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Hengshui Snowate Environmental Technology Co., Ltd.
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Biological Media Packing

Snowate

Hengshui Snowate Environmental Technology Co., Ltd.

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EDITION FOR SNOWATE CATALOG

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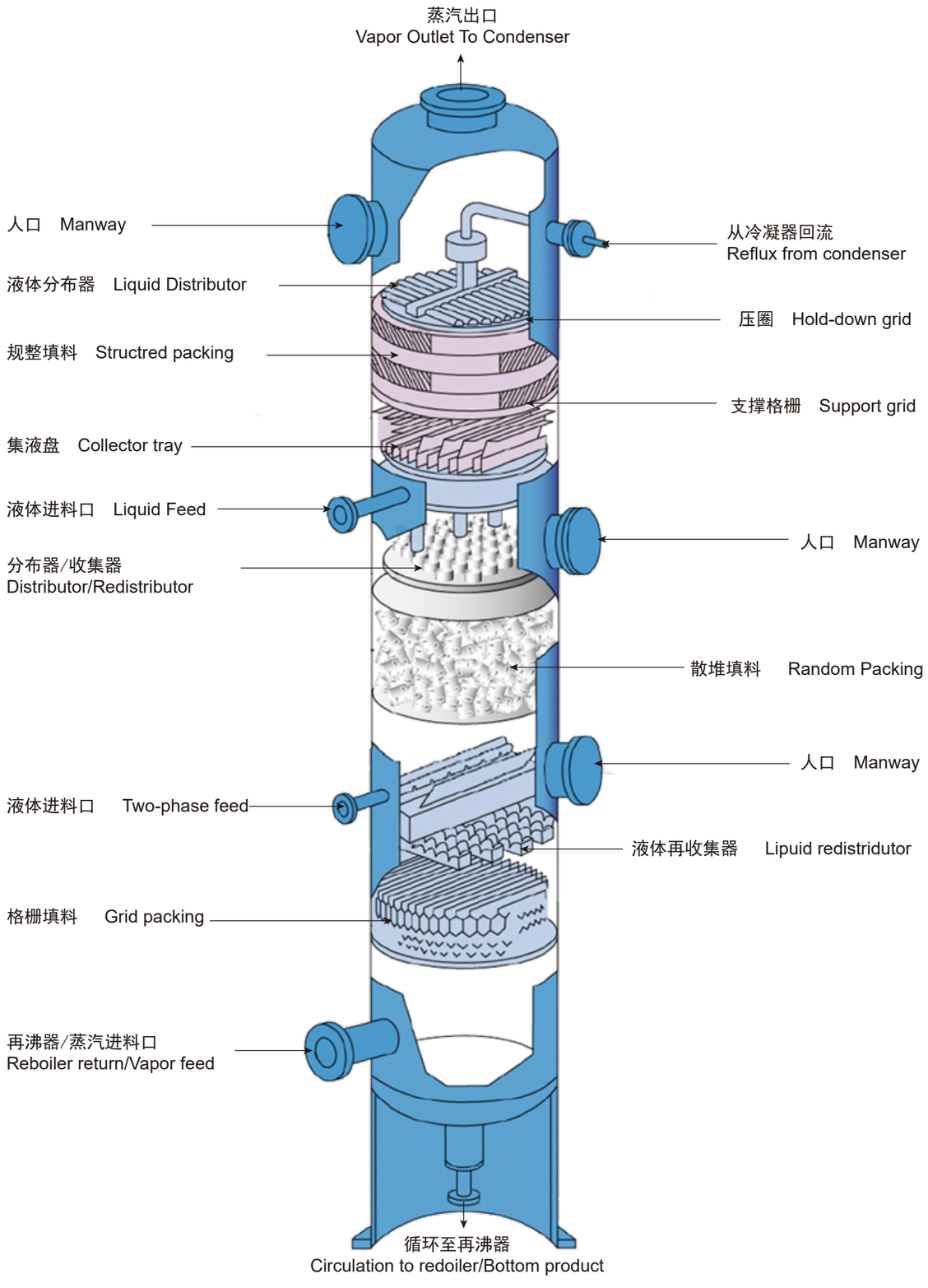


TOWER
塔器

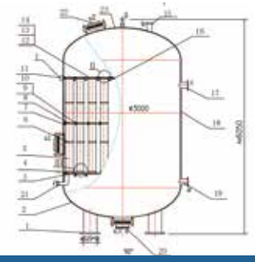
公司产品广泛应用于焦化、石化、炼油、煤化工、天然气、甲醇、制药、化纤等众多领域，市场覆盖全国 31 个省市的千余家企业，并将产品远销至国际市场。

Our products are widely used in coking, petrochemical, oil refining, coal chemical industry, natural gas, methanol, pharmaceutical, chemical fiber and other fields. The market covers more than 1000 enterprises in 31 provinces and cities in China, and exported to the international market.

Ceramic Membrane Filter
陶瓷膜过滤器

陶瓷膜过滤器是公司近几年来研发的一种新型，高效的水处理过滤环保设备。该设备适用于钢铁，石化，电力，冶炼，制药，化工等工业企业生产运行过程中产生的废水，废液处理，从而达到国家规定的排放标准或循环利用标准。

Ceramic membrane filter is a new and efficient environmental protection equipment for water treatment and filtration developed by the company in recent years. The equipment is suitable for the wastewater treatment and waste liquid generated in the production and operation of iron and steel, petrochemical, electric power, smelting, pharmaceutical, chemical and other industrial enterprises. So as to meet the national discharge standard or recycling standard.



槽式分布器
Trough Type Liquid Distributor

槽式分布器由一级槽和二级槽组成，一级槽置于二级槽上部，一级槽为矩形截面敞开式结构，其接受进料布液管的液体并对二级槽进行初始液体分布。

The trough type distributor is composed of a primary slot and a secondary slot. The primary slot is placed on the upper part of the secondary slot. The primary slot is an open structure with rectangular section, which receives the liquid from the feed liquid distribution pipe and carries out initial liquid distribution to the secondary slot.

槽式分布器水力学试验
Trough type liquid distributor water test

TOWER INTERNALS
塔内件

槽盘式分布器
Pan Type Distributor

槽盘式分布器安装在填料的段间，与槽式分布器的区别在于既能收集上段填料落下的液体，保证不漏液，而且通过对称式设计，使上升的气体得到均匀的分布，该分布器的气体阻力很小。同时该分布器又能将液体再次均匀分布。

The pan type distributor is installed between the sections of the packing. The difference between the trough type distributor and the pan type distributor is that it can not only collect the liquid falling from the upper section of the packing to ensure no liquid leakage, but also make the rising gas evenly distributed through the symmetrical design. And the gas resistance of the distributor is very small. At the same time, the distributor can distribute the liquid evenly again.

