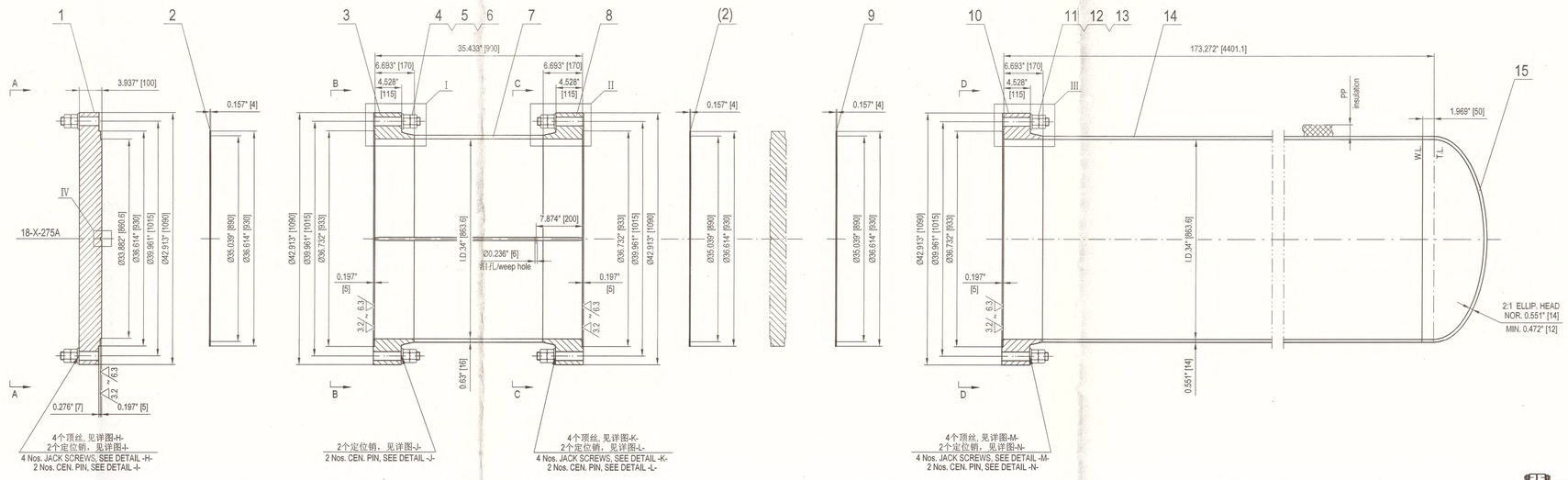
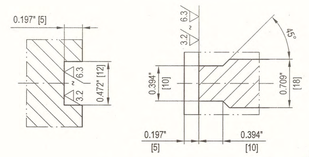
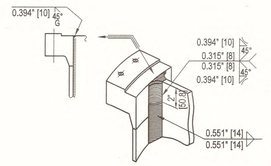
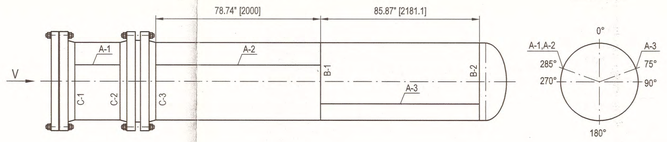


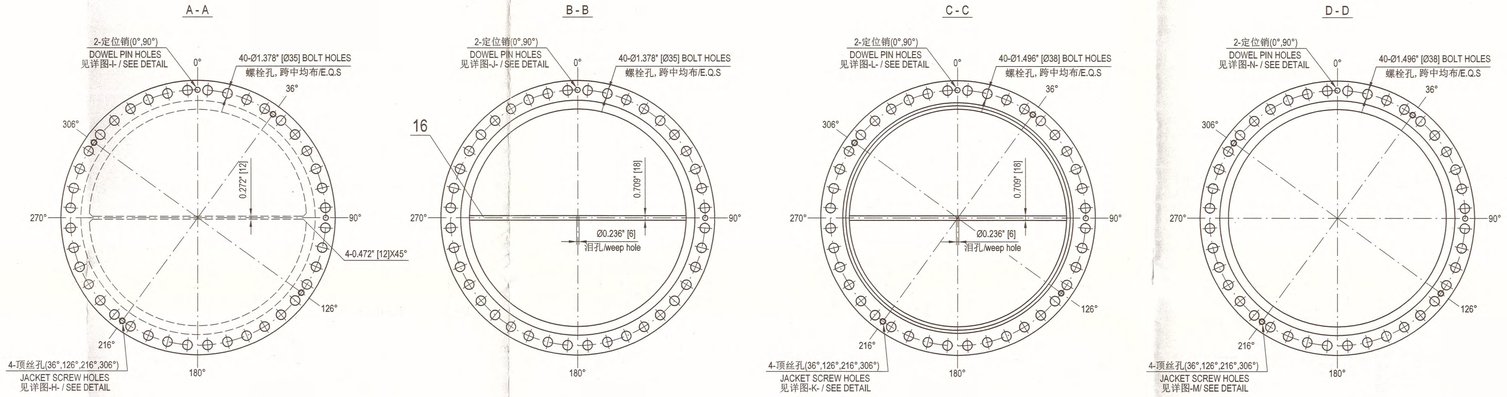


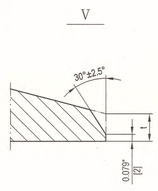
分程隔板焊接详图
DETAIL WELDING OF PASS PARTITION



