

DEP SPECIFICATION

OXIDATION OF STAINLESS STEEL WELDMENTS

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DESIGN AND ENGINEERING PRACTICE



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1. INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for the prevention and removal of oxidation that may develop at weldments in stainless steels whether applied as solid material or as cladding. The acceptance criteria for oxidation are also included.

These stainless steels include, but are not limited to:

- austenitic stainless steels , such as AISI 316L and the high alloy type UNS S31254;
- austenitic/ferritic (duplex) stainless steels such as UNS S31803;
- high nickel austenitic alloys such as Incoloy 825 and Inconel 625.

This is a revision of the DEP of the same number dated December 1998; see (1.5) 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. Any authorised access to DEPs does not for that reason constitute an authorisation 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 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

Term	Definition
Backing Gas	The gas applied inside a component, pipe or pipeline section to remove the oxygen from the welding.
Copious	More than enough.
Shielding Gas	The gas applied through the welding torch to protect the arc (for example GTAW welding process).

1.3.3 Abbreviations

Term	Definition
GTAW	Gas Tungsten Arc Welding
SMAW	Shielded Metal Arc Welding
TIG	Tungsten Inert Gas (welding)

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 (5).

1.5 SUMMARY OF MAIN CHANGES

This DEP is a revision of the DEP of the same number dated December 1998. The following are the main, non-editorial changes.

Section	Change
1.1	Such as SS316....
2.	Added relation to ISO TR 17671-3, Introduced two material classes hydrogen sensitive/non hydrogen sensitive, Added oxygen analysing equipment option, Added guideline on thickness.
3.	Addition of mechanical surface cleaning methods, Changed chloride ion to halide ion concentration of 200 ppm to 100 ppm, in line with Cl-SCC limits, Added use of dewpointed air purging, Application of paste on inside of equipment and components, Paste is containing HF, therefore halide components (removed restriction).
4.	Added final product to be acceptable.
5.	Added new DEP references.