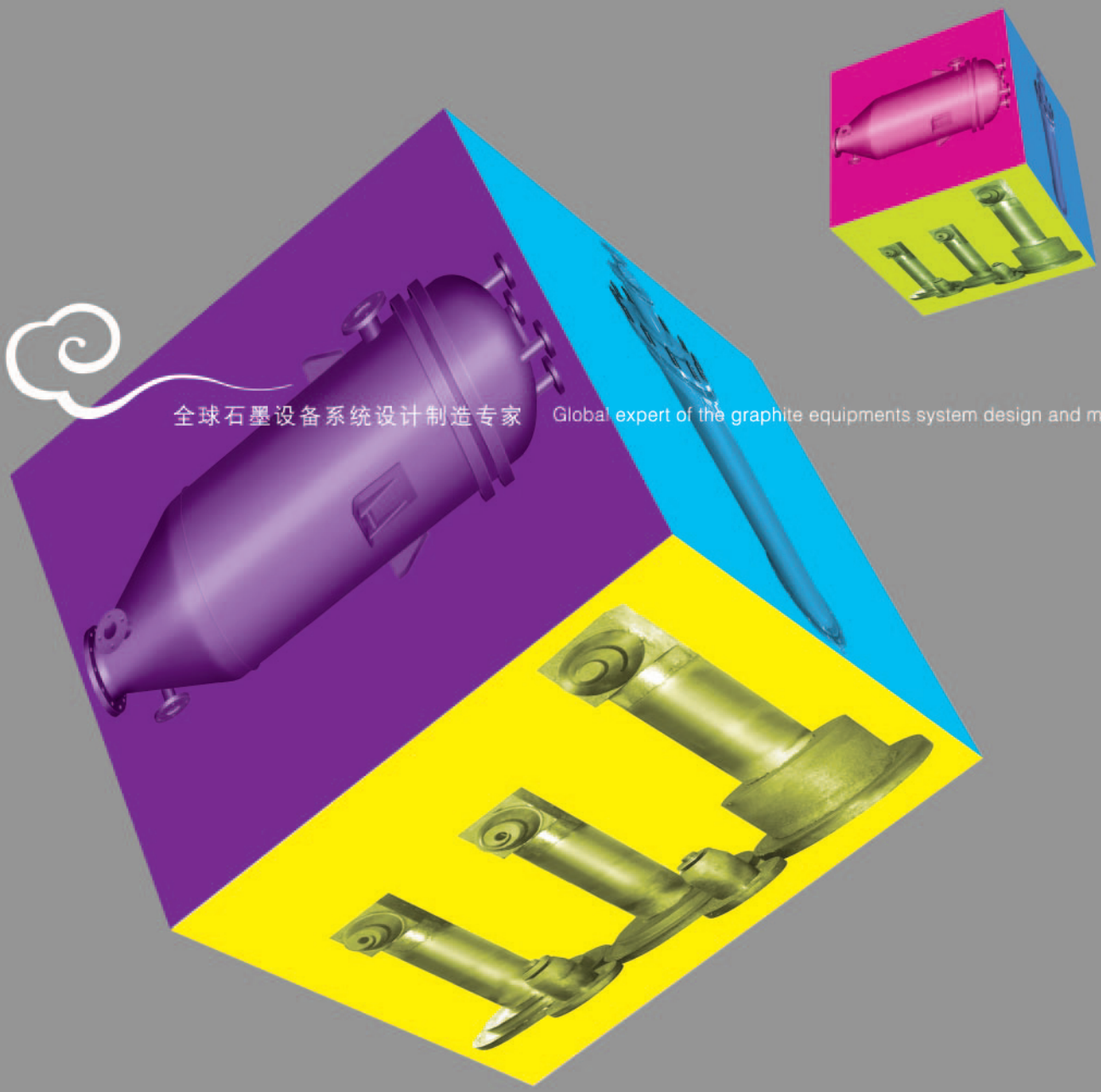
三圣
SUNSHINE

工艺设备

Process Equipment

南通三圣石墨设备科技股份有限公司

NANTONG SUNSHINE GRAPHITE EQUIPMENT TECHNOLOGY CO.,LTD.



全球石墨设备系统设计制造专家　Global expert of the graphite equipments system design and manufacture.