焊缝布置图
WELD SEAM PLAN







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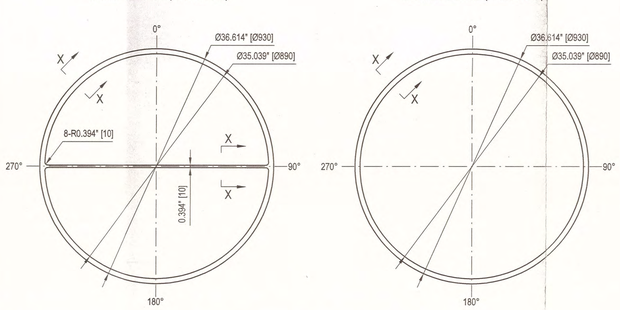
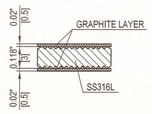
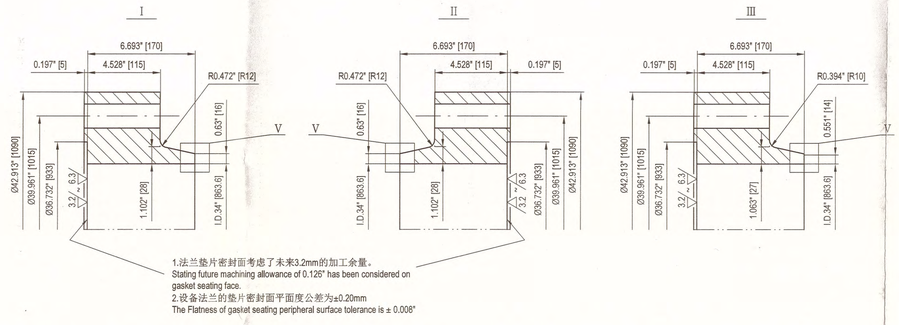


垫片详图(件号2)
GASKET DETAIL (PART NO.2)

垫片详图(件号9)
GASKET DETAIL (PART NO.9)



注/NOTE
1.垫片为KAMMPROFILE(或FLEXITALLIC 或LAMONS制作)垫片，由3mm厚SS316L金属板和上下两层0.5mm厚的石墨组成;
THE GASKET IS KAMMPROFILE(EITHER FLEXITALLIC OR LAMONS MAKE)；THICKNESS OF PERIPHERAL GASKETS SHALL BE 3mm+0.5mm+0.5mm GRAPHITE LAYERS IN BOTH SIDES.
SERRATED METAL MATERIAL IS SS316L.
2.垫片系数：
GASKET FACTORY IS m=4.25,y=10100 psi.



平盖处顶丝安装详图
JACK BOLT ASSEMBLY DETAIL AT FLAT COVER

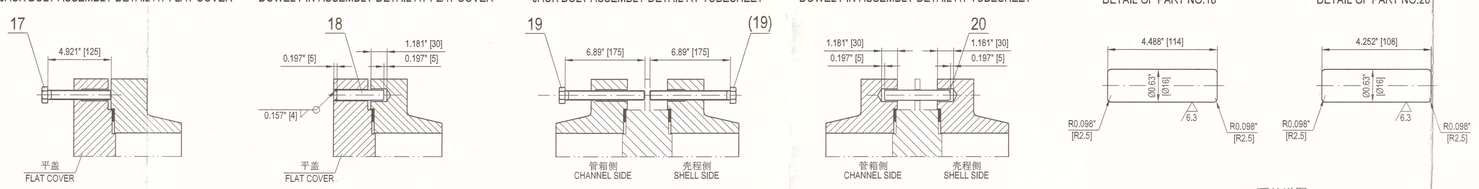
平盖处定位销安装详图
DOWEL PIN ASSEMBLY DETAIL AT FLAT COVER

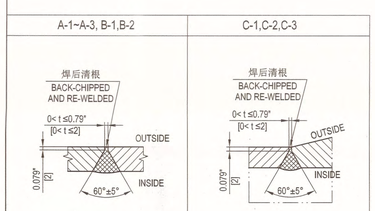
管板处顶丝安装详图
JACK BOLT ASSEMBLY DETAIL AT TUBESHEET

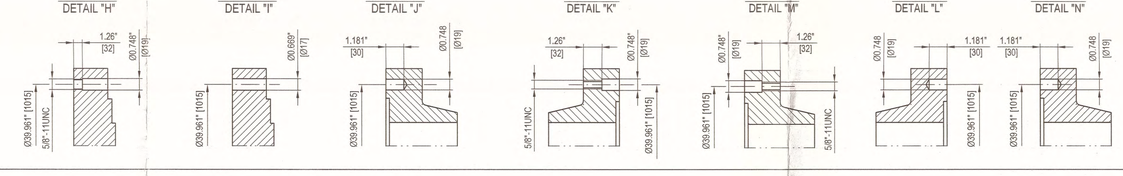
管板处定位销安装详图
DOWEL PIN ASSEMBLY DETAIL AT TUBESHEET

