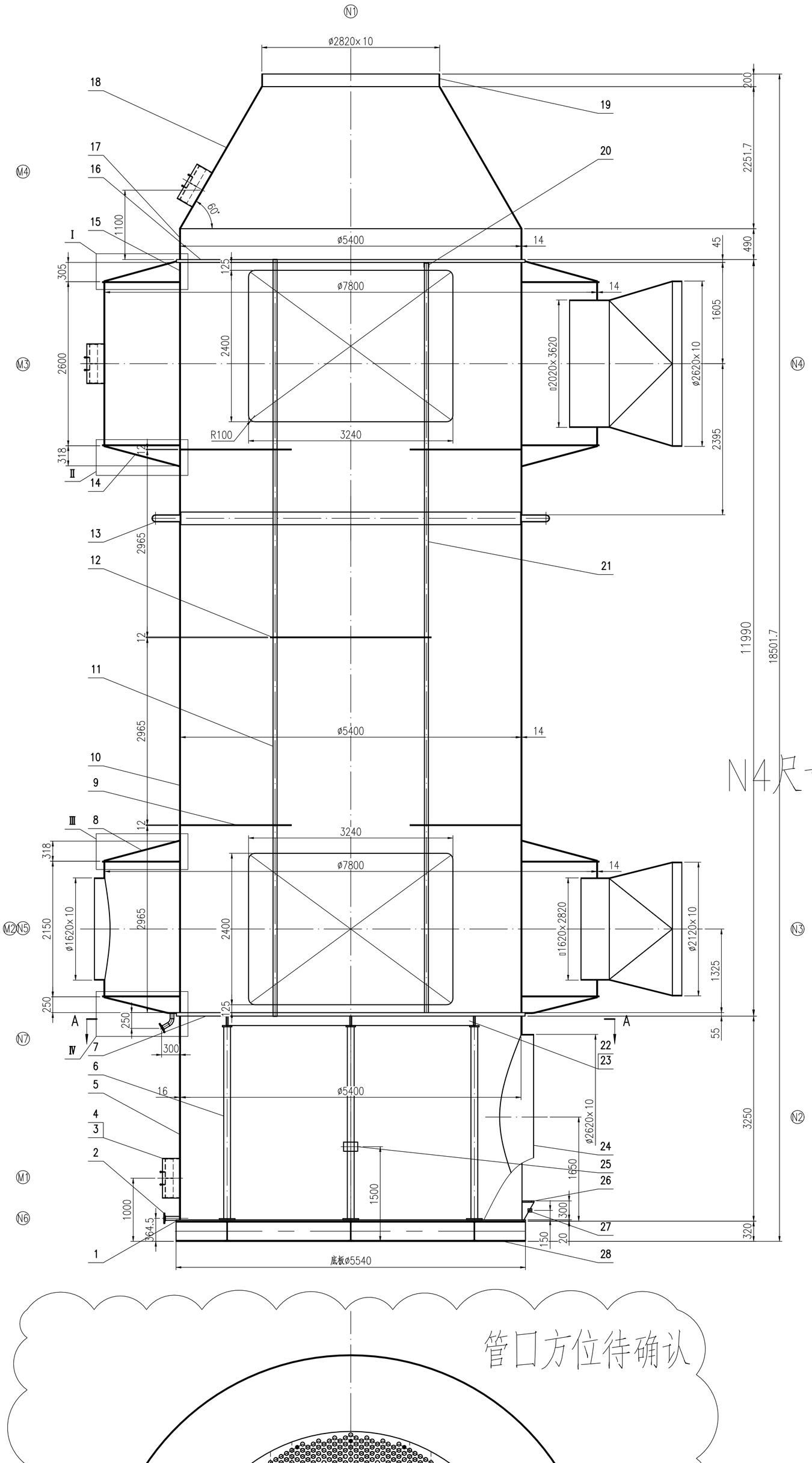
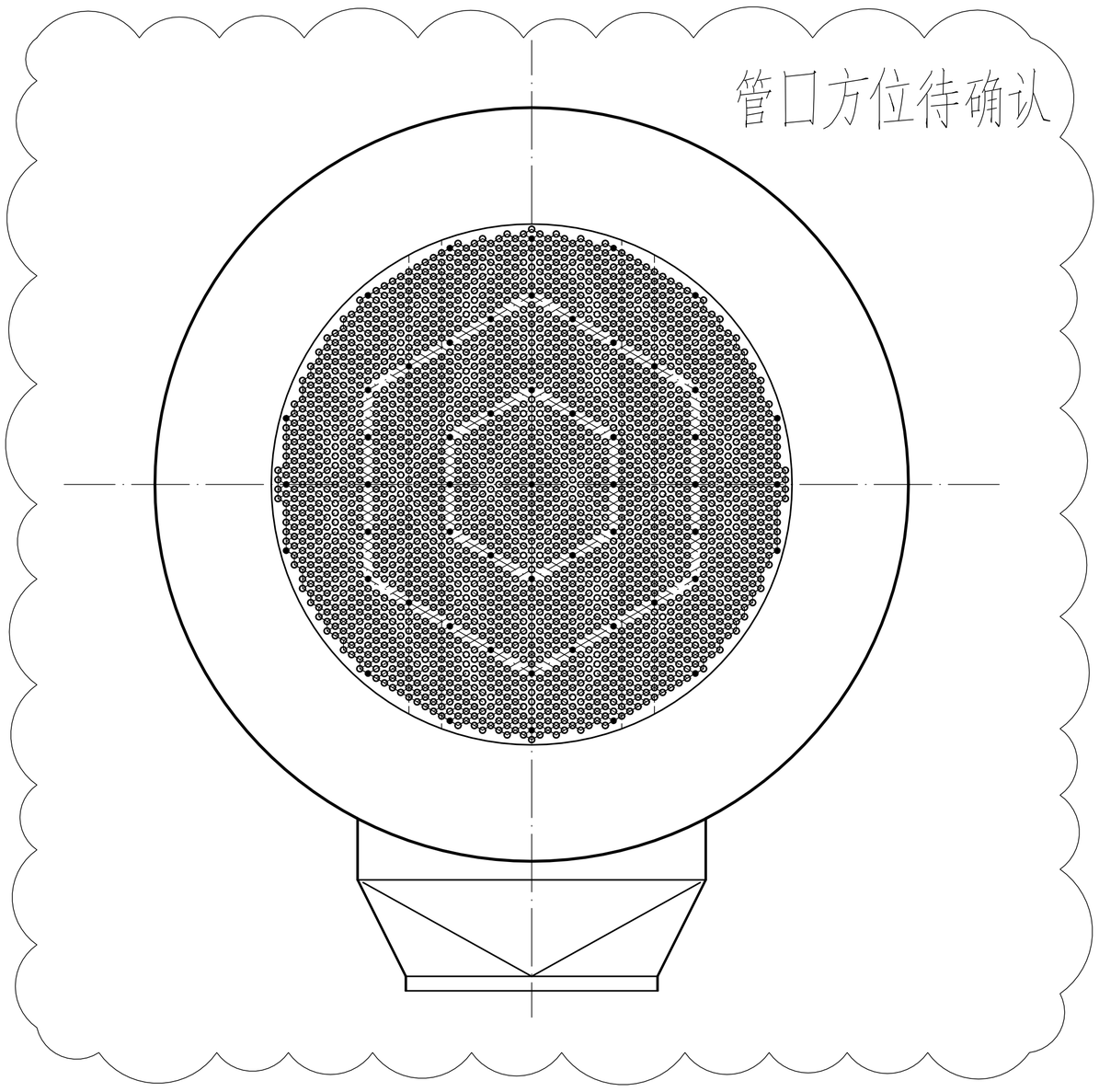


N4尺寸需确认

管口方位待确认



技术特性表 TECHNICAL SPECIFICATION

		壳程 SHELL SIDE	管程 TUBE SIDE
容器类别/级别 PRESSURE VESSEL CATEGORY/GRADE		/	
参数名称 PARAMETER NAME			
工作温度(进口/出口) OPERATING TEMP.(INLET/OUTLET)	℃	150/312.6	461.3/340.1
设计温度 DESIGN TEMPERATURE	℃	340	475
工作压力 WORKING PRESSURE	MPa	0.0136	0.0258
设计压力 DESIGN PRESSURE	MPa	0.025	0.04
最高允许工作压力 MAXIMUM ALLOWABLE WORKING PRESSURE	MPa	/	/
金属壁温 METAL AVERAGE TEMPERATURE	℃	/	/
腐蚀裕量 CORROSION ALLOWANCE	mm	3	3
焊接接头系数（筒体/封头） JOINT EFFICIENCY(SHELL/HEAD)		0.85	0.85
设计使用年限 DESIGN SERVICE LIFE	YEAR	10	10
主要工艺介质 MAIN PROCESS FLUID 介质名称 OPERATING MEDIUM		SO_2	SO_2、SO_3
介质组别 MEDIUM GROUP		第二组 SECOND GROUP	第二组 SECOND GROUP
介质特性/密度 MEDIUM PROPERTY/DENSITY	kg/m³	中度危害 MODERATE TOXICITY	中度危害 MODERATE TOXICITY
介质流量 MEDIUM FLOW	Vap.Liq.: kg/h Gas:Nm³/h	/	/
程数 NUMBER OF PASS		1	1
耐压试验种类 TYPE OF PROOF PRESSURE TEST		/	/
耐压试验介质 TEST MEDIUM		/	/
耐压试验压力(立式/卧式) TEST PRESSURE(VER./HORI.)	MPa	/	/
泄漏试验种类 TYPE OF LEAK TEST		气密性试验 AIR TIGHTNESS TEST	气密性试验 AIR TIGHTNESS TEST
泄漏试验介质 LEAK TEST MEDIUM		压缩空气 COMPRESSED AIR	压缩空气 COMPRESSED AIR
泄漏试验压力 LEAK TEST PRESSURE	MPa	0.025	0.04
保温/防火材料(密度) INSULATION AND FIRE PROTECTION MATERIAL(DENSITY)	kg/m³	/	/
保温/防火材料厚度 THICKNESS OF INSULATION AND FIRE PROTECTION	mm	200	200
全容积 FULL CAPACITY	m³	248	188
热处理要求 REQUIREMENT OF HEAT TREATMENT		/	/
操作质量 WORKING WEIGHT	kg	/	
充水质量 FULL WATER WEIGHT	kg	/	
油漆、包装、运输要求 COATING, PACKING & TRANS. REQS.		见工程统一规定 SEE UNIFIED ENGINEERING REGULATIONS	

设计、制造、检验标准及要求 SPEC. FOR DESIGN,MANUFAC. & INSPECTION

标准规范 STANDARD AND CODE	GB/T151-2014《热交换器》《HEAT EXCHANGERS》
	NB/T47003.1-2009《钢制焊接常压容器》《STEEL WELDED ATMOSPHERIC PRESSURE VESSELS》
安全监察规程 SAFETY SUPERVISION	
焊接规程 WELDING CODE	NB/T47015《压力容器焊接规程》《WELDING PROCEDURES FOR PRESSURE VESSELS》
焊接材料选用 ADOPTION OF WELDING MATERIALS	NB/T47018《承压设备用焊接材料订货技术条件》《TECHNICAL CONDITIONS FOR ORDERING WELDING MATERIALS FOR PRESSURE EQUIPMENT》
焊缝结构 WELDING STRUCTURE	除注明外采用全焊透结构 FULL PENERTRATION WELDING UNLESS OTHERWISE NOTED
除注明外角焊缝腰高 THICKNESS OF FILLET WELD EXCEPT NOTED	取相焊件较薄者之厚度 THICKER PART THICKNESS
管法兰与接管焊接标准 WELDING BETW.PIPE FLANGE AND PIPE	按相应法兰标准 ACCORDING TO THE CORRESPONDING FLANGE STANDARD
管板与筒体连接应采用 CONNECTION OF TUBESHEET AND SHELL	焊接 WELDING
管子与管板连接方式 CONNECTION MANNER OF TUBE AND TUBESHEET	强度焊+贴胀 STRENGTH WELDING + STICKING DISTENSION
焊接接头型式及尺寸 WELDED JOINT TYPE AND SIZE	除图中注明外，其余焊接结构按 UNLESS OTHERWISE NOTED；HG/T20583《钢制化工容器结构设计规定》的相关规定 AS PER《SPECIFICATION FOR STRUCTURAL DESIGN OF STEEL CHEMICAL VESSELS》

无损检测 N.D.E.

