

Preparation of cavities – basic rules

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Preparation of dental caries (cavity preparation)

- Instrumental treatment that removes dental caries
- The rest of the tooth must be restorable with filling materials
- The rest of the tooth as well as the filling must be resistant against occlusal forces
- The risk of secondary caries must be minimized

Basic rules

Access to the cavity

Preparation of cavity borders and extention
for prevention - outlines

Retention for the filling

Resistance of the restored tooth as well as the
restoration (filling)

Excavation of carious dentin

Finishing of the walls

Final control

Basic rules

Access to the cavity

Preparation through the hard dental tissues

Removing of the undermined enamel
(enamel that is not supported with dentin)

Separation of teeth (wooden wedges)

Separation or removing of gingiva (with
temporary filling or surgical)

Basic rules

Preparation of cavity borders and extention
for prevention

Depends on

Dental material

Oral hygiene

Precautions of secondary caries

Basic rules

Retention of the filling

Precautions of its lost

Macromechanical retention

Micromechanical retention

Chemical retention

Basic rules

Resistance of the restored tooth

Against occlusal and other forces

Depends on

- *Material*
- *Individual occlusal forces*

Basic rules

Excavation of carious dentin

Necessary (risk of recurrent caries)

Ball shaped (spheric) bur - slow speed (3000 rpm)

or

Excavator

Basic rules

Finishing of the walls

Depends on the kind of material

- *Bevel or without bevel*
- *Fine diamond bur*

Basic rules

Final control

Direct or indirect view

Good illumination

Magnification

Preparation

- Hand

Excavator, cleaver

- Power driven

Burs, diamonds

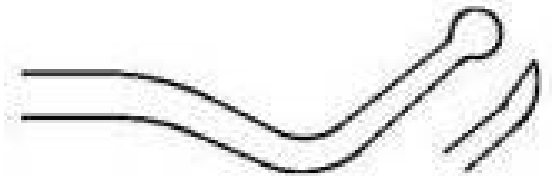
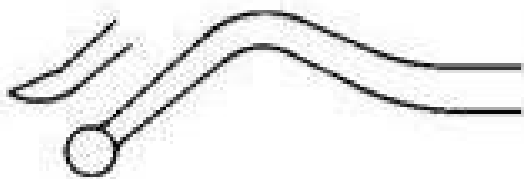
Chisel – for enamel Cleaver



Chisel for enamel



Excavator



Instruments for cavity preparation

Power driven (powered) instruments for cutting

- Rotary instruments

Comon design characteristics



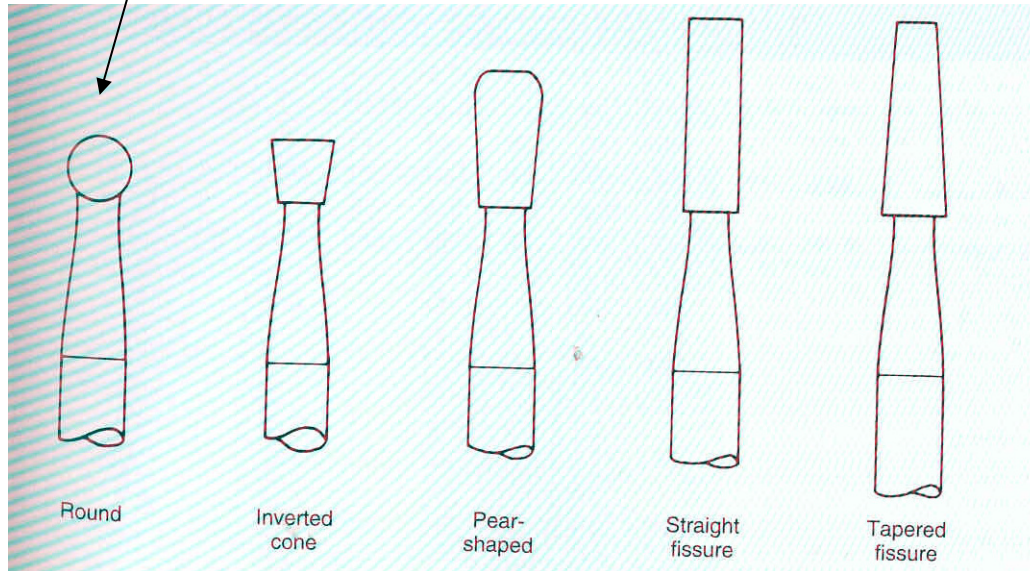
Cutting instruments - burs

Steel

Tungsten carbide

Cutting instruments – burs head shapes

Round (ball shaped)

