

TECHNICAL SPECIFICATION

STAINLESS STEEL PIPE (AMENDMENTS/SUPPLEMENTS TO ASTM A 358)

MESC SPE 74/009

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MESC SPECIFICATION DOCUMENT



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

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PART I INTRODUCTION

1.1 SCOPE

This MESC SPE specifies requirements for stainless steel pipe.

This MESC SPE shall apply in addition to the applicable MESC Buying Description, purchase order or requisition sheet.

This MESC SPE only applies to stainless steel pipe to ASTM A 358, Grades 304, 304L, 304H, 316, 316L, 321, 321H and 347, all of Class 1.

This MESC SPE is written as amendments and supplements to ASTM A 358:2008, which are covered in Part II of this MESC SPE. The clause numbering of ASTM A 358:2008 has been retained and any amendments are identified as '*Add*', '*Modify to read*' or '*Delete*'. Any clauses of ASTM A 358:2008 that are not amended or supplemented by this MESC SPE shall apply as written.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by Shell GSI, the distribution of this MESC SPE is confined to Shell companies and, where necessary, to Contractors and Manufacturers/Suppliers nominated by them.

This MESC SPE is intended for use in oil refineries, chemical plants, gas plants, exploration and production facilities and, where applicable, supply/distribution installations.

If national and/or local regulations exist in which some of the requirements may be more stringent than in this MESC SPE 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 safety, environmental, economic and legal aspects. In all cases the Contractor shall inform the Principal of any deviation from the requirements of this MESC SPE 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 MESC SPE as closely as possible.

1.3 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 or maintenance 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 its design and construction. The Principal will generally specify the technical requirements. 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.

1.4 CHANGES SINCE PREVIOUS EDITION

The previous edition of this MESC SPE was dated **May 2010. The change is to update email address of MESC SPE administrator and to incorporate new section on "Length" for pipes.**

1.5 COMMENTS ON THIS MESC SPE

Comments on this MESC SPE may be sent to the MESC SPE Administrator at MESC@shell.com. Shell staff may also post comments on this MESC SPE on the Surface Global Network (SGN) under the Standards folder.

PART II AMENDMENTS/SUPPLEMENTS TO ASTM A 358:2008

- 6.2.1 *Add:*
The longitudinal seam weld shall be made by an automatic welding process.
- 6.2.5 *Add* Pipe ordered to Grade 304 or 304L shall be made using welding procedures qualified with impact testing at $-196\text{ }^{\circ}\text{C}$ ($-321\text{ }^{\circ}\text{F}$) in accordance with the requirements of ASME B31.3, Section 323.2.2. The material certificates of these welded pipes shall refer to these WPQs.
- 6.3.3 *Add* If a stabilised heat treatment is specified, the pipe shall be given a stabilising heat treatment in accordance with supplementary requirement S5 within a temperature range of $870\text{ }^{\circ}\text{C}$ to $900\text{ }^{\circ}\text{C}$ ($1600\text{ }^{\circ}\text{F}$ to $1650\text{ }^{\circ}\text{F}$) for 4 hours subsequent to the solution heat treatment.

Alternatively, the Manufacturer may submit a stabilisation heat treatment procedure for approval by the Principal, and supplementary requirement S6 (Intergranular corrosion test) shall apply.
- 6.3.4 *Add* Any cold working shall be done before the final heat treatment.
- 6.3.5 *Add* Heat treatment procedures shall be subject to statistical process control to ensure that the final material properties comply with the material specification and this MESC SPE. The process control data and related periodic quality control checks shall be documented.
- 7.1 *Add:*
For pipe ordered to Grade 316, the carbon content shall not exceed 0.030 %.
- 7.3 *Add* All welds of austenitic stainless steel pipe shall have a ferrite number between 3FN and 8FN. Ferrite number testing shall be in accordance with ISO 8249, other test methods are subject of approval by the Principal.
- 8.1.4 *Add:*
Alternatively, for nominal pipe size up to and including DN 600 (NPS 24), permitted variations in wall thickness may be in accordance with ASTM A 312:2008 paragraph 9.1.
- 15.2 *Add:*
Hydrostatic testing shall be performed after heat treatment.

Hydrotesting shall be performed with water containing no more than 50 ppm chloride. The pipe shall be dry before any end closures are installed.
- 15.3 Modify Purchaser to read Principal.
- 15.4 *Add* Austenitic stainless steels shall be capable of passing an intergranular corrosion test in accordance with supplementary requirement S6. The frequency of this test shall be sufficient for the Manufacturer to assure that all tests would be successful, if subsequently performed. If periodic data are not available, then an intergranular corrosion test shall be performed for each heat in the purchase order.
- 17 Modify to read:

Circumferentially welded joints are not allowed.
- 18.1 *Add:*
In addition, marking shall also include the nominal pipe size (DN), and the pipe schedule number or specified wall thickness (mm).

Marking shall also include the charge number (heat number) and, where applicable, the heat treatment batch number.

If pipes are manufactured to ASTM A 312 permitted variations in wall thickness,

the marking shall include the following: (WTK TOL - ASTM A 312)

20

Add

Certification

Unless specified otherwise, inspection and test certificates shall be supplied to the Principal.

21

Add

Length

Unless specified otherwise in the purchase order, the Unit of Length (UoL) for pipe is in meter or feet. The form of delivery shall be in single random length (SRL or double random length (DRL). The specified quantities of random lengths on the purchase order shall be converted to aggregate length on the basis of 6.1 m (20 ft) for single random length and 12.2 m (40 ft) for double random length.

To satisfy the purchase order required pipe length, the delivered quantities of random lengths shall amount to at least the calculated aggregate length.

PART III REFERENCES

In this MESC SPE, reference is made to the following publications:

NOTES:

1. Unless specifically designated by date, the latest edition of each publication shall be used, together with any amendments/supplements/revisions thereto.
2. Most of the referenced external standards are available to Shell staff on the SWW (Shell Wide Web) at <http://sww.shell.com/standards>.

AMERICAN STANDARDS

Process Piping

ASME B31.3

Issued by:
American Society of Mechanical Engineers
ASME International
Three Park Avenue, M/S 10E
New York, NY 10016, USA

Standard Specification for Seamless, Welded, and
Heavily Cold Worked Austenitic Stainless Steel Pipes

ASTM A 312

Standard Specification for Electric-Fusion-Welded
Austenitic Chromium-Nickel Stainless Steel Pipe for
High-Temperature Service and General Applications

ASTM A 358

Issued by:
American Society for Testing and Materials
1916 Race Street, Philadelphia
19103, USA

INTERNATIONAL STANDARDS

Welding - Determination of Ferrite Number (FN) in
Austenitic and Duplex Ferritic-Austenitic Cr-Ni Stainless
Steel Weld Metals

ISO 8249

Issued by:
ISO Central Secretariat
1, ch. de la Voie-Creuse
Case postale 56
CH-1211 Genève 20
Switzerland

Copies can also be obtained from national standards
organizations.