	焊接接头种类 JOINT CATEGORY	检查方法 METHOD	检测率 TEST RATIO	检测标准 TEST CODE	技术等级 TECH. CLASS	合格级别 CLASS
壳程 SHELL SIDE	A、B	RT	10%	NB/T47013.2	AB	Ⅲ
	C、D、E	MT	100%	NB/T47013.4	/	Ⅰ
管程 TUBE SIDE	A、B	RT	10%	NB/T47013.2	AB	Ⅲ
	C、D、E	MT	100%	NB/T47013.4	/	Ⅰ

管板密封面与壳体轴线垂直度公差 VERTICAL TOLERANCE OF TUBESHEET SEALING SURFACE AND SHELL AXIS	mm	1
换热管规格 ØxtxL /根数 TUBE SIZE (QUANTITY)	mm	ø63.5x3.5x12000/2404
换热器管束等级 TUBE BUNDLE CLASS		Ⅰ
换热面积(外径) HEAT TRANSFER AREA(OD)	m²	~5298
无图零件切割面粗造度 SURFACE ROUHGNESS OF PART WITHOUT DWG.		50
表面处理要求 REQUIREMENT OF SURFACE TREATMENT		Sa2.5
最大吊装质量 MAX. LIFTING WEIGHT	kg	/
设备自重(其中不锈钢质量) NET WEIGHT(SS INCLUDED)	kg	242146
管口及支座方位 NOZZLES & SUPPORT ORIENTATION		按工艺管口方位图 ACCORDING TO THE ORIENTATION DIAGRAM OF PROCESS NOZZLE

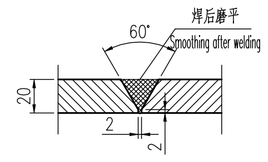
主要受压元件材料 MATERIAL OF MAIN PRESSURE PART

名称 NAME	标准 CODE	牌号 BRAND	供货状态 STATUE	附加要求 ADDTIONING REQUIREMENT
板材 PLATES	GB/T 713	Q345R	热轧	管板用正火板
换热管 TUBES	GB/T 9948	20+渗铝	冷拔(轧) COLD DRAWING	/

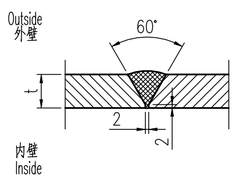
接管表 NOZZLE SCHEDULE

符号 MARK	公称尺寸 N. SIZE	公称压力 N. PN/CL.	连接标准或接管规格 CON. STD	法兰型式 TYPE	连接面型式 FACING	用途或名称 SERVICE	法兰密封面至设备中心线距离 PROJ.FROM CL TO F.F.
N1	2800	/	ø2820x10	/	BW	管程烟气进口 TUBE SIDE FLUE GAS INLET	见图 SEE FIGURE
N2	2600	/	ø2620x10	/	BW	管程烟气出口 TUBE SIDE FLUE GAS OUTLET	2900
N3	2100	/	ø2120x10	/	BW	壳程烟气进口 SHELL SIDE FLUE GAS INLET	5250
N4	2600	/	ø2620x10	/	BW	壳程烟气出口 SHELL SIDE FLUE GAS OUTLET	5250
N5	1600	/	ø1620x10	/	BW	旁路接口 BRSIDE GAS INLET	4064
N6	50	16	GB/T 9124.1	SO	RF	管程排酸口 TUBE SIDE ACID DISCHARGE NOZZLE	2966
N7	50	16	GB/T 9124.1	SO	RF	壳程排酸口 SHELL SIDE ACID DISCHARGE NOZZLE	见图 SEE FIGURE
M1~4	600	/	ø630x10	/	BW	人孔 Manhole	见图 SEE FIGURE

底板拼接焊缝详图
Detail drawing of bottom plate splicing weld
不按比例 Not to scale



A、B类焊接接头详图
Detail drawing of type A、B welding joint
不按比例 Not to scale



件号 PART NO.	图号或标准号 DRAWING NO. OR	名称 DESCRIPTION	数量 QTY.	材料 MATERIAL	单重(kg) SINGLE WEIGHT	总重(kg) TOTAL WEIGHT	备注 REMARK
29	按本图 According to this drawing	保温撑板 t=3 THERMAL INSULATION BRACE	1	Q235B		128	
28	P01-324-JS-003-06	底座 BASE	1	组合件 ASSEMBLY		2383	
27	按本图 According to this drawing	接地板 t=6 GROUNDING PLATE	4	S30408	0.15	0.6	
26	P01-324-JS-003-08	锚支座 ANCHOR CHAIR	4	组合件 ASSEMBLY	13.5	54	
25		铭牌组件 NAMEPLATE COMPONENT	1	组合件 ASSEMBLY		5	
24	P01-324-JS-003-06	管程烟气出口 PIPE SIDE FLUE GAS OUTLET	1	组合件 ASSEMBLY		1930	
23	按本图 According to this drawing	支撑筋 1960x150 t=28 SUPPORT BAR	6	Q345R	64.6	388	
22	按本图 According to this drawing	支撑筋 980x150 t=28 SUPPORT BAR	6	Q345R	32.3	194	
21	GB/T 9948	支撑管 ø63.5x3.5=11878 SUPPORTING TUBE	53	20+渗铝(ALUMINIZING)	61.5	3260	
20	GB/T 9948	导向管 ø76x4 L=75 GUIDE TUBE	53	20	0.533	28.2	
19	按本图 According to this drawing	接管 ø2820x10 L=200 PIPE	1	Q345R		139	
18	按本图 According to this drawing	锥体 ø5400/ø2800 t=14 60° CONE	1	Q345R		3692	以内径为基准 BASED ON THE INNER DIAMETER
17	按本图 According to this drawing	筒体Ⅲ DN5400x14 L=490 SHELL	1	Q345R		916	
16	P01-324-JS-003-04	上管板 t=45 UPPER TUBE PLATE	1	Q345R		5720	
15	按本图 According to this drawing	筒体Ⅱ DN5400x14 L=4000 SHELL	1	Q345R		7477	
14	P01-324-JS-003-07	壳程出气箱 SHELL SIDE EXHAUST BOX	1	组合件 ASSEMBLY		1569	
13	P01-324-JS-003-08	膨胀节 EXPANSION JOINT	1	组合件 ASSEMBLY		972	
12	P01-324-JS-003-04	折流板 Ⅱ t=12 BAFFLE PLATE	1	Q345R		772	
11	GB/T 9948	换热管 ø63.5x3.5=12000 TUBE	2404	20+渗铝(ALUMINIZING)	62.1	149285	两端60mm范围不需渗铝 No aluminizing is required within 60mm at both ends
10	按本图 According to this drawing	筒体Ⅰ DN5400x14 L=7778 SHELL	1	Q345R		14539	
9	P01-324-JS-003-04	折流板 Ⅰ t=12 BAFFLE PLATE	2	Q345R	769	1538	
8	P01-324-JS-003-05	壳程进气箱 SHELL SIDE INTAKE BOX	1	组合件 ASSEMBLY		13604	
7	P01-324-JS-003-04	下管板 t=55 LOWER TUBE PLATE	1	Q345R		6992	
6	P01-324-JS-003-03	支柱 PILLAR	18	组合件 ASSEMBLY	86.8	1562	
5	按本图 According to this drawing	裙座筒体 DN5400x16 L=3230 SHELL	1	Q345R		6903	
4	参照NB/T 11025-2022	补强圈 ø830/ø640 t=10 STIFFENING RING	4	Q345R	17.2	68.8	
3	43SCG-1-3-0	焊接人孔 DN600 WELDING MANHOLE	4	组合件 ASSEMBLY	59	236	H=385
2	P01-324-JS-003-03	N6管程排酸口 TUBE SIDE ACID DISCHARGE NOZZLE	1	组合件 ASSEMBLY		8.17	
1	按本图 According to this drawing	底板 ø5540 t=20 BASEPLATE	1	Q345R		3785	

版次 REV.	说明 DESCRIPTION	设计 DEGND	校核 CHEKD	审核 APPRD	批准 AUTHD	日期 DATE

中国化学工程第六建设有限公司
中国化学 CHINA NATIONAL CHEMICAL ENGINEERING SIXTH CONSTRUCTION Co., Ltd

PT KOLAKA NICKEL INDONESIA
KNI

KNI年产12万吨镍湿法项目配套4×1000kt硫磺制酸装置EPC工程
KNI's annual production of 120,000 Tons of nickel hydrometallurgical project is supported by a 4X1000kt sulfuric acid plant

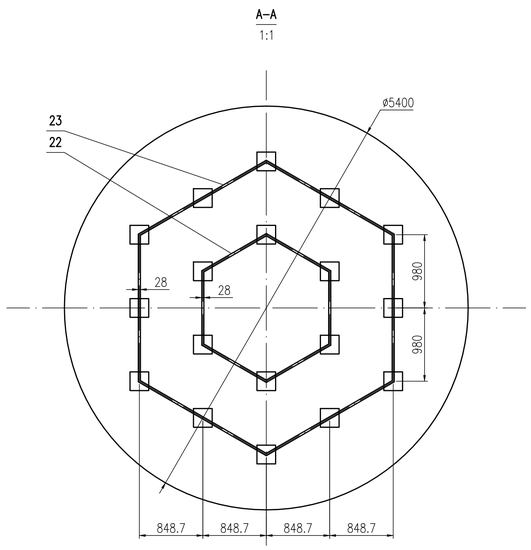
冷热换热器
Cold and hot heat exchanger
装配图
ASSEMBLY DRAWING

位号/ITEM NO.: P01-324-HG-HE-103/203/303/403

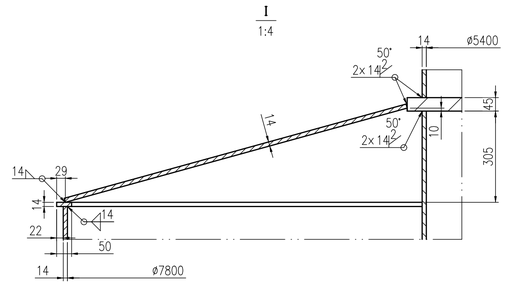
焚硫及转化系统 SULFUR BURING AND CONVERSION
详细工程设计 DETAILED ENGINEERING

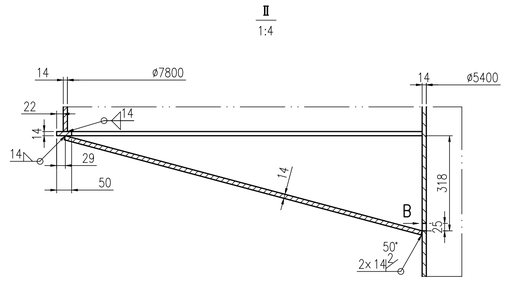
P01-324-JS-003-01 | 版 REV. 1

专业 SPECI	设备 EQUIPMENT	区域 AREA	--	比例 SCALE	1:40	第 SHT. 1 张 共 OF 1 张

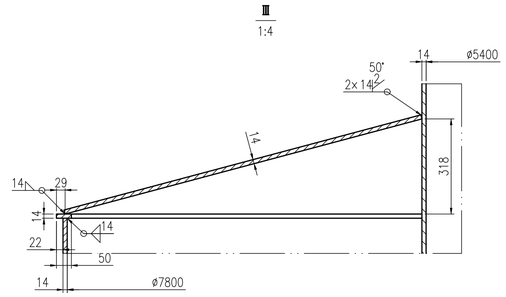


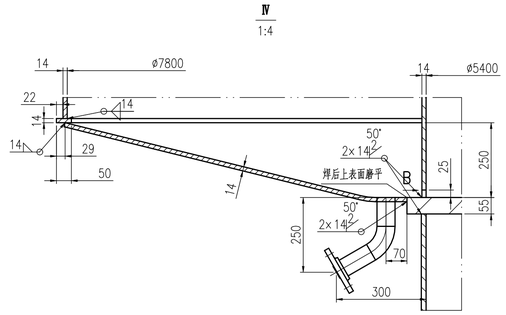
锚支座与筒体焊接详图
Detail drawing of anchor support and cylinder welding
不按比例 Not to scale





换热管与管板焊接详图
Welding details of heat exchange tube and tubesheet
不按比例 Not to scale





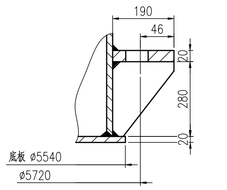
折流板与筒体焊接详图
Detailed drawing of baffle plate and cylinder welding
不按比例 Not to scale

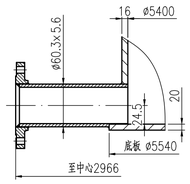
接管N6详图
Nozzle N6 details
不按比例 Not to scale

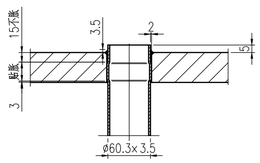
B向
VIEW B
不按比例 Not to scale

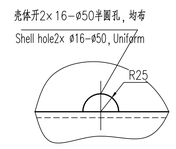
技术要求：
1、法兰螺栓孔应跨设备中心线或其平行线布。
2、所有零部件焊接前，须清除焊缝附近的铁锈及油污。
3、任意3000mm长度筒体直线度允差为3mm;设备安装垂直度允差为18mm;筒体同一截面最大直径与最小直径之差不大于14mm;底板的平面度允差为3mm。
4、管板安装时上下管板面应相互平行,且与壳体中心线垂直,极限偏差为0.8mm。
5、换热管为整根无缝钢管,不允许拼接,同时亦应符合NB/T47019-2021《锅炉、热交换器用管订货技术条件》的Ⅰ级换热管要求，按最小壁厚供货。换热管轧制出厂前必须逐根做水压检测和逐根超声波检测。
6、换热管及定距管内外表面按GB/T18592-2001《金属覆盖层 钢铁制品热浸镀铝 技术条件》进行渗铝处理，渗铝厚度≥0.1mm,扎膜要求2级合格。
7、上、下管箱内壁,上管板上表面,下管板下表面,底板上表面以及与上、下管箱连接的所有零部件，接管及人孔内表面均需喷铝,喷铝按GB/T9793-2012《热喷涂 金属和其它无机覆盖层 锌、铝及其合金》中的要求,喷铝厚度不小于0.3mm。喷铝前应做喷砂处理,达到GB/T8923-2011《涂覆涂料前钢材表面处理 表面清洁度的目视评定》。渗铝管与管板的焊接接头应进行补喷铝。
8、换热管与管板之间采用强度焊加贴胀,采用先胀后焊工艺。焊接采用手工电弧焊,焊条为E309MO-16.焊接至少为两道，且在完成第一道和最后一道焊接后,均按NB/47013.5-2015各进行一次100%PT，Ⅰ级合格。
9、管板与壳程筒体的环焊缝(壳程最后一道环向封闭焊缝)应以氩弧焊打底,保证全焊透,并进行100%PT,符合NB/T 47013.5-2015的Ⅰ级为合格。
10、折流板仅与壳体焊接，与换热管及支撑管均不得焊接。
11、接管N2/N3/N4筒节及及其筒节外缘350mm范围内壳体上的A/B类焊缝均应进行100%RT,符合NB/T47013.2-2015中的Ⅱ级(技术等级AB级)为合格。
12、设备制作完毕后用煤油检验焊缝严密性，在焊接接头背面无油渍为合格，完毕后分别进行管程(40KPaG)/壳程(25KPaG)的气密性试验,保留30in不得有漏气现象。
13、壳程筒体上烟气进/出口开孔数量各2个(对称开设),管口方位按工艺管口方位图,但管口N3,N4与壳程筒体开孔相对位置呈90°布置。管板支撑与底座、折流板缺口、壳程筒体开孔的相对位置必须按视图制作。
14、设备外保温按工艺保温结构图制作,底座内用硅酸铝纤维填塞。
15、设备接管管道安装完毕后,短脚螺栓座螺母反松一圈以利于设备膨胀。
16、其它要求见换热器技术协议。
17、本设备共制造4台,图中为单台设备重。
注:1、所有无盲板法兰在运输过程中，应用木制板保护。
2、为便于运输，下导流筒、上导流筒制造完毕后分割成两半,运输至现场后组对焊接。

