Specification for "DIN EN 10216-2 Grade 1.5415"- 16Mo3 Pipes

(W.O: D157 - D160 – 700MWe SG)
NPCIL Project: GHAVP-1&2
(NPCIL PO No: CMM/FTP/10-33-1-1158/e-PO/22549 dtd 08/03/2018)

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Rev 00 (Date:30.01.2019): First Issue
Rev 01 (Date:17.05.2019): Clause 12.1 added Clauses 9.0 and 12 modified.
Clause 8.1 modified based on the feedback from NDTL/BHEL
Rev 02(Date:06.11.2019): Clause 8.1 Heading is retained as 'Non-destructive Testing' since UT & Flux Leakage tests are mentioned. Ultrasonic Testing –Detection of Longitudinal Imperfections only retained.

न्यूक्लियर पावर कार्पोरेशन ऑफ इंडिया लिमिटेड
NUCLEAR POWER CORPORATION OF INDIA LTD.
☐ अनुमोदित / APPROVED
☑ टिप्पणी के अनुसार अनुमोदित / APPROVED AS NOTED
☐ संविरचन को आगे बढ़ाए / रोकें ।
PROCEED WITH / HOLD FABRICATION
☐ अंतिम ट्रांसपेरेन्सी एवं प्रतियां भेजें ।
SEND FINAL TRANSPARENCIES & PRINTS
☐ संशोधन करें एवं अनुमोदन के लिए पुनः प्रस्तुत करें।
REVISE AND RESUBMIT FOR APPROVAL

जाँचकर्ता CHECKED BY	समीक्षक REVIEWED BY	अनुमोदन कर्ता APPROVED BY
7/11/19	07/11/19	7/11/19

किए जानेवाले कार्य का अनुमोदन आपूर्ति को विनिर्देशनों के अनुसार आपूर्ति के उत्तरदायित्व से मुक्त नहीं करता ।
The Approval of the work to be done does not relieve the supplier of responsibility of supply according to specifications.

1.0 Scope

1.1 This specification covers the requirements for material, manufacture, inspection, examination, testing and supply of "DIN EN 10216-2 Grade 1.5415"- 16Mo3 Pipes

2.0 Applicable Documents

2.1 DIN EN 10216-2, EN ISO10893-3, EN ISO 10893-10, EN ISO 8492, ENISO 8493 , EN ISO 8495, EN ISO 8496

3.0 Material:

Material Specification: DIN EN 10216-2 Grade 1.5415
Test Category: 2
Size and Quantity: As per Purchase Order

4.0 Billet/Bloom Requirements:

4.1 The steel making process shall be mentioned in the quotation and subsequently in quality Plan & Manufacturing Process Plan. The steel shall be of fully killed.
4.2 Ladle analysis: Chemistry shall be controlled as per material specification.

5.0 Chemical Composition and Process of Manufacture of Pipes:

5.1 The pipes shall be manufactured by a seamless process. The pipes may be either hot or cold finished. The pipe manufacturing process shall be mentioned in the Technical Bid and subsequently in quality Plan & Manufacturing Process Plan. Inner surface Finish of Pipes shall be 6.3 Microns or better.
5.2 Product analysis: Chemistry shall be controlled as per material specification.

6.0 Heat Treatment.

Pipes shall be supplied in Normalized condition as per material specification.

7.0 Mechanical/Metallurgical Test Requirements & Extent of Test

7.1 Quantum of Tests: As per material Specification & Test category-2
7.2 Tensile Test at Room Temperature: As per material Specification
7.3 Tensile Test at 350°C: As per material Specification
7.4 Flattening Test or Ring Tensile Test: EN ISO 8492 or EN ISO 8496 respectively
7.5 Drift Expanding Test or Ring Expanding Test: EN ISO 8493 or EN ISO 8495 respectively

8.0 Non Destructive Examination

8.1 Non Destructive Test: Pipes shall be subjected to a Non-Destructive Testing for The detection of longitudinal imperfections covering 100% of volume (Notch type shall be 'V'. Matching contour probe shoe/wedge shall be used in case of contact method. Otherwise immersion method can be followed) in accordance with EN ISO 10893-10, to acceptance level U2, sub-category C.
Or Flux Leakage Test as per EN ISO 10893-3 acceptance level F2.

9.0 Leak Tightness Test:

Each Pipe shall pass a hydrostatic test or electromagnetic test for leak-tightness as per material Specification.

10.0 Finish and Repair

Inside and outside surfaces shall be free from scales and defects like laps, seams, folds, cracks, pitting etc. Repairs by welding are prohibited. Surface defects can be removed mechanically, ensuring smooth curved surface and maintaining specified minimum thickness without affecting the workmanlike finish.

11.0 Dimensional Tolerances and Check:

Each Pipe shall be visually examined and checked for dimensional requirements Dimensions are as per relevant P.O and/or drawings. Tolerances on dimensions, Straightness shall be as per Material specification.

12. 0 Documentation

12.1 Following documents shall be submitted to the purchaser for review and approval.

a) Quality Plan, Manufacturing Process Plan, Heat Treatment Plan, NDE Procedure& Technique sheets and Leak Tightness Test Procedure.

12.2 **Reports**

Three set of following test report/certificates shall be submitted to the purchaser for review and approval.

a) Chemical analysis-both ladle & product.
b) Mechanical test Report-Tensile(RT,350°), Flattening/Ring Tensile Test, Drift Expanding/Ring Expanding Test .
c) Non-destructive examination reports.
d) Heat treatment details (Heat treatment chart shall form part of the Test Certificate)
e) Leak Tightness Test Report
f) Visual and dimensional control report.
g) Material Mix-up Report

13.0 Marking, Packing & Shipment

13.1 All the pipes shall be marked with the following information.

a) Material designation.
b) Heat no.
c) Serial Number
d) Manufacturer's identification.
e) Inspection agency stamps
f) P.O Number

13.2 Before shipment, suitable easily removable rust preventive coating shall be applied on the product.

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