DEVELOPMENT IN PREPARATION-TECHNIC

Oscillating Instrument, Laser

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- The **preparation** (manual skill)
- The **shape of preparation** is defined by the education and literature with precise geometrical data. (knowledge)
- The **technic** is chosen by the dentist. (instruments)
- The **aim of the chosen technik** has to be always the same. (Aim)

THE AIM OF PREPARATIONSTECHNIC (KIMMEL)

- Careful workingmethod (atraumatic for tooth and soft tissue)
- Optimum result (the shape and the marginal seal of the cavity)
- Rational workingprocess (system, ergonomie, patient and dental-staff protection)

INSTRUMENTS AND EQUIPMENTS FOR TOOTH PREPARATION

Hand-instrument	Rotary instrument	**Oscillating Instrument**	**Laser**	Oson	Chemical mechani-cal caries removing
		EVA system (mechanical)			Caridex
		Ultrasonoab-rasive syst.			Carisolv
		Sonoabrasive			

PROBLEMS WITH ROTARY INSTRUMENTS

- Iatrogen damage of adjacent tooth (70-100%) (in proximal cavity)

- Shaping of gingival wall (for inlay or amalgam)
-Vestibular and oral walls, in proximal cavity.
(Metal and ceramic inlay, komposit filling.

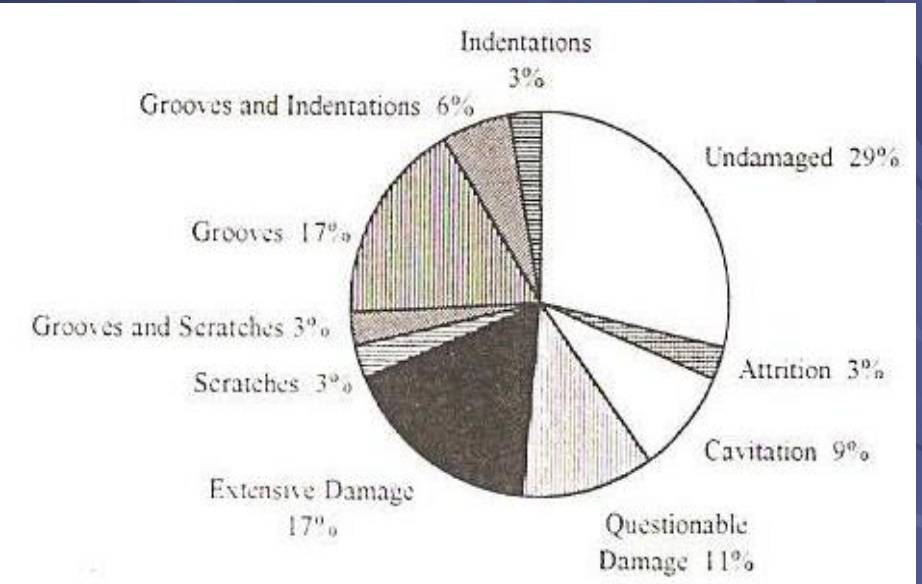
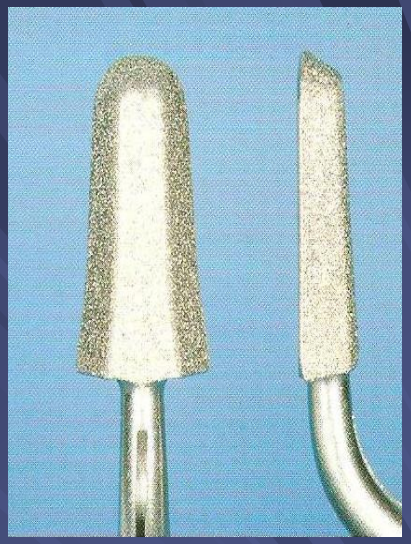


Fig. 2. Analysis of damage to 35 approximal surfaces adjacent to Class II restorations.

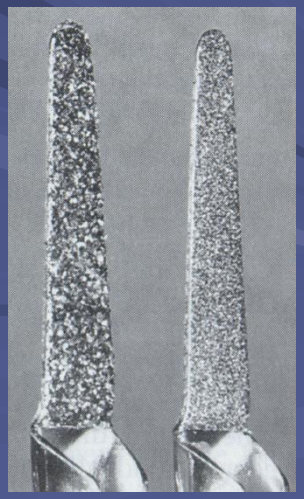
Oscillating instrument



- Basic principle:

They can transfere the shape of the working tip through an abrasive medium to the tooth surface.

Abrasive medium: in generally diamond



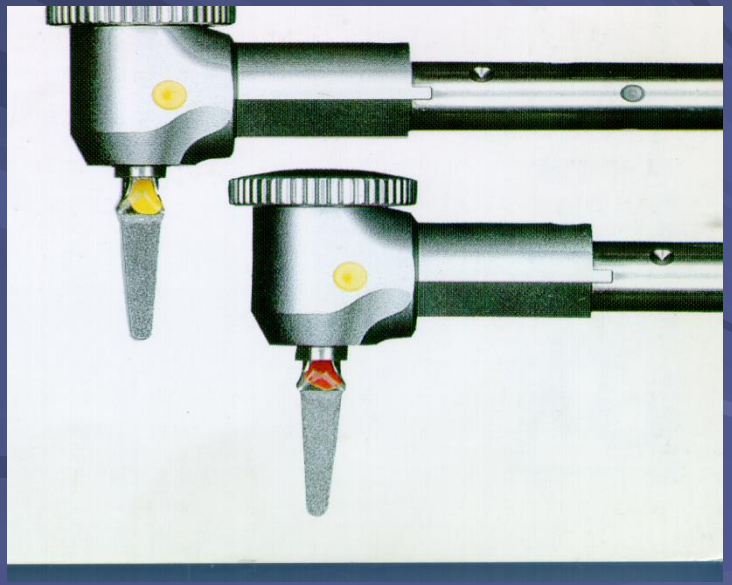
Oscillating instrument
EVA Mechanical system

- Micromotor + handpiece with a special head + special tip (file)