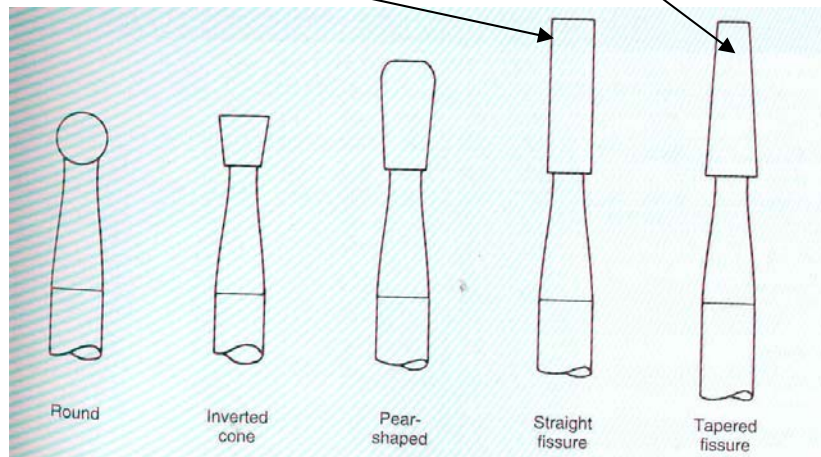


Cutting instruments – burs head shapes

Fissure with flat end

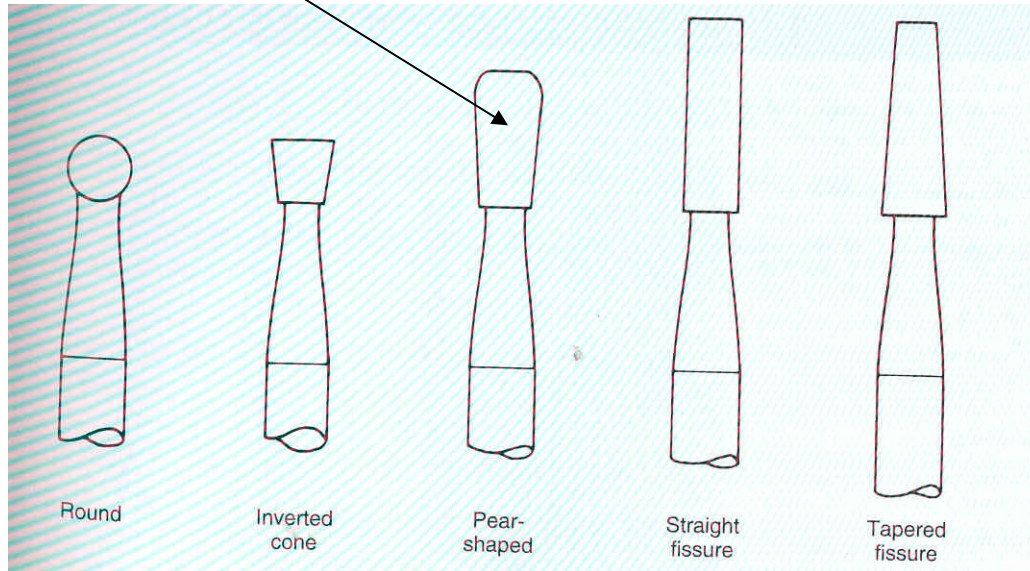
Fissure with pointed end

Straight or tapered form



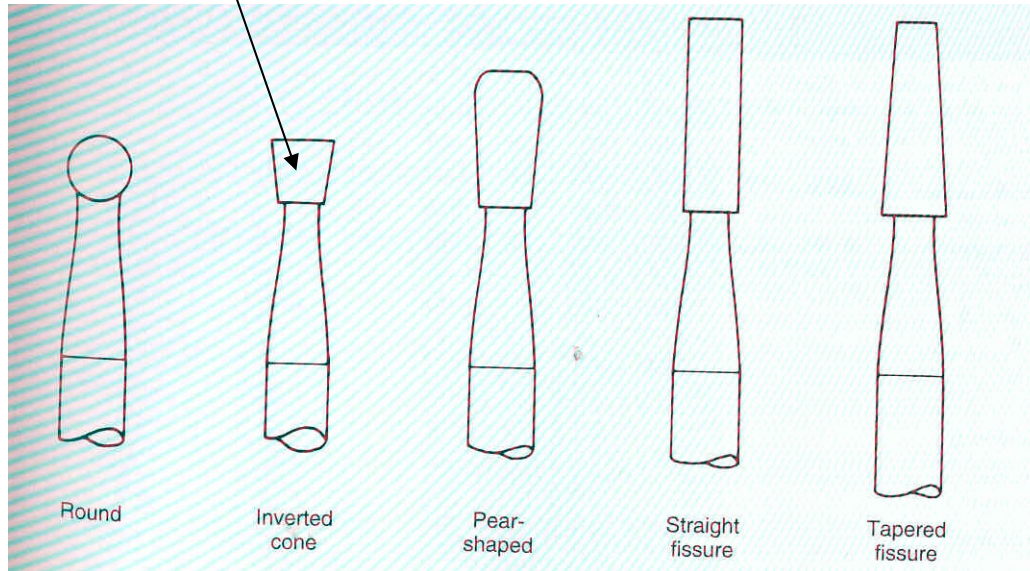
Cutting instruments – burs head shapes

Pear



Cutting instruments – burs head shapes

Inverted conus



Cutting instruments – diamonds

Extra coarse – black

Coarse – green

Standard – blue or without any marker

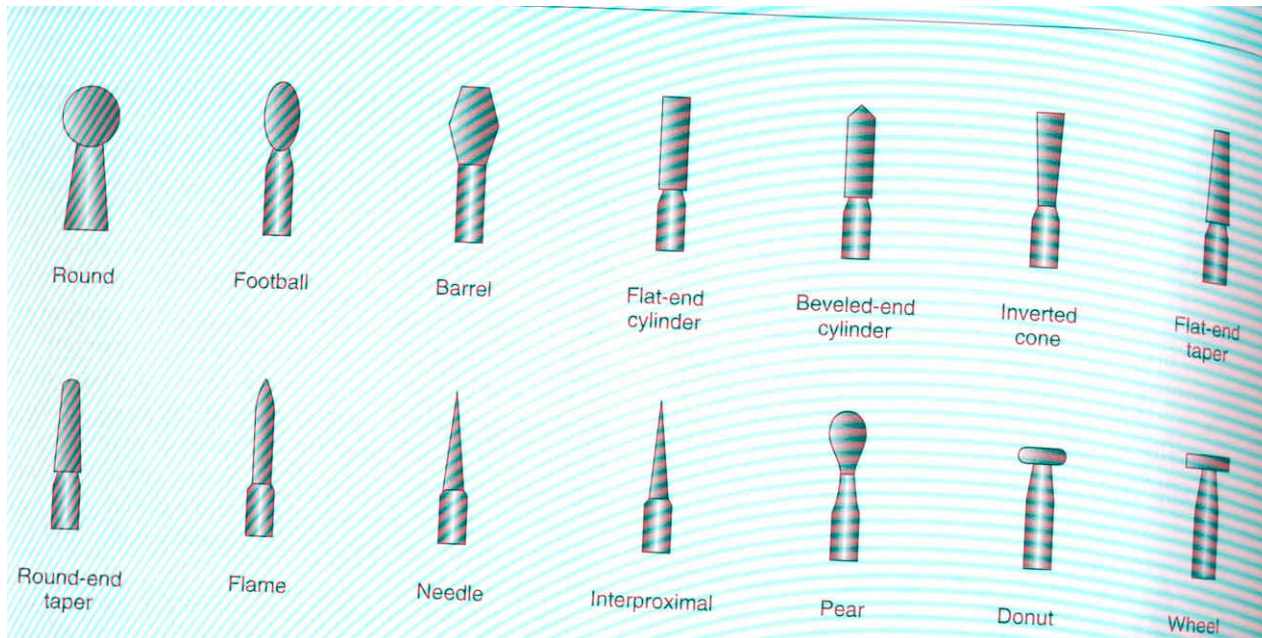
Fine - red

Extra fine - yellow

Ultrafine - white

Cutting instruments – diamonds head shape

- Ball, pear, cylinder,taper,flame, torpedo, lens and others.....



