



INSPECTION REPORT

To:	xxxxxxx	Attn:	xxxxxxx
From:	Troika Inspection Service Co., Ltd	Report Date:	xxxxxxx

Project No.:	:	xxxxxxxxx
Vendor Name	:	xxxxxxxxx
Factory Name	:	xxxxxxxxx
Factory Address	:	xxxxxxxxx
Order No. / PO No.	:	xxxxxxxxx
Product description:	:	Heat Exchanger
Inspection Date:	:	xxxxxxxxx

1.0 Scope of Inspection:

(Brief description of details of inspections, tests etc. carried out/witnessed)

Equipment description:	Heat Exchanger	
I.T.P. line number	Inspection Activity	Results
002	Mill certificates review of tube sheets	<input type="checkbox"/> Accepted without deviation <input checked="" type="checkbox"/> Accepted with deviation <input type="checkbox"/> Reject
003	Mill certificates review of nozzles C&D;	<input type="checkbox"/> Accepted without deviation <input checked="" type="checkbox"/> Accepted with deviation <input type="checkbox"/> Reject
004	Dimension and marking check of mock up test specimens;	<input checked="" type="checkbox"/> Accepted without deviation <input type="checkbox"/> Accepted with deviation <input type="checkbox"/> Reject
005	Welding witness of mock up test specimens;	<input type="checkbox"/> Accepted without deviation <input type="checkbox"/> Accepted with deviation <input checked="" type="checkbox"/> Reject
006	Randomly welding witness nozzles to flanges C&D;	<input checked="" type="checkbox"/> Accepted without deviation <input type="checkbox"/> Accepted with deviation <input type="checkbox"/> Reject

2.0 Reason for visit

The purpose of this visit is to check the status of material in work shop and witness the mock up test specimens;

3.0 Documentation used

DOCUMENT NUMBER	REV. No.	TITLE	Approval Status
ZS16-E217-01~10	1	Assembly drawing	A
10001-2	2	Code Calculation/Performance Curve/Sizing Calculations	A
ITP16-E-10	1	Inspection Test Plan (ITP)	A
JIR-16033	0	Weld Procedures Specification/ Procedure Qualification Record	A
YSMUT2016043	3	Mock up test procedure	A



4.0 Details of inspection performed

4.1 Material status

- As information from mill, tubes had been received by them;
- Tube sheets had been received by mill;
- Carbon plates of shell and channel had been received by mill;
- Baffle plates had been received by mill;
- Nozzles and flanges of shell had been received by mill;

4.2 Fabrication status

- Baffle plates model had been readied by mill, and baffle plates are in process of making.
- Shell to shell B1~B3 RT had been finished; A2&A2A welding had been finished.
- Left tube sheet drilling holes had been finished; Right tube sheet machining had been finished.
- Nozzles to flanges C&D welding had been finished, opening is still in process.

4.3 Fabrication progress:

Item No.	head Forming	Welding of shell	welding of nozzles	tube bundle	welding of tube to tube sheets
Hydro-test	Painting				
E-10	0%	100%	30%	0%	0%
0%	0%				

4.4. Inspection activity

4.4.1 Mill certificates review of tube sheets

- TIS inspector performed mill certificates review of tube sheets according to list of quality documents (2016-CP-217(CG-GY16-1327FSY)) including certificate of quality for clad plate, UT report for clad plate, certificate of quality for duplex stainless steel plate, intermetallic phases test report for duplex stainless steel plate etc., the results were pending according to Dow specification G8S-4001-51(26-MAY-2015) and G8S-6580-01(08-DEC-2015), the details as below:

(-a) For detrimental intermetallic phases in accordance with ASTM A-923 method c, only base metal (SA 240 S32205) test report was found. But according to Dow specification G8S-4001-51(26-MAY-2015) paragraph 2.2.3, samples from welded products shall contain base metal, heat-affected zone and weld metal.

(-b) According to G8S-6580-01(08-DEC-2015) paragraph 4.2 and 6.0, test shall be in accordance with ASME. But actual test standard is according to NB/T 47013 (Chinese standard).



4.4.2 Mill certificates review of nozzles C&D

- TIS inspector performed mill certificates review of nozzles C&D including material grade, specification, chemical composition, mechanical property and delivery condition etc., the results were pending according to drawing no.: ZS16-E217-02, Rev.2. The details as below, and mill had been submitted material substitution requisition to Dow for approval.

(-a) For nozzle C&D, req. material grade in drawing ZS16-E217-02, Rev.2 is SA-106B; Actual material grade in mill certificate is SA-105N.

4.4.3 Dimension and marking check of mock up test specimens

- TIS inspector performed dimension and marking check of mock up test specimen of E-10 including thickness of tube sheet, O.D. of tube, dimension of tube sheet holes, specimens marking and traceability marking check, the result was acceptable according to Mock up procedure(YSMUT2016043, Rev.3) and Dow specification G8T-6581-01(05-Jan-2016).

4.4.4 Welding witness of mock up test specimens

- TIS inspector performed the assembly and welding check of mock up test specimen of E-10 of YSMUT2016043-05 including tube projection length check, welding consumable check, welders' name and welding parameter check, the result was failed because cracks were found during root layer welding.