公司简介：
Company Introduction

南通三圣石墨设备科技股份有限公司，通过2008《高新技术企业认定管理办法》认定的高新技术企业，全球三大石墨设备制造商之一，中国中小企业100强，公司现已进入上市轨道。

公司同时拥有由国家质量监督检验检疫总局首批颁发的《非金属（石墨）压力容器制造许可证》和《非金属（石墨）压力容器设计许可证》，拥有33项国家专利和多项专有技术，其中多项专有技术达到或超过国际先进水平。

公司是法国国际检验局（BV）审核通过的ISO9001：2000认证企业，是国内惟一包括废硫酸浓缩工艺设计、石墨设备设计、石墨设备制造三项同时通过审核的石墨设备制造企业，并且是国内惟一通过PED质量体系认证，出口欧盟免检的石墨设备供应商。

公司拥有省级自营进出口权，出口产品按照欧洲AD压力容器标准或美国ASME标准制造，产品远销德国、瑞士、法国、瑞典、荷兰、美国等20多个国家和地区。

Nantong Sunshine Graphite Equipment Technology Co., Ltd. A hi-tech enterprise certificated according to the "Certification Method of Hi-tech enterprise (version 2008)", is one of the three largest graphite equipments manufacturers in the world, and one of the best 100 middle and small size enterprises in China. Now, the company is gong to be a listed company.

The company passed the design qualification inspection and manufacture qualification inspection of non-metal (graphite) pressure vessels by China State Quality Supervision, Inspection and Quarantine Bureau. The company has 33 patents and many technical know-how, most of them reach or exceed advanced international standards.

The company got the ISO 9001:2000 certification by BV (France), is the only domestic enterprise certificated covering the design of waste sulfuric acid concentration process, the design and manufacture of graphite equipment. Also the only enterprise certified by the PED Quality System Certification. Now, the company is the graphite equipment supplier to EU exempted from inspection.

The company has the provincial import and export license. The products manufactured according to the AD pressure vessels standard of Europe or ASME standard of USA. The products exported to more than 20 countries or regions including Germany, Switzerland, Sweden, Holland, USA, etc.

三圣总部
HQ of Sunshine Group

三圣工业园
Sunshine Industrial Park

XYKCH新型石墨硫酸稀释冷却器
XYKCH new model graphite sulfuric acid dilution cooler

专利号：ZL 97 2 36809.4　　Patent No: ZL 97 2 36809.4

结构与特点：

上部为浓硫酸和稀释剂混合、稀释、分配部分，与酸接触之材料为聚四氟乙烯，下部为圆块孔式石墨冷却器。可以将浓硫酸的浓度从98%稀释到65%以下，然后可以直接冷却降温到40℃以下。

设计温度：−20—180℃

设计压力：服务侧系统：≤0.6MPa

工艺侧系统：≤0.1MPa

规　　格：3−500m²/台 根据客户要求设计、制造，可设计立式或卧式。
也可设计全套工艺及操作规程。

Structure and Features:

New model concentrated sulfuric acid dilution cooler is devided into two parts of upper and lower parts. The upper part serves the mixing, dilution, distribution of concentrated sulfuric acid and diluter. It adopts the PTFE material, structures two-layer mixed special flow. The lower part is holed-circular-block-type graphite cooler. This model is the most advanced equipment in sulfuric acid dilution process. It can dilute concentrated sulfuric acid from 98% to 65% below in concentration and simultaneously directly cool it down to below 40℃ after dilution.

Design temperature:-20 - 180℃

Design pressure: ≤0.6MPa for cooling system:
≤0.1MPa for process fluid, longitudinal

Size: 3 - 500m² / unit

Or design and manufacture according to customer' s requirements.
Can provide whole-set process and operation regulations.

HUX型化工尾气综合吸收塔
HUX model chemical tail gas complex absorbing column

专利号：ZL 96 2 23446.X（获南通市“十佳”专利称号，南通市“百亿”工程项目）
发明人：冯圣君

Patent Number: ZL 96 2 23446. X (Honored "Best Ten" Patent in Nantong, "Ten Billion" Project in Nantong)
Inventor: Feng Shengjun

设备性能优点：

主要应用化工、农药、冶金、轻工、化纤、医药等行业排放的工业尾气：HCL、CL_2、SO_2、H_2S、HF、P_2O_5等的吸收。

Structure and features:

Tail gas from Chemical Industry can be absorbed, treated and recycled in one step (also can be in recycling) by this column,simplifies the traditional multi-step cooling and absorbing.It can mainly be applied to Chemical Industry, Pesticides, Metallurgy, Light Industry, Synthetics Fiber, Pharmaceutics and other industries' tail gas: HCL,CL_2,SO_2,H_2S,HF,P_2O_5.

