Electroless plating of dielectric surfaces

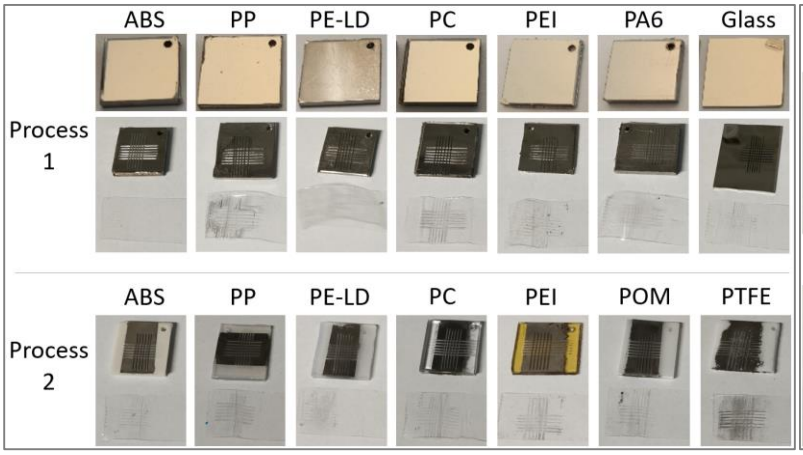
Transfer offer

In the galvanic metallization of plastics there is, with increasing requirements for approved reagents (e.g. REACH), a high market demand for alternative, environmentally friendly processes. For plastics such as ABS or PA, for example, a pickling step in chromosulfuric acid is essential to achieve good coating adhesion. In this context, two metallization processes were developed which (1) can be used on a wide range of dielectric surfaces (plastics, composites, glass, ceramics) and (2) do not require any chemical pickling steps at all.

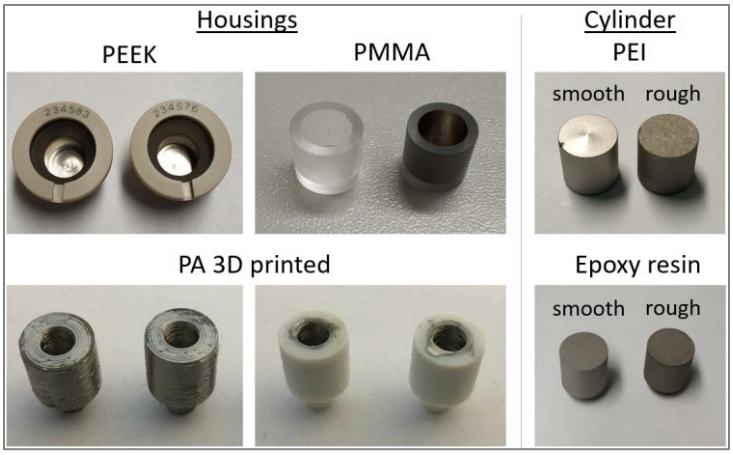
Technical solution

Through the use of plasma techniques, several process steps have been developed for electroless nickel plating:

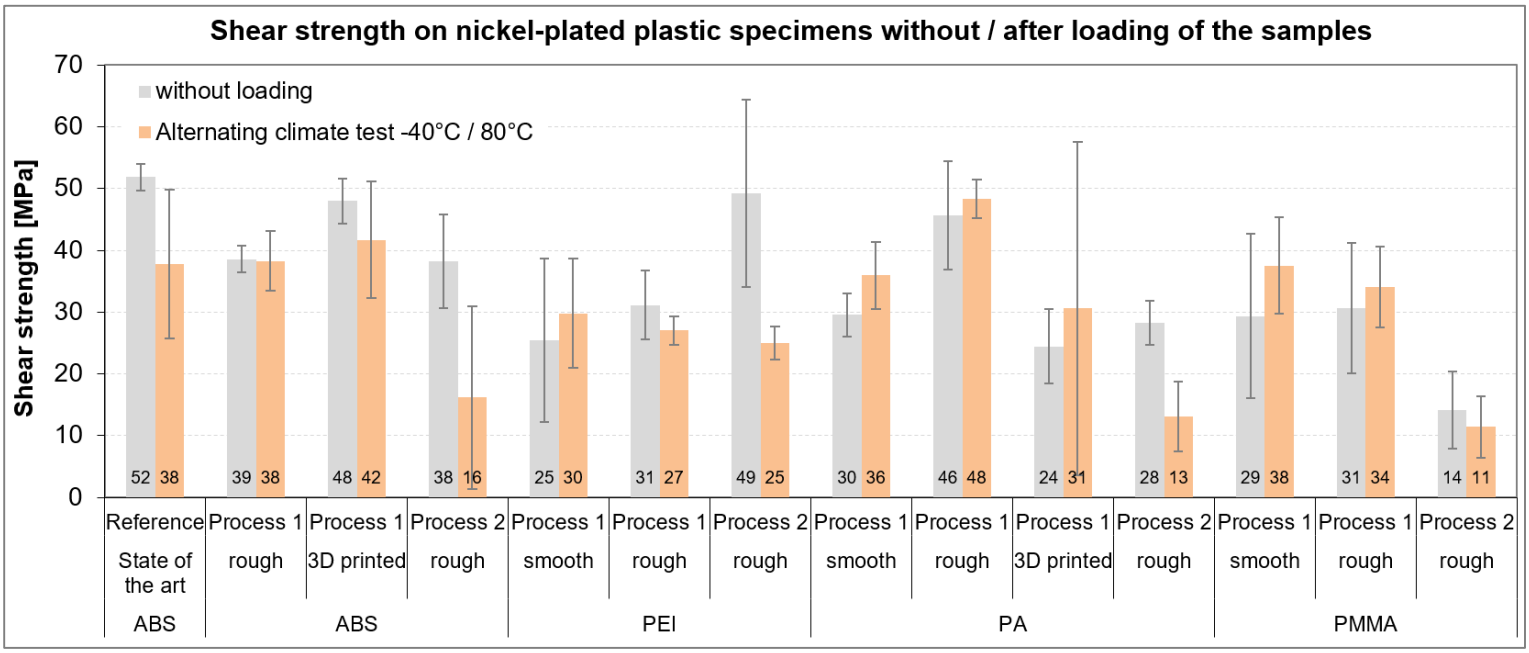
- Plasma pre-treatment adapted to the material => uniform palladium coverage during chemical Pd activation
- Direct deposition of Pd nanoparticles with atmospheric pressure plasmas => savings on immersion baths & chemicals



Metallised flat substrates (smooth) with process 1 & 2; Cross-cut



3D-components: Metallisation of the outer / inner contour



Shear strength on electroless nickel-plated ABS, PEI, PA, PMMA substrates, compared to state of the art ABS plating

Advantages

- **Suitability of the processes for a wide range of plastics as well as for composites (e.g. CFRP, GFRP, filled epoxy resin), glass, ceramics**
- **No use of pickling solutions and aggressive chemicals**
- **Depending on the process, coating of flat substrates, 3D geometries or partial metallization is possible**
- **Fields of application: EMC protection, electrical conductivity & contacting, decorative surfaces**

Level of development and property rights

- **Own laboratory facilities for plasma pre-treatment, Pd plasma activation and electroless nickel plating**
- **Further upscaling of the processes for the coating of small batches is being sought**
- **Own property rights for Pd plasma activation (EP2631332B1)**
- **Wide range of surface analytics available to evaluate coating-adhesion, -morphology, -thickness, conductivity, abrasive wear & surface energy**

Contact
Dr. Sven Gerullis SG@innovent-jena.de
Dr. Sebastian Spange SS2@innovent-jena.de
Phone +49 3641 2825-51
www.innovent-jena.de/en