

DEP SPECIFICATION

**PIPELINE ISOLATING JOINTS
(AMENDMENTS/SUPPLEMENTS TO ISO 15590-2: 2003)**

DEP 31.40.21.31-Gen.

September 2011

DESIGN AND ENGINEERING PRACTICE



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All administrative queries should be directed to the DEP Administrator in Shell GSI.

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PART I INTRODUCTION

1.1 SCOPE

This DEP specifies requirements for the design, fabrication, inspection and testing of monolithic isolating joints, for electrical isolation of pipelines from plants and/or other pipelines. Installation considerations specific for buried conditions have been included.

Part III of this DEP provides amendments and supplements to ISO 15590-2. The section numbering in Part III follows that of ISO 15590-2. Where clauses of ISO 15590-2 are not amended or supplemented by this DEP, they shall apply as written.

Part IV provides the requirements for isolating joints not covered by ISO 15590-2.

This is a revision of the DEP of the same number dated September 2010; see (1.6) regarding the changes.

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.

This DEP is intended for use in facilities related to pipelines in oil and gas production, gas handling, oil refining, chemical processing, gasification, distribution and supply/marketing. Application in other facilities may also apply.

When DEPs are applied, a Management of Change (MOC) process should 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 may 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 regard 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

Data Sheet	The data/requisition sheet DEP 31.40.21.93-Gen., to be used by Principal and completed by the Manufacturer/Supplier
Fitting	Term used in ISO 15590-2 which has the same meaning as isolating joint
Purchase	Term used in ISO 15590-2 which has the same meaning as Principal

1.3.3 ABBREVIATIONS

DN	Nominal Diameter, in mm
HIC	Hydrogen-Induced Cracking
NDE	Non-Destructive Examination

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 Part V.

1.5 ACTION ITEMS

Items requiring selection or a decision by the Principal are identified by the use of a (P) in the margin. The required selection shall be indicated on the DEP data/requisition sheet DEP 31.40.21.93-Gen.

1.6 SUMMARY OF MAIN CHANGES

This DEP is a revision of the DEP of the same number dated September 2010, having only editorial changes.

1.7 COMMENTS ON THIS DEP

Comments on this DEP may be sent to the Administrator at 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://www.shell.com/standards> and on the main page of the DEPs DVD-ROM.

PART II ISOLATING JOINT FUNCTIONAL REQUIREMENTS

1. GENERAL

Isolating joints provide an electrical break between pipeline sections of the same or different pipelines, or between pipeline sections and neighbouring structures. The purpose of the isolating joint is to prevent detrimental electrochemical interaction and improve the effectiveness of the cathodic protection system. Isolating joints are also used to ensure effective current distribution for cathodic protection systems.

Wherever feasible, the isolating joint is to be installed above ground, or in an inspection pit in dry conditions, in order to limit the possibility of electrical bridging across the joint. It is intended to be girth welded between two pipeline sections.

However, where other overriding factors dictate that the isolating joint is to be buried, the following factors shall be addressed:

- The isolating joint shall be installed to minimize circumferential and bending stresses due to soil loading. An appropriate foundation shall be realised, providing adequate bearing support below the entire isolating joint.
- Care shall be taken selecting the location for installation of buried isolating joints, such that the selected location does not impair or compromise the required functionality of electrical isolation between the two different cathodic protection systems; namely Impressed current and sacrificial anodes.
- Special consideration shall be given to the external coating of the isolating joint to ensure long-term integrity.
- Test Cables upstream and downstream of the isolating joint shall be installed and brought above ground to facilitate easy monitoring of stray current, if applicable.

- (P) The design of the isolating joint shall be compatible with the design code adopted for the pipeline in which it is installed. ISO 13623 amended by DEP 31.40.00.10-Gen. is the governing code to be used for pipeline engineering, in addition to applicable local design codes. In some situations, e.g. within plant fences, the pipeline sections connected to the isolating joint may be designed to a plant piping code, in accordance with ISO 15649. The isolating joint shall be suitable for operation under the design/operating and environmental conditions specified by the Principal.

The isolating joint shall be suitable for pigging operations.

2 ISOLATING JOINT COMPONENTS

The isolating joint shall consist of the following components (see Figure 1 in Appendix A):

- Two spools, each consisting of a pipe segment with a bevelled end for welding to the pipeline on one side, having a welded-on boltless flange at the other end for encapsulation into isolating and filler material. Slip-on flanges shall not be used. The material used for the pipe segments shall be compatible with the pipeline material, as specified by the Principal in the data sheet.
 - A rigid casing (retaining ring) for strength connection of the two spools.
 - Isolating and filler materials for electrical isolation between the two spools.
 - One set of ring seals for pipeline internal pressure containment.
- (P) If specified by Principal, there shall be a second set of ring seals.

NOTE: A double sealing arrangement shall be specified for design pressures in excess of 50 bar (ga), or if the conveyed fluid is classified by Principal as very toxic (see DEP 01.00.01.30-Gen.).