

		API 682 MECHANICAL SEAL DATA SHEET				Contract: A8KM	
		Doc. No.: A8KM-18-090-540127-A				Item No: 18-P-1805	
						Revision: 1 Date: 21-Mar-23	
		Note: This data sheet has been modified from that in the annex of API Standard 682, Third Edition. (See Note 9.3)				Unit: South Tank Farm	
				P.O. No.: 4505551383			
				Inquiry No.: 4-601D-RQ			
				Sheet 1 of 3			
REV							
1	Client: World Energy Paramount		Project: World Energy Renewables Project				
2	Service: T-10003 Recirculating Pump		Facility: World Energy Paramount				
3	No. Seals Required per Pump: One (1)		Site: Paramount, CA				
4	NOTES: Information Below to be Completed : ☐ By Purchaser ☒ By Manufacturer ☒ By Manufacturer or Purchaser						
5	Seal Specification - (Ref. 4.1, Figures 1 to 6)						
6	CATEGORY	☐ Seal Category 1 ☒ Seal Category 2 ☐ Seal Category 3 ☒ Seal Code (Annex D) 21A-SFX-048-11/62					
7	TYPE	☒ Type A (3.1.90) ☒ Type B (3.1.91) ☒ Alternate Stationary (Type A&B) ☒ Type C (3.1.92) ☒ Alternate Rotating (Type C) ☒ Single Spring (Type A)					
9	ARRANGEMENT	Default Configuration Alternate Design Flush Plans (See Annex G)					
10	1 (3.1.2)	Single	☒ 1CW-FX	☒ 1CW-FL ☒ Dist. Flush ☒ Alternative Bush	☒ 01 ☒ 13 ☒ 23 ☒ 50 ☒ 62 ☒ 02 ☒ 14 ☒ 31 ☒ 51 ☒ 03 ☒ 11 ☒ 21 ☒ 32 ☒ 61		
13	2 (3.1.3)	Liquid	☒ 2CW-CW	☒ FX ☒ Dist. Flush ☒ Tangential LBO Connection	☒ 01 ☒ 13 ☒ 23 ☒ 41 ☒ 62 ☒ 75 ☒ 02 ☒ 14 ☒ 31 ☒ 52 ☒ 71 ☒ 76 ☒ 11 ☒ 21 ☒ 32 ☒ 61 ☒ 72		
16	3 (3.1.4)	Liquid	☒ 3CW-FB	☒ 3CW-BB ☒ FX ☒ 3CW-FF ☒ Tang. LBO Conn.	☒ 01 ☒ 13 ☒ 53A ☒ 54 ☒ 74 ☒ 02 ☒ 14 ☒ 53B ☒ 61 ☒ 11 ☒ 32 ☒ 53C ☒ 62		
18		Gas	☒ 3NC-BB	☒ 3NC-FF ☒ 3NC-FB	☒ 11 ☒ 32 ☒ 53C ☒ 62		
19	SLEEVE-SHAFT DRIVE		☒ Set-Screw Onto Shaft ☒ Alternative (6.1.3.15) Specify :				
20	MATERIALS (REFERENCE 6.1.6 & ANNEX B) (Note 7.3)						
21	SECONDARY SEALS	SEAL FACES	METAL BELLOWS	SPRINGS	METAL PARTS		
22	☒ FKM ☒ FFKM	☒ CARBON vs SIC	☒ UNS N10276 (TypeB)	☒ UNS N10276	☒ UNS S31600 / S31635		
23	☒ Spiral Wound Gasket	☒ SIC vs SIC	☒ UNS N07718 (TypeC)	or UNS N06455	☒ UNS N10276		
24	☒ EPM / EPDM ☒ NBR	☒ SS-SIC ☒ RB-SIC	☒ UNS N08020	☒ UNS S31600	☒ UNS N08020		
25	☒ Other :	☒ vs	Other :	or UNS S31635	☒ Other :		
26	MECHANICAL SEAL DATA						
27	☒ Seal Vendor : John Crane			☒ Dynamic Sealing Pressure Rating (3.1.27) : 350 psig			
28	☐ Data Requirements Form (Annex J)			☒ Static Sealing Pressure Rating (3.1.84) : 630 psig			
29	☒ Size / Type : 2.375" / Single			☒ Maximum Allowable Temperature (3.1.51) : 275 °F			
30	☒ Seal Drawing No.: GA-267949-1			☒ Min. Design Metal Temperature (6.1.6.11.1) : 32 °F			
31	☒ Vendor's Seal Code : 1648			☒ Generated Heat at Normal Conditions : 1278.12 BTU/hr			
32	☐ Modified Faces For Pump Performance Test			☒ Heat Soak at Normal Conditions : -5.7 BTU/hr			
33	☐ Alternative Seal For Pump Performance Test			☒ Total Seal Axial Thrust on Shaft : 94.4 lb			
34	SEAL CHAMBER DATA (REFERENCE 6.1.2.4)						
35	☒ API 610 ☒ ASME B73.1&2 ☒ Cylindrical ☒ Tapered ☒ ISO 3069-C ☒ Other :						
36	☐ Bolt-On Chamber (6.1.2.5) ☒ Seal Chamber Flush Port Req'd ☒ Seal Chamber Vent Req'd						
37	☒ Floating Throat Bushing ☒ Fixed Throat Bushing ☒ Chamber Heating ☒ Chamber Cooling						
38	PUMP DATA						
39	☒ Manufacturer : SULZER PUMPS ☒ Model : OHH ☒ Size : 3X4X8A ☒ Case Material : 316L SS						
40	Pump Operating Pressure : ☒ Discharge Press. (Rated) : 58.1 psig ☒ Suction Press. (Rated) : -1.2 psig						
41	Seal Chamber Press.: ☒ Norm.: 24.8 psig ☐ Min/Max (MDSP 3.1.53): / psig ☐ MSSP (3.1.55): psig						
42	Shaft: ☒ Horizontal ☒ Vertical ☒ Diameter : 1.89 ☒ Shaft Speed : 3520 RPM						
43	☒ Shaft Rotation (Viewed From Driver) : ☒ CCW ☐ CW						
44	NOTES						
45	7.1 Deleted.						
46	7.2 Seal Manufacturer shall consider the Liquid Characteristics and Operating Conditions on sheet 2.						
47	7.3 Seal Manufacturer shall recommend seal face material, elastomers and spring material based on pumped fluid properties.						
48	7.4 Refer to 8ES-2DG1 – WEP Instrumentation & Electrical Standard Vendor List, for Instrumentation.						
49	7.5 Deleted.						
50	Deleted.						
51							
52							
53							
54							
55							
56							

