

GENERAL SPECIFICATION

CORROSION

GS EP COR 354

External protection of onshore structures and equipment by painting

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1. Scope

This standard specification defines the technical requirements for the execution of coating operations for the high durability external corrosion protection (as defined in [ISO 12944-1](#)) of on shore structures and equipment, **which are not located within coastal areas**. For equipments and structure located within coastal areas, [GS EP COR 350](#) shall be used.

2. Reference documents

The reference documents listed below form an integral part of this General Specification.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and addendums, is the latest revision published at the effective date of this document.

Reference	Title
ASTM A380	Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
ASTM D4285	Standard Test Method for Indicating Oil or Water in Compressed Air
ASTM D4752	Standard Practice for Measuring MEK Resistance of Ethyl Silicate (Inorganic) Zinc-Rich Primers by Solvent Rub
ASTM D4940	Standard Test Method for Conductimetric Analysis of Water Soluble Ionic Contamination of Blast Cleaning Abrasives
ASTM D5162	Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates
DIN 50014	Climates and their technical application; Standard atmospheres
ISO 12944 (Parts 1; 3; 4; 7; 8)	Paints and Varnishes - Corrosion Protection of Steel Structures by Protective Paint Systems - Parts 1; 3; 4; 7; 8
ISO 16276 (Parts 1; 2)	Corrosion protection of steel structures by protective paint systems - Assessment of, and acceptance criteria for, the adhesion/cohesion (fracture strength) of a coating - Parts 1; 2
ISO 19840	Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Measurement of, and acceptance criteria for, the dry-film thickness of coating on rough surfaces
ISO 4628 (Parts 1; 2; 3; 4; 5)	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Parts 1; 2; 3; 4; 5
ISO 8501 (Parts 1; 3)	Preparation of Steel Substrates Before Application of Paints and Related Products - Visual Assessment of Surface Cleanliness - Parts 1; 3

Reference	Title
ISO 8502 (Parts 3; 6; 9)	Preparation of Steel Substrates Before Application of Paints and Related Products - Tests for the Assessment of Surface Cleanliness - Parts 3; 6; 9
ISO 8503 (Parts 1; 2)	Preparation of steel substrates before application of paints and related products Surface roughness characteristics of blast-cleaned steel substrates - Parts 1; 2
RAL 840-HR	Colors standard
SSPC SP1	Solvent Cleaning

Total General Specifications

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and addendums, is the latest revision published.

Reference	Title
GS EP COR 001	Corrosion control on production facilities: Design and construction
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP COR 355	External protection of piping and equipment by thermal spray coating
GS EP COR 356	Corrosion Protection of Fasteners

3. Surfaces to be painted

All surfaces shall be painted using the relevant specified system, except when otherwise stipulated hereafter.

3.1 Items not to be painted

Unless otherwise specified, the following surfaces are not required to be painted:

- Galvanized steel grating, stairs and associated galvanized fasteners
- Concrete structures
- Plastic and plastic coated materials, provided their resistance to UV has been demonstrated, and colour coding is not necessary
- Non ferrous materials such as 90-10 and 70-30 copper nickel alloys, monel, aluminium bronze, and nickel alloys when not thermally insulated
- Machined surfaces
- Stainless steel tubings.

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3.2 Case of stainless steels

Stainless steels shall be painted when requested in the present specification. Only piping, pipelines and vessels or other pressure containing equipment > 2" are concerned.

All stainless steels shall be painted on areas in contact with carbon steel piping supports.

When stainless steel is not required to be painted, **surfaces under support and stickers shall be painted.**

Any paint containing Zinc is prohibited on stainless steels.

In cases when construction works are likely to continue after pickling and passivation, all stainless steel shall be protected from iron contamination (projections from power tooling & welding of neighboring carbon steels). If Contractor cannot demonstrate that he can adequately protect stainless steels, then all stainless steel shall be painted.

TSA (Thermally Sprayed Aluminum) coating according to **GS EP COR 355** can be used as an alternative.

