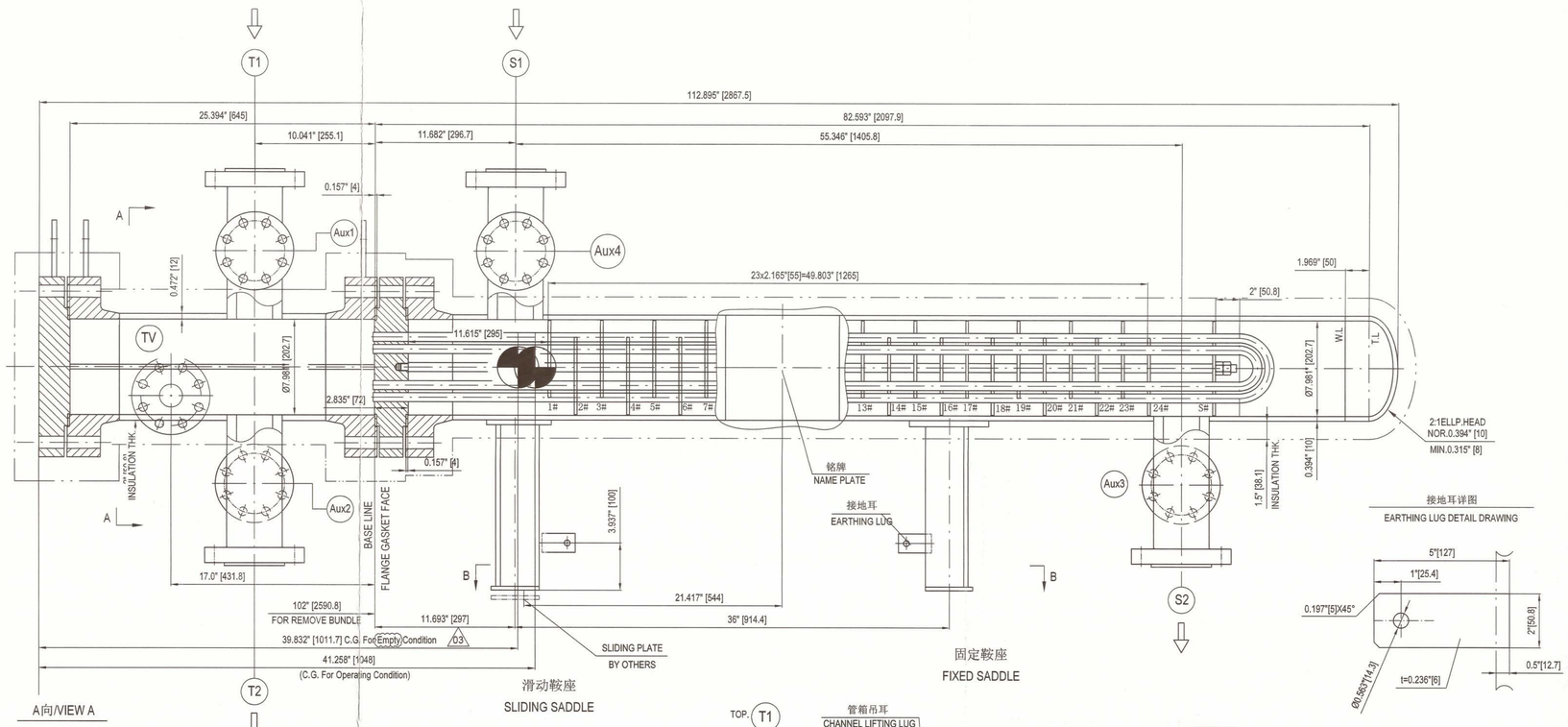
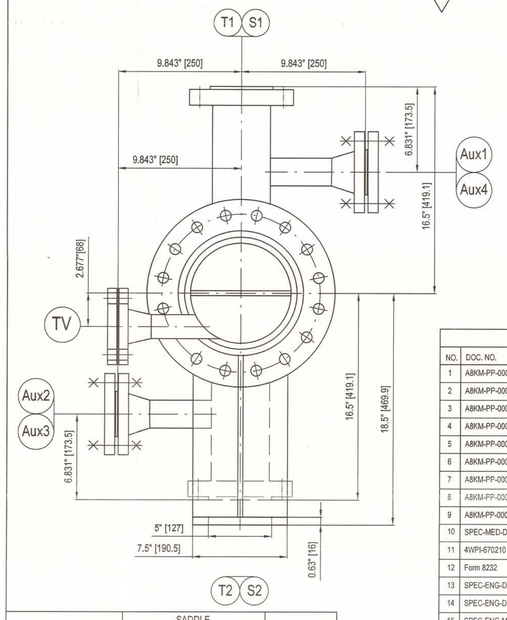
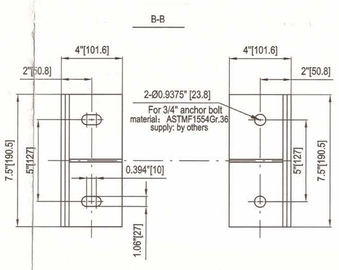
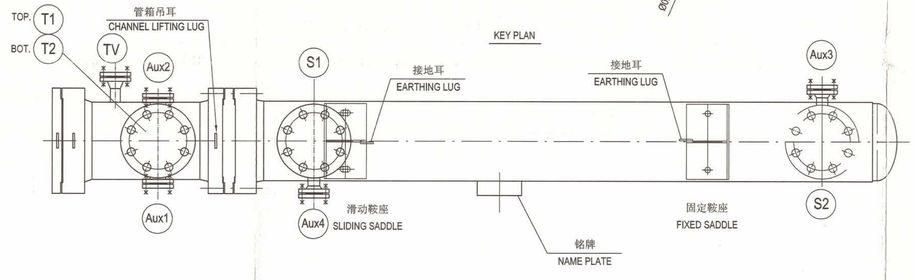


