RCM

LABORATORY OF INDUSTRIAL CHEMISTRY

PreoKorr

USE OF INNOVATIVE CHEMICAL COMPOSITION TO PROTECT METAL CONSTRUCTIONS FROM CORROSION

«In order to regain technological leadership we need to thoroughly to choose the priorities. The candidates are comprised of such industries as... high-tech chemistry, nano-technologies.»

President of the Russian Federation, V.V. Putin,
January 20, 2012.

www.erciem.ru

Actuality of the issue

Any corrosive process affects drastically the functional characteristics of metal structures and technical systems.

Commercial loses related to metal corrosion are defined not only by the costs of the corroded metal but by the costs of repair work, as well as losses due to temporarily being out of operation and engineering systems, by the costs of preventing emergency repair, in some cases absolutely intolerable from an environmental safety standpoint.

Cost evaluations related to corrosion (as per foreign sources data) show that on average, the total annual expenditures per world's countries for mitigating the consequences of corrosion amount to 1.5 - 4.0% GDP.

The evaluations also show that every year direct and indirect commercial losses due to metal corrosion are equivalent to 10% or more loss of the total metal manufactured in the country.

For Russia in 2014 this indicator amounted to 10 million tons of steel approximately (given an annual output over 70 million tons) whish cash value exeeds 4 billion US dollars.

A portion of these losses is inevitable, as it is not realistic to eliminate all corrosion destructions.

Nevertheless, in many cases it is feasible to reduce corrosion losses by using innovative technologies protecting the surface of metal structures.

The requirements of GOST (31384-2008, 9.602-2005, 9.402-2004, 9.014-78 etc.) for the protection of metal structures and facilities against corrosion are obligatory and prescribe the mandatory use of various protective coatings which must be applied only to a specially prepared surface.

Surface preparation must ensure good adhesion and the complete removal of even the smallest particles of corrosion from the surface to be protected.

Sand blasting and grit blasting today are among the main methods used to prepare the surface for applying protective coatings.

These methods of surface preparation are labor intensive, have high costs per 1 sq. meter and require the conducting of complicated and expensive measures for labor and environmental protection.

The costs of these methods of surface preparation may contribute to over 70% of the total cost of surface anti-corrosion protection.

The proposed solution

We have developed an innovative iron oxides converter - PreoKorr, which ensures the complete conversion of the layer of corrosion (up to a 300 micron thickness) on the surface of metal into a consistent protective coating with improved adhesive properties providing further high quality adhesion when applying the paint and lacquer coating.

PreoKorr

PreoKorr not only reacts with corrosion particles on the surface of metal, but also substantially reduces the potential development of future corrosion processes by means of a corrosion inhibitor contained in PreoKorr.

The innovative converter of iron oxides - PreoKorr – ensures the complete conversion of the corrosion layer (300-500 microns thick) located on the metal surface into a stable protective film with improved strength and adhesive properties, which ensure the subsequent high quality adhesion of the protective paint coating after its application.

PreoKorr

The PreoKorr not only reacts with corrosion particles on the metal surface, transforming the corrosion layer into a layer of neutral chemical protection of increased strength, but also significantly slows down the possible development of future corrosion processes through the corrosion inhibitors contained at the PreoKorr.

Thin layers of rust, when interacting with the PreoKorr, completely dissolve, leaving only a visually clean metal surface, which is actually covered with a thin but strong protective film.

Thick layers of stubborn rust (300 - 500 microns thick) are transformed on the surface into a black protective film, which also prevents external corrosion.

The other advantages

- Absence of mineral acids in its composition which allows to avoid an additional washing of the surface before applying the coating (which must be obligatory when treating with mineral acids and extremely environmentally harmful due to toxicity of the cleaning products);
- It is completely non-flammable;
- It can be used as an individual coating if not exposed to direct atmospheric condensation even in a humid atmosphere.

The use of PreoKorr allows to cut down expenses on surface preparation at least by 3 times in comparison to the use of sand - or grit blasting surface preparation methods.

At the same time the warranty period for corrosion protection of a surface treated by PreoKorr under finished lacquer coating will be significantly increased.

The innovations

Original phosphating catalyst

An absolutely original phosphating catalyst was used;

Smart packaging

An absolutely original surface wetting agent was used, due to which the preparation has enhanced penetration characteristics;

Environmental friendliness and safety

In terms of environmental friendliness and safety, PreoKorr belongs to substances of the FOURTH hazard class, which is not found in any converter in the world that contains phosphoric acid;

Unique technology

The unique film remaining on the surface after applying PreoKorr has no any analogues at strength and adhesion characteristics;

Sustainability and efficiency

Long-term stability and effectiveness of corrosion inhibitors in the composition of the PreoKorr;

Easy to use

The PreoKorr - unlike to acid formulations - does not require special protective procedures, has high simplicity of application and many application methods (brush, spray, etc.).

The innovations

Leaves no plaque

Phosphoric acid is present in extremely small quantities and acts only as an additional phosphate substrate; for this reason, the minimum amount of phosphoric acid is completely converted when interacting with the surface without the characteristic sulfur-steel coating.

There is no surface phosphate film on the treated surface.

Unique formula

As the main component that converts iron oxide, a unique set of complexones and mineral salts is used, which has no analogues.

Safety of use

For the first time, it was possible to achieve the combined occurrence of phosphating* and galvanizing** processes in a single complex process.