  (blue 20.000 min^{-1})

- The special head: converts the rotary movement to an up and down movement

  (file movement)

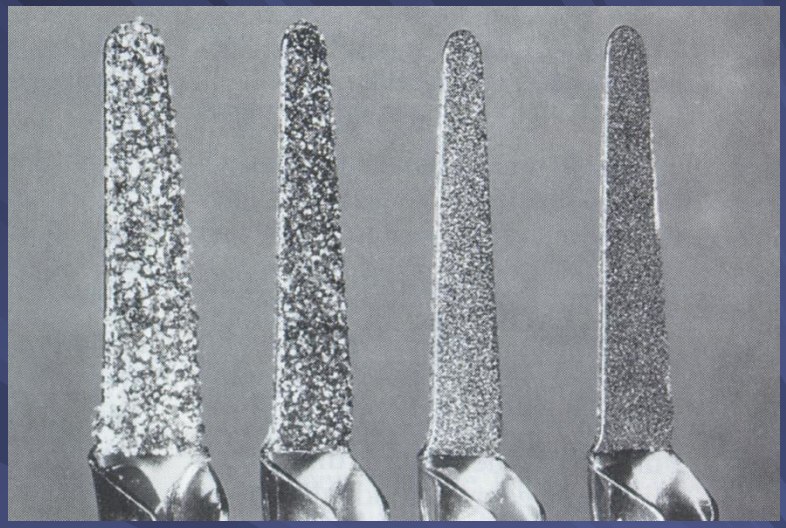


- Amplitude: 1,5 - 0,4 mm

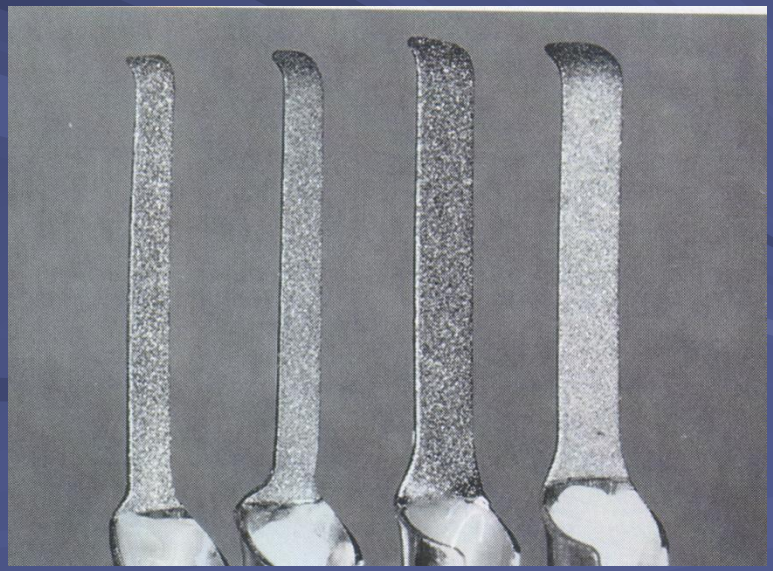
1971 Axelson (periodontologie)

EVA TIPS

Tips/Files:one side is with diamond-coated, the other one is smooth.



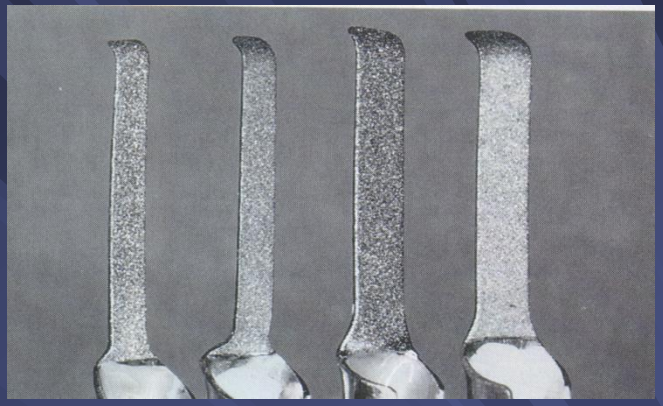
Therefore don’t hurt the surface of neighbouring tooth.



EVA TIPS

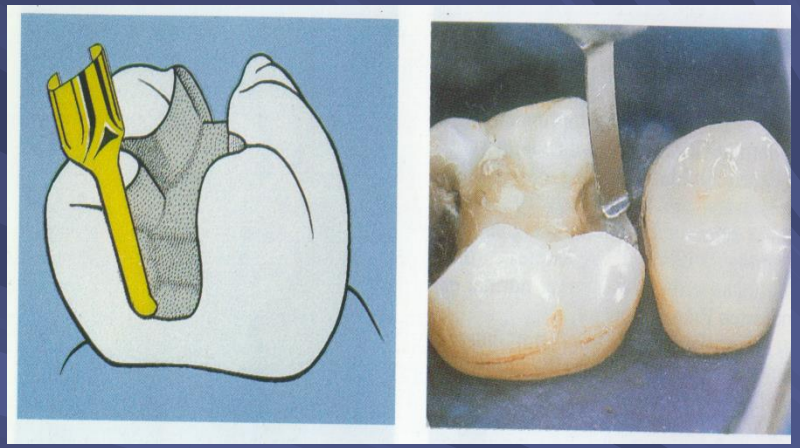
- **CAVISHAPE FILE**

  the distal end is curved.

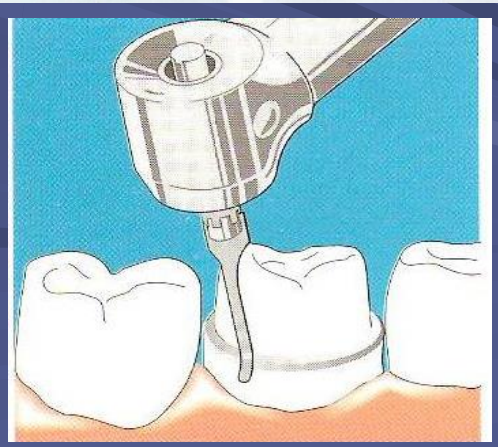


- **Application**:

  -finishing of lateral walls, and proximal curvature in box-cavities.

