

# Rust converting primer based on water-borne epoxy ester

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The rust converting primer eliminates the costly and time consuming processes of surface preparation of materials like sand blasting, pickling and phosphating, before applying coatings over rusted mild steel. The primer acts as the rust converter as well as primer. The epoxy ester resin prepared is incorporated with pigments such as titanium dioxide, bentonite and phosphoric acid. The primer is applied over rusted specimens and the physical and chemical resistance properties of such specimens have been evaluated by accelerated tests such as salt spray (fog) tests.

**Key words:** Rust converting primer, water borne epoxy ester, physical and chemical resistance

## INTRODUCTION

The general practice in metal finishing industry is to prepare the surface of the metal either by sand blasting or pickling, followed by phosphating prior to the application of the paint. The cost, time and money involved in the surface preparation are high.

In this paper, the preparation of water borne rust converting primer based on epoxy ester which eliminates the costly method of surface preparation and its properties have been studied.

## EXPERIMENTAL

### Preparation of water borne rust converting primer

The preparation of water borne rust converting primer based on epoxy ester, the reaction product of epoxy resin and linseed fatty acid has been patented [1]. The patented process consists in the preparation of water borne epoxy ester and incorporation of pigments such as titanium dioxide, bentonite etc. and phosphoric acid for making it into a rust converting primer.

### Preparation of painted panels

The rust converting primer is applied by brush over the rusted mild steel panels of various sizes after the removal of loose rust to a thickness of 20 microns. The painted panels dried within 24 hours are kept for 15 days before carrying out the required tests.

### Determination of physical properties of the coating

The physical properties of the coating, such as, adhesion, flexibility, impact resistance, scratch hardness and abrasion resistance have been determined as per ASTM and B.S. specifications.

### Chemical resistance properties of the coating

*Immersion tests:* Chemical resistance has been determined

by immersing the painted specimens (5 cm × 7.5 cm size) in distilled water, 2% sulphuric acid, 5% sodium hydroxide solution and 3% sodium chloride solution. Observations of the painted specimens have been made periodically.

*Salt spray (fog) test:* The test has been conducted as per ASTM specification B117-72.

## RESULTS AND DISCUSSION

The physical and chemical resistance properties of the coating are given in Tables I and II respectively. It is seen from Tables I and II that the physical and chemical resistance properties of the primer system have passed the various tests as per standards. The painted panels withstand salt spray (fog) test for 120 hours.

TABLE-I: Physical properties of the coating

No.	Property	Results
1.	Impact resistance	Passes a fall of tub of weight 900 gms from a height of 20 cm.
2.	Scratch hardness	Passes 500 gm load
3.	Conical mandrel bend test (Extensibility)	Passes 1/8" thickness
4.	Abrasion (Taber) 1000 revolution with 1000 gms. load	Loss of 130 m.gm

## CONCLUSION

The water borne rust converting primer reported possesses

TABLE—II: Resistance of rust converting primer to various chemicals/solvents

No.	Property (resistance to)	Results
1.	Distilled water	No change even after 200 hrs
2.	2% Sulphuric acid	Film affected in 5 hrs
3.	5% sodium hydroxide solution	Film affected in one hour
4.	3% sodium chloride solution	No change even after 150 hours
5.	Salt spray (fog) test	Passes 120 hrs

good physical and corrosion resistant properties and hence can be used over rusted mild steel surfaces, avoiding costly surface preparation.

#### REFERENCE

1. K Raghupathy and S Guruviah, Ind. Patent Provisional Specification (1989)