升气板式分布器
Rise deck distributor

这种类型的分布器通常采用多片式结构，通过夹紧焊接到柱壁上的壁架 / 支撑环进行连接。该分布器可在升气管中配备防迁移杆，以消除对床层限制器的要求。

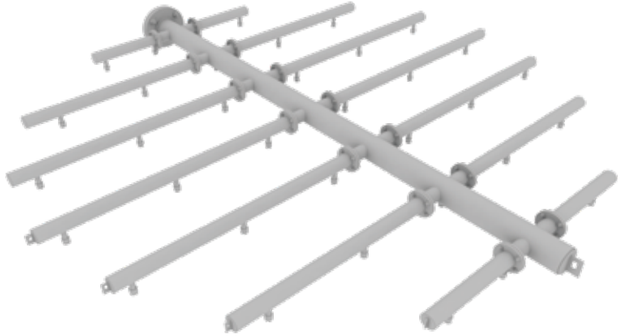
This style of distributor is generally supplied in multi-piece construction. It is by clamping to a ledge/support ring that is welded to column wall. This distributor can be provided with anti-migration bars in the risers to eliminate the requirement for a bed limiter.

叶片集液塔盘
Vane Collector Tray

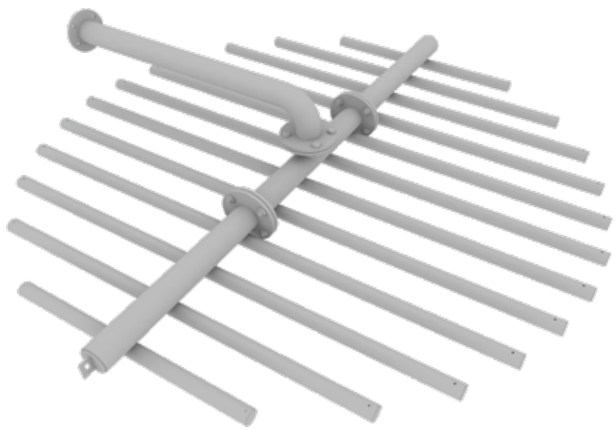
集液塔盘
安装在支撑格栅下方，以收集从填料流出的液体。液体收集器有不同的设计风格，以满足特定应用的需要。

Collection trays is installed below the support grid in order to collect the liquid running off the packing.Collector trays come in different design styles to meet the needs of specific applications.

喷嘴式分布器
Spray Nozzle Type Distributor



管式分布器
Pipe distributor

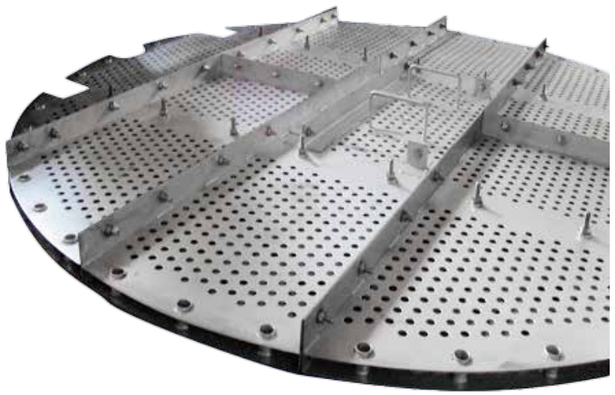


TOWER INTERNALS
塔内件

挡板
Perforated Baffle Plates

它们的主要功能是提供一个屏障，将液体从湍流入口区均匀地分配到平静的分离区。

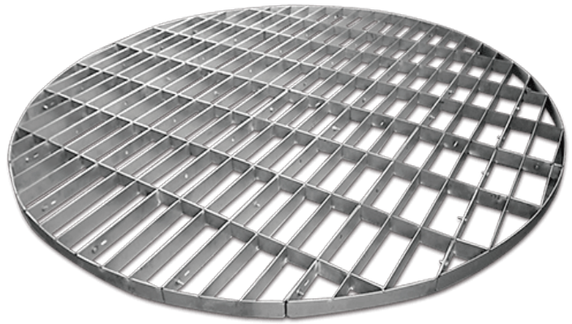
Their primary function is to provided a barrier and distribute the liquid evenly from the turbulent inlet zone to the calm separation zone.



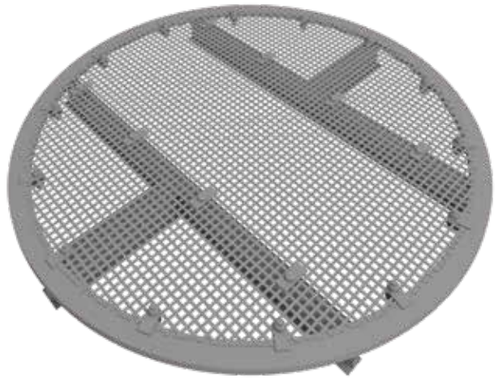
压圈
Bed Limiter

床层限制器和压紧板是填充床上方用来防止流态化和限制填料移动，床层限制器用于金属和塑料散堆填料和规整填料。它们通过支承环固定在柱壁上或螺栓夹。它们也可以悬挂在液体分配器的拉杆上。

Bed limiters and hold down plates are retaining devices used above packed beds to prevent fluidization and restrict packing movement .Bed limiters are used for metal and plastic random packings as well as structured packings. They are fastened to the column wall by means of a support ring or bolting clips. They can also be suspended on tie rods from the liquid distributor.