Hazards with cutting instruments

Pulpal precautions

Soft tissue precautions

Eye precautions

Ear precautions

Inhalation precautions

Filling materials

- Temporary
- Definitive, permanent

Temporary filling materials

- Zinkoxidsulphate cement and one component derivatives
- Zinkoxidphosphate cement
- Zinkoxideugenol cement
- Polymer based materials
- Guttapercha

Permanent filling materials

Amalgam

Composites

Glasionomers

Amalgam

L. Roubalíková

Amalgam

Metal-like restorative material composed of silver-tin-copper alloy and mercury.

Types of amalgam restorative materials

Low – Copper Amalgam (5% or less copper)

Composition – wt%

Silver	63 - 70 %
Tin	26 – 28 %
Copper	2 - 5%
Zinc	0 - 2%

Types of amalgam restorative materials

High – Copper Amalgam (13% - 30%)

copper

Composition – wt%

Silver	40 - 70 %
Tin	26 – 30 %
Copper	2 - 30%
Zinc	0 - 2%

Particles of the alloy

- ✓ Irregularly shaped (filings - lathe cut)
- ✓ Microspheres
- ✓ Combination of the two.

Particles shape

High – Copper Amalgam

Microspheres of the same composition
(unicompositional)

Mixture of irregular and spherical particles of
different or the same composition (admixed)

Production of irregular particles

Metal ingredients heated, protected from oxidation, melted and poured into a mold to form an ingot.

Phases of the alloy:



Production of irregular particles

cooled slowly

Ingot heated at 400°C (6 – 8 hours)
(homogeneous distribution of Ag₃Sn)

Ingot cut on the lathe, particles passed through a fine sieve and ball milled to form the proper particle size.

Aging of particles (60 - 100°C, 6 – 8 hours)

Particle size: 60 – 120 μm in length

10 – 70 μm in width

10 – 35 μm in thickness

Production of irregular particles

Molten alloy is spraying into water under high pressure



Irregularly shaped high-copper particles

Production of spherical particles

Molten alloy is spraying under high pressure of inert gas through a fine crack in a crucible into a large chamber