件号18详图
DETAIL OF PART NO.18

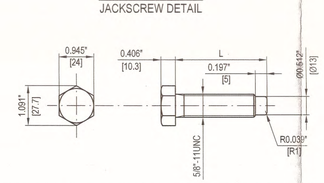
件号20详图
DETAIL OF PART NO.20







顶丝详图
JACKSCREW DETAIL



							TOTAL : 3630 kg
20		定位销 DOWEL PIN	2	SA-479 304	0.2	0.4	
19		顶丝 5/8"-11UNC L=175 JACKSCREW	8	SA-479 304	0.4	3.2	
18		定位销 DOWEL PIN	2	SA-479 304	0.2	0.4	
17		顶丝 5/8"-11UNC L=125 JACKSCREW	4	SA-479 304	0.3	1.2	
16		分程隔板 t=18 PASS PARTITION	1	SA-516 Gr.70N		105	
15		2:1 椭圆封头 I.D863.6X14 2:1 ELLIPTICAL HEAD	1	SA-516 Gr.70N		105	After forming: 12
14		壳体 ID.863.6X14 L=4181.1 SHELL	1	SA-516 Gr.70N		1268	
13	ASME PCC-1- 2019 APPENDIX M	硬质圆垫圈 1 3/8" HARDENED CIRCLE WASHER	80+8	TYPE 1	/	/	
12	ASME B18.2.2-2022	重型六角螺母 1 3/8"-8UN-2B HEX HEAVY NUTS	160+16	SA-194 Gr.2HM	0.3	48.0	
11	ASME B18.2.1-2012 (R2021)	全螺纹螺柱 1 3/8"-8UN-2A L=480 FULL THREADED STUD BOLTS	40+4	SA-193 Gr.B7M	3.6	144	
10		壳程法兰 SHELL FLANGE	1	SA-266 Gr.2N		307	
9		壳程法兰垫片 SHELL FLANGE GASKET	1+2	见注 1/See note 1		/	
8		管箱法兰 CHANNEL FLANGE	1	SA-266 Gr.2N		307	
7		管箱筒体 ID.863.6X16 L=560 CHANNEL SHELL	1	SA-516 Gr.70N		194	
6	ASME PCC-1- 2019 APPENDIX M	硬质圆垫圈 1 1/4" HARDENED CIRCLE WASHER	80+8	TYPE 1	/	/	
5	ASME B18.2.2-2022	重型六角螺母 1 1/4"-8UN-2B HEX HEAVY NUTS	160+16	SA-194 Gr.2H	0.3	48.0	
4	ASME B18.2.1-2012 (R2021)	全螺纹螺柱 1 1/4"-8UN-2A L=385 FULL THREADED STUD BOLTS	40+4	SA-193 Gr.B7	2.5	100	
3		管箱法兰 CHANNEL FLANGE	1	SA-266 Gr.2N		307	
2		管程法兰垫片 CHANNEL FLANGE GASKET	2+4	见注 1/See note 1		/	
1		平盖 FLAT COVER	1	SA-266 Gr.2N		732	
件号 PART NO.	图号或标准号 DWG. NO. OR STD. NO.	名称 DESIGNATION	数量 QTY.	材料 MATERIAL	单EACH重量(kg) WEIGHT	总TOTAL重量(kg) WEIGHT	备注 REMARKS

AIR PRODUCTS　FLUOR

Air Products Project Number	EN207122	Fluor Project Number	A8KM
Project Name	World Energy Renewables Project	RFQ No.	A8KM-4-403-RQ
Purchase Order Number	4505600570	PO/Contract No	A8KM-4-403-PO-4
Air Products Open Text document number	EN207122-WUXI-9V3-00029	Project Area	SWS/H2S
Client	WORLD ENERGY PARAMOUNT	Client Doc No:	

REV.	版次说明/DESCRIPTION	设计/PREPARED	审核/REVIEWED	批准/APPROVED	日期/DATE
05	竣工图/ AS-BUILT	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	21-APR-23
04	供批准/ ISSUED FOR APPROVAL	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	10-JAN-23
03	供批准/ ISSUED FOR APPROVAL	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	27-OCT-22
02	供批准/ ISSUED FOR APPROVAL	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	15-Aug-22
01	供批准/ ISSUED FOR APPROVAL	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	22-Jun-22
00	供批准/ ISSUED FOR APPROVAL	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	30-Apr-22

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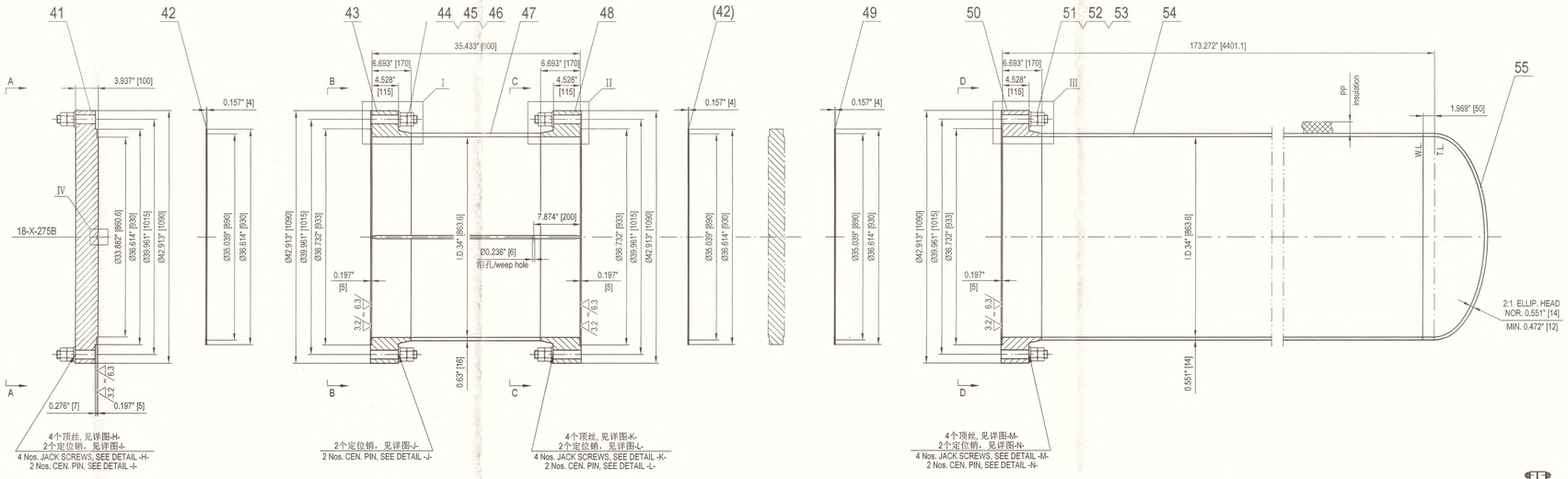
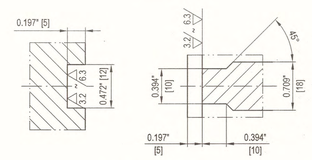
WCE 无锡化工装备股份有限公司
WUXI CHEMICAL EQUIPMENT CO., LTD.

