







Plant CA	Client PCC Rokita	Code Rokita VI	Doc ID Code PDEL-EQS-G000-EC-00001				Project No. 05-1864			
	Cover Sheet Brine Heater for Filling						TON 06E004			
							Item			
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TECHNICAL SPECIFICATION										
Page	Description								Revision	
1	Cover Sheet									
2	Plate Heat Exchanger									
3	Process Design Case									
4	Nozzle Sheet									
5	Detail									
6	Applicable Codes & Standards									
7	General Requirements									
8	Documentation									
00	IFI	Issue for Inquiry	12-Mar-24	Langner	19-Mar-24					
Rev.	Status	Description	Date	Prepared	Date	Checked	Date	Approved	AC	
									Category Code: AC	
Customer Document ID:										
						Shown on PID: 0603				

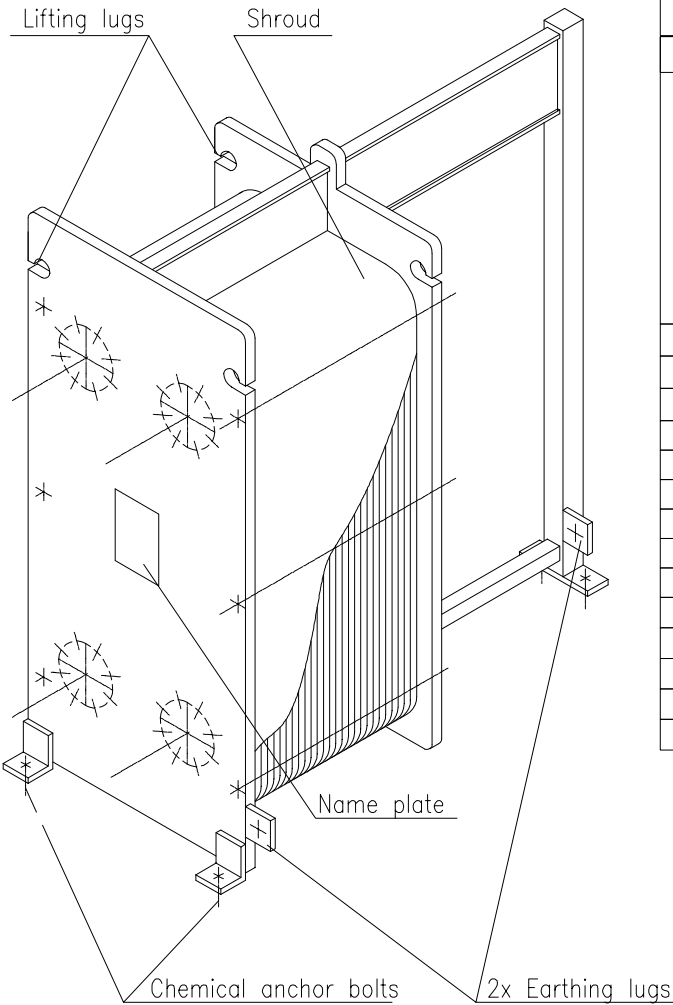
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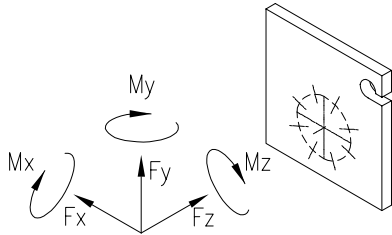
Plant CA	Client PCC Rokita	Code Rokita VI	Doc ID Code PDEL-EQS-G000-EC-00001	Project No. 05-1864			
	Plate Heat Exchanger Brine Heater for Filling			TON	06E004		
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Line	Process Requirements I		IDX	Process Requirements II		Remark	Rev.
2	Quantity Operat. / Stand-by	1 0		Material Process Side	Ti 0.2% Pd	Ti 0.2% Pd	
3	Type	Plate-and-Frame, gasketed		Exchg Surf. per Exchg/Total m²			1)
4	Arrangement	<input type="checkbox"/> Parallel <input type="checkbox"/> Serial <input type="checkbox"/> Stand-by		Qty. of Plate Assembled			2)
5	Process Fluid, Fluid 1	Ultra Pure Brine	5)	Min Plate Thickness mm		0.6	
6				Insulation Type	Splash Guard		
7	Process Fluid, Fluid 2	Low Pressure Steam					
8		Steam Condensate					
9		Fluid 1		Fluid 2			
10	pH-Value						
11	Class of Hazard	H290					
12	Physical Condition In/Out	L L		V	L		
13	Density, Liquid In/Out kg/m³	1184 1164				962	
14	Density, Gas In/Out kg/m³			1.719			
15	H2-Partial Press. In/Out bara						
16	Operating Temp. In/Out °C	55 80		135		95	
17	Operating Press. In/Out bara	3.5 3)		3.1			3)
18	Allowable Pressure barg	8		-1		6	
19	Allowable Temperature °C	3 170		3		170	
20	MDMT at MAWP °C						
21	Ambient Temperature °C	-25 / 35					
22							
23	Abbreviations for Physical Condition: (S)olid, (L)iquid, (G)as, (V)apour, (IDX) Index for Remarks						
24	Mechanical Requirements		IDX	Material			
25	Design Code	PED / EN 13445		Part	Materials	Remarks	
26				Bars/Support Columns	CS	4)	
27	Corros. Allow., for Calc. mm	0 0		Covers	CS	4)	
28	Joint Efficiency			Plate Pack	Ti 0.2% Pd	4)	
29	Test Pressure	Acc. to Code		Plate Gaskets	EPDM		
30	Non-Destructive Test	Acc. to Code		Nozzle	Fluid 1 Ti 0.2% Pd lining		
31	Insulation mm			Flanges	Fluid 2 Ti 0.2% Pd lining		
32	Seismic Loads			Nozzle	Fluid 1		
33	Wind Loads			Pipes	Fluid 2		
34	Inspection by	Rokita		Bolts / Nuts	Fluid 1 CS	A2E	
35	Painting	Manufacturer Standard			Fluid 2 CS	A2E	
36	Pickling and Passivation			Gaskets	Fluid 1		
37					Fluid 2		
38				Anchor Bolts			
39				Lifting Lugs / Trunnions			
40				Sliding Plate			
41				Mounting Feet	CS		
42				Tie Bolts / Tie Nuts	CS		
43							
44							
45							
46							
47	Remarks :						
48	1) Surface with min 10% safety margin 2) Fram with 20% spare places 3) To be defined in engineering phase according to pressure drop calculation 4) Material certificates 3.1 acc. to EN 10204 are required. 5) NaCl 305gpl, Na2SO4 10gpl, NaClO3 10gpl, Na2Co3 400 mgpl, Suspended solids < 0,5 mgpl, NaOH < 200 mgpl						