规整填料压圈
Structured Packing Bed Limiter



散堆填料压圈
Random Packing Bed Limiter

支撑格栅
Support Grid

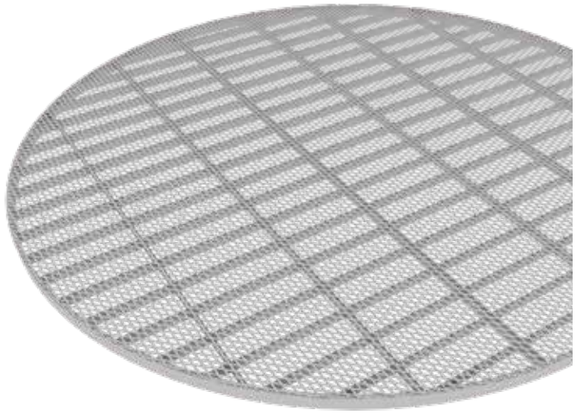
对于塔内的填料支撑，我们有多种支撑格珊。

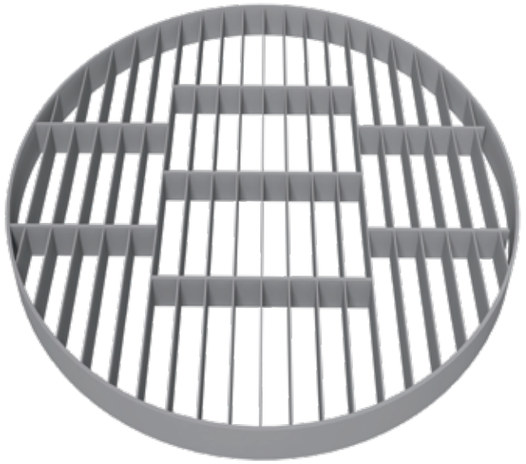
For the packing supporting in the column , we have a variety of support grids.

散堆填料支撑格栅
Random packing support grid

这种床限位器通常推荐用于金属和塑料散堆填料。

This bed limiter is normally recommended for metal and plastic random packings.





规整填料支撑格栅
Structured packing support grid

这种支撑格栅通常推荐用于使用规整填料的塔。

This support grid is normally recommended for towers using structured packings.

驼峰支撑
Hump Support

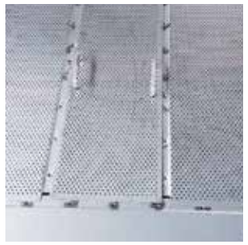
驼峰支承板又称驼峰式填料支撑板，也叫梁型气体喷射式填料支承板。它是目前较好的散堆填料支承之一。

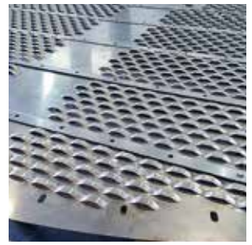
Hump support plate, also known as hump type packing support plate, also known as beam type gas jet packing support plate. Mostly used for random packing.

传质塔盘
Mass Transfer Tray

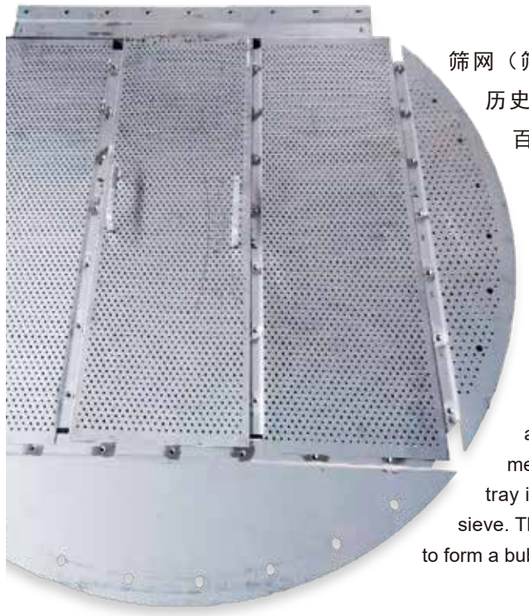
我们提供多种设计和材料的传质塔盘。我们供应阀门，筛板，泡罩塔板，隧道塔板和特殊的塔板结构。除金属外，还可使用热塑性材料（PPH、PE、PVC、CPVC、PVDF、PTFE）。

We offer mass transfer trays of various designs and materials. We supplies valve, sieve trays, bubble cap trays, tunnel trays and also special tray constructions. Beside metals also thermoplastic materials can be used (PPH, PE, PVC, CPVC, PVDF, PTFE,).





筛网塔盘
Sieve Tray



筛网（筛孔）塔板简称筛板，是塔内件的一种。其结构简单，历史悠久，至今仍是应用最为广泛的一种传质分离设备。近百年来，对筛板的流体力学和传质性能的研究已取得很大进展，因而筛板的设计方法已渐趋成熟。筛孔塔盘是一种带有降液管的塔盘，其上开有筛孔，形成筛网，气体通过筛孔上升，穿越液层，形成鼓泡区，进行传质。

Sieve plate (sieve hole) is a kind of tower internals. It has a simple structure and a long history. It is still the most widely used mass transfer and separation equipment. In the past century, great progress has been made in the study of hydrodynamics and mass transfer performance of sieve plate, So the design method of sieve plate has become more and more mature. The sieve tray is a tray with a downcomer, on which a sieve is opened to form a sieve. The gas rises through the sieve and passes through the liquid layer to form a bubbling area for mass transfer.

浮阀塔盘
Floating valve trays

阀门的形状可以是圆形或长方形，垂直上下移动，以产生可变的侧面开口，使蒸汽在液池中气泡。增加蒸汽能会使阀门向上移动，当蒸汽能量很低时，阀门就位于甲板上。

The valves are either round or rectangular in shape, which moves vertically up/down to create variable lateral openings for the vapors to bubble through the liquid pool. Increase in vapor energy will move the valve in upward direction and the valves sit on the deck when vapor energy is very low.

固阀塔盘
Fixed Valve Trays

固定式浮阀塔板是一种阀组固定在全开位置的浮阀塔板，是一种模仿阀门形状的低成本固定式装配。它们比筛板有更好的调节比。与其他浮阀塔板相比，无移动阀盘可消除磨损和粘滞。阀门可以是扁平的圆顶形，三角形或者是长方形的。

The fixed valve tray is a valve tray whose valve units are fixed in the fully open position and is a low-cost stationary assembly which imitates the shape of valve. They have better turn-down ratio than sieve trays. The absence of the moving disk eliminates wear and sticking. The valve can be flat-dome shaped, triangular or rectangular.