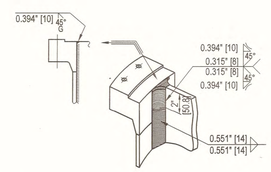
设计 PREPARED	黄晓圣	2023.4.21	Lean Amine Cooler SHELL DETAIL DRAWING	设计项目 DESIGN ITEM	World Energy Renewables Project
审核 REVIEWED	黄晓圣	2023.4.21		设计阶段 DESIGN PHASE	竣工图 Detail Design
批准 APPROVED		2023.4.21		设备位号 ITEM NO.	18-X-275A
			比例: SCALE 1:1	图号 DWG. NO.	WXCE6706-01-1
			版次: REV. 05	第 1 页 共 2 页 PAGE 1 OF 2	

As Built

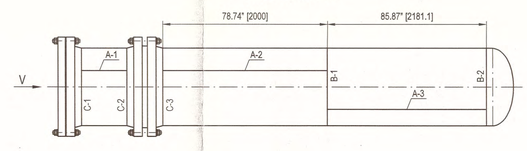




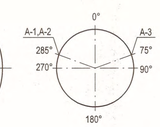
分程隔板焊接详图
DETAIL WELDING OF PASS PARTITION



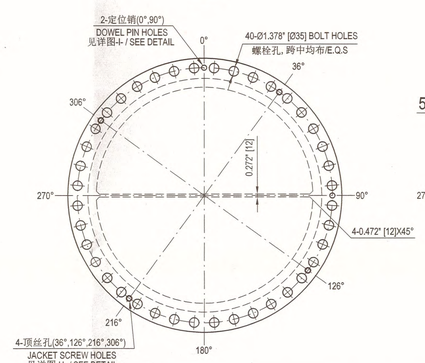
焊缝布置图
WELD SEAM PLAN



VIEW V



A - A



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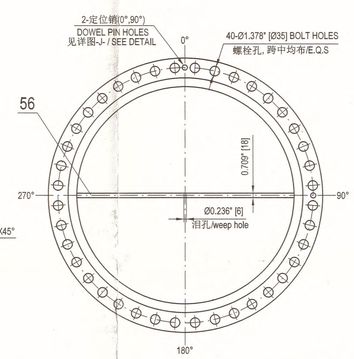
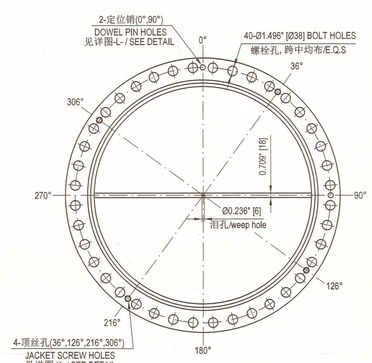
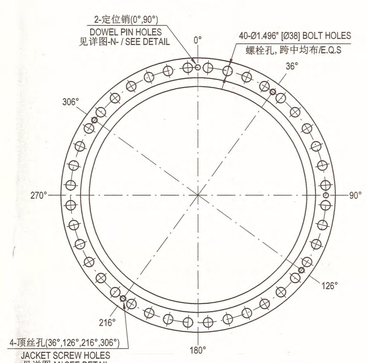


C - C



D - D



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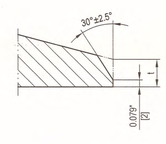
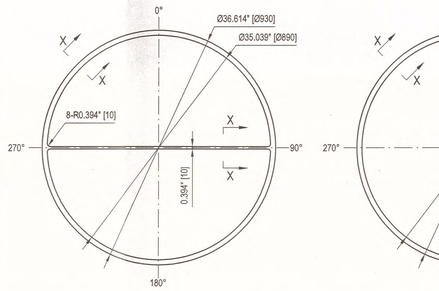
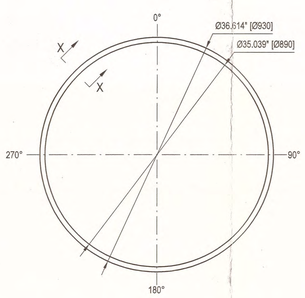


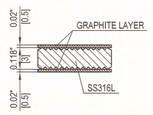
垫片详图(件号2)
GASKET DETAIL (PART NO.2)



垫片详图(件号9)
GASKET DETAIL (PART NO.9)

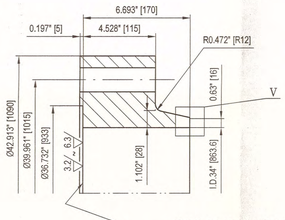


X - X



注/NOTE
1.垫片为KAMMPROFILE(或FLEXITALLIC 或LAMONS制作)垫片，由3mm厚SS316L金属板和上下两层0.5mm厚的石墨组成；
THE GASKET IS KAMMPROFILE(EITHER FLEXITALLIC OR LAMONS MAKE)；THICKNESS OF PERIPHERAL GASKETS SHALL BE 3mm+0.5mm+0.5mm GRAPHITE LAYERS IN BOTH SIDES. SERRATED METAL MATERIAL IS SS316L.
2.垫片系数：
GASKET FACTORY IS m=4.25,y=10100 psi.