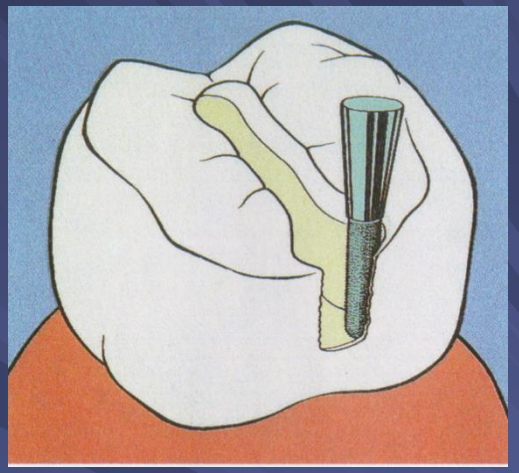


  -shoulder preparation



CAVISHAPE FILE

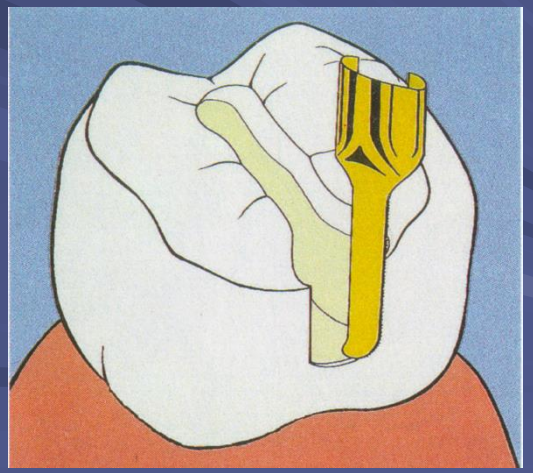
- In a small proximal cavity it is difficult to remove the enamel-lamellen, with rotary instruments .



- Cavishape feile make it possible :

  -to remove the enamel-lamellen and

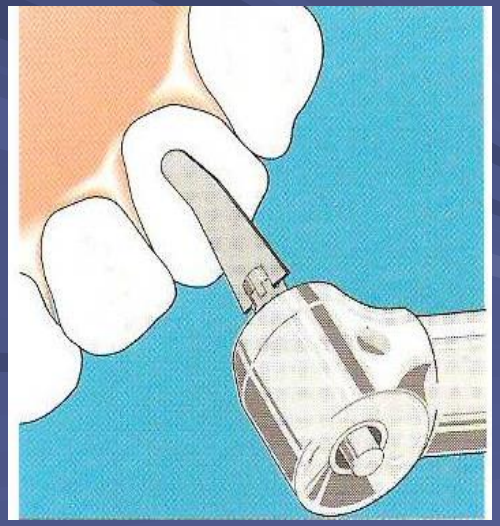
  -to finish the cavosurface margin without hurting the neighbouring tooth.



EVA TIPS

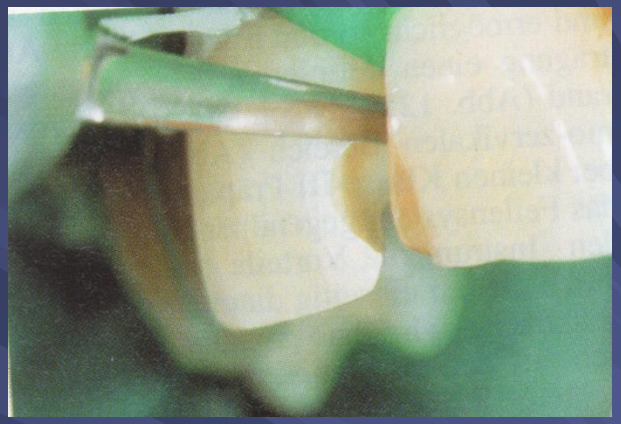
- **PROXOSHAPE FILE:**
  different diamond-grit
  the width: 0,5-1 mm

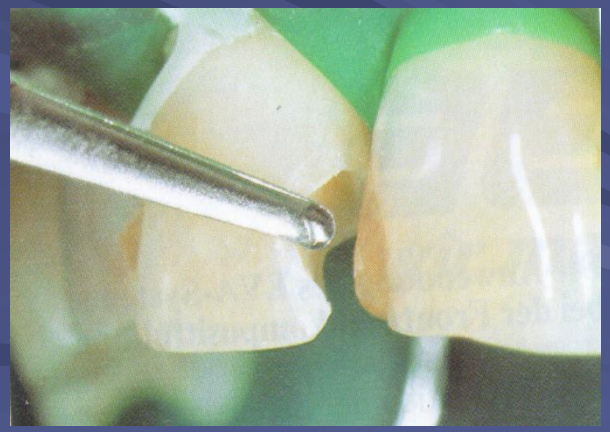
- **Application:**
  - finishing of the walls
  - removing excess material



EVA TIPS

- **BEVELSHAPE FILE :**
  has a three-dimensional shape. It shows an axial curvature, and the end is a halfball shaped. The curved surface is dia-mond coated, the conca-ve backside is smooth.