Plant CA	Client PCC Rokita	Code Rokita VI	Doc ID Code PDEL-EQS-G000-EC-00001	Project No. 05-1864		
	Process Design Case Brine Heater for Filling			TON	06E004	
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Line	Process Requirements		IDX			IDX Rev.
2		Fluid 1		Fluid 2		
3	Process Fluid	Ultra Pure Brine		Low Pressure Steam		
4				Steam Condensate		
5	Material Process Side	Ti 0.2% Pd		Ti 0.2% Pd		
6	Surf.-Treatm./Coat. (Proc. Side)					
7	Insulation Type	Splash Guard				
8	Physical Condition In/Out	L L		V	L	
9	Class of Hazard	H290				
10	pH-Value					
11	H2-Partial Pressure In/Out	bara				
12	Max. Operating Temperature	°C 90		160		
13	Max. Operating Pressure	barg 6		5		
14	Allowable Temperature	°C 3 170		3	170	
15	Allowable Pressure	barg 8		-1	6	
16	Mean Metal Temperature	°C				
17	Abbreviations: (S)olid, (L)iquid, (G)as, (V)apour, (IDX) Index for Remark					
18	Operating Conditions per Unit			Fluid 2		
19		Inlet Outlet		Inlet Outlet		
20	Mass Flow, Total	kg/h 94720		3296		
21	Mass Flow, Vapour/Gas	kg/h				
22	Mass Flow, Steam	kg/h		3296		
23	Mass Flow, Inerts	kg/h				
24	Mass Flow, Liquid	kg/h 94720 94720				
25	Mass Flow, Water	kg/h		3296		
26	Operating Temperature	°C 55 80		135	95	
27	Operating Pressure	bara 3.5 2)		3.1	2)	
28	Liquid					
29	Density	kg/m³ 1184 1164		1.719	962	
30	Dynamic Viscosity	mPa*s 0.93 0.64				
31	Specific Heat	kJ/(kg*K) 3.3 3.27		4.21		
32	Thermal Conductivity	W/m*K 0.6120 0.622		0.676		
33	Specific Enthalpy	kJ/kg		0.297		
34	Boiling Point	°C				
35	Solidification Point	°C				
36	Surface Tension	N/m				
37	Steam/Gas					
38	Molar Weight	kg/kmol		18.015		
39	Density	kg/m³		1.14		
40	Dynamic Viscosity	mPa*s		0.014		
41	Specific Heat	kJ/(kg*K)		2.086	4.12	
42	Thermal Conductivity	W/m*K		0.029		
43	Condensation Temperature	°C				
44	Condensation Enthalpy	kJ/kg				
45	Design Requirements					
46	Number of Passes					
47	Velocity (Mean)	m/s				1)
48	Pressure Drop, Admiss./Calc.	bar 0.5		0.5		
49	Fouling Factor	Surface in % / m²K/W 0.0005		0.0001		1)
50	Corrected Mean Temp. Diff.	°C 47				1)
51	Heat Duty per Exch. / Total	kW 2171 /				
52	Heat Transf. Coeff, Max./Calc.	W/m²K /				1)
53	Required Liquid Static Head	m				
54	Remarks :					
55	1) To be given / confirm by manufacturer 2) To be defined in engineering phase according to pressure drop calculation Line 20,48 ->Pressure Drop has to be calculated for flow rate of 94720 kg/h of Fluid 1 Line 12,14 -> only possible for a short period. Normal conditions: steam temperature 135 °C					