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FLUOR



API 682 MECHANICAL SEAL DATA SHEET

Contract:		A8KM	
Item No:		18-P-1805	
Revision:	1	Date:	21-Mar-23
Unit:		South Tank Farm	
P.O. No.:		4505551383	
Inquiry No.:		4-601D-RQ	
Sheet	2	of	3

Note: This data sheet has been modified from that in the annex of API Standard 682, Third Edition. (See Note 9.3)

REV

FLUID DATA

PUMPED STREAM (PLANS 01, 02, 11, 12, 13, 14, 21, 23, 31, 41)

☒ Type or Name : **Treated Feed Off Spec** Conc'n : **100** %
☐ Dissolved Contaminant ☐ H₂S : _____ ppmw ☐ Wet
☐ Cl₂ : _____ ppmw ☐ Other: _____ @ _____ wt%
☐ Solid Contaminant : _____
☐ Conc'n (Mass Fract. or PPM) : _____
☒ Fluid Temp.: Min _____ °F Norm **120** °F Max **200** °F
☒ Spec. Gravity : @ Norm. Temp.: **0.90** @ Min. Temp.: _____
☒ Vapor Pressure : @ Norm Temp.: **0.0** psi(a)
☐ @ Max Temp.: _____ psi(a)
☐ Atmospheric Boiling Point : _____ °F
☒ Viscosity : Normal : **26.2** cP Max.: **26.2** cP

☐ Hazardous ☐ Flammable ☐ _____
☐ Fluid Solid at Ambient ☐ Solidifies @ : _____ °F
☐ _____
☐ Pour Point : _____ °F
☐ Pumped Stream Solidifies Under Shear
☐ Pumped Stream Contains Agents That Polymerize
 Specify Agents : _____ @ Temp : _____ °F
☐ Pumped Stream Can Plate Out or Decompose :
 Specify Conditions : _____
☐ Pumped Stream is Regulated For Fugitive or Other Emissions
 Regulation Level : _____ wt%
☐ Special Pump Cleaning Procedures : _____
☐ Alt. Process Fluids (incl. Commissioning) Specify : _____

FLUSH FLUID (PLAN 32)

☐ Type or Name : _____ Conc'n : _____ %
☐ Seal Vendor Review Required
☐ Fluid Temp : Min _____ °F Norm _____ °F Max _____ °F
☐ Spec. Gravity : @ Norm. Temp.: _____ @ Max. Temp.: _____

