



RANIPET

QUALITY ASSURANCE
TECHNICAL DELIVERY CONDITIONS
FOR HIGH STRENGTH LOW ALLOY SHEETS AND PLATES WITH
ATMOSPHERIC CORROSION RESISTANCE FOR GATES & DAMPERS

TDC : RTG : 476

Rev. No. 01

DATE: 13.04.2013

TECHNICAL DELIVERY CONDITIONS

FOR HIGH STRENGTH LOW ALLOY SHEETS AND PLATES WITH ATMOSPHERIC CORROSION
RESISTANCE APPLICABLE TO GATES & DAMPERS

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4	TDC : RTG : 476	01	13.04.2013	TECHNICAL DELIVERY CONDITIONS FOR HIGH STRENGTH LOW ALLOY SHEETS AND PLATES WITH ATMOSPHERIC CORROSION RESISTANCE FOR GATES & DAMPERS	Clause No. 05 - NDT Standard Changed to ASTM A435 & A578 which is applicable to steel plates & steel special plates respectively instead of ASTM A 388 which is applicable to steel forgings. Clause No. 04 – Modified based on feedback received from MM Dept.
3	TDC : RTG : 476	00	11.08.2012	TECHNICAL DELIVERY CONDITIONS FOR HIGH STRENGTH LOW ALLOY SHEETS AND PLATES WITH ATMOSPHERIC CORROSION RESISTANCE FOR GATES & DAMPERS	1. TDC : 511 WITHDRAWN. 2. ALL THE REQUIREMENTS OF ABOVE TDC ARE COVERED IN THE TDC : RTG : 476 AND NUMBERING SCHEME OF TDC CHANGED AS PER SYSTEM PROCEDURE 3. NEW CLAUSES LIKE, DIMENSIONAL TOLERANCE, SPECIAL FLATNESS, UT REQUIREMENTS, INSPECTION & TESTING REQUIREMENT ARE ADDED AND RELEASED AS ORIGINAL ISSUE.
2	TDC : 511	00	15.11.1995	TDC FOR CORROSION RESISTANT PLATES & SHEETS TO ASTM A 588 MATERIAL	1. TDC : RTA : 006 WITHDRAWN. 2. ALL THE REQUIREMENTS ARE COVERED IN THIS TDC AND NUMBERING SCHEME OF TDC CHANGED AS PER SYSTEM PROCEDURE. 3. TDC RELEASED AS ORIGINAL ISSUE.
1	TDC : RTA : 006	04	15.04.1993	TDC FOR CORROSION RESISTANT PLATES & SHEETS TO ASTM A 588 MATERIAL	ORIGINAL RELEASE
SL NO	TDC / CLAUSE NO	REV. NO.	EFFECTIVE DATE	TITLE OF DOCUMENT	REVISIONS MADE

HISTORY OF RECORD OF REVISIONS



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1.0 SCOPE :

- 1.1 This Technical Delivery Conditions (TDC) specifies the requirements for supply of high strength low alloy plates with weathering or atmospheric corrosion resistance to various specifications mentioned below applicable to Gates & Dampers.
- 1.2 a) COR – TEN B or ASTM A 588 Gr. A
b) EN 10025-5 GR. S355J2W + N (Matl. No. 1.8965)
c) SAILCOR IRSM 41

2.0 MATERIAL & MANUFACTURE :

- 2.1 The Chemical and Mechanical properties of the material shall be as per respective specifications mentioned in clause 1.2 above.
- 2.2 The steel shall be fully killed with fine grain structure
- 2.3 Sheets and Plates shall be either hot rolled or cold rolled and shall be supplied in a Normalized condition.

3.0 DIMENSIONAL TOLERANCES :

Clause Sl. No.	Tolerance on	Allowable or Acceptable Limits
3.1.1	Thickness for Sheets & Plates of 1.6 mm to 12 mm	Class B of EN 10029 (Fixed Minus Tolerance)
3.1.2	Thickness for Plates of 16 mm and more	Class A of EN 10029 (for minus thickness tolerance depending on the nominal thickness)
3.2	Width	+ 20 to + 30 mm depends on thickness of the plates
3.3	Length	+ 50 mm for a length of 8000mm to 12000mm
3.4	Edge Camber – Length wise	Max 10mm permitted for a length of 8000 to 12000mm
3.5	Out of Squareness or diagonal difference	1% of Width size permitted

4.0 SPECIAL TOLERANCES ON FLATNESS – ON BOTH AXIS :

- 4.1 For Plate thickness of 5 mm to 8 mm – For a span length of 4000mm the maximum flatness permitted shall be 10 mm.
- 4.2 For Plate thickness of 10 mm to 12 mm – For a span length of 4000mm the maximum flatness permitted shall be 6 mm.
- 4.3 For Plate thickness of 16 mm and up to 25 mm – For a span length of 4000mm the maximum flatness permitted shall be 4 mm.
- 4.4 For Plate thickness of more than 25 mm – Flatness shall be as per the respective specification / standard.

