AFFINIS SYS360 putty – maximum precision and easy to use

DR. RALPH SCHÖNEMANN, NOVEMBER 2010

Dentists can now select from a wide range of very different impression materials supplied by a large number of manufacturers, of which silicone and polyether are the most common.

The correction and dual-mix impression techniques have become standard for preparation impressions in dental practices in our regions. In recent years the use of digital optical impressions for fabrication of CAD/CAM-generated workpieces has become more common and the work processes in laboratories have been modified considerably to accommodate this technique. However, taking an impression from the patient cannot be substituted by optical techniques as the basis for fabrication of a working cast.

When comparing silicone and polyether the following properties can be briefly compared. The viscosity and consistency of silicone can be relatively easily adjusted. For high-viscosity silicone this advantage ensures a high press-on pressure and as a result very good displacement of important soft tissues such as the interdental papillae and the unattached gingiva.

In a moist environment the reproduction accuracy of silicone is very good. While patients perceive the neutral flavour of the material as pleasant, dentists appreciate the general ease of handling. On the other hand, many dentists strongly favour polyether. This is particularly due to its chemical properties in situations that are very difficult to keep dry. The very good flow properties give an excellent reproduction of the preparation situation.

However, it is precisely the very good flow properties, so much appreciated by users of polyether, that is one of the main reasons for transfer errors by blurring while taking the impression. It does not have the snap-set behaviour, which ensures that the impression material sets in the mouth as quickly as possible. The position of the tray in the mouth is much less stable and more prone to movement compared to the more viscous silicones. I will discuss this topic in more detail in the section explaining the impression. The patient finds it difficult to become used to the taste of impression materials of polyether and often finds them unpleasant.

The surface affinity of the inherently hydrophobic silicone material has been significantly improved in recent times by optimisation of the material properties. This is expressed particularly by improved flow behaviour in a moist environment. There are enthusiastic users of both materials in the world of dentistry, with most preferring only one material in their own practices. Users who selectively use both materials appear to be a much smaller group. In my own practice I have come to appreciate the qualities of A-silicone.

AFFINIS SYS360 putty was subjected to a practical test to prove its value. The planned application was a partial crown preparation of teeth 36, 37 and 38 in the left mandible. Secondary caries was present at three extended insufficient amalgam fillings. Frequent impaction of food residues in the proximal region had the usual consequences, such as increased probe depths and inflammation of the marginal gingiva (Fig. 1 + 2).

The patient decided in favour of a non-metallic restoration of indirect composite. The expressed wish for permanent adhesive leak prevention in the marginal region and good experience with direct composite restorations were the reasons for this selection (see literature at I. Krejci, Geneva, and also D. Dietschi, Geneva, and R. Spreafico, Milan).

During pretreatment the amalgam fillings and the linings were removed. Next were excavation and treatment of the proximal root surfaces by micro-debridement and smoothing, then the restoration with adhesive (A.R.T. Bond) built-up restorations (ParaCore) (Fig. 3). The pretreatment was followed by a phase of re-evaluation of the pulpitic and periodontal development. Then the three molars were prepared for partial crowns. The requirements for preparation for indirect composite restorations are generally similar to those for full-ceramic restorations. Avoiding sharp angles, sufficient spatial conditions, rounded boxes and steps, clear preparation margins and smooth surfaces help with taking the impression and the fabrication of a well-fitting restoration. The prepared and unprepared sections of the teeth were thoroughly coated with

AFFINIS regular body (Fig. 4). At the same time the assistant filled a prepared AC-President Tray with AFFINIS SYS360 putty (Fig. 5). The advantage of this impression tray is that the finished impression can be autoclaved in the steam steriliser. This maintains sterility for the practice team, dental technology team and the patient.

The consistency of the impression material immediately after filling by the mixing machine must be judged as very satisfactory. It is easy to distribute and press down the impression material in the tray with the thumbs (Fig. 6). The material behaves like a hand-kneaded putty and does not stick to gloves. The filled tray is then placed on the teeth (Fig. 7). The contact pressure is pleasantly high and the tray is in a relaxed position in the patient's mouth immediately after the impression has been positioned as desired. I find this relaxed position very advantageous, because any inaccuracies caused by movement can be significantly reduced. A comparison to the polyether-based materials seems appropriate at this point. The good flow properties of polyether certainly do enable it to flow around the preparation well, but the setting effect of the impression is very delayed. This is primarily due to the slow setting of polyethers (therefore risk of blurring). In contrast, the Coltène/Whaledent AG A-silicones have a snap-set behaviour, which means that the impression material sets as quickly as possible - immediately it has been placed in the mouth. The machine-mixed putty that was used in this case was much more stable during the impression compared to conventional silicones. I consider this part of taking an impression with polyethers as particularly critical, because even very small movements of the tray or by the patient can cause serious distortions of the impression. In my own practice when using polyethers I have had to compensate for the unstable position of the tray in the mouth by customising the impression tray as much as possible and by placing stops in the inside of the tray. These additional steps are unnecessary when using AFFINIS SYS360 putty.

Identical materials in the dual-mix technique were used for impressions in the maxilla and mandible (Fig. 8 + 9). After taking the impression a bite record was also made with JET BLUE BITE (Fig. 10). A temporary restoration for the three teeth was made with Cool Temp NATURAL using the direct technique (Fig. 11). A preliminary impression of the same teeth, also made with AFFINIS SYS360 putty, was used as a mould after they had been restored with adhesive build-up fillings. The impressions were processed in the dental laboratory after the above clinical steps. It makes considerable sense to bring the dental technician and the patient together to define the tooth shade before delivery of the temporary dentures. With indirect composite restorations, the assessment of the dentine shading and the visible and measurable enamel thickness provide very valuable information during the process of fabricating these extremely individual products.

