

IRONSAFE-01

Corrosion-proof system



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1. PRODUCT FEATURES

The corrosion-proof system Gicolor Ironsafe-01 increases the resistance against corrosion of metallic parts (particularly iron and iron alloys), in order to improve their durability. This protective effect is achievable using specific coating products, which are expressly formulated for double layer applications.

The first layer – Ironsafe-01 - is an epoxy product, which guarantees a high protection against corrosion, applied on a pre-processed substrate, for example by sandblasting. The second layer consists of a specific product suitable for the purpose: polyester powders for RAL colors, or paint products based on polyurethane powders for surfaces to be decorated with sublimation technology.

The pictures below show some sample panels in three steps of the corrosion-proof treatment.



Picture 1: Iron alloy panel after sandblasting.

Picture 2: Iron alloy panel coated with Gicolor Ironsafe-01.

Picture 3: Iron alloy panel painted with top coat (e.g. RAL color 9010).

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2. TECHNICAL INFORMATION

● FIRST LAYER RAW MATERIAL SPECIFICATIONS – IRONSAFE-01

Type of powder	Epoxy product suitable to be top coated
Class resistance to U.V.	Not necessary

● SECOND LAYER SPECIFICATIONS

Type of powder	Based on the selected product
Class resistance to U.V.	Based on the product used as second layer

● METAL SUBSTRATE PREPARATION

A careful pre-treatment of the surface to be painted is very important in order to guarantee a perfect adhesion of the coating layer to the substrate: if it is not duly performed, the protective layer may fail, without providing a proper protection of the mechanical properties required. Among the pre-process of the substrate before painting, one of the most adaptable to individual requirement is sandblasting with abrasive sands, that allows to reach a well-defined and homogeneous surface roughness.

● APPLICATION METHODS AND CURING CONDITIONS

Double layer powder coating applications:

- First layer → 60-80 µm of Ironsafe-01 product, cured for 20' at 180°C (356°F) (peak metal temperature); it is recommended not to leave uncovered parts because the corrosion can start from there;
- Second layer → 60-80 µm of coating powder, duly cured, according to the final use.

NOTE: Make sure to avoid any contamination between the sandblasting and the first layer painting process, and between this step and the final coating process.

● MECHANICAL PROPERTIES

This is a double layer powder coating system, it has therefore a high thickness and the mechanical properties are typical of high thickness. Any mechanical job (bending, cutting and grinding, etc.) must be done before coating.

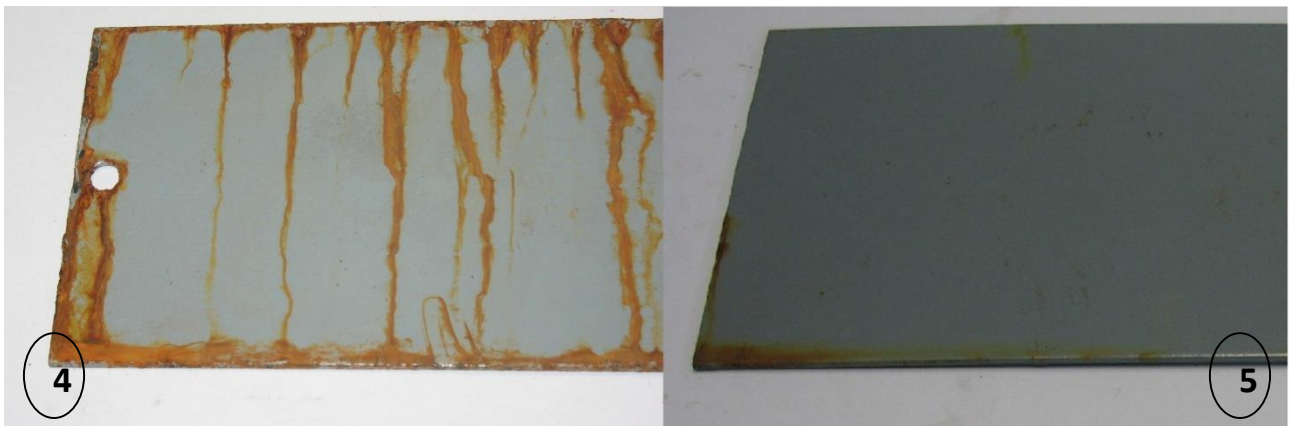
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●CORROSION STRENGTH

