

How can dental materials be made better?

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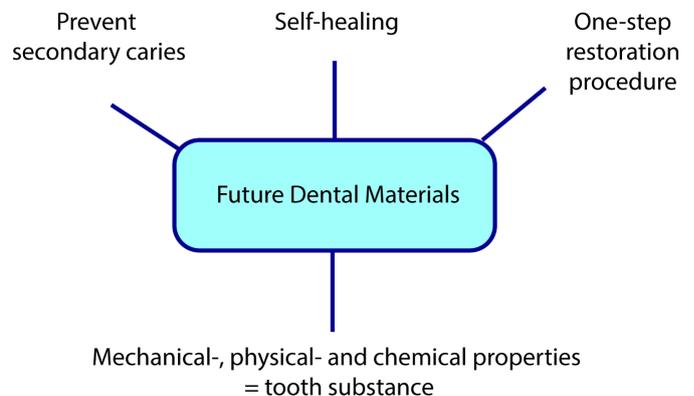
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Future resin-based dental materials must combat the reasons current materials fail, mainly secondary caries and fracture, but still be easy for the dentist to use and safe for the patient.

Ideally, materials should be capable of binding directly to enamel and dentin. This would simplify the restoration procedure and make it less technique sensitive. To reduce secondary caries, materials able to prevent biofilm formation and growth on their surface are needed. Future materials must show higher resistance against the mechanical and biochemical challenges of the oral cavity, and preferably have equal or better mechanical-, physical- and chemical properties compared to those of natural tooth substance.

How to achieve this?

- The development of universal adhesives, dual-cure and bulk-fill composites simplify the restoration procedure. A restoration requires hydrophilic tooth substance to be replaced with hydrophobic materials. To achieve equal or better properties than those of tooth substance, future materials must be based on new chemistry that also takes into account the biological properties of enamel and dentin.
- Materials with antimicrobial components have been developed to fight secondary caries. An alternative is to incorporate substances that disrupt the adherence of bacteria to the material surface and formation of biofilm.
- Methacrylate-based polymers are susceptible to chemical and biochemical degradation in the oral cavity. Many alternative polymers are being investigated; the challenge is achieving good mechanical-, physical- and chemical properties.
- Self-healing materials seal initial cracks and prevent fracture.



Reference:
 Viktige egenskaper ved fremtidens dentalmaterialer
 Stenhagen I. S. R., Dahl J. E.
[Aktuel Nordisk Odontologi, 01/2019 \(Volum 44\): 159-172.](#)

Future dental materials must combat the reasons current materials fail.

Self-healing materials.

Colour assessment. How good are you?

Hanne Wellendorf
Chief Engineer



Frode Staxrud
Scientist



Finding the best colour match for your restorations, crowns and bridges, is often frustrating, but do not despair, as training and practice makes you better and more confident.

This was the conclusion after a small test among the employees at NIOM, where we asked 20 participants to match shade tabs from two VITA Classical® Shade Guides. One of the Shade Guides was blinded, the other was not.

Traditionally, shade guides are based on empiric observations and mimic naturally occurring colours. Newer shade guides are based more scientifically. Nevertheless, colour is a personal perception of reflected light in our eyes.

NIOM's little test show that persons practicing colour assessment, and stay trained, perform best. Experienced dentists and dental technicians using their clinical judgement, find the best colour match. This is competence, understood as the combination of practical experience and knowledge. The study among NIOM employees also indicate that the age of the participants does not seem to influence the result, although women had a slight tendency to score better than their male counterparts did.

In order to find the basic colour of a tooth, which can be modified by characterization techniques, it is recommended to hold the shade tabs at a distance of 30-40 cm. Do not stare directly at the specific tooth or shade tab, take a more distant glance at the entire situation where the tooth is a functional part. Make a quick decision, your eyes gets weary after 8 to 10 seconds.

Finally, it would be advisable to calibrate yourself by performing our little comparison test, preferably every year. All you need is two identical shade guides, blind one of them and match the tabs under normal light conditions at your clinical practice. Good luck!



Shade tabs



Colour match

Reference:

Hvor god er du til å bestemme farge på restaureringene dine?
Wellendorf H, Staxrud F

[Den norske tannlegeforenings tidende 2018; 128 \(11\): 924-927](#)

Persons practicing colour assessment, and stay trained, perform best.

Calibrate yourself regularly.