

LUMMUS TECHNOLOGY HEAT TRANSFER/ BCPL		J.O. NO :				
INSPECTION ATTRIBUTE LIST		INSPECTION REPORT NO :				
CLIENT : BCPL		ITEM NUMBER				
PROJECT: Brahmaputra Petrochemical Complex		REQ. NO:				
SELLER LOCATION :		ISSUES DATE NO:				
SUB CONTRACTOR/LOC :		SUPPLEMENT NO:				
DESCRIPTION : Radiant Tubes for Naphtha Cracker Furnaces		SHOP ORDER NO:				
		SUB-ORDER NO :				
		SUB-CONTRACTOR SHOP NO:				
No.	INSPECTION ATTRIBUTE LIST	INSP. STATUS		* V	* W	* P
		PRIOR VISIT	THIS VISIT			
1	Verify documents/procedures identified on requisition submitted			x		
	for review/approval, including :					
	- Fabrication , Inspection & test plan					
	- Welding, procedures and procedure qualification reports					
	(BA62559SPC1200, Para. 6)					
	- Liquid penetrant and radiographic examination procedure					
	(BA62559SPC1200, Para. 9 & 10)					
	- Proprietary alloy compositions, if applicable					
	- Shop drawing/ fabrication details					
	- Weld Maps					
2	Welder and welding operator qualification- On File			x		
3	NDT personnel qualification - On File			x		
4	Mechanical properties and tests of cast tubes and fitting					
	Random Witness					
	- Stress (Creep) Rupture Tests (BA62559SPC1200, Para. 4.1(B.VI)			x	x	
	- Aged Ductility Tests (25-35- Nb low carbon)			x	x	
	- Tension test at room temperature (if required by requisition)			x	x	
5	Metallurgical structure and test of tubes- review macro-etch rings			x		x
6	Visual & dimensional inspection of tubes prior to					
	welding, including : (Random Witness)					
	- Austenitic shot cleaned			x	x	
	- Outside surface tubes (BA62559SPC1200. Para. 8.)			x	x	
* V (VERIFIED)- CONFIRMED THAT A FUNCTION OR REQUIREMENT IN TRUE BY EVIDENCE * W (WITNESSED)- PERSONAL OBSERVATION WHILE MANUFACTURER PERFORMS TASK * P (PERFORMED)- PERSONAL PERFORMANCE OF THE TASK						
INSPECTION STATUS CODES:						
(S) SATISFACTORY (ACCEPT)		(NA) NOT APPLICABLE				
(U) UNSATISFACTORY		(RW) REWORKED AND SATISFACTORY				
(NCR) NONCONFORMANCE		(N) NO ACTIVITY PERFORMED ON THIS VISIT				
REVIEWED BY:				PREPARED BY :		
Inspection Coordinator				Requisitioning Engineer		

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	- Inside Surface of Tubes (BA62559SPC1200. para. 8.1)			X	X	
	- Machined end preparation for tubes & fittings			X	X	
	- Outside of Tubes machined			X	X	
	- Wall Thickness of Tubes			X	X	
	- Tolerance of tubes			X	X	
	- Visual inspection on all surfaces not machined			X	X	
7	- Liquid penetrant examination of tubes & fittings prior to welding (Random Witness)					
	- Tube inside diameter for a distance of 2X nominal diameter					
	- All external machined surfaces of tubes and fitting including weld end preparation of machined area			X	X	
8	Radiography of castings- review radiographic film					
	- Pilot castings			X		X
	- Casting critical area			X		X
	- Casting weld ends not shop welded			X		X
9	Pressure test of material prior to welding/bending					
	- Pneumatic test of tubes prior to welding - Random Witness			X	X	
	- Hydrostatic test of fittings not welded in shop- Random Witness					
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10	Visual inspection of fit-up - Random Witness			x	x	
11	Verify/Witness in- process welding and controls per reviewed Procedure, including , proper consumables being used- Random Witness			x	x	
12	Boroscope inspection of weld penetration- Random Witness				x	x
13	Visual inspection of welding			x		x
14	Liquid penetrant examination of first root bead , (not continuously welded) and final external welds- Random Witness			x		x
15	Visual and dimensional inspection of tube tolerance after welding Random Witness			x	x	
16	Radiographic examination film review- 100% required			x		x
17	Hydrostatic test of coils Random Witness			x	x	
18	Visual inspection of drying- Random Witness			x	x	
19	Visual inspection of weighing and marking of weights of coils assemblies- Random Witness			x	x	
20	Visual inspection of hanging of coils				x	
21	Visual inspection of marking - Random Witness			x		x
22	Visual inspection of final cleaning, preparation for shipment including export crating (of applicable) - Random Witness			x		x
23	Final documentation review prior to inspection release					x
24	Inspection Release					x
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