技术特性：

吸收效率：99.9%　每日吸收量：3T/m^2　吸收液最大喷淋量：57-228Kg/h•m^2　冷却水用量：2T/ h•m^2

冷却水温度：20℃~25℃　总传热系数：K=600-750W/m^2 •℃　使用温度：-20~170℃

设计压力：服务侧：≤0.6MPa　工艺侧：≤0.2MPa

规　　格： HUX30处理吸收量9T/d　HUX40处理吸收量12T/d

……　HUX100处理吸收量150T/d

或根据客户要求设计、制造。

Technical property:

Absorbing efficiency: 99.9%
Absorbing quantity/day: 3T/m^2
Max. spraying quantity for absorbing liquid: 57-228kg/h•m^2
Cooling water quantity: 2T/h•m^2
Temperature of cooling water: 20-25℃
Total thermal conductivity: K=600-750w/ m^2•℃
Allowable temperature: -20~1700C
Design pressure: Tube side: ≤0.6MPa
Shell side: ≤0.2MPa

Specification: HUX 30 treating inlet 9T/d
HUX 40 treating inlet 12T/d
……
HUX100 treating inlet 150T/d
Or design and manufacture according to customer's requirements

SSWQL型钛白粉炉窑尾气提浓稀硫酸石墨塔(石墨文丘里塔)

SSWQL weak sulfuric acid concentration graphite column used with titanium dioxide kiln tail gas (graphite Venturi)

专利号：ZL 01 2 17393.2 **Patent Number: ZL 01 2 17393.2**

硫酸法钛白粉生产中会产生大量的废酸（含H_2SO_4约20%，$FeSO_4$约10%），治理并回收利用这些废酸是解决环保促进硫酸法钛白工业发展的重要课题。同时，大量300—480℃左右的转窑热尾气直接排空，浪费大量热能并污染空气，回收利用减轻对空气的污染。

我公司开发的"利用钛白粉炉窑热尾气提浓稀硫酸石墨塔"，是采用聚四氟乙烯浸渍石墨新型材料制造，并用美国陶氏高分子材料作特殊设计，有效克服了碳钢与石墨材料线膨胀系数不一致，结合不稳定易剥落的弊端，使不同材料之间的线膨胀量得到相互补偿，趋于平衡。对转窑热尾气与稀废硫酸进行综合处理，提浓废硫酸的同时解决了两大污染源的问题，一举两得。

使用条件：在保持喷淋液的流量、压力的情况下，进气温度允许100—550℃

A great amount of waste acid is generated during the process of sulfuric acid method to produce titanium dioxide (approximately contains 20% H_2SO_4, 10% $FeSO_4$). Treatment and recovery of these waste acids are an important issue in environment protection and development in sulfuric acid method to produce titanium dioxide. In the mean time, a large volume of rolling kiln hot tail gas at about 300 ~ 480℃ is let out directly to atmosphere, much thermo energy is wasted and pollution is caused to the air.

The "concentration and recycling system for waste diluted sulfuric acid" adopts "Titanium Dioxide Kiln Tail Gas weak sulfuric acid concentration graphite column" as one of the main equipments, uses the new material of PTFE impregnated graphite, treats the hot tail gas from rolling kiln and the diluted waste sulfuric acid comprehensively, to reduce energy consumption and to solve the problem of two pollution sources, double effects with single effort.

Working conditions: inlet gas temperature of 100–550℃ is allowable while the flow rate and pressure of spraying liquid are fixed.

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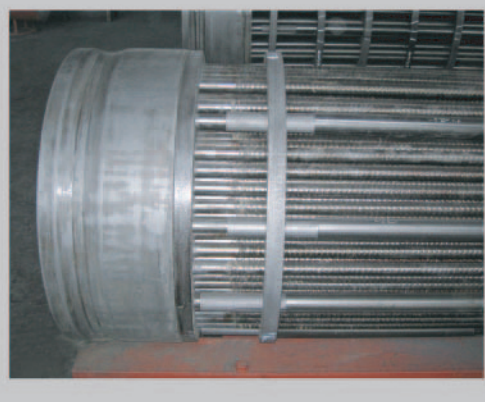
SSXTG型新型套管式石墨换热器
SSXTG sleeve type graphite heat exchanger



该换热器能承受较高的操作压力，可实现全逆流操作，传热效率极高。即使载热体流量较小时，也能获得较高的流速，并可有效防止杂质的沉积。如果外管和内管均采用石墨制材料时，可用于两种腐蚀性介质的热交换。该换热器适用于小流量或中等流量，并且对传热要求较高的场合。

The heat exchanger could stand high working pressure. The design ensures high flow rate even when the flow of heating agency is relatively less, and effectively prevents from foreign substance deposition. If both inner tube and sleeve are made from graphite, the equipment could be used for heat transfer between two corrosive mediums.The exchanger is applicable to small to middle flow and strict requirement of heat transfer.

