

BONDING OF CRITICAL SUBSTRATES ON ASSEMBLY LINE and REPAIR OF CAR BODY STRUCTURES WITH 2C SOLUTION

ABSTRACT:

SikaForce®-820 Product Description

Weight-saving activities in the automotive industry are still ongoing. Another trend is the use of more complex shapes at the car body. Designers want more freedom to fascinate customers. To combine light weighting and design freedom, automotive OEM and OES customers are replacing more and more steel and glass by plastic materials. To assemble exterior parts as roofs, tailgates, spoilers and fenders, Trim Shop adhesives are in use to combine thermoplastics and composites. One of the most important substrates to replace glass are PC (polycarbonate) and PC-blends. A good example is the bonding of roof modules. For the roof bonding application different adhesive systems are in use. All of them show limitations. Critical aspects are the combination of plasticizers inside the adhesive and solvents inside the primer. A proven and reliable solution is to apply a double layer of primer. In this case the primer is working as a barrier for plasticizers. Target for Sika was to minimize 2:1 mixing ratio, allows easy prototyping. Beside of modulus, the need to build up thick bondlines has to be mentioned. Creating a 2K PUR with excellent mixing behavior and good non-sag behavior is critical. Due to a special rheological adjustment, bondlines with a compressed thickness of approx. 5mm could be achieved.

SikaForce®-820 does not contain any stress critical ingredients. So, environmental stress cracking is history now with introduction of this new type of adhesive.

The easy application with static mixers, the missing pretreatment of PC and PC-blends, the possibility to apply thick bondlines and the compensation of thermal expansions make the SikaForce®-820 to a strong partner in bonding critical thermoplastic substrates.

the residual risk and to avoid any risk of environmental stress cracking and to offer a reliable and durable bonding of PC exterior parts. Working without primer is reducing the risk of stress cracking, but offers also a lean production process.

So, Sika established a new product which is especially developed for the bonding of PC and PC-blends. The new SikaForce®-820 merges the advantages of 1-K PU technology with the 2-K PU technology. With the development of the new and innovative SikaForce®-820 two main advantages could be offered:

- High flexibility in complete service temperature range
- Excellent adhesion to PC and PC-blends without primer
- No risk of environmental stress cracking (no ingredients that could lead to stress cracking, no primer necessary to achieve good adhesion)

The availability of cartridges due to the comfortable

SikaPower®-477 R Product Description

SikaPower®-477 R is a two component (2C) structural adhesive based on epoxy/amine technology with a new generation toughener to enhance crack sensitivity and therefore increase crash-resistance. The excellent adhesion properties allow professional bonding for a wide range of substrates like steel, aluminium and carbon-fibre reinforced plastic.

SikaPower®-477 R enables both a structural and crash-resistant repair of structural body parts made of steel or aluminium. Thanks to its high mechanical properties, the car is restored to its original conditions without any compromise on structural integrity. The innovative packaging concept of SikaPower®-477 R offers easy application with a standard 1C application gun at room temperature.

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The initial curing of the adhesive takes place at room temperature and is completed during the thermal curing of the repair paint. A robust and easy curing can also be achieved with a local heating e.g. infrared lamps or heating blankets. Contact on both substrates provides a good corrosion protection, and further processing operations such as welding or riveting are facilitated due to a long open time of approx. 60 minutes. The curing time can be accelerated by heating the product after application; e.g. during the thermal curing of the repair paint.

The applied heat leads to higher mechanical properties of SikaPower®-477 R. The outstanding product performance, excellent application properties and various application possibilities make SikaPower®-477 R the first choice for car body repair.

Technological Advantages

- Suitable for all structural repair applications
- Excellent crash-resistance performance
- Wide adhesion range (steel, aluminium, CFRP)
- Class leading glass transition temperature
- Increased stiffness
- High young's modulus
- Inhibits corrosion
- Free of solvent and PVC

Application Benefits

- Adhesive can be applied with a standard 1C application gun
- Glass beads (0.3 mm) ensure a defined bonding thickness
- Easy and fast bonding surface preparation
- Long open time enables easy welding and riveting afterwards