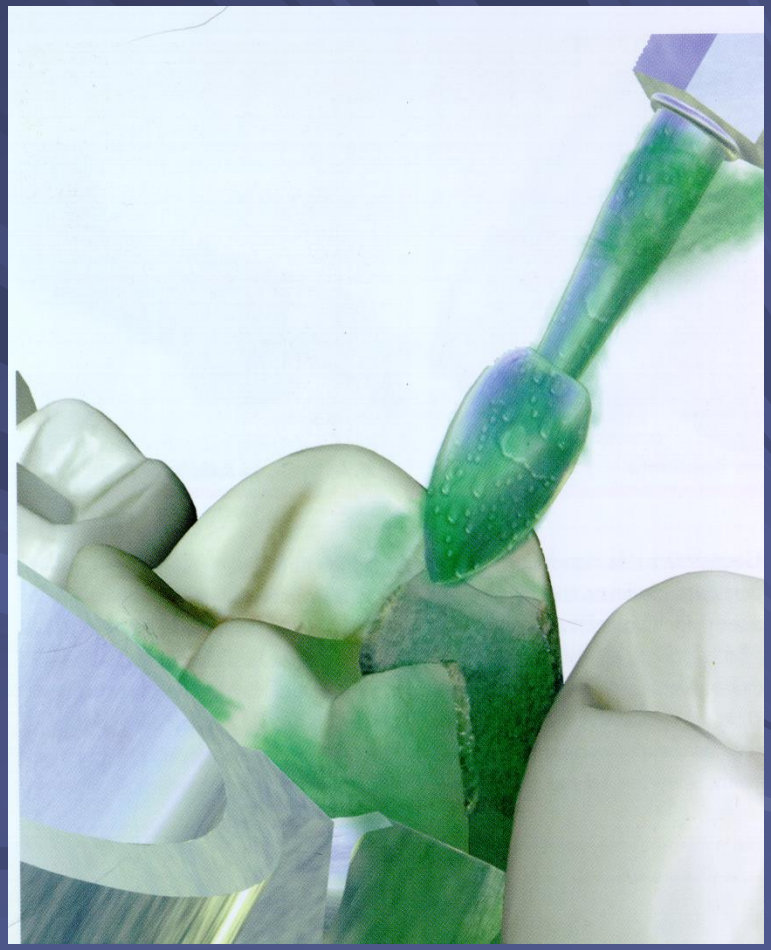




- **Application**: making beveling on proximal side

ULTRASONOABRASIVE SYSTEM

- Ultrasonic driving: 25 kHz
  Amplitudo: longitudinale
- **Application**: microinvasive preparation, and finishing the walls
- **Tip**: metal. The abrasiv is siliciumkarbid in watersuspension (50 μm)
  Diamond



SONOABRASIVE SYSTEM

- Pneumatic driving + airscaler + special tip

  Pneumatic driving: 6,5 kHz

- Amplitude:longitudinale and transversale

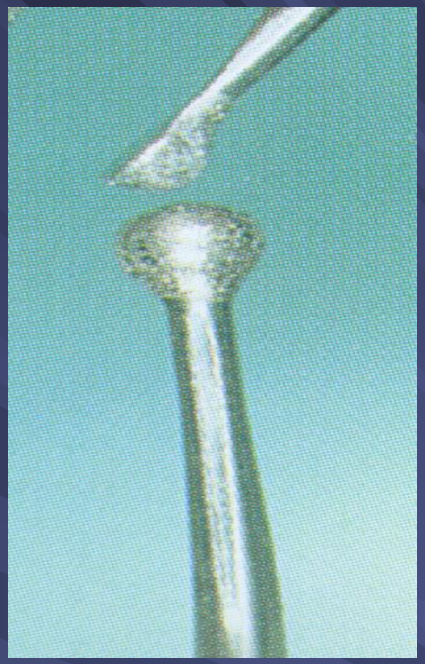
  therefore seems circular

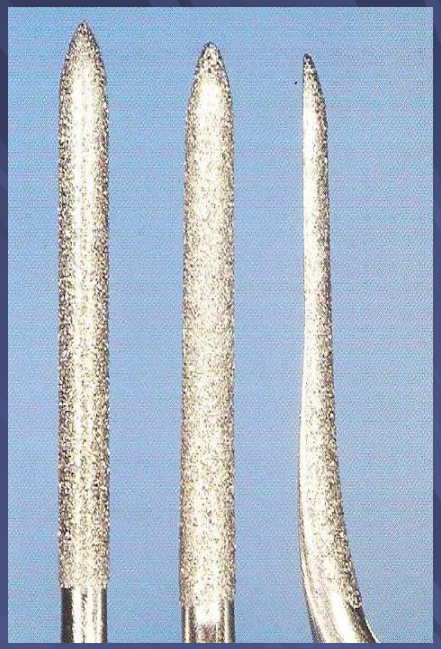
  (between 60 -1.000 µm)

  Watercooling: 15-30 ml/min

TIPS

- One surface of the tip's is with diamond-coated, and the other side is smooth.
- There are **tips (feile) for direkte restorations**: Sonicsys micro, Soniprep angle;…..
- There are **tips (feile) for indirekte restorations:** (Sonicsys approx, Sonicprep vario 45˚, 60˚