TOWER INTERNALS
塔内件

泡罩塔盘
Bubble Cap Trays

泡罩托盘是一种带竖管（如管道）的平板穿孔板周围的穿孔，并以倒置的罩杯形式盖住立管。蒸汽通过提升管上升，通过泡罩上的槽向下引导，最后通过塔盘上的液体。

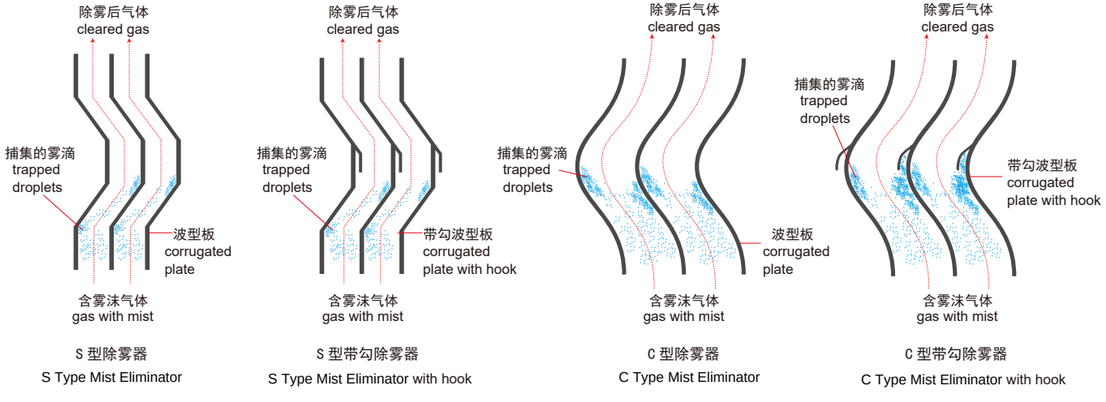
Bubble cap tray is a flat perforated plate with risers (like pipes) around the perforations, and caps in the form of inverted cups over the risers. Vapor rises through the riser and is directed downward by the cap passing through slots in the cap, and finally bubbling through the liquid on the tray.

塔盘配件
Tray hardware

我们还有各种类型阀门的用于在计划内或计划外停机期间的紧急交付。同时我们接受定制。

We also maintain a larger inventory of various types of valves and hardware for emergency delivery during your planned or unplanned shutdown. Also We accept customization.

叶片式除雾器
Vane-Type Mist Eliminator



S 型除雾器
S Type Mist Eliminator

S 型带勾除雾器
S Type Mist Eliminator with hook

C 型除雾器
C Type Mist Eliminator

C 型带勾除雾器
C Type Mist Eliminator with hook

提供多种叶片式除雾器，每种都可以根据您的具体需求进行调整。
除了各种各样的设计，我们还提供由不同材料制成的除雾器。最常见的形式是金属或塑料。我们的专家将为您的应用推荐最合适的材料。可用材料包括但不限于：

1、聚丙烯
2、玻璃钢
3、聚偏氟乙烯
4、不锈钢
5、碳钢

叶片式除雾器由弯曲的平行板制成，用于收集和排放分离的液体。由于其结构稳定，需要较少的维护，并且适用于各种用途，如分离器和压缩机吸入洗涤器，具有较低的效率压力损失以及高液体负荷。

We offer a variaty of vane demisters and each can be adjust to your specific needs.
Besides the various designs. We also provide demister made of different materials. The most common form is metal or plastic. Our specialists will advise the most suitable material for your application. Available materials include, but are not restricted to:
1.Polypropylene (PP)
2.FRP
3.Polyvinylidene fluoride (PVDF)
4.Stainless steel
5.Carbon steel
Vane Type Mist Eliminators are made of curved parallel plates with special characteristics related to the particular service to collect and drain the separated liquid.This construction requires less maintenance due to the robust design and is suitable for wide range of services such as separators and compressor suction scrubbers with lower pressure loss along with high liquid loads.

丝网除沫器
Wire Mesh Mist Eliminator

我们的丝网除雾器由各种材料制成，包括金属和非金属，任何尺寸和形状。钢丝直径、表面积、网格厚度和纤维与收集液体之间的界面张力是指定钢丝网垫时要考虑的主要变量。除雾器主要用于气体分离塔，以除去气流中的液体。当带着液体的气流流过除雾器网时，液体以液滴的形式聚集起来。这会导致除雾器下游产生更干燥的气体。除雾器安装在填料塔顶部或在两个填充床之间连接一个收集盘。他们把液滴从气流中分离出来。从一个阶段到下一个阶段的液滴排放和 / 或液体夹带最小化。我们的除雾器专为特定应用而设计，以达到最佳性能。

Our wire mesh mist eliminators are made in any size and shape from a wide range of materials, both metal and non-metal. Wire diameter, surface area, mesh thickness, and interfacial surface tension between the fibre and the collected liquid are the primary variables to consider in specifying a wire mesh pad. Mist eliminators are primarily used in gas separation columns to remove liquids from the gas stream. As a gas stream with entrained liquid flows through the mist eliminator mesh, the liquid collects as droplets. This results in creating a drier gas downstream of the mist eliminator. Mist eliminators are installed at the top of a packed column or in conjunction with a collecting tray between two packed beds. They separate liquid droplets from the gas stream. Droplet discharge from the column and/or the liquid entrainment from one stage to the next is minimized.
Our mist eliminators are engineered for optimal performance under specific applications.

不锈钢丝网除沫器
stainless steel wire mesh mist eliminators

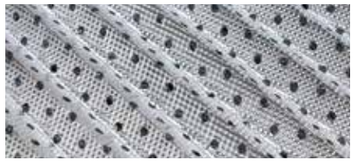
塑料丝网除沫器
Plastic wire Mesh Mist Eliminators

STRUCTURED PACKING
规整填料

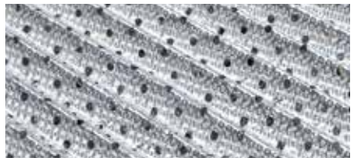
规整填料是在塔内按照均匀的几何形状排列和堆放的填料。整个塔段几何形状规则、对称、均匀，并规定了气液流道，减少了通道流和壁流现象，压降可以很小。在相同的能耗和压降条件下，它比散堆填料能提供更大的比表面积，在相同体积下获得更高的传质和传热效率。近几十年来，规整填料广泛应用于精细化工、香料工业、炼油、化肥、石油化工等领域的许多塔中。

Structured packing is a kind of packing arranged and stacked in accordance with uniform geometry in the tower. The geometry of the whole tower section is regular, symmetrical and uniform, and the gas-liquid flow path is specified, which reduces the phenomenon of channel flow and wall flow, and the pressure drop can be very small. Under the same energy cost and pressure drop, it can provide more specific surface area than random packing, and achieve higher mass transfer and heat transfer efficiency in the same volume. In recent decades, structured packing has been widely used in many towers in fine chemical industry, perfume industry, oil refining, fertilizer, petrochemical industry and other fields.

