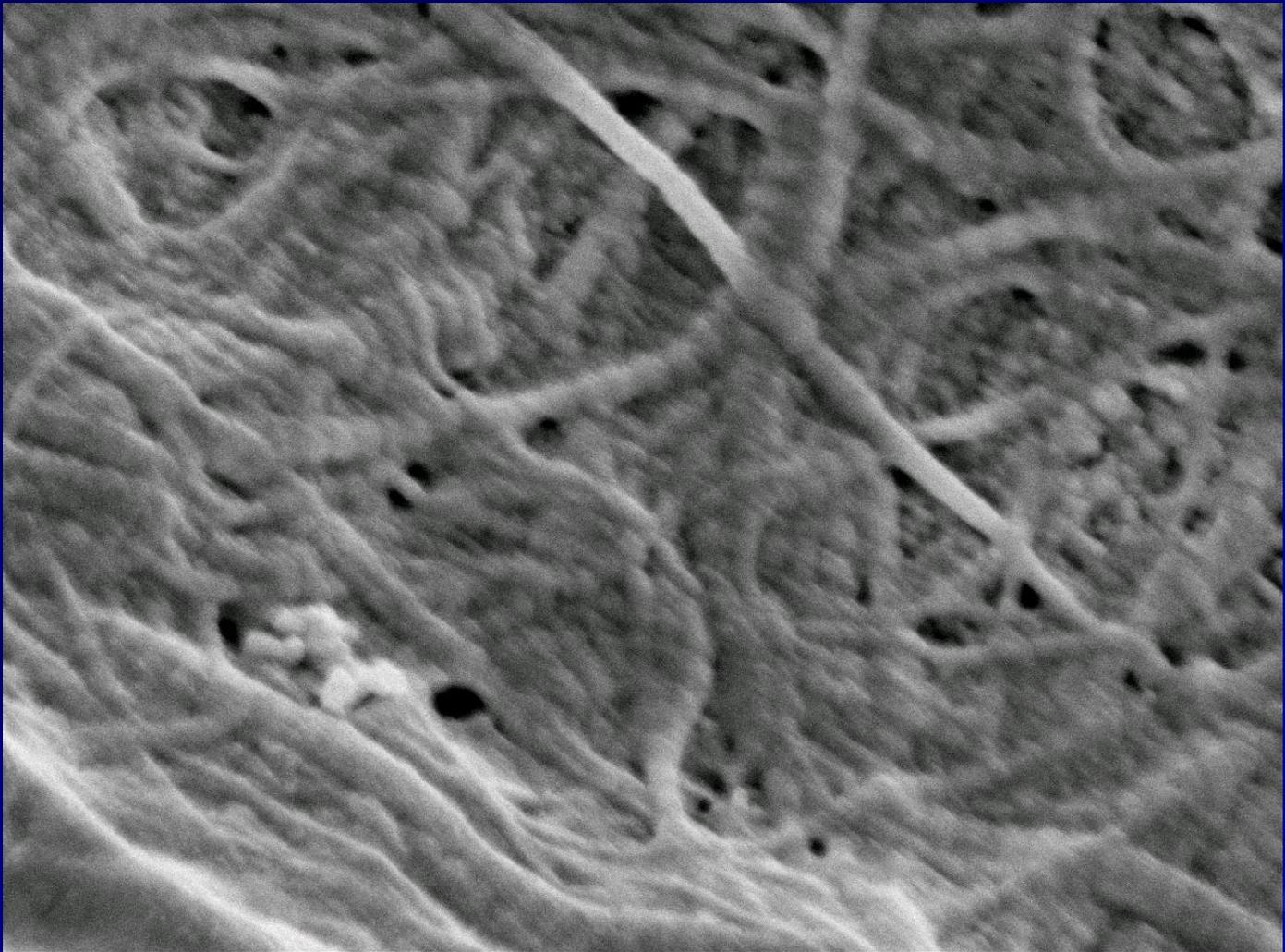
LEI

5.0kV

X2,000

10µm

WD 9.8mm



ISI

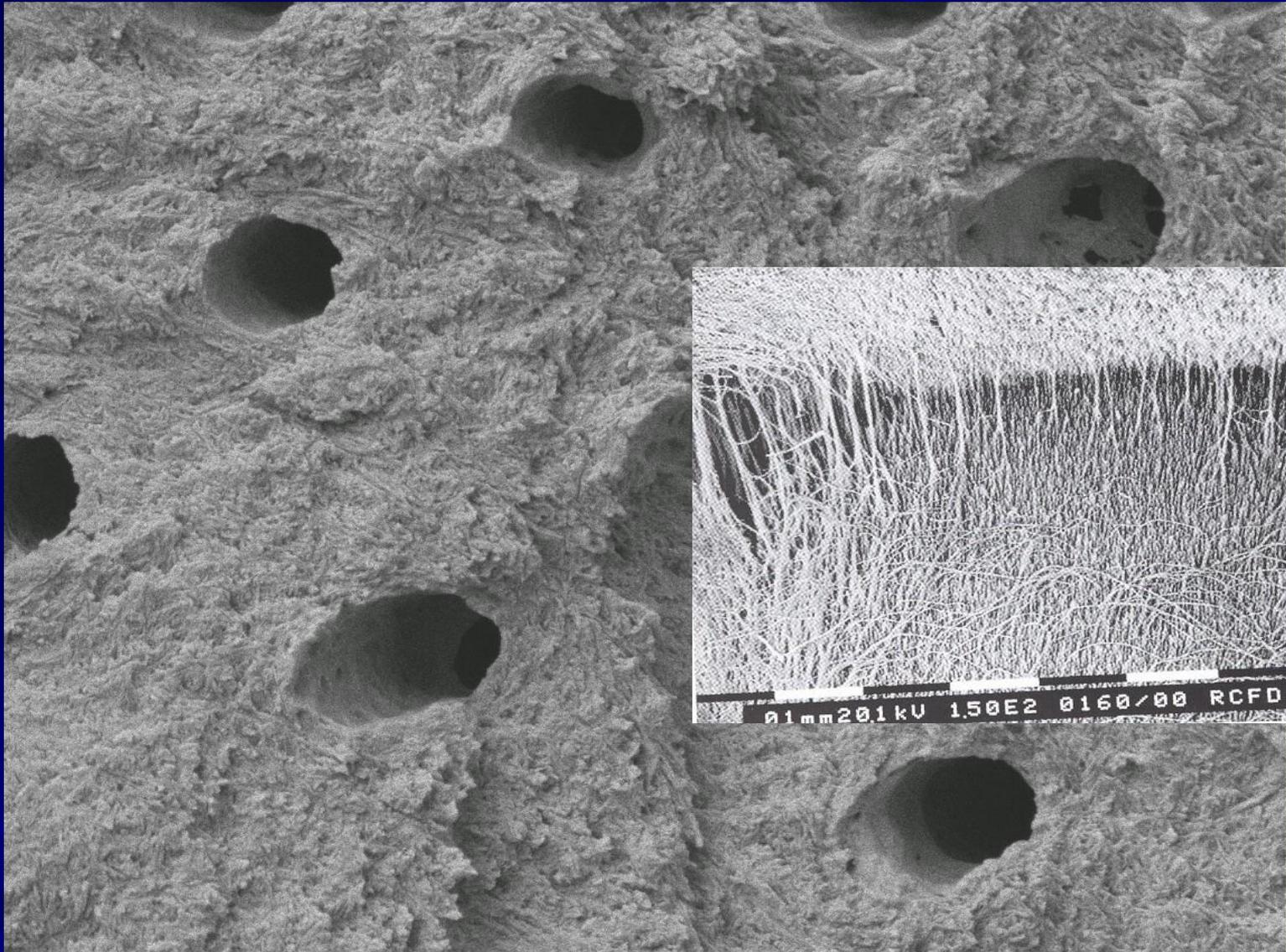
SEI

5.0kV

X55,000

100nm

WD 8.6mm



ISI

