



Exploration & Production

GENERAL SPECIFICATION

SUBSEA SYSTEMS

GS EP SPS 008

Thermal insulation of subsea stations

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1. Scope

The purpose of this specification is to provide the requirements for design, qualification, application and quality control of coatings for thermal insulation of subsea stations including X-Mas trees interconnecting modules (JM), manifolds, templates or subsea processing stations.

In addition to above, the specification cover the thermal insulation requirements of components such as valves, actuators, sensors, connector insulation caps and other components or parts on the XT, JM and manifold station to the extent necessary to maintain the overall heat insulation requirement for the subsea station.

The insulation coating and any component contributing to the thermal insulation assembly such as seals, sealant, gel material shall be qualified and well documented for the service conditions and life time specified for the Project.

Test methods and acceptance criteria as presented herein, are subject to Company's approval in accordance with section 2 of this document. The level of documentation and functional requirements described in this document shall be complied with.

This specification applies for passive insulation only.

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.

This technical specification is complementary to document **GS EP SPS 001** and shall therefore be read in conjunction with said document and the other Company specifications and standards identified herein.

Thermal insulation requirements for subsea stations are field specific. Consequently, specific requirements regarding produced fluids (oil, condensate or gas), pressure and temperatures, the required cool down periods etc. shall be extracted from the Project Basis for Design.

Standards

The subsea piping shall comply with all relevant statutory requirements and specifications as well as all relevant ISO and other standards, unless otherwise stated by Company.

Reference	Title
ASTM D 395	Standard Test Methods for Rubber Property-Compression Set
ASTM D 870	Practice for Testing Water Resistance of Coatings using Water Immersion
ASTM D 1525	Test Method for Vicat Softening Temperature of Plastics
ASTM G 17	Test Method for Penetration Resistance of Pipeline Coating (Blund Rod)
ASTM C 177	Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by means of the Guarded-Hot-Plate Apparatus
ASTM D 1141	Specification for substitute ocean water



Reference	Title
ASTM D 4940	Standard test method for conductimetric analysis of water soluble ionic contamination of blasting abrasives
BS 903	Physical Testing of Rubber
ISO EN 10286	Steel tubes and fittings for on- and offshore pipelines. External three layer extruded polypropylene based coating
ISO 34-1	Rubber, vulcanized or thermoplastic - Determination of tear strength - Part 1: trouser, angle and crescent test pieces
ISO 37:1994	Rubber vulcanised or thermoplastic - Determination of tensile stress-strain properties
ISO 188:1982	Rubber, vulcanised - Accelerated ageing or heat-resistance test
ISO 527:1993	Plastics - Determination of tensile properties (Part 1 and 2)
ISO 846:1978	Plastics - Determination of behaviour under the action of fungi and bacteria - Evaluation by visual examination or measurement of change in mass or physical properties
ISO 1817	Rubber, vulcanised - Determination of the effect of liquids

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 100	Design of cathodic protection of offshore structures
GS EP COR 221	Three layer polypropylene external coating for pipelines
GS EP COR 226	Materials for thermal insulation of pipeline, piping and subsea components
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP COR 560	Physical and chemical treatment of hydrostatic test water
GS EP SPS 001	Design philosophy and requirements for Subsea Stations
GS EP SPS 002	Design of subsea structures
GS EP SPS 009	Corrosion protection of subsea stations
GS EP SPS 029	Metallic Materials for Subsea Production Facilities

3. Definitions and Abbreviations

The following definitions and abbreviations are used in this specification:

- CFD Computational Fluid Dynamics
- Company TOTAL or its nominated representative(s)
- Contractor The Company contracted to perform the work
- FAI Fail As Is
- FEA Finite Element Analysis
- FSC Fail Safe Closed
- FSO Fail Safe Opened
- GOR Gas Oil Ratio
- JM Jumper Module
- MPV Manifold Production Valve
- RO Restriction Orifice
- System Combination of Units serving a particular function or functions
- TBC To Be Confirmed
- Unit Individual equipment item
- WAT Wax Appearance Temperature
- XT Christmas Tree