

Charisma Bulk Flow ONE

Flexural Strength

Prof. Dr. Nicoleta Ilie – LMU Munich, Germany

Mechanical behaviour of one-shade resin-based composite (RBC)

One of the recent trends in the development of resin-based composites focuses on ONE-shade composites to avoid time-consuming shade matching.

Aside from the time standpoint, one of the most important criteria, especially for posterior restorations, is the strength of composite materials and their ability to withstand mastication forces, as has been tested and published in previous studies. Since fractures are one of the reasons for restoration failure, the flexural strength of composite is an important indicator as to which extent the material is able to resist high forces.

To further ease the dentists work, Kulzer has developed Charisma Bulk Flow ONE. It is a flowable bulk fill composite, suited for basic restorations. It can be applied in layers up to 4 mm, saving time by reducing the number of increments. Also its ONE shade technology allows for an aesthetic restoration, by adapting to the colour of the surrounding tooth.

The following in vitro study by Prof. Dr. Nicoleta Ilie compares the flexural strength and flexural modulus of Charisma Bulk Flow ONE to other bulk fill materials.

Giving a hand to oral health.



KULZER
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Objective

The study analyses different bulk-fill resin-based composites amongst others in terms of the flexural strength and flexural modulus at two different aging conditions.

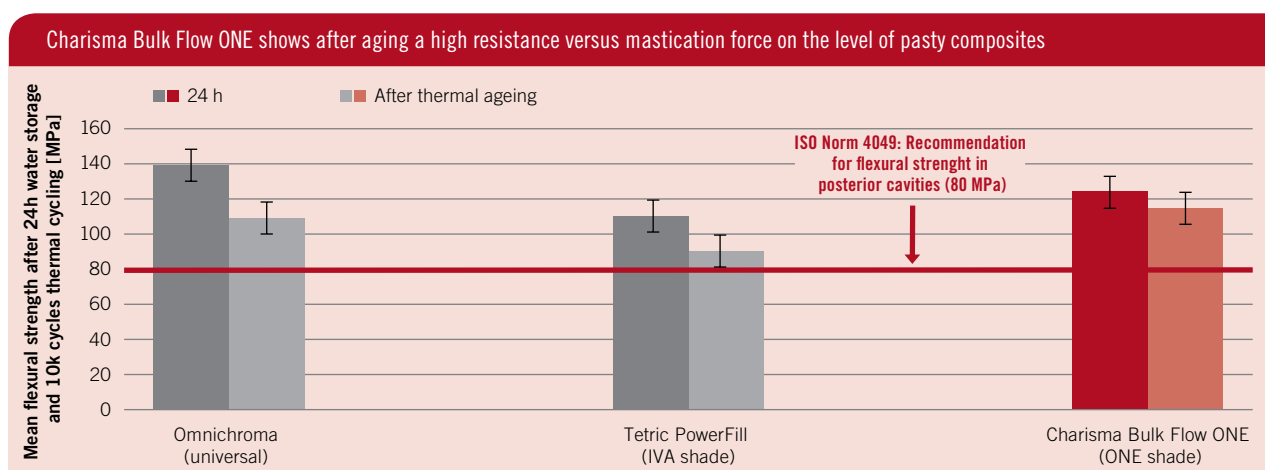
Materials & Methods

The tested composites including their shades and recommended curing times are indicated in the table below.

Brand name	Type of composite	Manufacturer	Shade	Curing time
Charisma Bulk Flow ONE	Bulk Fill Flowable	Kulzer	ONE	20 seconds
Tetric PowerFill	Bulk Fill pasty composite	Ivoclar Vivadent	IVA	10 seconds
Omnichroma	Pasty composite	Tokuyama	Universal	20 seconds

Results

Flexural strength:



Statistical analysis indicates a significant effect on the factors materials and ageing ($p < 0,001$). The influence of the material was stronger than the influence of ageing. Significant differences between the unaged groups were seen between all materials. Within the aged groups no significant differences were found between Omnichroma and Charisma Bulk Flow ONE, whereas Tetric PowerFill demonstrated significantly lower flexural strength than the other materials. Tetric PowerFill had an e-modulus of 6.6 GPa after 24h and 6,0 GPa after ageing, whereas Omnichroma showed 5.4 GPa after 24h, respectively 5.1 GPa after ageing. Charisma Bulk Flow ONE had an e-modulus of 3.9 GPa and 3.7 GPa after ageing.

Conclusion

Charisma Bulk Flow ONE meets the ISO 4049 recommendation for flexural strength in posterior cavities also after accumulated thermal aging.

Comment

Charisma Bulk Flow ONE exceeds the ISO 4049 recommendation for restoration materials suitable to restore occlusal posterior surfaces (minimum of 80 MPa) since these are the restorations which are subjected to the highest mastication force and possess therefore a higher risk for restorations fractures or chippings. This means that Charisma Bulk Flow ONE is suitable to be used in restorations with occlusal surfaces without a capping layer, which contributes in saving time during the treatment. It is important to mark that the composites used for comparison were pasty, while Charisma Bulk Flow ONE is a flowable composite. It is in particular suitable to be used in deep slot cavities where the incremental technique is difficult. The bulk& body technique with the usage of the flowable Charisma Bulk Flow ONE as base covered with a pasty composite (e.g. Charisma Diamond) can be an option if cusps or bigger functional occlusal surfaces need to be restored. To conclude, Charisma Bulk Flow ONE supports the dentist efficiently in restoring basic posterior cavities.

Source

Ilie N, Moldovan M, Ionescu AC: Microstructure and mechanical behaviour of modern universal-chromatic and bulk-fill resin-based composites developed to simplify dental restorative procedures. Journal of Functional Biomaterials 13, 178, 2022: <https://doi.org/10.3390/jfb113040178>

The study was abbreviated and summarised and all diagrams and titles have been established by Kulzer. Charisma is a trademark of Kulzer.