A向/VIEW A



B-B





PROJECT SPECIFICATION			
NO.	DOC. NO.	DESCRIPTIONS	Rev
1	ASKM-PP-000-200001-A	Plant Site Data Sheet	0B
2	ASKM-PP-000-400002-A	Structural Data for Mechanical Equipment General	0
3	ASKM-PP-000-500005-A	Design of Lifting Component for Mechanical Equipment	0
4	ASKM-PP-000-500510-A	Hot Insulation	0C
5	ASKM-PP-000-500520-A	Painting	0D
6	ASKM-PP-000-500512-A	Positive Material Identification - PMI	0
7	ASKM-PP-000-500530-A	Materials and Fabrication Requirements for Duplex Stainless Steel	0
8	ASKM-PP-000-500550-A	Welding-NDE Requirements for Equipment	0C
9	ASKM-PP-000-50720-A	Shell and Tube Heat Exchangers	0
10	SPEC-MED-DOC001	Design Basis for Mechanical Equipment	0
11	4WPI-870210	Bolt-Up Procedure for Flanged Connections	5
12	Form 8232	Flanged Joint Assembly Record and Tightening Sequence	
13	SPEC-ENG-DOC001	Supplier-Designed, Shop-Fabricated Pressure Equipment	0
14	SPEC-ENG-DOC002	Shell & Tube Heat Exchanger	0
15	SPEC-ENG-MQ057	Mechanical Equipment Gaskets	1
16	4WGN-10001	Shipment and Packing Specification for Equipment and Materials being Exported Directly by Vendors	6
17	4WEQ-1051	Welding of HyCO Plant Equipment	0
18	SPEC-ENG-MQ042	Material Certification and Retesting Requirements	0

	SADDLE		TOTAL
	SLIDING	FIXED	
EMPTY WEIGHT (lb)	1488.6	9.4	1498
OPERATING WEIGHT (lb) (CORRODED)	1531.3	73.7	1605
OPERATING WEIGHT (lb) (UNCORRODED)	1593.3	76.7	1670
TEST WEIGHT(FIELD) (lb)	1584.6	101.4	1686
TEST WEIGHT(SHOP) (lb)	1545.1	98.9	1644

