3DELTA CROWN

Physical Properties
& Scientific Findings

3DELTA CROWN

Physical Properties

3DELTA CROWN fulfills the essential requirements according to DIN EN ISO 10477. The standard is applicable for polymer-based crown and veneering materials used for permanent dental restorations. It sets strict minimum thresholds for physical properties, such as a flexural strength of at least 50 MPa, while also ensuring color stability and resistance to water sorption. **3DELTA** CROWN far exceeds the requirements set by the standard.

Flexural Strength

144 MPa
req.: ≥ 50MPa

Flexural Modulus

5815 MPa
req.: n.a.

Water Absorption

16$\mu g/mm^3$
req.: ≤ 40 $\mu g/mm^3$

Solubility

0,2$\mu g/mm^3$
req.: ≤ 7,5 $\mu g/mm^3$

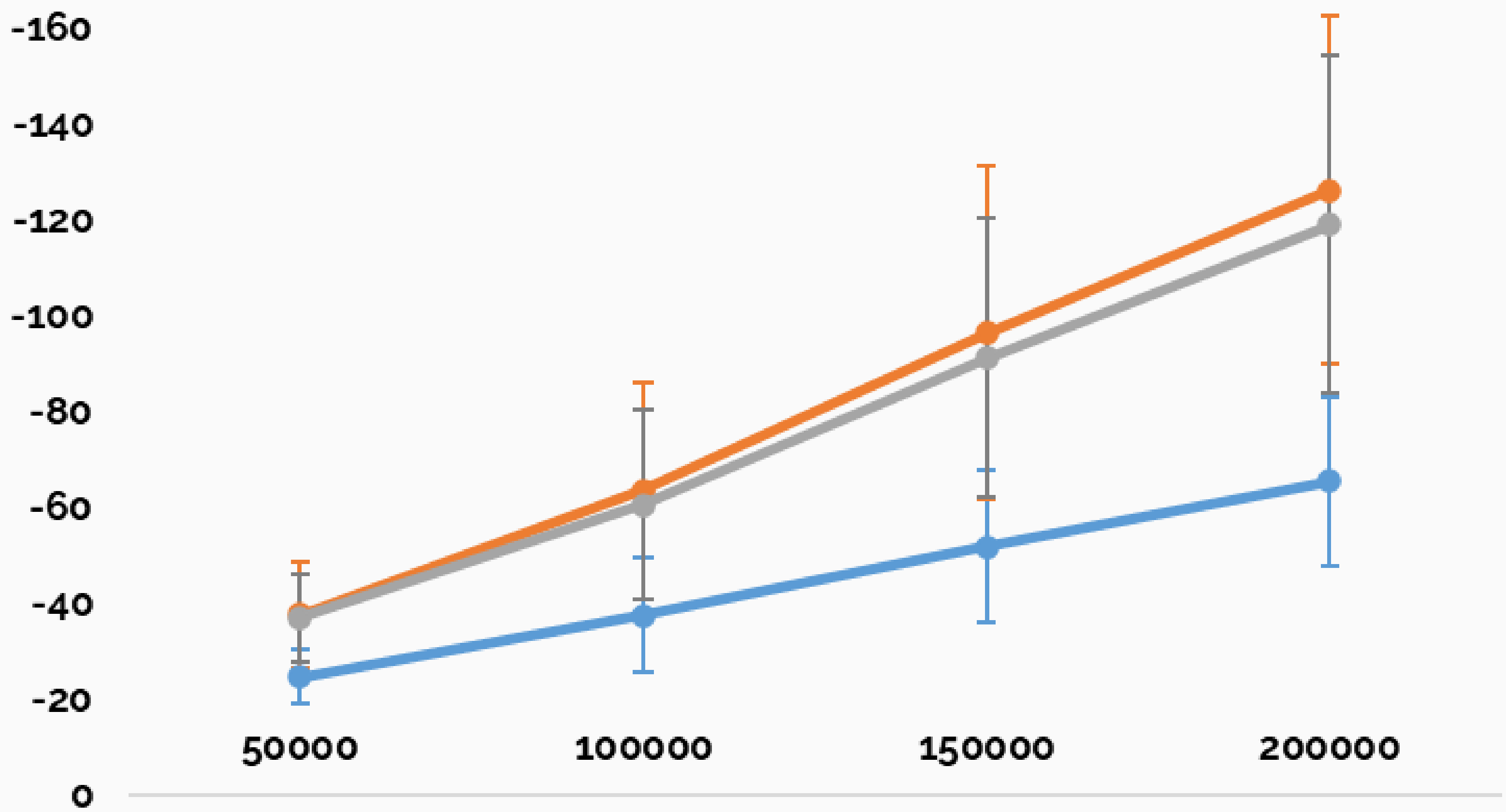
Compressive Strength

420 MPa
req.: > 300MPa

3DELTA CROWN

Wear Resistance of 3D printed resins

Analysis and comparison of the wear resistance of different 3D printed restorative materials for permanent restorations using the ACTA wear simulation method. The wear behaviour and material loss were evaluated and quantified after 200,000 abrasion cycles in a simulated environment.



3DELTA CROWN
-65.50 ± 17.55 µm*

Competitor A
-126.96 ± 36.19 µm*

Competitor B
-118.96 ± 35.29 µm*

*Mean wear loss after 200.000 cycles

Top-Performing 3D-Print Material: 3DELTA CROWN demonstrated the lowest wear among all 3D-printed materials tested in the study.

Significantly More Resilient: 3DELTA CROWN shows significantly less mean wear loss compared to competitors.

Long-Lasting Performance: After 200,000 wear cycles, **3DELTA** CROWN maintained its integrity with nearly half the wear of its 3D-printed competitors.

3DELTA CROWN | **3DELTA** ETEMP

What does Science say?

DeltaMed's 3D-printable composites, 3DELTA CROWN **and 3DELTA** ETEMP**, have been tested for years by renowned universities in independent studies. A selection of these studies is listed below.**