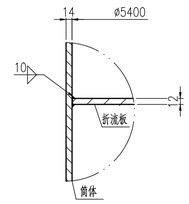
Technical requirements:
1, flange bolt hole should be across the center line of the equipment or its parallel lines.
2. Before all parts are welded, rust and oil stain near the weld shall be removed.
3. The straightness tolerance of any 3000mm length cylinder is 3mm; Equipment installation verticality tolerance is 18mm; The difference between the maximum diameter and the minimum diameter of the same section of the cylinder is not more than 14mm; The flatness tolerance of the bottom plate is 3 mm.
4. When installing the tubesheet, the upper and lower tube surfaces should be parallel to each other and perpendicular to the center line of the shell, with a limit deviation of 0.8 mm..
5. The heat exchange tube is a whole seamless steel tube, which is not allowed to be spliced. At the same time, it should meet the requirements of Class I heat exchange tube in NB/T47019-2021 Technical Conditions for Ordering Tubes for Boilers and Heat Exchangers, and be supplied at the minimum wall thickness. Before the heat exchange tubes are rolled out of the factory, water pressure testing and ultrasonic testing must be done one by one.
6. The inner and outer surfaces of the heat exchange tube and the distance tube shall be aluminized according to GB/T18592-2001 Technical Conditions for Hot-dip Aluminizing of Metal Covered Steel Products. The aluminized thickness shall be ≥0.1mm, and the porosity shall be qualified at Grade 2.
7. The inner walls of the upper and lower tube boxes, the upper surface of the upper tube plate, the lower surface of the lower tube plate, the upper surface of the bottom plate, all parts connected with the upper and lower tube boxes, and the inner surfaces of the nozzles and manholes shall be sprayed with aluminum, and the thickness of spraying aluminum shall not be less than 0.3mm according to GB/T9793-2012 "Thermal Spraying of Zinc, Aluminum and Their Alloys for Metals and Other Inorganic Coatings". Sand blasting should be done before spraying aluminum to meet GB/T8923-2011 Visual Assessment of Surface Cleanliness of Steel Surface Treatment before Coating. The welded joint between aluminized pipe and tubesheet should be sprayed with aluminum.
8. Strength welding and sticking expansion are adopted between the heat exchange tube and the tube plate, and the process of expanding first and then welding is adopted. Manual arc welding is used for welding, and the covered electrode is E309MO-16. There are at least two welds, and after the first and last welds are completed, they are all 100%PT once each according to NB/47013.5-2015, which is qualified in Grade I..
9. The girth weld (the last girth closed weld on the shell side) between the tube plate and the shell side cylinder shall be backed by hydrogen arc welding to ensure full penetration and 100%PT, which is qualified as meeting the grade I of NB/T 47013.5-2015.
10. The baffle is only welded with the shell, and shall not be welded with the heat exchange tube and the support tube.
11. 100%RT shall be carried out on the A/B welds on the N2/N3/N4 connector and the bright body within 350mm of the outer edge of the connector, and it shall be qualified if it meets the grade II (technical grade AB) in NB/T47013.2-2015.
12. After the equipment is manufactured, use kerosene to check the weld tightness. If there is no oil on the back of the welded joint, it is qualified. After the completion, conduct the air tightness test of tube side (40KPaG)/ shell side (25KPaG) respectively, and there shall be no air leakage after staying for 30in inches.
13. The number of flue gas inlet/outlet openings on the shell-side cylinder is 2 (symmetrically opened), and the nozzle orientation is according to the process nozzle orientation diagram, but the relative positions of nozzles n3 and n4 and the shell-side cylinder openings are arranged at 90. The relative positions of tube plate support and base, baffle gap and shell side cylinder opening must be made according to the view.
14. The external insulation of the equipment shall be made according to the process insulation structure diagram, and the base shall be filled with aluminum silicate fiber.
15, equipment to take over the pipeline after the installation, gallery bolt nut loose a circle, to facilitate equipment expansion.
16. See the technical agreement of heat exchanger for other requirements.
17. Four sets of this equipment are manufactured, and the figure shows the weight of a single equipment.
Note: 1. All flanges without blind plates shall be protected by wooden plates during transportation.
2. In order to facilitate transportation, the lower guide sleeve and the upper guide sleeve are divided into two halves after being manufactured, and then assembled and welded after being transported to the site.











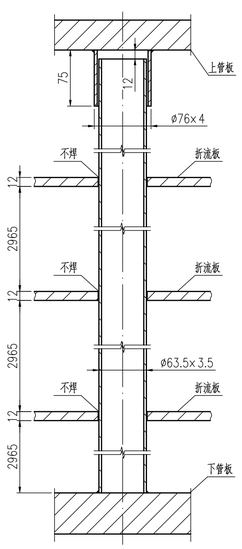
支撑管与管板焊接详图
Welding details of support tube and tubesheet
不按比例 Not to scale

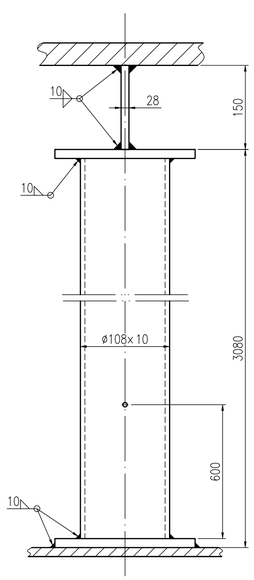
支柱与管板焊接详图
Welding details of strut and tubesheet
不按比例 Not to scale

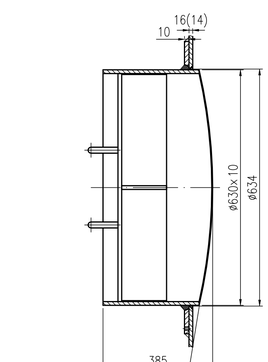
人孔与筒体焊接详图
Detailed drawing of manhole and barrel welding
1:5

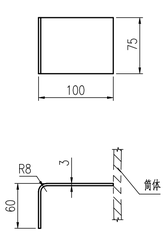
件号29详图
Detail drawing of part No.29
1:10

底板与筒体焊接详图
Welding details of bottom plate and cylinder
不按比例 Not to scale

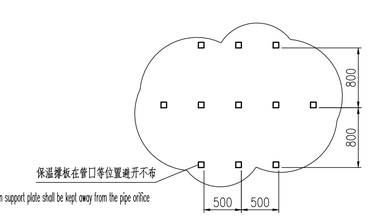


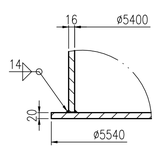




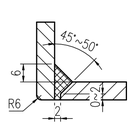


保温撑板布置图
Layout of insulation support plate
No scale





接管与壳体焊接详图
Welding details of nozzle and shell
No scale



版次 REV.	说明 DESCRIPTION	设计 DESIGNED	校核 CHECKED	审核 APPRD	批准 AUTHD	日期 DATE

中国化学工程第六建设有限公司
中国化学 CHINA NATIONAL CHEMICAL ENGINEERING SIXTH CONSTRUCTION Co., Ltd

PT KOLAKA NICKEL INDONESIA
KNI

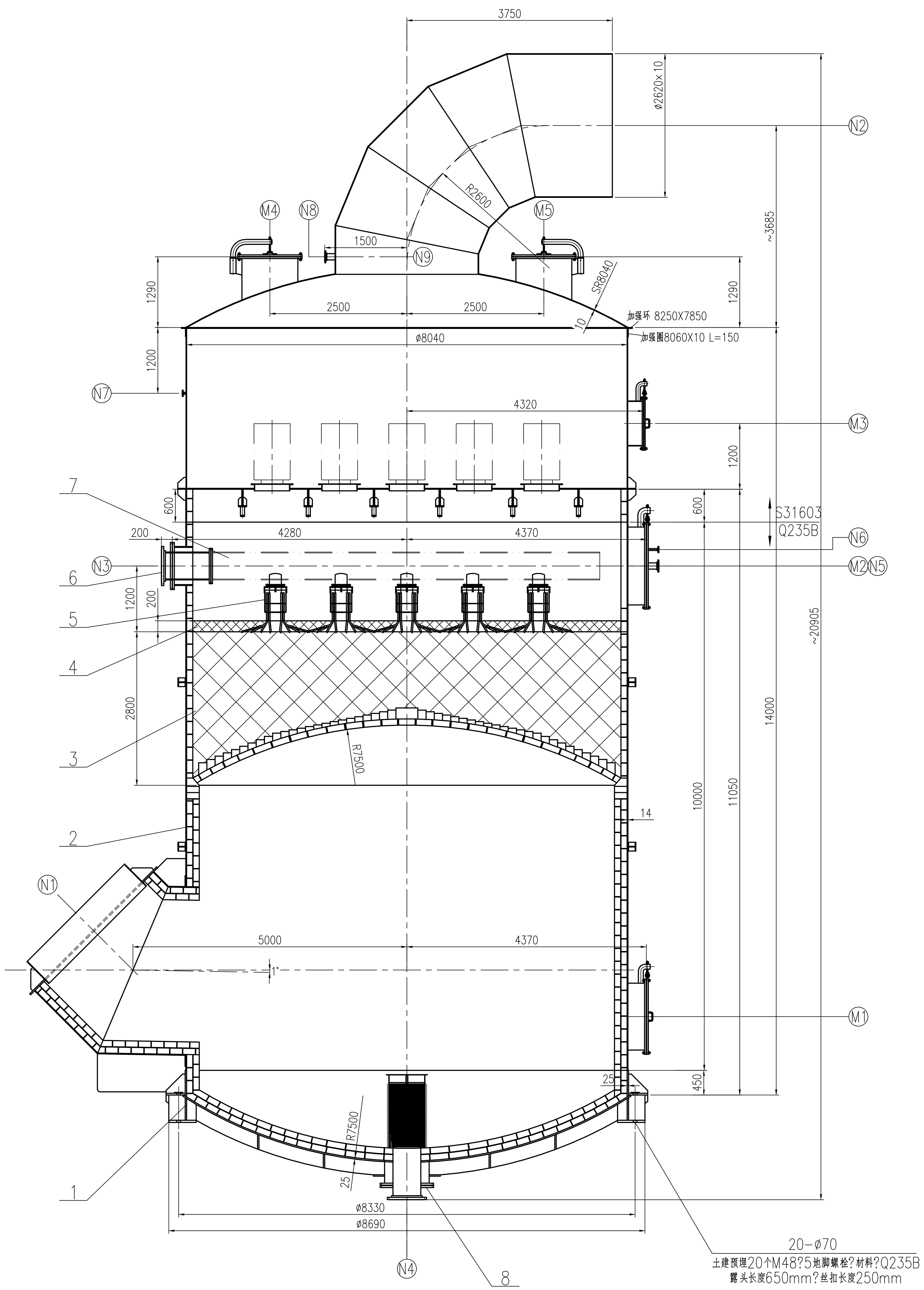
KNI年产12万吨镍湿法项目配套4×1000t/d硫磺制酸装置EPC工程
KNI's annual production of 120,000 tons of nickel hydrometallurgical project is supported by a 4X1000t/d sulfuric acid plant

冷热换热器
Cold and hot heat exchanger
装配图
ASSEMBLY DRAWING
位号/ITEM NO.: P01-324-HG-HE-103/203/303/403

焚硫及转化系统
SULFUR BURING AND CONVERSION
详细工程设计
DETAILED ENGINEERING

P01-324-JS-003-02 | 版 REV. 1

专业 SPECI	设备 EQUIPMENT	区域 AREA	--	比例 SCALE	1:40	第 SHT. 1	张 共 OF 1	张



技术要求

Technical requirements

1.筒体不圆度≤25mm,任意3m内的筒体直线度公差为3mm,塔体直线度公差≤12mm,塔体垂直度允差为±16.

1. The cylinder out of roundness ≤25mm, the cylinder straightness tolerance within any 3M is 3mm, the tower straightness tolerance ≤12mm, and the tower verticality tolerance is ±16.

2.组装完毕后底座地脚螺栓孔中心圆直径允差、相邻两孔弦长允差和任意两孔弦长允差均不大于2mm。

2. After assembly, the tolerance of center circle diameter of foundation bolt hole, chord length of adjacent two holes and chord length of any two holes shall not be greater than 2mm.

3.衬砖钢壳内表面平齐,焊缝要求打磨光滑,凡是棱角部位,均应呈圆角过渡,除注明外,圆弧半径:R≥5mm。

3. The inner surface of the brick lined steel shell shall be flush, and the weld shall be polished smooth. All edges and corners shall be rounded.Unless otherwise specified, the arc radius: R≥5 mm.

4.钢壳制作完毕后进行煤油渗漏试验。

4. Kerosene leakage test shall be conducted after steel shell fabrication.

5.衬里前，钢壳内表面应进行去污除锈处理,达到GB 8923.1-2011规范St3级要求。

5. Before lining, the inner surface of steel shell shall be sandblasted to meet the requirements of St3 in GB 8923.1-2011.

6.耐酸砖按GB/T 8488-2008《耐酸砖》Z-1进行检验和验收。胶泥采用KPI胶泥,衬里的砌缝应平整饱满、并及时地刮去砌缝中的多余胶泥.用5~10倍放大镜作表面砌缝检查，不允许产生裂纹，气泡等现象。

6. Acid resistant bnick shall be inspected and accepted in accordance with Z-1 of GB/T 8488-2008 acid resistant brick. KPI mastic shall be used for the mastic. The lining joints shall be smooth and full, and the excess mastic in the joints shall be scraped off in time. 5-10 times magnifier shall be used for surface joint inspection, and no cracks, bubbles and other phenomena are allowed.

7.除挡酸圈外,所有焊接工作都应在衬砖前完成,衬砖后不允许在钢壳上再施焊和敲击。

7.Except for the acid retaining ring, all welding work shall be completed before brick lining, and welding on steel shell is not allowed after brick lining.

8.不锈钢部分除污去油后进行酸洗钝化处理,所形成的钝化膜用蓝点法检测,无蓝点为合格。

8. Pickling and passivation treatment shall be carried out after part of stainless steel is decontaminated and degreased. The passivation film formed shall be tested by blue dot method. If there is no blue dot, it is qualified.

9.设备检验合格，碳钢外表面去油除锈处理,达到GB 8923.1-2011规范Sa2 1/2级要求后,涂环氧富锌底漆两道，干膜厚度60~80um,云铁环氧中间漆一道,干膜厚度50um.氟碳面漆两道，干膜厚度60~80um，面漆颜色为天(铁)蓝色。

9. After the equipment is inspected to be qualifed and the external surface of carbon steel is degreased and derusted to meet the requirements of Sa2 1/2 of GB 8923.1-2011, two coats of epoxy zinc rich primer, with a dry film thickness of 60-80um, one coat of micaceous iron epoxy intermediate paint, with a dry film thickness of 50um, two fluorocarbon topcoats, with a dry film thickness of 60-80um, and the color of top coat is sky (iron) blue.

