Dental treatment may be described as the sum of a series of operations performed one after another. Each individual therapy can, in turn, be determined by the sum of a series of successive procedures. Finally, each surgical procedure is nothing but a series of steps following one after another. The outcome of treatment depends on the quality of each step – even the smallest. A key feature of all restorative procedures in conservative dentistry is the application of an adhesive system that ensures the best possible bond between composite material and dental tissue. Classic earlier generation bonding systems are a highly effective means of connecting restorative materials with tissues in a single, highly complex application procedure, which sometimes consists of 10 successive steps performed one after another. Each step carries with it a potential risk of error, especially in cases when the treatment of patients involves many additional factors that can hinder the dentist's work.

It is no surprise that over the last few years advances in adhesion have focused on maximizing the simplicity in application procedures to eliminate the potential "weakest links" in those procedures when the operator is most prone to make errors.

The latest achievement in this area is the Bond-1 SF bonding system from the company Pentron, which has been developed together with the composite Simile™. This is a one-bottle system (and in principle a one-container system – supplied in the form of a syringe similar to a flow-type material) (Fig. 1), which does away with the need for a solvent. The bond is applied directly from the syringe using a suitable application tip in the form of an appropriately shaped brush (Fig. 2).

Abstract
The trend of adhesive systems in restorative dentistry has been going towards developing agents that ensure the easiest possible application while at the same time providing appropriate bonding strength. This tendency is due to studies confirming the effects that complicated application procedures have on the ability of a bonding system to achieve effective adhesion between a composite material and the hard tissue of teeth. One solution to this problem may be the Bond-1 SF system - which does not require a solvent - a benefit that considerably simplifies the application procedure. The study describes a clinical case involving the treatment of a child patient in which a simplified procedure appears to be the ideal solution.

Keywords
Adhesion, solvent, composite material, bottle caries

Fig. 1 Syringe with Bond-1 SF bonding system is fairly atypical for this group of products. It was possible to propose this convenient type of container since no solvent is required.
Because there is no solvent, the material is uniform and the syringe does not require shaking. It has higher filler content than other bonding systems (Fig. 3) (its consistency is similar to that of flowable materials). The absence of a solvent means that Bond-1 SF does not require air-blowing after application, which shortens the entire procedure to just two steps!

All bonding systems based on Bond-1 SF self-etching substances exhibit equal affinity to dentin and enamel. They have been proven effective in cases where we are dealing with a larger area of exposed dentin than enamel (Fig. 4). Prior to applying the bond, the cavity should be dried, but without desiccating the tissue (Fig. 5). We then apply the bonding system from the syringe and use the tip included in the pack to rub in the bond for 20 seconds (Fig. 6), after which we light cure it for 10 seconds (Fig. 7). We then achieve a hard tissue surface ready for the composite material to be applied (Fig. 8).

The short time and simplicity involved in the application procedure minimize the risk of error, which in turn ensures a high bonding strength that can be achieved time after time in every operation.

Composite fillings are becoming much easier to use, which may encourage the broader application of such materials in difficult clinical conditions when one of the main factors is the duration of the procedure itself. Pediatric dentistry would be an ideal area where composite materials could be employed on a wider scale. Until now, glass-ionomer cements have tended to be the material of choice, as they are simple to use on anxious patients. However, Simile™ combined with the Bond-1 SF system has emerged as a better solution as it offers greater bonding strength with a simpler and shorter application procedure.

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“Simplicity is the result of maturity.” Friedrich von Schiller

Maciej Mikołajczyk DDS, PhD, Warsaw, Poland

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Fig. 2 The manufacturer provides application tips adapted for rubbing the agent into the dentin tissue.

Fig. 3 The bonding system itself has a relatively thick consistency compared with traditional bonding agents.

Fig. 4 The bonding system should be applied to the lightly dried surface of the enamel and dentin.

Fig. 5 We perform all steps using only the container with the bonding system.

Fig. 6 After application, the agent should be rubbed into the dental tissue for 20 seconds, with no need for air-blowing.

Fig. 7 The next step is polymerisation, which takes 10 seconds.

Fig. 8 The cavity is prepared for the application of the composite material.

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A clinical case

A 3-year-old girl came with her parents to our dental clinic for treatment. The patient was suffering from baby bottle caries, which had already reached an advanced stage by the time she came to our clinic. In addition, an unsuccessful dentin impregnation procedure had resulted in considerable darkening of her carious lesions (Fig. 9), which caused great discomfort (although mainly of a psychological nature) to both the parents and the girl herself. Treating lesions in places on small patients is viewed as a fairly challenging task because they depend on the cooperation of a patient who becomes easily "bored" with the procedure. Another drawback is the technical problems involved in maintaining fillings on surfaces with little retention. It was decided to use the Bond-1 SF set together with Simile™ due to the advantages described above. Bond application was short and completely pain-free for the patient (Fig. 10). It is important to stress that thanks to its thick consistency we can achieve great precision during application, and appeal to child patients who find the taste neutral. Once the bonding system had been light-cured, we could begin applying the composite material (Fig. 11). The short duration of the procedures in this case allowed us to minimize the danger of saliva contaminating the area while the patient was very cooperative the whole time. The application of Simile™ ensured complete coverage of the exposed dentin and the elimination of unfavorable aesthetic effects (Fig. 12). Using the right bonding system guarantees that the restoration remains in place until the physiological replacement of the deciduous teeth occurs, which makes this treatment a success.

Fig. 9 The effects of baby bottle caries and unsuccessful dentin impregnation in a 3-year-old patient.

Fig. 10 The fast Bond-1 SF application procedure makes it possible to use composite fillings on small patients.

Fig. 11 The Simile™ composite material could now be applied.

Fig. 12 Treatment of anterior teeth in children is also important for aesthetic reasons. Hence, composite materials are the best choice in this case.