



JINDAL INDUSTRIES PRIVATE LIMITED, HISAR

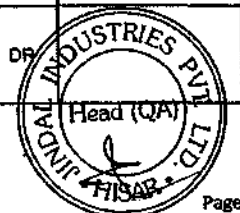
QUALITY PLAN

ERW PIPES AS PER IS 3589:2001, GRADE - Fe 330 & Fe 410
SIZES : OD 168.3 to 323.9 mm

Document Number:- **HPL/QP/3589/01**
 Rev. No.:- **00**
 Issue No:- **02**
 Issue Date:- **01.04.2018**

CLIENT: P.O. NO. CLIENT'S TECHNICAL SPECIFICATION NO.(IF ANY):

Sl. No.	COMPONENT/ OPERATION	CHARACTERISTIC - Inspection & Testing/ Type of Check	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	RESULTANT INSPECTION RECORD	Hold/Witness/Insp./OR/Monitoring Points				REMARKS
							Purchase	Production	Quality	Client/ TPI	
1	2	3	4	5	6	7	8	9	10	11	12
1	Raw Material	a) Chemical & Mechanical properties	Each Heat	IS 10748 & Cl. No. 8.1 & 8.2 and table 2 & 4 of IS 3589:2001	Chemical composition Max. values (%) Grade C Mn S P CE Fe330 - 0.16 1.20 0.040 0.040 - Fe410 - 0.20 1.30 0.040 0.040 0.45 Mechanical properties Grade T.S. Y.S. El% Fe330 - 330 195 20 Fe410 - 410 235 18	Raw material TC	-	DR	DR	DR	
		b) Dimension & Visual	Each Coil	IS 10748 & IS 3589:2001	The coil should not have laminations, Scales, Silvers, Laps, Burrs, Pitting etc. and the coil edges should be free from defect. If these defect found it shall be rectified by grinding. Thickness \pm 10% Width \pm 20mm, -0mm	Raw material TC/ Insp. Report	-	M	I/DR	DR	
2	In - Process inspections	a) Dimensional									
		i) Out side dia(mm)	Once/ Hour	As per Cl. No. 12.3.1 of IS 3589:2001	\pm 0.75% of Specified OD	Weight & Dimension Report	-	M	H,I	DR	
		ii) Ovality (mm)	Once/ Hour	As per Cl. No. 12.3.3 of IS 3589:2001	Max. 1% of Specified OD						
		iii) Wall Thickness (mm)	Once/ Hour	As per Cl. No. 12.3.2 of IS 3589:2001	\pm 10% of Specified thickness						
		iv) Length (Mtrs.)	Once/ Hour	As per Cl. No. 12.4 of IS 3589:2001	As per PO						
		v) Straightness (mm)	Once/ Hour	As per Cl. No. 12.5 of IS 3589:2001	Max 0.2 % of Pipe Length						
		vi) Weight (Kg/m)	Once/ Hour	As per Cl.No.11.1.1 & 12.1 of IS 3589:2001	As per Cl.No.11.1.1 & 12.1 of IS 3589:2001						
		vii) Weld Bead height	Once/ Hour	As per Cl.No.7.2 & 12.3.2 of IS	The max height of weld bead on the internal surface of the pipe shall not exceed 60% of Nominal wall thickness						
		viii) Bevel Angle / Root Face	Once/ Hour	As per Cl. No. 17.1 & 8.2 of IS 3589:2001	Bevel Angle : 30° to 35° Root Face : 0.8 to 2.4 mm						
		ix) Visual inspection, appearance & workmanship	100%	As per Cl. No. 14 of IS 3589:2001	All pipes shall be clearly finished, dent free and defects. The ends of the pipe shall be free from sharp edges & burrs.						
b) Hydrostatic Test	100%	As per Cl. No.10 of IS 3589:2001	Test pressure calculation based on 60 % of SMYS, P=2 S t / D. The maximum test pressure to be limited to 5 Mpa wherever applicable. The test pressure shall be applied for 5 second and shall not show any leakage in the pipe.	Hydro Test Report	-	P	H,I	DR			
c) Chemical Analysis	One Sample / Heat	As per Cl. No. 8.1 & 8.2 & table 2 of IS 3589:2001	Chemical composition Max. values (%) Grade C Mn S P CE Fe330 - 0.16 1.20 0.040 0.040 - Fe410 - 0.20 1.30 0.040 0.040 0.45	Chem. Analysis Report	-	-	DR	DR	No Testing is necessary if the consignment of steel strip is covered by ISI mark and received with manufacturer's test certificate.		
d) Physical tests											
i) Tensile, Yield & Elongation	One Sample / Each consignment of same thickness of skelp/ plate, and size of pipe and day of production	As per Cl. No. 9.1 & table 4 of IS 3589:2001	Grade T.S. Y.S. El% Fe330 - 330 195 20 Fe410 - 410 235 18	Physical Test report	-	M	H,I	DR			