10.平台与外部梯子、过道的连接由工艺确定。

10. The connection of platform, external ladder and aisle shall be determined by process.

注:1.进气口水平段安装有1°坡度要求，支撑墙与进气口应垂直。

Note: 1.The horizontal section of the air inlet is installed with a slope of 1°,the support wall should be vertical to the air inlet.

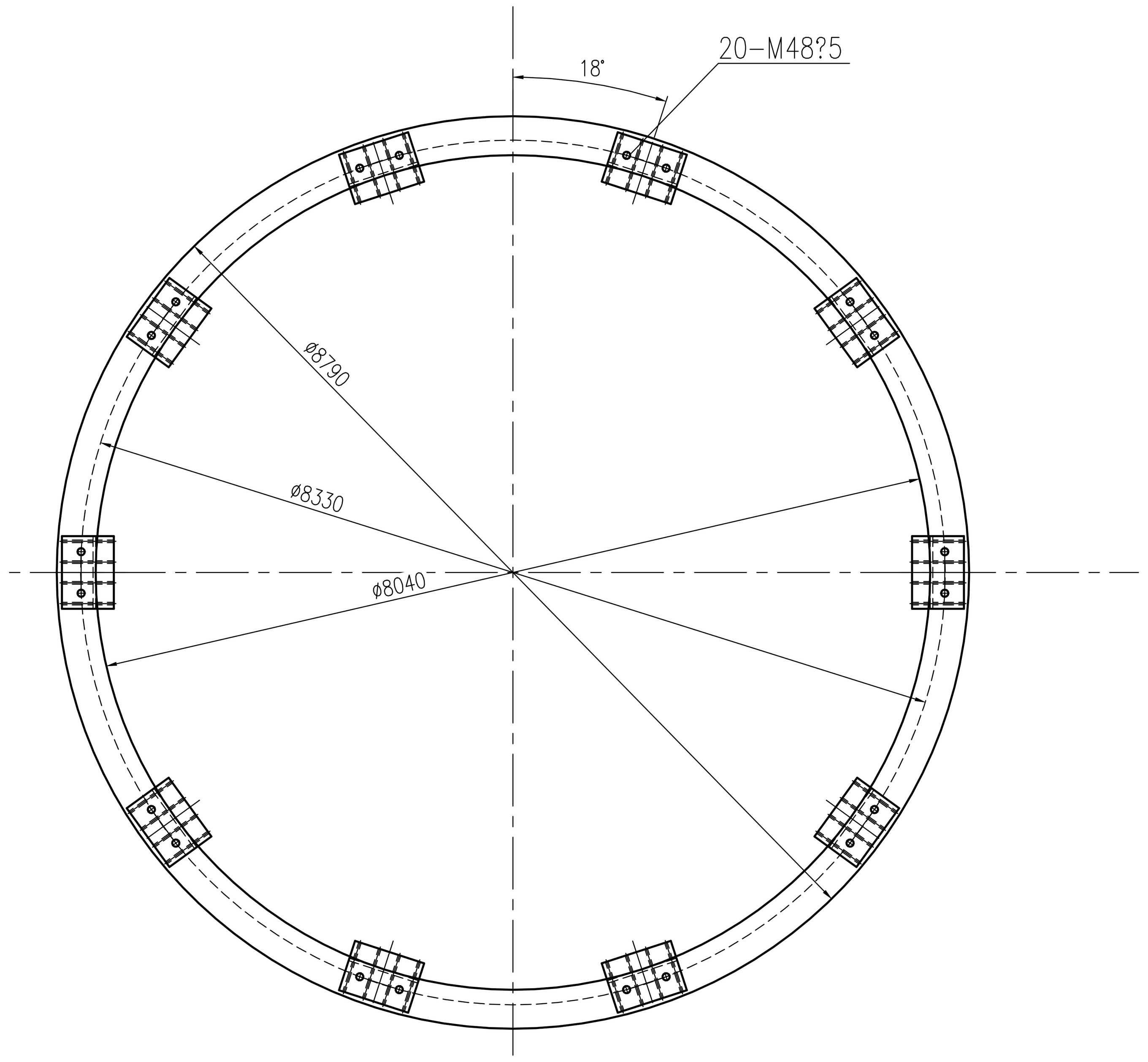
2.气体出口管道支撑由工艺专业考虑，支撑于土建平台上。

2. The gas outlet pipeline is supported on the steel platform and considered by the process discipline.

3.吊耳仅承受壳体(件1)吊装，不能用于整台设备吊装。吊装时支座可作为尾部吊耳使用。

3. The lifting lug only bears the hoisting of the shell (Part 1) and cannot be used for the hoisting of the whole equipment. During hoisting, the support can be used as tail lifting lug.

锚支座分布图
Anchor Support Distribution Map
不按比例
Not proportional



设计制造检验主要数据表
DESIGN/FABRICATION/INSPECTION DATA

标准规范 STANDARD AND CODE

- 常压容器 第一部分：钢制焊接常压容器 NB/T 47003.1-2022
- 纤维增强塑料化工设备技术规范 HG/T 20696-2018
- 化工设备衬里钢壳设计标准 HG/T 20678-2023
- 耐酸砖 GB/T 8488-2008

焊接 WELDING	NB/T 47014-2023?NB/T 4798.1~5?HG/T 20583-2020			
Q235B	S30403	S30403&C.S.	S31603	S31603&C.S.
E4316	E308L-16	E309-16	E316L-16	E309Mo-16

除注明外?焊接采用连续焊?角焊缝的焊脚尺寸按较薄板厚度?法兰与接管的焊接按相应法兰标准的规定?
UNLESS OTHERWISE SPECIFIED, ALL THE WELDING SHALL BE CONTINUOUS WELDING? THE LEG OF FILLET WELDS SHALL BE EQUAL TO THE THINNER PLATE?THE WELDING OF FLANGE AND NOZZLE SHALL BE IN ACCORDANCE WITH RELEVANT STANDARDS.

无损检测标准 NONDESTRUCTIVE EXAM. STANDARD	NB/T 47013-2015 (NB/T47013.3-2023)		
射线检测技术等级 RT TECHNIQUE LEVEL	AB	超声检测技术等级 UT TECHNIQUE LEVEL	B
焊接接头类别 WELDED JOINT CATEGORY	检测方法 EXAMINATION METHOD	检测基本比例 EXAMINATION ESSENTIAL PERCENTAGE	合格级别 ACCEPTABLE CLASS
A?B	射线 RT	10%	?
	超声 UT	/	/
C?D?E	磁粉 MT	100%	?
	渗透 PT	100%	?

热处理要求 HEAT TREATMENT	/
耐压试验压力 MPa PRESSURE OF PROOF PRESSURE TEST	/
泄漏试验压力 MPa PRESSURE OF LEAK TEST	煤油渗漏试验 KEROSENE LEAKAGE TEST
涂覆与运输包装 COATING,PACKING FOR TRANSPORT	NB/T 10558-2021

设备自重 kg NET WEIGHT	90518	正常操作 kg NOR.OPERATING	/
其中 kg INCLUDING	28920（不锈钢）	最大操作 kg MAX.OPERATING	/
		充水 kg FULL OF WATER	/

设计参数 DESIGN DATA

项目	单位	数值
压力容器类别 CATEGORY OF PRESSURE VESSEL		类外
设计使用年限 DESIGN SERVICE LIFE		10
设计压力 DESIGN PRESSURE	MPa	-0.01/0.01
工作压力 OPERATING PRESSURE	MPa	-0.0005~-0.005
最高允许工作压力 MAWP	MPa	/
设计温度 DESIGN TEMPERATURE	℃	100
工作温度 OPERATING TEMPERATURE	℃	66~80
工作介质 SERVICE FLUID		95~96%硫酸/空气 95~96%H_2SO_4/Air
介质密度 FLUID DENSITY	kg/m³	1726?进?1713?出?
介质特性 FLUID CHARACTERISTIC		中度危害 MODERATELY HAZARDOUS
腐蚀裕量 CORROSION ALLOWANCE	mm	3.0(C.S.)/1.0(S.S.)
焊接接头系数 JOINT EFFICIENCY		0.85
容积 VOLUME	m³	/
装量系数 FILLING RATIO		/
基本风压 REFERENCE WIND PRESSURE	Pa	300
基本雪压 REFERENCE SNOW PRESSURE	Pa	/
地面粗糙度 TERRAIN ROUGHNESS		A
抗震设防烈度?加速度? SEISMIC FORTIFICATION INTENSITY(ACCELERATION)		7(0.15g)
设计地震分组 DESIGN EARTHQUAKE GROUP		第二组
场地土类别 SITE-CLASS		?
月平均最低气温的最低值 AVERAGE MIN. TEMPERATURE OF MONTH	℃	25
绝热厚度 INSULATION THK.	mm	/
防火 FIRE PREVENTION		/
超压泄放装置 PRESSURE RELIEF DEVICE		/

管口表 NOZZLE TABLE

符号 SYMBOL	用途或名称 SERVICE	数量 QTY.	公称尺寸 DN	公称压力 RATING	连接标准及形式 STANDARD AND TYPE/FACE	接管长度 PROJECTION
N1	空气进口 AIR INLET	1	2500	/	BW	见图 SEE DWG.
N2	空气出口 AIR OUTLET	1	2600	/	BW	见图 SEE DWG.
N3	硫酸进口 ACID INILETACID INLET	1	500/700	PN16/PN2.5	GB/T 9124.1 SO/PL/RF	见图 SEE DWG.
N4	硫酸出口 ACID OUTLET	1	700/800	PN16/PN2.5	GB/T 9124.1 SO/PL/RF	见图 SEE DWG.
N5	酸雾测试口 ACID MIST TEST	1	100	PN16	GB/T 9124.1 SO/RF	见图 SEE DWG.
N6	压力测试接口 PRESSURE CONNECTION	1	25	PN16	GB/T 9124.1 SO/RF	见图 SEE DWG.
N7	压力测试接口 PRESSURE CONNECTION	1	25	PN16	GB/T 9124.1 SO/RF	见图 SEE DWG.
N8	酸雾测试口 ACID MIST TEST	1	100	PN16	GB/T 9124.1 SO/RF	见图 SEE DWG.
N9	木条测试口 STICK TEST	1	50	PN16	GB/T 9124.1 SO/RF	见图 SEE DWG.
M1	过滤器安装孔 FILTER MOUNTING HOLES	1	1200	/	PL/RF	见图 SEE DWG.
M2	分酸器安装孔 DISTRIBUTOR MANWAY	1	1400	/	PL/RF	见图 SEE DWG.
M3	人孔 MANHOLE	1	800	/	PL/RF	见图 SEE DWG.
M4~5	除雾器安装孔 DEMISTER MANWAY	2	1000	/	PL/RF	见图 SEE DWG.

注 ?1) 除图面另有注明外?筒体上接管长度是指设备中心线到法兰密封面的距离?
NOTES : EXCEPT INDICATED ON THE DWG. THE NECK LENGTH IS THE DIMENSION FROM FLANGE SURFACE TO EQUIPMENT CENTER LINE.

件号 No.	图号或标准号 DWG. OR STAND. No.	名称 DESCRIPTION	数量 QTY.	材料 MATERIAL	单UNIT 重量WEIGHT(kg)	总TOTAL 重量WEIGHT(kg)	备注 REMARKS
8	P01-325A-JS-001-07	过滤装置 FILTER UNIT	1	耐酸合金 ACID-RESISTANT ALLOYS		884	
7	/	除雾器 MIST ELIMINATOR	1	组合件 COMPONENT		/	外购 Outsource
6	P01-325A-JS-001-08	硫酸进口套管 ACID INILETACID INLET CASING PIPE	1	组合件 COMPONENT		604	
5	/	分酸器 ACID SEPARATOR	1	组合件 COMPONENT		/	外购 Outsource
4	GB/T 18749-2019	异鞍环填料 DN50 INTALOX SADDLE PACKING	1	耐酸瓷 ACID-RESISTANT PORCELAIN		/	
3	GB/T 18749-2019	异鞍环填料 DN76 INTALOX SADDLE PACKING	1	耐酸瓷 ACID-RESISTANT PORCELAIN		/	
2	GB/T 8848-2008	砌筑 BRICKLAYING	1	组合件 COMPONENT		/	
1	P01-325A-JS-001-02	壳体 Shell	1	组合件 COMPONENT		89030	

版次 REV.	说明 DESCRIPTION	设计 DEGND	校核 CHEKD	审核 APPRD	批准 AUTHD	日期 DATE
2	供制造 FOR MANUFACTURING					2025.8.11

中国化学工程第六建设有限公司
中国化学 CHINA NATIONAL CHEMICAL ENGINEERING SIXTH CONSTRUCTION Co., Ltd

PT KOLAKA NICKEL INDONESIA

KNI年产12万吨镍湿法项目配套4×1000kt硫磺制酸装置EPC工程
KNI's annual production of 120,000 tons of nickel hydrometallurgical project is supported by a 4X1000kt sulfuric acid plant

