



Exploration & Production

GENERAL SPECIFICATION

CORROSION

GS COR 240

**Fusion bonded epoxy based coating
for conductor pipes of drilling platforms**

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1. Scope

This document defines the minimum requirements in respect of the characteristics of a fusion bonded, epoxy based coating for external protection applied in plant to conductor pipes of wells of offshore drilling platforms.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
NACE RP 0394	Standard Recommended Practice. Application Performance and Quality Control of Plant. Applied, Fusion Bonded Epoxy External Pipe Coating
ISO 11124-2 to 4	Preparation of steel substrates before application of paints and related products. Specifications of metallic blast-cleaning abrasives
ISO 11125-1 to 7	Preparation of steel substrates before application of paints and related products. Methods for testing metallic blast-cleaning abrasives
ISO 12944-4	Paints and varnishes - Corrosion protection of steel structures by paint systems. Part 4: Surface types and preparation
ISO 12944-7	Paints and varnishes - Corrosion protection of steel structures by paint systems. Part 7: Execution and supervision of painting work
ISO 8501-1	Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings
ISO 8501-2	Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Part 1: Visual assessment of surface cleanliness
ISO 8502-1 to 4	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness
ISO 8502-6	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness: extraction of soluble contaminants for analysis - the Bresle method
ISO 8503-1 to 4	Preparation of steel substrates before application of paints and related products. Surface profile of abrasive blast-cleaned steel
ISO 8504-1 to 3	Preparation of steel substrates before application of paints and related products. Methods for surface preparation



Reference	Title
NF T 30-124 (ISO 2808)	Paints and varnishes. Determination of dry film thickness. Non-destructive magnetic flux method
ISO 2409	Paints and varnishes. Cross-cut test
ISO 4624	Paints and varnishes. Pull-off test

Professional Documents

Reference	Title
API 2B	Specification for the fabrication of structural steel pipe
API 5L	Specification for line pipe

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS PLR 406	Packaging and transportation of lines pipes

3. Material characteristics

The material minimal characteristics are based on standard [NACE RP 0394](#), completed or modified by this document.

3.1 Material choice

Material proposed by the CONTRACTOR shall be submitted to the OWNER for approval, with the specific characteristics listed in the above standard:

- Sieve analysis
- Density
- Gel time
- Moisture content
- Infrared spectrum
- Differential thermal analysis
- Adhesion.

4. Material application

4.1 General

This document is based on standard [NACE RP 0394](#). It also defines the OWNER's special requirements and any deviations from the above standard and areas not covered by it.

4.2 Surface preparation

Directly before coating, any dust or grit residues from blast cleaning shall be removed from the line pipe surface, by a method combining vacuum cleaning and brushing. A check on surface dust shall be carried out.

Cleaned line pipes shall be coated quickly and shall not be left in a moist atmosphere. If any signs of moisture or oxidation should appear before coating operations begin, the line pipes shall be completely blast cleaned again.

4.3 Coating application

The line pipe temperature defined for application shall be in accordance with the powder SUPPLIER's recommendations.

4.4 Powder recycling

Recycling of the powder from a particular batch shall be allowed up to a proportion of 10%, well mixed with fresh powder, provided that the recycled powder has been passed through a magnetic filter to remove all metallic dust and through a 120 micron sieve to remove all aggregates.

4.5 Coating thickness

After curing the film thickness shall comply with the following requirements:

- Nominal average thickness: 300 microns
- Absolute minimum thickness: 240 microns

4.6 Coating cut-back

Unless otherwise stipulated in the Job Specification, line pipe shall be left with an uncoated cut-back of 5 cm (± 0.5 cm) at each pipe end. Bevelled ends shall be protected from coating and from mechanical damage.

5. Quality assurance procedures

5.1 Design

Before the start of the application, a Quality Plan must be drawn up, detailing all the provisioning, application, inspection and repair procedures.

These shall be described in "detailed procedures".

5.2 Inspection and tests

5.2.1 General

Inspections and tests shall be carried out in accordance with standard [NACE RP 0394](#), as supplemented or amended by this document.

5.2.2 Thickness inspection

The coating thickness shall not be systematically checked on 100% of the pipe production. However, 20% of the daily production of coated line pipes shall be regularly inspected (12 measurements per line pipe) during each shift.

5.2.3 Holiday detection

After completion of coating operations but prior to storage, the coating of each line pipe shall be 100% inspected using a 1000 Volt DC holiday detector to check for significant insulation defects (pinholes, porosity) or other discontinuities. If the number of defects found does not exceed 5 per m², repairs shall not be necessary.

Over and above this number, however, the Coating CONTRACTOR must carry out the necessary repairs or entirely recoat the line pipe concerned.

6. Repairs

Line pipes requiring small repairs due to imperfections of the coating, slivers, scratches or other minor defects shall be repaired in plant as specified in the following paragraphs:

- Line pipe surfaces requiring repairs shall be cleaned to remove all traces of dust, oil, grease, scale and damaged coating. The surface shall then be abraded by grinding or other suitable means. The adjacent coating shall be feathered. Any dust shall be removed by blowing air or wiping with a clean cloth
- A compatible two part, solvent-free, liquid epoxy resin shall be applied to the surfaces, with a minimum thickness of 300 microns. The resin shall be cured properly before handling and storage
- Epoxy liquid resins shall not be applied if the temperature of line pipes is 13°C or less, except when special curing procedures recommended by the SUPPLIER are followed.



7. Marking

Markings shall be applied to each line pipe, with the information described in the Job Specification.

8. Storage - Handling and transportation

The stockpiling, handling, and transportation of coated line pipes shall be carried out in accordance with **GS PLR 406**, supplemented by the following recommendations:

- Girth spacers, soft enough to avoid denting, shall be placed on each line pipe, at regular intervals, in order to avoid punching during storage or transportation. The number of spacers per line pipe shall always be greater than $L/3$ per line pipe, where L is the length in metres
- During handling, equipment such as nylon slings, suction cups, padded hooks, etc., shall be used in order to avoid any damage to pipe walls, bevelled ends and coating. The use of chains or metallic cables is prohibited.

Transportation between different sites shall include sufficient padding to protect the line pipes and their coating against abrasion and impacts.