SSXFY型新型石墨反应器
SSXFY new model graphite reactor

结构与特点：

SSXFY新型石墨反应器适用于强腐蚀性气体与液体的混合反应。 本型设备采用增强型石墨管作为反应室，气体入口处设有独特的结构确保气体的均匀分布，反应室内可根据气体特性填加填料，以尽可能延长气体在反应室内的停留时间，液体入口处设有溢液成膜装置，使得液体在流动过程中形成1—1.5mm厚的薄膜，这样的结构将最终保证气体与液体的充分混合接触，以达到良好的反应效果，同时，还设有冷却夹套，移走反应过程中产生的热量。

设计温度：≤ 170℃

设计压力：≤0.6MPa

或根据用客户要求设计、制造。

Structure and features:

SSXFY Graphite Reactor is applicable to mixing reaction of corrosive gas and liquid. The equipment use reinforced graphite shell as reacting chamber with specially designed structure on gas inlet to make sure uniform distribution of gas. It is possible to add packing material in reacting chamber according to gas characteristics, in order to let gas stay in reacting chamber for longer time. A specially designed structure on liquid inlet makes liquid form a film of 1–1.5mm thick in flowing, which can make sure sufficient mixture of gas and liquid. Cooling jacket is available for taking out reacting heat.

Dsign temperature: ≤ 170℃

Design pressure: ≤0.6MPa

Or design and manufacture according to customer’s requirements

SSTHG型碳化硅换热器
SSXGH silicon carbide heat exchanger

结构与特点：

碳化硅换热器为耐强腐蚀耐高温的化工设备。设备材质为SiC及PFA，能够广泛地作为防腐蚀的结构材料，与其它材料相比较，化学稳定性较好，几乎可以抵抗任何化学品的腐蚀。作为热交换材料，碳化硅的导热率极佳，其管壁厚度可在2mm以下，因此其导热性能及佳，一般情况下，仅需要相当小的换热面积，并且其机械性能很好，可承受较大的机械应力和热应力。该换热器由壳体及管板等不同部件组成，每个部分都可以根据客户要求进行单独设计。碳化硅换热器安全运行的心脏部件是管板的设计，每一端的管板都由两片加衬的PFA的碳钢组成，确保了设备的安全运行和耐腐蚀性。该换热器特别适用于冷凝、冷却、加热及蒸发强腐蚀性介质。

Structure and features:

Silicon carbide heat exchanger is anti-corrosive and high-temperature resistant chemical equipment. Main materials for the equipment are SiC and PFA. Compare with other materials, SiC and PFA possess better chemical stability, nearly are universal chemical-resistant. As a heat-exchange material, thermal conductivity of SiC is excellent, and thickness of SiC tube could be less than 2mm, these mean high heat transfer performance and relatively less surface needed. Meanwhile, SiC could stand high mechanical stress and heat stress. The heat exchanger is composed with shell and tubesheet etc, each part could be separately designed according to customer requirements. The heart of SiC heat exchanger is the design of tubesheet. We use two pieces of PFA lined carbon steel to form tubesheet for each end, and this design guarantees safety operation and anti-corrosive performance of the equipment. The exchanger is especially applicable for condensing, cooling, heating and evaporating corrosive mediae.

优　　点：

所需空间小
容易操作
维修费用少
操作安全性更高
设计温度：-15℃～220℃
设计压力：-0.1～0.8MPa
主要尺寸：换热面积：0.5～50m²
管子长度：1.0～5m
壳体尺寸：DN100～DN500

Advantages:

Less space occupation
Easier operation
Less maintenance cost
More reliable operation
Design temperature: -15℃~220℃
Design pressure: -0.1~0.8MPa Dimension:
Heat exchange surface: 0.5~50m²
Tube length: 1.0~5m Shell size: DN100~DN500