焚硫及转化系统
SULFUR BURING AND CONVERSION

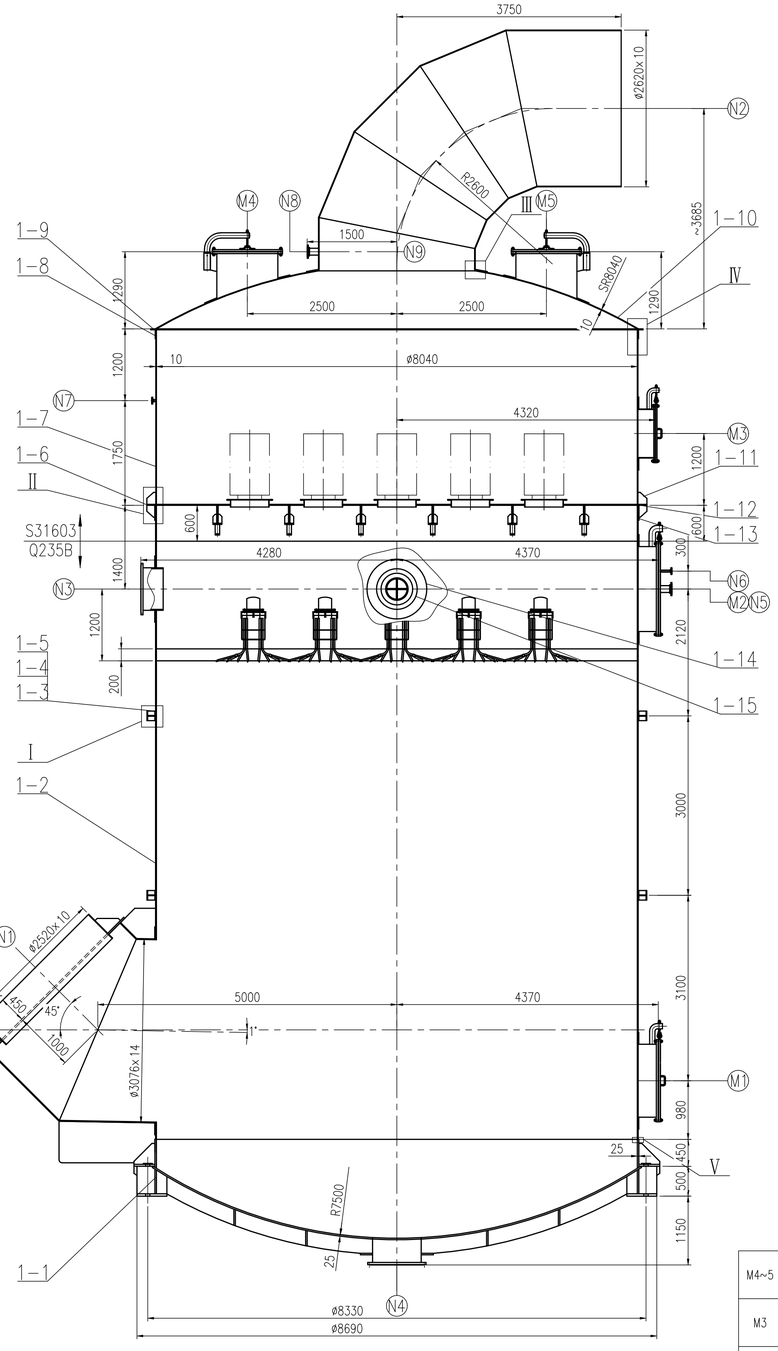
详细工程设计
DETAILED ENGINEERING

干燥塔
DRYING TOWER
装配图
ASSEMBLY DRAWING

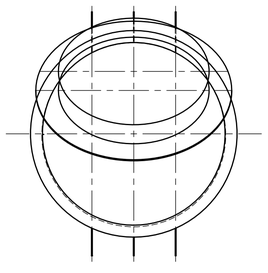
位号/ITEM NO.: P01-325A-HG-TW-101/201/301/401

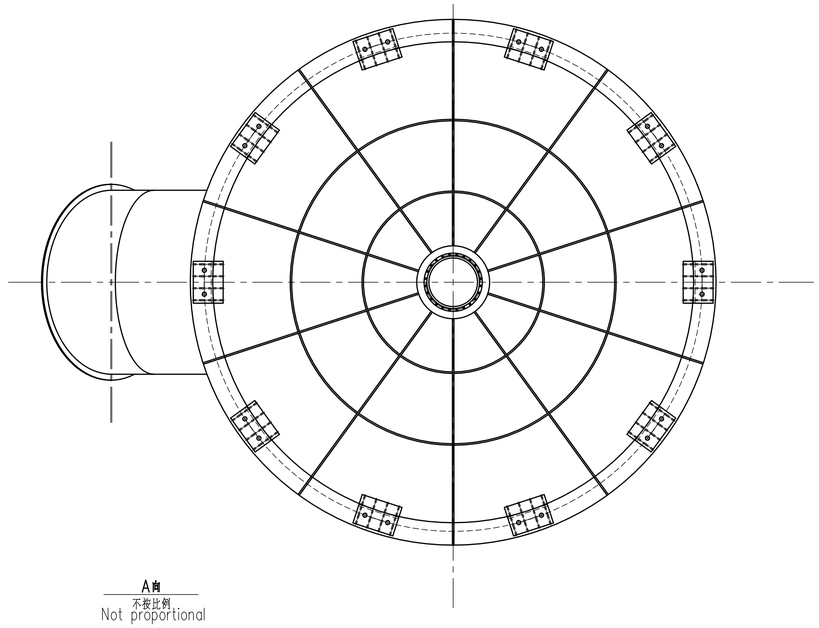
P01-325A-JS-001-01 | 版 REV. 2

专业 SPECI	设备 EQUIPMENT	区域 AREA	--	比例 SCALE	1:50	第 1 张 共 8 张 SHT. 1 OF 8

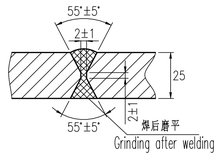


A向
不按比例
Not proportional

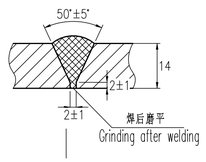




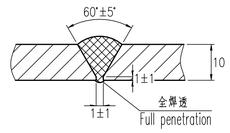
对接焊缝详图
Detail drawing of butt welds
不按比例
Not proportional



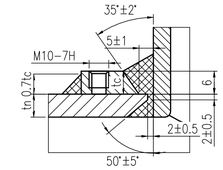
对接焊缝详图
Detail drawing of butt welds
不按比例
Not proportional



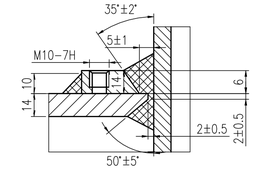
对接焊缝详图
Detail drawing of butt welds
不按比例
Not proportional



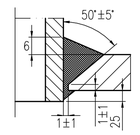
接管N1?M1~5与壳体焊接详图
Detail of welding of the tube?N1, M1~5?and shell
不按比例
Not proportional



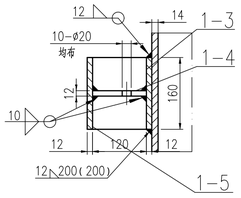
接管N3与壳体焊接详图
Detail of welding of the tube?N3?and shell
不按比例
Not proportional



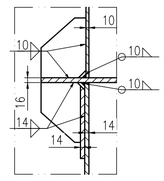
接管N7~9与壳体焊接详图
Detail of welding of the tube?N7~9?and shell
不按比例
Not proportional



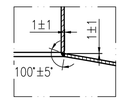
?
不按比例
Not proportional



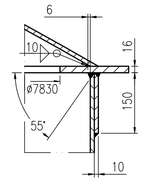
?
不按比例
Not proportional



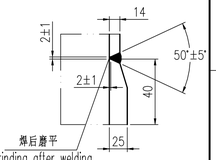
?
不按比例
Not proportional



?
不按比例
Not proportional



?
不按比例
Not proportional



件号 No.	图号或标准号 DWG. OR STAND. No	名称 DESCRIPTION	数量 QTY.	材料 MATERIAL	单UNIT 重量 WEIGHT(kg)	总TOTAL 重量 WEIGHT(kg)	备注 REMARKS
1-15	GB/T 3274-2017	轴式吊耳 AXB-6-60-14 Web	2	20/Q235B	103	206	
1-14	GB/T 3274-2017	垫板 ø1000 t=14 Pad	2	Q235B	86.3	173	
1-13	GB/T 4273-2015	筒体? DN8040?14 L=600 Cylinder ?	1	S31603		1679	
1-12	P01-325A-JS-001-04	管板组件 Tube Sheet Assembly	1	组合件 COMPONENT		10881	
1-11	GB/T 4273-2015	筋板 t=16 Web	40	S30408	4.9	196	均布
1-10	GB/T 4273-2015	封头 Head	1	S31603		4277	
1-9	GB/T 4273-2015	加强环? ø8250/ø7850 t=16 Gaskets	1	S31603		647	
1-8	GB/T 4273-2015	加强圈? ø8080?10 L=150 Acid outlet	1	S30408		302	
1-7	GB/T 4273-2015	筒体? DN8040?10 L=2918 Cylinder ?	1	S31603		5903	
1-6	GB/T 4273-2015	加强圈? ø8096?14 L=250 Acid outlet	1	S31603		702	
1-5	GB/T 3274-2017	加强圈?160?12 L=26260 Strengthing the ring	1	Q235B		396	
1-4	GB/T 3274-2017	筋板 ø8332/ø8092 t=12 Web	1	Q235B		292	
1-3	GB/T 3274-2017	加强圈160?12 L=25430 Strengthing the ring	1	Q235B		384	
1-2	GB/T 3274-2017	筒体? DN8040?14 L=10000 Cylinder ?	1	Q235B		27808	
1-1	P01-325A-JS-001-05	塔底 Bottom	1	组合件 COMPONENT		23233	

件号 No.	图号或标准号 DWG. OR STAND. No	名称 DESCRIPTION	数量 QTY.	材料 MATERIAL	单UNIT 重量 WEIGHT(kg)	总TOTAL 重量 WEIGHT(kg)	备注 REMARKS
M4~5	按本图 ACCORDING TO THIS DWG.	补强圈 B=200 t=10 REINFORCING PAD	2	S31603	62.3	125	
	CERE21522-1000	水平吊盖人孔PL1000-2.5 RF MANHOLE	2	组合件 COMPONENT	586	1172	H=797.5?1=10?制作检验
M3	按本图 ACCORDING TO THIS DWG.	补强圈 B=200 t=10 REINFORCING PAD	1	S31603		51	
	CERE21519-800	垂直吊盖人孔PL800-2.5 RF MANHOLE	1	组合件 COMPONENT		305	H=321
M2	按本图 ACCORDING TO THIS DWG.	补强圈 B=200 t=14 REINFORCING PAD	1	Q235B		112	
	CERE21519-1400	垂直吊盖人孔PL1400-2.5 RF MANHOLE	1	组合件 COMPONENT		829	H=413.2
M1	按本图 ACCORDING TO THIS DWG.	补强圈 B=200 t=14 REINFORCING PAD	1	Q235B		98	
	CERE21519-1200	垂直吊盖人孔PL1200-2.5 RF MANHOLE	1	组合件 COMPONENT		638	H=396.6
N9	按本图 ACCORDING TO THIS DWG.	接管 ø60.3x4 L=145 PIPE	1	S31603		0.81	
	GB/T9124.1-2019	法兰 DN50-PN16 SO RF ? FLANGE	1	S31603?		2.39	
N8	按本图 ACCORDING TO THIS DWG.	接管 ø114.3x6.3 L=193 PIPE	1	S31603		3.26	
	GB/T9124.1-2019	法兰 DN100-PN16 SO RF ? FLANGE	1	S31603?		4.38	
N7	按本图 ACCORDING TO THIS DWG.	接管 ø33.7x4.5 L=75 PIPE	1	S31603		0.24	
	GB/T9124.1-2019	法兰 DN25-PN16 SO RF ? FLANGE	1	S31603?		1.25	
N6	按本图 ACCORDING TO THIS DWG.	接管 ø33.7x4.5 L=257 PIPE	1	S31603		0.84	安放式
	GB/T9124.1-2019	法兰 DN25-PN16 SO RF ? FLANGE	1	S31603?		1.25	
N5	按本图 ACCORDING TO THIS DWG.	接管 ø114.3x6.3 L=255 PIPE	1	S31603		4.31	
	GB/T9124.1-2019	法兰 DN100-PN16 SO RF ? FLANGE	1	S31603?		4.38	
N4	GB/T9125.1-2019	螺母 M27 2型 NUT	40	30CrMo	0.15	3.6	
	GB/T9125.1-2019	全螺纹螺柱 M27x160 FULL THREAD STUD	20	35CrMo	0.61	14.6	
	按本图 ACCORDING TO THIS DWG.	接管 ø813?20 L=437 PIPE	1	Q235B		171	
	GB/T9124.1-2019	法兰 DN800-PN2.5 PL RF ? FLANGE	1	Q235B		66	
	GB/T9126.1-2019	垫片 RF DN800-PN2.5 GASKET	1	RPTFE		/	
N3	按本图 ACCORDING TO THIS DWG.	接管 ø711?16 L=373 PIPE	1	Q235B		102	
	按本图 ACCORDING TO THIS DWG.	补强圈 ø1111/ø711 t=14 REINFORCING PAD	1	Q235B		62.9	
	GB/T9126.1-2019	垫片RF DN500-PN16 GASKET	1	RPTFE		/	
	GB/T9125.1-2019	螺母 M30 2型 NUT	40	30CrMo	0.21	8.4	
	GB/T9125.1-2019	全螺纹螺柱 M30x165 FULL THREAD STUD	20	35CrMo	0.81	16.2	
	GB/T9125.1-2019	螺母 M24 2型 NUT	48	30CrMo	0.099	4.75	
	GB/T9125.1-2019	全螺纹螺柱 M24x145 FULL THREAD STUD	24	35CrMo	0.43	8.88	
	GB/T9124.1-2019	法兰 DN700-PN2.5 PL RF ? FLANGE	1	Q235B		48.5	
	GB/T9126.1-2019	垫片RF DN700-PN2.5 GASKET	1	RPTFE		/	
N2	按本图 ACCORDING TO THIS DWG.	补强圈 ø3020/ø2620 t=14 AIR OUTLET	1	S31603		196	
	P01-325A-JS-001-06	空气出口 AIR OUTLET	1	S31603		3514	
N1	按本图 ACCORDING TO THIS DWG.	补强圈 ø3476/ø3076 t=14 AIR OUTLET	1	Q235B		226	
	P01-325A-JS-001-03	空气进口 AIR INLET	1	组合件 COMPONENT		4155	

管口组件明细表?件号11?
LIST OF NOZZLE COMPONENTS (No. 11)

1:50	P01-325A-JS-001-02	P01-325A-JS-001-01
比例 SCALE	图号 DWG. NO.	装配图号 ASS. DWG. NO.

