

FILLER-FREE MULTILAYER PRECURSOR-DERIVED CERAMIC PROTECTIVE COATINGS

OF TUNABLE COMPOSITION AND MICROSTRUCTURE

STATUS QUO

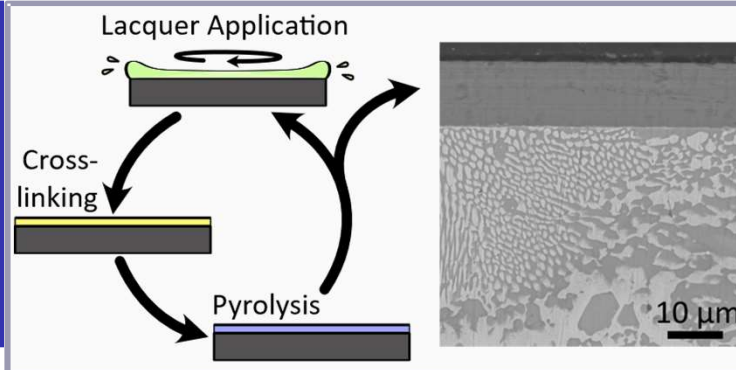
Processes for the preparation of ceramic coatings, such as APS, frequently are limited to oxides. Further, the yielded coatings often are porous, thereby, impairing their protection against corrosive species.

For precursor-derived ceramic coatings, commonly fillers are added in order to increase the achievable coating thickness, resulting in inhomogeneities and porosity in the derived ceramic coating.

OUR TECHNOLOGY

Various preceramic precursors, both oxidic and non-oxidic, are commercially available but also can be chemically modified or synthesized. They can be applied as a liquid lacquer onto the substrate, e.g. by spin, dip or spray coating. In a subsequent fast thermal treatment, the film is converted into a ceramic. Its properties can be controlled by the selection of the precursor and the thermal treatment.

This process is then repeated until the desired film thickness is obtained.



BENEFITS

- ▶ Access to oxidic and non-oxidic compositions and microstructure
- ▶ Dense and homogeneous ceramic coatings of adjustable thickness
- ▶ Simple coating methods such as spin, dip or spray coating

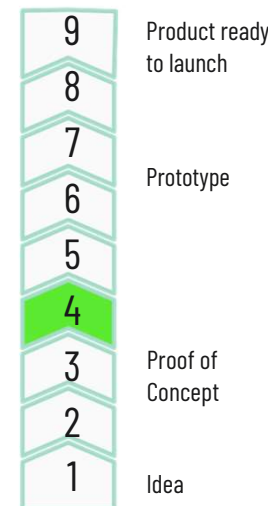
APPLICATION POSSIBILITIES

- Corrosion protection
- Erosion protection
- Thermal barrier coatings

COMMERCIALIZATION OPPORTUNITIES

There are various possibilities for cooperation between the industrial partner and TU Darmstadt: from an exchange with the know-how carriers of the technology up to a close cooperation in case of further development needs. The technology is protected by intellectual property rights and can be used by the industry partner after a sale or licensing agreement.

CURRENT STAGE OF DEVELOPMENT TECHNOLOGY READINESS LEVEL (TRL)



The technology development is at Level 4:
Ceramic coatings > 10 µm of different compositions have been prepared on several substrates and first oxidation studies have been conducted.

YOUR CONTACT PARTNERS AT TU DARMSTADT



IP- and Innovation Management

+49 6151 16-57215

innovation@pvw.tu-darmstadt.de



Prof. Dr. Ralf Riedel

Institute for Dispersive Solids

+49 6151 16-21624

ralf.riedel@tu-darmstadt.de