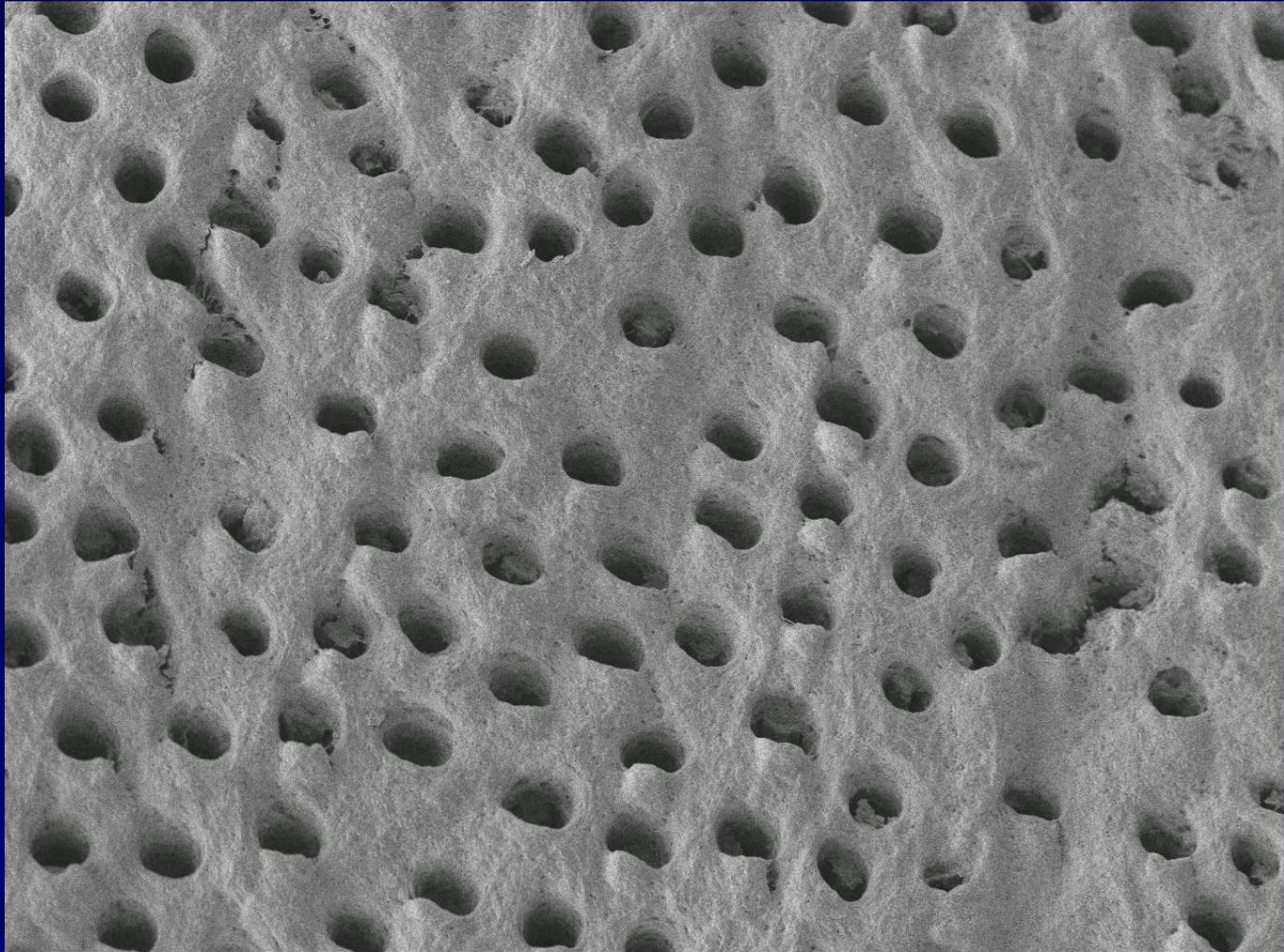
LEI

5.0kV

X6,000

1 μ m

WD 9.0mm



ISI

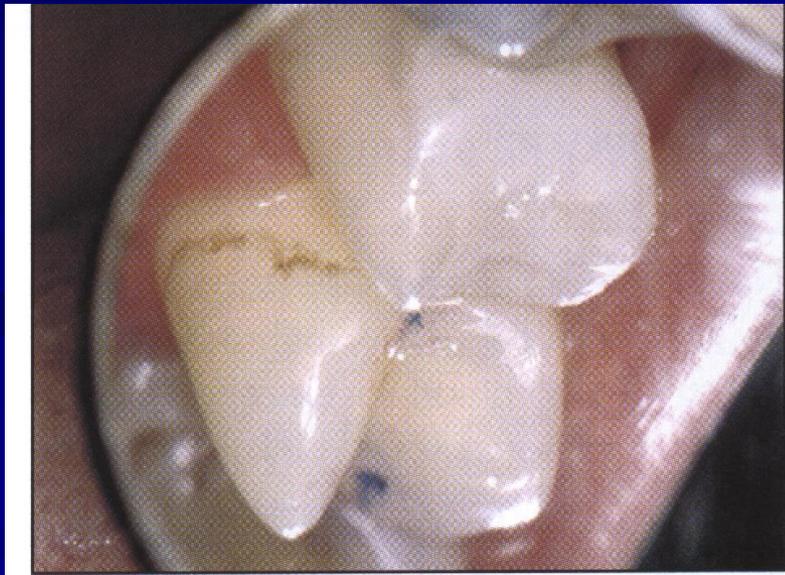
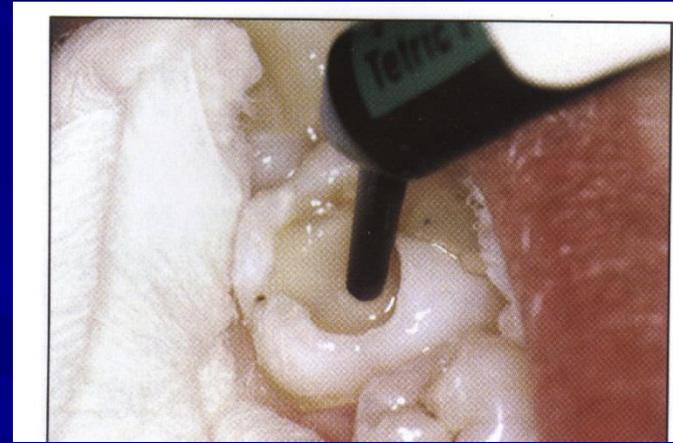
LEI