☐ Vapor Press: @ Norm. Temp: _____ psi(a) @ Max. Temp: _____ psi(a)
☐ Viscosity @ Normal Temperature : _____ cP
☐ Atmospheric Boiling Point: _____ °F
☐ Flow Rate Req'd Max. / Min.: _____ / _____ gpm
☐ Pressure Req'd Max. / Min.: _____ / _____ psig

QUENCH MEDIUM (PLAN 62)

☒ Type or Name : **Steam**

☒ Supply Temperature Max. / Min. : _____ / _____ °F
☒ Flow Rate Req'd (@STP for gas) Max. / Min. : **3-5** psig / **2** SCFH

BUFFER / BARRIER MEDIUM (PLAN 52, 53, 54, 72, 74)

☒ Type or Name : _____
☐ Purchaser Selection ☐ Seal Vendor Selection
☐ Seal Vendor Review ☐ Purchaser Review
☐ Flow Rate Req'd (@STP for Gas) Max. / Min.: _____ / _____ SCFH
☒ Supply Pressure Max. / Min.: _____ / _____ psig
☒ Fluid Temperature :
 Min.: _____ °F Normal : _____ °F Max.: _____ °F

☒ Specific Gravity:
 @ Normal Temperature : _____ @ Max. Temp. : _____
☒ Vapor Pressure at :
 Normal Temp.: _____ psia Max. Temp.: _____ psia
☒ Atmospheric Boiling Point : _____ °F
☒ Viscosity at Normal Pump Temperature : _____ cP
☒ Specific Heat Capacity at Const. Press.: _____ BTU/lb°F
☐ Cooling / Heating Required : _____

SITE AND UTILITIES

☒ Control Voltage : V : **120** Ph : **1** Hz : **60**
☒ Area Class: Cl.: **I** Gr.: **B/C/D** Div.: **2**
☒ Design Ambient (Min. / Max.): **35** / **105** °F
☒ ATEX (Ex Directive 94/9/EC) : Gr.: _____ Cat.: _____ T-CLASS: **T3C**

☒ Cooling Water Supply Temp. Norm.: **80** °F ☒ Cl⁻ : **< 840** ppmw
☒ Cooling Water Supply Press. Norm./Design: **45** / **120** psi(g)
☒ Cooling Water Allowable Pressure Drop : **10.0** psi
☒ Cooling Water Allowable Temp. Rise : **40.0** °F

ACCESSORIES (Clauses 8 and 9)

GENERAL

☐ Joint User / Vendor Layout of Equipment (8.1.3)
☐ Pipe Taper Threads (8.2.13) ☐ ISO 7 ☐ ASME B1.20.1
☐ Special Requirements For Hazardous Service
 Define : _____
☐ Special Cleaning and Decontamination Requirements
☐ Utility Manifold Connections Required (8.2.24)
☐ Type and Spec. of Heat Tracing (8.3.9.1.1) : _____
☐ Thermal Relief Valves Required (9.8.3)
PLAN 11, 12, 13, 14, 21, 23, 31, 32 and 41 SYSTEMS
☒ Connecting Line Supplier : **PUMP SUPPLIER**
☐ Tubing ☒ Piping (8.3.5.2) **Note 8.2**
☐ Restriction Orifice Nipple in Flush Line (8.3.5.4)
☐ Cyclone Separator Supplier : _____
☐ Plan 32 Equipment Supplier : _____
☐ Plan 32 Flow Indicator ☐ Plan 32 Temp. Indicator
☐ Plan 23 Vent Conn.w/ RF Flg. Valve ☐ Plan 23 Temp. Indicator

COOLING SYSTEMS (PLAN 21,22,23,41,52,53B,53C)

☐ Heat Exchanger Supplier : _____
☒ Water Cooled ☒ Air Cooled ☐ ISO 15649
☒ Equipment Reference / Code : _____
☐ Cooling Water Line Supplier:
☐ Tubing ☐ Galvanized Piping (8.2.21) ☐ Gal CS Piping
☐ Sight Flow Indicators (8.2.22) ☐ Open ☐ Closed
☐ Cooling Water Flow Requirement & Equipment Pressure Drop:
☐ Primary Equipment : _____ gpm ΔP : _____ psi
☐ Secondary Equipment : _____ gpm ΔP : _____ psi
PLAN 72 and 74 SYSTEMS
☐ Equipment Supplier : _____
☐ High Flow Alarm Switch (8.3.10.5)
PLAN 75 and 76 SYSTEMS
☐ Equipment Supplier : _____
☐ High Level Alarm Switch For Plan 75 (8.3.9.3.3)
☐ Test Connection (8.3.9.3.4)

