

## New materials and technologies – hybrids

*The development of hybrid-based products in science and technology is booming. Hybrids stopped being a vision for the distant future some time ago now. Every day, we encounter fusions of complex technologies in our everyday lives. The smartphone: a mobile computer with an integrated camera. The car: propelled by an electric engine and a combustion engine. tremco illbruck also capitalises on the benefits which hybrid technology offers and uses it when developing innovative sealants and adhesives.*

### **What exactly is a hybrid?**

In ancient times, the term hybrid, derived from the Greek ἵβρις hýbris and the Latin hybrida, originally meant hubris, but also referred to cross-breeds, or hybrid beings. In today's usage, a hybrid is understood to mean the product of two or more materials which have been combined. In the construction industry, combined composite construction materials are referred to as hybrids. A hybrid is created when two or more existing technologies are merged to create a new product.

### **What does that mean with regard to the technologies behind adhesives and sealants?**

A sealant or an adhesive, which combines the characteristics of a polyurethane product with those of a silicone product, unites the positive characteristics of both chemical materials.

These hybrid construction materials function as a binding element between materials which do not actually fit together, such as glass and metal or concrete.

In manufacturing, this means that when a whole product is created from several components, material characteristics can be produced which have hitherto never been achieved. Even if hybrid technology is based on an artificial process, it is in fact nature that serves as a model, as is so often the case with the development of complex technologies. Mixed materials such as bones and teeth or beehives are fascinating examples of hybrids from the natural world.

With hybrid products, new applications can be replicated on building sites and in many areas they can even be completely substituted. True to the slogan "adhesives are the new screws", today high-performance adhesives can already replace screws during installation. tremco illbruck is a specialist when it comes to the use of hybrid technologies for bonding and adhesive purposes.

Our objective is to equip the end product with characteristics which offer the user crucial added value. Thanks to hybrid technology, tremco illbruck's products deliver the following benefits:

- Odour-free (compared to polyurethane and acetoxy silicone)
- Highly transparent (e.g. illbruck SP030)
- No hazard classification (compared to polyurethane)
- Free from isocyanates and silicones

### **Construction products based on hybrid polymers**

Hybrid products combine desirable characteristics. The advantages of hybrid construction materials are clear: they are higher-performance products which have been adapted to meet customer requirements and which can be used in numerous areas of application.

Hybrid adhesives and sealants meet vital conditions which are set for the construction and installation sectors. These include, amongst others:

- Temperature resistance of between 70°C and 90°C
- Tension-equalising adhesion to mirrors (tolerance with mirrors and critical synthetics)
- Adhesion without a primer is possible in the majority of cases
- Skin formation in approximately 5 - 15 minutes
- Curing speed in the first 24 hours is approx. 2.5 - 4.0 mm
- Storage life of 12 months
- Long term flexibility
- UV resistance
- Can be applied without a primer coat
- Adhesion to all tools in standard use (universal adhesion)
- Environmentally friendly and non-damaging to the health

### **Technological progress using hybrid products**

The use of modern, innovative products based on hybrid technology ensures that our customers see technological progress. This is because in contrast with conventional construction products, we are able to offer a green alternative: our hybrids are free from solvents, isocyanates and silicones and are non-hazardous. Furthermore, they are low-odour and environmentally friendly. High-performance products for the widest variety of applications – a clear advantage when selecting a product.

## “The best of both”

Our hybrids combine the positive mechanical qualities of a polyurethane with the outstanding application characteristics and the resistance of a silicone.

tremco illbruck has recognised the need for such products in the construction and installation sectors at an early stage. The high demand and positive feedback confirm that the concept of capitalising on hybrid polymers to an even greater extent is a good one.

## Center of Excellence for hybrids and polymers

Combined composite materials have a long history at tremco illbruck: as one of the first manufacturers of these products, tremco illbruck cited hybrid technology as a core topic as early as ten years ago and has strategically developed it. In the Center of Excellence in Traunreut, the bulk of our research is focused on hybrid sealants and adhesives. Here, 20 R&D experts work together with our customers on more than a dozen projects per year. tremco illbruck will also offer and further develop customer-oriented solutions involving hybrid polymers in the future.

### Infobox Hybrid products

#### SP925 Air Seal

SP925 is a one-component, low-viscosity sealant based on hybrid polymer technologies. It is chemically neutral, low odour and is compatible with most common building substrates. SP925 Air Seal is a sealant specifically developed to provide weather and airtightness in areas difficult to seal with conventional sealants.

Brushable and sprayable | Permanently elastic | Solvent, isocyanate and silicone free

#### SP350 Fix & Seal High Tack

SP350 is a one component, non-sagging, elastic adhesive based on hybrid polymers. SP350 has been developed to bond materials to floor, wall and ceiling, where the extremely high initial strength of the product is very useful for this high performance adhesive.

High initial grab and rapid development of final bond | very low odour, and chemically neutral | Solvent, isocyanate and silicone free