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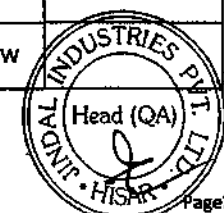
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Sl. No.	COMPONENT/ OPERATION	CHARACTERISTIC - Inspection & Testing/ Type of Check	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	RESULTANT INSPECTION RECORD	Hold/Witness/Insp./DR/Monitoring Points				REMARKS
							Purchase	Production	Quality	Client/ TPI	
1	2	3	4	5	6	7	8	9	10	11	12
	In - Process Inspections	i) Flattening Test	Once/ 4 Hour	As per Cl. No. 9.2.1 of IS 3589:2001	Flattening Rings not less than 40 mm in length cut from the ends of the selected tubes shall be flattened cold between parallel plates with the weld, if any at 90° (point of maximum bending) in accordance with IS 2328. No opening shall occur by fracture in the weld area until the distance between the plates is less than 75% of the original outside diameter of the tube and no cracks or breaks in the metal elsewhere than in the weld shall occur until the distance between the plates is less than 60% of the original outside diameter.	Physical testing report	-	M	H,I	DR	
		e) Galvanizing Tests: Mass of Zinc Coating, Uniformity & Adhesion	Once/Four hour production of one particular Size & steel grade	As per Cl. No.16.2 of IS 3589: 2001 & Cl.No.5 of IS:4736	Mass of zinc shall not be less than 360 g/m ²	Galvanizing test Report	-	M	H,I	DR	If applicable
		f) Marking & Finishing	Each Pipe	As per Cl. No. 18 of IS 3589: 2001 & Cl.No.4 of STI	i) The Standard Mark shall be applied at a suitable place on the outside surface of the pipe. a) In addition, following information shall be marked indivisually on the pipe: a) Manufacturer's name or trade mark; b) Pipe designation; c) Outside diameter and specified wall thickness, d) Identification mark in code or otherwise to enable the date and lot of manufacture to be traced back to works records, and e) Licence number (CMA.....)	Log book	-	M	H,I	DR	
3	Final Lot Inspections	a) Dimensional									
		i) Out side dia(mm)	As per IS:4711	As per Cl. No. 12.3.1 of IS 3589:2001	± 0.75% of Specified OD	Weight & Dimension Report	-	-	H,I	W	
		ii) Ovality (mm)	As per IS:4711	As per Cl. No. 12.3.3 of IS 3589:2001	Max. 1% of Specified OD						
		iii) Wall Thickness (mm)	As per IS:4711	As per Cl. No. 12.3.2 of IS 3589:2001	± 10% of Specified thickness						
		iv) Length (Mtrs.)	As per IS:4711	As per Cl. No. 12.4 of IS 3589:2001	As per PO						
		v) Straightness (mm)	As per IS:4711	As per Cl. No. 12.5 of IS 3589:2001	Max 0.2 % of Pipe Length						
		vi) Weight (Kg/m)	As per IS:4711	As per Cl.No.11.1.1 & 12.1 of IS	As per Cl.No.11.1.1 & 12.1 of IS 3589:2001						
		vii) Weld Bead height	As per IS:4711	As per Cl.No.7.2 & 12.3.2 of IS	The max.height of weld bead on the internal surface of the pipe shall not exceed 60% of Nominal wall thickness						
		viii) Bevel Angle / Root Face	As per IS:4711	As per Cl. No. 17.1 & 8.2 of IS 3589:2001	Bevel Angle : 30° to 35° Root Face : 0.8 to 2.4 mm						
		b) Visual inspection, appearance & workmanship	As per IS:4711	As per Cl. No. 14 of IS 3589:2001	All pipes shall be clearly finished, dent free and defects.The ends of the pipe shall be free from sharp edges & burrs.						
b) Hydrostatic Test	As per client requirment	As per Cl. No. 10 of IS 3589:2001	Hydrostatic test shall be carried out at a pressure of 5 MPa and the same maintained for atleast 5 second and shall not show any leakage in the pipe.	Hydro Test Report	-	-	H,I	W	If required by client		
c) Physical tests											
i) Tensile, Yield & Elongation	As per IS:4711	As per Cl. No. 9.1 & table 4 of IS 3589:2001	Grade T.S. Y.S. El% Fe330 - 330 195 20 Fe410 - 410 235 18	Physical Test report	-	-	H,I	W			