5.0kV

X2,000

10 μ m

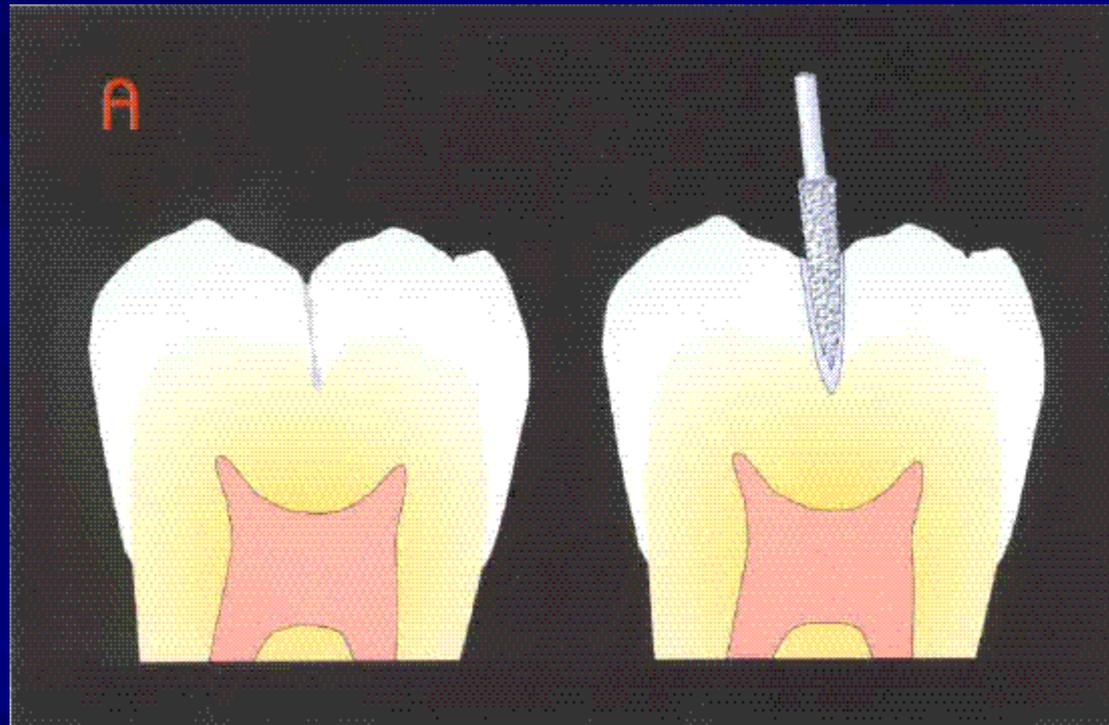
WD 8.6mm



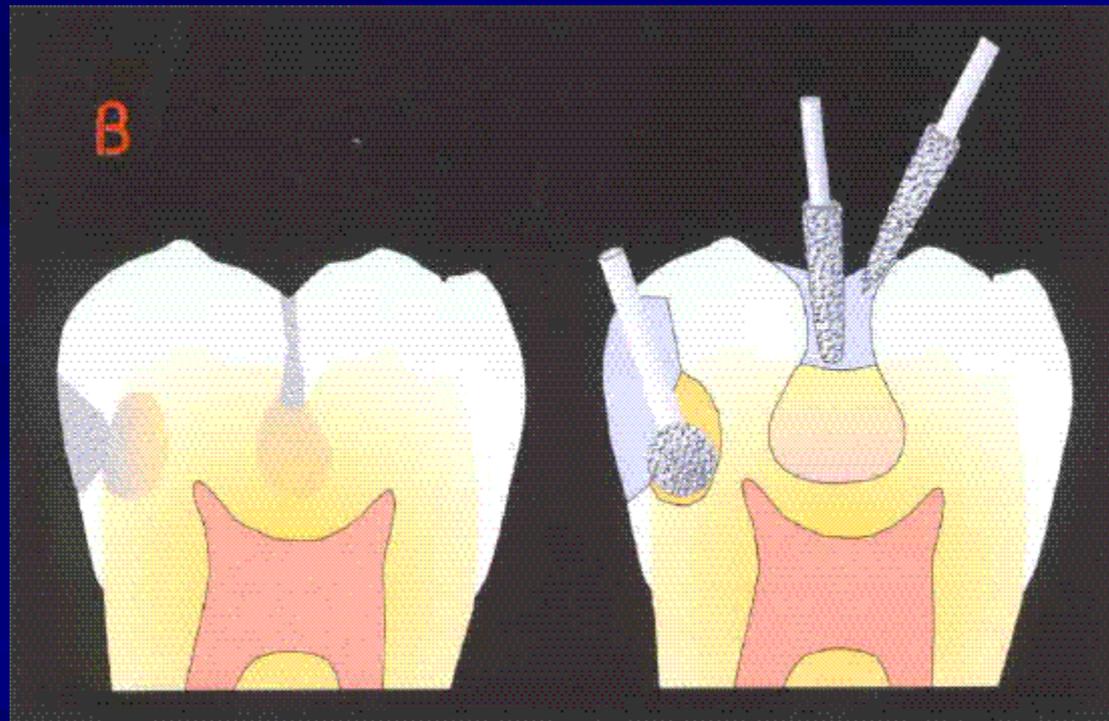




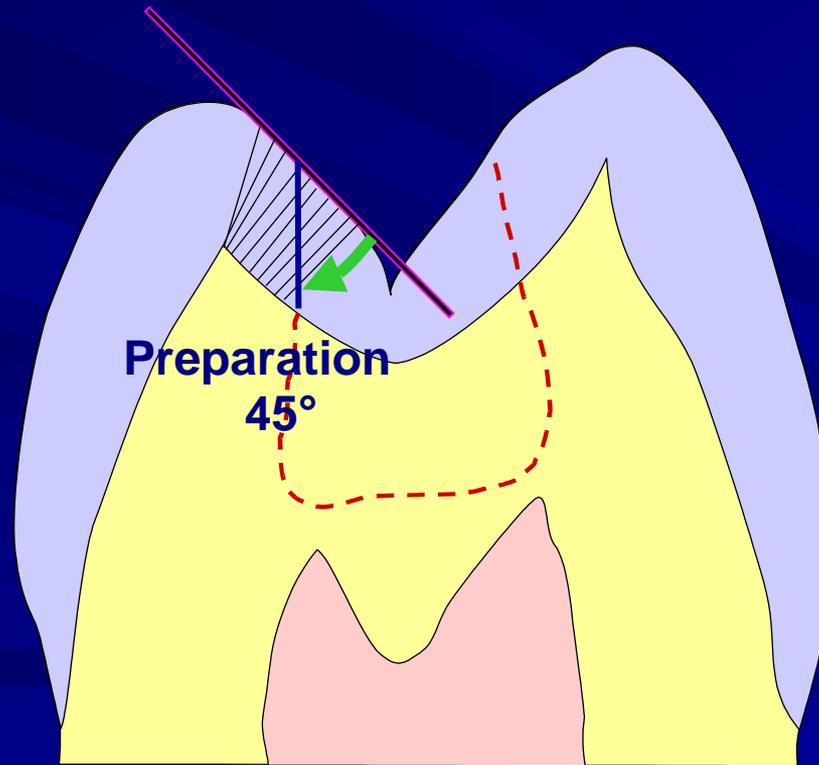
Adhesive preparation in a fissure