石墨砖板衬里
Graphite brick liner

结构与特点：

石墨砖板衬里以不透性石墨砖板为原材料，酚醛、呋喃、氟复合树脂等树脂或水玻璃胶泥为粘结剂，衬于钢制容器、玻璃钢容器等需进行防腐的设备，并采用美国陶氏高分子材料进行特殊设计，有效克服了碳钢与石墨材料线膨胀系数不一致，结合不稳定易剥落的弊端，使得不同材料之间的线膨胀量得到相互补偿，趋于平衡。衬里采用双层砖板交错结构，具有结构强度大、防渗漏性能好等特点。

技术特性：（按HG5—1322—80制造）

设计温度：＜170℃（酚醛树脂浸渍）

＜200℃（氟复合树脂浸渍）

设计压力：按容器设计等级，0—1.0MPa或更高

规　　格：根据客户提供的容器加工或就客户提供设计图样制造加工。

亦可根据客户要求的工作压力进行设计、制造。

Structure and features:

Graphite brick liner takes imperpermeable graphite brick board as raw material, using phenol aldehyde, furan and other resin or water glass daub as adhesive, lined in the part where anti-corrosion is needed inside the steel vessels, fiber glass vessels. The liner adopts crossing structure with two layers of bricks, it has a feature of strong structure, good property of anti-permeation.

Technical properties: (manufacture according to HG5-1322-80)

Design temperature：<170℃(phenolic resin impregnated)

<200℃(PTFE impregnated)

Design pressure:0-1.0MPa or even higher according vessel design grades

Size: Manufacture according to customer's vessel or drawing.

SSXBZ型新型石墨薄膜蒸发器
SSXBZ new model graphite thin film evaporator

1. 刮板式薄膜蒸发器

本设备适易于高粘度、高沸点，微量组份分离的浓缩精馏，由于系统可在300Pa以下的极限真空度下运行，夹套可耐0.6MPa表压（可以根据用户要求进行设计）的蒸汽加热，用加料离心雾化，刮板二次强制成型薄膜的原理，物料在汽化浓缩精馏过程中停留的时间极短，避免了热敏感产品以及易聚产品在浓缩精馏过程中的副反应，大大提高了浓缩精馏收率及保证了产品的质量，由于中轴线无叶轮，易造成液滴在加料离心雾化碰撞薄膜蒸发器加热壁反弹从中轴线落下蒸发器下部，对于易聚合爆炸的产品浓缩蒸发显然不够理想。

Scrapper type thin film evaporator

The equipment is applicable to concentration and rectification of highly viscous, high boiling point material. Since the system could be operated under the final vacuum below 300Pa, and the jacket of the equipment could stand 0.6MPa gauge pressure steam (designed on request of client), adopting centrifugal atomization process, scrapper compulsively disperse liquid drops again and form into thin film, so residence time of material during concentration and refining is very short, hence avoid side reaction of thermal-sensitive and easily polymerized material during concentration and refining process, quality of the product is ensured. The equipment is not perfect for concentrating or evaporating easily polymerized and explosive material.

2. 离心式薄膜蒸发器

本设备适易于高粘度，高沸点，易聚合易爆炸的浓缩精馏，由于系统可在300Pa以下极限真空度下运行，夹套可耐0.6MPa表压（可以根据用户要求进行设计）的蒸汽加热，采加料离心雾化，四组叶轮进行二次强制离心粉碎液滴并雾化成膜，物料在汽化浓缩精馏过程中停留时间极短，如产品纯度要求此较高时，出汽管的垂直高度可根据经验加高出汽管高度，利用空气冷却进行内回流，也可以使用冷却介质进行冷却内回流。避免了热敏感产品，微量组份分离，易聚合易爆炸产品在浓缩精馏过程中的副反应，大大提高了浓缩精馏产品收率和纯度的保证，由于中轴有四组内叶作用，有效避免了加料离心雾化液滴碰到薄膜蒸发器高温内壁后反弹从中轴线落下蒸发器下部的缺陷，特别适易于易聚合易爆炸的产浓缩精制，生产能力可随客户要求进行设计。

Centrifugal type thin film evaporator

The equipment is applicable to concentration and rectification of highly viscous, high boiling point, easily polymerized, explosive materials. Since the system could be operated under the final vacuum below 300pa, and the jacket of the equipment could stand 0.6Mpa gauge pressure steam (designed on request of client), adopting centrifugal atomization process, four sets of impeller compulsively centrifugally disperse liquid drops again and form into thin film, so residence time of material during concentration and refining is very short. Lengthen the vertical height of vapor outlet pipe could obtain higher purity product. The design avoids side reaction of thermal-sensitive and easily polymerized material during concentration and refining process, absorption rate of concentration and refining and purity of the product are ensured. The structure of four sets of impeller make the equipment especially applicable for concentrating or evaporating easily polymerized and explosive material.

