

Flextec® inside!



Modularity means flexibility. Simply combining a small number of different elements in different ways can result in a huge variety of finished components. With its Flextec technology, Henkel has now achieved just this. Flextec prepolymers are the building blocks for many different kinds of products, ranging from sealants to adhesives.

The basic structure of the polymers is relatively simple. Highly reactive silicon groups, also known as silane compounds, are docked onto the ends of polyether chains of different lengths. By modifying the length of the polyether chain or by varying the number of silane compounds or the position of these groups in the molecule, the adhesives researchers obtain products with, in some cases, fundamentally different characteristics. The longer the chains, the more elastic the product. The product developers are thus capable of covering a broad spectrum of elasticities. These range from products with a relatively low modulus of elasticity destined for the sealant market to products with higher moduli, which are more suitable for adhesives.

The number of chain branches, on the other hand, affects product strength. The more branched the chain, the stronger the product.

The scientists control the speed at which adhesives and sealants react and cure by varying the molecule types – methoxy groups, for instance – linked to the silane compounds at the ends of the chains. This is because the curing time has to be individually adjusted for each product and application. An assembly adhesive needs high initial tack and has to hold immediately if, for example, the user

wants to bond a shelf to a wall. A parquet adhesive, on the other hand, is designed to allow the flooring specialist to make corrections for some time during the installation process.

Modular system with Henkel know-how

Polymers are not the only ingredients of adhesives and sealants, which can consist of about 10 to 15 individual components. And these are the building blocks that the adhesives specialists put together to achieve the desired product characteristics. Henkel's special expertise lies in selecting the relative quantities of these components and their particular chemical compositions.

UV stabilizers make the products resistant to solar radiation, while special fillers influence their mechanical properties. By using still other additives, the developers adjust the consistency of the products.

Advantages over polyurethanes and silicones

Products based on Flextec technology have properties that are much the same as those of polyurethanes and silicones – but without their drawbacks. For instance, the polymers also adhere to

First products

As a result of close cooperation between the adhesives research and development departments in the USA, Spain and Germany, the first products based on Flextec technology are already available. One of these is the sealant Sista Solyplast SP 201 in Spain. It will be launched in other countries as well.

Another example is the powerful assembly adhesive Pattex PA 700, available in Germany as Pattex Super Montage spezial and in Benelux as Pattex Power Fix. Sista Solyplast SP 101 has multifunctional uses, serving as both a sealant and an adhesive. Thomsit Parquet Adhesives P685 and P690, launched in Germany in 2004, for bonding parquet and parquet composite flooring, also contain Flextec technology, as does Ponal Parkett- und Laminat-Fugenfüller (a parquet and laminate joint sealant). In the USA, Henkel is using Flextec technology under the Loctite brand, as a silicone substitute for sealants in the automotive industry, for example.

The latest product is Pattex Super Montage Detachable, the first detachable assembly adhesive. Even years later, the home improver needs nothing more than a kitchen knife or putty knife to separate bonded parts – usually without leaving residues and, if the appropriate technique has been used, without damaging the substrate. This is of huge benefit to home improvers who want interior design flexibility and for tenants who have to leave their apartments in their original condition when they move out. Henkel has been marketing this detachable assembly adhesive, the world's first, in Benelux since 2005.



Pattex Super Montage Detachable is the first detachable assembly adhesive. Even years later, parts bonded with it can be pried apart with a putty knife.

almost all substrates, but have a far greater UV stability compared to polyurethanes, making them suitable for outdoor applications, too. They also adhere extremely well to damp substrates, can be painted and bonded over, are compatible with paints and coatings, and are detachable. They do not become brittle at low temperatures, i.e. they exhibit what the experts call “cold flexibility.” The products

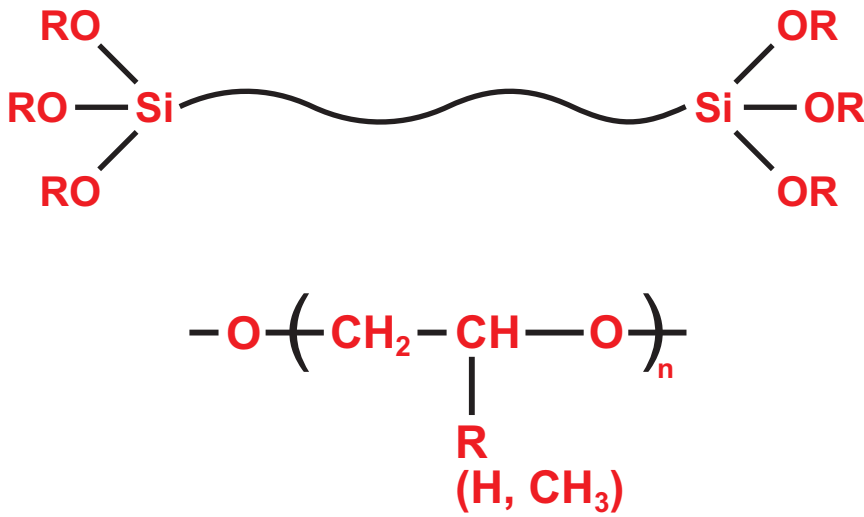
contain neither solvents nor isocyanate and, as one-component systems, are not only extremely user-friendly, but also combine all the positive properties of polyurethanes and silicones.

Also suitable for problem applications

Moreover, these innovative products can be used wherever polyurethanes or



Because silanes are highly reactive, already curing in the presence of atmospheric moisture – the higher the humidity, the faster the reaction – Flextec products are supplied to consumers in completely airtight packages.



A true all-around talent

Flextec is a high-performance, solvent- and isocyanate-free binder that is exempt from hazard labeling. Using Flextec basic technology in a modular system, it is possible to produce an endless sequence of new prepolymers based on silane compounds. Depending on the resultant degree of elasticity, these binders can be employed in a wide variety of adhesives and sealants. What they all have in common is “Flextec® inside!”

The basic structure of Flextec polymers: Polyether chains (bottom) with reactive silane groups at the ends (top)

silicones fall short – in particularly difficult bonding situations such as the underwater sealing of fire protection pond liners or swimming pools, or the bonding of materials with different thermal expansion behaviors, e.g. glass-reinforced polyester and steel. Other possible applications for these products include sealing problems in cold storage units or liquefied gas tanks.

This diversity combined with optimal characteristics promises Flextec a great future as a basic technology.



Developing a broad range of adhesives and sealants with the aid of the Flextec modular system (l. to r.):

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