

Gypsum

Dental plasters are used for many purposes. These mainly include imprinting and preparation of models. We rank them among model materials, impression plaster belongs to imprinting materials.

Composition

$CaSO_4 \cdot \frac{1}{2}H_2O$ It is a calcium sulfate hemihydrate. But other substances are added to it.

- Potassium sulfate – reduction of expansion, acceleration of solidification,
- borax – retarder to prolong the setting time,
- diatomaceous earth, quartz, limestone – improves brittleness.

Advantages and disadvantages of impression plaster

Advantages:

- low price,
- ease of preparation,
- very good reproduction of surface details,
- Excellent dimensional stability.

Disadvantages:

- rigidity
- difficult to remove from undercut spots,
- inaccuracy
- drying of the mucous membrane of the patient's mouth.

Types^{[1][2]}

- **Type I – impression plaster.**
 - Mixing ratio: powder 100 g, water 40–70 ml.
 - Setting time: 4 minutes.
 - Strength: 4 MPa.
 - Expansion two hours after solidification: maximum 0,15 %.
 - Application: preprints for laboratory production of total removable dentures, fastening models to articulation apparatus (they can be easily removed than when using another type of plaster).
- **Type II – alabaster gypsums.**
 - Mixing ratio: powder 100 g, water 60 ml.
 - Processing time: 6-7 minutes.
 - Setting time: 12–14 minutes (16–20 minutes).
 - Strength: 9 MPa.
 - Solidification expansion: 0,1 %.
 - Application: making preliminary, situational models, connecting the working model to the articulator (for example, when processing a full-shell cast crown).
- **Type III – hydrocasts.**
 - Mixing ratio: powder 100 g, water 28–32 ml.
 - Processing time: 4-7 minutes.
 - Setting time: 8–14 minutes (12–16 minutes).
 - Strength: 20.7 MPa.
 - Solidification expansion: 0.14–0.20%.
 - Application: making of working models without the need for maximum strength and low abrasion.
- **Type IV – density/stone.**
 - Mixing ratio: powder 100 g, water 22–23 ml (21–25 ml of water).
 - Processing time: 5-6 minutes.
 - Setting time: 10 minutes (12–16 minutes).
 - Strength: 34.5 MPa.
 - Solidification expansion: 0,1 %.
 - Application: precise and strenuous work in the laboratory.
- **Type V – stone^[2].**
 - Mixing ratio: powder 100 g, water 18–20 ml.
 - Setting time: 12–16 minutes.
 - Strength: 48.3 MPa.
 - Solidification expansion: 0.1–0.3%.
 - Field of application: models for the formation of insertions and replacements from base metal alloys (used to compensate for their contraction).
- **Special plasters:**
 - orthodontic gypsums,

- plaster for assembling models,
- fast-setting gypsum,
- gypsums that change color when solidifying.

Types I and II are so-called β -positionswires and types III and IV are so-called α -positionswires

Links

Related articles

- Modeling materials

Reference

1. DOSTÁLOVÁ, Taťjana. *Fixní a snímatelná protetika*. 1. edition. Praha : Grada Publishing, a.s, 2004. 220 pp. ISBN 80-247-0655-5.
2. HUBÁLKOVÁ, Hana – KRŇOULOVÁ, Jana. *Materiály a technologie v protetickém zubním lékařství*. 1. edition. Praha : Galén, 2009. 301 pp. ISBN 978-80-7262-581-9.

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