

GENERAL SPECIFICATION

CORROSION

GS EP COR 225

Polyethylene and Polypropylene coatings for bends and fittings

04	10/2009	Chemical conversion treatments
03	10/2008	Changes in epoxy adhesion tests
02	10/2006	General updating, especially for selection of epoxy primer
01	10/2005	Transformation in Corporate General Specification and general review
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1. Scope

This specification covers the manufacturing of multi layers PE and PP external anti corrosion coatings for bends and fittings for onshore and offshore pipelines.

It is limited to raw materials used in powder form.

PE top coat will be used for service temperature between -40°C and +80°C (depending on the type of epoxy primer used).

PP top coat will be used for service temperature between -20°C and +110°C (depending on the type of epoxy primer used).

Preferably, the choice of coating type for bends and fittings will relate to the coating of the corresponding line-pipe:

- PE for three layers PE coating of line-pipe as per **GS EP COR 220**
- PP for three layers PP coating of line-pipe as per **GS EP COR 221**.

All other choices or combinations will be submitted to COMPANY for approval.

1.1 Definitions of main parties involved

For the purposes of this specification, the following terms and definitions apply.

1.1.1 MANUFACTURER

The COMPANY which produces and sells the products used for the coating shall be referred to herein as the "MANUFACTURER".

1.1.2 APPLICATOR

The COMPANY in charge of the plant coating application and quality control which is eventually sub-contracted by the CONTRACTOR shall be referred to herein as the "APPLICATOR".

1.1.3 INSPECTOR

The COMPANY's representatives or members from COMPANY elected Inspection Bodies for the time being or from time to time duly appointed in writing by the COMPANY to act as its representatives for the purpose of the contract shall be referred to herein as the "INSPECTOR".

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
ASTM D 570	Standard Test Method for Water Absorption of Plastics
ASTM D 4940	Standard test method for conductimetric analysis of water soluble ionic contamination of blasting abrasives
CAN/CSA Z245-20	External fusion bond epoxy coating for steel pipe

Reference	Title
ISO 306	Plastics - Thermoplastic materials - Determination of Vicat softening temperature
ISO 527-1	Plastics - Determination of tensile properties - Part 1: General principles
ISO 527-2	Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics
ISO 868	Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)
ISO 1133	Plastics - Determination of the melt-mass flow rate (MFR) and melt-volume flow rate (MVR) of thermoplastics
ISO 2808	Paints and varnishes - Determination of film thickness
ISO 2811-1	Paints and varnishes - Determination of density - Part 1: Pycnometer method
ISO 6964	Polyolefine pipes and fittings: Determination of carbon black content by calcinations and pyrolysis: Test method and basic principles
ISO 8130-6	Coating powders - Part 6: Determination of gel time of thermosetting coating powders at a given temperature
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 8502-3	Preparation of steel substrates before application of paints and related products - Tests for the assessment of surface cleanliness - Part 3: Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method)
ISO 8502-6	Preparation of steel substrates before application of paints and related products - Tests for the assessment of surface cleanliness - Part 6: Extraction of soluble contaminants for analysis - The Bresle method
ISO 8502-9	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness: Field method for conductometric determination of water-soluble salts
ISO 8503-4	Preparation of steel substrates before application of paints and related products - Surface roughness characteristics of blast-cleaned steel substrates - Part 4: Method for the calibration of ISO surface profile comparators and for the determination of surface profile - Stylus instrument procedure

Reference	Title
ISO TR 10837	Determination of the thermal stability of Polyethylene for use in gas pipes and fittings
NF A49-710	External three layer polyethylene based coating

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

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 420	External field joint coatings of pipelines

3. Obligations of APPLICATORS and MANUFACTURERS

3.1 COMPANY requirements regarding coating products

The APPLICATOR shall, in his tender, submit the data sheets of its selected products concerning the epoxy primer material and the top coat product for approval.

The APPLICATOR shall inform by writing the MANUFACTURERS of the epoxy and the top coat of the COMPANY requirements related to:

- Test certificates, properties requirements and conformity certificates as detailed in the present document. A copy of this written notice shall be sent to COMPANY
- The packaging of the epoxy powder: The MANUFACTURER shall deliver the product in waterproof plastic bags to prevent water contamination and absorption of humidity during storage and transportation.

Once approved the epoxy primer material and top coat product shall not be changed by the APPLICATOR.

Approval of the products by the COMPANY shall not, under any circumstances, be considered as a guarantee from the COMPANY with respect to coating materials and repair products but simply as an authorisation for use.

3.2 Qualification of APPLICATOR's plant and coating system

Qualification of the proposed application plant, personnel, coating method and products shall be carried out in due time through a Procedure Qualification Trial (PQT). Qualification shall be organised jointly by the CONTRACTOR and the APPLICATOR, and witnessed by a COMPANY representative. Qualification testing shall be organised at least 2 months before the works start in order to ensure that a suitable solution can be implemented in case of test results fail to meet the requirements of this specification.

Qualification shall consist of the following step:

- Raw materials (epoxy, PE or PP top coat):
 - Conformity certificates (see § 4) and tests results for materials requirements (see § 4) shall be submitted to COMPANY for approval prior to the start of qualification process of the coating
 - Certificate of analysis (see § 4) for each batch of product used for qualification process shall be submitted to COMPANY.

Note:

- Coating process: Witnessed by COMPANY representative and in accordance with § 5. Coating process parameters shall be fully recorded during PQT. Same parameters shall be used for production, with a maximum discrepancy of 5% for each parameter.
- Coating properties: Witnessed by COMPANY representative and in accordance with § 6.

A summary of Qualification tests as well as acceptance criteria and frequency is given in Appendix 1. The CONTRACTOR and APPLICATOR shall submit a complete joint report of the Qualification test results to the COMPANY for approval.

Once approved, the system (considered as all individual components as a whole) will be considered as qualified in the corresponding coating plant. Any change in the components of the system shall lead to a new qualification process. The qualification of the system is valid for a duration of three years. Renewal of the qualification is based on a technical visit and/or track record. A new PQT can be requested in case of quality issues noted on the line during the three years duration.

- At start of production a PPT (Pre Production Test) shall be carried out, consisting mainly of reinforced test frequency over the first pipes of the first shift of production, as