NOTES

- 8.1 Pump Supplier has unit responsibility for the furnishing of all instruments & equipment associated with seal flush Plans.
- 8.2 Primary seal flush piping shall be 300# ANSI RFSW, schedule 160 minimum, 3/4" SW 316 Piping.
- 8.3 Plan 62 Steam quench system shall include steam trap, isolation valve, check valve, pressure gauge and drain valve on seal supply side. An isolation drain valve shall be provided on seal discharge side. Pump supplier shall provide piping/tubing with above instruments from seal to edge of skid.

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SULZER CONFIDENTIAL

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**API 682 MECHANICAL SEAL DATA SHEET**

Contract:	A8KM		
Item No:	18-P-1805		
Revision:	1	Date:	21-Mar-23
Unit:	South Tank Farm		
P.O. No.:	4505551383		
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Sheet	3	of	3

Note: This data sheet has been modified from that in the annex of API Standard 682, Third Edition. (See Note 9.3)

REV

ACCESSORIES (Clauses 8 and 9) CONTINUED**PLAN 52 AND 53 SYSTEMS**☒ Standard (Fig. G.35) ☒ Alternative (Fig. G.36)☐ Dimensional Variations To Standard Figure G.35 :☐ Dimensional Variations To Standard Figure G.36 :☒ Alternative Fabrication Standard :☐ Primary Equipment Supplier :☐ Supplier Reference / Code :☐ Connecting Line Supplier :☐ Tubing ☐ SCH. 80 Piping (8.2.9)☐ Equipment Support Supplier :☐ Filling System Supplier :☐ ASME Code Stamp Required☐ EN 13445 or Other Code Applicable :☒ Reservoir Capacity (8.3.6.2.5a) : gal☒ NLL to Gland Plate Height (8.3.6.2.2) : ft☐ Reservoir MAWP (3.1.52) : psig @ °F☒ Set Pressure Range, Max. / Min.: psig☒ System Hold-Up Period (Plans 53B & 53C) : days☐ Temperature Indicator (Plan 53B & 53C)☐ Pressure Alarm Setting (8.3.6.2.3) to Activate on :☒ Rising Pressure (Arr 2) Set at : psig☒ Falling Pressure (Arr 3) Set at : psig☒ Low Level Alarm Setting Required☒ High Level Alarm Setting Required (8.3.6.2.4)☒ Test Based H / Q Curve For Internal Circulating Device☐ External Circulating Pump (8.3.7)**INSTRUMENTATION**☒ User Specification Reference For Instrumentation / Controls :

(Note 7.4)

Pressure Gauges (9.4)

☐ Oil Filled Pressure Gauges (9.4.3)

Pressure Transmitters (9.5.2)

☐ Switches in Lieu of Transmitters

Level Transmitters (9.5.3)

☐ Switches in Lieu of Transmitters☐ Hydrostatic (Std. Option, 9.5.3)☐ Capacitance☐ Ultrasonic

Level Indicators (9.6)

☐ Weld Pad (Std. Option, 9.6.1)☐ External, Removable (9.6.2)

Flow Instruments (9.7) :

☐ Transmitters (9.5.4)**INSPECTION AND TESTING**☐ Purchaser Participation in Inspection & Test

Specify :

☐ Inspector's Check List (10.1.7 & Annex H)☐ Purchaser Approval Req'd For Welded

Connection Design (6.1.6.10.5)

☐ Hardness Test (10.2.3k) Required For :☐ 100% Inspection of All Welds (6.1.6.10.5) Using :☐ Magnetic Particle☐ Liquid Penetrant☐ Radiographic☐ Ultrasonic☐ Optional Qualification Testing Required (10.3.2)☒ Mod. Faces For Pump Test (10.3.6.1), Seal Page 1, Line 32☒ Alternate Seal Pump Test (10.3.6.2), Seal Page 1, Line 33**NOTES**

9.1 Seal flush systems and supports shall meet load requirements per Project specification A8KM-PP-000-40002-A, Structural Data For Mechanical Equipment, and A8KM-PP-000-20001-A, Plant Site Data Sheet.

9.2 Seal Data Sheets are in the API-682, 3rd Edition format. Paragraph references are to API-682, 4th Edition. Pump seals shall be in full compliance with API-682, 4th Edition.