名称 TITLE	图号 DWG. NO.	张数 SHEET NO.	名称 TITLE	图号 DWG. NO.	张数 SHEET NO.
管口详图 NOZZLE DETAIL DRAWING	WXCE6884-03	1/1			
管束详图 BUNDLE DETAIL DRAWING	WXCE6884-02	1/1	保温支撑图 INSULATION CLIP DETAIL DRAWING	WXCE6884-07	1/1
壳体图 SHELL DETAIL DRAWING	WXCE6884-01	1/1	运输及吊装图 SHIPPING AND LIFTING DETAIL DRAWING	WXCE6884-06	1/1
装配图 II GENERAL ASSEMBLY DRAWING II	WXCE6884-00	2/2	铭牌图 NAMEPLATE DETAIL DRAWING	WXCE6884-05	1/1
装配图 I GENERAL ASSEMBLY DRAWING I	WXCE6884-00	1/2	鞍座及吊耳详图 SADDLE AND LIFTING LUG DETAIL DRAWING	WXCE6884-04	1/1

图纸汇总表 DRAWING SUMMARY

扭矩表 TORQUE TABLE

部件 PART	螺栓规格 BOLT SIZE	扭矩 (lbf-ft) TORQUE
CHANNEL FLANGE AND SHELL FLANGE TO TUBESHEET	7/8"	449.1
NOZZLE Aux1~4, TV	5/8"	90

MAXIMUM FOUNDATION LOADING DATA(ASD)

		TOTAL		
		EMPTY	OPERATING	SHUTDOWN
WIND LOAD	TRANSVERSE SHEAR (Lbf)	103.1	103.1	103.1
	TRANSVERSE BENDING (Lbf-in)	1907.4	1907.4	1907.4
	LONGITUDINAL SHEAR (Lbf)	53.06	53.06	53.06
	LONGITUDINAL BENDING(Lbf-in)	981.6	981.6	981.6
EARTHQUAKE	TRANSVERSE SHEAR (Lbf)	813	906	-
	TRANSVERSE BENDING (Lbf-in)	15041	16761	-
	LONGITUDINAL SHEAR (Lbf)	813	906	-
	LONGITUDINAL BENDING (Lbf-in)	15041	16761	-
Bundle pull out: @150% bundle weight		436.5 lbf		

MATERIAL				
CHANNEL		SKID BARS/RAILS		SA-240 S316L
FLAT COVER	SA-266 Gr. 2N	IMPINGEMENT PLATE		-
CHANNEL FLANGE	SA-266 Gr. 2N	SPACERS		SA-213 TP316L
CHANNEL SHELL	SA-266 Gr. 2N	EXTERNAL ATTACHMENTS FOR CHANNEL		SA-516 Gr.70N
NOZZLE NECK	-	EXTERNAL ATTACHMENTS FOR SHELL		SA-240 S32205
NOZZLE FLANGE	SA-105N	EXTERNAL BOLTING/ NUT		SA-193 B7 / SA-194 2H
PASS PARTITION	SA-516 Gr.70N	INTERNAL BOLTING/ NUT		-
SHELL		SUPPORTS		SA-516 Gr.70N/SA-240 S32205
SHELL	SA-182 F60	SLIDING PLATE		BY OTHERS
SHELL FLANGE	SA-182 F60	ANCHOR BOLTS		ASTM F1554 Grades 36
NOZZLE NECK	-	GIRTH FLANGE GASKET		GMGC-316L+graphite filler
NOZZLE FLANGE	SA-182 F60	NOZZLE FLANGE GASKET		SPIRAL WOUND-316L+graphite filler INNER & OUTER RING:316L
TUBE BUNDLE		EARTHING LUG		SS.304
TUBES	SA-789 S32205 (Seamless)	NAMEPLATE		SS.304
TUBESHEETS	SA-182 F60	NAMEPLATE BRACKET		SA-240 S32205
BAFFLES	SA-240 S316L	COLLAR BOLTS :		SA-193 B7/SA-194.2H
TIE / SEAL RODS:	SA-479 316L	JACK SCREW / DOWEL PIN		SS.304