I



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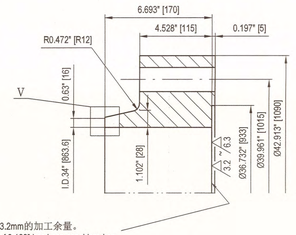
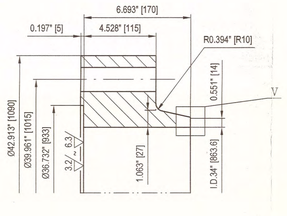
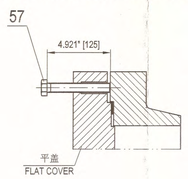


III

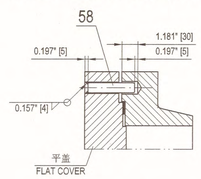


1.法兰垫片密封面考虑了未来3.2mm的加工余量。
Stating future machining allowance of 0.126" has been considered on gasket seating face.
2.设备法兰的垫片密封面平面度公差为±0.20mm
The Flatness of gasket seating peripheral surface tolerance is ± 0.008"

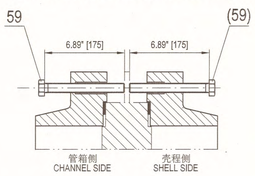
平盖处顶丝安装详图
JACK BOLT ASSEMBLY DETAIL AT FLAT COVER



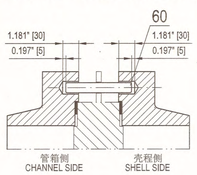
平盖处定位销安装详图
DOWEL PIN ASSEMBLY DETAIL AT FLAT COVER



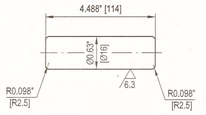
管板处顶丝安装详图
JACK BOLT ASSEMBLY DETAIL AT TUBESHEET



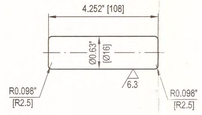
管板处定位销安装详图
DOWEL PIN ASSEMBLY DETAIL AT TUBESHEET

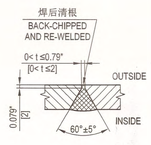
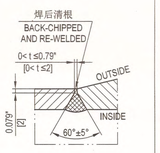


件号58详图
DETAIL OF PART NO.58

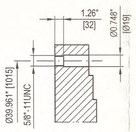


件号60详图
DETAIL OF PART NO.60

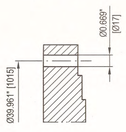


A-1~A-3, B-1,B-2	C-1,C-2,C-3
	

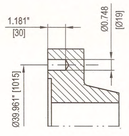
详图 "H"
DETAIL "H"



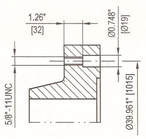
详图 "I"
DETAIL "I"



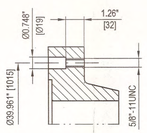
详图 "J"
DETAIL "J"



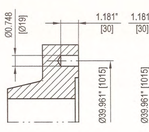
详图 "K"
DETAIL "K"



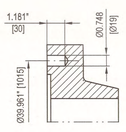
详图 "M"
DETAIL "M"



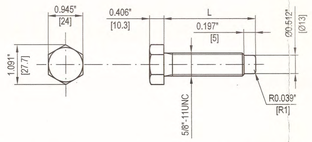
详图 "L"
DETAIL "L"



详图 "N"
DETAIL "N"



顶丝详图
JACKSCREW DETAIL



TOTAL : 3630 kg

件号 PART NO.	图号或标准号 DWG. NO. OR STD. NO.	名称 DESIGNATION	数量 QTY.	材料 MATERIAL	单EACH 重量(kg) WEIGHT	总TOTAL 重量(kg) WEIGHT	备注 REMARKS
60		定位销 DOWEL PIN	2	SA-479 304	0.2	0.4	
59		顶丝 5/8"-11UNC L=175 JACKSCREW	8	SA-479 304	0.4	3.2	
58		定位销 DOWEL PIN	2	SA-479 304	0.2	0.4	
57		顶丝 5/8"-11UNC L=125 JACKSCREW	4	SA-479 304	0.3	1.2	
56		分程隔板 t=18 PASS PARTITION	1	SA-516 Gr.70N		105	
55		2:1 椭圆封头 I.D863.6X14 2:1 ELLIPTICAL HEAD	1	SA-516 Gr.70N		105	After forming: 12
54		壳体 ID.863.6X14 L=4181.1 SHELL	1	SA-516 Gr.70N		1268	
53	ASME PCC-1- 2019 APPENDIX M	硬质圆垫圈 1 3/8" HARDENED CIRCLE WASHER	80+8	TYPE 1	/	/	
52	ASME B18.2.2-2022	重型六角螺母 1 3/8"-8UN-2B HEX HEAVY NUTS	160+16	SA-194 Gr.2HM	0.3	48.0	
51	ASME B18.2.1-2012 (R2021)	全螺纹螺柱 1 3/8"-8UN-2A L=480 FULL THREADED STUD BOLTS	40+4	SA-193 Gr.B7M	3.6	144	
50		壳程法兰 SHELL FLANGE	1	SA-266 Gr.2N		307	
49		壳程法兰垫片 SHELL FLANGE GASKET	1+2	见注 1/See note 1		/	
48		管箱法兰 CHANNEL FLANGE	1	SA-266 Gr.2N		307	
47		管箱筒体 ID.863.6X16 L=560 CHANNEL SHELL	1	SA-516 Gr.70N		194	
46	ASME PCC-1- 2019 APPENDIX M	硬质圆垫圈 1 1/4" HARDENED CIRCLE WASHER	80+8	TYPE 1	/	/	
45	ASME B18.2.2-2022	重型六角螺母 1 1/4"-8UN-2B HEX HEAVY NUTS	160+16	SA-194 Gr.2H	0.3	48.0	
44	ASME B18.2.1-2012 (R2021)	全螺纹螺柱 1 1/4"-8UN-2A L=385 FULL THREADED STUD BOLTS	40+4	SA-193 Gr.B7	2.5	100	
43		管箱法兰 CHANNEL FLANGE	1	SA-266 Gr.2N		307	
42		管程法兰垫片 CHANNEL FLANGE GASKET	2+4	见注 1/See note 1		/	
41		平盖 FLAT COVER	1	SA-266 Gr.2N		732	

