

Admira Fusion x-tra – Clinical results after two years

VOCO GmbH, Knowledge Communication Department

Anton-Flettner-Str. 1-3
27472 Cuxhaven
Germany

Tel.: +49 (0)4721-719-1111
Fax: +49 (0)4721-719-109

info@voco.de
www.voco.dental



With the introduction of the Admira Fusion product range, VOCO launched the first purely ceramic-based restorative materials on the dental market. Admira Fusion represents the combination of two outstanding innovations: nano-hybrid and ORMOCER® technology. One of the fundamental features of the Admira Fusion products is the pure silicate technology – all of the components are silicate-based. As such, no conventional methacrylate monomers are employed.

Abdalla et al. at Tanta University in Egypt are currently conducting a clinical study with Admira Fusion x-tra over a period of four years, which is investigating the influence of the layer thickness during application on the clinical success of the restorations.^[1] This Scientific Report presents the clinical results after two years.

Study design

The study presented here investigates whether the resulting restorations are of differing qualities when the material is applied in increments of 2 mm (conventional) and 4 mm (bulk fill technique).

The study population comprised 75 patients aged between 18 and 50. Each patient was treated with at least two Class II restorations. The cavities were prepared with standard instruments employing a minimally invasive approach, not involving bevelling of the enamel margins. In addition, extra attention was paid to the fact that the cervical edges were above the gingival margin. Deep cavities close to the pulp were lined with a layer of calcium hydroxide. Cotton rolls and saliva ejectors were used to keep saliva away from the site. Futurabond U (VOCO) (self-etch mode, application in accordance with the manufacturer's specifications) was used for the adhesive.

This was followed by the application of Admira Fusion x-tra. Two groups were defined, each containing 95 restorations. In the first group, Admira Fusion x-tra was applied using the conventional incremental technique with a maximum thickness of 2 mm. In the second group, the bulk fill technique was employed, i.e. increments in a thickness of 4 mm were placed. Deep cavities were treated with one or two increments first and then covered with a final increment of 4 mm. The final steps, finishing and polishing, were performed with diamond tips, rubber tips and flexible discs. Each restoration was assessed in accordance with the USPHS criteria^[2] immediately after finishing and polishing (initial). A further evaluation was performed six months after placement of the filling. Regular evaluation check-ups are scheduled until the end of the clinical trial after four years. This Scientific Report presents the results after two years. The parameters investigated were: shade match, anatomical shape, marginal adaptation and marginal discoloration.

Table 1: Recall overview

Restorative material used	Number of assessed restorations			
	Initial	6 months	12 months	2 years
Admira Fusion x-tra, (4 mm, bulk fill technique)	95	95	90	88
Admira Fusion x-tra, (2 mm, increment technique)	95	95	92	91
Total restorations	190	190	182	179

Study results

No loss of retention was observed after two years, with a total of 179 restorations being evaluated. Fig. 1 depicts the results after two years in a bar graph.