Kessler A., Tseng P., Sabbagh H., Schwendicke F., Spies B., Kernen A., Lüchtenborg J. (2026). **An in vitro analysis of two-body wear and three body wear, hardness, and degree of conversion of 3D-printed restorative materials,** Dental Materials, https://www.sciencedirect.com/science/article/abs/pii/S0109564126002903?via%3Dihub

Hoffmann, M., Coldea, A., & Stawarczyk, B. (2025). **Mechanical Properties of Novel 3D-Printed Restorative Materials for Definitive Dental Applications.** Materials, 18(20), 4662. https://doi.org/10.3390/ma18204662

Montenbruck, L., Lüchtenborg, J., Elgezawi, M., Keßler, A., & Kaisarly, D. (2025). **Influence of pretreatment strategies on the tensile bond strength of 3D printed composite resins for definitive cementation to dentin.** The Journal of Prosthetic Dentistry. https://doi.org/10.1016/j.prosdent.2025.04.043

KEßLER, A., Hickel, R., & Ilie, N. (2021). **In vitro investigation of the influence of printing direction on the flexural strength, flexural modulus and fractographic analysis of 3D-printed temporary materials.** Dental materials journal, 40(3), 641-649. https://www.jstage.jst.go.jp/article/dmj/40/3/40_2020-147/_pdf

Reymus, M., Fabritius, R., Keßler, A., Hickel, R., Edelhoff, D., & Stawarczyk, B. (2020). **Fracture load of 3D-printed fixed dental prostheses compared with milled and conventionally fabricated ones: the impact of resin material, build direction, post-curing, and artificial aging—an in vitro study.** Clinical oral investigations, 24(2), 701-710 https://pubmed.ncbi.nlm.nih.gov/31127429/

Reymus, M., & Stawarczyk, B. (2020). **Influence of Different Postpolymerization Strategies and Artificial Aging on Hardness of 3D-Printed Resin Materials: An In Vitro Study.** International Journal of Prosthodontics, 33(6).

Kessler, A., Reymus, M., Hickel, R., & Kunzelmann, K. H. (2019). **Three-body wear of 3D printed temporary materials.** Dental Materials, 35(12), 1805-1812.

To be continued

DeltaMed

TURNING IDEAS INTO MATERIALS

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