

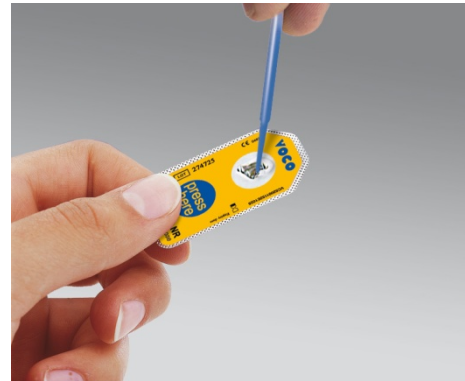
The VOCO Single Dose

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Mixing errors in multi-component systems frequently occur. These errors can have a negative effect on the physical properties of the material and thus its clinical success. For this reason, VOCO endeavours to eliminate such mixing errors by providing application assistance. The advantages of application systems, however, are not limited to just the avoidance of mixing errors.

The *SingleDose* blister

Many bonding systems are based on several liquids that must be mixing together before the actual application. Mixing errors can never be completely excluded with 2-bottle, self-etch bonds. Most bonds are in dropper bottles that are dispensed onto a mixing slab. Many things can affect the amount of liquid that is dispensed: holding the bottle at a different angle while dispensing the liquid, small air bubbles, storage temperature variances and/or numerous other factors. With a total volume of well under 1 ml, errors in the micro-liter range have a significant effect on the mixing ratio.

Another important factor for all systems with organic solvents as the base is the incidents involving volatilisation. Instead of water, many materials contain ethanol, acetone or ethyl acetate as the solvent. These have a high vapour pressure, i.e. they also evaporate below their boiling point to a large degree. A loss of solvents means a simultaneous change in the concentration of the solution. In 2-bottle systems, in which the solvent in each bottle evaporates in different degrees, mixing errors can thus also occur in this way, even with absolutely identical dropper volumes. The Futurabond products are all based on water/ethanol mixtures, so that the incidents involving volatilisation only play a minor role for the products in the Futurabond series.

Mixing errors lead to a reduction in the adhesion of the bond and, in the worst case scenario, the loss of the placed restoration and thus the associated inconveniences for the practitioner and the patients. VOCO offers an ideal solution to this problem: the *SingleDose blister*, developed and patented by VOCO. In this 2-chamber system, the components are protected from light and, through thick insulation, free from the incidents involving volatilisation. The two chambers are connected to each other by a passage that can be selectively opened. When the *SingleDose* is activated, an opening is created and the contents of one of the chambers are rapidly pressed into the second chamber.

Mixing errors can be excluded with this type of mixing, since the volumes and filling quantities in each chamber are exactly coordinated with each other. The *SingleDose* has a specified point to be pierced with the applicator to remove the mixture. Subsequently stirring the mixture with the instrument yields an absolutely homogeneous mixture of the components in the optimal ratio.

Application still should be carried out soon afterwards, since the solvent, especially with bonding materials, also fulfills a function beyond the release of ingredients: organic solvents facilitate the penetration of the smear layer. An excessive loss of solvent leads to a decrease in the adhesive bond.

In addition to providing an exact mixture of the components, the *SingleDose* offers further advantages. The *SingleDose* is leak proof in every position can be comfortably held with two fingers. Furthermore, the packaging for a single use is an ideal way to exclude contamination of the material - the *SingleDose* is more hygienic than all bottle-based systems. The use of the *SingleDose* additionally offers a speed advantage: The activation of the *SingleDose* takes place in a fraction of a second. Futurabond NR and Futurabond DC, the two-component systems, are as quick as a one-bottle bond in the *SingleDose* application.

The *SingleDose* blister

The above-described blister has also been developed and patented as a one-chamber version. With the *SingleDose* blister, the prevention of mixing errors is not in the forefront, but instead the problem of evaporating solvents described above and, of course, the generally accepted advantages of simple application and optimal hygiene.

As stated above, solvents fulfill more functions than the pure solution of all the contents. The contribution to the penetration of the smear layer during bonding has already been mentioned above; the conclusions naturally also apply to the "all-in-one" bonds like Futurabond M. Solvents additionally have a large influence on the wetting behaviour of liquids. Since most organic solvents have a low viscosity (lower than water), they deliver optimal wetting of the application surface. This applies to the bonding as well as, for example, fluoridation (Bifluorid).

Conclusion: The patented Single Dose systems by VOCO offer numerous advantages: optimal mixing with multi-component systems, hygienic application without the risk of cross-contamination, reliable protection from evaporation of the solvent as well as a minimal treatment duration.