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Visible security features on automotive spare parts represent a seal of quality for manufacturers and consumers. They guarantee that spare

parts are original. Whereas for the driver original parts mean a lower risk of an accident, the proof that they are original protects the manufacturer from any claims for compensation which are brought on the basis of counterfeit products. In the case of spare parts that are subjected to high stresses, such markings wear off too quickly. At this year's IAA, INM – Leibniz Institute for New Materials will be unveiling methods and materials which can be used to ensure that security markings remain visible for a long time even when parts are dirty or subjected to high stresses. It will present its results in cooperation with automotive.saarland in Hall 4.0 at Stand D27.

Nowadays typical security markers are produced from plastics. Embossing processes are used to embed random structures into these foils in the form of codes which appear as a hologram to the person looking at them. Heavy mechanical stresses and heat lead to scratching, abrasion or charring and thus to the holograms being destroyed or becoming illegible in a short space of time.

The developers from INM use glass-like materials based on silicates for their hologram-like structures. They cure at 500 degrees Celsius and after this they are able to withstand the high stresses mentioned above. Holographic grating structures which are embossed beforehand are preserved during the curing process in spite of their typical size being in the submicrometre range and therefore likewise achieve the level of resistance of the base material.

In addition, the scientists also cover the holograms which are produced with another, glass-like material. This has a significantly deviating refractive index. This means that the marking remains easy to read even in the event of heavy soiling or oily residues. "At the same time, this form of coating makes it harder for such markers to be copied," adds Peter William de Oliveira, head of the Optical Materials program division. The materials presented were particularly suitable for metallic

substrates.

In addition to the material basis, the INM also has facilities for mastering and for replicating corresponding structures. This makes it possible to support all development steps from the design of customer-specific features through to the development of production processes.

Provided by Leibniz Institute for New Materials