版次 REV.	说明 DESCRIPTION	设计 DESIGN	校核 CHECK	审核 APPRD	批准 AUTHD	日期 DATE
2	供制造 FOR MANUFACTURING					2025.8.11

中国化学工程第六建设有限公司
中国化学 CHINA NATIONAL CHEMICAL ENGINEERING SIXTH CONSTRUCTION Co.,Ltd

PT KOLAKA NICKEL INDONESIA

KNI年产12万吨镍湿法项目配套4×1000kt硫磺制酸装置EPC工程
KNI's annual production of 120,000 tons of nickel hydrometallurgical project is supported by a 4X1000kt sulfuric acid plant

干燥塔
DRYING TOWER
零件图
PART DRAWING

位号/ITEM NO.: P01-325A-HG-TW-101/201/301/401

焚硫及转化系统
SULFUR BURNG AND CONVERSION
详细工程设计
DETAILED ENGINEERING

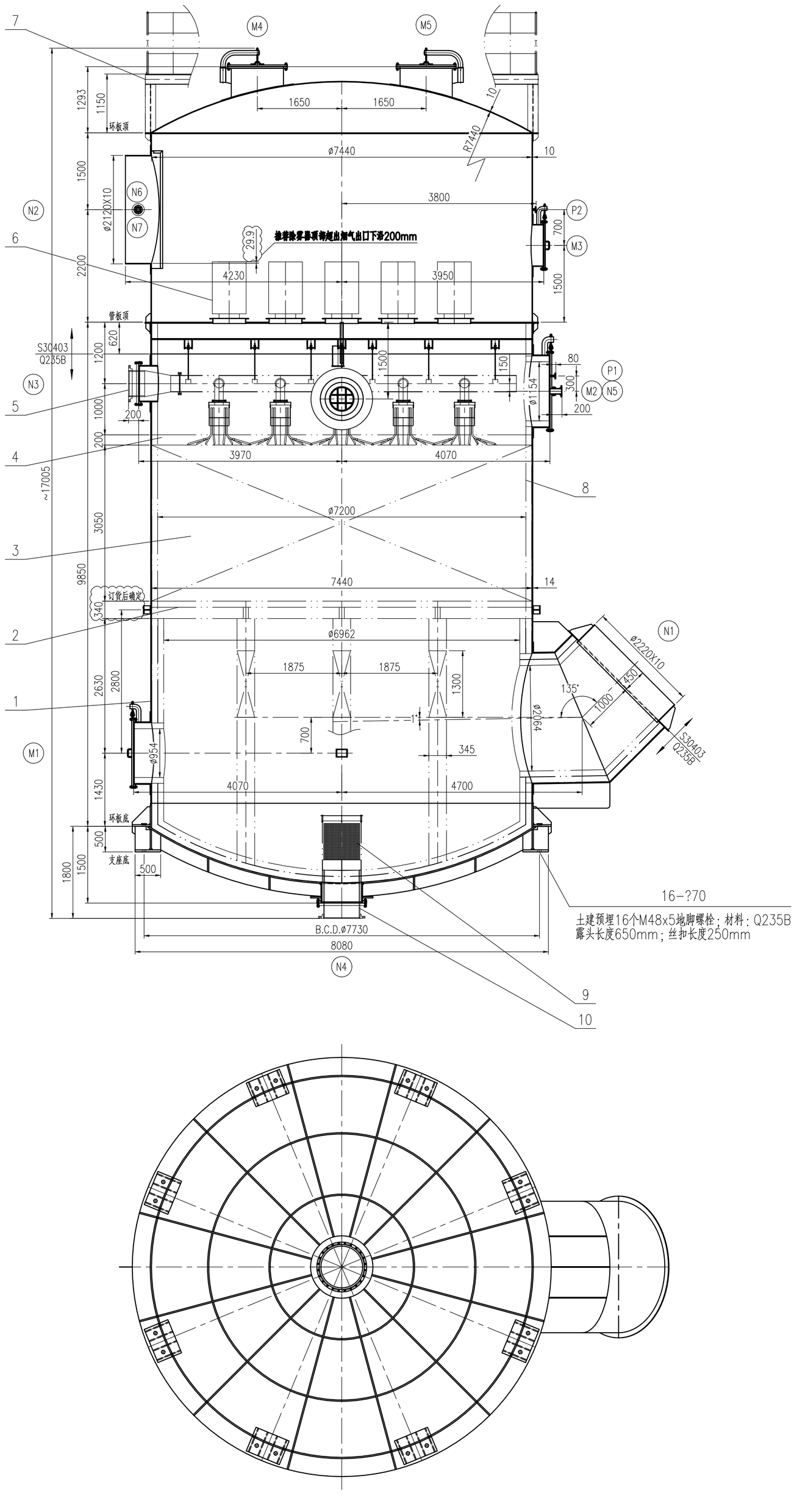
P01-325A-JS-001-02 | 2 版 REV.

专业 SPECI	设备 EQUIPMENT	区域 AREA	--	比例 SCALE	1:50	第 SHT. 2 张 共 OF 8 张

A1 594×841

专业 SPECI	工艺 CP	仪表 IN	粉体 MA	给排水 WS					
签字 SIGNATURE									

A1 594×841



设计制造检验主要数据表
DESIGN/FABRICATION/INSPECTION DATA

标准规范 STANDARD AND CODE					设计参数 DESIGN DATA	
● 常压容器 第一部分：钢制焊接常压容器 NB/T 47003.1-2022 ● 化工设备衬里钢壳设计标准 HG/T 20678-2023 ● 砖板衬里化工设备 HG/T 20676-1990 ● 钢制化工容器制造技术要求 HG/T 20584-2020					压力容器类别 CATEGORY OF PRESSURE VESSEL	类外
					设计使用年限 DESIGN SERVICE LIFE	10
					设计压力 DESIGN PRESSURE MPa	0.02
					工作压力 OPERATING PRESSURE MPa	0.002~0.007
					最高允许工作压力 MAWP MPa	--
焊接 WELDING	NB/T 47014-2023、NB/T 47018.1~47018.5-2017、HG/T 20583-2020				设计温度 DESIGN TEMPERATURE °C	180
Q235B	S30403	S30403&C.S.	S31603	S31603&C.S.	工作温度 OPERATING TEMPERATURE °C	88~155
E4316	E308L-16	E309-16	E316L-16	E309Mo-16	工作介质 SERVICE FLUID	(气GAS)Dry Air (液LIQUID)98.5~98.6%H_2SO_4
除注明外，焊接采用连续焊，角焊缝的焊脚尺寸按较薄板厚度，法兰与接管的焊接按相应法兰标准的规定。 UNLESS OTHERWISE SPECIFIED, ALL THE WELDING SHALL BE CONTINUOUS WELDING, THE LEG OF FILLET WELDS SHALL BE EQUAL TO THE THINNER PLATE, THE WELDING OF FLANGE AND NOZZLE SHALL BE IN ACCORDANCE WITH RELEVANT STANDARDS.					介质密度 FLUID DENSITY kg/m³	(气GAS)115~80 (液LIQUID)80~95
					介质特性 FLUID CHARACTERISTIC	中度危害 MODERATELY HAZARDOUS
无损检测标准 NONDESTRUCTIVE EXAM. STANDARD	NB/T 47013-2015 (NB/T47013.3-2023)				腐蚀裕量 CORROSION ALLOWANCE mm	3.0(C.S.)/1.0(S.S.)
射线检测技术等级 RT TECHNIQUE LEVEL	AB	超声检测技术等级 UT TECHNIQUE LEVEL	B		焊接接头系数 JOINT EFFICIENCY	0.85
焊接接头类别 WELDED JOINT CATEGORY	检测方法 EXAMINATION METHOD	检测基本比例 EXAMINATION ESSENTIAL PERCENTAGE	合格级别 ACCEPTABLE CLASS		容积 VOLUME m³	601
A、B	射线 RT	10%	Ⅲ		装量系数 FILLING RATIO	--
	超声 UT	--	--		基本风压 REFERENCE WIND PRESSURE Pa	300
C、D、E	磁粉 MT	100%	I		基本雪压 REFERENCE SNOW PRESSURE Pa	0
	渗透 PT	100%	I		地面粗糙度 TERRAIN ROUGHNESS	A
热处理要求 HEAT TREATMENT	--				抗震设防烈度(加速度) SEISMIC FORTIFICATION INTENSITY(ACCELERATION)	7(0.15g)
耐压试验压力 MPa PRESSURE OF PROOF PRESSURE TEST	--				设计地震分组 DESIGN EARTHQUAKE GROUP	第二组
泄漏试验压力 MPa PRESSURE OF LEAK TEST	煤油渗漏试验 KEROSENE LEAKAGE TEST				场地土类别 SITE-CLASS	Ⅱ
涂覆与运输包装 COATING,PACKING FOR TRANSPORT	NB/T 10558-2021				月平均最低气温的最低值 AVERAGE MIN. TEMPERATURE OF MONTH °C	25
设备自重 kg NET WEIGHT	--	正常操作 kg NOR.OPERATING	--		绝热厚度 INSULATION THK. mm	--
其中 kg INCLUDING	--(不锈钢)	最大操作 kg MAX.OPERATING	--		防火 FIRE PREVENTION	--
		充水 kg FULL OF WATER	--		超压泄放装置 PRESSURE RELIEF DEVICE	--

管口表
NOZZLE TABLE

符号 SYMBOL	用途或名称 SERVICE	数量 QTY.	公称尺寸 DN	公称压力 RATING	连接标准及形式 STANDARD AND TYPE/FACE	接管长度 PROJECTION
N1	烟气进口 GAS INLET	1	2200	/	BW	见图 SEE DWG.
N2	烟气出口 GAS INLET	1	2100	/	BW	见图 SEE DWG.
N3	硫酸进口 ACID INILETACID INLET	1	500/700	PN16/PN2.5	GB/T 9124.1 SO/PL/RF	见图 SEE DWG.
N4	硫酸出口 ACID OUTLET	1	650/800	PN16/PN2.5	GB/T 9124.1 SO/PL/RF	见图 SEE DWG.
N5	酸雾测试口 ACID MIST TEST	1	100	PN16	GB/T 9124.1 SO/RF	见图 SEE DWG.
P1	压力测试接口 PRESSURE CONNECTION	1	25	PN16	GB/T 9124.1 SO/RF	见图 SEE DWG.
P2	压力测试接口 PRESSURE CONNECTION	1	25	PN16	GB/T 9124.1 SO/RF	见图 SEE DWG.
N6	酸雾测试口 ACID MIST TEST	1	100	PN16	GB/T 9124.1 SO/RF	见图 SEE DWG.
N7	木条测试口 STICK TEST	1	50	PN16	GB/T 9124.1 SO/RF	见图 SEE DWG.
M1	过滤器安装孔 STRAINER MANWAY	1	1200	/	PL/RF	见图 SEE DWG.
M2	分酸器安装孔 DISTRIBUTOR MANWAY	1	1400	/	PL/RF	见图 SEE DWG.
M3	人孔 MANHOLE	1	800	/	PL/RF	见图 SEE DWG.
M4~5	除雾器安装孔 DEMISTER MANWAY	2	1000	/	PL/RF	见图 SEE DWG.

注 NOTES：1) 除图面另有注明外，筒体上接管长度是指设备中心线到法兰密封面的距离。
EXCEPT INDICATED ON THE DWG. THE NECK LENGTH IS THE DIMENSION FROM FLANGE SURFACE TO EQUIPMENT CENTER LINE.

技术协议中过滤装置法兰直径为650???

技术要求Technical Requirements

1.筒体不圆度≤25mm,任意3m内的筒体直线度公差为3mm,塔体直线度公差≤12mm,塔体垂直度允差为±16mm.
The cyinder out of roundness≤25mm, the cyinder straightness tolerance within any 3m is 3mm, the tower straightness tolerance ≤12mm, and the tower verticality tolerance is ±16.

2.组装完毕后底座地脚螺栓孔中心圆直径允差、相邻两孔弦长允差和任意两孔弦长允差均不大于2mm.
After assembly, the tolerance of center circle diameter of foundation bolt hole, chord length of odjocent two holes and chord length of any two holes shall not be greater than 2mm.

3. 衬砖钢壳内表面平齐，焊缝要求打磨光滑，凡是棱角部位，均应呈圆角过渡，除注明外，圆弧半径: R>5mm.
The inner surface of the brick lined steel shellshll be flush, ond the weld shll be polished smooth. Al edges and comers shall be rounded.Unless otherwise specified, the orc radius: R>5 mm.

4. 钢壳制作完毕后进行煤油渗漏试验。
Kerosene leakage test shall be conducted after steel shell fabrication.

5.衬里前，钢壳内表面应进行去污除锈处理。达到GB/T8923.1-2011规范St3级要求。
Before lining, the inner surface of steel shell shall be sandblosted to meet the requirements of St3 in GB/T8923.1-2011

6.耐酸砖按GB/T8488- 2008《耐酸砖》Z-1进行检验和验收。胶泥采用KPⅠ胶泥,衬里的砌缝应平整饱满。并及时地刮去确缝中的多余胶泥，用5~10倍放大镜作表面砌缝检查,不允许产生裂纹，气泡等现象。
Acid resistant brick shall be inspected ond accepted in accordance with Z-1 of GB/T8488-2008 acid resistont brick. KPI mastic shall be usedfor the mastic. The lining joints shallbe smooth and full nd the excess mastic in the jonts shall be scraped offi time. 510 times magniffershall be used for surface joint inspection, and no crocks, bubbles and other phenomena ore allowed.

7. 所有焊接工作都应在衬砖前完成。衬砖后不允许在钢壳上再施焊和敲击。
All welding work shallbe completed before brick lining,ond welding on steel shellis not llowed after brick lining.

8. 不锈钢部分除污去油后进行酸洗钝化处理,所形成的钝化膜用蓝点法检测,无蓝点为合格。
Pickling and poivation treatment shall be corred out after part of stainless stee is decontaminated and degreased. The possivation flmformed shall be tested by blue dot method. If there is no blue dot, it is qudlified.

9.设备检验合格，碳钢外表面去油除锈处理，达到GB/T8923.1-2011规范Sa2 1/2级要求后，涂环氧富锌底漆两道，干膜厚度60~80μm,云铁环氧中间漆一道，干膜厚度50μm,氟碳面漆两道，干膜厚度60~80μm,面漆颜色为天(铁)蓝色。
After the equipment is inspected to be qualified and the externdl surface of carbon steel is degreased and derusted to meet the requirementsof Sa2 1 / 2 of GB/T8923.1-2011, two coats of epoxy zinc rich primer, with a dry film thickness of 60-80μm, one coat of micaceous iron epoxyintermediote paint, with a dry film thickness of 50μm, two fluorocarbon topcoats, with a dry film thickness of 60-80μm, and the color of topcoat is sky (iron)blue.

注Note:

1.进气口水平段安装有1°坡度要求，支撑墙与进气口应垂直。
The horizontal section of theair inlet is installed with a slope of 1°,the support wallshould be vertical to the air inlet.

2. 吊耳仅承受壳体(件1)吊装,不能用于整合设备吊装。吊装时支座可作为尾部吊耳使用。
The lifting lug only bears the hoisting of the shell (Port 1) and connot be used for the hoisting of the whole equipment. During hoisting, thesupport con be used astailifting lug.