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	Final Lot Inspections	ii) Flattening Test	As per IS:4711	As per Cl. No. 9.2.1 of IS 3589:2001	Flattening Rings not less than 40 mm in length cut from the ends of the selected tubes shall be flattened cold between parallel plates with the weld, if any at 90° (point of maximum banding) in accordance with IS 2328. No opening shall occur by fracture in the weld area until the distance between the plates is less than 75% of the original outside diameter of the tube and no cracks or breaks in the metal elsewhere than in the weld shall occur until the distance between the plates is less than 60% of the original outside diameter.	Physical testing report	-	-	H,I	W	
		d) Galvanizing Tests: Mass of Zinc Coating, Uniformity & Adhesion	As per IS:4736	As per Cl. No.16.2 of IS 3589: 2001 & Cl.No.5 of IS:4736	Mass of zinc shall not be less than 360 g/m ²	Galvanizing test Report	-	-	H,I	W	If applicabe
4	Marking	Identification & Tracability	As per IS:4711	As per Cl. No.18 of IS 3589: 2001 & Cl.No.4 of STI	Each tube shall be marked on external surface with manufacturer's name or trade-mark, IS No. that is IS 3589, Outside Diameter, Wall thickness, Designation of pipe, Manufacturing process as ERW & Grade of pipes.	Weight & Dimension Report	-	-	H,I	W	
5	Protection	Ends / Surface Protection	As per IS:4711	As per Cl. No.16.1 Annex. A to D of IS 3589: 2001	(i)Both ends of the pipe shall be protected by high impact plastic bevel protector. (ii)Black tubes not otherwise protected shall be varnished or suitably painted externally throughout the length unless ordered unvarnished or unpainted.	-	-	-	H,I	W	
6	MHI Test Certificate	Heat No.Wise	100%	IS 3589: 2001	IS 3589: 2001	MTC	-	-	M	DR	
7 FINAL STAMPING AND DESPATCH INSPECTION											
7.1	Final Documents	Review of Internal test reports, Calibration reports and MTC of pipes	100%	IS 3589: 2001	IS 3589: 2001	Internal test reports, calibration reports and	-	-	M	DR	As per Spec/ PO
7.2	Stamping of pipes by TPIA	Stamping for Identification	As per client PO	As per client PO	As per client PO	TPIA Inspection Report	-	-	M	H	Final stamping shall be done by client/TPI on pipes after inspection
7.3	Issue of Inspection Release Note	Completeness	100%	TPIA Inspection Report	As per client PO / TPIA	TPIA IRN Format	-	-	M	H	

Abbreviations: H- HOLD W-WITNESS M-MONITERING DR-DOCUMENT REVIEWED I-INSPECTION

Prepared By:  Dy. Manager (QA)	Reviewed By:  Head-QA	Approved By:	Inspection Agency:-
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