„Eastman Tritan™ copolyester makes a global contribution to higher security."

INTERVIEW with Daniel Lützelschwab, engineer and specialist for smart card foils, who speaks about the future of security documents and reveals, why it is important to use a high-performance plastic.

Mr. Lützelschwab, to what extent have the requirements for identity documents changed during the last few years?

Back in the 50s, names were still printed on a simple piece of plastic - the membership card was ready with that. Still earlier than that, even a printed piece of paper was enough. Nowadays, security documents are frequently smart cards, namely high-tech products that contain advanced electronics and a variety of different security features. Only the dimensions have remained the same.

What contribution can smart cards makes to global security?

Security-critical documents, such as smart cards, are usually digitalized and completely IT-compatible nowadays. They make it possible to identify a person electronically and without human intervention. Even a comparison with personal data in databases can be carried out. Modern smart cards are forgery-proof. This is relied on by security services, immigration officers and police authorities, at national borders, at airports and by many other official agencies. Other security documents, too, are nowadays protected in a similar way: Identity cards, passports (data page), driving licenses, healthcare cards, transport and bank cards.

Which plastics are suitable for modern security-critical documents?

The requirements are high: The durability of the polymer is relevant, and also the aging resistance with regard to chemicals, light and oxidation, as well as its mechanical rigidity and resistance to stress corrosion cracking. Especially stress corrosion cracking is becoming increasingly important, because more and more electronics are being installed in smart cards.
The plastics that have been available up to the present are only suitable to a limited extent. Polycarbonate is not resistant enough to chemicals, is subject to stress corrosion cracking and is negatively affected by skin oils. PVC is generally not durable enough.

Eastman Chemical Company is producing a new plastic called Eastman Tritan™ copolyester, which is most suitable.

How does Tritan make it possible to meet the requirements?

Tritan is a high-performance material, which has been developed on the basis of the newest insights of polymer chemistry. It disposes over a whole series of exceptional material properties, which have been combined in a balanced way at a very high level. Examples of this are its long service life of more than 10 years, its excellent resistance to skin oils, and its simple processing. Furthermore, Tritan has an excellent resistance against stress corrosion cracking, and it is free of such hormonally active substances as bisphenol A (BPA) and bisphenol S (BPS).

In short: Card producers can use Tritan to build in all mechanical, electronic, optical, biometric, and cryptographic security features, which can be used to protect a smart card against forgery and data theft, without a negative effect on the required durability. Tritan sets a new benchmark for smart cards.

Smart cards made of Tritan will then probably be quite expensive?

No. It depends on the total cost over the entire service life, namely the total cost of ownership (TCO), as defined by modern practice in business schools and economics. In the past, many card producers saw a favorable foil price as being equivalent to a cheap smart card - the foil price determined the selection of the material. Today, it is important to understand that the selection of the plastic has a decisive effect on the project costs of a smart card. The foil price is now only a fraction of the overall cost.

Why this change?

Governments are increasingly demanding sustainable products and are even including this demand in legislation. The cost calculation has to be expanded, also for smart cards. It is currently an important criterion that all of the installed properties and security features are functional for a longer period. Can a smart card maintain its full functionality during a period of 10 years, or does it have to be replaced or repaired a second or third time, due to low durability or premature wear and tear? The longer full functionality can be ensured, the lower will be the TCO.

Can you name an example?

Of course. To say it simply, one has to make a choice. Should one select a plastic that, while being cheaper, is not very durable? Or should one make a decision for a somewhat more expensive plastic that is substantially more durable. The TCO of smart cards are decisively determined by, amongst others, their mechanical, chemical, and physical properties. The costs of a finished smart card are currently rising in general, because increasingly complicated and expensive security features are being installed, with the objective of being sustainably superior to even the most skillful forger.

Would you go as far as to say that Tritan is a future-oriented plastic for security documents?

Yes, of course. The unique material properties of Tritan make it possible, to further advance the functionality of smart cards. Only in this way can state-of-the-art electronics and multiple security elements be installed, while also further personalizing these cards.

Folienwerk Wolfen is an important partner, for the manufacturers and issuers of smart cards. Which tasks are assumed by the foil manufacturer?

That can be explained quite simply. In the value-added chain of smart cards, the Tritan resin is converted into a foil. I work for Folienwerk Wolfen in Germany, which has been specialized in manufacturing foils for decades. It was one of the first PETG manufacturers in Europe, and it has a long tradition in the production of polyester foils. These foils are produced in Germany. This ensures an unchanging high quality.

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