件号 No.	图号或标准号 DWG. OR STAND. No.	名称 DESCRIPTION	数量 QTY.	材料 MATERIAL	单重UNIT WEIGHT(kg)	总重TOTAL WEIGHT(kg)	备注 REMARKS
10		酸出口 ACID OUTLET	1	组合件 COMPONENT		--	外购 OUTSOURCE
9		过滤装置 FILTER UNIT	1	组合件 COMPONENT		--	外购 OUTSOURCE
8		砌筑 HEAD	1	组合件 COMPONENT		186578	外购 OUTSOURCE
7		护栏及爬梯 GUARDRAILS AND LADDERS	1	组合件 COMPONENT		--	
6		除雾器 DEFOGGER	16	组合件 COMPONENT		--	外购 OUTSOURCE
5		分酸器 ACID SEPARATOR	1	组合件 COMPONENT		--	外购 OUTSOURCE
4	GB/T18749-2019	异鞍填料 DN76 DIFERENT SADDLE RING PACKING	8.2m3	耐酸瓷 ACID RESISTANT CERAMICS	450	3690	外购 OUTSOURCE
3	GB/T18749-2019	异鞍填料 DN76 DIFERENT SADDLE RING PACKING	124m3	耐酸瓷 ACID RESISTANT CERAMICS	450	53320	外购 OUTSOURCE
2		条梁组件，篦子板 THE BEAM COMPONENT,GRATE BRICK	1	--		--	外购 OUTSOURCE
1	--	壳体 SHELL	1	组合件 COMPONENT		77134	

版次 REV.	说明 DESCRIPTION	设计 DEGND	校核 CHEKD	审核 APPRD	批准 AUTHD	日期 DATE
2	供制造 FOR MANUFACTURING					

PT KOLAKA NICKEL INDONESIA

KNI年产12万吨镍湿法项目配套4×1000kt硫磺制酸装置EPC工程
KNI's annual production of 120,000 tons of nickel hydrometallurgical project is supported by a 4X1000kt sulfuric acid plant

二吸塔
Final ABSORPTION TOWER

装配图
ASSEMBLY DRAWING

位号/ITEM NO.: P01-325A-HG-TW-103/203/303/403

干吸及低温热回收系统 DRY ABSORPTION SYSTEM

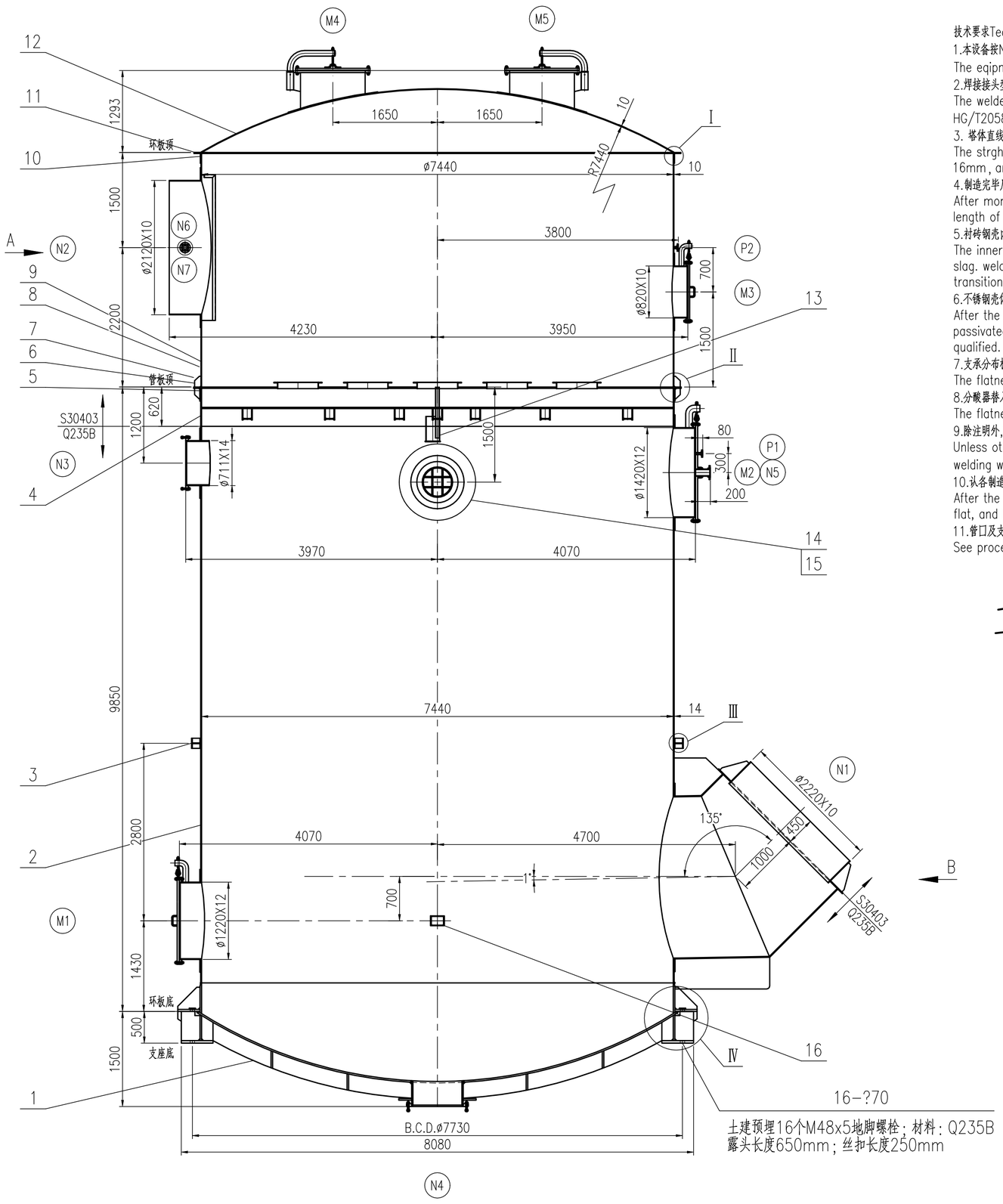
详细工程设计 DETAILED ENGINEERING

专业 SPECI	设备 EQUIPMENT	区域 AREA	--	比例 SCALE	1:50	第 SHT. 2 张共 OF 9 张	版 REV. 2

P01-325A-JS-002-01(1/3)

专业 SPECI	工艺 CP	仪表 IN	粉体 MA	给排水 WS					
签字 SIGNATURE									

A1 594×841



技术要求Technical Requirements

1.本设备按NB/T47003.1-2022《钢制焊接常压容器》进行制造,试验和验收。
The eqipmt s mnfcd, ested depedcong t0 NB/T47003.1-2022《steel welded atmospheric preaaure vesswl》

2.焊接接头型式及尺寸除图中注明外,按HG/T20583-2020中规定;角译焊缝的焊角尺寸按较薄板的厚度;法兰的焊接按相应法兰标准中的规定。
The welded joint type ond size in oddition to the indicated in the groph, occording to specified in HG/T20583-2020;The flt meldng ongur size cding to the tinesof the shet

3. 塔体直线度允差为不超过12mm,塔体安装垂直度为16mm,筒体不圆度≤25mm.
The strghness tolerne of the tower bd is not mre than 12mm, the instdlotin peendiuoriy of the tower body is 16mm, and the cyinder out of roundness is ⩽25mm.

4.制造完毕后支座螺栓孔中心圆直径允差以及相邻两孔和任意两孔弦长允差不超过2mm..
After monufocturing, the tolerance of center circle diometer of bose bolt hole ond the toleronce of chord length of two odjocent holesond ony two holes sholl not exceed 2mm.

5.衬砖钢壳内表面应平齐，焊缝表面应平整，不得保留有焊渣、焊瘤和毛刺；接管内缘转角处须修磨成圆滑过渡,圆角R3 ~ 6mm。
The inner surfoce of the brick lined steel shell shall be flat, and the weld surfoce shall be flat without welding slag. weld beoding and burr;the corner of the inner edge of the nozzle shall be polished into a smooth transition, with the fillet of R3-6mm.

6.不锈钢壳体和部件内部清除污垢去油后应进行酸洗钝化处理，所形成的钝化膜用蓝点法检查，无蓝点为合格
After the stainless steel shell and parts are cleaned of dirt and degreased, they shall be pickled and passivated. The passivation fim formed shall be inspected bythe blue dot method. If there is no blue dot, it is qualified.

7.支承分布板焊接安装后的平面度公差为3mm.
The flatness tolerance of support distribution plate after welding and installotion is 3mm

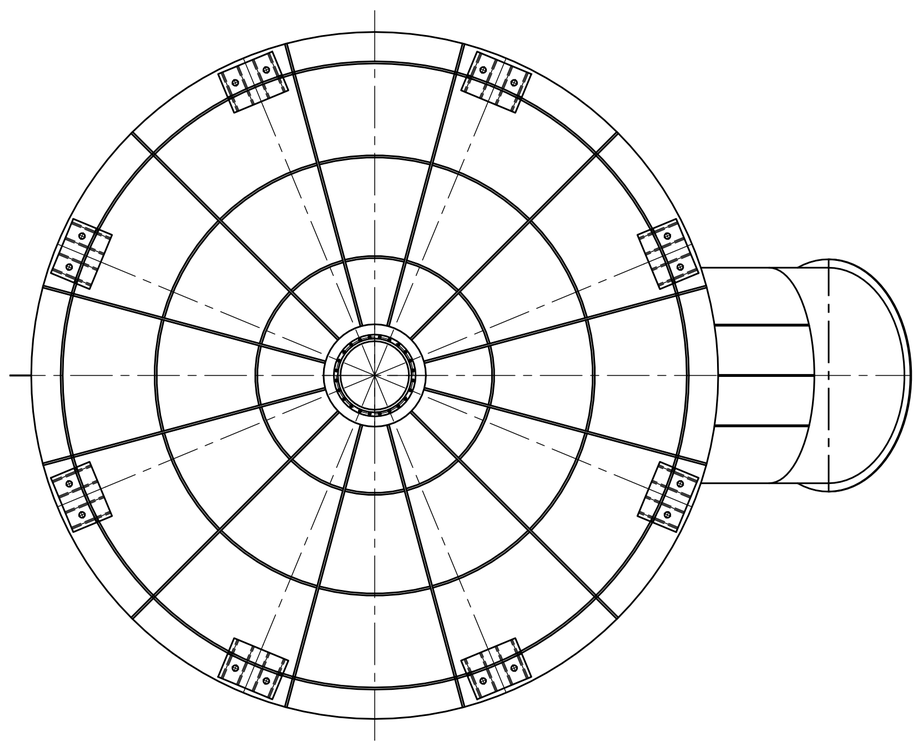
8.分酸器替入口的平面度公差为3mm.
The flatness tolerance of the inlet of the acid separator pipe is 3mm.

9.除注明外,所有焊接工作(包括工艺,电气,仪表,土建等的平台支架等)衬里后不许动用明火。
Unless otherwise specified, open fire is not allowed to be used after lining of all welding works (including platform supports for process, electrical, instrument, civil engineering, etc.)

10.认各制造完毕后应清除所有焊透,内壁打磨平整,并进行煤油渗漏试验。
After the equipment is manufoctured, all welding slag shall be removed, the inner wall shall be polished and flat, and kerosene leakage test shall be carried out.

11.管口及支座方位见工艺管口方位图.
See process nozze orientation drmng for nozle and support onentation.

工艺管口方位图？？？



件号 No.	图号或标准号 DWG. OR STAND. No.	名称 DESCRIPTION	数量 QTY.	材料 MATERIAL	单重 UNIT WEIGHT(kg)	总重 TOTAL WEIGHT(kg)	备注 REMARKS
16	42SCG-2-2-0	铭牌组件 Nameplate Assembly	1	组合件 COMPONENT		2.6	MP100
15	HG/T21574-2018	轴式吊耳 AXC-8-85-14 TRUNNION LUG	2	组合件 COMPONENT	183.4	367	
14	按本图 ACCORDING TO THIS DWG.	垫板 ø1200 t=14 PAD	2	Q235B	124.3	249	
13	P01-325A-JS-002-06	接液杯 PICK UP LIQUID CUP	2	组合件 COMPONENT	20.5	41	
12	P01-325A-JS-002-04	球冠形封头 SR7440X10 QIUGUANXING HEAD	1	S30403		3663	
11	按本图 ACCORDING TO THIS DWG.	环板 ø7670/ø7270 t=16 CIRCLE PLATE	1	S30403		596	
10	按本图 ACCORDING TO THIS DWG.	短节 DN7460,δ10 L=155 THE SHORT ANSWER	1	S30403		289	
9	按本图 ACCORDING TO THIS DWG.	筒体 DN7440,δ10 L=3684 SHELL	1	S30403		6838	
8	P01-325A-JS-002-05	管板 TUBE SHEET	1	组合件 COMPONENT		10144	
7	按本图 ACCORDING TO THIS DWG.	筋板2 t=14 STEEL PLATE	20	S30403	1.28	25.6	圆周均布 EQUALLY SPACED
6	按本图 ACCORDING TO THIS DWG.	筋板1 t=14 STEEL PLATE	20	S30403	1.25	25	圆周均布 EQUALLY SPACED
5	按本图 ACCORDING TO THIS DWG.	短节 DN7468,δ14 L=200 THE SHORT ANSWER	1	S30403		522	
4	按本图 ACCORDING TO THIS DWG.	筒体 DN7440,δ14 L=600 SHELL	1	S30403		1560	
3	P01-325A-JS-002-04	外加强圈 EXTRA STRONG RING	1	组合件 COMPONENT		992	
2	按本图 ACCORDING TO THIS DWG.	筒体 DN7440,δ14 L=8780 SHELL	1	Q235B		22596	
1	P01-325A-JS-002-02	塔底 BOTTOM	1	组合件 COMPONENT		20790	

1	壳体 SHELL	组合件 COMPONENT	77134	--	--	--
上级件号 UP LV. NO.	名称 DESCRIPTION	材料 MATERIAL	重量 WEIGHT	比例 SCALE	所在图号 DRAWING NO.	装配图号 ASS. DWG. NO.