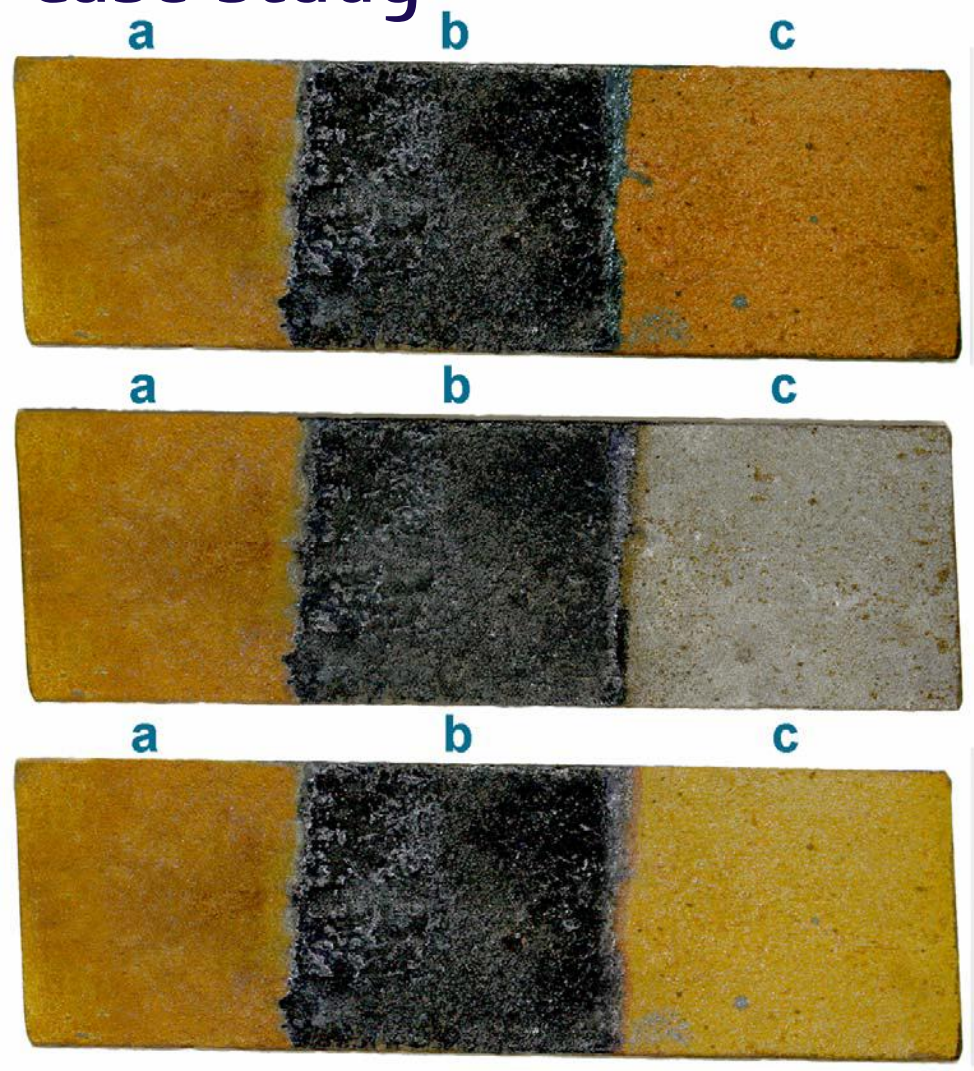
There are no residues of chemically active substances on the treated surface, which makes the use of the PreoKorr absolutely safe for human health and the environment.

The solution for any task

Viscosity of the PreoKorr can be adjusted depending on the special needs of its practical application - from liquid form to gel form.

* transfer of phosphate groups
** replacement of iron atoms by zinc atoms in the active zones of the crystal lattice

Case study



PreoKorr

Corroded metal strip.
Zone b is treated with PreoKorr.

The same strip.
In Zone c corrosion is removed.

The same strip.
Corrosion in Zone c after 5 days in a humid atmosphere to a great degree was restored.
Zone b remained unchanged

Metal construction before and after treatment with PreoKorr

ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

ДЕПАРТАМЕНТ ПРОФИЛАКТИКИ ЗАБОЛЕВАНИЙ И ГОСУДАРСТВЕННОГО САНИТАРНО-ЭПИДЕМИОЛОГИЧЕСКОГО НАДЗОРА
МИНИСТЕРСТВА ЗДРАВООХРАНЕНИЯ КЫРГЫЗСКОЙ РЕСПУБЛИКИ
КЫРГЫЗСКАЯ РЕСПУБЛИКА, БИШКЕК

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СВИДЕТЕЛЬСТВО
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Продукция:
Преобразователь ржавчины "ПреоКорр". Изготовлена в соответствии с документами: ТУ 2389- 001- 13618842 - 2018. Изготовитель (производитель): ООО "ЭРСИЭМ", 140100, Московская область, Раменский район, город Раменское, улица Карла Маркса, дом 5, здание Ткацкое производство №1, этаж 2, комната 4, Российская Федерация. Адрес производства: 140100, Московская область, Раменский район, город Раменское, улица Карла Маркса, дом 5, здание Ткацкое производство №1, Российская Федерация. Получатель: ООО "ЭРСИЭМ", 140100, Московская область, Раменский район, город Раменское, улица Карла Маркса, дом 5, здание Ткацкое производство №1, этаж 2, комната 4, Российская Федерация.

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