

Admira Fusion x-tra – Clinical results after 3 years

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With the launch of the Admira Fusion product family VOCO presents the first purely ceramic-based filling materials on the dental market. Admira Fusion stands for the combination of two excellent innovations: nano-hybrid combined with the ORMOCER® technology. The Pure Silicate Technology is the essential feature of all Admira Fusion products as all ingredients are based on silicate. No conventional methacrylate monomers are used.

Abdallah et al. are currently conducting a clinical four-year study with Admira Fusion x-tra at the University of Tanta (Egypt), examining the influence of the layer thickness on the clinical success of restorations.^[1] This scientific report presents the clinical results after three years.

Study design

The presented study clarifies, whether there are qualitatively different results when the material is applied in 2 mm (conventional) or 4 mm increments, according to the bulk-fill technique.

75 patients aged between 18 and 50 years participated in this study. Each patient was treated with at least two class II restorations. Besides using a rubber dam, the cavities were prepared with conventional instruments followed by a minimally invasive approach; the enamel margins were not bevelled. In addition, care was taken to ensure that the cervical margins were above the gingival margin. Deep cavities close to the pulp were lined with a calcium hydroxide material. The saliva was isolated using cotton rolls and saliva ejectors. Futurabond U (VOCO) was applied as the adhesive in self-etch mode.

Followed by the application of Admira Fusion x-tra, two groups of each 95 restorations were defined. The first group had Admira Fusion x-tra applied using the conventional incremental technique with a maximum of 2 mm layer thickness. In the second group the bulk-fill method was used, i.e. increments of 4 mm were applied. In very deep cavities, one or two increments were applied first and then were overlaid with another 4 mm increment. The final finishing and polishing steps were done with diamond and rubber tips and flexible discs. Each restoration was evaluated immediately after finishing and polishing according to USPHS criteria^[2] (initial), another evaluation followed after 6 months. Frequent evaluation intervals follow until completion of the clinical study after four years. This scientific report presents the results after three years. Shade match, anatomical shape, marginal adaptation and marginal discoloration were evaluated.

Chart 1: Recall overview

Applied filling material	Number of evaluated restorations				
	Initial	6 months	12 months	2 years	3 years
Admira Fusion x-tra, (4 mm, bulk-fill technique)	95	95	90	88	81
Admira Fusion x-tra, (2 mm, incremental technique)	95	95	92	91	87
Total	190	190	182	179	168

Results

No loss of retention occurred after three years, 168 restorations have been evaluated in total. The results after three years are shown in figure 1, together with the initial results, as well as those after one and two years. For reasons of clarity, the results after 6 months are not included in this figure.