Diameter of the spheres: 2 – 43 μ m

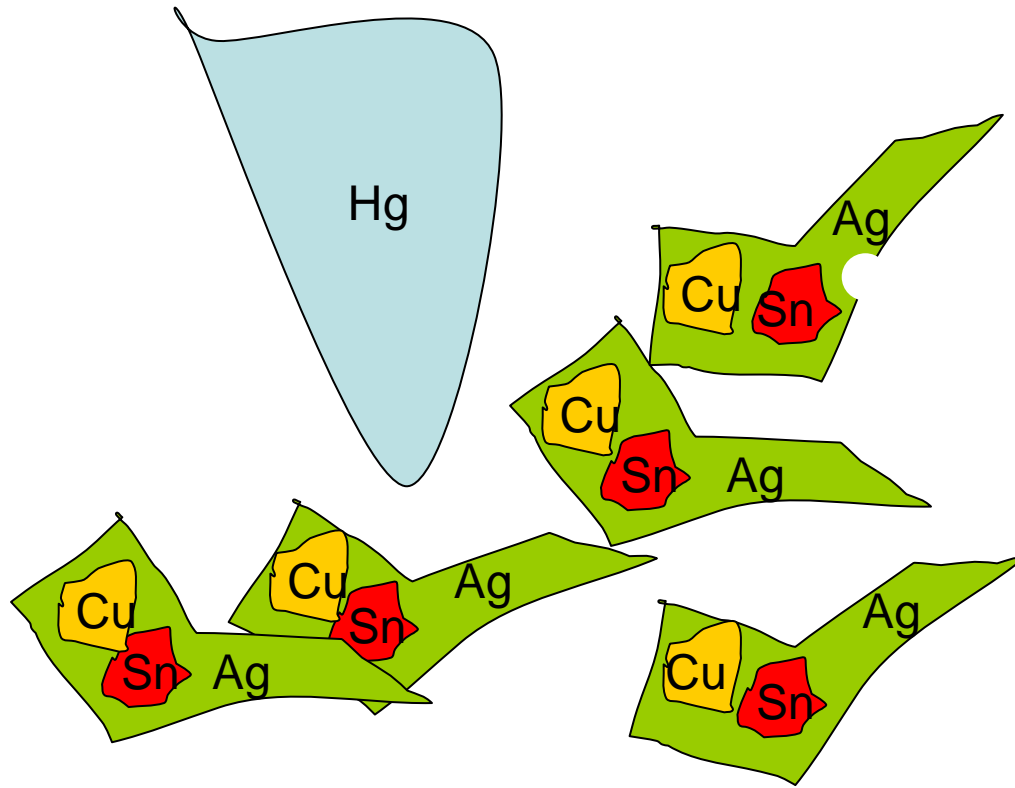
Amalgamation processes

alloy is mixed with pure mercury

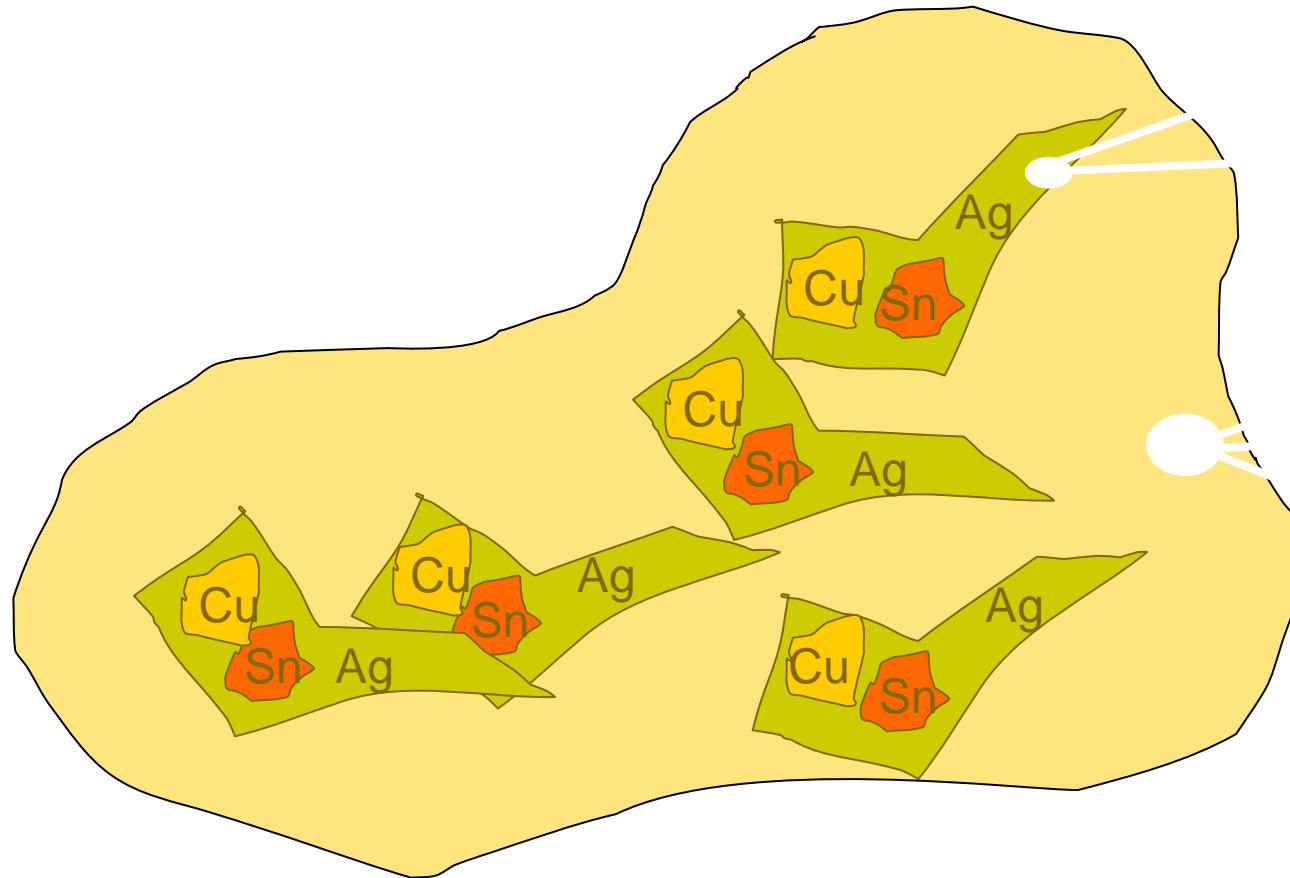


Trituration

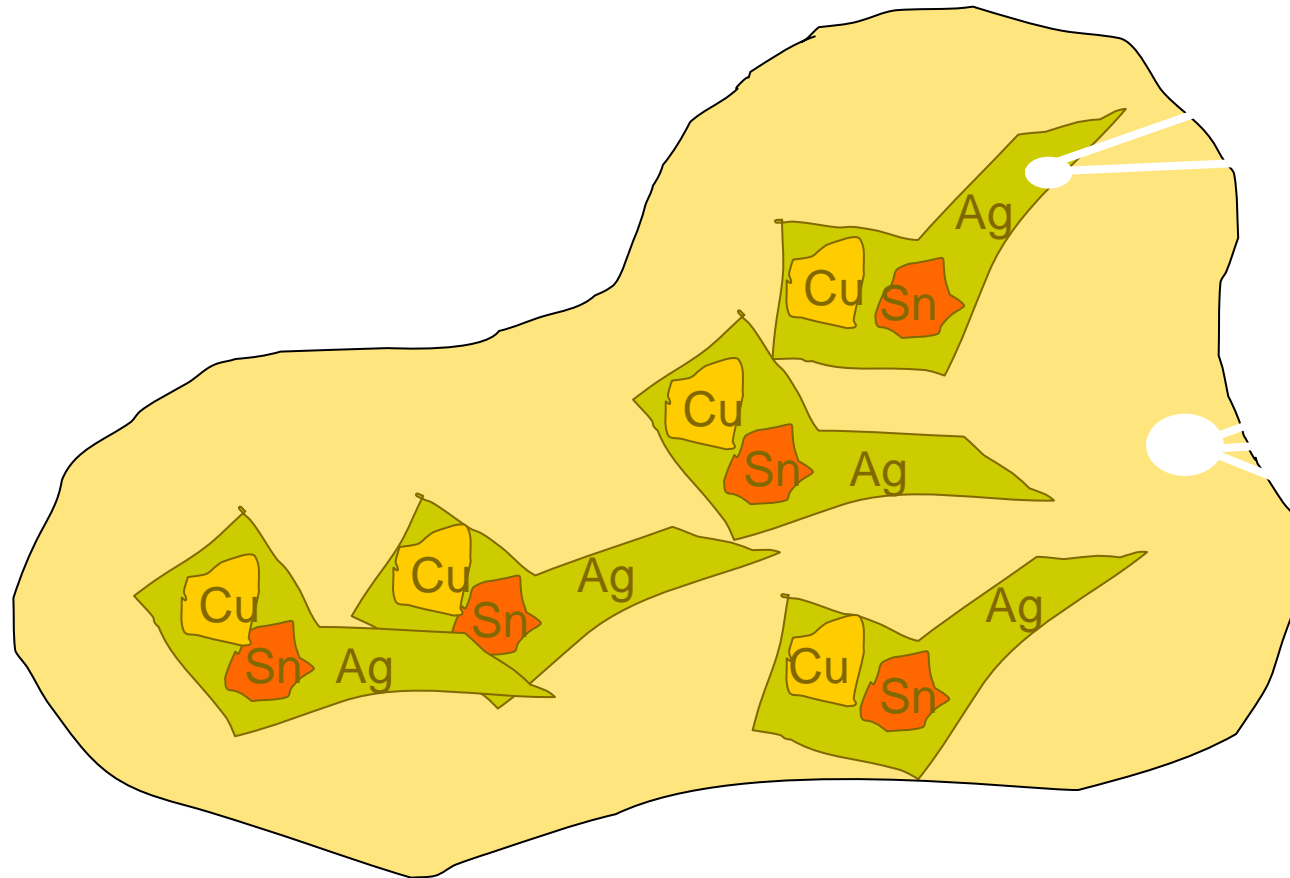
Amalgamation processes



Amalgamation processes