管口表 NOZZLE SCHEDULE

符号 MARK	数量 QTY.	公称尺寸 NPS	壁厚等级 SCH /THK	外强圈外径x厚度 REIN. PAD O.D.X THK.	公称压力 RATING	连接标准, 法兰型式 密封面 CONNECTING STD./ TYPE	法兰密封面到设备中心线长度 PROJECTION FROM BSMEL CL. TO FLANGE FACE	用途或名称 SERVICE	备注 REMARKS
T1	1	3 "	0.803" [20.4]	--	CL600	ASME B16.5-2017 LWN/RF	16.5" [419.1]	TS INLET	
T2	1	3 "	0.803" [20.4]	--	CL600	ASME B16.5-2017 LWN/RF	16.5" [419.1]	TS OUTLET	
S1	1	3 "	0.803" [20.4]	--	CL600	ASME B16.5-2017 LWN/RF	16.5" [419.1]	SS INLET	
S2	1	3 "	0.803" [20.4]	--	CL600	ASME B16.5-2017 LWN/RF	16.5" [419.1]	SS OUTLET	
TV	1	1 1/2 "	0.4" [10.15]	--	CL300	ASME B16.5-2017 WN/RF	见图/SEE DWG	TS VENT	WITH BL.
Aux1~4	4	2 "	0.218" [5.54]	--	CL300	ASME B16.5-2017 WN/RF	见图/SEE DWG	AUXILIARY	WITH BL.

无损检验 NONDESTRUCTIVE EXAMINATION

焊接接头型式或焊缝编号 JOINT TYPE OR WELD SEAM NO		焊接接头系数 JOINT EFFICIENCY	射线探伤 R.T 检测比例 EXAM. RATE	射线探伤 R.T 合格级别 CLASS OF ACC.	超声波探伤 U.T Appendix 12	磁粉探伤 M.T Appendix 6	着色探伤 P.T Appendix 8	备注 REMARKS
A,B类 CATEGORY A,B	壳程 SHELL SIDE	1.0	FULL	UW-51	/	/	100%	
	管程 TUBE SIDE	1.0	FULL	UW-51	/	100%	/	
C类/CAT. C	壳程 SHELL SIDE 设备法兰与壳体 GIRTH FLANGE TO SHELL	1.0	FULL	UW-51	/	/	100%	
	壳程 SHELL SIDE 接管与法兰 NOZZLE TO FLANGE	/	/	/	/	/	100%	
	管程 TUBE SIDE 设备法兰与壳体 GIRTH FLANGE TO SHELL	1.0	FULL	UW-51	/	100%	/	
	管程 TUBE SIDE 接管与法兰 NOZZLE TO FLANGE	/	/	/	/	100%	/	
D类 TYPE D		/	/	/	/	100% Tube side	100% Shell side	
吊耳焊缝 LIFTING LUG WELDS		/	/	/	100%	100%	/	
鞍座焊缝 SADDLES WELDS		/	/	/	/	100%	100%	
换热管与管板的连接接头 TUBE TO TUBESHEET JOINT		/	/	/	/	/	100%	

注/NOTE:
1.应对吊耳进行超声波检查及磁粉检测。
Lifting lugs shall be ultrasonically checked and magnetic particle inspection .
2.无损检测要求见"其他要求和说明第6条"
For requirements of NDT, see clause 6 of "Other Requirements and Notes"

