

Elastomery

Elastomers are flexible synthetic impression materials (vulcanizing rubber-like polymers) solidifying chemically, either by polyaddition or polycondensation.

General properties of elastomers

- **high level of elastic deformation;**
- **the best ability to reproduce;**
- **Volume stability.**

Use for imprints demanding precision (fixed prosthetics).

All elastomers are two-component - activating component.

Polyethers

Paste/paste type.

- Paste - base: ether polymers with terminal ethylenine groups (60%), fillers (SiO₂ - diatomaceous earth - 40%), plasticizers.
- Paste - catalyst: sulfonic acid (20%), plasticizer (dioctyl phthalate - 65%), fillers (SiO₂).

Polyethers are weakly hydrophilic, thixotropic and volume-stable.

- **Spoon:** individual.
- **Technique:** single-stroke monophase.
- **Application:** for imprinting fixed parts of combined non-bond prostheses, for imprinting hybrid prostheses, in implantology, in the creation of inlays, onlays, aesthetic veneers, glued bridges, for imprinting of toothless parts of the alveolar process.
- **Contraindications:** subgingival step preparation.
- **Disadvantages:** water absorption in contact with an aqueous solution (high air humidity is also a problem), worse biocompatibility, possible development of allergic reactions.

Silicones

Silicone impressions are divided according to the type of solidification into condensation C-silicones and addition A-silicones. Individual silicones are further divided according to viscosity into: heavy/putty, crème/light, paste/medium.

- Spoon: rigid.
- Technique: single-stroke monophase, single-stroke two-phase, two-stroke two-phase.
- Application: fixed and removable prosthetics.

Condensation C-silicones

- **Base:** (solid/paste/cream)
 - Polymer: The main component is oily polydimethylsiloxane (α - ω -hydroxypolydimethylsiloxane) with free hydroxyl groups.
 - Filling: 10-80 % (depending on viscosity) TiO₂, ZnO, silicates and others.
- **Activating component:** (liquid/paste)
 - The catalyzing component of C-silicones consists of tetrafunctional alkoxysilanes, which react with the hydroxylated groups of the main component in the presence of catalyzing substances (zinc octoate, dibutylzinc dilaurate).
- **Solidification:**
 - Condensation causes contraction in proportion to the amount of filler (0.35-1.0% over 24 hours). Less activation component prolongs the setting time, more activation component does not affect the speed, but shrinkage and reduced elasticity.
 - Stiffen for 3-5 minutes.
- **Preparation:**
- **Application:** universal impression material, mainly in fixed prosthetics as the main imprint.
 - Fixed prosthetics
 - Solid - situational imprint: Double mixing, double imprinting.
 - Paste - situational imprint: Double mixing.
 - Cream - detailed imprint: Double mixing, double imprinting.
 - Removable prosthetics
 - Paste - myodynamic imprint in IL.
- **Disadvantages:** possible toxicity, contact allergic reaction, transient erythema of the oral mucosa, herpes labialis, necessary to process the imprint within 12-24 hours.

Addition of A-silicones

Paste/paste type.

- Paste – base: polydimethylsiloxane with loose vinyl groups.
- Paste – catalyst: divinylpolysiloxane, organic platinum binder.

Result after addition polymerization: multifunctional organohydrogenpolysiloxane with ethyl bridges. When solidifying, a contraction of 0.05% occurs.

- **Disadvantages:** hydrophobia, sulfates and metal salts cause inhibition of solidification, high price

Polysulphides

The basic mass consists of macromolecular polysulfides with SH-groups (markaptan group). Other substances are: ZnO, CaSO₄, TiO₂. The catalyst paste mainly contains lead oxide, which has the purpose of catalyzing the solidification reaction. Other components of the catalytic paste are sulfur and oils. They polymerize by polycondensation reaction. Water gets to the surface of the imprint, which is a by-product of the polycondensation reaction. This reaction takes place for a long time and it is necessary to leave the imprint for 5 minutes at rest after the end of the imprint (after it seems to have solidified).

- Spoon: individual.
- Technique: single-stroke monophasic, single-stroke two-phase.
- Disadvantages: possible toxic action, upon contact in the wound may cause inflammation.

Links

Related Articles

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