Amalgamation processes



Amalgam - properties

Amalgam

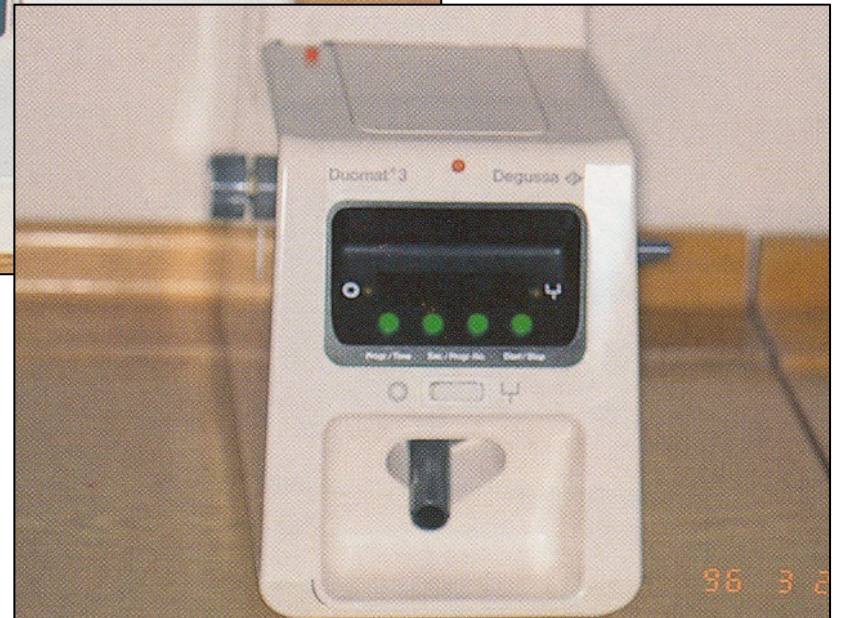
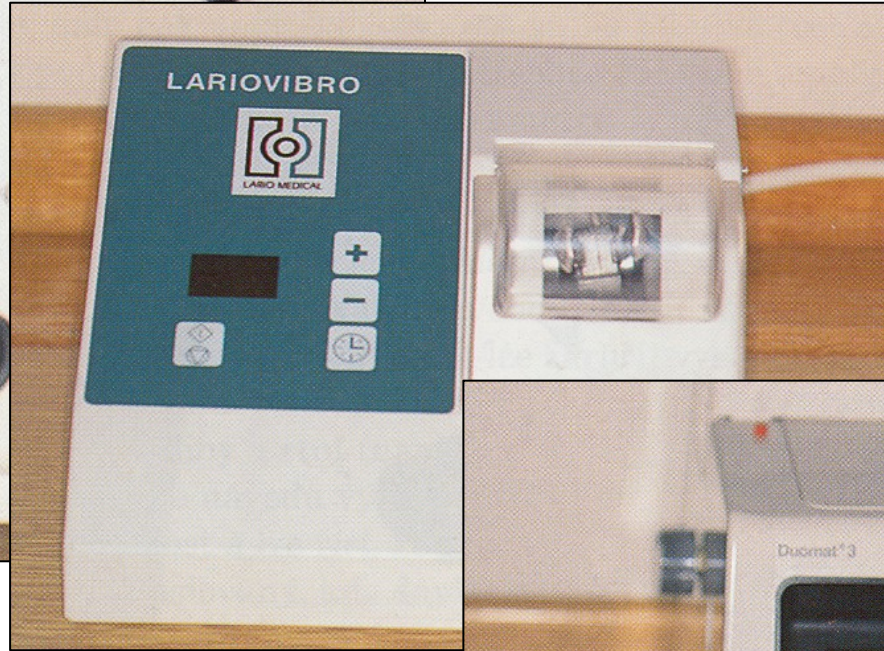
- **Wear and pressure resistance (2mm thickness at least)**
- **Easy handling**
- **Thermal and electrical conductivity**
- **Corrosion**
- **Bad aesthetics**