版次 REV.	说明 DESCRIPTION	设计 DESIGND	校核 CHEKD	审核 APPRD	批准 AUTHD	日期 DATE
2	供制造 FOR MANUFACTURING					

中国化学工程第六建设有限公司
中国化学 CHINA NATIONAL CHEMICAL ENGINEERING SIXTH CONSTRUCTION Co., Ltd

PT KOLAKA NICKEL INDONESIA

KNI年产12万吨镍湿法项目配套4×1000kt硫磺制酸装置EPC工程
KNI's annual production of 120,000 tons of nickel hydrometallurgical project is supported by a 4X1000kt sulfuric acid plant

二吸塔
Final ABSORPTION TOWER
装配图
ASSEMBLY DRAWING
位号/ITEM NO.: P01-325A-HG-TW-103/203/303/403

干吸及低温热回收系统
DRY ABSORPTION SYSTEM
详细工程设计
DETAILED ENGINEERING

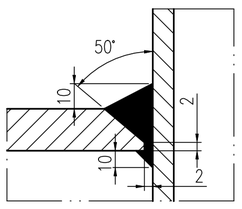
P01-325A-JS-002-01(2/3) 版 REV. 2

专业 SPECI	设备 EQUIPMENT	区域 AREA	--	比例 SCALE	1:50	第 SHT. 3 张 共 OF 9 张

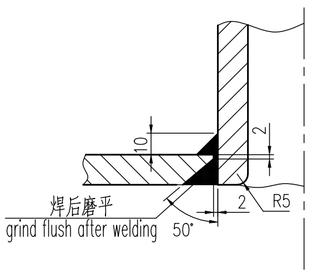
专业 SPECI	工艺 CP	仪表 IN	粉体 MA	给排水 WS					
签字 SIGNATURE									

A1 594×841

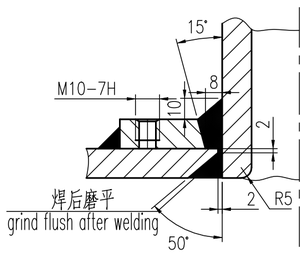
内伸接管管口节点详图
The stretch over nozzle detail drawing
1:4



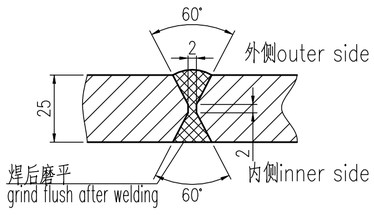
无内伸接管管口节点详图
No inner stretch over nozzle detail drawing
1:4



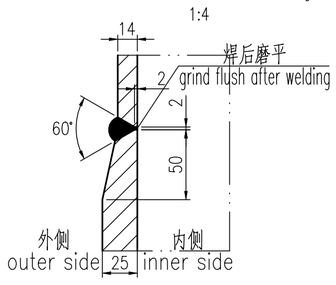
无内伸接管管口带补强圈节点详图
No inner stretch over nozzle with reinforcing ring detail drawing
1:4



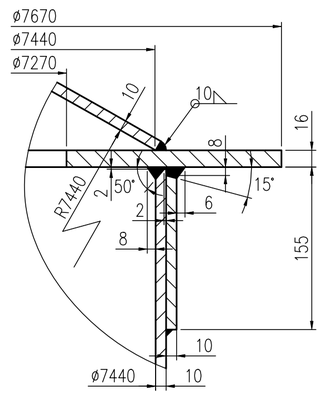
对接焊缝详图
Detail of butt weld
1:4



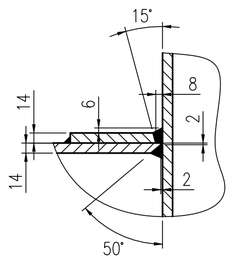
筒体与塔底焊接详图
Barrel and bottom detail of welding
1:4



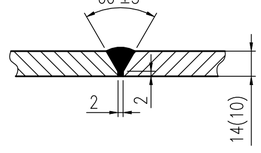
Ⅰ
1:5



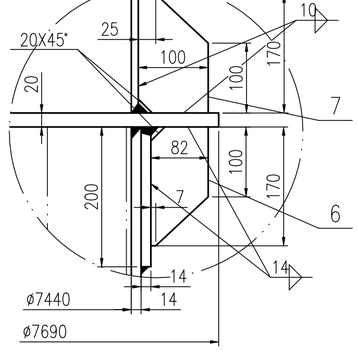
内伸接管管口带补强圈焊接详图
Detailed welding drawing of internally extending nozzle with reinforcing pad
1:4



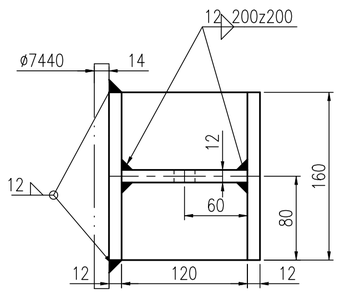
等厚板的对接焊缝图
Butt weld drawing of equal thickness plate
1:4



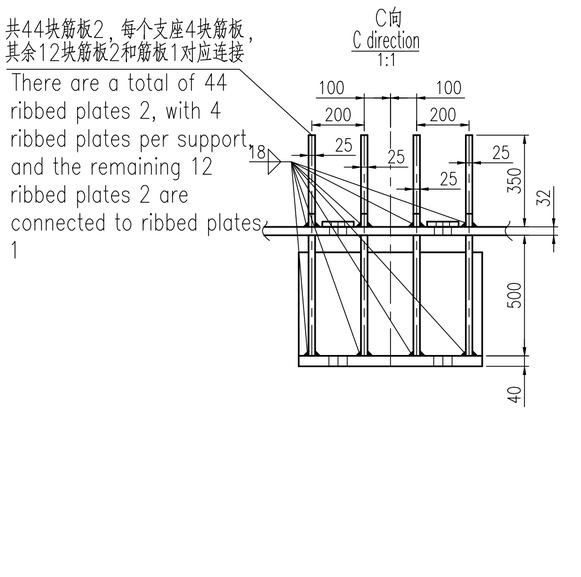
Ⅱ
1:5



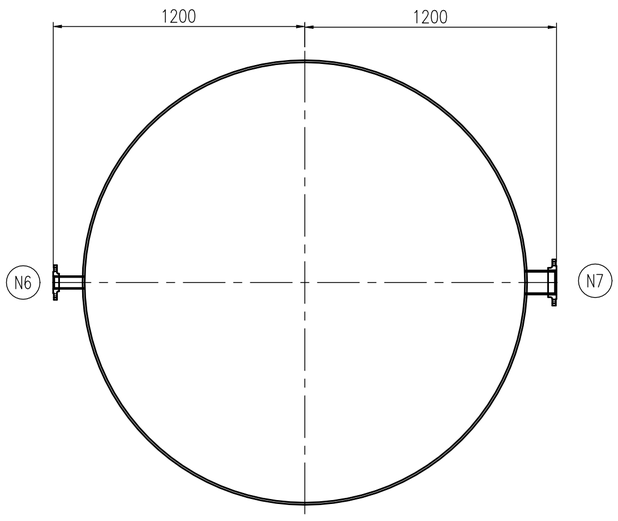
Ⅲ
1:5



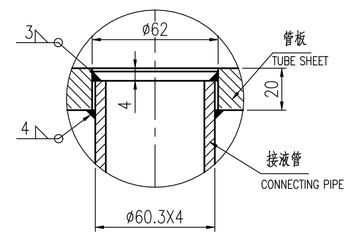
Ⅳ
1:5



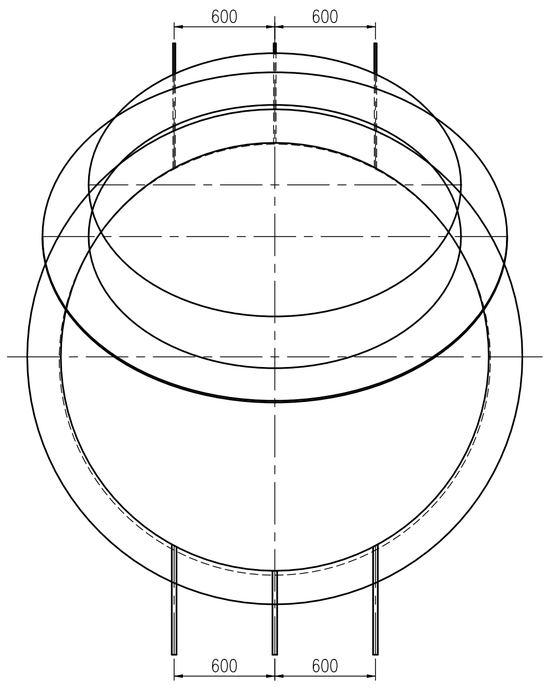
A向
A direction
1:5



管板与接液杯焊接详图
Detailed welding diagram of tube plate and liquid receiving cup
1:4



B向
B direction
1:1



共44块筋板2，每个支座4块筋板，
其余12块筋板2和筋板1对应连接
There are a total of 44 ribbed plates 2, with 4 ribbed plates per support, and the remaining 12 ribbed plates 2 are connected to ribbed plates 1

C向
C direction
1:1

技术协议要求N2为Q235B，N3\4管口材料耐酸合金，N5~7、P1~2,M1~5为S316L???

M1~4人孔为标准件，图在模型中

件号 No.	图号或标准号 DWG. OR STAND. No.	名称 DESCRIPTION	数量 QTY.	材料 MATERIAL	单重UNIT WEIGHT(kg)	总重TOTAL WEIGHT(kg)	备注 REMARKS
M4~5	按本图 ACCORDING TO THIS DWG.	补强圈 B=200 t=10 REINFORCING PAD	2	S30403	62.3	125	
	CERE21522-1000	水平吊盖人孔PL1000-2.5 RF MANHOLE	2	组合件 COMPONENT	544	1088	H=637, t=10, 垫片代号B
M3	按本图 ACCORDING TO THIS DWG.	补强圈 ø1220/ø820 t=10 REINFORCING PAD	1	S30403		51	
	CERE21519-800	垂直吊盖人孔PL800-2.5 RF MANHOLE	1	组合件 COMPONENT		291	H=253, t=10, 垫片代号B
M2	按本图 ACCORDING TO THIS DWG.	补强圈 ø1820/ø1420 t=14 REINFORCING PAD	1	Q235B		112	
	CERE21519-1400	垂直吊盖人孔PL1400-2.5 RF MANHOLE	1	组合件 COMPONENT		853	H=418, t=12, 垫片代号B
M1	按本图 ACCORDING TO THIS DWG.	补强圈 ø1620/ø1220 t=14 REINFORCING PAD	1	Q235B		98	
	CERE21519-1200	垂直吊盖人孔PL1200-2.5 RF MANHOLE	1	组合件 COMPONENT		657	H=400, t=12, 垫片代号B
P2	按本图 ACCORDING TO THIS DWG.	钢管 ø33.7x4.5 L=75 PIPE	1	S30403		0.25	
	GB/T9124.1-2019	法兰 DN25-PN16 SO RF Ⅰ FLANGE	1	S30403Ⅲ		1.25	
P1	按本图 ACCORDING TO THIS DWG.	钢管 ø33.7x4.5 L=107 PIPE	1	20		0.35	
	GB/T9124.1-2019	法兰 DN25-PN16 SO RF Ⅰ FLANGE	1	Q235B		1.25	
N7	按本图 ACCORDING TO THIS DWG.	钢管 ø60.3x4 L=145 PIPE	1	S30403		0.81	
	GB/T9124.1-2019	法兰 DN50-PN16 SO RF Ⅰ FLANGE	1	S30403Ⅲ		2.39	
N6	按本图 ACCORDING TO THIS DWG.	钢管 ø114.3x6.3 L=144 PIPE	1	S30403		2.44	
	GB/T9124.1-2019	法兰 DN100-PN16 SO RF Ⅰ FLANGE	1	S30403Ⅲ		4.38	
N5	按本图 ACCORDING TO THIS DWG.	钢管 ø114.3x6.3 L=222 PIPE	1	20		3.7	
	GB/T9124.1-2019	法兰 DN100-PN16 SO RF Ⅰ FLANGE	1	Q235B		4.38	
N4	按本图 ACCORDING TO THIS DWG.	钢管 ø813x20 L=384 PIPE	1	Q235B		150	
	GB/T9125.1-2019	螺母 M27 2型 NUT	48	30CrMoA	0.15	3.6	
	GB/T9125.1-2019	全螺纹螺柱 M27x160 FULL THREAD STUD	24	35CrMoA	0.61	14.6	
	GB/T9124.1-2019	法兰 DN800-PN2.5 PL RF Ⅰ FLANGE	1	Q235B		66	
N3	按本图 ACCORDING TO THIS DWG.	补强圈 ø1111/ø711 t=14 REINFORCING PAD	1	Q235B		62.9	
	按本图 ACCORDING TO THIS DWG.	钢管 ø711x16 L=373 PIPE	1	Q235B		102	
	GB/T9125.1-2019	螺母 M24 2型 NUT	48	30CrMoA	0.099	4.75	
	GB/T9125.1-2019	全螺纹螺柱 M24x145 FULL THREAD STUD	24	35CrMoA	0.428	10.3	
	GB/T9124.1-2019	法兰 DN700-PN2.5 PL RF Ⅰ FLANGE	1	Q235B		48.5	
N2	P01-325A-JS-002-04	烟气出口 GAS INLET	1	组合件 COMPONENT		492	
N1	P01-325A-JS-002-03	烟气进口 GAS INLET	1	组合件 COMPONENT		4183	

管口组件明细表(件号11) LIST OF NOZZLE COMPONENTS (No. 11)

总重(weight)：8434 kg

版次 REV.	说明 DESCRIPTION	设计 DESIGN	校核 CHEKD	审核 APPRD	批准 AUTHD	日期 DATE

中国化学工程第六建设有限公司
中国化学 CHINA NATIONAL CHEMICAL ENGINEERING SIXTH CONSTRUCTION Co., Ltd

PT KOLAKA NICKEL INDONESIA

KNI年产12万吨镍湿法项目配套4×1000kt硫磺制酸装置EPC工程
KNI's annual production of 120,000 tons of nickel hydrometallurgical project is supported by a 4X1000kt sulfuric acid plant

二吸塔
Final ABSORPTION TOWER
装配图
ASSEMBLY DRAWING

干吸及低温热回收系统
DRY ABSORPTION SYSTEM

详细工程设计
DETAILED ENGINEERING

位号/ITEM NO.：P01-325A-HG-TW-103/203/303/403

P01-325A-JS-002-01(3/3)

版 REV. 2

专业 SPECI	设备 EQUIPMENT	区域 AREA	--	比例 SCALE	1:50	第 SHT. 4 张 共 OF 9 张