

DEP SPECIFICATION

THERMAL-SPRAYED CERAMIC COATING REQUIREMENTS

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DESIGN AND ENGINEERING PRACTICE



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PREFACE

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These views are based on the experience acquired during involvement with the design, construction, operation and maintenance of processing units and facilities. Where deemed appropriate DEPs are based on, or reference international, regional, national and industry standards.

The objective is to set the standard for good design and engineering practice to be applied by Shell companies in oil and gas production, oil refining, gas handling, gasification, chemical processing, or any other such facility, and thereby to help achieve maximum technical and economic benefit from standardization.

The information set forth in these publications is provided to Shell companies for their consideration and decision to implement. This is of particular importance where DEPs may not cover every requirement or diversity of condition at each locality. The system of DEPs is expected to be sufficiently flexible to allow individual Operating Units to adapt the information set forth in DEPs to their own environment and requirements.

When Contractors or Manufacturers/Suppliers use DEPs, they shall be solely responsible for such use, including the quality of their work and the attainment of the required design and engineering standards. In particular, for those requirements not specifically covered, the Principal will typically expect them to follow those design and engineering practices that will achieve at least the same level of integrity as reflected in the DEPs. If in doubt, the Contractor or Manufacturer/Supplier shall, without detracting from his own responsibility, consult the Principal.

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- 3) Contractors/subcontractors and Manufacturers/Suppliers under a contract with users referred to under 1) or 2) which requires that tenders for projects, materials supplied or - generally - work performed on behalf of the said users comply with the relevant standards.

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

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1. INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for surface preparation, materials, application and quality control testing of thermal-sprayed ceramic coating systems for use on offshore structures or marine equipment.

The only Service Category included in this document is in Appendix A. It is anticipated that if there are other Service Categories they will be addressed in the contract documents.

This DEP is a revision of the DEP of the same number dated February 2013. The following are the main, non-editorial changes.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorized 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 authorized 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, gas handling, oil refining, chemical processing, gasification, distribution and supply/marketing. This DEP may also be applied in other similar facilities.

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 authorized to act for, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

The word **may** indicates a permitted option.

1.3.2 Specific definitions

Term	Definition
Accept / Accepted / Acceptance	This shall mean Principal's written agreement that the submitted item has been performed in accordance with requirements
Ambient	Ambient shall mean environmental conditions in the immediate area of the coating work, including air temperature and surface temperature.
Application Procedure	Application procedure is to mean the detailed plan for performance of work, describing specific methods, materials, equipment and activities which Applicator will use.
Applicator	Applicator shall mean Contractor or Subcontractor who undertakes the surface preparation and coatings application activities defined by this DEP.
Contract	The specific agreement between Principal and a Contractor.
Contract Articles	Contract articles refer to specific sections of contract.
Drawings	The approved Drawings and/or Parts Lists and revisions of which define the system configuration in enough detail to allow material order and construction/manufacture. Depending on the specification system invoked by the Contract Articles, these may alternatively be referred to as approved for Construction Drawings (AFC drawings) or approved Drawings and Parts Lists (AD&PL).
Feathered	A smooth transition between coatings and adjacent uncoated surfaces or between layers of coating where multiple layers are exposed.
Nonconformance	Nonconformance is non-fulfilment of specified requirements.
Quality Assurance	All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality.
Quality Plan	The approved document setting out specific quality practices, resources and sequence of activities relevant to a particular product, service, contract or project. This is also known as an Inspection Test Plan (ITP)
Quality System	The organizational structure, responsibilities, procedures, processes and resources for implementing quality management.
Review / Reviewed	The Principals right, but not obligation, to comment on the submitted item.
Service Category	Specific coating requirements for a material, environment or location.

Term	Definition
Specification	Any or all of the sections, paragraphs, appendices, tables, figures or attachments of the specification system or documents invoked by Contract.
Waiver / Waived	This is to mean written authorization to use materials, components or methods which do not conform to requirements of specifications or this DEP.
Work	The work shall mean any portion of engineering, procurement, fabrication or treatment identified in Contract.

1.3.3 Abbreviations

Term	Definition
DFT	Dry Film Thickness
HRC	Hardness Rockwell C Scale
ITP	Inspection Test Plan
NIST	(United States) National Institute of Standards and Technology

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 (8).

1.5 SUMMARY OF MAIN CHANGES

This DEP is a full revision of the DEP of the same number dated February 2013. The following are the main, non-editorial changes.

Section/Clause	Change
All	Restructured and clarified requirements, enforced use of shall / should / may for normative statements

1.6 COMMENTS ON THIS DEP

Comments on this DEP may be submitted to the Administrator using one of the following options:

Shell DEPs Online (Users with access to Shell DEPs Online)	Enter the Shell DEPs Online system at https://www.shelldeps.com Select a DEP and then go to the details screen for that DEP. Click on the "Give feedback" link, fill in the online form and submit.
DEP Feedback System (Users with access to Shell Wide Web)	Enter comments directly in the DEP Feedback System which is accessible from the Technical Standards Portal http://swwww.shell.com/standards . Select "Submit DEP Feedback", fill in the online form and submit.
DEP Standard Form (other users)	Use DEP Standard Form 00.00.05.80-Gen. to record feedback and email the form to the Administrator at standards@shell.com .

Feedback that has been registered in the DEP Feedback System by using one of the above options will be reviewed by the DEP Custodian for potential improvements to the DEP.

1.7 DUAL UNITS

This DEP contains both the International System (SI) units, as well as the corresponding US Customary (USC) units, which are given following the SI units in brackets. When agreed by the Principal, the indicated USC values/units may be used.

1.8 NON NORMATIVE TEXT (COMMENTARY)

Text shown in italic style in this DEP indicates text that is non-normative and is provided as explanation or background information only.

Non-normative text is normally indented slightly to the right of the relevant DEP clause.