

Technical Specification

1.0	Scope
	This specification describes the requirements for manufacture, inspection, testing and supply of carbon steel pipe fittings of various grades. The supplier has to quote against each item in testing charges column for tests mentioned Below.
2.0	Applicable standards
	ASTM standard A 420 ASTM Standard A 350 ASTM Standard A 370 ASTM Standard A 530
3.0	Inspection and tests
3.1	The supplier shall provide all reasonable facilities to the purchaser's inspector satisfy him that the material is being furnished in accordance with the specification. The supplier shall conduct all tests required to ensure that the pipe fittings furnished confirm to the requirements of the applicable codes and standards. The Supplier shall arrange sample for destructive testing without any extra cost.
3.2	Chemical Composition
	Chemical analysis shall be done for each lot/size shall meet the requirements to satisfy that the material furnished confirms to as per relevant code and the test certificates shall be furnished along with the material. The supplier shall produce original mill certificate at the time of Pre-despatch inspection. The photocopy is not acceptable.
3.3	Mechanical tests
	The supplier shall produce original mill certificate at the time of Pre-despatch inspection. If original mill certificate is not available the following tests shall be carried out in Govt./ NPCIL approved Lab for each lot/size as per the applicable standards and the certificates shall be furnished along with material. 1. Tension test (For all pipe fittings) 2. Hardness (For all pipe fittings) 3. Impact testing (For A 420 & A 350 Material) The mechanical properties as obtained from the above tests shall confirm to the requirements of the specific grade of the material as per ASTM code.
3.4	Hardness Measurement
	The supplier shall carry out the hardness measurement using portable hardness meter (in presence of HWPK representative) for 10% qty of each item at minimum two points (Minimum 1 Qty per item). The portable hardness meter shall be calibrated with date of calibration not more than one year.
3.5	Thickness Measurement
	The supplier shall carry out the Thickness measurement of all butt weld type fittings by UT thickness gauge (in presence of HWPK representative) at 3 Locations on 10% qty. The UT thickness gauge shall be calibrated with date of calibration not more than one year.
3.6	Quality surveillance inspection & testing
	Supplier shall be an Indian manufacturer or its authorised dealer only. All pipe fittings shall have thickness/Dia. in range of applicable ASTM code. All pipe fittings shall have Maximum hardness of 187 BHN. All flanges shall be raised face without serration with surface finish of 125 RMS. All inspection & testing covered under this specification shall be subjected to quality surveillance by the purchaser or his authorized representative.

	<p>Test certificates shall indicate the actual values of test results obtained and meet the requirement of applicable code and test conditions.</p> <p>All other requirements such as tolerances on diameter, wall thickness, surface finish, marking etc. shall be as per the applicable ASTM specification.</p>
3.7	Remarks
	<p>The material shall be considered for inspection only when certificates attesting the origin of metal, heat number, lot number, material type number, chemical analysis have been handed over to the inspector. For one particular material whole quantity shall be from one Lot/heat number.</p>
4	Marking
	<p style="text-align: center;">All the pipefittings shall be stamped with following data:</p> <ul style="list-style-type: none"> (i) Size designations (ii) Heat no. (iii) Schedule/Thickness/ratings (iv) Name of Manufacturer or brand (v) Applicable ASTM code <p>Each fitting shall be legibly marked individually as per the applicable standards.</p>
5	Packing
	<p>Each pipe fittings shall be suitable wrappings to prevent ingress of foreign matter, dirt etc.</p>

QUALITY ASSURANCE PLAN							Annexure-IV			
Sl. No.	Components & Operation	Characteristics	Type of Check	Quantum of check	Ref.Doc.	Acceptance Norms	Form of Record	Insp.Agency		
								P	W	R
Raw Material										
1.	Material identification	Chemical /Mechanical	Full Chemical composition, Tensile & Yield, % Elongation, % reduction in area, Hardness etc.	One sample from each Heat	Tender Specification, Applicable Material Standard/Code	Tender Specification, Applicable Material Standard/Code	Original Material Test Certificates/ Lab TC	1,2	2	2,3
In-Process										
2.	Manufacturing	Profile/ Dia.	Visual	100%	Tender Specification, Applicable Material Standard	Tender Specification, Applicable Standard Code	Inspection & Testing Report/ Certificates, Heat treatment charts, Lab Reports	1,2	2	2,3
3.	Product testing	Chemical	Full Chemical composition	100%	A 350, A 420 ASTM A 370 ASTM A 530			1,2	2	2,3
		Mechanical	Tensile & Yield, % Elongation, % reduction in area, Hardness etc. as per applicable code.					1,2	2	2,3
Final Inspection										
4.	Dimensions and visual	Length/Dia./thickness and hardness	Visual and dimensions	100%	Tender Specification, Applicable Material Standard	Applicable Standard Code	Inspection report	1,2	3	2,3
5.	Hardness	Hardness	Portable Hardness meter	10%	Tender Specification	187 BHN(Max.)	Inspection report	1,2	3	2,3
6.	Thickness Measurement	3 points /item	UT Thickness gauge	10%	Tender Specification	Applicable Standard Code	Inspection report	1,2	3	2,3
7.	Final Documents	Review of Documents	Review	100%	Tender Specification, Applicable Testing Standard, Approved QAP	Tender specification, applicable Testing Standard, Approved QAP	Reports, Certificates, charts, etc.	2	-	3
LEGENDS:										
P = Performing Agency, W = Witnessing Agency, R = Review of documents										
1 = Sub-Vendor, 2 =Supplier/Manufacturer, 3 = HWP (K) representative.										