

## DEP SPECIFICATION

# INSULATION FOR PIPE-IN-PIPE (PIP) FLOWLINES

DEP 37.81.40.34-Gen.

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## DESIGN AND ENGINEERING PRACTICE



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## 1. INTRODUCTION

### 1.1 SCOPE

This new DEP specifies requirements and gives recommendations for materials, application, testing and inspection of coating/thermal insulation for pipe to be utilized as carrier pipe (inside pipe) in subsea pipe-in-pipe flowlines.

Contractor shall furnish at their cost, all labour, supervision, equipment, materials, and testing necessary to complete coating/thermal insulation application work. Unless specifically stated as the Principal's responsibility, the requirements of this DEP shall be the responsibility of the Contractor.

All surface cleaning, coating/thermal insulation application, and pipe handling shall be performed in a safe manner and in accordance with the principles of good workmanship.

The review and approval by the Principal of any procedure and or other documents, as referred to in this DEP, shall only indicate a general requirement and shall not relieve the Contractor of their obligation to comply with the requirements of the Purchase Order.

### 1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by Shell GSI, the distribution of this DEP is confined to Shell companies and, where necessary, to Contractors and Manufacturers/Suppliers nominated by them. Any authorised access to DEPs does not for that reason constitute an authorization to any documents, data or information to which the DEPs may refer.

This DEP is intended for use in facilities related to oil and gas production, and is intended for use on pipeline, flowline and riser projects.

When DEPs are applied, a Management of Change (MOC) process shall be implemented; this is of particular importance when existing facilities are to be modified.

If national and/or local regulations exist in which some of the requirements could be more stringent than in this DEP, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable with regards to the safety, environmental, economic and legal aspects. In all cases the Contractor shall inform the Principal of any deviation from the requirements of this DEP which is considered to be necessary in order to comply with national and/or local regulations. The Principal may then negotiate with the Authorities concerned, the objective being to obtain agreement to follow this DEP as closely as possible.

### 1.3 DEFINITIONS

#### 1.3.1 General definitions

The **Contractor** is the party that carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project or operation of a facility. The Principal may undertake all or part of the duties of the Contractor.

The **Manufacturer/Supplier** is the party that manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party that initiates the project and ultimately pays for it. The Principal may also include an agent or consultant authorised to act for, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

**1.3.2 Specific definitions**

| <b>Term</b>             | <b>Definition</b>                                                                                                                      |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ambient</b>          | Environmental conditions in the immediate area of coating work and upon surfaces being coated                                          |
| <b>Applicator</b>       | Company doing the coating/ insulation application                                                                                      |
| <b>Batch</b>            | Quantity of surface preparation and coating/ insulation materials manufactured at one (1) time and identified by a unique batch number |
| <b>Coating System</b>   | Refers to the combination of the insulation and corrosion protection coatings                                                          |
| <b>FBE</b>              | Fusion-bonded epoxy coating (thin film thermoset epoxy)                                                                                |
| <b>Service Category</b> | Specific coating / insulation requirements for a material, environment or location as defined by this DEP                              |
| <b>Specification</b>    | Specifications, including project specific data sheets                                                                                 |

**1.3.3 Abbreviations**

| <b>Term</b> | <b>Definition</b>            |
|-------------|------------------------------|
| <b>AFC</b>  | Approved for Construction    |
| <b>ID</b>   | Inner Diameter               |
| <b>ITP</b>  | Inspection and Test Plan     |
| <b>MP</b>   | Manufacturing Plan           |
| <b>NIST</b> | Nominal Insulation Thickness |
| <b>OD</b>   | Outside Diameter             |
| <b>QA</b>   | Quality Assurance            |
| <b>QC</b>   | Quality Control              |
| <b>QP</b>   | Quality Plan                 |
| <b>SCP</b>  | Standard Coating Procedure   |

**1.4 CROSS-REFERENCES**

Where cross-references to other parts of this DEP are made, the referenced section number is shown in brackets ( ). Other documents referenced by this DEP are listed in (12).

**1.5 COMMENTS ON THIS DEP**

Comments on this DEP may be sent to the Administrator at [standards@shell.com](mailto:standards@shell.com), using the DEP Feedback Form. The DEP Feedback Form can be found on the main page of "DEPs on the Web", available through the Global Technical Standards web portal <http://swwww.shell.com/standards> and on the main page of the DEPs DVD-ROM.