Plant CA		Client PCC Rokita		Code Rokita VI		Doc ID Code PDEL-EQS-G000-EC-00001		Project No. 05-1864	
		Nozzle Sheet Brine Heater for Filling						TON 06E004	
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Nozzle Symbol	Designation	DN mm	PN	Standard DIN	Flange Type	Flange Facing	Pipe Dimensions mm	Remarks	Rev.
N01	Brine Inlet	1)	10	EN 1092-1		A			
N02	Brine Outlet	1)	10	EN 1092-1		A			
N03	Steam Inlet	1)	10	EN 1092-1		A			
N04	Condensate Outlet	1)	10	EN 1092-1		A			
Remark:									
1) To be given by manufacturer									


Plant CA	Client PCC Rokita	Code Rokita VI	Doc ID Code PDEL-EQS-G000-EC-00001	Project No. 05-1864		
	Detail Brine Heater for Filling			TON	06E004	
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Connection loads / moments			
Direction of forces on connections			
			
Nozzle loading			
Nom. size		F	M
DN	NPS (in)	N	N•m
50	2	1039	378
80	3	1826	1148
100	4	2386	1788
150	6	3882	3750
200	8	5482	6178
250	10	7166	9047
300	12	8918	12353
350	14	10730	16101
400	16	12595	20301
450	18	14507	24965
500	20	16462	30107

- Supplies shall include the following items:
- Name plate. Material: S.S.
 - Chemical anchor bolts. Material: S.S.
 - 2 separate earthing connections. Material: S.S.
 - Sleeves for tie bolts. Material: plastic (manufacturer standard).
 - Shroud Material: S.S.

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Plant CA		Client PCC Rokita		Code Rokita VI		Doc ID Code PDEL-EQS-G000-EC-00001		Project No. 05-1864		
		Applicable Codes & Standards Brine Heater for Filling						TON 06E004		
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1	Info	Type	Description					Issue Date		Rev.
2		Global Codes & Standards								
3		<input checked="" type="checkbox"/> PED 2014/68/EU	Pressure Equipment Directive					latest issue		
4		<input checked="" type="checkbox"/> EN 13445	Unfired pressure vessel					latest issue		
5		<input type="checkbox"/> EN 13121	GRP tanks and vessels for used above ground					latest issue		
6		<input checked="" type="checkbox"/> Manufacturer Standard								
7										
8		Company Standards: tk Uhde Project Engineering Specifications								
9		<input type="checkbox"/> PDEL-EQS-G000-EC-0001	ES Vessels and Equipment of GRP							
10		<input checked="" type="checkbox"/> PDEL-EQS-G000-EC-0002	ES for Plate Heat Exchanger							
11		<input checked="" type="checkbox"/> PDEL-EQS-G000-EC-0003	Process vessel and equipment>0.5bar(g) (based on PED)							
12										
13		Company Standards: UN								
14		<input type="checkbox"/> UN 2000-06 Part 2	Clips for ladders and platforms							
15		<input type="checkbox"/> UN 2000-09 Part 1	Name plate for vessel							
16		<input type="checkbox"/> UN 2000-10 Part 1	Title blocks for manufactures drawing							
17		<input type="checkbox"/> UN 2002-05 Part 1	Manufacturing defects at glass reinforced thermosetting plastics vessel and equipment							
18		<input type="checkbox"/> UN 2002-03 Part 1	Vessel and equip. of glass-fibre-reinforced plastics; Typical configuration							
19		<input type="checkbox"/> UN 2002-04	Transport and erection for vessel and tanks of GRP							
20		<input checked="" type="checkbox"/> UN 2003-01	Earthing connections for vessels and equipment							
21		<input checked="" type="checkbox"/> UN V416-04	Water quality for pressure tests and flushing of equipment and other components							
22		<input checked="" type="checkbox"/> UN 8281-02 Part 7	Foundation and anchoring, type F							
23		<input type="checkbox"/> ES-Y1	Painting							
24										
25		Remarks :								
26										

