

Activation of application capsules

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The use of capsules in restorative therapy with glass ionomer cements offers many advantages: an optimal relationship between the components, safe mixing and the minimisation of the inclusion of air bubbles. The use of the capsule does present a few obstacles, however, that can easily be overcome with a little skill.

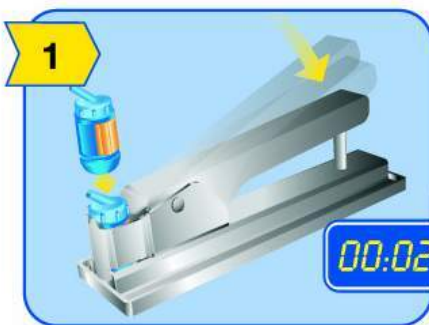
The interior of the application capsule is comprised of two chambers. The larger chamber is the mixing chamber and it additionally contains the powder (The white powder is visible from the outside.) There is a piece of foil on the side of the capsule that covers a separate pillow on the inside that contains the liquid. During activation, this pillow is opened and the liquid empties into the interior of the capsule. This pillow must be completely expressed to achieve an optimal mixing relationship between the two components. Incomplete evacuation is easy to recognise: a reduced setting time and a viscosity that is too high after mixing. The opening in the pillow is visible after expressing the contents of the capsule (see figure on the left) and it can simultaneously be used as an indicator for complete emptying of the capsule. The opening of pillow is made with pressure - a predetermined breaking point that bursts when pressure



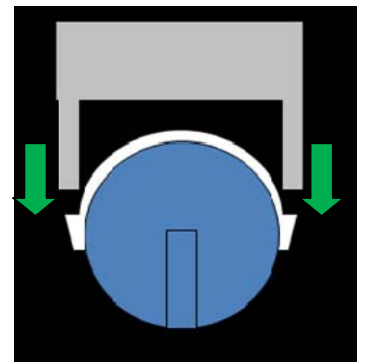
is applied is located on the outlet to the mixing chamber. The pressure should not be exerted abruptly to ensure that the pillow is really only opened on this spot. A kind of karate chop to the activator can lead to the pillow also bursting on the side, causing the liquid to not entirely empty into the mixing chamber. For this reason, the activator should be gently pressed down.



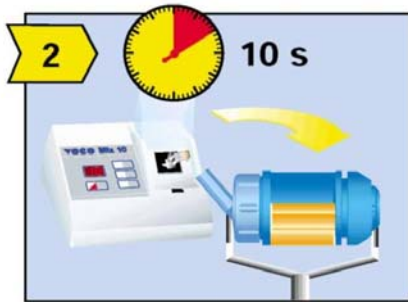
The transmission of pressure from the activator to the capsule takes place on both of the clamp's shoulders that are evenly pressed down (see diagram). The closed capsule is inserted in such a way so that the outlet is pointed in the opposite direction of the lever. During activation, it should be verified that both shoulders press down evenly. This is not the case with all activators. Especially in older activators, there can be too much distance between the pressure senders, which can result in only one shoulder being pressed down. In most cases, such an error does not get passed to the capsule without being noticed and it is visible after activation.



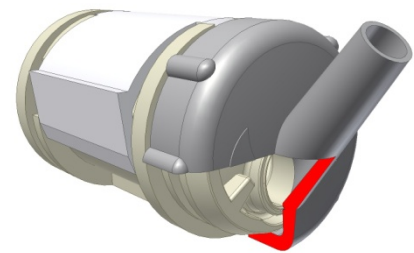
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The following picture shows where a pressure sender side slipped over the shoulder of the capsule during activation. This error resulted in not all of the liquid being evacuated from the pillow, which caused the viscosity of the paste to be too high. The resulting scrapes are characteristic for this type of error. The activator should be replaced when this type of error occurs. The activator must be engaged for at least two seconds to ensure that all of the liquid has been emptied from the pillow. A shorter press as with a hole puncher or stapler is not sufficient here! The integrity of the shoulders should always be verified before putting a capsule into the mixer. The capsule should be mixed for 10 seconds at a vibration rate of 4000-4500 per minute. The mixing time can be reduced 1 to 2 seconds for machines that reach a higher



frequency. The viscosity of the material after mixing can serve as an indicator here: The mixing time can be reduced if the material is too firm. After successful mixing, the capsule can be placed in the applicator. The capsule must be opened with a 180° half turn before the application. The outlet shifts to central axis - therefore, a quarter turn does not mean that the capsule is half open. The capsule is only opened after the



last few degrees of the half turn. Of course, sometimes the dentist can achieve a better angle for entire capsule must be turned to change the angle.

The curing reaction of the cement begins in the moment of activation. The setting reaction is greatly accelerated by the movement during mixing. VOCO cements are adjusted so that the cement already has a packable consistency directly after mixing. The application should be carried out immediately after mixing, since every second waited allows the cement to further harden.

Conclusion: The correct activation of application capsules can be easily carried out by observing the details presented here. This ensures that all of the advantages of the application capsules are available for a smooth procedure.