**1.6 DOCUMENT PRIORITY**

In the event of conflicts between Contract documents, AFC Drawings, Specifications and other referenced standards, the following document priority shall apply:

- a) Contract or Agreement (including any approved exceptions)
- b) AFC Drawings - Latest revision
- c) The Principal's Specifications (including project specific data sheets)

d) Referenced Standards and Specifications

Any lawful government regulations or requirements, which result in more stringent requirements, shall supersede all other specified requirements. In the event of conflict between any of the applicable documents, the more stringent requirement shall govern.

The Thermal Insulation Data Sheet(s) summarizes the nominal dimensional data and thermal design data for the preferred insulating coating. Literature data has been used for the thermal conductivity of the coating materials. If Contractor has reason to believe that one (1) or more of these values are not representative values for the material properties, they should propose values representing the correct material properties (and provide back-up documentation) and corresponding dimension to meet the thermal requirements of this DEP.

1.7 DATA SHEET

Use data sheet DEP 37.81.40.91-Gen. with this DEP.

## 2. GENERAL

### 2.1 THE PRINCIPAL'S ACCESS AND AUTHORITY

The Principal's representative, including independent inspectors or consultants as may be contracted by the Principal, shall be permitted access to the coating application site at any time for the purpose of conducting performance analyses, including quality control tests of the materials being used.

The Principal representative has the right to reject any and all work or equipment that in his/her opinion does not conform to this DEP. Any work that in the opinion of the Principal representative does not comply with this DEP shall be rectified at Contractor's expense.

### 2.2 PROCEDURES

The Contractor shall prepare a detailed Standard Coating Procedure (SCP) to ensure compliance with the requirements set forth in this DEP. It should be noted that the SCP refers to both the corrosion coating and the thermal insulation. The SCP shall be submitted with the quotation, and shall include details of coating material/properties and storage, coating equipment and operator requirements, surface preparation, application techniques and process control parameters, all repair procedures, tally and identification, in-plant handling and shipping procedures, and quality assurance testing. The procedure should also include waste handling of materials and disposal methods.

The SCP shall be developed using the requirements of this DEP, Manufacturer's recommendations and applicable documents.

Applicator facility, coating/thermal insulation application line, and SCP shall be approved by the Principal prior to start of production coating operations. Inspection and Test Plan (ITP) shall be submitted for the Principal approval within two weeks of contract award and before start of the coating operation.

### 2.3 APPLICATOR'S TECHNICAL REPRESENTATIVE

Applicator shall designate a technical representative who is fully conversant with the coating/thermal insulation materials and application techniques. The technical representative shall attend the pre-job meeting and other similar meetings, serve as the primary liaison between the Principal and the Applicator, and provide the Principal's representative with copies of all documents and reports required by this DEP.

Applicator shall require the coating/thermal insulation Manufacturer to designate a Manufacturer's technical representative who is fully conversant with the materials and application techniques. The Manufacturer's technical representative shall, as required, attend the pre-job meeting and other similar meetings, and provide field guidance and personnel instruction during initial stages of blasting and coating operations, if required.

All communication shall be in English. Contractor may use the metric system for their internal communications, but any communication with Principal shall have US Customary units provided in brackets for relevant numbers. Dimensions on Principal's drawings and existing Principal's specifications that use US Customary units will not be revised to accommodate Contractor. Contractor is responsible for verifying correct conversions.

### 2.4 PRE-JOB MEETING

Contractor shall schedule a pre-job meeting to ensure that job requirements are fully understood. The personnel present at the meeting should include, but not be limited to, the Principal's representative, Applicator's technical representative, coating supervisor, and QC representative, the Principal's safety representative, and the Manufacturer's technical representative (as required).

Minutes of meetings, including action items and target dates for their completion, shall be the responsibility of the Contractor and shall be promptly furnished to the Principal.

## 2.5 SAFETY

This DEP may involve the use of hazardous materials, operations, and equipment, and does not purport to address all of the potential safety concerns associated with its use. It is the responsibility of the Applicator to establish appropriate safety and health requirements, and determine any regulatory requirements or limitations prior to use.

Safety concerns regarding personnel and the environment shall be identified and included in the detailed application procedures, and pre-job discussions. All surface preparation and application systems shall undergo a complete safety inspection and checkout prior to use.

Adequate exhaust/ventilation equipment shall be used, as required, for removal of over-spray and other spray by-products to acceptable air quality standards, and to provide for operator personal protection.

Industry standard recommended safe practices shall be followed. Waste material shall be handled and disposed of properly. Protective equipment requirements on Manufacturer's Material Safety Data Sheet(s) shall be followed.

Coating work pieces shall be electrically grounded, as required, to eliminate static charges associated with surface preparation and coating operations.