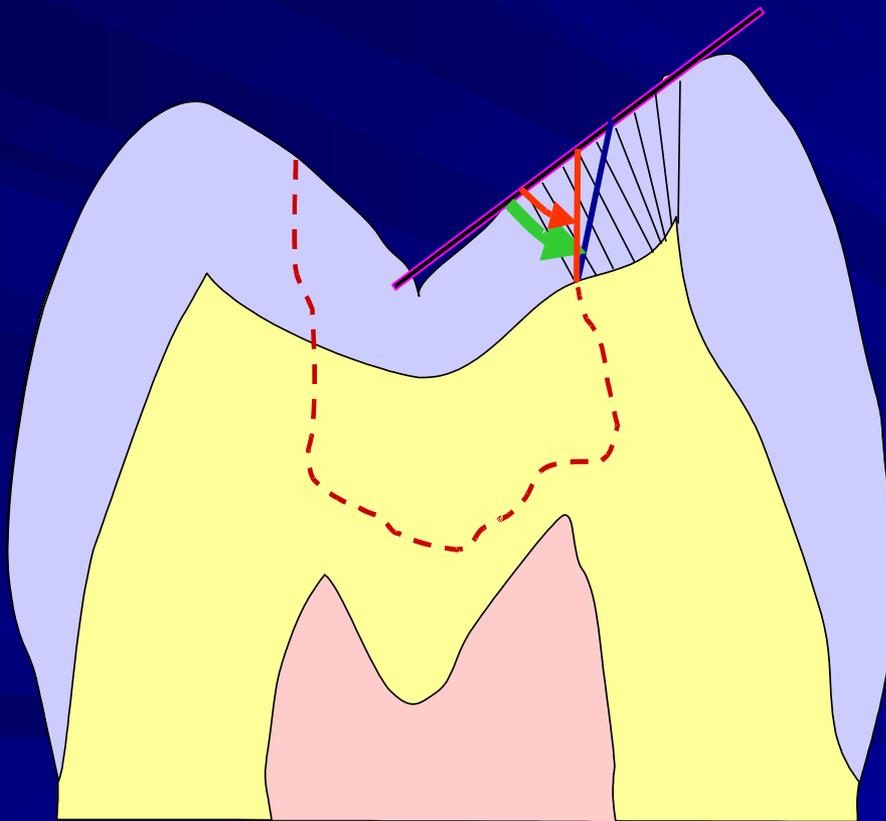


Adhesive preparation

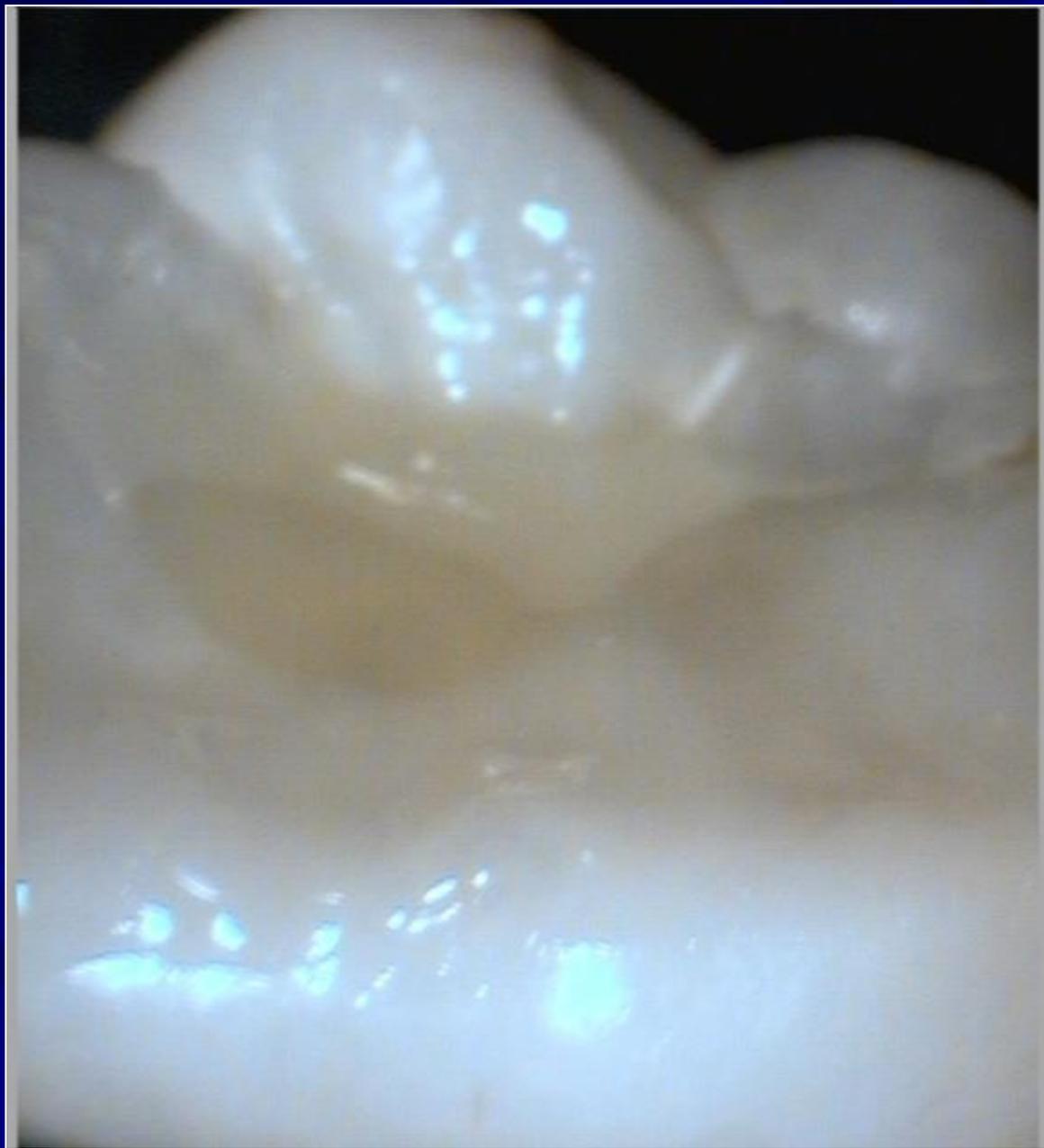


Preparation of enamel borders





Next to cusp
50-60°,
Never cover the cusp



Class II.



Class II.

■ Main problems:

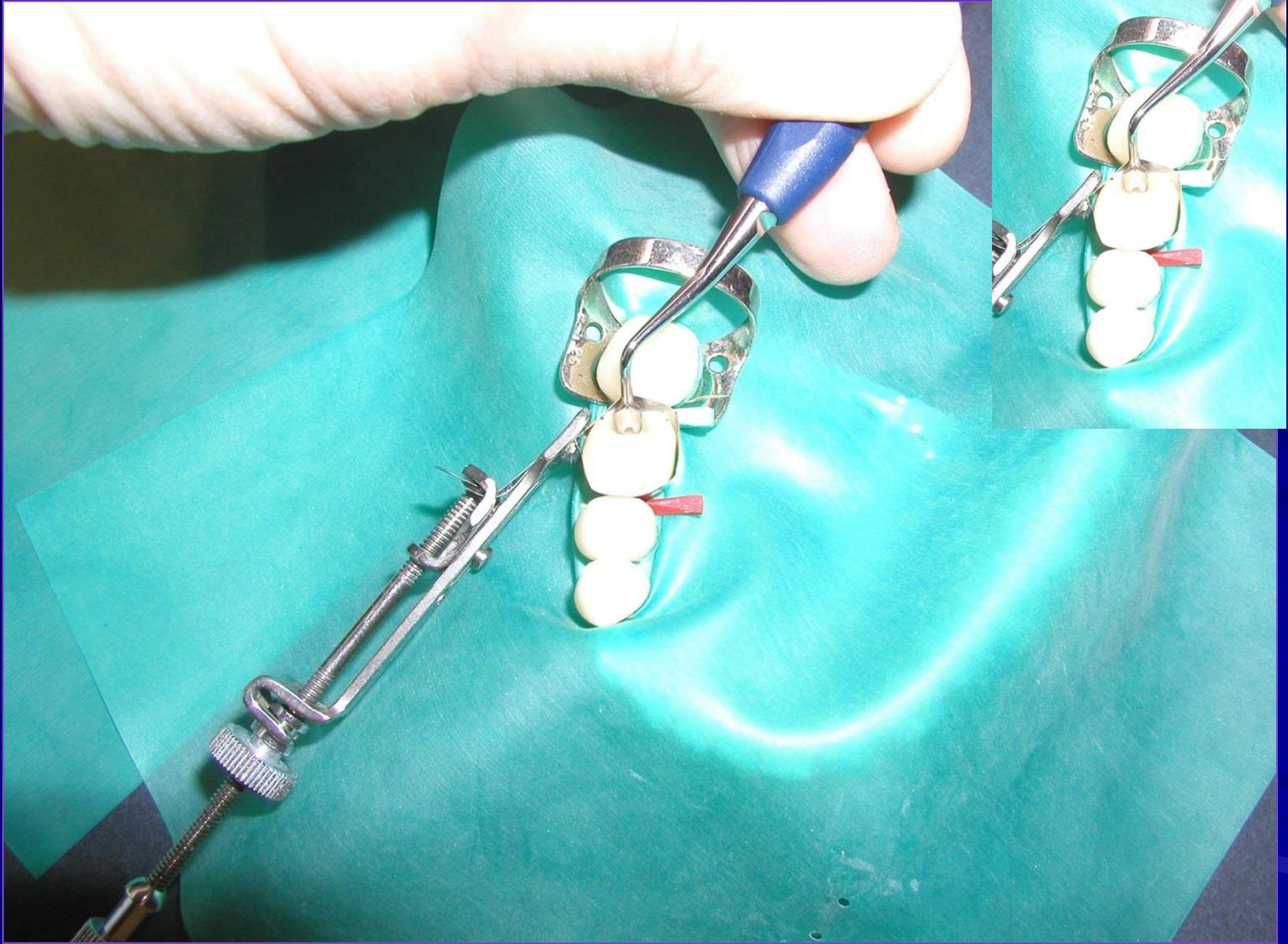
Contact point

Marginal adaptation

Contact point





















Kompozitní výplně II. třídy



Kompozitní výplň II. třídy



Kompozitní výplň II. třídy

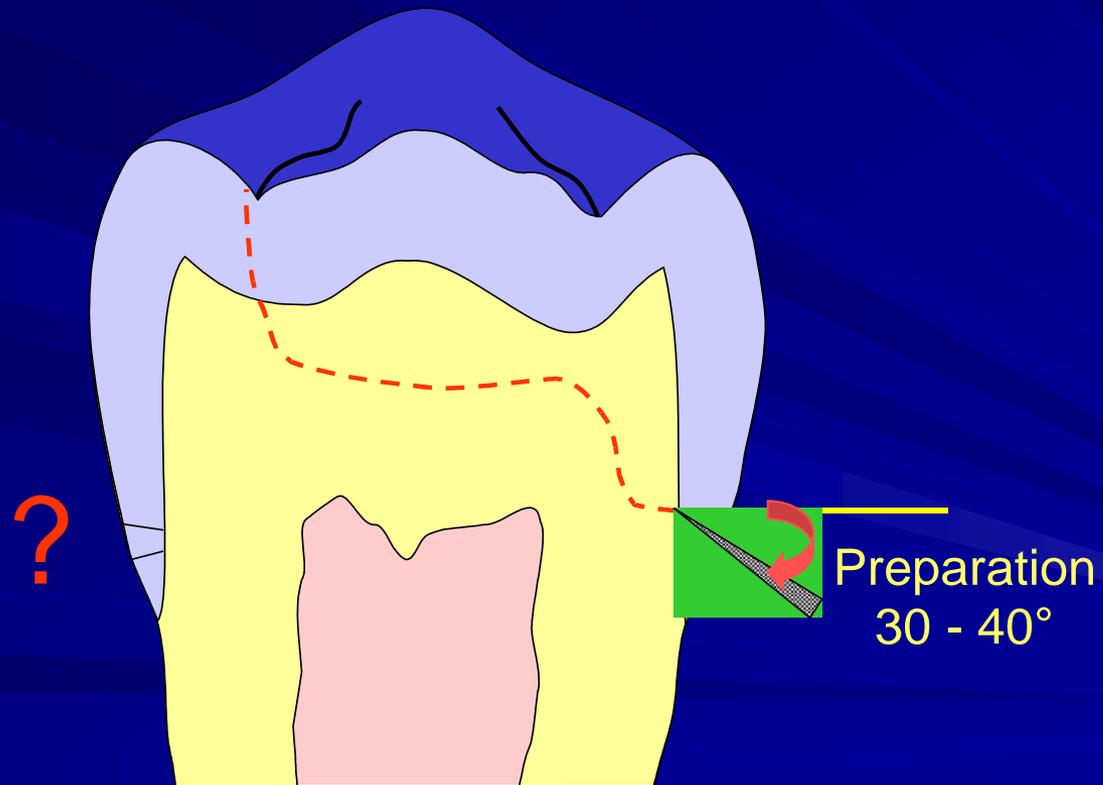


Kompozitní výplň II. třídy



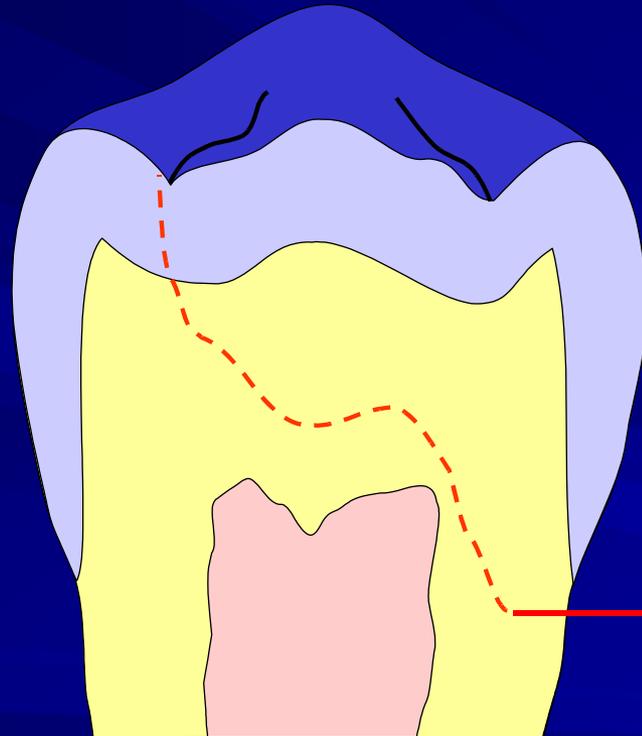
Marginal adaptation

Margin in enamel



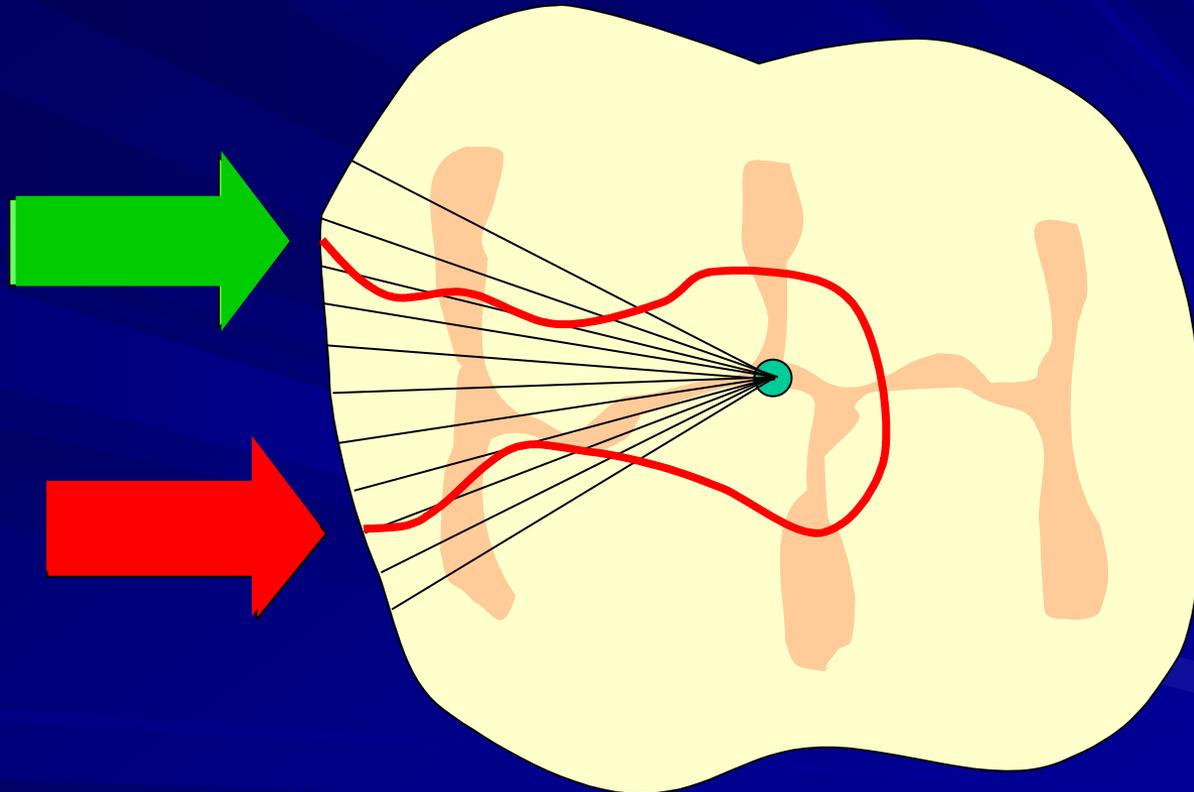
Marginal adaptation

In dentin

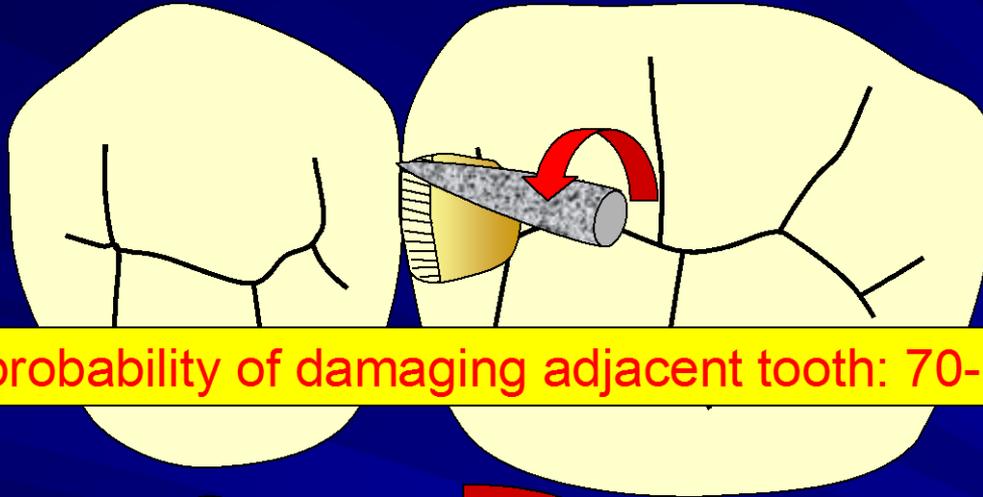


Preparation
do not bevel!!!