STRUCTURED PACKING
规整填料



“X”型
Type “X”



“Y”型
Type “Y”

结构填料有两种不同的倾角，即“X”型和“Y”型。“Y”型填料与水平轴的倾角约为45°，是应用最广泛的填料。“X”型填料与水平轴的倾角为30°，用于高容量和低压降应用。

Structured packings are available in two different inclination angles, i.e. Type “X” and Type “Y” . The “Y” type packings have an inclination angle of about 45º from the horizontal axis, and are the most widely used. The ” X” type packings have an inclination angle of 30 ° from horizontal axis and are used in high capacity and low pressure drop applications.

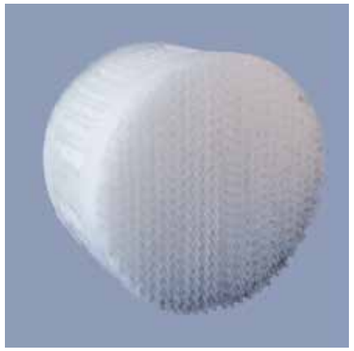
金属孔板波纹填料
Metal Corrugated-Plate Packing

型号 Model	比表面积 Surface area m^2/m^3	空隙率 Void fraction %	理论塔板数 NT M^{-1}	压力降 Pressuredrop Pa/m
125X	125	98	0.8-0.9	140
125Y	125	98	1-1.2	200
250X	250	97	1.6-2	180
250Y	250	97	2-2.5	300
350X	350	95	2.3-2.8	230
350Y	350	95	3.5-4	350
500X	500	92	2.8-3.2	280
500Y	500	92	4-4.5	400
700Y	700	90	9	660
1000Y	1000	90	13	850

塑料孔板波纹
Plastic Corrugated-Plate Cacking

自从金属波纹板被开发并被市场接受以来，科学家们发现金属波纹板填料不适合任何介质（酸）的要求。而且在工业领域很难得到广泛的应用。此后，塑料波纹板包装应运而生。与金属波纹板填料相比，具有流量大、压降低、比表面积高等优点。

Since Metal Mellapak was be developed & accepted by market. Scientists find Metal Corrugated plate packing was not suitable in any medium’ s requirement (acid). Furthermore, it is very hard to widely used in industry field. After that, Plastic Corrugated plate packing was born. Compared with Metal Corrugated plate packing, it has large flux, low pressure drop,large surface area and so on.



型号 Model	比表面积 Surface area m^2/m^3	空隙率 Void fraction %	理论塔板数 NT M^{-1}	压力降 Pressuredrop Pa/m
125X	125	98	0.8-1.9	140
125Y	125	98	1-2	200
250X	250	97	1.5-2	180
250Y	250	97	2-2.5	300
350X	350	94	2.3-2.8	130
350Y	350	94	3.5-4	200
500X	500	92	2.8-3.2	180
500Y	500	92	4-4.5	300

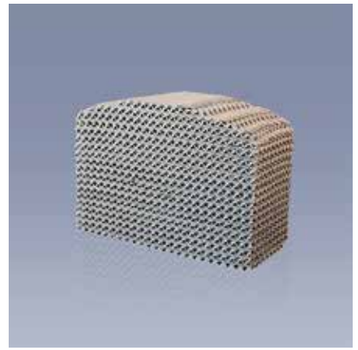
PTFE材质

STRUCTURED PACKING
规整填料

陶瓷孔板波纹
Ceramic Corrugated-Plate Cacking

由于陶瓷表面具有良好的亲水性，可以扩大气液接触表面积。同时，陶瓷表面的微孔结构也得到改善润湿性，另外，陶瓷优异的耐腐蚀性使陶瓷波纹板填料更适合于硫酸吸收、硝酸盐浓缩、气体净化等。陶瓷的高热稳定性使其工作温度超过 1000℃。

Owing to ceramic surface has good hydrophilic, it can enlarge to gas-liquid contacting surface area. Meanwhile, ceramic surface’ s microporous structure also improve wettability.In addition, ceramic excellent corrosion resistance makes Ceramic Corrugated plate packing more suitable for sulfuric acid absorption, the nitrate concentration,gas purification and so on. Ceramic high thermal stability make its operating temperature exceeds 1000 ℃.



型号 Model	比表面积 Surface area m^2/m^3	空隙率 Void fraction %	理论塔板数 NT M^{-1}	压力降 Pressuredrop Pa/m
100X,Y	100	90	1	250-300
125X,Y	125	87	1.5-2.8	280-350
160X,Y	160	87	1.8-2.0	250-300
250X,Y	250	82	2.3-2.5	220-280
350X,Y	350	78	2.5-2.8	200-260
400X,Y	400	76	2.8-3.2	180-260
450X,Y	450	75	3-4	200-250

STRUCTURED PACKING
规整填料

丝网规整填料
Wire Mesh Structured Packing

丝网规整填料具有较高的比表面积，同时由于丝网独特的毛细管效应，填料表面具有较好的润湿性，因此具有较高的分离效率。与其它填料相比，它具有较低的压降和较低的持液量，特别适用于难分离的材料和热敏性系统。制造丝网填料的主要材料有不锈钢、铜、铝、铁、镍等。

Wire mesh structured packing has a high specific surface area. At the same time, because of the unique capillary effect of the mesh. The packing surface has better wettability. So it has a high separation efficiency. Compared with other types of packing, it has lower pressure drop and less liquid holding, and it is especially suitable for materials hard to separate and heat sensitive systems. The main materials for making wire gauze packing are stainless steel, copper, aluminum, iron, nickel, etc.

型号 Model	比表面积 Surface area m^2/m^3	空隙率 Void fraction %	波峰 peak height mm	倾斜角度 inclination angles
500 (BX)	500	95	6.3	30
700 (CY)	700	87-90	4.5	45

STRUCTURED PACKING
规整填料

集成填料
Plastic Manifold Block Filler

塑料集成填料由 2 层若干个六边环相互连接构成，填料板片厚为 2mm 左右，材质为聚丙烯。该填料板片全部垂直向下，通气能力强，阻力小，不易堵塞。填料为两层六边形单元结构集成，转换角度多，破气破液能力强，气，液传质效果好；填料是一次性注塑成型，稳定性能好，抗压强度高，不倒伏，不散架，耐腐蚀，使用周期长，便于拆卸清洗，重复使用。本产品适用于脱硫塔，变脱塔，清洗塔，降温塔等工艺环境恶劣的化工塔器。

The plastic manifold block filler is composed of two layers of several hexagonal rings connected with each other. The filler plate is about 2mm thick and made of polypropylene. The packing plates are all vertically downward, with strong ventilation capacity, small resistance and not easy to be blocked. The packing is integrated with two-layer hexagonal unit structure, with multiple conversion angles, strong gas and liquid breaking capacity and good gas-liquid mass transfer effect; The filler is one-time injection molding, with good stability, high compressive strength, no lodging, no falling, corrosion resistance, long service life, easy disassembly, cleaning and reuse. This product is suitable for chemical towers with poor process environment, such as desulfurization tower, variable stripping tower, cleaning tower, cooling tower, etc.