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5.0 NON DESTRUCTIVE TESTS :

- 5.1 The material shall be free from scales, laps, piping, cracks, laminar imperfection (single / multi plane inclusion bands or cluster) and any other injurious defects to raw materials.
- 5.2 All the plates of thickness 40mm and above (100%) shall be Ultrasonic Tested (UT) by Straight-Beam Ultrasonic Examination method for steel plates as per ASTM A-435 or ASTM A 578.
- 5.3 Supplier may choose any of the following method for UT and its corresponding acceptance norms, as applicable.

5.3.1 ACCEPTANCE NORMS:

5.3.1.1 As per clause no. 6.1 of ASTM A-435 (or)

5.3.1.2 As per clause no. 7.1 of ASTM A-578 (Acceptance Standard – Level A)

6.0 INSPECTION & TESTING

- 6.1 The verification of chemical composition shall be carried out by each cast wise or heat no wise and TCs shall be submitted for BHEL verification.
- 6.2 The verification of mechanical properties shall be carried out by each cast wise or heat no wise and testing units are as follows:
 - 6.2.1 One Tensile Test for every 40 MT of plates from each heat or part thereof.
 - 6.2.2 One Notched Bar Impact Test (3 Specimens) for every 40 MT of plates from each heat or part thereof.
- 6.3 In case of indigenous supplier the testing of materials shall be carried out either at works or at any of the NABL approved Labs, as per the clause no. 6.1 & 6.2 – subject to the Purchase Order Qty and test reports shall be shown to BHEL / BHEL's Authorized Inspection Agency (AIA) who will conduct the inspection at their works.
- 6.4 In addition to above clause no.6.3, the BHEL / BHEL's Authorized Inspection Agency (AIA) will witness the test, as per the clause no. 6.1 and 6.2 on random basis subject to 10% of offered qty – either at supplier's works or at NABL approved Labs and the physically witnessed test reports shall be sent to BHEL for verifications.
- 6.5 In case of foreign supplier the testing of materials shall be carried out either at works or at any of the internationally accredited Labs, as per clause no. 6.1 and 6.2 - 100% subject to the Purchase Order Qty and the test reports shall be sent to BHEL for their verification. These test reports shall be sent to BHEL well in advance – minimum 15 days advance prior to the actual dispatch of the materials from the country of origin.

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7.0 MARKING, LABELLING AND PACKAGING :

- 7.1 Each of sheet and plate shall be stenciled and hard stamped & bordered with white paint with the following details on top surface of the each plates.
- Purchase Order No.
 - Size & Quantity
 - Specification
 - Melt / Heat Number
 - Maker's / Mill's Identification / Logo / emblem
- 7.2 **Colour code** : One coat of yellow colour painting – minimum 100mm width shall be applied on each of stack of sheets and plates on both axis – on thickness side - viz., length wise and width wise at any preferable locations. If the plate is of single one then the yellow colour shall be applied through out the length on the thickness side.
- 7.3 The Coils and Sheets shall be coated with a suitable rust preventive fluid on both sides which can withstand marine corrosion and covered with polyethene sheets – thickness more than 20 microns shall be wrapped over the coil / sheet bundle, subsequently these bundles shall be again wrapped with HDPE sheets with suitable metal band at minimum four locations to avoid transit loss / damage to bundles.
- 7.4 The Plates shall be coated with rust inhibitive paint on both sides which can withstand marine corrosion and shall be bundled suitably for easy handling during shipment. Bundling of plates or delivering of plates separately both is acceptable.

8.0 INSPECTION DOCUMENTATION :

- 8.1 The supplier shall send the test certificates (in .pdf format) in English only to reach BHEL Ranipet minimum 15 days advance - before the physical receipt of materials at BHEL stores and it shall contain the following documents /information's:
- Purchase Order Number and Date
 - TDC Number with Rev. no and Date
 - Material Specification and Grade
 - Size, Number, Qty and Weight
 - Chemical Composition – Each Melt wise
 - Mechanical Properties – as per clause no. 6.0
 - Random Witness Test Report by BHEL / BHEL's AIA
 - Ultrasonic Testing Report for the plates > or = 40 mm thickness of plates
 - Heat Treatment Particulars if any.,

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9.0 AUDIT CHECK AT BHEL :

- 9.1 BHEL reserves the right, at their discretion to carry out audit checks for chemistry, heat treated condition and mechanical properties on the delivered plates..
- 9.2 If any plate is found to be defective during audit check test as per clause 9.1 or during subsequent processing at BHEL, such plates delivered against the PO are liable for rejection and has to be replaced at the risk and cost of supplier.

10.0 End Use :

- 10.1 These Sheets & Plates are intended for use in Gates & Dampers which are coming under Boiler Auxiliaries Products.

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