设计.制造.检验与验收数据表
DATA SHEET OF DESIGN,FABRICATION,INSPECTION & ACCEPTANCE

设计.制造.检验与验收标准 STANDARDS OF DESIGN,FABRICATION ,INSPECTION & ACCEPTANCE

1. ASME SECTION VIII DIV.1 2021 ED.
2. TEMA Tenth Edition CLASS R
3. API660-2020.

设计数据 DESIGN DATA

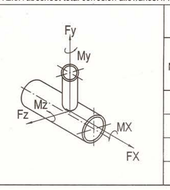
名称 DESIGNATION	壳程 SHELL SIDE	管程 TUBE SIDE
换热器型式 EXCHANGER TYPE(TEMA)	AEU	04
传热面积 HEAT TRANSFER SURFACE AREA ft²[m²]	21.98 [2.04]	
DESIGN DUTY mmBtu/hr	0.25	
设计压力(内压/外压) DESIGN PRESSURE (INT/EXT) psig[barg]	180/15 [12.41/1.03]	232/15 [16/1.03]
工作压力(NORMAL) OPERATING PRESSURE psig[barg]	31 [2.14]	50 [3.45]
最大允许工作压力 MAWP(INTERNAL) psig[barg]	412.2 [28.42] (Limited by nozzle flange)	532.3 [36.7] (Limited by nozzle flange)
最大允许工作压力 MAWP(EXTERNAL) psig[barg]	15@300 [148.9]	15@400 [204.4]
最大允许压力 MAP psig[barg]	600 [41.37] (Limited by nozzle flange)	740 [51.02] (Limited by nozzle flange)
设计温度 DESIGN TEMPERATURE *F[*C]	430 [221.1]/300 [148.89] NOTE.1	430 [221.1]/400 [204.44] NOTE.2
工作温度 OPERATING TEMPERATURE *F[*C]	120 [48.89]/140 [60.00]	328 [164.4]/297.12 [147.3]
最低设计金属温度 MDMT *F	32 @412.2 PSIG	32 @532.3 PSIG
工作介质 OPERATING FLUID	Recovered Feed	Steam
介质特性 VESSEL SERVICE	-	-
湿H2S工况 WET H2S SERVICE	NO	NO
氢工况 HYDROGEN SERVICE	NO	NO
介质致死工况 FLUID LETHAL SERVICE	非致死/Nonlethal	非致死/Nonlethal
介质密度 DENSITY OF FLUID lb/ft³[kg/m³]	56.4[903]/55.9	-/57.4
腐蚀裕量 CORROSION ALLOWANCE In.[mm]	1/16" [1.588] NOTE.3	1/8" [3.175] NOTE.3
焊接接头系数(筒体/封头) JOINT EFFICIENCY (SHELL/HEAD)	1.0/1.0	1.0/-
容 积 CAPACITY ft³[m³]	2.12 [0.06]	1.06 [0.03]
冲击试验 IMPACT TEST	YES	NO
程数 NUMBER OF PASSES	1	2
换热管与管板的连接 TUBE-TO-TUBESHEET JOINT	强度焊+贴胀 Strength Welded+Light Expansion	
换热管间距/排列方式/数量 PITCH/PATTERN/NO.	1"/90°/10U	
换热管外径/壁厚/直段管长 TUBE O.D./WALL THK./LENGTH	0.75"/0.065"(Avg.)/72"	
焊后热处理 POST-WELD HEAT TREATMENT	不需要/NO	不需要/NO
成型后热处理 POST FORMING HEAT TREATMENT	封头/ head Solution annealing SEE Note 3.16	U形管 U-BENDS SEE Other Requirements and Notes 2.9
保温类型/厚度 INSULATION TYPE/THK In.	1.5 (IH)	2 (IH)
防火类型/厚度 FIREPROOF MATERIAL/THK In.[mm]	NA	NA
油漆系统号 PAINT SYSTEM CODE	System 6	System 6

名称 DESIGNATION	壳程 SHELL SIDE	管程 TUBE SIDE
NB REGISTRATION	YES	
ASME CERTIFICATE	YES (With U Designator)	
工厂水压试验 SHOP HYDROSTATIC TEST psig[barg]	779.6 [53.75]	961.6 [66.3]
现场水压试验 FIELD HYDROSTATIC TEST psig[barg]	580.5 [40.03]	696.2 [48.0]
气密试验 PNEUMATIC TEST psig[barg]	/	/
制造重量 FABRICATED WEIGHT Lb[Kg]	1456 [662]	
空重 EMPTY WEIGHT Lb[Kg]	1498 [681]	
安装重量 ERECTED WEIGHT Lb[Kg]	1498 [681]	
操作重量(腐蚀) OPERATING WEIGHT(CORRODED) Lb[Kg]	1605 [730]	
操作重量(不腐蚀) OPERATING WEIGHT(NO CORRODED) Lb[Kg]	1670 [759]	
水压试验(现场) TEST WEIGHT(FIELD) Lb[Kg]	1686 [766]	
水压试验(工厂) TEST WEIGHT(SHOP) Lb[Kg]	1644 [747]	
管束重量 TUBE BUNDLE WEIGHT Lb[Kg]	291 [132]	
管箱重量 CHANNEL WEIGHT	320 [145]	
管箱盖重量 CHANNEL COVER WEIGHT	121 [55]	
地震设计规范 SEISMIC DESIGN CODE	ASCE 7-2016, S1=0.579g, Ss=1.616g SDs=1.077g, SD1=0.996g, Site Class=D IMP. FACTOR=1.5, DESIGN CATEGORY=D	
风载设计规范 WIND DESIGN CODE	ASCE 7-2016	
基本风速 BASIC WIND VELOCITY mph.[m/s]	101 [45.2] EXPOSURE CATEGORY=C	
管口方位 NOZZLE ORIENTATION	按本图 AS PER THIS DWG	