轻瓷填料
Light Ceramic Packing

轻瓷填料是一种强度高，比表面积大，结构合理，操作阻力小，吸水率低，孔隙率大，比重更轻，耐酸腐蚀性能好等优点的新型填料。该填料广泛应用于焦化脱硫，洗萘，洗苯，洗氨，硫酸的干燥，化肥热水饱和塔，电厂滴水冷却塔，吸收塔中。

Light Ceramic packing is a new type of filler with the advantages of high strength, large specific surface area, reasonable structure, low operating resistance, low water absorption, large porosity, lighter specific gravity and good acid corrosion resistance. The packing is widely used in Coking Desulfurization, naphthalene washing, benzene washing, ammonia washing, sulfuric acid drying, fertilizer hot water saturation tower, power plant drip cooling tower and absorption tower.

名称 Name	对边距 Margin distance	孔径 Aperture diameter	比表面积 Surface area	孔隙率 Void ratio	堆积重量 Bulk Density	堆积个数 Num./m^3
七孔连环 Seven ring	220±2.5 mm	65	115	85	280	200
七孔带筋 Seven ring with veins	220±2.5 mm	65	128	75	320	200
菱形环 Lozenge ring	220±2.5 mm	65	135	72	340	200
菱形带筋 Lozenge ring with veins	220±2.5 mm	65	132	75	300	200
多齿环 Gear ring	220±2.5 mm	65	148	73	348	200

［专利产品］七孔联众环
Honeycomb Shape Plastic Support Block

七孔联众环是采用合成塑料注塑而成，可以根据不同的工况调整配方从而达到最理想的效果。完全取代了以前常用的轻瓷填料。我们开发的联众环可以反复利用，比表面积大，通气量也大 ， 效力是轻瓷的两倍。特别是在检修的过程中轻瓷填料变成了固废很难处理 ， 而联众环可以作为再生资源重复利用 ， 既环保又节能。经过焦化脱硫塔的长期测试证明联众环具备很强的抗堵能力，分离净化效果极佳。

七孔联众环广泛应用于石油、焦化、发电、化肥、合成氨等煤化工及精细化工行业，在气体净化中的脱硫、洗涤、脱苯、脱奈洗蒸氨、精溜、吸收、干燥、发应合成等化工工艺流程中的填料。其产品使用寿命长 ， 操作弹性大。

Honeycomb shape plastic support block is made of synthetic plastic injection molding. The formula can be adjusted according to different working conditions to achieve the best effect. It completely replaces the light ceramic packing commonly used before. The honeycomb shape plastic support block developed by us can be used repeatedly, with large specific surface area and large ventilation capacity, and its effectiveness is twice that of light porcelain. Especially in the process of maintenance, the light ceramic packig becomes solid waste, which is difficult to deal with. But honeycomb shape plastic support block can be reused as renewable resources, which is environmental protection and energy saving. Through the long-term test of Coking Desulfurization Tower. It is proved that honeycomb shape plastic support block has strong anti blocking ability and excellent separation and purification effect.

Honeycomb shape plastic support block is widely used in petroleum, coking, power generation, chemical fertilizer, synthetic ammonia and other coal chemical and fine chemical industries. It is used as filler in the chemical process of gas purification such as desulfurization, washing, debenzylation, dealkylation, ammonia distillation, refining, absorption, drying and synthesis. The product has a long service life and large operation flexibility.

名称 Name	材质 Material	规格 Size mm	比表面积 Surface area m^2/m^3	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m^3	堆积重量 Bulk density Kg/m^3	压降 Pressure drop Pa/M
Honeycomb Shape Plastic Support Block	FRPH	248*238*100	145	95	210	100	20

湿式网格填料
Wet Net Filler

它由一系列组装成格子结构的塑料网构成，其内部结构设计成蜂窝状。这种网络结构提供了较大的接触面积，可以实现均匀的液体分布，并以最小的阻力增加了液体流速。它的高比表面积体积比有助于提高传质效率。该介质用途广泛，可以堆叠成块状，适合在塔中使用。由黑色的聚丙烯（PP）制成。

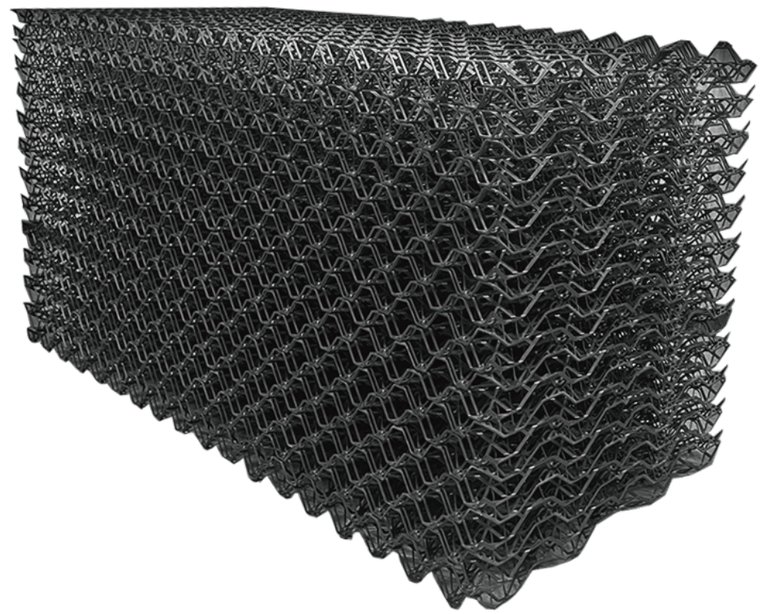
压降低，高效率及处理能力，最小的持液量，易维护，大比表面积，耐腐蚀，高温。

主要应用于畜牧业，吸收塔，废气处理（例如烟气洗涤塔），蒸馏塔，热交换等。

It is constructed by a series of plastic sheets assembled into a lattice structure, with its internals engineered to the geometry of honeycombs. This network structure provides a large contact area which allows even liquid distribution, augmenting liquid flow rate with minimum resistance. Its high surface area to volume ratio contributes to high mass transfer efficiency. Structured packing media is versatile and can be stacked into block-form, suitable for use in towers. Made of Polypropylene (PP) in colour black.

