

## Chromium-free Passivation for Optimum Adhesion

Qualitative and quantitative coating inspection and process monitoring possible



View of the pre-treatment plant at Kesseböhmer: The advantages of the optimised pre-treatment process are better adhesion of the paint, a reduction of the sludge and a working temperature that saves energy.

For industrial varnishing companies the company KIESOW DR. BRINKMANN GmbH & Co. KG provides the passivation product "SURFASEAL 440" that permits chromium and phosphate-free passivation of aluminium, steel and zinc surfaces before varnishing.

The passivating agent "SURFASEAL 440" developed specially for aluminium, steel and zinc surfaces is free of chromium, nickel, cobalt, molybdenum and phosphates and can be used in the spraying process as well as for dipping.

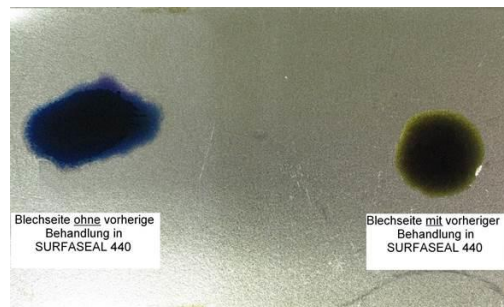
The advantages of this process are self-evident:

- better adhesion of the lacquer than in the iron phosphate coatings
- lower working temperatures (20 to 40 °C)
- process bath with much less sludge
- short exposure time (1 minute)
- process bath and coatings can be analysed
- simple disposal, therefore environmentally friendly

The conversion coatings formed in this way have a coating thickness of between 30 and 100 nm, providing an excellent primer for subsequent varnishing. The passivation is carried out at a pH value of 4.8 to 5.2 and at a concentration of 5 to 20 ml/l. On steel material the passivation SURFASEAL 440 forms a yellowish to blue/violet iridescent coating. On the other hand transparent coatings are formed on aluminium and zinc. Guido Kipsieker, Head of Powder Coating at Kesseböhmer, is satisfied with the results, "Kesseböhmer stands for design, quality and surprisingly different solutions. For this reason more than two years ago we changed the iron phosphating process over to the

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passivation product SURFASEAL 440 which is much more economical and environmentally friendly and hence optimised the pre-treatment process at that time. The better paint adhesion, the reduced quantity of sludge and a working temperature that corresponds to the ambient temperature quickly convinced us." The quality of the passivation coating can be tested on steel, aluminium and galvanised material by means of a drop test. For this test a 0.1 % solution is then spread over the treated surface /dropped on it by means of a pipette. If there is a coating the solution colour changes to yellow within 20 to 60 seconds.



Panel side without treatment  
in SURFASEAL 440

Panel side with treatment  
in SURFASEAL 440

"The quality of the passivation coating can be tested on steel,  
aluminium and galvanised material by means of a drop test."

In order to be able to also determine the quantity of coating on the aluminium an analytical method was developed in which an aluminium test plate is immersed, after treatment, in a stripping cuvette in order to remove the coating. Then this solution is subsequently treated with reagents and measured photometrically. Additionally the concentration at the process bath can be determined very easily with the use of a photometer at a wavelength of 500 nm. This guarantees optimum monitoring of the process.

Since this passivation method ensures optimum adhesion of coatings both on aluminium surfaces and on steel surfaces as well as on zinc, it is used in many industrial coating sectors. Therefore passivation on galvanised steel material is used by, among others, sub-contractors in the automotive sector. The passivation of steel and aluminium by SURFASEAL 440 is used in various contract coating companies and in internal coating departments, such as at Kesseböhmer in Bad Essen, a company in the metalworking sector active at the international level. Kesseböhmer is one of the most successful suppliers to the furniture sector in the areas of furniture fitting systems, shop fitting / goods presentation, office furniture and the automotive industry.

Since 2013 the product has additionally obtained the provisional QUALICOAT certification and has been included in the list of authorised alternative pre-treatment processes (No. A-094) in the field of powder coating of aluminium surfaces in front construction.

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