

Highly corrosion-inhibiting steel coating

Transfer offering

Particularly in the markets of special machines, mechanical engineering, agricultural machinery and metal construction, special demands must be made on corrosion protection due to the fact that they are primarily used outdoors. The pretreatment and painting processes used according to the state of the art often lead to insufficient durability. Furthermore, they are clearly too expensive and thus do not represent an economic solution in the above-mentioned price-sensitive markets. The inadequate durability also results in premature corrosion damage and considerable

Approach

Using a process combination of wet chemical pre-treatment and sol-gel corrosion protection coating with subsequent conventional powder coating, highly corrosion-resistant layers can be produced on steel.

Table 1: Results of planar steel samples with anti-corrosion coating after exposure to the neutral salt spray test (NSS); comparison between industrial process and developed coating technology

	industrial process	phosphating / sol-gel	
		without corrosion inhibitor	with corrosion inhibitor
NSS	750 hrs	750 hrs	1500 hrs
corrosion protection class	C3	C3	C5

Advantages

- good adhesion to the substrate and the powder coating
- Coating control possible by colouring the sol-gel layers
- joint baking process of powder coating and sol-gel layer
- doubling of the corrosion protection effect compared to the industrial process used to date



Example for a possible application of the coating technology

Development status and property rights

The topic presented was the subject of a publicly funded research project. In the future, the aim is to use this process to achieve the required corrosion protection class C5 on 3D components as well.