Low pressure drop, high efficiency and treatment capacity, minimum liquid holding capacity, easy maintenance, large specific surface area, corrosion resistance and high temperature. Absorption towers, waste gas treatment (e.g. flue gas scrubbers), distillation columns, heat exchange, etc.

It is mainly used for deodorization in animal husbandry, Absorption towers, waste gas treatment (e.g. flue gas scrubbers), distillation columns, heat exchange, etc.



鲍尔环
Pall Ring

它是由德国巴斯夫公司发明的，与拉西环相比，最重要的改进是增加了两排向内弯曲的内舌。这种结构促进气液流动性，提高了塔填料的传质性能。

It was invented by German BASF, the first generation Plastic Random packing. To compared with Raschig ring, the most important improvement is increase two row of inward ligule. It promotes liquid-gas liquidity and improve tower’s packing’s mass transfer performance.

塑料材质： PP， HDPE, PVC, PPH, CPVC, PTFE, PVDF, PFA
Plastic material: PP, HDPE,PVC,PPH,CPVC,PTFE,PVDF,PFA

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ16	188	91	179000
Φ25	175	90	53500
Φ38	115	89	15800
Φ50	93	90	6500
Φ76	73.2	92	1980
Φ100	52.8	94	1000

金属材质：碳钢，不锈钢，铜，铝，钛材，哈氏合金
Metal Material: Carbon steel,stainless steel,copper,Alumina,titanium,hastelloy

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ6	904	88.6	4000000
Φ10	482	93.8	768000
Φ12	450	94.5	480000
Φ13	415	94.8	410000
Φ16	**362**	**94.9**	210000
Φ25	**219**	**95**	53000
Φ38	146	95.9	15300
Φ50	109	96	6500
Φ76	71	97	1980
Φ89	61	97.1	1220

陶瓷材质 Ceramic material

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	220	75	50000
Φ38	150	78	13400
Φ50	120	78	6400
Φ80	75	80	1950

阶梯环
Cascade Mini Ring

它由英国公司 MTL Ltd 开发，也被称为 CMR。

It was developed by British company MTL Ltd, which also called CMR.

塑料材质： PP， HDPE, PVC, PPH, CPVC, PTFE, PVDF, PFA
Plastic material: PP, HDPE,PVC,PPH,CPVC,PTFE,PVDF,PFA

尺寸 size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	228	90	81500
Φ38	132.5	91	27200
Φ50	114.2	93	11600
Φ76	90	93	3650
Φ100	89	91	1450

金属材质：碳钢，不锈钢，铜，铝，钛材，哈氏合金
Metal Material: Carbon steel,stainless steel,copper,Alumina,titanium,hastelloy

直径 Diameter mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	220	96.5	97160
Φ38	154.3	95.9	31800
Φ50	109.2	96.1	12300
Φ76	73.5	97.6	3540

International standard: HG/T21557.2-95

型号 Type mm	尺寸 size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
0P	17*15*6*0.3	427	94	530000
1P	25*22*8*0.3	230	96	150000
1.5P	34*29*11*0.3	198	97	60910
2P	43*38*14*0.4	164	97	33170
2.5P	51*44*17*0.4	127	97	17900
3P	66*57*21*0.4	105	98	8800
4P	86*76*29*0.4	90	98	5000
5P	131*118*41*0.6	65	98	1480

陶瓷材质 Ceramic material

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	250	69	74000
Φ30	230	72	46200
Φ40	185	81	32500
Φ50	149.6	78	8980
Φ76	75	78	2500

矩鞍环
Saddle Ring

由于这个填料的形状就像马鞍，所谓的马鞍环或贝尔环。在我们的实际应用中，当气体向上流动时，液体会随着弧形通道向下流动，这种运动方式将直接减少壁面流动的发生。但是，拱形外部框架也会导致重叠和桥接。因此，科学家们将两端改为矩形接触面，这种改善将会减少桥接的发生，故此称之为矩鞍环。

Owing to this pack’ s shape is like saddle, so called saddle ring or Berl Ring. The earliest saddle ring’ s material is ceramic. In our actual application, when gas flows upward, liquid will flow downward along with arc channel. This Movement way will directly reduce wall flow’ s happening. However, Arched external frame also cause overlapping & bridging . Therefore, scientists change two ends into rectangle type contact surface. This improvement will reduce bridging’ happen.

塑料材质： PP， HDPE, PVC, PPH, CPVC, PTFE, PVDF, PFA
Plastic material: PP, HDPE,PVC,PPH,CPVC,PTFE,PVDF,PFA

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	288	85	128400
Φ38	265	95	57300
Φ50	250	96	11600
Φ76	200	97	5500

金属材质：碳钢，不锈钢，铜，铝，钛材，哈氏合金
Metal Material: Carbon steel,stainless steel,copper,Alumina,titanium, hastelloy

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	171	96.7	95000
Φ38	123	97.7	40000
Φ50	79	98.2	13500
Φ76	55	97	4700

陶瓷材质 Ceramic material

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ16	350	73	269000
Φ25	254	77	58300
Φ38	180	80	19700
Φ50	115	79	8260
Φ76	81	75	2430

异鞍环
Super Saddle Ring

这是一个基于英特洛克环结构的改良款。最大的改进是鞍形的弧形轮廓会变成波浪形或锯齿形。同时增加弧形液体通道中间位置的一些孔隙。这种结构的变化不仅增加了填料的接触间隙，而且改善了气液在填料层的运动和分布。

It was one improved ring based on Intalox ring’ s structure. The biggest improvement is that Intalox saddle’ s arc profile will be change wavy or jagged profile. meanwhile, increase some pores in the arc liquid channel’ s middle position. This structure’ s change not only increase packing’ s contacting gap, but also improve gas & liquid’ s movement and distribution in packing layer.

塑料材质： PP， HDPE, PVC, PPH, CPVC, PTFE, PVDF, PFA
Plastic material: PP, HDPE,PVC,PPH,CPVC,PTFE,PVDF,PFA

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	200	90	39200
Φ50	168	93	6300
Φ76	130	94	3700

陶瓷材质 Ceramic material

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number 个 Pieces/m³
Φ25	260	77	58300
Φ38	210	75	19700
Φ50	140	79	8260
Φ76	105	77	2430

海尔环
Heilex Ring

它也叫海尔环，皇冠型拉西环等。波状的气液接触扩大了液体的接触面积，也提高了气液流动的效率。另外，交错锥型立式结构可以大大减少塔的填料嵌套，壁面流动和不均匀分布。

It also called Heilex ring, crown-type raschig ring and so on. It is a new type of Perforated Packing. Wavy gas-liquid interface enlarges liquid’ s contacting area and also improve gas-liquid flow efficiency. In addition, interlacing cone type vertical structure can largely reduce towers’ packing nesting, wall flow and unevenly distribution.

