

Synthetic Elastomeric

Four types of synthetic elastomeric impression materials are available to record dental impressions:

polysulfides, condensation silicones, addition silicones (polyvinylsiloxanes), and polyethers. Polysulfides were the first synthetic elastomeric impression material introduced (1950). Condensation silicones were made available to dentists in 1955, polyether in 1965, and addition silicones in 1975.

Polysulphide

Polysulfides were the first synthetic elastomeric impression material introduced in 1950. Polysulfide impression materials are supplied as two pastes. Typically, one paste is dark brown, and the other paste is white.

The two pastes are dispensed in equal lengths on a paper mixing pad. An impression material spatula is used to mix the two pastes. Mixing may take from 30 to 90 seconds depending on the amount and viscosity of the material.



Figure.3.polysulphide

-Indications

- complete denture
- removable partial denture
- crown and bridge
- base
- polysulfide polymers
- fillers
- Plasticizers

-Catalyst

lead dioxide (or copper)

fillers By-product is water

-Advantages

Long working time

High tear strength

High flexibility

Good detail reproduction

Lower cost compared to silicones and polyethers.

-Disadvantages:

Poor dimensional stability

pour within one hour

single pour

Custom trays

bad odor

Long setting time.

may stain clothing.

Condensation Silicone



Figure.4. condensation silicone

-indication

complete dentures

crown and bridge

-Advantages

Better elastic properties

Clean, pleasant

Stock tray

Good working and setting time

-Disadvantages

Poor dimensional stability

high polymerization shrinkage

evaporation of ethanol Hydrophobic

Addition Silicones

Improvement over condensation silicones no by-product.



Figure.5. addition silicone

-Advantages

Highly accurate

High dimensional stability

pour up to one week

Stock or custom trays

Pleasant odor

Multiple casts

Easy to mix

-Disadvantages

Expensive

Short working time

Lower tear strength

Polyether

-Indications

crown and bridge

bite registration



Figure.6.polyether

-Advantages

Highly accurate

Good dimensional stability

Stock or dual-arch trays

Good surface detail

Pour within one week

Multiple casts

Good wettability

-Disadvantages

Expensive

Rigid

Short working time

Bitter taste

difficult to remove from undercuts

Low tear strength

Absorbs water

changes dimension

Comparison of properties

Dimensional stability best to worst

addition silicone > polyether > polysulfide > condensation silicone > hydrocolloid.

Tear strength greatest to least

polysulfide > addition silicone > polyether > condensation silicone >> hydrocolloids

Setting time shortest to longest

alginate < polyether < agar < silicones < polysulfide

Working time longest to shortest

agar > polysulfide > silicones > alginate = polyether

Cost lowest to highest

alginate < agar = polysulfide < condensation silicone < addition silicone < polyether