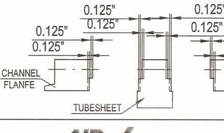
NOTE.1:300°F is for shell side F.V case.
NOTE.2:400°F is for tube side F.V case.
NOTE.3:Tubesheet total corrosion allowance:1/16",Tube:0.

apave Reviewed / Witnessed
ZHAO Xiwei NB15677 AI
APAVE SA

管口载荷表 NOZZLES LOADS LIST



NOZZLE	NPS	FORCES (UNIT: Lbf) Fy	Fx	Fz	MOMENTS (UNIT: Lbf-ft) Mx	Mz	My
T1	3"(2X300#)	1060	1340	1340	1080	1360	1720
T2	3"(2X300#)	1060	1340	1340	1080	1360	1720
S1	3"(2X150#)	840	1060	1060	860	1080	1380
S2	3"(2X150#)	840	1060	1060	860	1080	1380



*FUTURE MACHINING ALLOWANCE (AT SITE)
-GASKET SURFACE OF TUBESHEET : 0.125"
-GASKET SURFACE OF GIRTH FLANGE : 0.125"
-PASS PARTITION RIB OF TUBESHEET & FLAT COVER : 0.125"
-PASS PARTITION PLATE : 0.125"(BOTH SIDES)
-GIRTH FLANGE & TUBESHEET OUTER FACE : 0.125"
-EXTENDED FLANGE FACE OF TUBESHEET: 0.125"
-GASKET SURFACE & OUTER FACE OF FLAT COVER

AIR PRODUCTS

FLUOR

Engineer in Responsible Charge
2023.5.12

Air Products Project Number	EN207131	Fluor Project Number	A8KM
Project Name	World Energy Renewables Project	RFQ No.	A8KM-4-412-RQ
Purchase Order Number	4505729451	PO/Contract No	A8KM-4-412-PO-1
Air Products Open Text document number	EN207131-WUXI-9V3-00011	Project Area	Utilities
Client	WORLD ENERGY PARAMOUNT	Client Doc No:	

版次 REV.	版次说明/DESCRIPTION	设计/PREPARED	审核/REVIEWED	批准/APPROVED	日期/DATE
05	竣工图/ AS BUILT	WenChao Hu	Shengfang Zhao	Kevin Yang	12-May-23
04	供批准/ ISSUED FOR APPROVAL	WenChao Hu	Shengfang Zhao	Kevin Yang	21-Apr-23
03	供批准/ ISSUED FOR APPROVAL	WenChao Hu	Shengfang Zhao	Kevin Yang	17-Feb-23
02	供批准/ ISSUED FOR APPROVAL	WenChao Hu	Shengfang Zhao	Kevin Yang	17-Oct-22
01	供批准/ ISSUED FOR APPROVAL	WenChao Hu	Shengfang Zhao	Kevin Yang	15-Aug-22

WCE 无锡化工装备股份有限公司 WUXI CHEMICAL EQUIPMENT CO., LTD.

设计项目 DESIGN ITEM	World Energy Renewables Project				
设计阶段 DESIGN PHASE	Detail Design				
设计 PREPARED	胡文超	2023.5.12	T-2002 Recirculating Exchanger GENERAL ASSEMBLY DRAWING I	设备位号 ITEM NO.	18-X-1811
审核 REVIEWED	赵胜芳	2023.5.12		图号 DWG. NO.	WXCE6884-00
批准 APPROVED		2023.5.12	比例: SCALE 1:6	版次: REV. 05	第 1 页 共 2 页 PAGE 1 OF 2