

Annexure-1

Attachment to technical specifications for material testing, fabrication ,Inspection, testing, packaging, guarantee and delivery of heat exchanger (H-R condenser) as per enclosed drawing and specification at BARC, Mumbai

Description	Test for conformance		Witnessing		Acceptance for process	
			Party	BARC		
Material	Plate	TC (from the original source)	100%	100%	Conformance to applicable standard	
		Chemical	100%	-		
		Mechanical	100%	100%		
		UT	100%	100%	Defect indication 2mm FBH as per clause 3.4	
	Pipes/Tubes	TC (from the original source)	100%	100%	Conformance to applicable standard	
		Chemical	100%	-		
		Tension test	100%	100%		
		Flare test	100%	100%	As Per ASTM SB 829	
		Non destructive test	100%	100%	As Per ASTM SB 829	
	Forgings	TC (from the original source)	100%	100%	Conformance to applicable standard	
		Chemical	100%	-		
		Mechanical	100%	100%		
		UT	100%	100%	Defect indication 2mm FBH as per clause 3.4	
	Fabrication	Welder Qualification	WPS	100%	--	As per ASME section IX
			PQR	100%	100%	
Welding consumable		AWS G2.1 M	100%	100%	Conformance to standard	
Root Pass		D.P test	100%	100%	No linear defects	
Final Pass		D.P test	100%	100%	No linear defects	
		Radiography	100%	100%	2 2T plate type IQI sensitivity, No round or linear defects	

Description	Test for conformance		Witnessing		Acceptance for process
	Test	Procedure	100%	100%	
Tube to Tube sheet Joints	Joint strength	Procedure	100%	100%	As Per Clause 5
		Mock test/Shear Load Test	100%	100%	As per Clause 5 of document
		D. P Test for seal weld	100%	100%	
Expansion Joint		Visual Inspection	100%	100%	As per 6.2 clause
		D.P test	100%	100%	
		Pressure test	100%	100%	As Per Clause 6.3
		Spring rate	100%		As per Clause 6.4
		Axial Movement , design life	100%		
Hydro test of Shell side and tube Side		2 bar Shell side and Tube side Separately	100%	100%	As Per clause 7
Leak Detection for tube assembly with header		He L.D	100%	100%	As per Clause 8
Dimensional Inspection		Dimension indicated	100%	100%	As per Drawing
		Surface finish/geometric features	100%	100%	As per Drawing/Specification