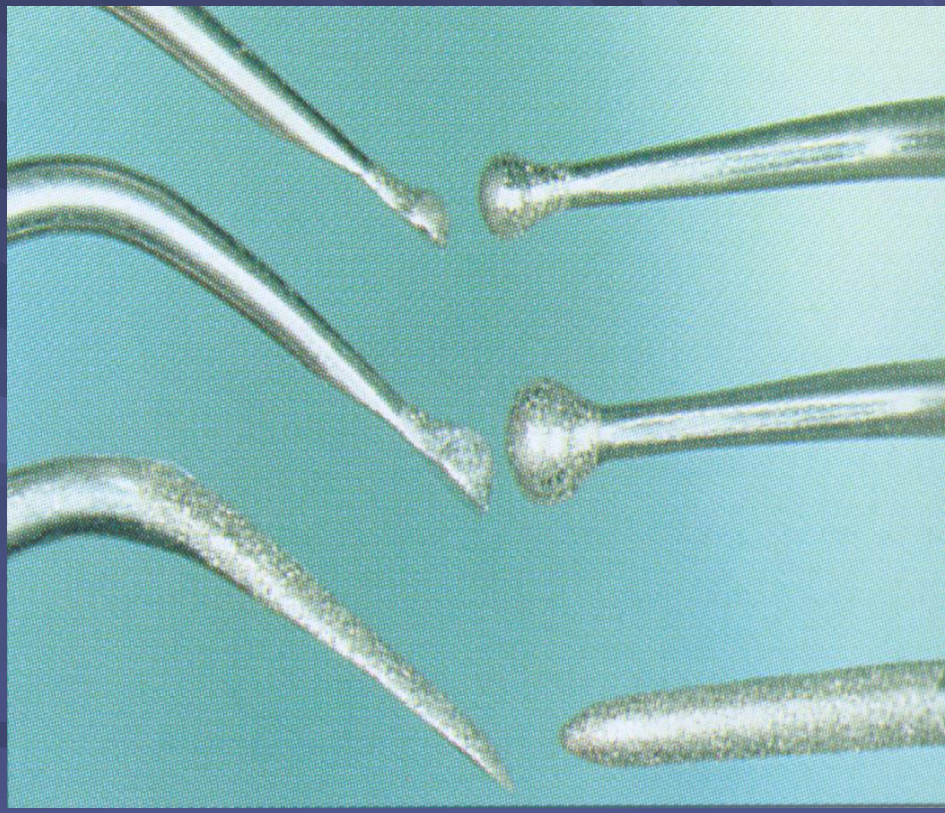


SONICSYS MICRO

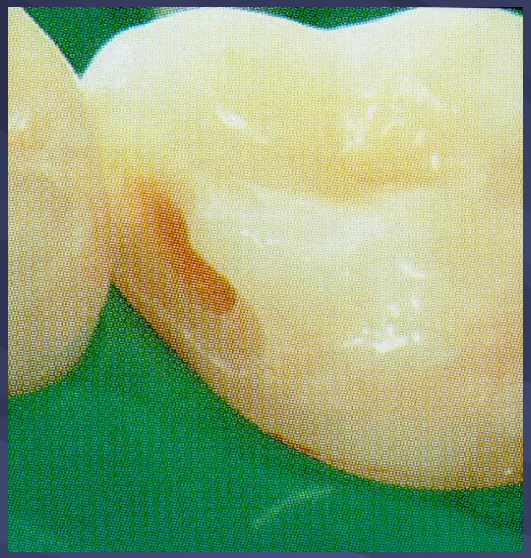
for direkte restorations:

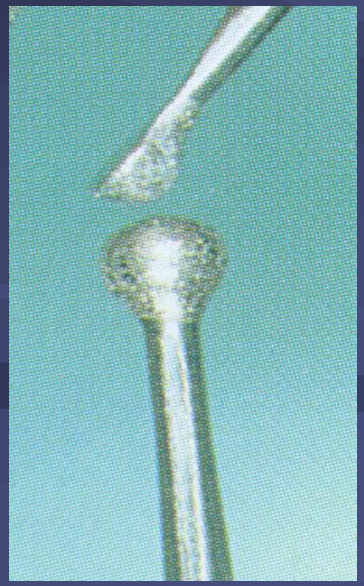
- Smaller and larger hemispherical shape
- Torpedo shape

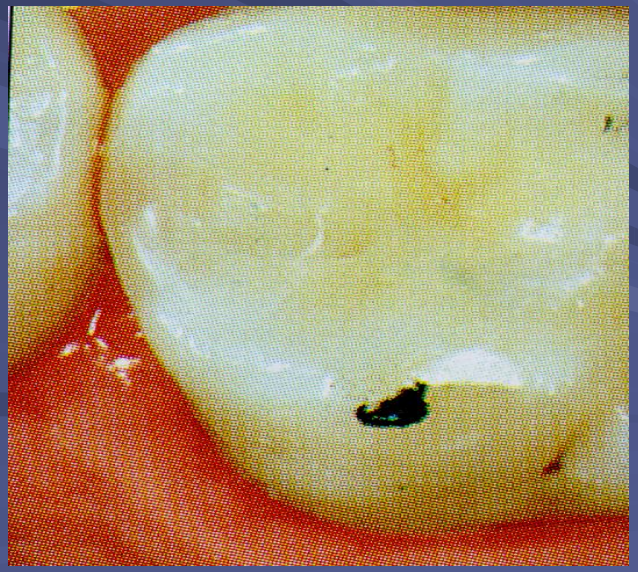
- It can be used for minimal invasiv prepa-ration and for making beveling.



Minimal-invasive Preparation with hemispherical tip

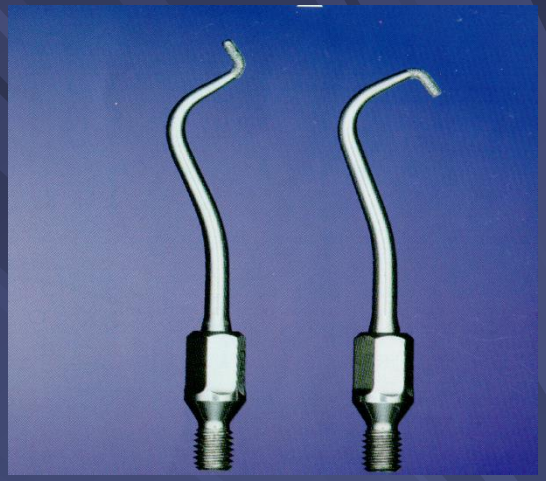




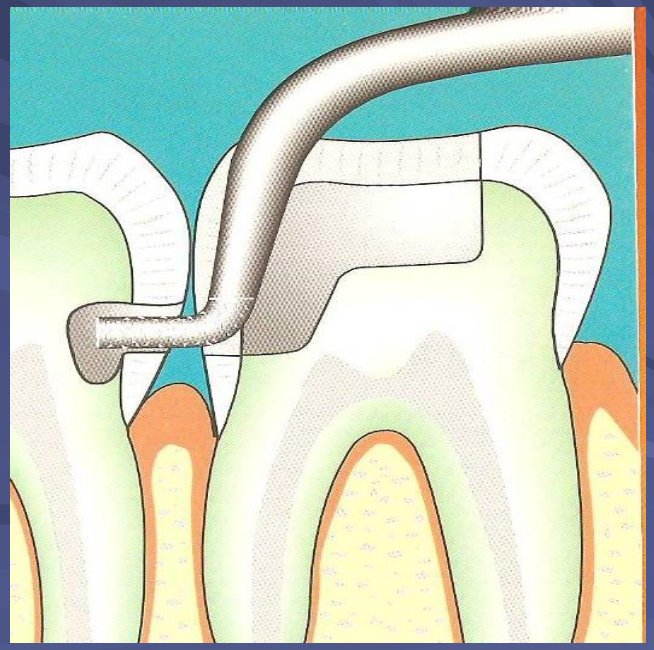


SONICprep(flex) ANGLE TIP

for direkte restorations:



- Tip: has a special curvature, and the frontal part of the tip has no diamond coating.



