

GENERAL SPECIFICATION

CORROSION

GS EP COR 233

Risers coatings

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1. Scope

This General Specification defines the technical requirements for the qualification, supply and execution of coating works of rigid risers.

This specification is applicable to all external surfaces of risers from the ESDV down to splash zone lower limit.

This specification covers the coating for protected static risers, either inside the jacket for new jacket, or by riser protectors for existing jacket as per **GS EP PLR 100**.

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 D4940	Standard Test Method for Conductimetric Analysis of Water Soluble Ionic Contamination of Blast Cleaning Abrasives
ASTM G62	Standard Test Methods for Holiday Detection in Pipeline Coatings
ASTM D5162	Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates
ASTM D2372	Standard Practice for Separation of Vehicle From Solvent-Reducible Paints
ASTM D2621	Standard Test Method for Infrared Identification of Vehicle Solids From Solvent-Reducible Paints
ASTM D4060	Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
ASTM G14	Standard Test Method for Impact Resistance of Pipeline Coatings (Falling Weight Test)
ASTM G8	Standard Test Methods for Cathodic Disbonding of Pipeline Coatings
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

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Reference	Title
ISO 8502 (Parts 3; 4; 6; 9)	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness – Parts 3; 4; 6; 9
ISO 8503 (Parts 1; 2; 4)	Preparation of steel substrates before application of paints and related products - Surface roughness characteristics of blast-cleaned steel substrates - Parts 1; 2 ;4
ISO 1431-1	Rubber, vulcanized or thermoplastic – Resistance to ozone cracking – Part 1 Static and dynamic strain testing
ISO 1817	Rubber, vulcanized or thermoplastic – Determination of the effect of liquids
ISO 188	Rubber, vulcanized or thermoplastic – Accelerated ageing and heat resistance tests
ISO 2781	Rubber, vulcanized – Determination of density
ISO 6502	Rubber – Guide to the use of curemeters
ISO 7619-1	Rubber, vulcanized or thermoplastic – Determination of indentation hardness - Part 1 Durometer method (Shore hardness)
ISO 813	Rubber, vulcanized or thermoplastic – Determination of adhesion to a rigid substrate – 90 degree peel method
ISO 12944-4	Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 4: Types of surface and surface preparation
ISO 12736	Petroleum and natural gas industries — Wet thermal insulation coatings for pipelines, flow lines, equipment and subsea structures
ISO 16276-1	Corrosion protection of steel structures by protective paints systems - Assessment of, and acceptance criteria for, the adhesion/cohesion (fracture strength) of a coating - Part 1 Pull-off testing
ISO 15711	Paints and varnishes - Determination of resistance to cathodic disbonding of coatings exposed to sea water
ISO 20340	Paints and varnishes - Performance requirements for protective paint systems for offshore and related structures
ISO 2812-2	Paints and varnishes - Determination of resistance to liquids -- Part 2 Water immersion method
ISO 8501 (Parts 1; 3)	Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness – Parts 1; 3
NACE SP 0394	Application, Performance, and Quality Control of Plant-Applied Single Layer Fusion-Bonded Epoxy External Pipe Coating

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Reference	Title
SSPC-AB 2	Cleanliness of Recycled Ferrous Metallic Abrasives
SSPC-SP 1	Solvent Cleaning

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

Reference	Title
GS EP COR 220	Three layer polyethylene external coating for pipelines
GS EP COR 221	Three layer polypropylene external coating for pipelines
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP COR 420	External field joint coatings of pipelines
GS EP PLR 100	Submarine pipeline systems
GS EP SAF 337	Passive Fire Protection: basis of design

3. Definitions and abbreviations

Splash zone: Between the crest level of the 100 years wave superimposed on the maximum surge height plus the normal Mean High Water Springs (MHWS) and 3 m below the Lowest Astronomical Tide (LAT) or the annual swell, whichever is the greater

ESDV:	Emergency Shut Down Valve
FJC:	Field Joint Coating
ITP:	Inspection and Test Plan
MSDS:	Material Safety Data Sheet
PQT:	Procedure Qualification Trial
PPT:	Pre Production Trial
PE:	Polyethylene
PP:	Polypropylene
EPGF:	Glass flake reinforced Epoxy
NOGF:	Glass flake reinforced Novolac
PEGF:	Glass flake reinforced Poly-ester
VYGF:	Glass flake reinforced Vinyl-ester

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4. Surfaces to be coated

All external surfaces of the risers from the ESDV down to splash zone lower limit shall be coated using the relevant specified system according to paragraph 6 of this specification depending of the operating temperature and whether a passive fire protection is required or not.

5. Qualified coating Supplier

Coating Suppliers shall be selected among painting/coating manufacturer listed in the Company Approved Vendor List.

When a passive fire protection is required, only products certified by an approved third part laboratory in accordance with **GS EP SAF 337** shall be used.

6. Coating systems description

Max Operating temperature (°C)	System	Associated paragraph	Remarks
When <u>NO</u> passive fire protection is required			
+80	Glass flake reinforced paints	See paragraph § 10 of this specification	Shall be prequalified by Company.
+80	Three layer polyethylene external coating	See paragraph § 13 of this specification	
+95	Three layer polypropylene external coating	See paragraph § 14 of this specification	
When a passive fire protection <u>is required</u>:			
+90	Elastomer based coating	See paragraph § 12 of this specification	
+150	Syntactic phenolic resin-based coating	See paragraph § 11 of this specification	

7. Transition zones

Transition zones correspond to the junction between the riser coating/topside paint system. Special care shall be taken as to prevent any corrosion or damage in these zones:

- The location of the transition between riser coating / topside paint system shall be at a level accessible for later inspection, out of any supporting clamp
- A smooth bevel of the riser coating shall prevent disbanding and penetration of water
- A compatible coating shall be applied at the transition zone to prevent water ingress between the two coating types.