

Coatings for Stainless Steel Constructions:


Innovative coating product for stainless steel meets customer demands!

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Example of use: Heat exchanger


 Ceramic Polymer GmbH has developed the new premium coating system Proguard CN-OC, which is designed especially for high requirements on stainless steel substrates. The idea to formulate such a specific coating was formed by a multitude of explicit customer requests, in which even stainless steel did not provide satisfactory corrosion protection.

Henceforth, we have completed this market niche. In cooperation with the independent research institute INNOVENT e. V. in Jena/Germany we have created a unique coating product line, which fulfills highest demands by the chemical integration of special organic fillers in our multifunctional, hybrid epoxy resin base.

Chemical resistance tests

Proguard CN-OC was exposed to highly-aggressive chemical attack non-stop for more than 9.000 hours (1 year) in different formulations. In these test series various curing variants were explored (room temperature and room temperature plus diverse steps of tempering). The chemical resistance was tested in an extremely aggressive liquid (killer-solution), which contained 3 fluids of each 33,3% volume-mixture with a permanent temperature of 50°C:

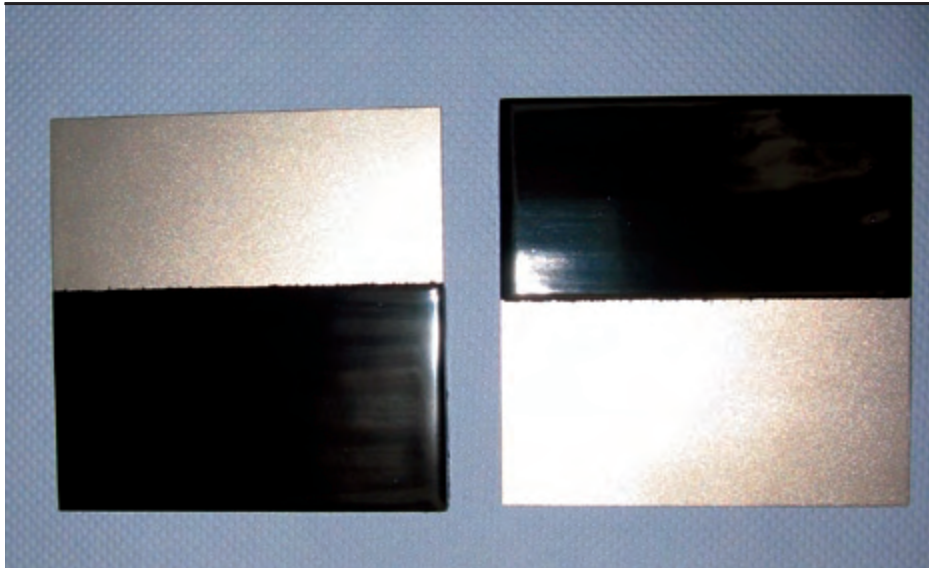
98% H₂SO₄ sulfuric acid + 100% methanol + 3% sodium chloride solution

Extra tests according to customer requests were performed with excellent results, e. g. sole 98% H₂SO₄ sulfuric acid at 50°C and 60°C, also diverse warm and hot acid-mixtures.



Proguard CN-OC provides:

- Extreme adhesion > 30 N/mm²
- Excellent chemical resistance against acids and alkaline solutions
- Excellent chemical resistance against hot, corrosive gases
- Easy and solvent-free application by airless spraying methods
- Direct application, no previous use of a primer necessary
- Adequate and acceptable pot life and curing times



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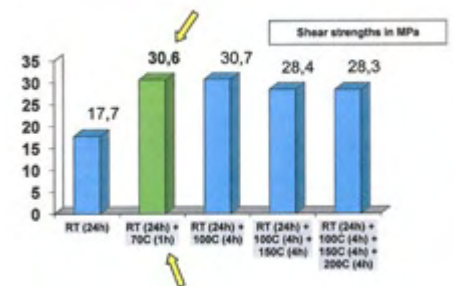
Our Product:

- PROGUARD CN-OC

New results, analyses and prospects

The extreme adhesion of Proguard CN-OC on stainless steel:

The key to the high adhesion might be located on the interface between the coating and the stainless steel surface. Here, chemical interactions are generated by slightly tempering of the organic-filled coating. These interactions cause after preliminary findings special formations of carbides, which induce an extremely high adhesion by strong bonding to the coating as well as to the stainless steel structure.



General thoughts concerning special mechanism:

- Disintegration of the passive layer Cr2O3 to get direct contact to the crystalline structure of stainless steel surface.
- Diffusion of C-compounds (nm = in nanometer-scale) from the coating into the interface by temperature influences.
- Reactive anchoring of the coating in the metal structure mainly by carbide formation. Hence, a very high adhesion is generated.

Precise results:

- The adhesion value on stainless steel is averaged 17,7 N/mm² after curing at room temperature (20°C) for 24 hours. The coating can be removed partially by shear test.
- After tempering of 70°C for 1 hour the coating cannot be removed by shear test. All specimens with 70°C-tempering show cohesion fractures.
- From the measured data of the cohesion fractures the internal strength of the coating can be defined on more than 30 N/mm².
- Further steps of tempering at 100°C, 150°C and 200°C do not improve the internal strength of the coating.
- The real adhesion value of Proguard CN-OC on stainless steel is higher than its internal strength. This feature is currently being further explored in more test series.

Of course, we will keep you constantly informed about our research activities and new findings.

Do you have any questions regarding our new development Proguard CN-OC?

Are you interested in product samples for inspection or own tests?

Our corrosion experts will gladly assist you.