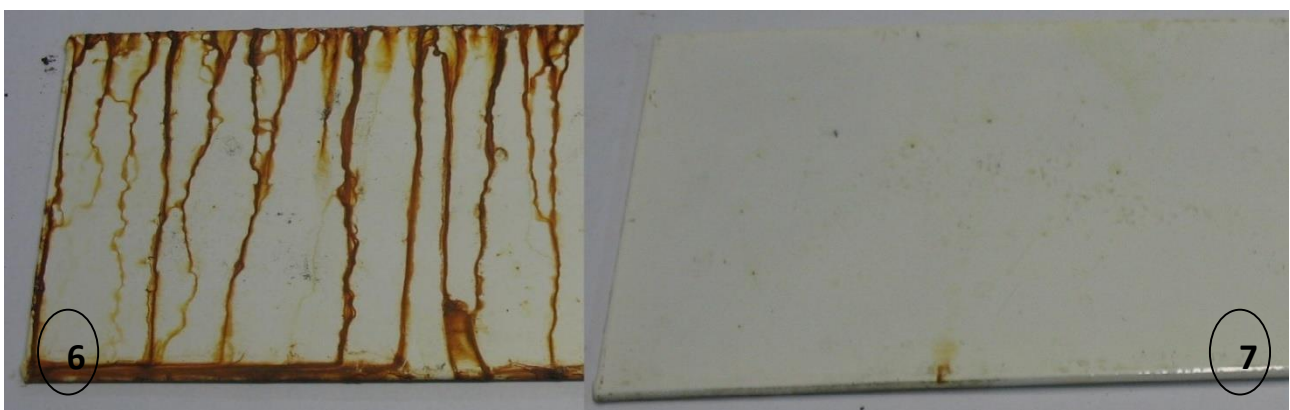
Gicolor LAB tests the average life of corrosion proof-system on some sample panels exposed to Neutral Salt Spray (NSS). This type of test consists of a continuous nebulization, by appropriate instruments, of a deionized water solution with 50 ± 5 g/l of sodium chloride dissolved at constant temperature of $35 \pm 2^\circ\text{C}$ ($95 \pm 3^\circ\text{F}$).

In the following pictures there are some examples of iron alloy sample panels exposed to NSS (duration of test: 1.543 hours).



Picture 4: Sandblasted sample panel painted with polyester after 1.543 hours of exposition at NSS test.

Picture 5: Sandblasted sample panel coated with Gicolor Ironsafe-01 after 1.543 hours of exposition at NSS test.



Picture 6: Polyester sample panel overpainted with top coat after 1543 hours of exposition at NSS test.

Picture 7: Ironsafe-01 sample panel overpainted with top coat after 1543 hours of exposition at NSS test.

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3. VARIANTS AND SPECIAL FORMULATIONS

The color of the first layer is grey, so a coat with high hiding power is strongly recommended as second layer; the final effect depends on the type of coating, which characterizes the final surface of the metal piece.

Chemical composition of the second layer:

- Polyester RAL powder
- Polyurethane powder, suitable for sublimation with the required pigmentation.

Possible structures of the top coating:

- Smooth matt
- Smooth glossy
- Textured
- Hammered
- Glitter
- Salt-lake
- Ice-Touch
- Mirror.