During fabrication of the working model, the dental technician judged the filling of the dental stone in the preparation as very good (Fig. 12), with the characteristics of the set silicone giving the stones good flow properties (Fig. 13).

The maxilla was plastered into the articulator with a transfer table after a facebow recording. The JET BLUE BITE register helped with setting the mandible in the articulator by setting it together with the maxilla (Fig. 14). The bite record, with its final hardness of approx. 90 Shore A, enabled a stable and accurate positioning of the model in the exact position. For programming the articulator, we ensured that a front cuspid segment could be removed separately when checking in the model (Fig. 15).

Before the layering of the composite restorations was started, the clearly visible preparation margins were carefully freed to allow access for instruments and brush during modelling. Lacquers that give an impression of space should be applied very sparingly in the marginal region. The Vectris isolation worked well here and applied a very thin wax layer in an ethanol solution to the stump. Multiple coats can be applied in some peripheral regions (Fig. 16). We recorded all information required for indirect composite restorations, such as the desired shade coating, in a laboratory order. The individual partial crowns were fabricated with SYNERGY D6 composite from Coltène/Whaledent AG (Fig. 17 + 18). To give character to the fissures we used effect pastes from Miris^2 or paint-on colours (Coltène/Whaledent AG) (Fig. 19). It is important to reduce this intensive shading again and to restrict it to the deepest fissure sections only (Fig. 20 + 21). The work is then thoroughly polymerised with a polymerisation lamp (Fig. 22). The thin spacer layer of wax was melted off with hot water before removal of the modellation to restore the original preparation dimension (Fig. 23 + 24). The static and dynamic occlusion of all restorations was checked in the articulator and then polished. The test-fit on the laboratory stump and on the prepared teeth in the patient's mouth indicated an identical situation, which is due to factors such as the high accuracy of the

dimension transfer by the impression (Fig. 25 – 27). The work was cemented in with A.R.T. Bond and tips heated in Calset with SYNERGY D6 Universal (Fig. 28).

Conclusion on AFFINIS Sys360 putty:

The neutral flavour of AFFINIS SYS360 putty was generally perceived as pleasant by our patients with no after taste as with polyethers. However, the demoulding was somewhat more difficult than, for example, with AFFINIS heavy body or MonoBody. This is primarily because of the way the material flows around the moulded parts. Injection of air into the impression from the side breaks the vacuum and makes it easier to remove the impression. Because of the high Shore value, the impression is not closed with a periodontally damaged dentition, but patients may still perceive it as unpleasant.

Mixing by machine ensures a homogenous, bubble-free and constant quality, while the higher viscosity corresponds to a genuine putty material. Our dental technician found it very easy to cut. The mixed material can be moulded in the tray and does not stick to gloves during distribution.

AFFINIS SYS360 putty makes is easier to take an impression, because the highly viscous consistency combined with ideal snap-set behaviour keeps the tray stable after it has been positioned. I found the reduced proneness to blurring a very significant improvement. The very high press-on pressure of AFFINIS SYS360 putty presses the low-viscosity correction component AFFINIS regular body very deeply into thoroughly dried sulcus sections to yield very reproducible details. The legibility of the impression is very good, even when combined with AFFINIS correction materials.

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Fig. 1

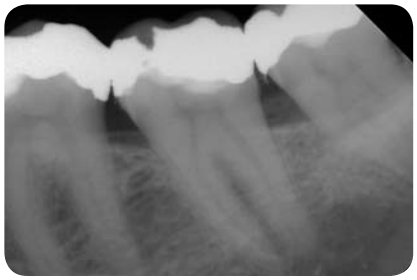
Fig. 2


Fig. 3


Fig. 4


Fig. 5

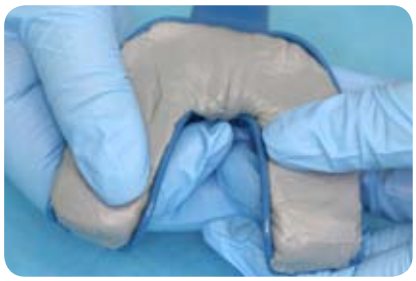
Fig. 6


Fig. 7


Fig. 8


Fig. 9


Fig. 10


Fig. 11

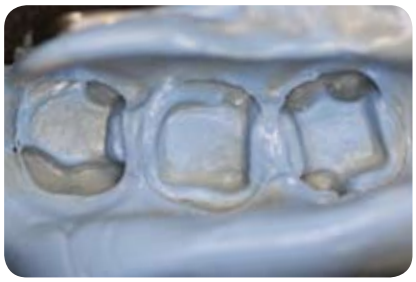
Fig. 12

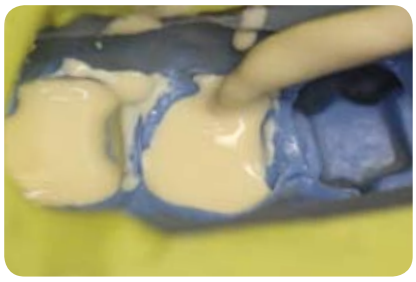
Fig. 13


Fig. 14


Fig. 15


Fig. 16


Fig. 17

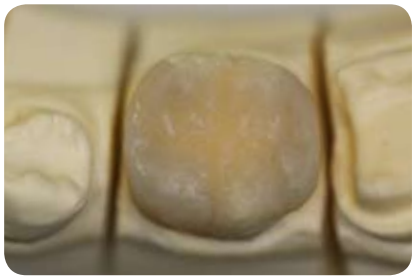
Fig. 18


Fig. 19


Fig. 20


Fig. 21


Fig. 22


Fig. 23


Fig. 24


Fig. 25


Fig. 26


Fig. 27


Fig. 28