FHH型反应釜内环流式石墨换热器
FHH Recirculating–type Graphite Heat Exchanger in Reactor

专利号：ZL 98 2 26524.7　　Patent No: ZL 98 2 26524.7

结构与特点：

本设备用于反应罐内化学介质中，在反应剧烈放热时，可快速冷却（夹套冷却不及时）防止产生过多的副产物，加快反应速度，缩短反应时间。也可作加热器、蒸发器，不影响反应斧内的搅拌。　代替传统的铅，不锈钢盘管式换热器，本设备材质为浸渍石墨块，流体通道为石墨块，较铅、不锈钢等材料有良好的耐腐蚀性和十多倍的导热系数。

规　　格： 可按反应罐大小来确定，从500L–30000L均可，

换热面积： 5m²–150m²

设计压力： 0.6MPa

Structure and features:

The equipment is located among chemical media inside the reactor. In the case the jacket cooling device could not Drastic reaction heat could be cooled quickly to prevent from generation of excessive byproducts, and to shorten reaction time. When used as heater or evaporator, the unit would not effect agitation. Impregnated graphite is used for the equipment instead of lead or stainless steel, it ensures good corrosion resistance and 10 times heat transfer coefficient more than lead and stainless steel.

Size: determined according to reactor size, range of 500L–30000L is available.

Heat transfer area: 5m²–150m²

Design pressure: 0.6MPa

SSSL型反应釜内置鼠笼式石墨换热器
SSSL cage-like graphite heat exchanger inside reactor

结构原理与FHH型相似，流体通道为石墨管；具有流体阻力小，设备重量轻，安装简单，维修方便等优点。

The equipment is similar to FHH type heat exchanger, with advantages of less fluid resistance, less weight of the unit, simple installation, and convenient maintenance.

SSXGL型高粘性物料超滤管式过滤器
SSXGL high viscous fluid ultrmicro filtration tubular type filter

专利号：200520072095.4　　Patent Applying Number: 200520072095.4

SSXGL型超滤高粘液体管式过滤器主要特点：

1、对人员和环境的保护。
静态封闭的过滤系统避免操作人员与产品的直接接触，大大的降低了被污染的风险。
2、高耐腐蚀性能。
3、可半自动或全自动操作。操作系统可采用PLC控制系统自动控制过滤过程，也可以人工手动操作。
4、操作简便、安全性高。过滤过程的任一个环节出现故障，都可以关闭相应的手动阀门将其切断。
5、滤料品种多，选用范围广。过滤器可选用多种型号的毡和孔径小于0.5um的多孔膜作为滤布，给滤液提供了广阔的选择范围。
6、由于滤层压力高（单位滤层的压力），解决了高粘度，高油脂悬浮液难过滤的难题。
7、体积小、占地面积小。跟相同处理量的传统过滤器相比，体积仅是它们的八分之一。过滤能力远远大于其它过滤设备。
8、可自动清洗、连续过滤。可在数秒内自动清洗滤芯，清洗时无需将料液排空，清洗结束后过滤器立即进入过滤状态，整个过程由PLC控制系统周期循环控制。
9、寿命长，运行成本低。
10、过滤、增稠、干燥三功能于一体。

液体管式过滤器应用领域：

1、钛白生产中，酸解钛液过滤除渣；一洗、二洗的铁、钛洗涤分离，一洗后， Fe离子≤100ppm， 二洗后Fe离子≤15ppm；浓缩废酸中回收TiO_2；污水处理净化，回收水资源；
2、氯碱工业中的盐水精滤。
3、染料化工的废水处理。
4、钢铁工业酸洗的过滤。
5、精细化工、医学。

Main features of the filter :

1. Protect the staff and the environment The static sealed filter system avoids the direct touch between the staff and the product, largely reduce the risk of the pollution.
2. High anticorrosion performance
3. Half-control or auto-control The operating system adopts PLC controlling system to control the operating process automatically, also can be operated by hand.
4. Convenient operation and high safe performance. If any malfunction occurs in the operating process, cut off by closing relative hand-valve.
5. Many kinds of filter cloth, widely choice range. Many types of felt and Multi-hole membrane with hole diameter $\Phi \leqslant 0.5\,\mu m$ can be chosen as filter cloth , offer largely choice range for the filtrated suspension. 6. For the higher liquor pressure on the filtering layer, the problem of high viscosity, high grease suspension hard leaching can be solved.
7. Small volume, space saving Comparing with the traditional filter to the same treatment quantum, the volume is only 1/8 of it. Filtration ability is much larger than others.
8. Wash automatically and filtrate continuously. Wash the filter pipe automatically in a few seconds, no need to discharge the suspension when cleaning. After washing, the filter can start to lfiltrate at once, the whole process is controlled by the PLC system for periodic circulation.
9. Long life, low cost.
10. Filtration,thickener and drying function as a whole .