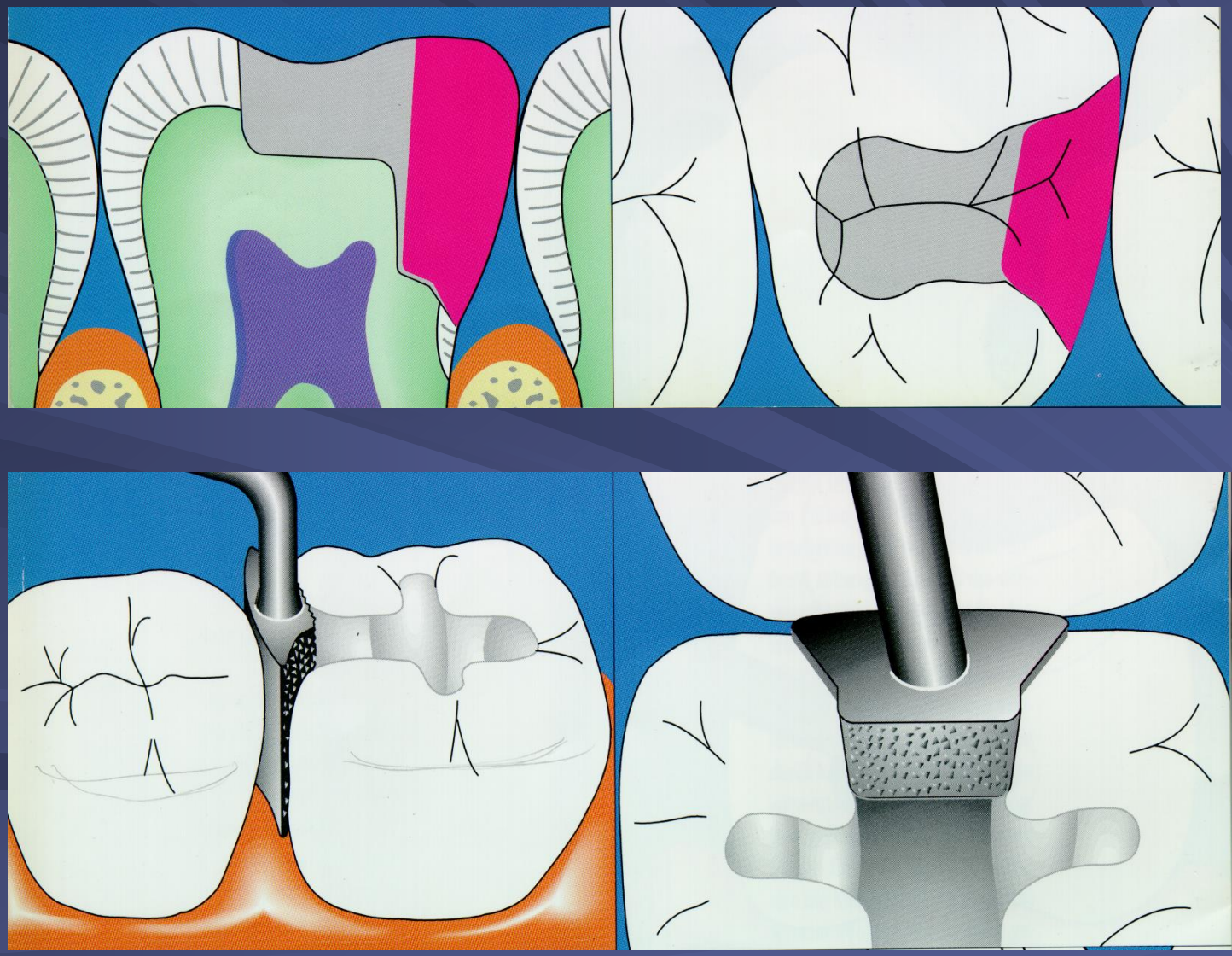
- Recommended:

for tunnel preparation

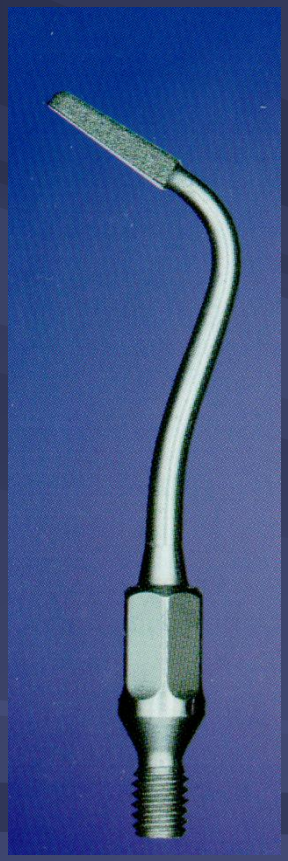
Tips (feile) for indirekte restorations:
SONICSYS APPROX

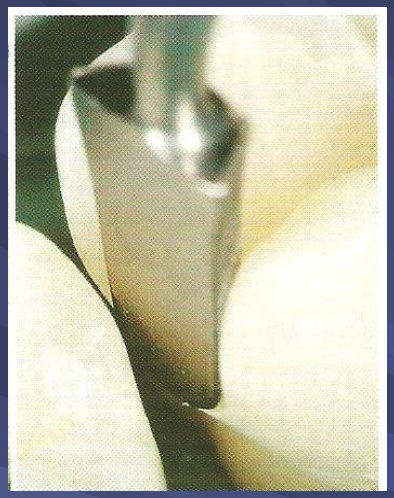
- 3 preparation tips, in different size (mes. and dist.)
- Prefabricated empress inlay in 3 different sizes
- The Divergence: 4˚