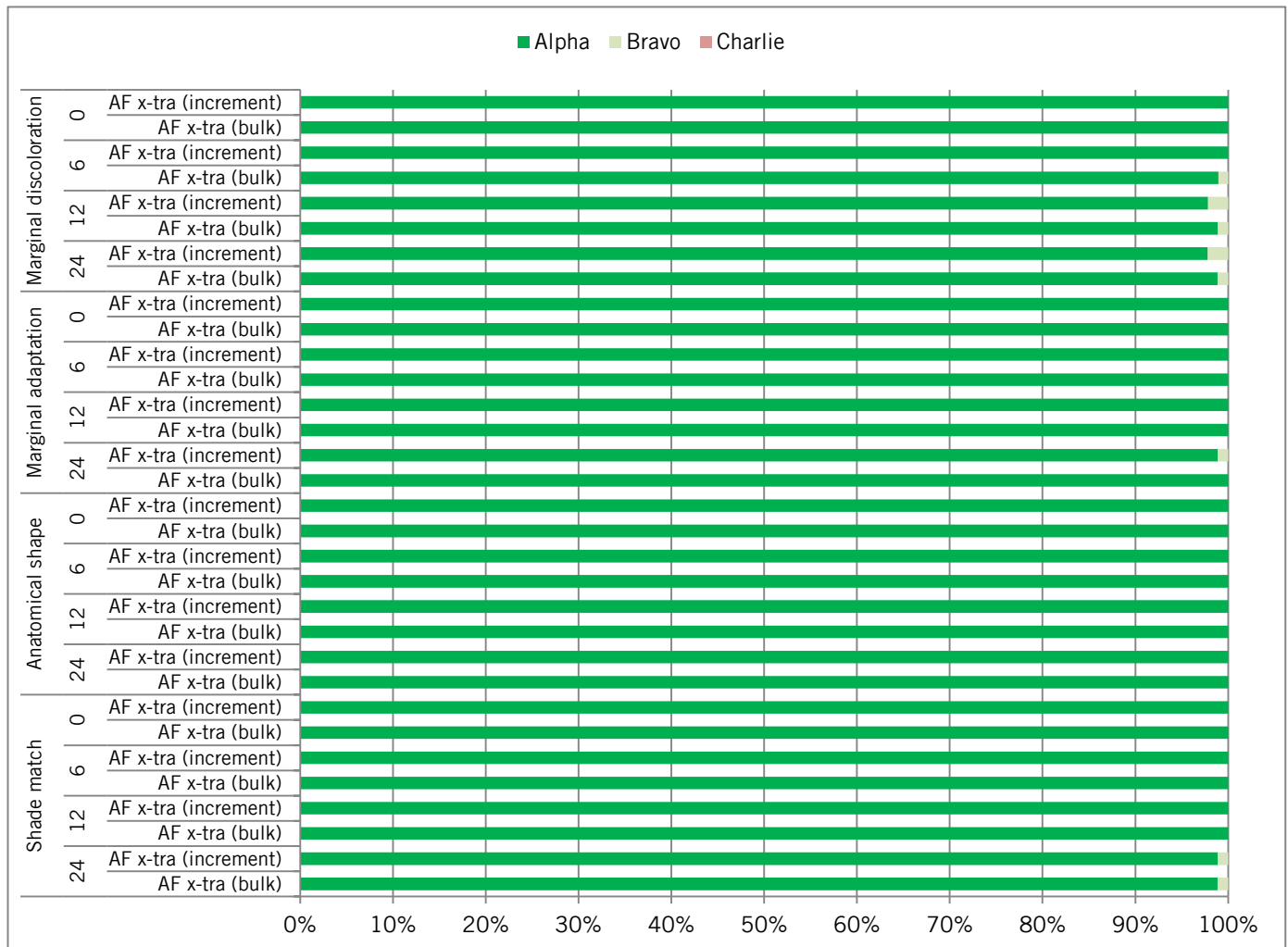


Figure 1: Clinical evaluation of Admira Fusion x-tra (bulk fill and increment technique) after 0, 6, 12 and 24 months.

After two years, there were no significant differences observed between the different restorative techniques. In the bulk fill group, one restoration displayed minimal shade deviation and one restoration displayed minimal marginal discoloration. All other restorations were in excellent condition and awarded an Alpha rating. In the group of conventionally placed restorations, one filling also displayed minimal discoloration and another restoration displayed slightly limited marginal adaptation. Two restorations also displayed slight marginal discoloration and were awarded a Bravo rating. The other 175 restorations were all in perfect condition and awarded an Alpha rating.

Conclusion: The excellent assessments of Admira Fusion x-tra confirm that the material is outstandingly suited to use in the bulk fill technique. Not least due to the low shrinkage of 1.25 % by volume and the very low shrinkage stress of 3.9 MPa, Admira Fusion x-tra achieves identical results when applied in a 4 mm layer to those obtained in conventional application in 2 mm increments.

[1] Abdalla, Al.et al, *Clinical Evaluation ofOrmocer Bulk Fill Materials in Class II cavities restored by either incremental or bulk-fill techniques*, Tanta University, Egypt, report for VOCO, 2015.

[2] Cvar J.F., Ryge G., *Reprint of criteria for the clinical evaluation of dental restorative materials 1971*, Clin Oral Investig, 2005; 9: 215 - 32.