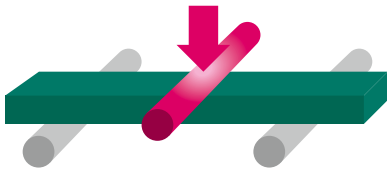


3-point flexural strength



a) Materials and methods

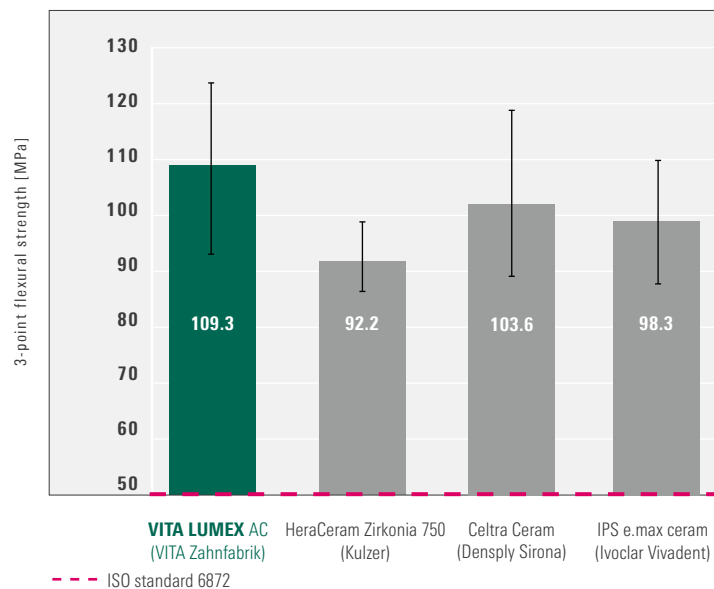
For the preparation of the samples, the ceramic powders mentioned below were mixed with demineralized water to form a paste and poured into a mould. After drying, the specimens were removed from the mould and fired using the VITA VACUMAT 6000 M furnace. Then the specimens were ground to the final dimensions of 1.2 x 4 x 20 mm. Ten specimens of each material were produced, loaded to fracture using a universal testing machine (Zwick Z010, ZwickRoell GmbH & Co. KG) and the 3-point flexural strength was determined.

b) Source

Internal study, VITA R&D, (Gödiker, 08/2019, [1] see Literature)

c) Result

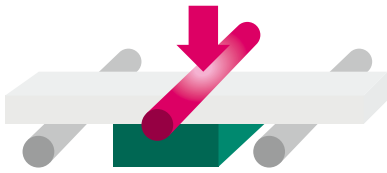
Flexural strength



d) Conclusion

All ceramics examined in this test produced values well above the standard requirement (> 50 MPa). In comparison with competitors, the strength values determined for VITA LUMEX AC are at a high level.

Bond quality



a) Materials and methods

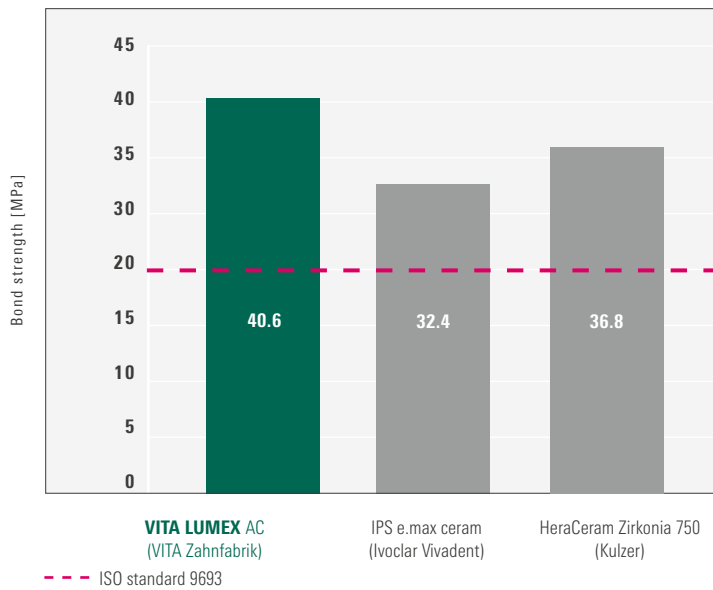
Bond tests are procedures for assessing the bond quality (i.e., the load capacity of the bond between the veneering and the substructure material). A standard method for examining the bond quality of veneering ceramics on metal and zirconia substructures is the "Schwickerath test" (see DIN EN ISO 9693), which was used in this test setup. The veneering ceramics mentioned below with a layer thickness of 1.1 mm were applied centrally to six zirconia (VITA YZ HT) specimens with dimensions of 25 x 3 x 0.5 mm each. After drying, they were fired with the VITA VACUMAT 6000 M furnace, according to the manufacturer's specifications. The test specimens were then loaded using a universal testing machine (Zwick Z010, ZwickRoell GmbH & Co. KG) until the veneer was separated from the substructure material and the bond strength was determined subsequently.