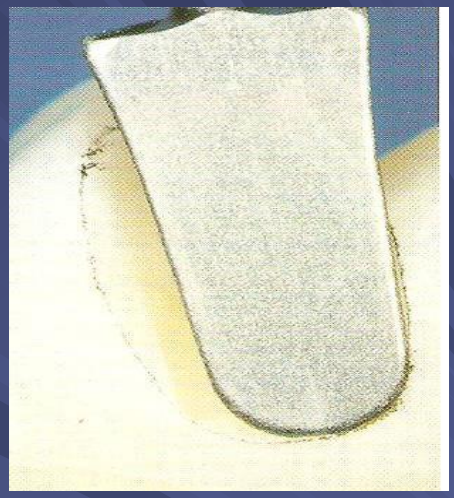
SONICSYS APPROX (Insert)



Different tips (feile)
for indirekt restorations: esthetics inlay
Sonicflex vario 60˚

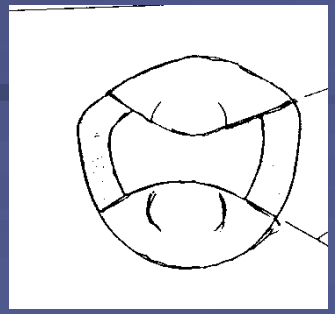






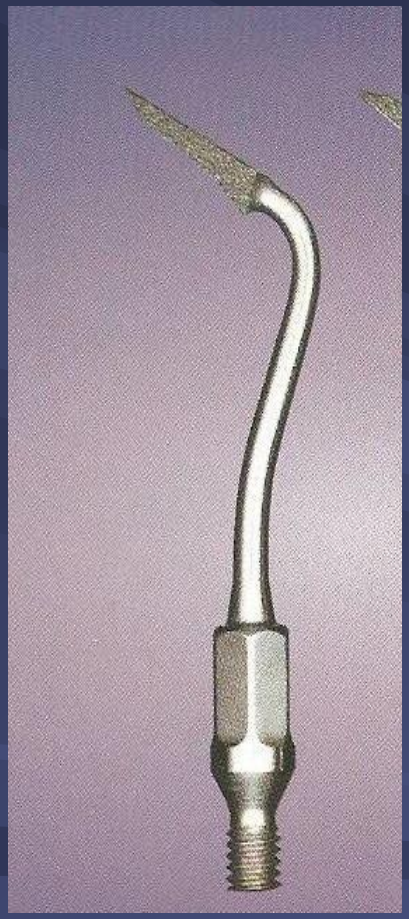
The proximale surfaces are prepared in 60° with the curvature.

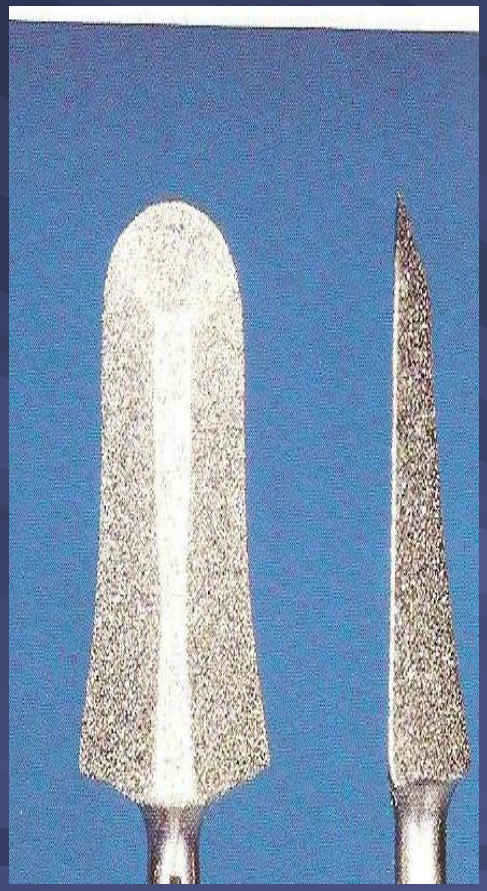
The laterale and gingivale surfaces are rounded.

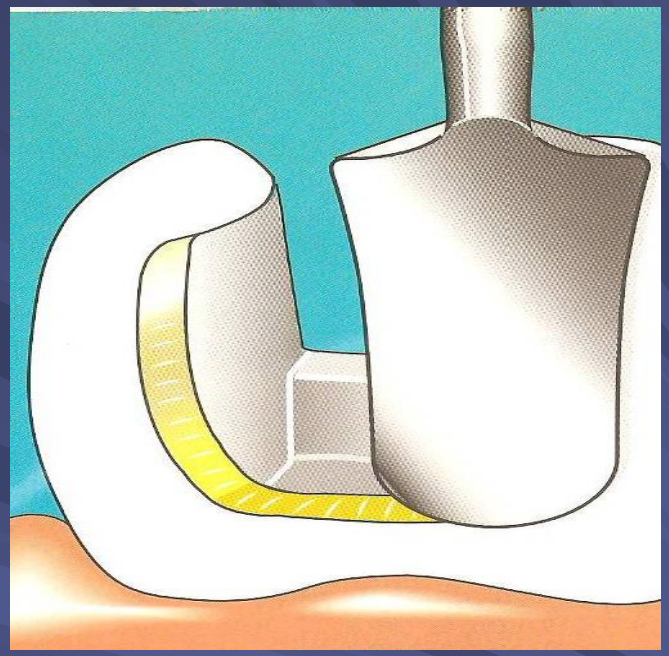


(KaVo)

Different tips (feile)
for indirekt restorations: metall inlay
Sonicflex vario 45˚







The gingivale part is 30°-degree, the proximale part is 45°-degree. The laterale and gingivale surfaces are rounded.