AIR PRODUCTS　FLUOR

Air Products Project Number	EN207122	Fluor Project Number	A8KM
Project Name	World Energy Renewables Project	RFQ No.	A8KM-4-403-RQ
Purchase Order Number	4505600570	PO/Contract No	A8KM-4-403-PO-4
Air Products Open Text document number	EN207122-WUXI-9V3-00029	Project Area	SWS/H2S
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	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	21-APR-23
04	供批准/ ISSUED FOR APPROVAL	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	10-JAN-23
03	供批准/ ISSUED FOR APPROVAL	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	27-OCT-22
02	供批准/ ISSUED FOR APPROVAL	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	15-Aug-22
01	供批准/ ISSUED FOR APPROVAL	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	22-Jun-22
00	供批准/ ISSUED FOR APPROVAL	Xiaosheng Huang	Shengfang Zhao	Kevin Yang	30-Apr-22

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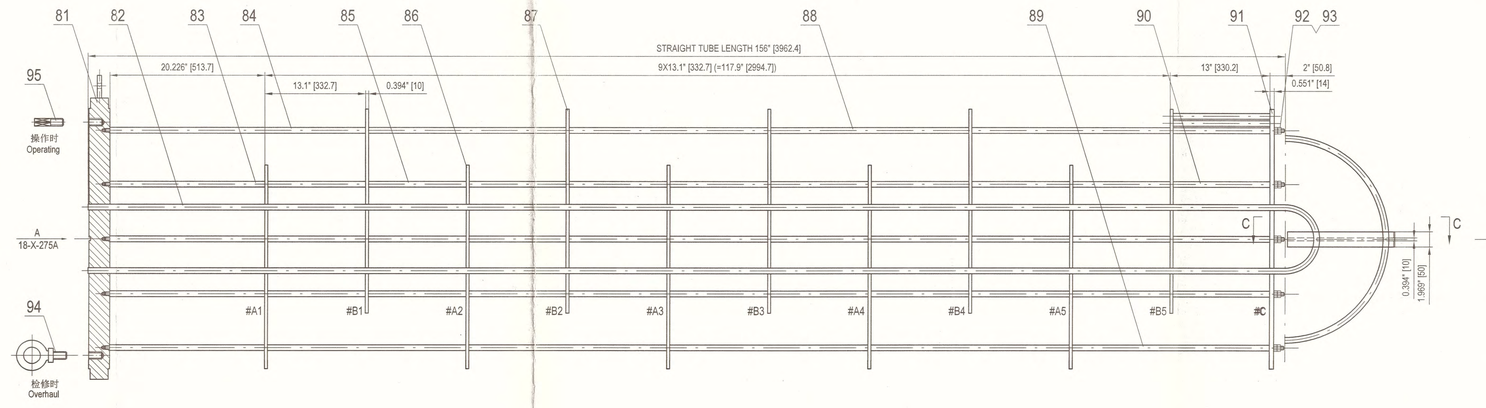
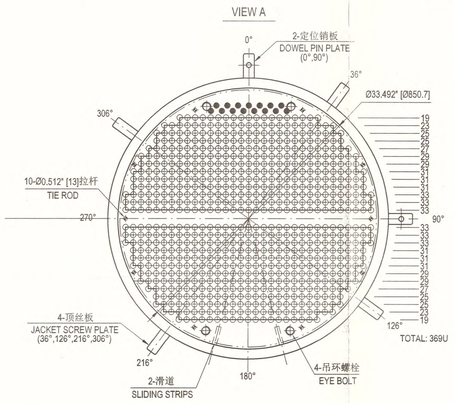
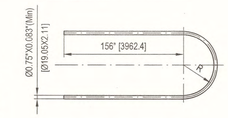
设计 PREPARED	黄晓圣	2023.4.21	Lean Amine Cooler SHELL DETAIL DRAWING	设计项目 DESIGN ITEM	World Energy Renewables Project
审核 REVIEWED	李郑杰	2023.4.21		设计阶段 DESIGN PHASE	竣工图 Detail Design
批准 APPROVED		2023.4.21	比例: SCALE 1:1 / 版次: REV. 05	设备位号 ITEM NO.	18-X-275B
				图号 DWG. NO.	WXCE6706-01-2
				第 2 页 共 2 页 PAGE 2 OF 2	

As Built





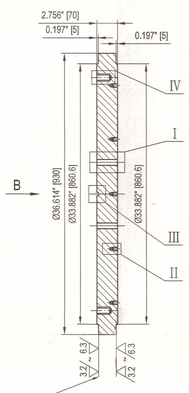


换热管尺寸表 TUBES CHART

注/NOTE:
1.换热管应逐根水压试验，还需按照SA-450/SA-450M进行涡流检测。电测试应证实覆盖换热管至个体积。钢管厂提供的试验报告应能证明对换热管进行的所有无损检测类型覆盖。
Eddy Current test per SA-450/SA-450M shall be used in addition to hydrostatic test. Electric test shall cover the entire metal volume of the tube. Mill test reports shall verify the type and extent of the all NDE tests applied to tubes.
2.弯管后，U形弯将100% MT检测
After bending, the U-tube shall be subject to 100% MT
3.U形管弯曲后应逐个进行水压试验，试验压力不应低于换热器管侧和壳侧试验压力的较大值
After bending, the U-tube shall be subject to hydrostatic test one by one, and the test pressure shall not be lower than the larger value of the test pressure of the tube side and shell side of the heat exchanger
4.弯管的扁平度不应超过管子公称外径的10%。
Flattening at the bend shall not exceed 10% of the nominal tube outside diameter.
5.换热管应为无缝钢管，每根U形管应由整根管子制成。
The tubes shall be seamless, U-tubes shall be of one piece construction.
6.u形管弯管需要消应力热处理，得从H2S环境中CS设备和管道的材料和制造要求参见A8KM-PP-000-50532-A。
Heat treatment of U-bend is required. Refer A8KM-PP-000-50532-A for material & fabrication requirements for CS equipment & piping in wet H2S environment.