3.3 Painting of fastenings

Fastenings shall be painted according **GS EP COR 356**.

3.4 Painting under personal protection (perforated guards/sheets)

When perforated guards or sheets are used as personal protection, painting system shall be selected as for un-insulated surfaces.

4. Painting systems

4.1 Approved systems

The list and application area of all painting systems are given Appendix 2.

For structures and equipments in areas classified as corrosivity categories C3 and C4 the approved systems shall be selected from the ACQPA reference systems and can be found on www.acqpa.com.

For structures and equipments in areas classified as corrosivity category C5 the approved systems shall be selected from the **GS EP COR 350** Appendix 3.

Corrosivity categories are given in accordance with **GS EP COR 001**.

4.2 Substitution rule

When selecting a painting system, a system designed to withstand environments with higher corrosivity shall always be applicable to lower corrosivity environments

4.3 Colour coding

Colour coding shall be according to the schedule defined by the project. Generally, colours will be chosen to match those of installations already present in the same country.

If the project has no specific requirements, the colour coding is according to Appendix 3.

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In any case, the painting works carried out by Contractor shall include all colour coding and markings required for service identification.

5. Certification of personnel

5.1 Operators

Operators shall be individually certified by an approved organization (ACQPA/FROSIO, or equivalent).

5.2 Inspectors

Inspectors shall be individually certified in accordance with NS 476 (Inspector certified level III) or NACE certified coating inspector level III. Certification shall be delivered by the following approved organizations:

- ACQPA
- FROSIO
- NACE.

6. Qualification of the application procedures

6.1 Application procedure

A detailed application procedure shall be established for Company approval based on the requirements of this specification. No painting work shall begin before the application procedure is approved by Company.

The application procedure follows [ISO 12944-8](#) and will include at the minimum the following information:

- Equipment/structure/piping to be coated
- Operating temperature of the equipment
- Type of substrate to be coated
- Surface preparation
- Methods of application and application requirements
- Painting cycle
- Painting Systems to be used
- Coating products to be used
- Product data sheets (abrasives and paint materials)
- Safety data sheets
- Health and safety requirements
- Test and inspections

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- Certification of the personnel
- Handling and storage
- Repair method
- Template of painting daily report.

6.2 Application procedures tests

One month before work commences, all the selected painting systems shall be applied on samples representative of the structure to be painted. The products used shall be sampled from the same batches as these intended for the works.

The painting system shall be applied in presence of the paint Manufacturer and the Company representative, in climatic conditions that are as similar as possible to the worst case conditions that can be foreseen during the work on the construction site. Application shall be performed by the painting specialist who will be responsible for application during the work, using the same dedicated equipment that will be used during the work. During surface preparation and paint application, all tests described in Appendix 1 shall be followed.

When the painting systems are fully cured, visual inspection and adhesion testing shall be carried out to confirm that the performance of the painting systems meet those specified for each system.

7. Kick off meeting

A technical kick off meeting shall be organized by the Contractor in the presence of Company specialists (HQ Corrosion Department) and paint Manufacturer to review all the details regarding the work, application procedures, and inspection test plan. All the documentation shall be submitted to Company for review at least two (2) weeks prior to this meeting.

Paint Manufacturer shall provide Contractor with technical assistance. All recommendations made by Paint Manufacturer other than these outlined in the present specification shall be supported by a written statement from the Paint Manufacturer head office.

8. Technical content of tenders

Tenders include the following information:

- Proposed paint systems for each category/location of item to be painted
- Product data sheets
- Proposed qualification program if any
- List of derogations to the present General Specification, if any. **Derogations will not be granted for painting systems after Contract award.**
- Terms and conditions of guarantee
- A statement showing that all parties involved (Contractor, paint Manufacturer, and Applicator) will be carrying out the work according to the present specification, or if relevant, to the project particular specification, including derogations duly agreed by Company (HQ Corrosion Department) before Contract award. This statement shall also