

Heraeus Dental Science

Scientific Information

Venus Diamond

A dental composite needs low degrees of shrinkage and shrinkage stress for an optimised marginal adaptation. Thus minimises the risk of a filling loss, secondary caries, marginal discolouration and hypersensitivity¹. Low shrinkage and low shrinkage stress therefore are key factors for higher longevity of restorations.

The following two in vitro studies are proofing the excellent shrinkage and shrinkage stress behaviour of Venus Diamond.

¹ Finger, W. J. et al.: Interaction of self-etch adhesives with resin composites. Journal of Dentistry 35 (2007): 923 – 929

Setting Shrinkage Stress of Venus Diamond

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Volume Shrinkage During Polymerization

C. Koplín, G. da Silva Rodrigues, R. Jaeger, Fraunhofer Institut of Mechanics of Materials, Freiburg, Germany



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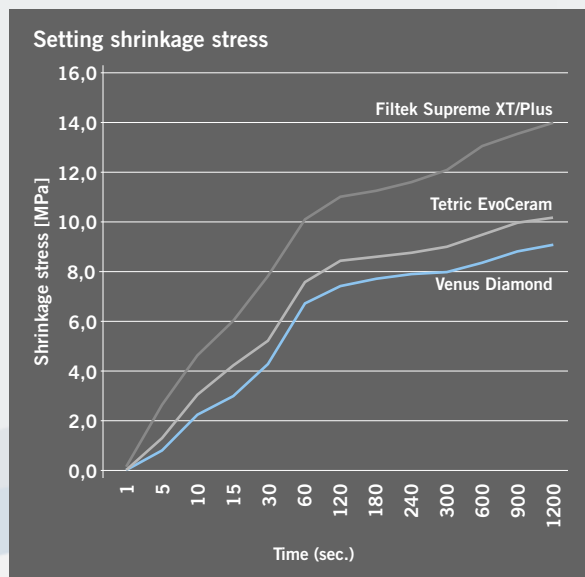
Objective

This study had the aim to measure setting shrinkage stress during polymerisation. Three materials have been tested: Venus Diamond (Heraeus), Tetric EvoCeram (Ivoclar Vivadent) and Filtek Supreme XT/Plus (3M ESPE).

Materials & Methods

Shrinkage stress was determined using a tensiometer. Therefore, a portion of composite paste was inserted between a glass plate and a steel bold head. The specimen was cured, whereupon measurements were taken during a period of 30 minutes. The distance between glass plate and bold head was held constant.

Results



Conclusions

Compared with Filtek Supreme XT/Plus and Tetric EvoCeram Venus Diamond exhibited the lowest shrinkage stress during polymerisation. Low shrinkage stress is one of the key factors for higher longevity of composite filling materials.

Source

Kleverlaan C. J., Feilzer A. J. 2008: Setting Shrinkage Stress of Venus Diamond (2008). Data on file.

Volume Shrinkage During Polymerisation

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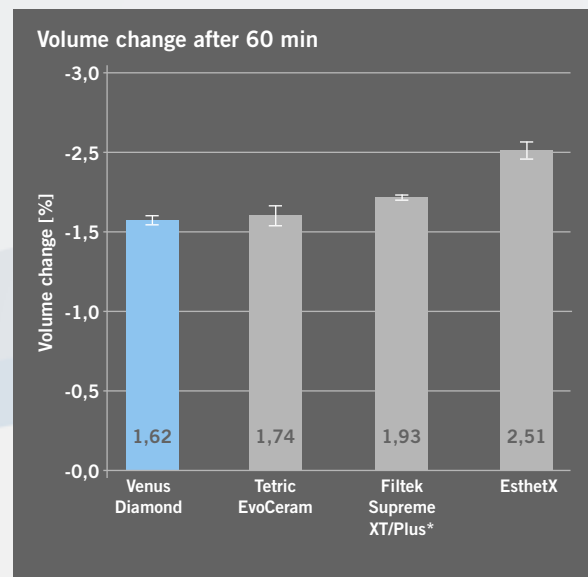
Objective

Purpose of this study was to evaluate volume shrinkage during polymerisation. Measurements were conducted on the following composite filling materials: Venus Diamond (Heraeus Kulzer), Tetric EvoCeram (Ivoclar Vivadent), Filtek Supreme XT/Plus (3M ESPE) and EsthetX/X-Flow (Dentsply).

Materials & Methods

The volumetric behavior during and after the curing was measured by the "Archimedes' principle". With the initiation of the curing process, five buoyancy weighing measurements were taken.

Results



Conclusions

Volume shrinkage of Venus Diamond was 1.62% and therefore the lowest within this group of tested composites. Low shrinkage in conjunction with low shrinkage stress helps to improve the marginal integrity of dental restorations.

Source

Koplin C.: Calculating internal stress during curing of dental composites, IADR-CED Munich 2009, presentation 145.