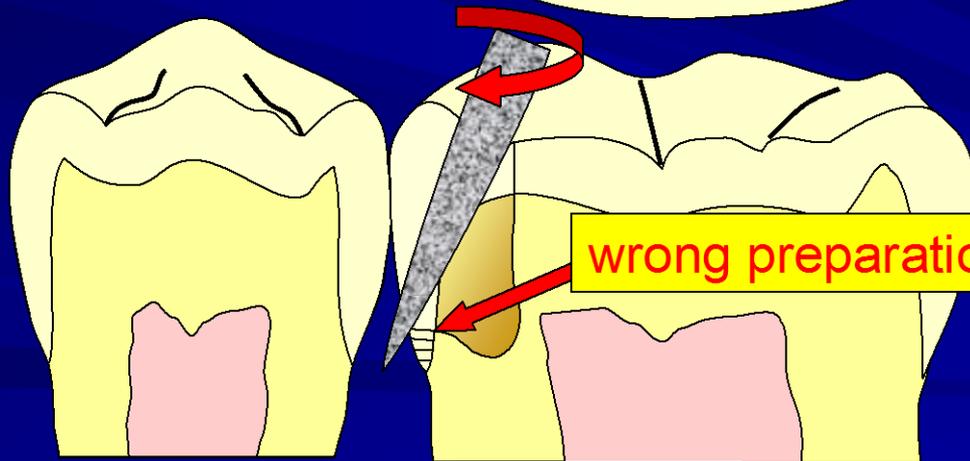
Interproximal vertical borders



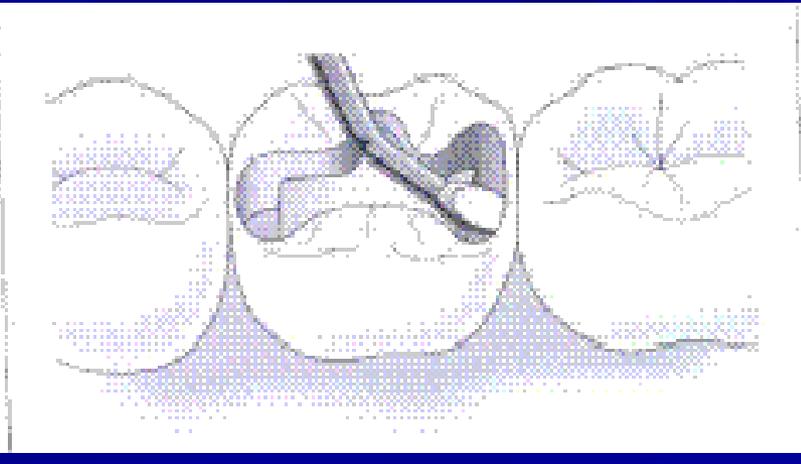
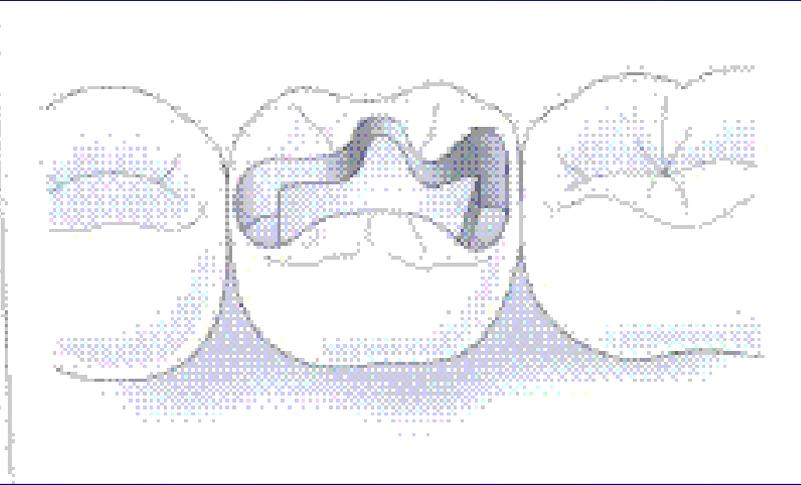
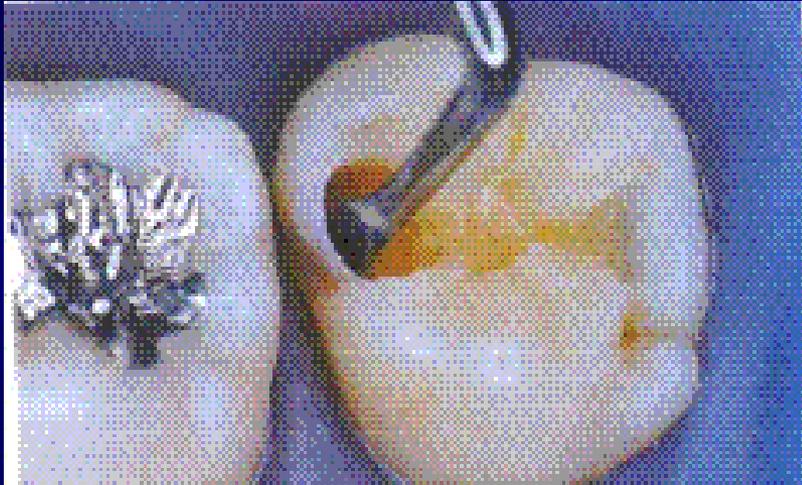
Preparační technika