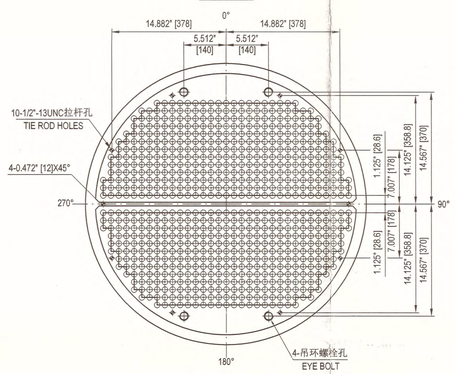
序号 NO.	弯曲半径R(mm) BENDING R(mm)	单根展开长度(mm) TOTAL LENGTH	数量 QTY.	单重(Kg) UNIT WEIGHT	总重(Kg) TOTAL WEIGHT	弯管段消应力 SR FOR BENDING AREA
1	1.125" [28.6]	315.551" [8015]	33	7.1	233	YES/要
2	2.125" [54.0]	318.701" [8095]	33	7.1	235	YES/要
3	3.125" [79.4]	321.850" [8175]	33	7.2	238	YES/要
4	4.125" [104.8]	324.961" [8255]	31	7.3	225	YES/要
5	5.125" [130.2]	328.110" [8334]	31	7.3	228	YES/要
6	6.125" [155.6]	331.260" [8414]	31	7.4	230	YES/要
7	7.125" [181]	334.409" [8494]	29	7.5	217	YES/要
8	8.125" [206.4]	337.559" [8574]	29	7.6	219	YES/要
9	9.125" [231.8]	340.669" [8654]	27	7.6	206	YES/要
10	10.125" [257.2]	343.819" [8733]	25	7.7	192	YES/要
11	11.125" [282.6]	346.969" [8813]	25	7.8	194	YES/要
12	12.125" [308.0]	350.118" [8893]	23	7.8	180	YES/要
13	13.125" [333.4]	353.268" [8973]	19	7.9	150	YES/要

管板详图
TUBESHEET DETAIL

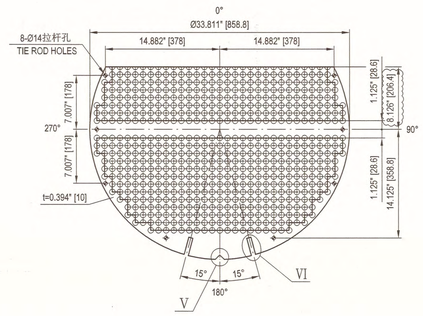


注：在垫片密封面两侧都考虑了未来0.126"的加工余量。
Note : Stating future machining allowance of 0.126" has been considered on both side of gasket seating face.

