



Solving the Challenge in Developing an Ideal Single- Component Universal Adhesive

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Since 1985, SHOFU has been developing a number of bonding agents, including self-etching adhesives which simplify the bonding procedures, establishing our original adhesion technology for bonding to various dental substrates. Until recently, however, we did not have a single-component universal adhesive which is applicable in both direct and indirect restorations and bonds to various adherends including tooth structure, glass ceramics, zirconia, metals, and so on. What types of challenges existed to produce such a universal adhesive? In recent years, self-etching adhesives have been used as a dentin bonding agent for their ease of use; they contain acidic monomers and water, which are essential components for bonding to tooth structure. On the other hand, bonding agents containing a silane coupling agent have been generally used for bonding to glass ceramics and cured composite. In order to develop a single-component universal adhesive which can bond to teeth, glass ceramics and cured composite, one approach was attempted by incorporating a conventional silane coupling agent into a self-etching adhesive. In this attempt, immediately after preparation the solution containing the silane coupling agent and the self-etching adhesive showed adhesion to both teeth and glass ceramics as well as cured composite owing to the effect of the acidic monomers and the silane coupling agent. However, after a certain period of time the conventional silane coupling agent became hydrolyzed in the solution due to the influence of the acidic monomers, causing the molecules of the hydrolyzed silane coupling agent to bind to each other and become inactivated. This led to a significant decrease in adhesion to glass ceramics and cured composite after a certain time from the preparation of the adhesive. In order to solve the challenge, SHOFU has developed a novel single-component universal adhesive “BeautiBond Xtreme” that contains an originally formulated silane coupling agent. Thanks to the composition of its adhesive monomers, BeautiBond Xtreme can be applied to a variety of adherends without separately using a silane coupling agent. In this lecture, I would like to introduce the features of BeautiBond Xtreme.

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