Plant CA		Client PCC Rokita		Code Rokita VI		Doc ID Code PDEL-EQS-G000-EC-00001		Project No. 05-1864	
		General Requirements Brine Heater for Filling						TON 06E004	
								Item	
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1	Info	Description							Rev.
2		General							
3		<input checked="" type="checkbox"/> Stress analysis shall be performed by the manufacturer in accordance with design specifications							
4		<input type="checkbox"/> Specified wall thicknesses are minimum values and shall be increased if required by stress calculation							
5		<input type="checkbox"/> Nozzle necks shall be least DN 50/ 2". They shall be reduced to the required nominal flange size if necessary.							
6		<input checked="" type="checkbox"/> Bolts, nuts and gaskets for joints with tapped holes have to be supplied by the vessel manufacturer.							
7									
8		Supplies Shall include the following Items							
9		<input type="checkbox"/> Clips, pads and ladders for vessel							
10		<input type="checkbox"/> Additional 2 sets gaskets for flanges with cover and blind flanges							
11		<input type="checkbox"/> Additional 10% of bolts and nuts, as spare							
12		<input checked="" type="checkbox"/> Lifting lugs for erection							
13		<input checked="" type="checkbox"/> 2 separate earthing connections to be provided 180 degree apart resp. 1 per saddle, if not otherwise specified							
14		<input type="checkbox"/> All internals							
15		<input checked="" type="checkbox"/> Spare parts for 2 years to be quoted separately							
16		<input checked="" type="checkbox"/> Anchor Bolts							
17		<input checked="" type="checkbox"/> For applicable standards see page ' Index of Applicable Codes and Standards'							
18									
19		Remarks :							
20									

Plant CA	Client PCC Rokita	Code Rokita VI	Doc ID Code PDEL-EQS-G000-EC-00001	Project No. 05-1864						
 thyssenkrupp	Documentation Brine Heater for Filling				TON 06E004					
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	For Information		For Review		For Approval		Erection Doc.		Final Doc.	
	Dispatch of Documents	No. of copies	Dispatch of Documents	No. of copies	Dispatch of Documents	No. of copies	Dispatch of Documents	No. of copies	Dispatch of Documents	No. of copies
Priced spare parts list	2 weeks after order	e								
Fabrication schedule	4 weeks after order/each month	e								
Material status report	8 weeks after order/each month	e								
Stress calculation			6 weeks after order	e					with delivery	4
Foundation loads Foundation drawing 1)	3 weeks after order	e								
General arrangement drawing (1st issue)					4 weeks after order	e	2 months before delivery	e	with delivery	4
General arrangement drawing (rev. issue)					2 week after receipt of comments	e				
Detail drawing with part list (1st issue)					4 weeks after order	e	2 months before delivery	e	with delivery	4
Detail drawing with part list (rev. issue)					2 weeks after receipt of comments	e				
Welding procedure specification (WPS) and qualification record (PQR)			8 weeks after order	e					with delivery	4
Quality plan and testing schedule			4 weeks after order	e			2 months before delivery	e	with delivery	4
Transportation sketch			8 weeks after order	e			2 months before delivery	e	with delivery	4
Operation and maintenance instruction 2)			8 weeks after order	e			2 months before delivery	e	with delivery	4
Storage instruction			8 weeks after order	e			2 months before delivery	e		
Certificates (material test, test/inspection, quality, welder/laminator qualification, etc.)									with delivery	4
1) penalized data 2) in English and Polish language e-> electronic format										