- Then TIS inspector stopped welding process at once, after confirming with Dow, YSMUT2016043-06 was permitted to welding to verify if this tube sheet will produce crack as well. For YSMUT2016043-06, no crack was found by visual and PT. But for tubes 11~16, 2pcs burn through were found, the welder no. is W11 (He Zilong).

4.4.5 Randomly welding witness nozzles to flanges C&D

- TIS inspector randomly witness welding of nozzle to flange (nozzle C) including welding consumable, welding parameter and welder's qualification (W11&W04), the results were acceptable according to WPS no.:YA-95, Rev.3 and Dow specification G8S-6500-01(25-Jan-2016).

Note: Mill stated that they would take all the risk before material substitution requisition was approved by Dow.

5.0. Result of Inspection

☐ Accepted without deviation ☐ Accepted with deviation ☒ Reject

6.0. Quality Records reviewed and attached:

- Raw Material certificate
- Dimension and visual inspection report
- NDE operator certificate
- Welder certificate

7.0 Progress Status

Befroe to next step, the mill should confirm it with client for the above findings.



8.0 Next Forecasted Inspection Date:

TBA;

9.0 Attendees

- Mr. XXX project manager
- Mr. XXX Inspector
- Mr. XXX TIS inspector on behalf of XXX

Any deviation & PUNCH attached : Yes <input checked="" type="checkbox"/> No, <input type="checkbox"/>	Punch No.: XXX
IRN attached : Yes <input type="checkbox"/> No, <input checked="" type="checkbox"/>	IRN No.: NA

10. Photo Report



Photo 5. Mock up test: I.D. check



Photo 6. Mock up test: projection length check



Photo 7. Mock up test: welding consumable check



Photo 8. Mock up test: welding process




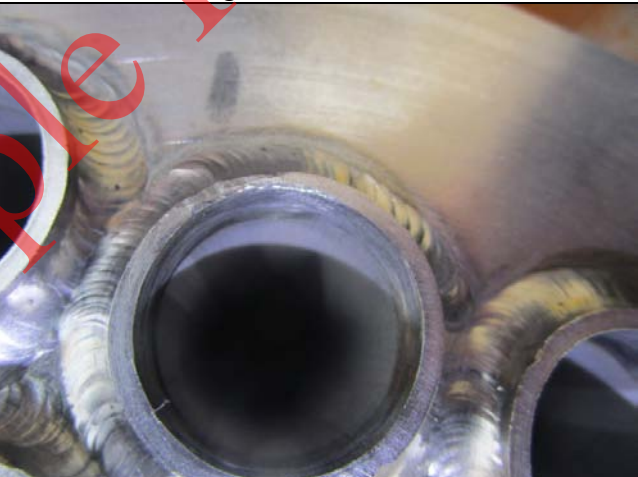

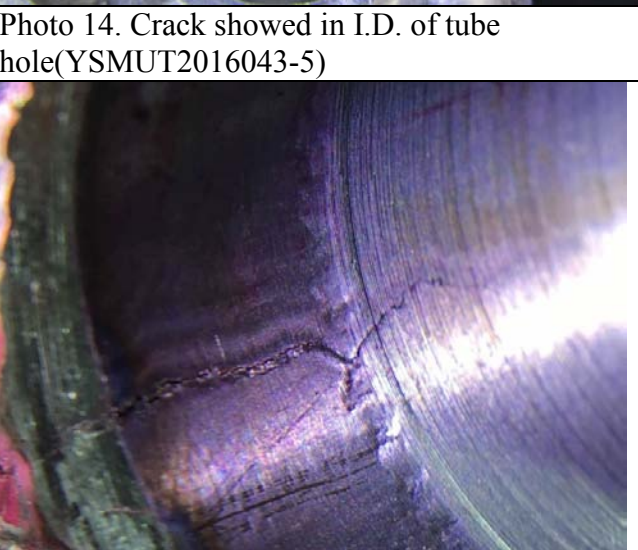


Photo 9. Mock up test: welding parameter check



Photo 10. Mock up test: crack was found, YSMUT2016043-5



<p>Photo 11. Mock up test: crack was found, YSMUT2016043-5</p>	<p>Photo 12. Mock up test: no crack was found, YSMUT2016043-6</p>
	
<p>Photo 11. Mock up test: No crack was found by visual (no.6)</p>	<p>Photo 12. YSMUT2016043-6, Welder no.11 failed, burn through</p>
	
	

<p>Photo 15. Randomly dimension check for flange</p> 	<p>Photo 16. Randomly dimension check for flange</p> 
<p>Photo 17. Randomly marking check for nozzle</p> 	<p>Photo 18. Misalignment check</p> 
<p>Photo 19. Process of welding</p> 	<p>Photo 20. Inter-pass cleaning check</p> 

Photo 21. Welding consumable check	Photo 22. Welding consumable check: I.D.
	
Photo 23. Process of welding	Photo 24. Welding parameter check
	
Photo 25. Visual check	Photo 26. Visual check
	



Troika Inspection Service

Your Quality Solution Partner

Report No.:xxxxx

Prepared by : xxxxx Signed: xxxxxx Date: xxxxx	Reviewed by : xxxxxxxx
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TIS Sample Report