

The anti-carries effect of modern fissure sealants is undisputed in the literature. Compared to local fluoridation⁴ the risk of caries is six times lower. This results in a large need for sealing of molars and premolars, which can hardly be achieved by us dentists alone for economic reasons.

The newest generation of fissure sealants developed for use on wet enamel, such as smartseal® & loc from DETAX, enables the work to be significantly simplified in many points. A trained member of the practice staff can perform fissure sealing safely and gently due to the simplified and faster work sequence. Placing a rubber dam, as postulated by Gleim³ 2006, is completely unnecessary so a six-year old child can be treated faster and more easily.



Fig. 1: "Older generation" sealing in need of renewal

Sealants of the Bis-GMA type available hitherto have a markedly lower hardness because their filler content is reduced by approx. 40 -50% compared to fillings (Fig. 1). smartseal® & loc also uses about 50% filler but the particle size is just inside the nano range at less than 1 µm. This explains its high abrasion resistance and very good flow behaviour. Air bubbles and chipping are often reported in the literature¹. I have not observed this with smartseal® & loc. The modern fissure sealant smartseal® & loc is hydrophilic, quite the opposite to conventional sealants. This means that application to a wet surface is possible. Apparently, the wet surface enables better moistening (Fig. 2) and thus deeper penetration of the material,



Fig. 2: Good wetting properties of smartseal® & loc

which is expressed as increased adhesion and less cracking at the margins...

Why can the new fissure sealants bond very well with the wet tooth surface due to their hydrophilic properties?

Because of their particular chemical properties (acid groups contained in the formulation), they form a strong chemical bond with the calcium in the tooth surface. However, the acid content of the sealant appears to be so low that no tooth sensitivity was observed even with several applications directly to dentin (not licensed by the manufacturer!). Prior treatment of the dental enamel should consist of thorough cleaning (cleaning paste or powder spray). This should be followed by acid etching for 20 – 40 seconds



Fig. 3: Etching with smarseal® etch

depending on the viscosity and phosphoric acid content of the etching gel used in the practice (Fig. 3). To avoid acid residues or dissolved enamel elements remaining on the tooth surface, rinsing for at least 20 seconds is recommended. It is particularly important to gently drive large "puddles"



Fig. 4: Cleaned and etched enamel surface with small cavities for extended fissure sealing

les" out of the fissures with a gentle air stream. As soon as the tooth cusps begin to look dull, this should be stopped so that the water film in the fissure is maintained (Fig. 4).

Even when applying the material with the cannula (Fig. 5), the special wetting properties of the material can be seen.



Fig. 5: applying with the cannula

Naturally, this flows in a liquid stream apparently without a large contact angle. Light curing should be for at least 20 seconds. Further working is hardly ever needed after optimal use except in the case of rare occlusion corrections (Fig. 6). The only other recommendation is subsequent fluoridation of the etched areas of enamel not covered by the sealant.

A marked oxygen inhibition layer was not found in any case. The margins of the sealing can no longer be felt. The surface of smartseal® & loc feels very hard and strong (Fig. 7).

After using it for over six months, no damage or deterioration of margin quality was found on initial follow-up. The air



Fig. 6: hydrophilic smartseal® & loc

bubbles frequently described in the literature appear to be avoided effectively by the intensive moistening on the wet tooth enamel and the very precise application through the long and very fine cannula.



Fig. 7: "Sandwich technique" with smartseal® & loc white with fluoride

smartseal® & loc comes in two colours, semi-transparent and white. Semi-transparent allows checking for caries and remains unobtrusive visually while the white sealant is easier to check for completeness and also contains fluoride. Experience with smartseal® & loc shows that the significant material improvement makes for simplification and saves time, coupled with qualitative advantages for the patient.

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Bibliography:

1. De crane LGP, Martens LC, Dermont LR, Summon PAS: A clinical evaluation of a lightcured fissure sealant (Helioseal®), ASC J dent Child 1989, 56: 97-101
2. Garlichs J, Holzmeier M: Wet-Bonding-Der neue Weg in der Fissurenversiegelung DZW Spezial 2005, 6: 12-14
3. Gleim A: Retentionsrate und klinische Verarbeitungseigenschaften der Fissurenversiegler Helioseal-F und Fissurit- F im Vergleich Inaugural Dissertation: edition scientifique VVB Laufersweiler Vlg 2006
4. Splieth Ch, Förster M, Meyer G: Vergleich von Lokalfleuridierung zur Kariesprophylaxe an ersten Molaren bei Kindern. Dtsch Zahnärztl Z 1998, 53: 799-804

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