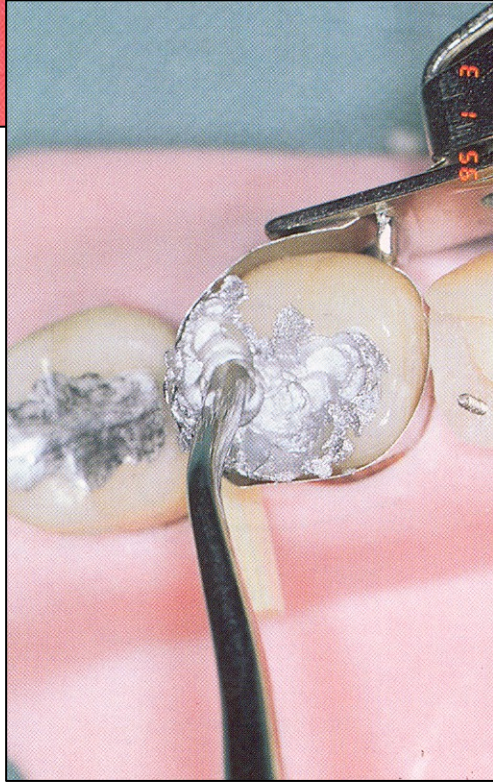
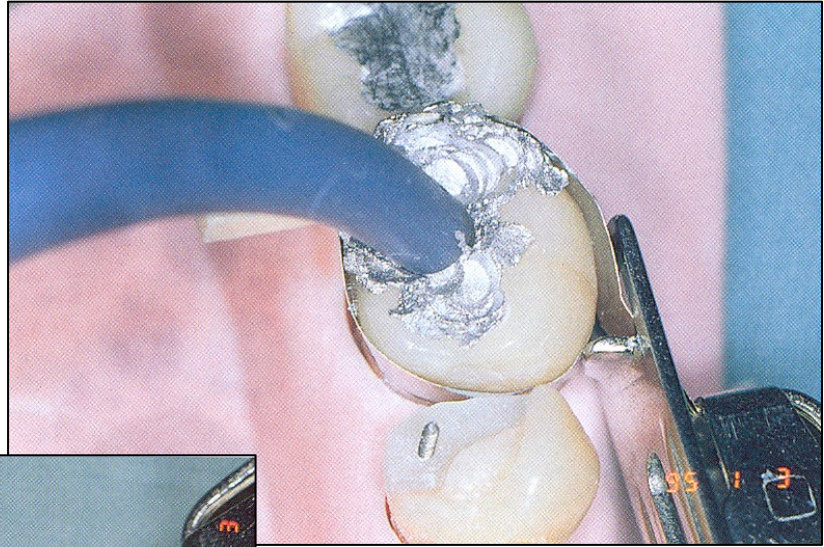
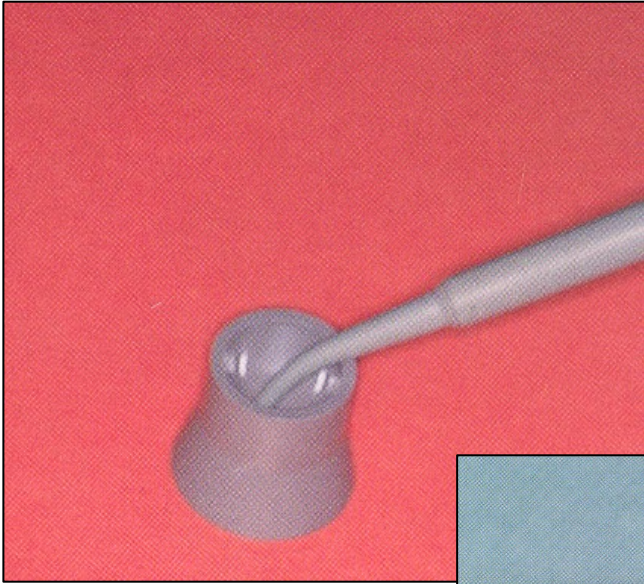
Trituration

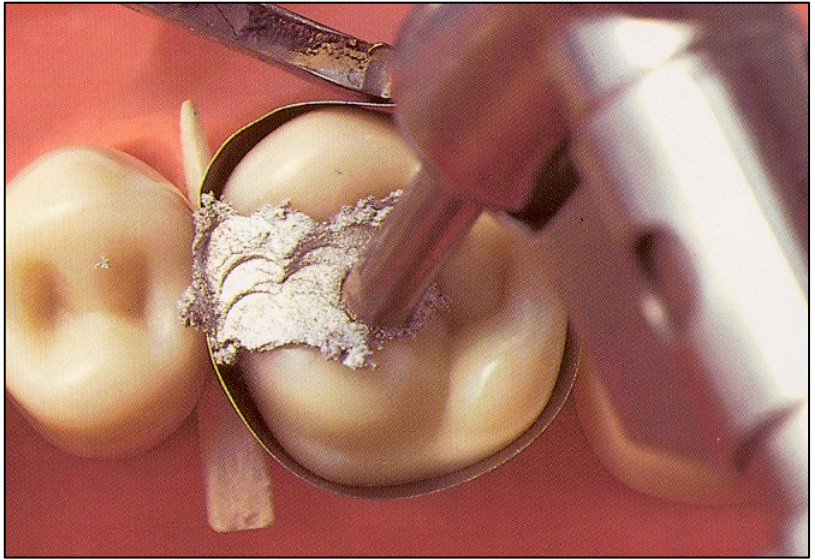
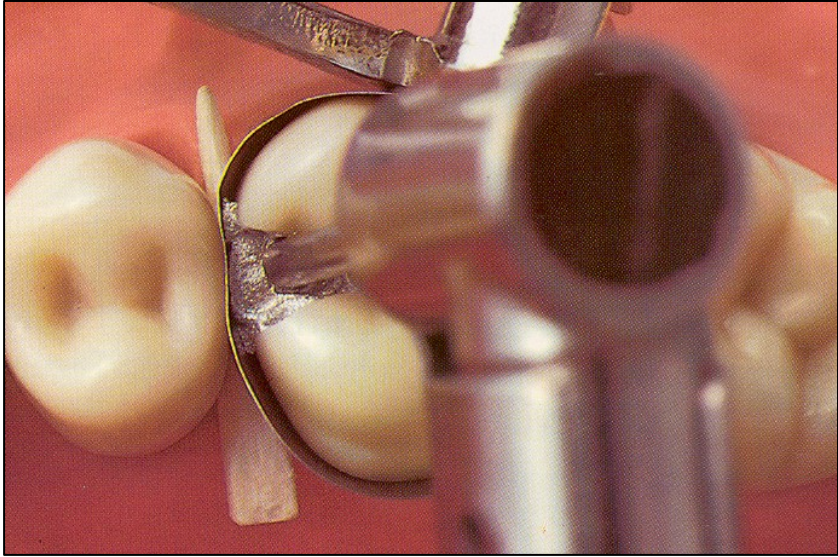
- **Hand mixing (obsolete)**
- **Power driven trituration**