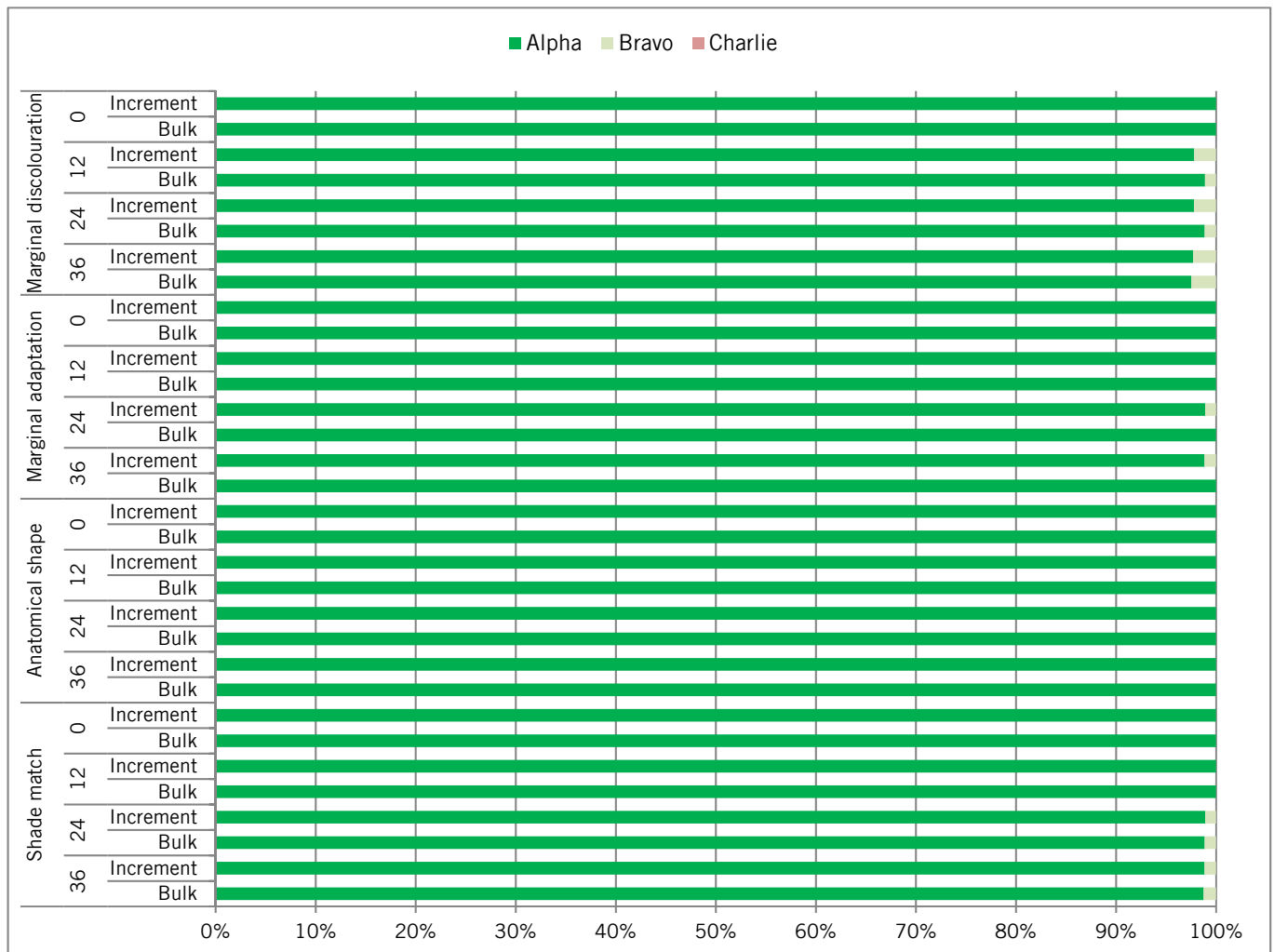


Figure 1: Clinical evaluation Admira Fusion x-tra (bulk-fill and incremental technique) initial, after 12, 24 and 36 months

No significant differences could be observed between the different restoration techniques after three years. In the bulk-fill group one restoration showed slight shade deviation and two restorations showed minimal marginal discolouration. The other 78 restorations were in excellent condition and were rated Alpha. In the group of conventional restoration technique also two fillings had minimal shade changes, another restoration showed slightly limited marginal adaptation. Two restorations showed minor marginal discolouration and were rated Bravo. All other 83 conventionally applied restorations showed impeccable condition and were rated Alpha.

Conclusion: The excellent evaluations of Admira Fusion x-tra verify that the material is perfectly suitable for the application in bulk-fill technique. Not least due to the low shrinkage of 1.25 Vol.-% and the very low shrinkage stress of 3.9 MPa Admira Fusion x-tra achieves identical results in 4 mm increment applications as well as in the conventional 2 mm increment application.

[1] Abdalla A *et al.*, *Clinical Evaluation ofOrmocer Bulk Fill Materials in Class II cavities restored by either incremental or Bulk fill techniques*, University Tanta, Egypt, report to VOCO, 2018.

[2] Cvar JF, Ryge G, *Clin Oral Investig*, **2005**, 9: 215 - 32.