KELATE®MR6

REACTIVE CONVERSION COAT FOR PASSIVATION OF RESIDUAL RUST ON STEEL

HOW TO PAINT ON OXIDIZED STEEL

When confronted to oxidized (rusted) steel, different options can be considered:

- Paints and coatings
- Mechanical surface treatment
- Wet or dry surface blasting
- Acid surface pre-treatments

Paints and coatings

The anti-corrosive protection of a non-oxidized steel surface with a suitable paint no longer raises any problem. Due to the use of modern polymers, protection of 10 years can be assured, even under the severest conditions, by applying the correct paint system.

Surface rust, on the other hand, always creates problems and its presence should be strictly avoided. The reasons are that rust does not provide a firm mechanical base, but, more important, that rust is electrochemically unstable under a paint film.

Therefore, even the best paint will not give a full protection when applied on a steel surface which is not entirely rust free, and this fact has caused many problems, despite existing techniques available for surface preparation.[1]

Mechanical surface treatments

Most mechanical surface treatments, such as scraping, hand brushing or power cleaning, do not remove all the rust from the cavities of the surface, and the presence of this residual rust encourages continuation of the corrosion process under paint films subsequently applied.

Wet or dry surface blasting

Blasting the surface to white metal provides an excellent substrate for paint, but a freshly blasted surface is highly reactive, and once exposed to atmospheric humidity, dew or rain, will rust quickly. This means that to preserve investment in blasting for instance, the freshly blasted surface must be coated immediately.

And for all its acknowledged advantages as a base for paint, sandblasting is often ruled out due to cost, environment protection, inconvenience of rigging, dust and spark potential, limited size of areas to be cleaned, difficulty of arranging blasting/painting cycles, etc.

Acid surface pre-treatments

Similarly acid surface pre-treatment for corroded steel surfaces have shown limited advantage in relieving the problem. Removal of the rust is extremely difficult under temperature, concentration and application conditions of the field.
Also in many situations, residual acids or salts left in the pores of the rust have caused failure by osmotic blistering of the paint system.

Even under the best field conditions, the use of conventional phosphoric acid-based pre-treatment is also unsatisfactory.
Such products do not accomplish a true passivation of the metal surface, and their reaction with the different rust layers is not homogeneous and inefficient.

[1] "How to Avoid Quick Deterioration of Paints Applied to Oxidized Steel" – Roger Penne

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RUST PASSIVATION WITH KELATE®

Since residual rust can encourage further under film corrosion and since acid cleaning in the field is unsatisfactory, an ideal solution would be to completely passivate the tightly bound residual rust, chemically preventing it from participating in further corrosion.[2]

The **KELATE®MR6** has been developed with this principle in mind:

1. Thorough passivation of residual rust
2. High reactivity
3. Excellent adhesion promoter
4. Will also react with blasted (non rusted) steel

KELATE® - DESCRIPTION

KELATE®MR6 is a water reducible chelating polymer that has been designed for field application to rusted steel which has been hand or power cleaned, or blasted.

KELATE® - WAY OF WORKING

KELATE®MR6 neutralizes the corrosion process. It reacts quickly with the rust and transforms iron oxides into a stable and insoluble blue-black metallo-organic complex which is ready for painting after reaction. The action of KELATE® on the rust corresponds to an anodic passivation.

KELATE®MR6 effects a thorough chemical passivation of the substrate and makes it a sound base for the application of coating systems.

Reaction time is ± 3 hours and it is not necessary to wash the surface with water after reaction.

KELATE®MR6 offers in addition an insulating and barrier effect.

Conventional chemical agents such as phosphoric acid based pre-treatment do not accomplish a true passivation of the metal surface. This has been demonstrated in the studies on the active substance of **KELATE®** made by the Centre Belge d'Etude de la Corrosion and by the University of Paris, Ecole Nationale Supérieure de Chimie.

Sulphuric acid and hydrochloric acid are pickling agents and since iron chlorides and iron sulphates are water-soluble salts, these acids may not be considered as rust converters.

KELATE® MR6 penetrates directly into the residual rust.

KELATE® - MAIN PROPERTIES AND BENEFITS

KELATE®MR6 reacts quickly with the rust. Average reaction time is 3 hours. The film which is formed is water insoluble and even hydrophobic.

KELATE®MR6 is an excellent adhesion promoter for subsequent coating systems.

Contrary to most chemical treatments of the rust, it is not necessary to wash the treated surface with water before the application of the first coat of paint.

[2] "Corrosion of iron and passivation" – Article available on request

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KELATE® ON BLASTED STEEL

KELATE®MR6 reacts also with steel that has been blasted to white metal or thoroughly cleaned with abrasive disk or paper.

Consequently **KELATE®MR6** may also be applied on surfaces which are only partially rusted or on a superficial rust such as the one which forms very quickly after sandblasting.

Applied on blasted steel, **KELATE®MR6** allows to avoid the disadvantage of the flash rust caused by certain water based primers.

KELATE®MR6 FORMULATION

KELATE®MR6 is supplied **as a concentrate** and must be diluted to a ready to use condition before application.

The ready to use material may be prepared from the concentrate using the following ratios for dilution:

KELATE®MR6:	67.0 parts by weight
WATER:	33.0

This dilution is made under good stirring (400-500rpm) during minimum 5 minutes in stainless steel, glass lined or plastic tank.

Plastic packing is also recommended for the ready to use product.

Alternatively, we can also supply the ready to use formulation as **KELATE®MR6D**.

ADDITIONAL INFORMATION

Please consult us for additional available information (info@kelate.be):

- Technical data-sheets
- Specifications
- MSDS
- “Corrosion of iron and passivation”
- “How to Avoid Quick Deterioration of Paints Applied to Oxidized Steel” – Roger Penne
- Testing and evaluating KELATE®
- Instructions for use and labelling
- KELATE® compatibility with paints and coatings