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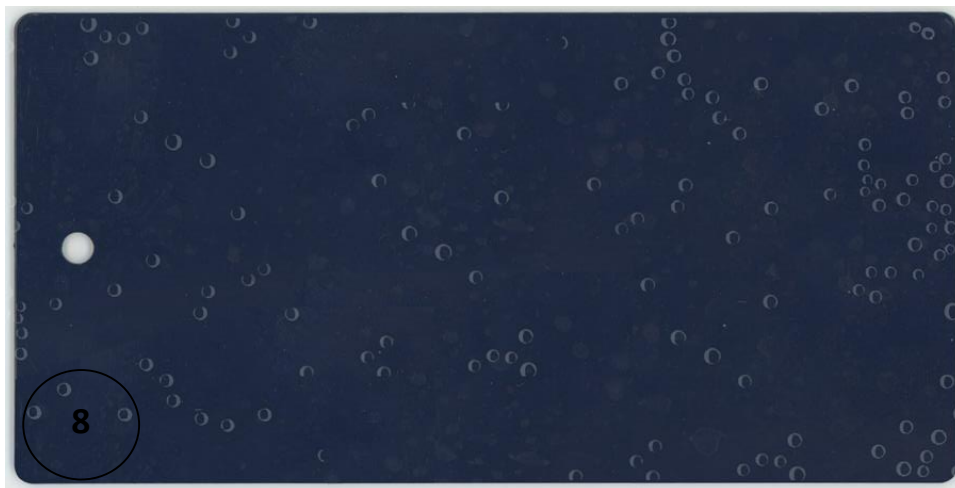
4. CORROSION-PROOF TESTS

A) Resistance test to boiling water, method with a pressure cooker

This test is carried out according Qualisteelcoat Handbook (EN 13438), which consist in two hours immersion in boiling demineralized water into a pressure cooker (1 bar), on two kind of sample panels:

- sandblasted iron alloy sample panel, coated with Gicolor Ironsafe-01 and overpainted with 6.447.7511-SJT;
- sandblasted iron alloy sample panel, painted with 6.447.7511-SJT (WHITOUT corrosion-proof system).

The sample without corrosion-proof system at the end of the test presents a diffuse blistering on its surface, while the sample panel with Ironsafe-01 is still in perfect conditions, as shown in pictures below.



Picture 8: Sandblasted and painted sample panel after the resistance test to boiling water.



Picture 9: Sandblasted and overpainted sample panel with Ironsafe-01 after the resistance test to boiling water.

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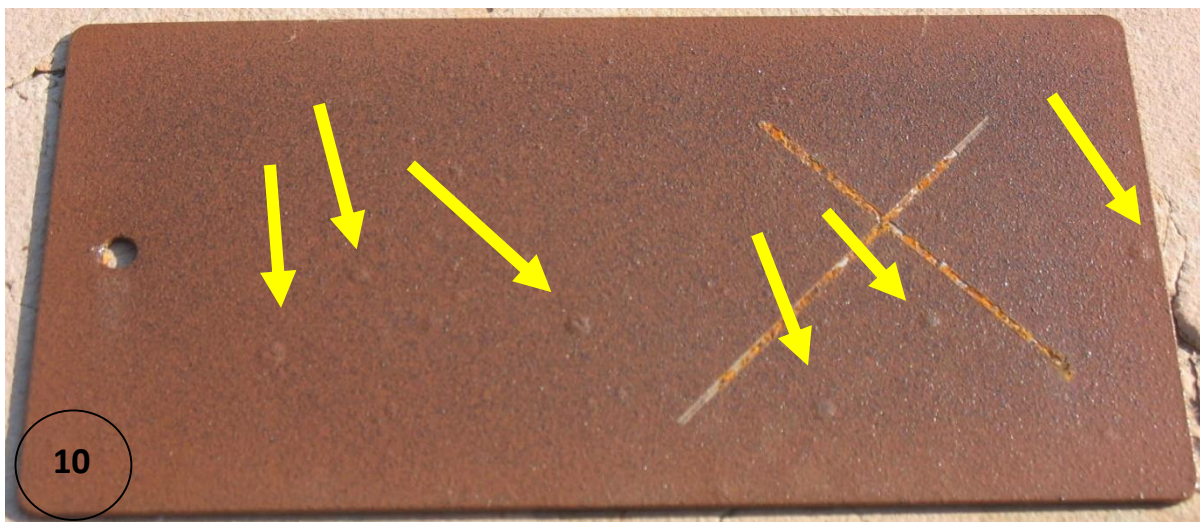
B) Constant climate condensation water test

The constant climate condensation water test is carried out on two kind of sample panels:

- sandblasted iron alloy sample panel, coated with Gicolor Ironsafe-01 and overpainted with 6.666.3342-GJT;
- sandblasted iron alloy sample panel, painted with 6.666.3342-GJT (WHITOUT corrosion-proof system).