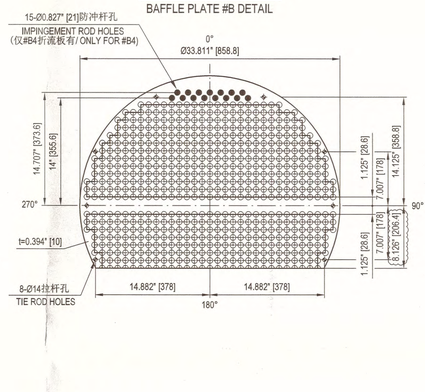
VIEW B



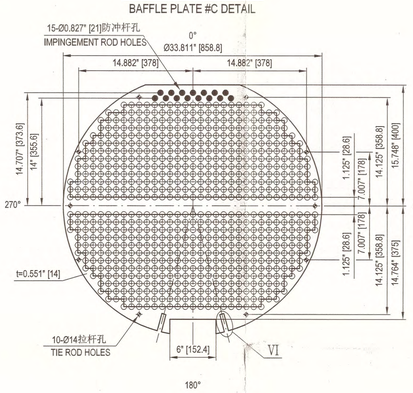
折流板#A详图
BAFFLE PLATE #A DETAIL

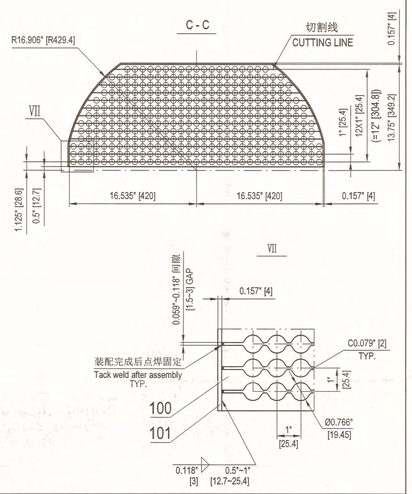


折流板#B详图
BAFFLE PLATE #B DETAIL

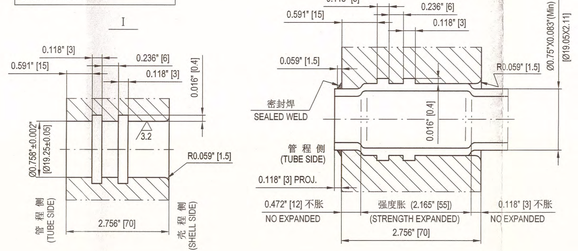


折流板#C详图
BAFFLE PLATE #C DETAIL

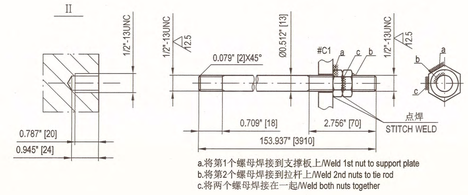




换热管与管板连接详图
DETAIL OF TUBES TO TUBESHEET

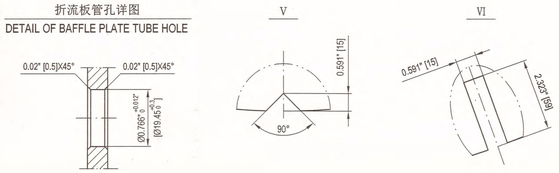


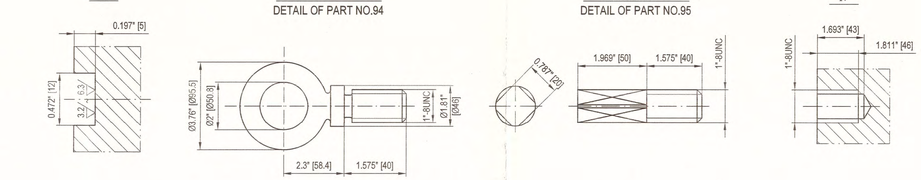
拉杆详图
DETAIL OF TIE ROD



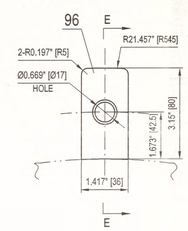
a.将第1个螺母焊接到支撑板上/Weld 1st nut to support plate
b.将第2个螺母焊接到拉杆上/Weld 2nd nuts to tie rod
c.将两个螺母焊接在一起/Weld both nuts together

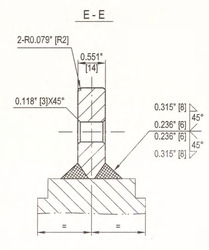
折流板管孔详图
DETAIL OF BAFFLE PLATE TUBE HOLE



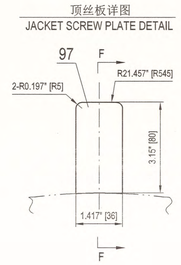


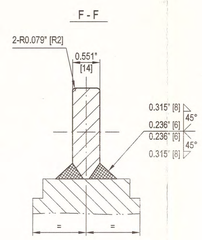
定位销板详图
DOWEL PIN PLATE DETAIL



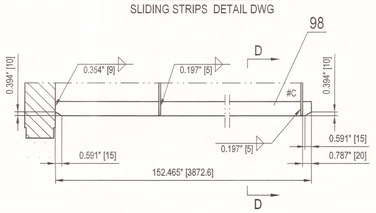


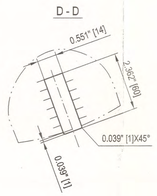
顶丝板详图
JACKET SCREW PLATE DETAIL



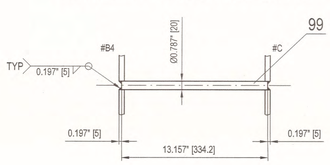


滑道详图
SLIDING STRIPS DETAIL DWG

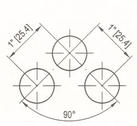




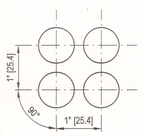
防冲杆焊接详图
DETAIL WELD OF IMPINGEMENT RODS TO BAFFLE



防冲杆布置详图
DETAIL OF IMPINGEMENT RODS LAYOUT



换热管布置详图
DETAIL OF TUBE LAYOUT



						TOTAL: 3300 kg	
101		扁钢 50X4 BAR	1	SA-516 Gr.70N		2.0	
100		挡条 t=10 BAFFLE STRIPS	1	SA-516 Gr.70N		11.0	
99		防冲杆 Ø20 IMPINGEMENT RODS	15	SA-36	1.2	18.0	
98		滑道 t=14 SLIDING STRIPS	2	SA-516 Gr.70N	25.5	51.0	
97		顶丝板 t=14 JACKET SCREW PLATE	4	SA-516 Gr.70N	0.4	1.6	
96		定位销板 t=14 DOWEL PIN PLATE	2	SA-516 Gr.70N	0.4	0.8	
95		螺塞 PLUGS	4	SA-105	0.5	2.0	
94	CROSBY S-279	吊环螺栓 1"-8UNC L=40 EYE BOLT	4	SA-105	1.0	4.0	
93	ASME B18.2.2-2022	六角螺母 1/2"-13UNC-2B HEX NUT	20	SA-36	0.05	1.0	
92		拉杆 Ø13 L=3910 TIE RODS	10	SA-36	4.1	41.0	
91		支撑板#C t=14 SUPPORT BAFFLE #C	1	SA-516 Gr.70N		27.0	
90		定距管 Ø19.05X2.11 L=320.2 SPACERS	8	SA-179	0.28	2.2	
89		定距管 Ø19.05X2.11 L=652.9 SPACERS	2	SA-179	0.58	1.2	
88		定距管 Ø19.05X2.11 L=655.5 SPACERS	16	SA-179	0.58	9.3	
87		折流板#B t=10 BAFFLE #B	5	SA-516 Gr.70N	23.1	115	
86		折流板#A t=10 BAFFLE #A	5	SA-516 Gr.70N	23.1	115	
85		定距管 Ø19.05X2.11 L=322.7 SPACERS	54	SA-179	0.28	15.1	
84		定距管 Ø19.05X2.11 L=846.5 SPACERS	2	SA-179	0.75	1.5	
83		定距管 Ø19.05X2.11 L=513.7 SPACERS	8	SA-179	0.45	3.6	
82		换热管 Ø19.05X2.11 (Min) TUBES	369U	SA-179		2747	(SEALMESS)
81		管板 TUBESHEET	1	SA-266 Gr.2N		248	
件号 PART NO.	图号或标准号 DWG. NO. OR STD. NO.	名称 DESIGNATION	数量 QTY.	材料 MATERIAL	单EACH/总TOTAL 重量(kg) WEIGHT		备注 REMARKS

AIR PRODUCTS　FLUOR

Air Products Project Number	EN207122	Fluor Project Number	A8KM		
Project Name	World Energy Renewables Project	RFQ No.	A8KM-4-403-RQ		
Purchase Order Number	4505600570	PO/Contract No	A8KM-4-403-PO-4		
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