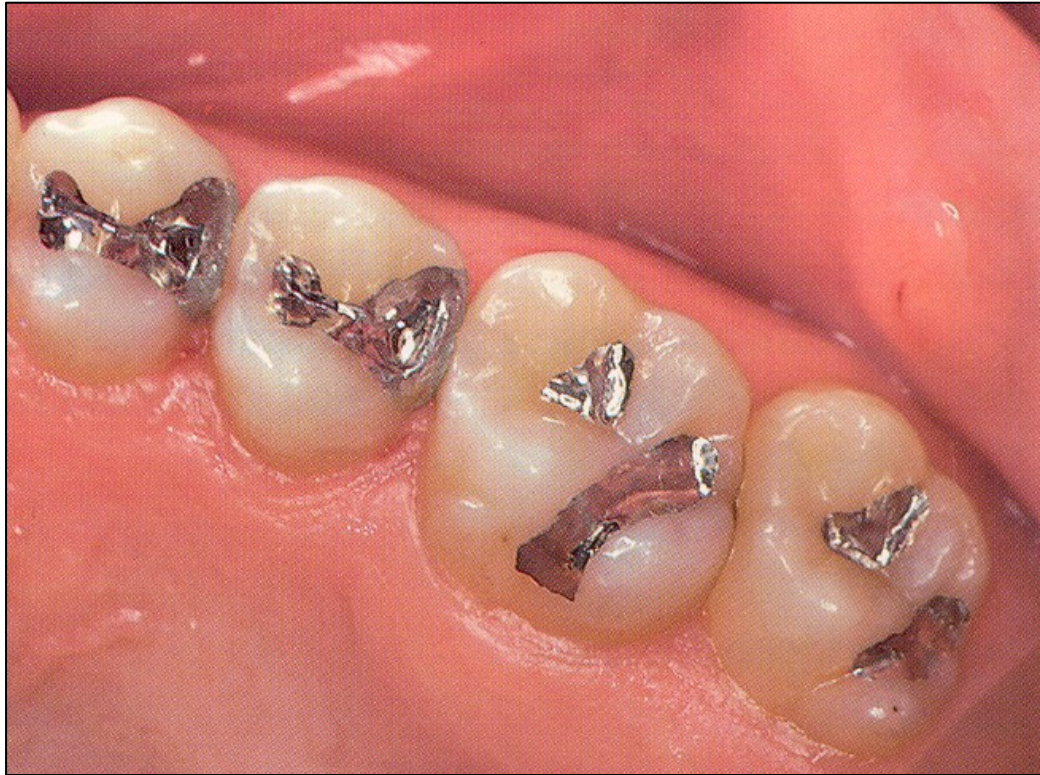


Amalgamators









Instruments

➤ **Preparation instruments**

➤ **Filling instruments**

➤ **Carvers**

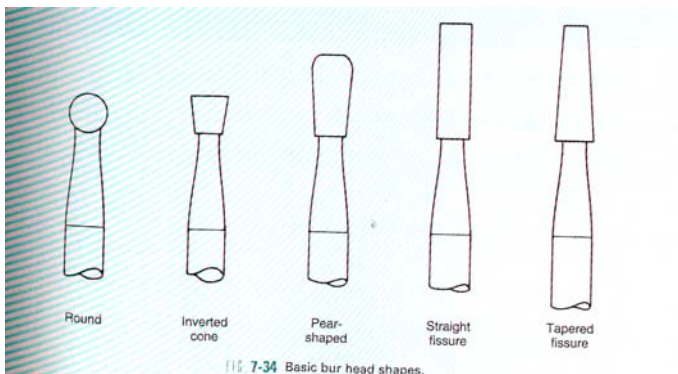
➤ **Burnishers**

Instruments

Preparation instruments - power driven

Burs

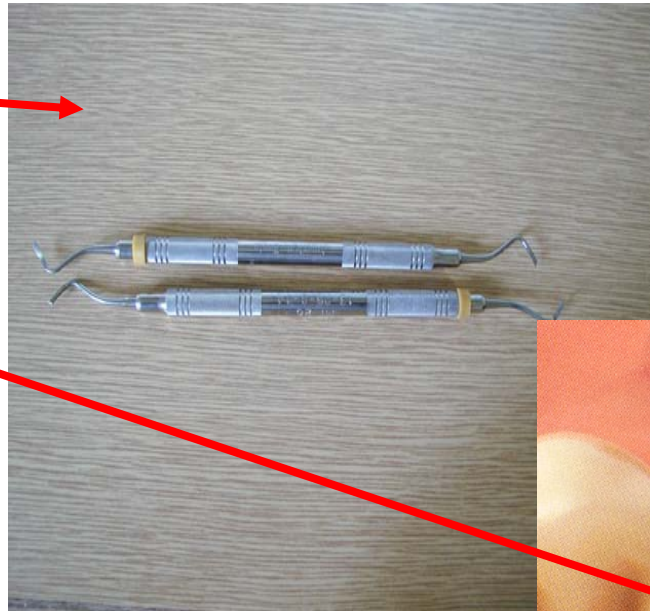
Diamonds



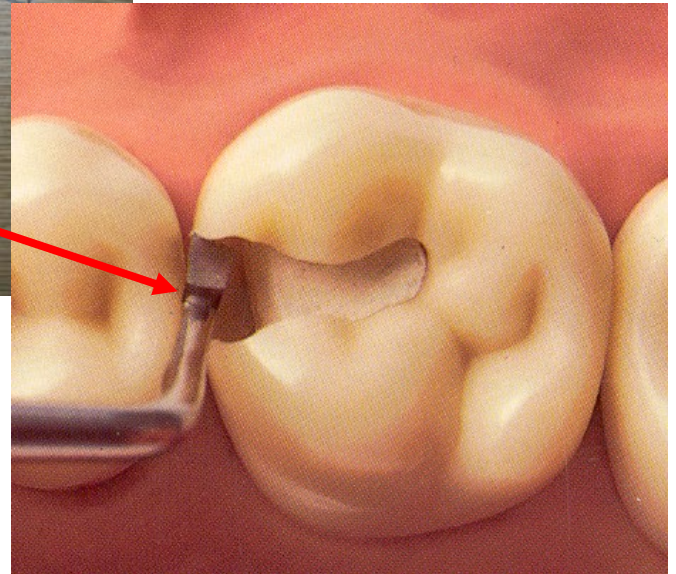
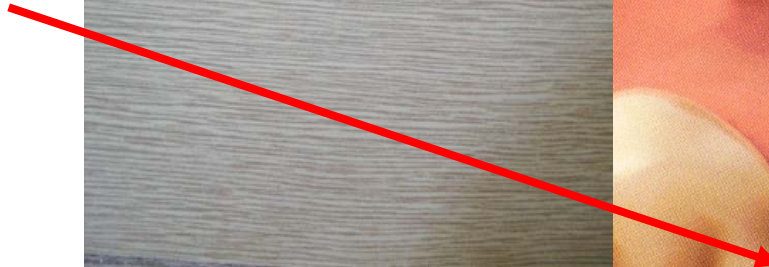
Instruments