probability of damaging adjacent tooth: 70-100%



wrong preparation angle



Filling and Caries Excavation



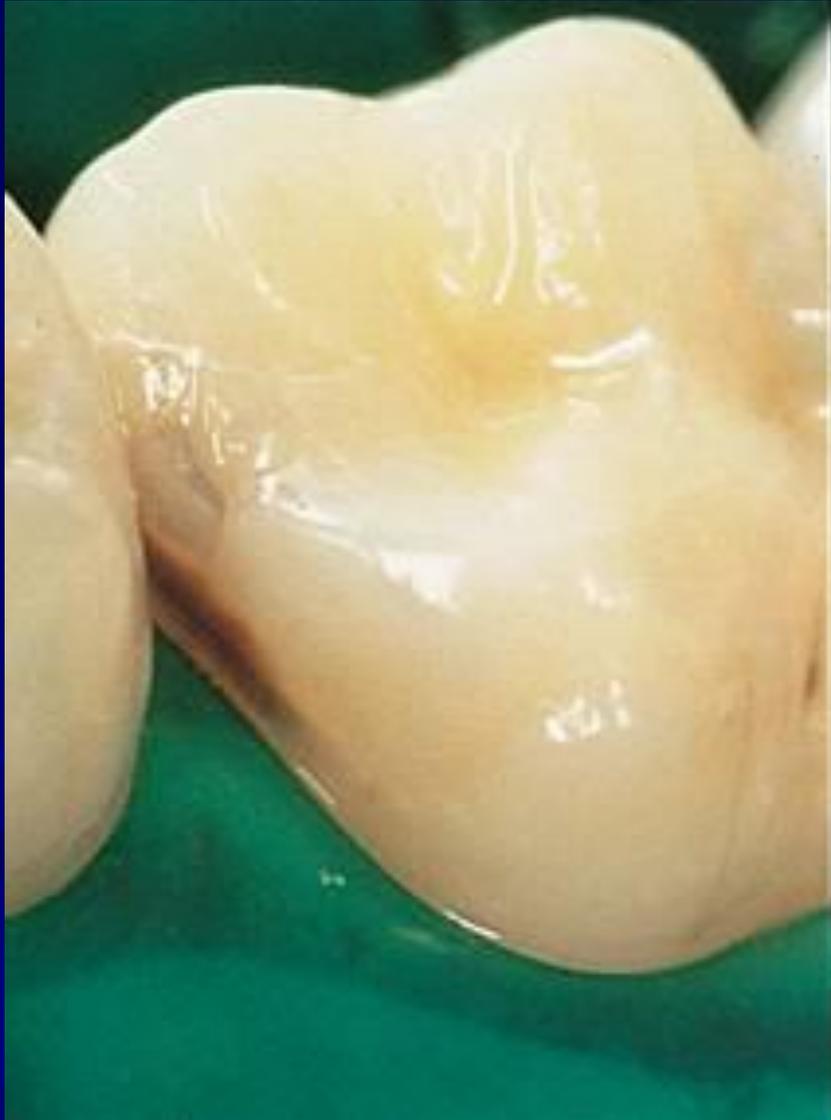
Proximal Preparation with SonicSys



Final Preparation of Cavity



Approximal Caries



Approximal Caries



















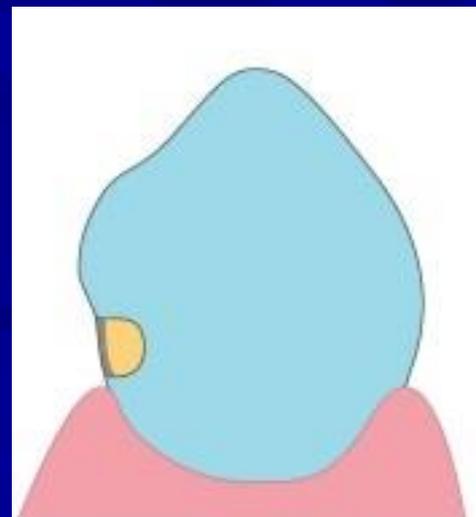
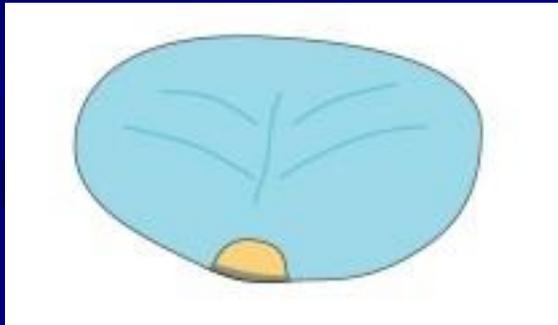
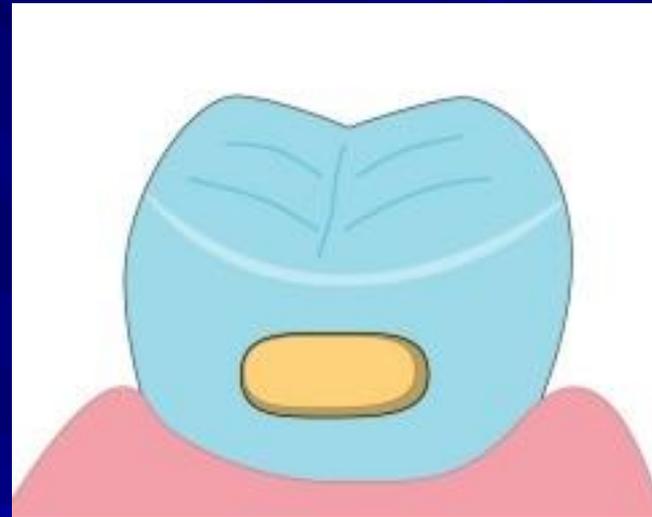
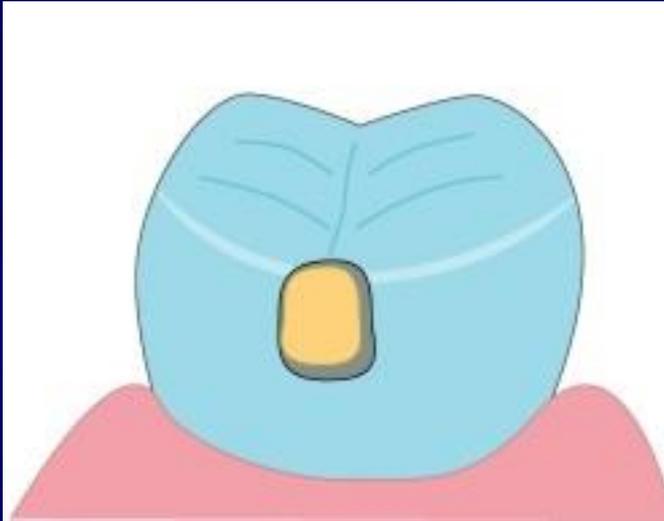


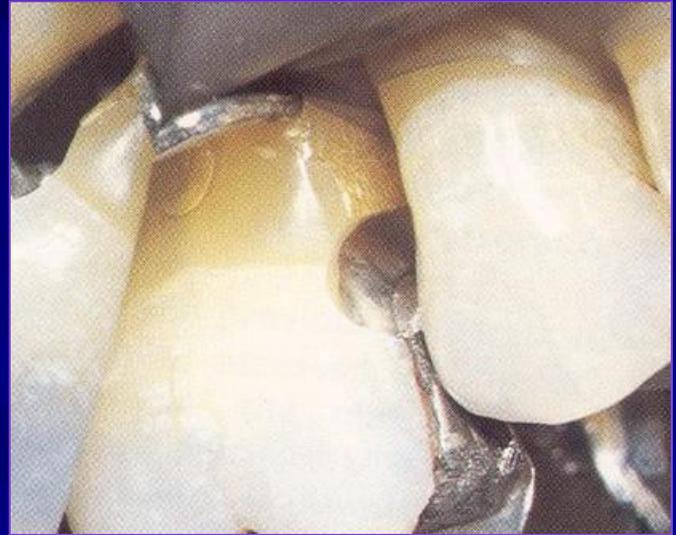






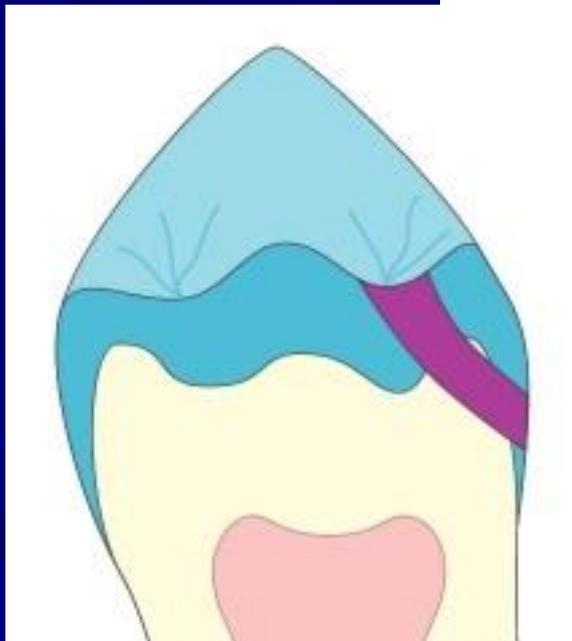
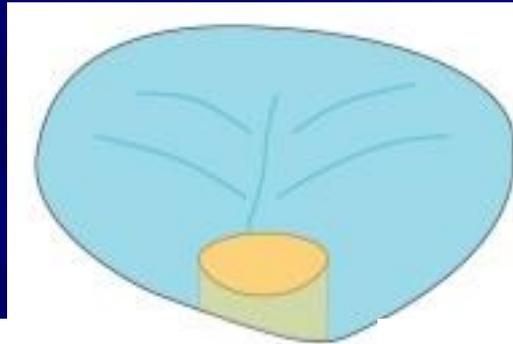
Alternative preparation - slot

