

## TECHNICAL SPECIFICATIONS FOR SEAMLESS CARBON AND CARBON MANGANESE STEEL TUBES

*Scope: This specification covers technical requirements applicable for Seamless Carbon and Carbon Manganese Steel Boiler Tubes required for manufacture of boiler tubing.*

- 1.0 Material:**
- 1.1 Material Specification:** BS 3059 : Part 2 : S2 360 : Cat.2 / BS 3059 : Part 2 : S2 440 : Cat.2  
(Individual material specification shall be as indicated in the enquiry or the order).
- 1.2** Steel shall be fully killed and shall conform to all requirements of Indian Boiler Regulations.
- 2.0** Governing Code: BS 3059 : Part 2 : 1990.
- 3.0** Process of manufacture: Hot Finished Seamless / Cold Finished Seamless (As indicated in the enquiry or order).
- 4.0** Delivery Condition: As per specification.
- 5.0** Tube Length: Exact Length (Tolerance on length shall be +50/-0 mm)
- 6.0** Tube ends: Square cut free from burrs.
- 7.0** Product Analysis: To be carried out on each heat basis.
- 8.0** Ultrasonic Examination or Eddy-Current Test: Practice E 213 or E 309. 100 % of tubes shall be examined by Ultrasonic Examination or Eddy-Current Test.
- 9.0** Hydraulic Test:
- 9.1** All tubes up to 38 mm OD shall be hydro tested at a pressure of 250 kg/cm sq g.
- 9.2** All tubes above 38 mm OD shall be hydro tested at a pressure of 200 kg/cm sq g.
- 10.0** Inspection Agency (IA): Lloyd's Register / Bureau Veritas.
- Scope of inspection by IA:**
- a) Raw material identification.
  - b) Review of manufacturer's Heat Treatment Records.
  - c) Review of manufacturer's Chemical Analysis for Heat and Product for compliance as per specification requirements.
  - d) Selection of Test Specimens for Mechanical Testing.
  - e) Witnessing of Mechanical Testing.
  - f) Witnessing of Eddy-Current or Ultrasonic Examination.
  - g) Witnessing of Hydrostatic Examination.
  - h) Visual and Dimensional Examination.
  - i) Identification Marking.
  - j) Endorsement of Test Certificates.
- 11.0** Identification Marking:
- 11.1** Stenciled Marking: Each tube shall be legibly stenciled with Manufacturer's Logo, HFS or CDS, Size of Tube, Material Specification & Grade, Heat No, ISGEC Work Order No and IA stamp.

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0	05.10.2005	Issued for procurement	RV	Rajinder Vohra	SKU
<b>ISGEC - Pressure Vessel Division</b> The Indian Sugar & Gen Engg Corpn YAMUNA NAGAR -135 001 (Haryana) Kanha/BS3059-360-440/IBR/Gen		<b>TECHNICAL DELIVERY CONDITIONS FOR                  SEAMLESS CARBON AND CARBON                  MANGANESE STEEL TUBES</b>		SPECN NO	REV
				BT-012	0
				SHEET 1 of 2	

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- 11.2 Hard Stamping:** Hard stamping of IA stamp shall be carried out on each tube at a distance of 150 mm approx from tube end which shall be duly encircled with white paint.
- 12.0 End Use:** Tubes are required for manufacture of boiler tubing to be designed and constructed as per requirements of Indian Boiler Regulations, 1950 including latest amendments.
- 13.0 Test Certificates:**
- 13.1** Manufacturer's test certificates as per IBR Form IIIB duly endorsed by IA shall be furnished in six sets.
- 13.2.0 Reporting Requirements:**
- 13.2.1** Test certificates shall state that all requirements of material specification, which are to be fulfilled by material manufacturer have been fully complied with.
- 13.2.2** Test certificates shall specifically report results of all tests required as per material specification and this document along with following:
- Certification of material as per IBR Form IIIB.
  - Manufacturer's name / symbol.
  - Certificate Identification No and date of issue.
  - Our Order No and Date.
  - Item size, quantity and weight.
  - Process of manufacture. Steel is fully killed.
  - Complete chemical analysis for ladle and product along with specification range for chemical analysis.
  - Heat treatment data i.e. soaking time, soaking temperature and cooling medium for delivery condition heat treatment.
  - Physical test results in as delivered condition.
  - Tensile specimen type, size, gauge length and gauge diameter along with specification range for physical properties.
  - Year and addenda of material specifications and code applicable as per this specification.
  - Results of Eddy-Current Examination.
  - Results of Hydrostatic Examination.
  - Visual and dimensional examination.
  - Identification marking on tubes and tags.
- 13.3** Test certificates shall be furnished at following address through Registered Post / a reliable courier service along with despatch of materials:
- Head Contracts, Pressure Vessel Division, The Indian Sugar & Gen Engineering Corporation, YAMUNA NAGAR- 135 001 (Haryana), INDIA**
- 14.0 Surface Protection:** All tubes shall be coated with a coat of red oxide zinc chromate primer before carrying out marking by stenciling or a coat of thin and clear varnish after stenciling.
- 15.0 Bundling of Tubes:**
- 15.1** All tubes shall be despatched duly bundled on each heat and size basis. Weight of a bundle shall not exceed 3 MT.
- 15.2** Tubes of different heat and size shall be bundled separately.
- 15.3** Each bundle shall be provided with suitable lifting arrangement for handling at our end.

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		<b>BT-012</b> SHEET 2 of 2	<b>0</b>

1/3/8