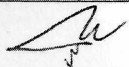


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1.0	Scope	
1.1	This TDC specifies the additional requirements for the delivery of N10276 clad on one side of carbon steel plates Class 5 conforming to ASTM A265-12 and to the latest edition.	
1.2	The size and Quantity shall be as specified in the Enquiry/ Purchase order	
2.0	Chemical composition and process	
2.1	UNS N10276 as per ASTM B575	
2.2	Carbon steel as per ASTM A36/ IS 2062 Gr. A/IS 2062 E 250 Gr. BR	
2.3	The method of bonding of cladding metal to base plate shall be Explosion bonding or Hot rolling or combination of both to achieve the required quality as per ASTM A265-12.	
2.4	In the clad plate, there shall not be more than one number of joints in cladding metal sheet before cladding and no joint in Carbon steel base plate. 100% Radiographic testing of all such joints shall be done by vendor as per ASME, Sec. VIII, Div.1, UW-51. Weld seam location and orientation shall be provided by manufacturer before cladding.	
3.0	Dimensional tolerances	
3.1	The plates shall be supplied to the dimensions specified in the enquiry/PO. Enquiry/PO shall state the following	
	1) Length and width of plate. 2) Base metal thickness 3) Clad metal thickness The following dimensional tolerances shall apply	
	a) Thickness	As per Enquiry/ PO
	b) Clad plate Thickness	Composite thickness should not be less than the specified thickness. (+)3mm (or) (+)10% of composite thickness (whichever is greater), (-)0mm
	c) Clad Metal thickness	Thickness should not be less than the specified thickness. Over tolerance on clad metal thickness shall be as per clad metal specification. Thickness of clad metal in C276 clad plate shall be measured as per ASTM E 376 or any other equivalent ASTM/ASME/ISO/EN/DIN standard. For the purpose of measurement, the C 276 clad plate shall be divided into 4 equidistant grid lines (perpendicular to longitudinal axis) and 3 equidistant grid lines (parallel to longitudinal axis). Thickness of clad metal in C 276 clad plate shall be measured at the intersection points of above referred grid lines.
	d) Base metal thickness	Tolerance on thickness shall be as per Base plate specification and should fulfill sl no. (b) specified above
	e) Length	(+)5mm, (-) 0mm
	f) Width	(+)5mm, (-)0mm
	g) Flatness	5mm/m and 8mm/2m (max)
4.0	Heat Treatment	
4.1	Unless otherwise specified, the plates shall be supplied in heat- treated condition.	
4.2	Clad plates shall be stress relieved by Heat treatment (as per supplier's procedure)	
5.0	Mechanical Test	
5.1	Test samples shall be selected and prepared as per ASTM A265. Number of tests and re-tests shall be carried out as per ASTM A265.	
	a) Tensile test	The tensile test to be conducted as per Clause 7.1 of ASTM A265 with acceptance norms specified therein.
	b) Ductility	Two bend tests for ductility of clad plate shall be done, one with the cladding metal in compression and other with the cladding metal in tension. Specimen

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		preparation and procedure for ductility bend test shall be as per ASTM E290 with bend angle and diameter as per Bend test. The convex surface of specimen shall withstand bending without cracking. Any cracks within one thickness of the edge of the specimen are not considered a bend test failure. Cracks occurring in the corners of the bent portion shall not be considered significant.
	c) Bond Strength:	
	c.1) Shear strength test	The shear strength test shall be carried out as per clause 7.2.1 of ASTM A265. The shear strength of the clad plate shall not be less than 140 MPa.
	Vendor has the option of carrying out either Shear Strength Test (or) Bend Test	
	c.2) Bend test	Three bend tests shall be made with the cladding metal in compression to determine the quality of the bond. These bend tests shall be made in the manner of the tension tests indicated in Fig.2 of ASTM A265 and shall be bent through an angle of 180° to the bend diameters provided in either ASTM A6/A6M or specification ASTM A20/A20M. At least two of the three tests shall show not more than 50% separation on both edges of the bent portion.
	d) Ultrasonic test	The clad plate shall be examined ultrasonically as per ASTM A578/A578 M, with acceptance level C.
6.0	Freedom from defects	
6.1	The material shall be clean, smooth, sound and free from injurious defects.	
6.2	Any repair work on the clad plate is not allowed as such.	
7.0	Inspection at Supplier's works	
7.1	BHEL's representative shall have free access at all times until work on contract of BHEL is being performed, to all parts of the manufacturer's works. The supplier shall offer BHEL's representative all reasonable facilities without any financial implication to satisfy the latter that the material is being furnished in accordance with this specification.	
8.0	Packing and Marking	
8.1	The material shall be separated by size and prepared for shipment in such a manner as to ensure acceptance by common carrier transportation and to afford protection from the normal hazards of transportation by sea. Packing shall be of sea worthy packing. Each package shall be suitably marked with the following details. A metal label shall be securely attached to each package and shall bear the following information: 1. C 276 clad Carbon steel plates 2. BHEL PO no: 3. Consignment and Identification No. 4. Size, number and Weight 5. Supplier's name	
8.2	Painting- Non-clad portion of Carbon steel base plate shall be coated with one coat of Inorganic Zinc silicate primer, DFT- 20μ	
9.0	Dispatch	
9.1	It is the responsibility of the supplier to ensure that no damage occurs during transit.	
10.0	Inspection and Certification	
10.1	All tests shall be complied as per the specification for each heat and dimensional reports containing all elements of cl.3.1 & cl 5.1 shall be furnished for our verification. Dispatch	




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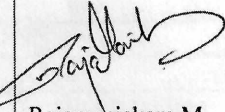
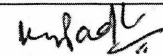
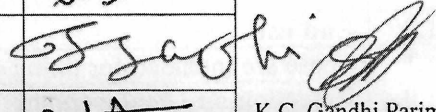
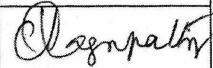
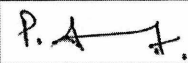
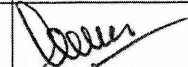
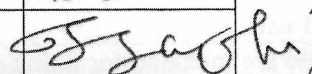
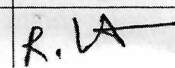
	clearance will be issued after verification of reports and is mandatory before effecting despatch to BHEL stores.
10.2	The test certificates shall be furnished with the following details legibly in English language only 1. BHEL reference a) BHEL PO no b) C276 cladde carbon steel plates 2. Supplier's reference: a) Supplier's name b) Test certificate no c) Quantity and Weight d) Identification marks e) Process of manufacture 3. Test results: a) Material test certificates of base plate and cladding metal sheet b) RT report c) Heat treatment Batch no and details d) Clad metal thickness in cladde plate e) Mechanical properties f) Bond strength g) Ultrasonic test report h) Dimensional report
11.0	End use
11.1	These are intended for lining of absorber in FGD system.
12.0	Rejection and replacement
12.1	In the event of any cladde plate proving defective in the course of rolling (forming), machining, testing, assembly or erection, such plates shall be rejected notwithstanding, any previous certification of satisfactory testing and/or inspection.
12.2	The supplier shall undertake to replace the rejected plates at his own cost and the rejected plates shall be sent back to the supplier after fulfilling the commercial terms and conditions.




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RECORD OF REVISIONS

REV. NO	Clause revised	Details of revision	Date
00	--	Original issue	26.02.2019
01	1.1, 2.1, 2.2& 3.1	Revised Issue- Based on Engg comments	20.05.2019

Prepared by	Reviewed by		Signature	Approved by
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Issued by Quality Assurance				