KaVo

SONIC PREP VARIO 45˚ 60˚

for gold inlay

for adhesive inlay

LASER TYPES BY SOURCE AND WAVELENGTH

Typ	Source	Wavelength	mode	output
Infrared	CO_2 CO_2 Nd:YAG Nd:YAG **E:YAG**	10,6 µm 10,6 µm 1,06 µm 1,06 µm **2,94 µm**	continuous pulsed continuous pulsed **pulsed**	1000 W 1000 mJp 100 W 1000 mJp **60-500mJp**
Visible	HeNE Argon	633 nm 514,488nm	continuous continuous	25 W 20 W

LASER: Light Amplification by Stimulated Emission of Radiation

Laser for removing caries

- **E:YAG laser** (1987 Ulm)

Pulsed laser 2,94 μm infrared

-Enamel preparation: no pulp reaction (120 mJ)

-Dentin preparation: local pulp reaction (50-60mJ) produce no smear layer

Adventages: no pain, no anaesthesia, no pressure, vibration and drilling noise

Disadventage: longer treatment time, undercuts eye –glasses; pilot beam;

LASER IN CARIES DIAGNOSTIC

- Wavelength: 650 nm (visible)
- Difference in fluorescence are measured.
- DIAGNOdent
- DIAGNOcam

Ozon

- Ozon removes the bacteria.
- Ozon is produced from pure oxygen, passing through a high voltage gradient (5-13 Megavolts).

$$3O_2 + 68{,}4\ \text{cal} = 2\ O_3$$

Ozon is the third most potent oxidant after the fluorine and persulphate.

Chemomechanical caries removal (CMCR) +

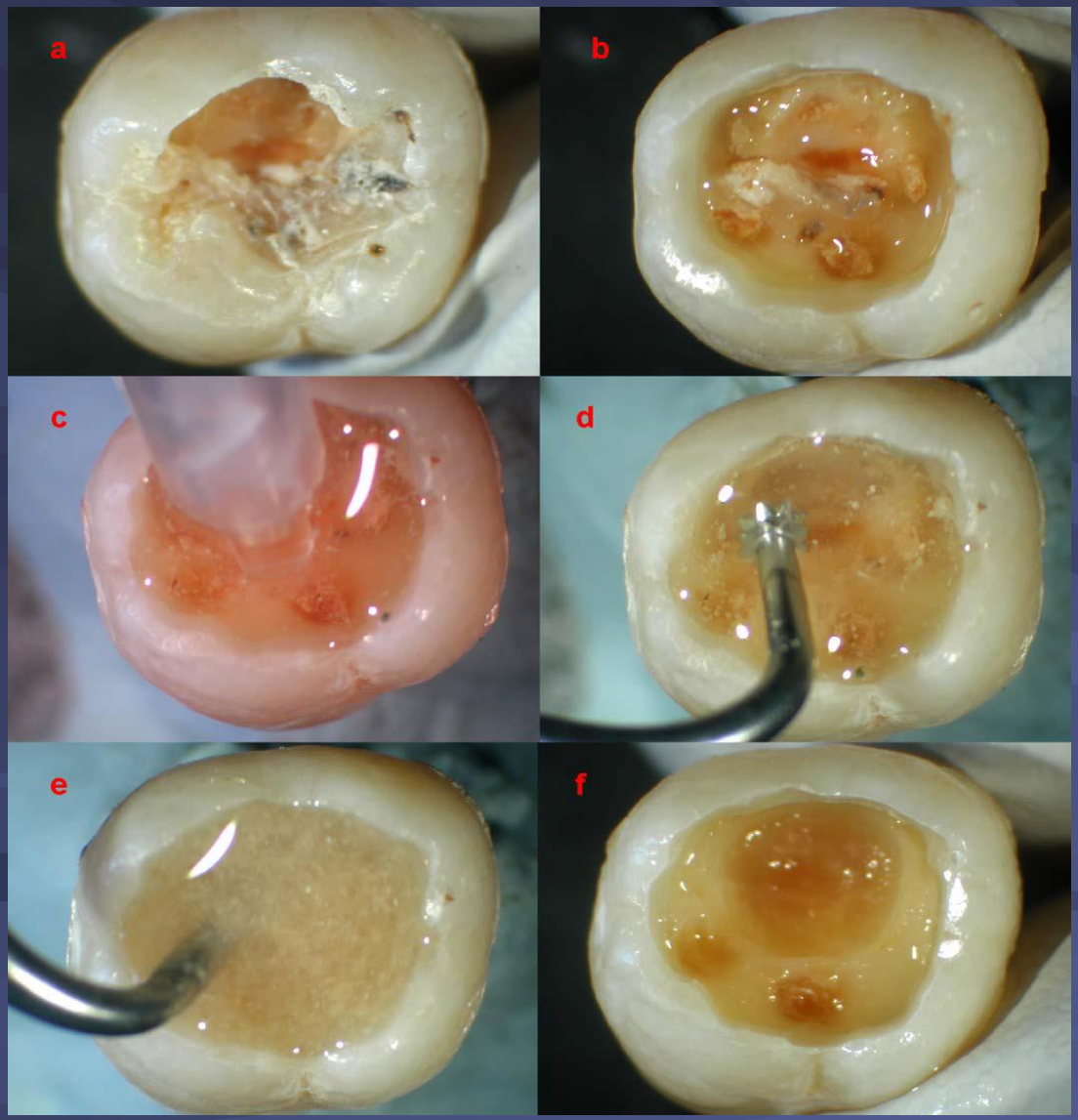
- It involves the selective removal of soft carious dentine (outer, infected layer).

- The reagent: (pH 12)
- 3 amino-acids (lysin, leucin, glutamin)+ sodium hidrochlorite (Na0Cl)

  (Caridex solution, Carisolv gel (1 ml))

  Handinstrument

Caries removal using chemo-mechanical CarisolvTM gel.



- (a) The original occlusally cavitated carious lesion in a mandibular molar.
- (b) The full extent of the carious dentine and sound margin exposed after enamel removal.
- (c) Clear gel applied and left for 40 s before
- (d) agitation against the dentine using a mace-tip abrasive hand instrument.
- (e) Turbidity of the gel prior to rinsing and
- (f) the final excavation when no further caries is dissolved by the gel, leaving affected dentine.

Air Abrasion

- Disadvantage**:** no or little tactile sensation eye protection!
- Adventage: no or less pain

Aluminium oxid partikel : different size

powder 25-50µm

in suspension