

Inspection and Test Plan for Shell and Tube Heat Exchanger								
No.	Inspection and Test Plan	Reference Document	Acceptance Criteria	Verifying Document	Activity By			Remark
					Manuf.	TPI	Client	
1	Pre-Inspection Meeting	Spec.	Spec.	MOM	H	H	H	-
Before Manufacturing								
2	DWG, Design, Calculation Document	ASME, Spec	ASME, Spec	DWG, Calculation book	H	R	A	-
3	WPS&PQR	ASME	ASME IX	Welding Book	H	R	A	-
4	Welder Qualification Certificates	ASME	ASME IX	Certificates	H	R	-	-
5	NDT procedure	ASME	ASME V,VIII, IX	Procedures	H	R	A	-
6	NDE Personnel Certificates	ASME	ASME V	Certificates	H	R	-	-
7	PWHT Procedure (if needed)	ASME	ASME VIII	Procedure	H	R	A	-
8	Hydro Static Test Procedure	ASME	ASME VIII	Procedure	H	R	A	-
9	Painting Procedure	ASME	Spec.	Procedure	H	R	A	-
Materials								
10	Material Certificates	ASME	ASME II	Original Material Certificates	H	R	-	-
11	Storage of raw material and Welding	ASME	ASME	-	H	W	-	-
12	Visual, Dimension and Marking Control	ASME VIII	ASME VIII	Report	H	W	-	-
During Manufacturing-Shell and Channel								

13	Transferring of marking Material	ASME VIII	ASME VIII	Report	H	SW	-	-
14	Cutting & Edge Preparation	DWG	DWG	-	H	SW	-	-
15	Head forming and Dimension Check	DWG	DWG, ASME VIII	Report	H	W	-	-
16	Check of Rolling for Shell	DWG	DWG, ASME VIII	-	H	SW	-	-
17	Check of Welding plan with WPS	DWG/WPS	WPS/DWG	-	H	SW	-	-
18	Fit Up & welding (shell to shell)	DWG/WPS	WPS/DWG	-	H	SW	-	-
19	Second Rolling of Shell	DWG	DWG, ASME VIII	Report	H	SW	-	-
20	Fit Up Heads to Shell/Channel	DWG/WPS	WPS/DWG	-	H	SW	-	-
21	Dimension Check	DWG/WPS	WPS/DWG	-	H	SW	-	-
22	Welding Head to Shell/Channel	DWG/WPS	WPS/DWG	-	H	SW	-	-
23	Visual Check	DWG/WPS	WPS/DWG	-	H	W	-	-
24	NDT Test(RT)	NDT Procedure	ASME VIII	Report	H	R	-	-
25	Dimension Check Body Flanges	DWG/WPS	WPS/DWG	-	H	SW	-	-
26	Fit Up Body Flanges to Shell/Channel	DWG/WPS	WPS/DWG	-	H	SW	-	-
27	Dimension Check	DWG/WPS	WPS/DWG	-	H	SW	-	-
28	Welding Body Flanges to Shell/Channel	DWG/WPS	WPS/DWG	-	H	SW	-	-

29	Visual Check	DWG/WPS	WPS/DWG	-	H	W	-	
30	NDT TEST (RT)	NDT Procedure	ASME VIII	Report	H	R	-	
31	Fit Up Nozzles to Flange	DWG/WPS	WPS/DWG	-	H	SW	-	
32	Dimention Check	DWG/WPS	WPS/DWG	-	H	SW	-	
33	Welding Nozzles to Flanges	DWG/WPS	WPS/DWG	-	H	SW	-	
34	Visual Check	DWG/WPS	WPS/DWG	-	H	SW	-	
35	NDT Test(RT)	NDT Procedure	ASME VIII	Report	H	R	-	
36	Fit Up Nozzles to Shell & Channel	DWG/WPS	WPS/DWG	-	H	SW	-	
37	Dimension Check	DWG/WPS	WPS/DWG	-	H	W	-	
38	Welding Nozzles to Shell/Channel	DWG/WPS	WPS/DWG	-	H	SW	-	
39	Visual Check	DWG/WPS	WPS/DWG	-	H	SW	-	
40	NDT Test (UT)	DWG/WPS	WPS/DWG	Report	H	R	-	
41	Cutting Sub Peaces of Saddle	DWG/WPS	WPS/DWG	-	H	SW	-	
42	Dimension Check	DWG/WPS	WPS/DWG	-	H	W	-	
43	Welding Saddle Peaces	DWG/WPS	WPS/DWG	-	H	SW	-	
44	Visual Check	DWG/WPS	WPS/DWG	-	H	SW	-	