Applications of the filter:

1.In the titanium dioxide production, remove the residue away the black liquor from digestion; separate Fe and Ti from the 1st and 2nd washing. After the 1st washing, the content of Fe ion is not more than 100 ppm, and the content of Fe ion will be less than 15 ppm after the 2nd washing; titanium dioxide recovery during the process of waste acid concentration; purify the waste water and clean water recovery.
2.Special filtration of the brine in the Chlorine and alkali industry.
3.Waste water treatment in the dye industry.
4. The leaching of acid washing in steel industry.
5. Fine chemistry and medicine.

设计温度：-20~150℃
设计压力：0.4-1.0MPa
过滤面积：2-300m²
Design temperature：-20~150℃
Design pressure：0.4-1.0MPa
Filtration area：2-300m²

化工管道安全罩（专利保护）
Safety shield (protected by patent)

应用与特点：

该产品采用耐腐蚀性能良好的PP材料制作而成，广泛应用于众多的化学化工领域。对于在有酸、碱或压强在0.1MPa以上的管道系统中，为了保证生产及人身的安全，必须对法兰连接加以保护，以防止在泄漏情况下，介质无控制地喷溅。使用该产品能立即减少喷溅压力，并可在不拆除法兰的情况下进行检查。

Applications and features:

The safety shield is made of anti-corrosive material PP, and extensively used in chemical industry. In order to ensure manufacturing and personal safety, flange connections in pipe systems with acids, alkaline or pressure of more than 0.1MPa should be protected against the uncontrolled sprayout of media in case of a leakage. Using of the products could reduce the pressure of the spray instantly, and provide visual inspection of pipe joints.

使用温度： −40℃～110℃
规　　格： 每卷长：50m
宽　　度： 50，70，100，140，180mm

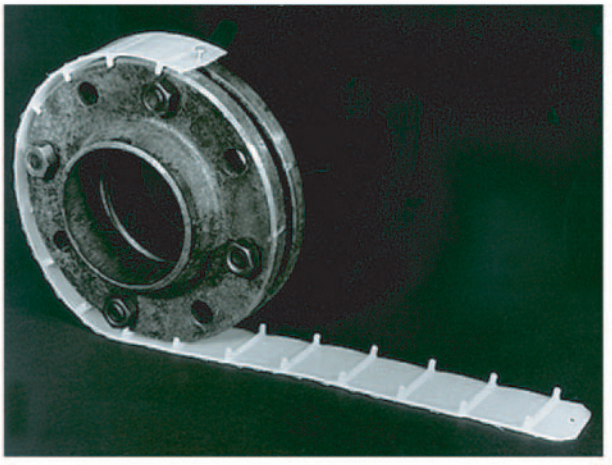
Working temperature: −40℃~110℃
Length of the roll: 50mv
Available width: 50, 70, 100, 140, 180mm

优　　点：

使用寿命长
节省存储空间和相关成本
便于取用：从带卷上剪下所需长度，包在法兰周围，并用螺钉固定。 抗紫外线，适于户外使用。

Advantages:

Long service life
Storage space and cost saving
Easy handling: cut the needed length off the roll, wrap it around the flange and fix it with a screw.



SSTBZ型钛液专用石墨薄膜蒸发器
SSTBZ graphite film evaporator for titanic liquid

结构与特点：

SSTBZ钛液专用石墨薄膜蒸发器用于钛液的蒸发浓缩，设备加热部分采用氟复合树脂浸渍石墨加工成蒸发通道，具有传热效率高，结构强度高等特点，特殊设计的蒸发室保证良好的汽液分离效果，整体设备的性价比远远优越于其它材质类似设备。

设计温度：200℃（或根据客户要求设计可达240℃）

设计压力：0.6MPa（或根据客户要求设计可达1.0MPa）

Structure and features:

The equipment is new substitute for titanic liquid. Evaporating pass in the equipment made by fluorine resin impregnated graphite has the features of high heat transfer efficiency and high structural strength.

