A new generation of automotive bonding, sealing, damping and reinforcing systems are, however, needed to ensure that the components have the necessary finish and durability. One of the leaders in the development of these systems is Sika Automotive. Automotive Industries (AI) asked Dirk Urbach, Director Key Project Management at Sika Automotive, to share some of the company’s latest automotive innovations.

Urbach: In response to the increasing number of automotive exterior assembly applications where various plastic parts are involved Sika Automotive has developed fast-curing but robust 1C-Polyurethane systems for design of exterior parts using thin thermoplastic material even for class-A surfaces. In addition, SikaForce-7570 HP is used for bonding where plastics replace typical metal components. As an example, the adhesive is ideal for manufacturing full thermoplastic tailgate, offering an impressive weight saving compared to the steel version. Due to the fact that it can be used without surface treatment SikaForce-7570 HP provides greater process safety, which results in higher safety based on an improved, stable quality of the final part.

AI: Similarly, how have Sikaflex-270 for fast-curing exterior elastic bonding and SikaForce-7571 L04 for structural bonding helped changed the way automobiles are manufactured?

Urbach: The fast curing system Sikaflex-270 1C-Polyurethane plus SikaBooster AC-30 was introduced by Sika for a very important aspect within the requirement list of automotive customers which had often been neglected. It is the expectation of our customers to get a robust and reliable system which can cover variations in environmental conditions during production, as well as certain changes in the quality of their substrates. Therefore, it has to be seen in combination with our UV-resistant pre-treatment SikaPrimer-207. The combination of primer and adhesive can be used on almost all relevant exterior part materials. The treatment ensures a stable and fast adhesion build-up independent of the substrate, and less dependent on the environmental conditions. Overall, the system has helped our customers to create production lines which are more cost-effective, but at the same time ensuring a consistent quality. It is now possible to produce parts for different car models or even different OEMs on the same production lines by using the same adhesive and pretreatment for all.

Dirk Urbach, Director Key Project Management at Sika Automotive.

Breakthroughs in bonding and coating enable OEMs to reduce weight by switching to plastic parts

Polyurethane and polycarbonate components and body parts are coming into their own as manufacturers strive to reduce weight in order to lower emissions.

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Our latest development SikaForce-7571 belongs to our new generation of 2C-Polyurethane adhesives. Currently in the introductory phase in the market, Sika’s expectation is that it will support a wider introduction of polycarbonates and their derivatives into the design of automotive exterior parts. SikaForce-7571 is able to provide a higher-level confidence when using polycarbonate (PC) materials because of its mechanical properties and chemical composition. It addresses the concerns regarding long term durability using currently available elastic adhesives.

**AI:** Give us some examples of OEMs that have applied these technologies in their vehicles.

**Urbach:** The above-mentioned products are mainly used by Tier suppliers as they are utilized for component bonding e.g. spoilers, panoramic roofs and tailgates. They are used for parts manufactured for all major OEMs around the world.

**AI:** How can solvent-free adhesives and plasticizers guarantee a minimized risk for the bonding of polycarbonate?

**Urbach:** Polycarbonate is an interesting material for the construction of a new generation of lightweight exterior parts. For the broader implementation of this substrate it also needs a suitable adhesive solution. In the case of exterior parts, the polycarbonate needs to be bonded to carrier and frame materials like e-coated steel or CRP which have a much lower thermal elongation than the PC itself. This requires the use of elastic adhesives to cover the stress in the bond line related to temperature changes. The standard elastic adhesives need a solvent based primer and contain a certain amount of plasticizer.

Unfortunately, polycarbonate is sensitive to chemicals which are typically part of the solvent-based primers. In addition, plasticizers from the adhesive can have a long-term negative effect on the mechanical properties of the plastic. This is well known and the OEMs try to cover this risk by manufacturing their PC parts with less tension or protect them with a hard coat, which is a cost-intensive process. Long-term ageing tests are done to make sure that no defect will occur throughout the lifetime of the car.

However, there is still a potential risk of a failure in the PC-part. For this specific task Sika has developed SikaForce-7571. This product will lower the risk for what is called environmental stress cracking. This adhesive does not need any solvent based primer on the PC component, and it does not contain plasticizer. Also because of its flexible characteristics and application properties it is our latest solution for the challenge of bonding polycarbonate. Next to this really innovative product we are offering polyurethane hot melts and other 2C-Polyurethane adhesives which have proven their performance properties especially for headlight bonding where Polycarbonate is one of the main substrates.

**AI:** How innovative is Sika’s Safety First or SF series of hotmelts for automotive interiors?

**Urbach:** The SF series of polyurethane hot melts is a new class of adhesives containing lower levels of residual monomer content of isocyanate than conventional adhesives. This lower monomeric content helps to address current industry concerns in the handling of these types of products. In the past, products with a reduced monomer content showed definitively lower performance regarding adhesion and heat resistance. The contributing benefit of the new SF series is an improved environmental sustainability while maintaining the excellent performance properties required for stringent lamination applications.

**AI:** How do they help in making interiors more comfortable and sound-proof?

**Urbach:** The SF hot melt series is mainly used for the lamination of automotive interior trim. As an example, one of the interior megatrends is the increasing number of leather laminated parts to improve interior comfort. Sika’s intention is to provide adhesive solutions which are able to pass the increasing OEM requirements for interior trim parts, while ensuring a safer working environment at the manufacturing site.

Sika has introduced a new generation of sealants for bonding glass with lightweight exterior components.

The SF hot melt series is designed for the lamination of automotive interior trim.