



INSTRUCTIONS FOR ANTI-CORROSIVE PAINT SYSTEMS

A guide to help select paint system, cleaning methods and coat thicknesses



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30 YEARS OF FIELD TESTING

The need for lowering the costs of maintenance has driven Introteknik to develop a set of surface tolerant rust protection systems focused on maintenance. One key insight has been that the ideal conditions and surfaces of a laboratory environment can't be found in real life.

That is why we have specialized in paint systems for treating surfaces that has suffered oxidation and rust. Our systems are ideal when the object, its surroundings, or environmental considerations make it impossible to sand blast to conventional cleanliness.

By choosing Isotrol paint system you can paint on location, skip disassembly and minimize down time for maintenance.

ISOTROL - a rust protection system to trust even in the toughest of conditions.

1. CORROSIVITY CLASS

In the field of anti-corrosion paints we divide different regions or environments by the degree of atmospheric corrosion that metals are subject to. The degree of corrosivity is assessed by the measurement of a corrosion class (C-Class). To make a rational choice of paint system to protect a steel surface, one needs to take account of the environment and actual corrosivity. In general, it holds that higher corrosivity requires thicker or more coats of paint to protect the metal from corrosion. Inland rural areas are generally C2. Higher corrosivity is usually found by the coast or in the proximity of industry pollution. In snowy winter climate, road clad areas can have a very high corrosion class due to road salt to counter icing, reaching C5.

Corrosivity classes according to SS-EN ISO 9223

Corrosivity-Class	Impact	Outdoors/exteriors	Indoors/interiors
C1	Very low	-	Heated buildings with clean air, such as offices, shops, schools, hotels, etc.
C2	Low	Atmosphere with low pollution. For example, in the countryside.	
C3	Medium	Urban and industrial areas, moderate sulphur dioxide pollution. Coastal areas with low salt content.	Buildings for production with high atmospheric humidity and some air pollution food processing plants, such as, breweries, dairies and laundries.
C4	High	Industrial areas and coastal areas with moderate salt impact	Chemical plants, swimming pools and coastal ship- and boatyards.
C5	Very High	Industrial areas with high humidity and aggressive atmosphere. Coastal areas and offshore with high salinity	Buildings or areas with almost permanent condensation and with high pollution.

2. SYSTEM BY CORROSIVITY CLASSES

This description supposes an application on a previously painted surface, or a surface corroded to rust degree B-D treated with water blasting, or steel brushing, to St2 ISO 8501-1. If the surfaces is sand blasted to Sa 2½ or more Isotrol Primer is left out of the system.

ALKYD SYSTEM

System C1	Product name	Coat thickness dry film	Drying 24° C	Coverage ^a
Primer:	Isotrol Primer or Isotrol Primer Black	10-15 µm	8 h	38-30 m ²
one of the top coats:	Isotrol Aluminium/ Isotrol Primer Black	15-20 µm	24 h	38-30 m ²
	Isoguard Pansar ^b	40-80 µm		13,0-6,5 m ²
	Isotrol Finish	40-60 µm		13,0-8,7 m ²

Minimum total coat thickness: 25/50 µm

System C2	Product name	Coat thickness dry film	Drying 24° C	Coverage ^a
Primer:	Isotrol Primer ^a	10-15 µm	8 h	38-30 m ²
Intermediary:	Isoguard Pansar ^b	40-80 µm	24 h	13,0-6,5 m ²
Top Coat:	Isoguard Pansar ^b or	40-80 µm	24 h	13,0-6,5 m ²
	Isotrol Finish	40-60 µm	24 h	13,0-8,7 m ²

Minimum total coat thickness: 90 µm

ALKYD SYSTEM

System C3	Product name	Coat thickness dry film		Drying 24° C	Coverage ^a
		Rusty surfaces	Previously painted surface		
Primer:	Isotrol Primer ^a	10-15 µm		8 h	38-30 m ²
Touch up and edge- painting:	Isoguard Pansar ^b	40-80 µm	-	24 h	13,0-6,5 m ²
Touch up and edge- painting:	Isoguard Pansar ^b	40-80 µm	-	24 h	13,0-6,5 m ²
Top coat:	Isoguard Pansar ^b or	40-80 µm		24 h	13,0-6,5 m ²
	Isotrol Finish	40-60 µm		24 h	13,0-8,7 m ²

Minimum total coat thickness:

130 µm

50 µm

HYBRID SYSTEM

System C4	Product name	Coat thickness dry film		Drying 24° C	Coverage ^a
		Rusty surfaces	Previously painted surface		
Primer:	Isotrol Primer ^a	10-15 µm	-	24 h	38-30 m ²
Touch up and edge- painting:	Isomastic ^c	80-150 µm	-	16 h	8,0-5,3 m ²
Touch up and edge- painting:	Isomastic ^c	80-150 µm	-	16 h	8,0-5,3 m ²
Top coat:	Isomastic or	80-150 µm	-	16 h	8,0-5,3 m ²
	Temadur 50	40-60 µm		-	14,0-9,3 m ²

Min total coat thickness:

280 µm

40 µm

HYBRID SYSTEM

System C5	Product name	Coat thickness dry film		Drying 24° C	Coverage ^a
		Rusty surfaces	Previously painted surface		
Primer:	Isotrol Primer ^a	10-15 µm		24 h	38-30 m ²
Touch up and edge- painting:	Isomastic ^c	90-150 µm	-	16 h	7,5-5,3 m ²
Touch up and edge- painting:	Isomastic	90-150 µm	-	16 h	7,5-5,3 m ²
Intermediary:	Isomastic	90-150 µm		16 h	7,5-5,3 m ²
Top coat:	Temadur 50	40-60 µm		-	14,0-9,3 m ²
Minimum total coat thickness:		320 µm	130 µm		

^a Coverage is listed in theoretical values. The practical coverage is determined by application technique and conditions as well as shape and roughness of the surface. For Isotrol Primer observe that the practical coverage diverges markedly against the practical coverage due to the paint penetrating properties and the absorption of the surface.

^b When applying multiple coats of Isoguard Pansar please control the drying, and exhaustion of solvents in painted coats before applying additional coats. This is to hinder the capsulation of solvents resulting in long setting times. Alkyd systems with Isoguard Pansar may need up to 2 weeks to reach full load bearing capacity to withstand mechanical wear.

^c In C4 and C5 environments; when Isotrol Primer is to be coated with Isomastic: Directly after applying Isotrol Primer; wipe excess Isotrol Primer from the surface with a cloth. Intervals in between applications of Isotrol Primer and Isomastic *minimum* 24h. Used cloths are collected to minimize the risk of autoignition.

3. RUST DEGREES

RUST DEGREE OF STEEL SURFACES DESIGNATES HOW CORRODED A SURFACE IS. SURFACES ARE GRADED FROM A TO D ACCORDING TO ISO 8501-1:2007

Rust degrees are defined as follows:

- A.** Steel surface largely covered with adhering mill scale but little, if any, rust.
- B.** Steel surface which has begun to rust and from which the mill scale has begun to flake.
- C.** Steel surface on which the mill scale has rusted away or from which it can be scraped, but with slight pitting visible under normal vision.
- D.** Steel surface on which the mill scale has rusted away and on which general pitting is visible under normal vision.



ASSESSMENT OF THE DEGREE OF RUST

The degree of rust on a surface is measured by the worst occurring degree of rust on the object.

The Isotrol systems can be applied on all steel surfaces with rust degree A-D.

Recommended pre-treatment and cleaning methods for maintenance is mainly water blasting (ISO 8501-4) or steel brushing to St 2 (ISO 8501-1).

Cleaning have a large environmental impact. Make sure to collect all old paint residue in case of red lead paints.



PAINT FLAKING FROM STEEL SURFACE WITH MILL SCALE

4. CHECK LIST FOR PAINTED SURFACES

- When maintenance is due first decide which kind of paints have been used previously on the object. The type of primer suitable is depending on earlier used paint type.
- Old paint coatings are checked for adhesion. Paint with good adhesion may be overcoated (2 MPa for alkyd paint and 4 MPa for epoxy). All paint with less adhesion need to be removed.
- The conditions of existing old coatings are assessed according to ISO 4628-1 through ISO 4628-6.



CONTROL OF PREVIOUS PAINT



ADHESION TEST



COAT-THICKNESS METER

5. CLEANING AND PRE-TREATMENT

Factors to consider when selecting a suitable pre-treatment method:

- Depending on the object, the extension of the rust, condition of previous paint, different methods for cleaning and pre-treatment are suitable.
- Different methods have different environmental impacts.
- Remove ALL loose rust before painting.
- For larger areas water blasting is recommended, 70 MPa (SS-EN ISO 8501-4). If used no other means of cleaning is necessary and remaining paint will normally be coated over without further pre-treatment.
- Smaller surfaces with rust are pre-treated manually with steel brushing St 2 (ISO 8501-1). No need to sand blast.
- In practice steel brushing need a combination with other methods, i.e. scraping.
- Preferably treat pitting rust locally with rust pick or similar.
- When maintenance is done on surfaces previously painted with glossy epoxy or polyurethane, the surface might require grinding or rugging of the the surface.