➤ Preparation instruments - hand

Chisel

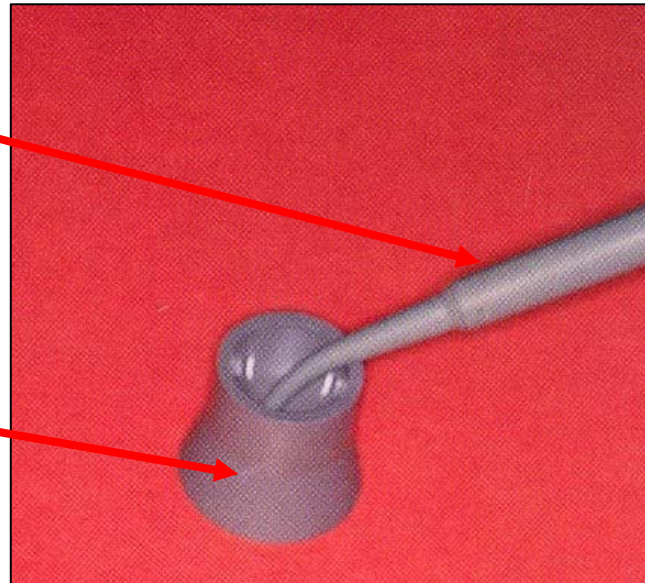


Excavator



Amalgam gun

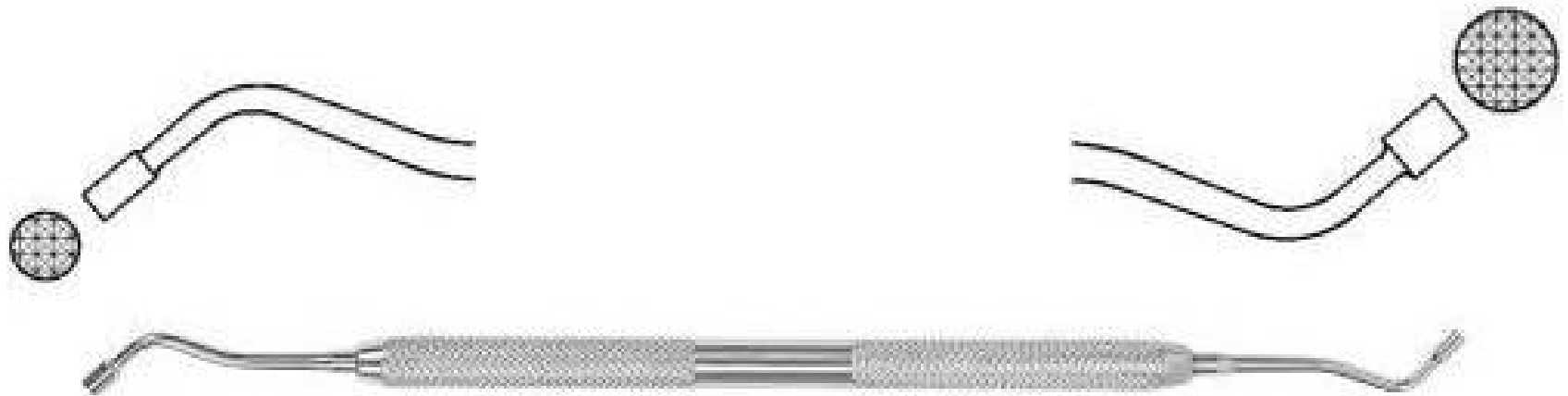
Crucible



Amalgam carrier



Amalgam carrier



Instruments

- **Filling instruments condensers and spatulas**

Condensor -
stamen



Condensor –stamen

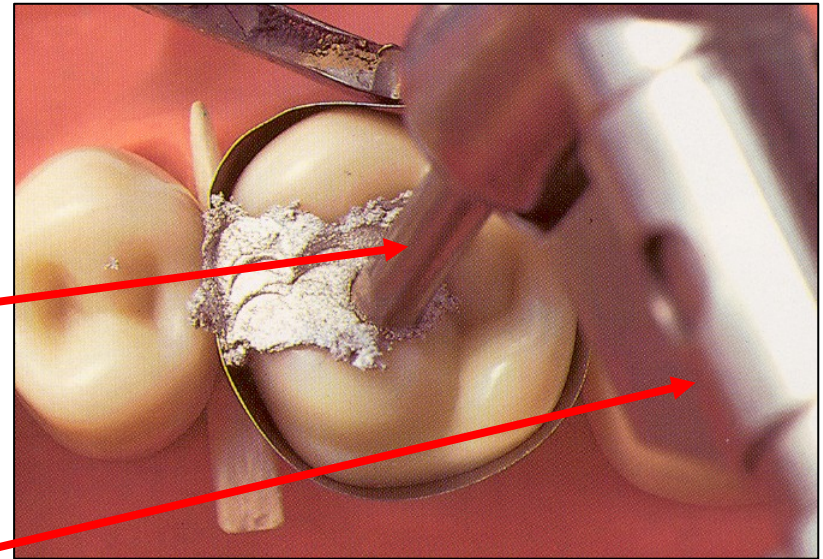


Condensor and burnisher - spatula combined



**Power driven
condensor
- stamen**

**Special
handpiece**



Burnisher - spatula

Angular- trough edge trough
face



Burnisher – spatula, angular three face



Instruments

➤ **Burnishers**

Ball condensor – used as a
burnisher at most