b) Source

Internal study, VITA R&D, (Gödiker, 08/2019, [1] see Literature)

c) Result

Bond strength to zirconia (VITA YZ HT)



d) Conclusion

All ceramics examined in this test produced values above the standard requirement (> 20 MPa). The bond strength determined for VITA LUMEX AC is at a high level, compared with competitors.

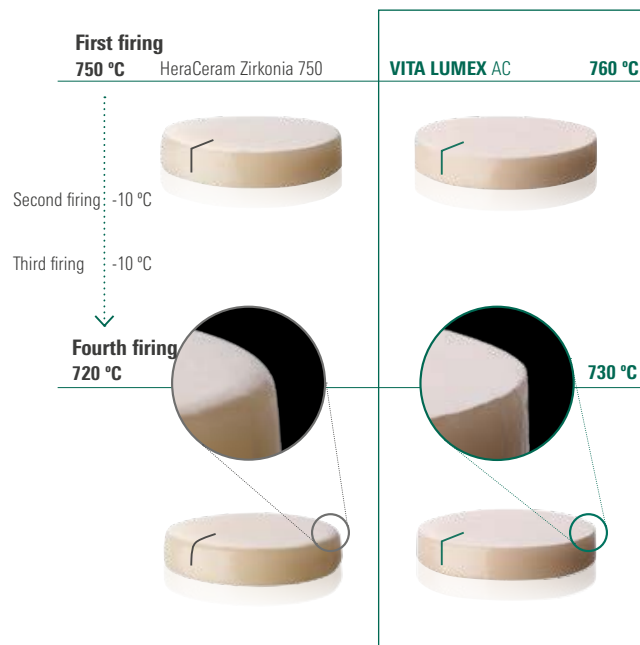
Dimensional stability after firing

a) Materials and methods

Four test specimens of each ceramic material were produced by moistening 0.7 g of powder with distilled water and forming cylindrical specimens with a punching tool. Afterwards, the specimens were fired in the VITA VACUMAT 6000 M furnace, where one specimen of each ceramic material was fired once, then twice, then three times and four times. The firing temperature corresponds to the manufacturer's specifications for the dentine firing and was reduced by 10 °C after each firing. The temperature was reduced after each dentine firing, in accordance with the standard processing method for veneering ceramics in the laboratory.

b) Source

Internal study, VITA R&D, (Gödiker, 08/2019, [1] see Literature)



d) Conclusion

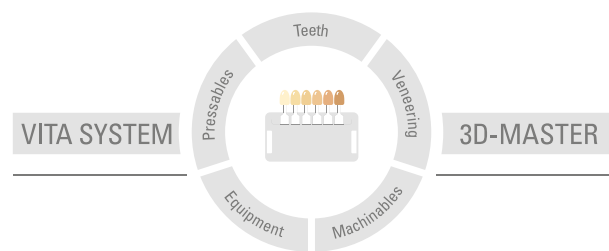
The test shows that it is possible to reliably achieve dimensionally stable firing results with VITA LUMEX AC, even after several firings (see photo documentation above - fourth firing). In a direct comparison with a competitor's ceramic, the VITA LUMEX AC specimens demonstrate a significantly higher edge stability in the visual comparison after the fourth firing. The high dimensional stability of VITA LUMEX AC results from the material-specific softening behavior. With the firing parameters recommended for VITA LUMEX AC, the softening and the deformation of the material is negligible.

You can find more information on VITA LUMEX AC at:
www.vita-zahnfabrik.com/lumex

References

1. Internal studies, VITA R&D:

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