Qualisteelcoat Handbook (ISO 6270) is the reference for specifications of this test: a cross-cut incision with a width shall be made to score the organic coating down to the metal on all the sample panels.

After an exposition of 1200 hours in constant climate chamber, the sample panel without corrosion-proof system presents bubbles and flaking phenomena on its entire surface, while the sample panel with Ironsafe-01 is still in perfect conditions, as shown in pictures below.



Picture 10: Sandblasted and painted sample panel after 1200 hours of test in constant climate chamber.



Picture 11: Sandblasted and overpainted sample panel with Ironsafe-01 after 1200 hours of test in constant climate chamber.

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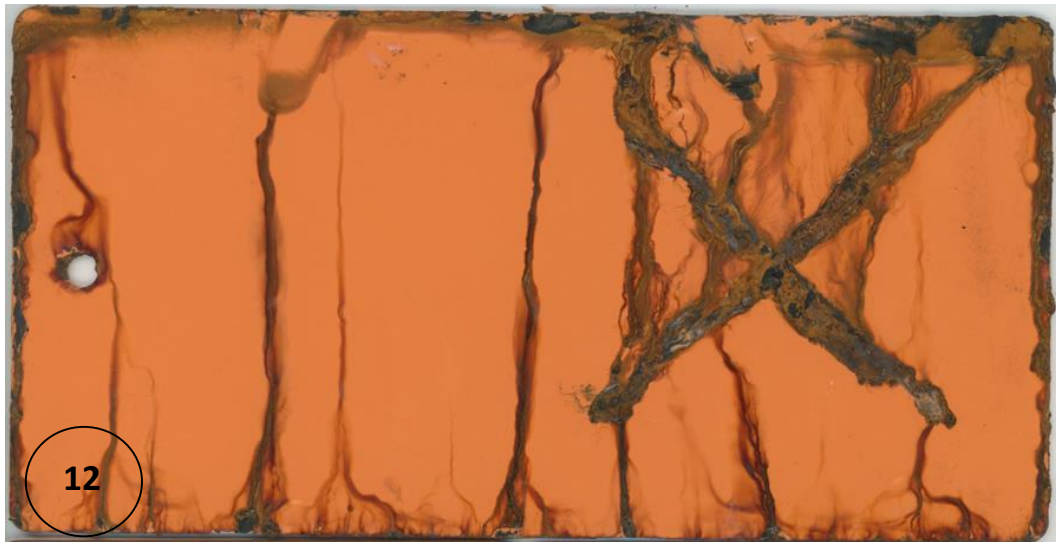
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C) Neutral salt spray resistance test

Salt spray resistance test is carried out on two kind of sample panels:

- sandblasted iron alloy sample panel, coated with Gicolor Ironsafe-01 and overpainted with 6.447.4203-SJT;
- sandblasted iron alloy sample panel, painted with 6.447.4203-SJT (WHITOUT corrosion-proof system).

The procedure described on Qualisteelcoat Handbook (ISO 9227) provides to make a cross-cut incision with a width to score the organic coating down to the metal on all the sample panels, and to expose them in salt spray chamber for 1000 hours. After this time, an evaluation of sample panels shows that in presence of Ironsafe-01 does not occur any damage except for the presence of rust due only for the incision on iron's surface, while without corrosion-proof system tested panel shows significant degradation on its entire surface, as shown in following pictures.



Picture 12: Sandblasted sample panel painted with polyester after 1000 hours of exposition at NSS test.



Picture 13: Sandblasted sample panel coated with Gicolor Ironsafe-01 and overpainted with polyester after 1.000 hours of exposition at NSS test

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5. POSSIBLE APPLICATIONS

The corrosion-proof system Gicolor Ironsafe-01 can be applied on metal alloys to protect them against corrosion: steel or other metal architectures, banisters, fences, guardrails, street and commercial furniture.



Security systems



Guardrail



Grate

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