45	Fit Up Saddle to Wear Plate	DWG/WPS	WPS/DWG	-	H	SW	-	
46	Dimension Check	DWG/WPS	WPS/DWG	-	H	W	-	
47	Welding Saddle to Wear Plate	DWG/WPS	WPS/DWG	-	H	SW	-	
48	Visual Check	DWG/WPS	WPS/DWG	-	H	SW	-	
49	NDT Test (PT)	NDT Procedure	ASME VIII	Report	H	R	-	
During Manufacturing-Tube Bundle								
50	DIM. Check of tubesheet, Baffles and Support Plates	DWG	ASME VIII	-	H	SW	-	
51	Drilling Tubesheet & Baffles	DWG	ASME VIII	-	H	SW	-	
52	Dimension & Visual Check	DWG	ASME VIII	Report	H	W	-	-
53	Cutting tubes & Spacers	DWG	ASME VIII	-	H	SW	-	-
54	Dimension Check of Tubes & Tie Rods & Spacers	DWG	ASME VIII	Report	H	R	-	-
55	Fit Up The Tube to Tubesheet	DWG	ASME VIII	-	H	SW	-	-
56	Dimension Check of Tube Bundle	DWG	ASME VIII	-	H	W	-	-
57	Tube Expanding	DWG	ASME VIII	Report	H	W	-	
58	Hydro Static Test	Procedure	ASME VIII	-	H	H	-	-
Final Inspection								

59	Final Dimensional & Visual Check	DWG/Spec.	ASME VIII	Report	H	H	-	-
60	Pressure Test (Tube)	Procedure	ASME VIII	Report	H	H	W	-
61	Complete draining and Drying	Procedure	ASME VIII	-	H	SW	-	-
62	Cleaning of Inside Surface	Procedure	ASME VIII	-	H	SW	-	
63	Sand Blasting and Painting	Procedure	SSPC	Report	H	W	-	
64	Name Plate, Tagging and Marking	DWG	Spec.	Report	H	H	-	
65	Preparation for Shipment	Spec.	Spec.	-	H	SW	-	
66	Review of Final Inspection	DWG/WPS/Welding Map	ASME VIII	-	H	H	-	
67	Inspection Release Note	Packing List	Spec.	Report	H	H	-	Submitted by

Abbreviations:

H: Hold Point = Hold on the production till TPI Inspector performs inspection and supervise the required test

W: Witness Point = Manufacture shall notify client and TPI Inspector but there is no hold on the production; Client can waive this inspection based on his discretion and informs TPI Inspector accordingly.

R: Document Review = Review means Review document, which includes of material test certificates, WPS, PQR, NDT Procedures and etc.

A: Approval

SW: Spot Witness = for items with spot witness manufacture shall notify TPI inspector as fulfilling the monitoring; For example one random visit for whole UT tests or one or two visits for whole surface preparation works for painting.

MOM: Minute of Meeting

P.O: Purchase Order

For more information review following articles

www.inspection-for-industry.com

<http://www.inspection-for-industry.com/heat-exchanger-inspection.html>

<http://www.inspection-for-industry.com/third-party-inspection-for-shell-and-tube-heat-exchanger.html>

<http://www.inspection-for-industry.com/inspection-and-test-plan-for-shell-and-tube-heat-exchanger.ht>