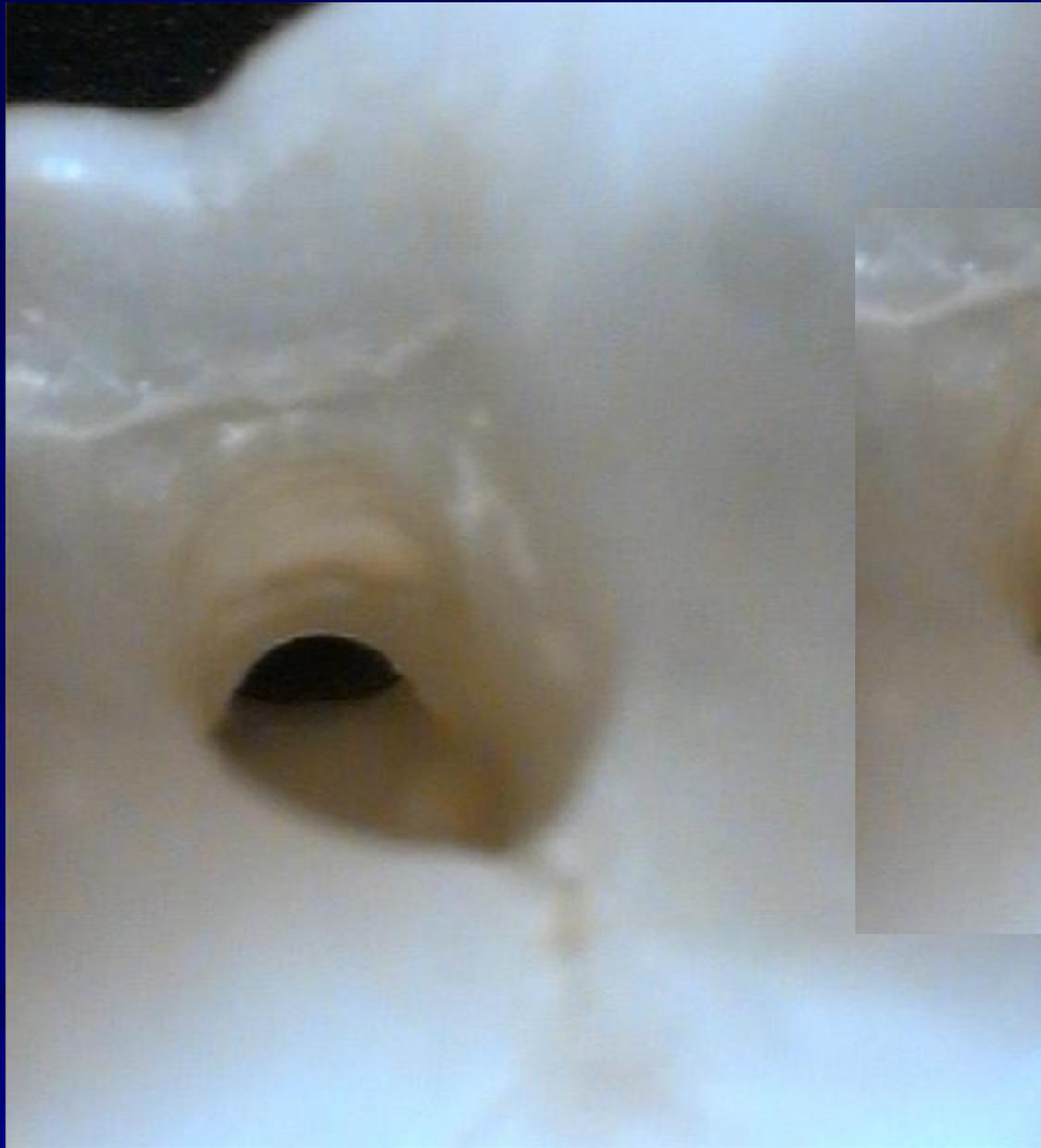


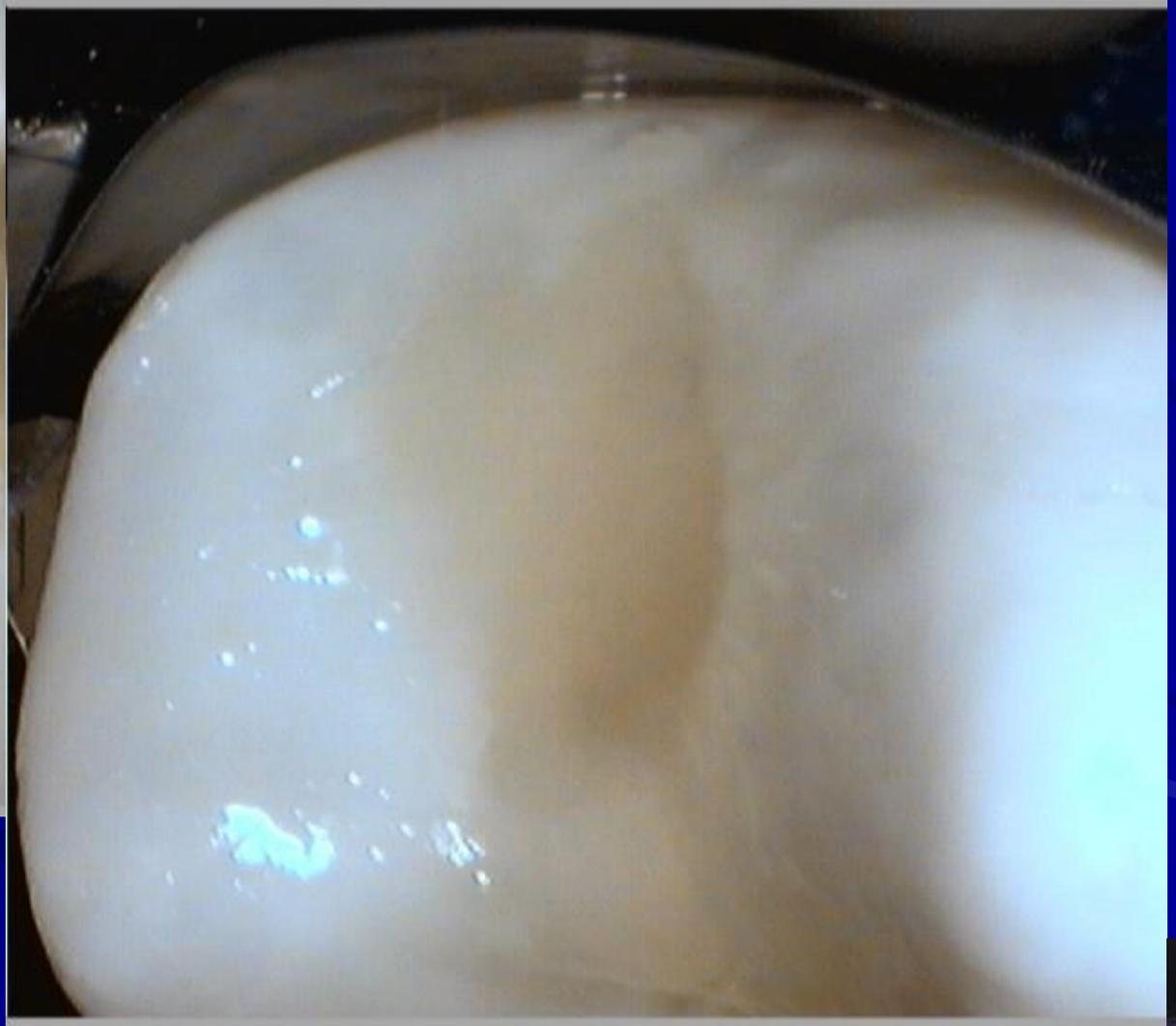




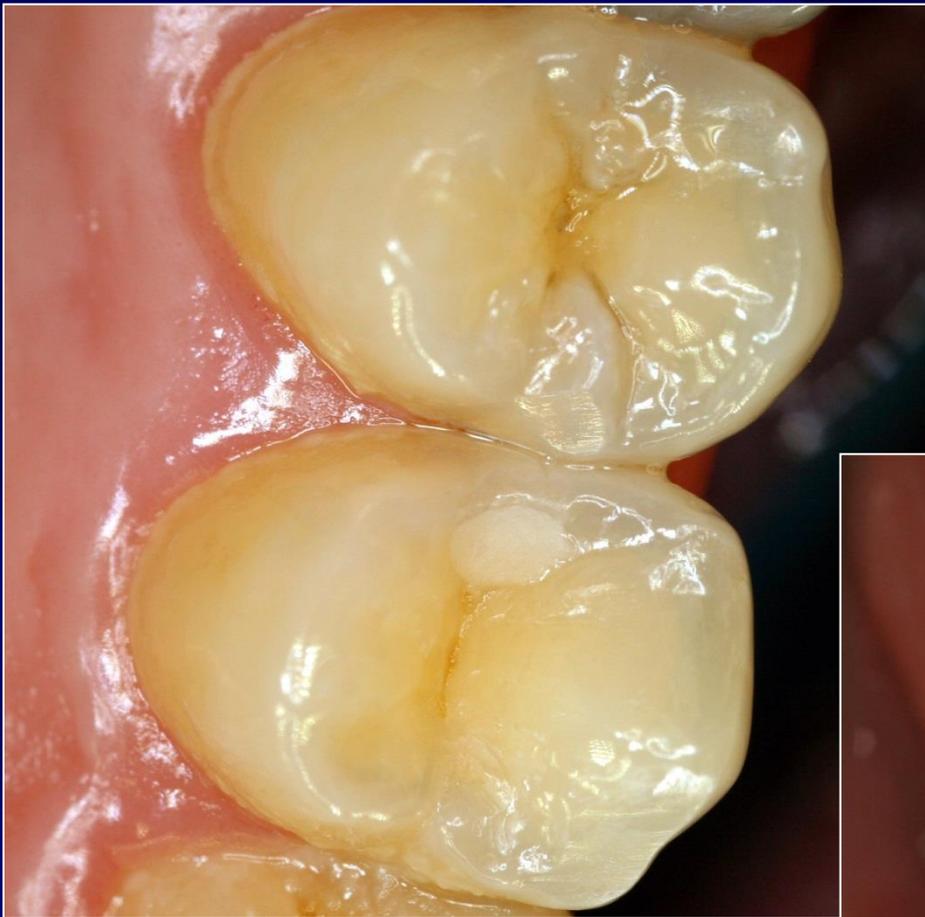
Tunnel preparation











Success?

1. Low caries risk
2. Proximal ridge without infracture
3. Good cooperation
4. D2



Success

1. Loups or microscope
2. Miniinstruments
3. Dezinfection
4. GIC in capsules
5. BW post op