The purpose of the pre-treatment is to remove all loose paint and leave the remaining old paint with insufficient adhesion.

Adhesion after pre-treatment should be at least 2 MPa for alkyd paint and at least 4 MPa for epoxy paint.



6. APPLICATION INSTRUCTIONS

Follow the instructions according to ISO 12944-7 when painting steel to ensure a professional standard.

All surfaces must be dry. The temperature of the ambient air, surface or paint should not fall below +10°C and relative humidity should not exceed +40°C during application and drying. The surface temperature of the steel should remain at least 3°C above the dew point (ISO 8502-4). Observe the max/min application temp for each product. Mix the paint thoroughly before use. Machine stirrer is recommended. Thinning specification for each product is to be found in the product datasheet. The paint contains oxidizing oils. Handle cloths with paint so that the risk of autoignition is minimized. The components and solvents of paints are harmful when inhaled or ingested. Follow security measures stated in datasheets.

The pre-treatment of hard and thick pitting rust can be removed by a rust pick or needle scaler. Surfaces with pitting are primed by one extra coating before applying intermediary-/top- coats to the rest of the surface. Pits and pores in the surface should be filled with Isotrol Primer. The surface should be saturated to a glossy surface is visible.

One or two additional layers coats of paints is recommended when good adhering paint are overcoated.

Before applying top coat inspect the surface for any damages in the primer coating. Repair any found before painting.

To get the best result notch with primer, intermediaries and top coats around bolts, rivets, joints and edges before each application.

Consider applying an extra coat on surfaces which will be exposed for weather, like wind and sun. It is recommended an extra coat for best durability for walkways, waterways and water spouts.



EXAMPLE OF NOTCHING AROUND BOLTS

7. MAINTENANCE PLAN

To achieve a good economy when making rust protective maintenance it is recommended to establish a plan before applying your new paint system.

To wash an object might hinder dirt accumulation or the growth of algae or similar. Dirt and algae are collectors of moist and salts which may lead to corrosion and rust.

The time and cost for maintenance by washing should be considered relative the costs for shorter intervals of a full re-painting or extensive reparations. By a continuous control of the surfaces and repair of damages in the topcoat you will prolong the longevity of your newly applied paints. Small damages will lead to bigger corrosion impact as the rust spreads under the paint, resulting in flaking. If maintenance is done continuously bigger measures can be avoided.

Maintenance inspection:

Control the thickness and adhesion of the paint when inspecting the object. Through continuous inspection the need for washing, smaller reparations are assessed and if a more extensive repair is needed.

Washing:

Washing is normally done by hand with a soft brush and a neutral cleaner, ca pH 6-7. The process is to be done from the bottom up, preventing drying of washing water before rinsing. Rinsing is done with clean water. Do not wash larger areas than can be rinsed without drying. Removal of clogging in water spouts, aisles or byways should be done regularly to avoid standing water. This is especially important on objects with an inclination angle below 7°.

Repairs of damages in the paint coats:

Single damages in the coat, or rust spots, shall immediately be rectified by scraping/brushing the surface to St2 and primed it with Isotrol Primer. After drying apply intermediary and topcoat to mirror the original system. Spot treatment with Isotrol systems enables easy application of topcoats and a good economy. Mostly, a strategy of targeted maintenance of exposed areas will lend a far better economy than longer intervals with full repainting of the entire object.

Very old paint coatings might have a red lead primer. Damages to coats that exposes red lead should immediately be painted with Isotrol Primer and a top coat.

PRODUCTS IN THE ISOTROL SYSTEM



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- Specializing in protective paints for anti-corrosion maintenance

PLAN FOR THE
FUTURE AND
AVOID
UNNECESSARY
COSTS

The Isotrol systems
have shown to cut the
maintenance costs
significantly.

This is achieved by the
surface tolerance Isotrol
and the lack of need for
sand blasting.

Less pre-treatment
saves money.

Do you need help to
selecting the right
system for your object?

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