Specially designed flash chamber makes sure sufficient separating of vapor and liquid.

Design temperature: 200℃ (design for temperature of 240℃ is available according to customer's requirements)

Design pressure: 0.6MPa (design for pressure of 1.0MPa is available according to customer's requirements)

SSSPZ型石墨喷嘴
SSSPZ graphite ejection nozzle

我公司根据客户的不同要求和使用条件设计加工的 石墨喷嘴，具有耐腐性能优越，雾化效果好，不易堵塞，使用寿命长，更换简单等优点。

Graphite ejection nozzle designed and fabricated according to customer requirements has advantages of exceptional corrosion resistance, excellent atomization, blocking-free, long life span and convenient replacement.

检测和实验
Inspection and experiment

检测和实验中心配备有专业技术人员和检测设备，负责为客户使用介质推荐可靠的防腐蚀材料、材料质量检测、半成品检测、成品综合指标检测，同时参与公司的新材料、新工艺的研发工作。

1、当接到客户的订单时，我们会根据客户工艺条件进行多种石墨材料在该条件下的耐腐蚀实验，选择合适的材料推荐给客户。

2、根据客户的工艺条件通过模拟实验确定传热系数“k”值，确定合理经济的换热面积和产品和结构形式。

3、设备选型确定后，我们对选用的石墨材料进行抗拉、抗弯、抗压等综合机械性能和物理性能测试，确保证所使用的材料质量。

4、凡是粘接部件，必须进行试件抗拉强度检测后，才可进行同等条件下的施工。

5、所有石墨成品必须通过综合指标检测方可进入组装工序。

6、为保证产品的质量，必须按相关标准和图纸设计要求进行综合指标测试，经质量评定合格后方可发货。

7、对废酸回收系统进行中试运行。

我公司实验室建有多条综合工艺流程装置，可以根据客户提供的介质，进行各种状态下的模拟运行测试，从中找到较佳的工艺流程。

Inspection and experiment center of the company is equipped with specified testing devices and professional technicians. It could offer reliable testing results to customers about material, material quality, semi-manufactured products and finished products according to different media, and is involved in development of new material and new process.

1.After receipt of purchasing order, do anti-corrosion test on graphite material under the process conditions offered by the customer and recommend suitable material to the customer.

2.Determine heat-transfer coefficient K value according to customer offered process conditions by analog test, than find reasonable and economic heat-transfer area and structure.

3.After the determination of equipment type, do mechanical and physical performance test, eg. tensile test, bending test and compression test, etc., on selected graphite material to ensure reliable quality.

4.For kitting parts, manufacture under the same conditions as for sample tensile test.

5.Assemble all the graphite parts after passed comprehensive performance tests.

6.To guarantee quality of the product, do comprehensive performance tests according to related codes and requirements on drawings, and deliver only when quality is acceptable.

7.Pilot-run the waste acid recovery system.

三圣 SUNSHINE

左图：化学分析室
右图：理化测试室
Left: chemical analysis room
Right: mechanical and physical testing room

石墨材料的主要物理机械性能
Main Physical and Mechanical Properties of Graphite Material

特性 speciality	单位 Unit	石墨块材 Graphite Block			石墨管材 Graphite tube			
		CARBEX® BF1	CARBEX® BF2	CARBEX® BF3	CARBEX® T	CARBEX® TT	CARBEX® TB	CARBEX® TS
最大颗粒尺寸 Max.grain size	mm	3	0.8	0.2	0.2	0.2	0.4	0.6
体积密度 Bulk density	g/cm³	1.85–1.90	1.88–1.92	1.95–2.05	>1.90	>1.92	>1.92	>1.90
抗压强度 Compressive strength	MPa	>60	>78	>90	>80	>85	>80	>80
抗拉强度 Tensile Strength	MPa	>14	>16	>20	>20	>20	>20	>16
抗弯强度 Bending strength	MPa	>25	>32	>45	>55	>55	>50	>30
热导率 Thermal conductivity	W/mk	>110	>120	>140	>40	>40	>50	>50
线胀系数 Lin. coefficient of thermal expansion (20–200℃)	$K^{-1}\cdot10^{6}$	4–6	8–10		4–6	4–6	4–6	4–6
许用温度 Max. service Temperature	℃	180	200	200	170	170	200	200
渗透系数 Coefficient of permeability	cm²/s	10^{-6}	10^{-6}	10^{-7}	10^{-7}	10^{-7}	10^{-6}	10^{-6}
灰分 Ash content	%	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5

SUNSHINE

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