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
50×50	107	93	8000
76×76	75	94	3420
100×100	55	95	1850

拉西环
Raschig Ring

它是最早开发的散堆填料，其高度和外径对等。是由德国化学家弗里德里希·拉希格（Friedrich Rashig）于 1914 年发明，同时也标志着塔填料的发展已进入科学的轨道。然而在实际应用中,经常发生“壁流,流道流”等现象。

It is a earliest development of random packing, which its height is equal to outside diameter. Raschig Ring was invented by German Chemist Friedrich Raschig in 1914, it also marks that the development of fills hds entered a scientific track. However, in the actual application, Such as ” Wall flow, Channel flow and so on” often happened in Packed bed.

塑料材质： PP， HDPE, PVC, PPH, CPVC, PTFE, PVDF, PFA
Plastic material: PP, HDPE,PVC,PPH,CPVC,PTFE,PVDF,PFA

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	220	85	53000
Φ38	150	90	15800
Φ50	110	92	6500
Φ76	65	93	1927

金属材质：碳钢，不锈钢，铜，铝，钛材，哈氏合金
Metal Material: Carbon steel,stainless steel,copper,Alumina,titanium,hastelloy

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ15	350	95	230000
Φ25	220	92	50000
Φ35	150	93	19000
Φ50	110	95	6500
Φ80	65	96	1600

陶瓷材质 Ceramic material

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ6	712	62	3022935
Φ13	367	64	377867
Φ16	305	73	192500
Φ19	243	72	109122
Φ25	190	74	47675
Φ38	121	73	13667
Φ40	126	75	12700
Φ50	92	74	5792
Φ80	46	80	1910
Φ100	70	70	1000

共扼环
Conjugated Ring

它是由华南理工大学发明的。独特的共轭曲线翅片结构可以改变点对点接触而不是填料间的线性接触。因此，促进液体均匀分布，避免填料重叠现象，增加液体收集和分散等。

It was invented by South China University of Technology. Unique conjugated curve finned structure can change point-to-point contacting instead of linear contacting between packing. Therefore, it promote liquid evenly distribution, avoid packing overlapping phenomenon and increase liquid gathering & dispersing etc.

塑料材质： PP， HDPE, PVC, PPH, CPVC, PTFE, PVDF, PFA
Plastic material: PP, HDPE,PVC,PPH,CPVC,PTFE,PVDF,PFA

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	185	95	74000
Φ38	142	91	16320
Φ50	104	80	9500
Φ76	81	95	3980
Φ100	55	96	1850

金属共轭环
Metal Conjugated Ring

金属材质 ： 碳钢 、不锈钢、铜、铝、钛材、哈氏合金

Metal Material: Carbon steel,stainless steel,copper,Alumina,titanium,hastelloy

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ16	313	97	211250
Φ25	185	95	75000
Φ38	116	96	19500
Φ50	86	96	9772
Φ76	81	95	3980

陶瓷共轭环
Ceramic Conjugated Ring

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	175	78	64000
Φ38	118	80	14000
Φ50	72	81	6300

花环
Teller Rosette Ring

泰勒花环是由 12 个小环制成的，这是美国泰勒 AJ 在 1956 年发明的，它就像一个球被螺旋弹簧包围着，两端相连。由于多环的结构，它将扩大气液接触面积，延长液体滞留时间。因此，它被认为是理想的气体洗涤净化塔。

Teller rosette ring is made by 12 small rings, which invented by American Teller A J in 1956,like a ball surrounded by helical springs which are connected by end to end.Due to the structure of polycyclic enabling, it will enlarge gas & liquid contacting area and prolong liquid retention time.Therefore, it was recognized a ideal packing in Gas washing,purification tower.

型号 Type	尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
泰勒花环 Teller Rosette Ring	Φ25	269	82	170000
	Φ47	185	88	32500
	Φ51	180	89	25000
	Φ73	127	90	8000
	Φ95	94	91	3900
	Φ100	90	91	3000
	Φ145	65	95	1100
科斯特花环 Koster Rosette Ring	Φ100	94	90	3000
日系花环 Japanese Rosette Ring	Φ145	100	93	1100

无边花环
Boundless Rosette Ring

无边花环填料其结构是由 12 个小圆环按径向排列而组成的一个大扁球体，很类似于一个螺旋形弹簧首尾相接绕成的一个圆球体。

The structure of Boundless garland packing is a large oblate sphere composed of 12 small rings arranged in a radial direction, which is very similar to a sphere formed by a spiral spring connected begin to end.

型号 Type mm	尺寸 Size mm	高度 Height mm	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
S-O	47	19	88	32500
S	51	19	89	25000

带刺花环
Ceilcote Teller Rosette Ring

这是一个普通花环的改进产型。最明显的区别是齿型结构。该结构不仅增加了气液接触点和面积，而且大大提高了气液分离性能。该产品非常适合废气处理，汽提塔等领域。

It is an improved product of ordinary teller rosette ring. The most obvious difference is Tooth Type structure. This structure’ s feature in not only increase gas & liquid contacting point and area, but also largely improve gas & liquid separation performance. The product is very suitable for waste gas treatment, stripper and other fields.

型号 Type mm	尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
2K	82.5	28	95	5830
3K	105	31	96	1910

金属花环
Metal Teller Rosette Ring

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
50×25×0.8	112.8	96.2	19180
76×76×1.0	64.1	97.3	6000
100×45×1.2	53.4	97.3	2520

雪花环
Snowflake ring

它提供优越的分离效率和能力，在环境应用，如洗涤和汽提。独立试验已证明雪花环是地下水气提应用中最有效的填料，可产生 99% 或以上的去除效率。

It offer superior separation efficiency and capacity in environmental application, such as scrubbing and stripping. Independent tests have proven Snowflake ring to be the most effective packing available for groundwater air stripping applications, yielding removal efficiency of 99 % or above.

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
94x34x1.5	138	97	5000

高流环
Hiflow Ring

高流环是第三代高性能塔填料，提供了高机械稳定性，空隙率和优良传质性能的优化设计。

Hiflow Ring is a 3rd generation high performance tower packing which provides an optimal design of high mechanical stability, void fraction and superior mass transfer performance.

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ38	150	94	15800
Φ50	110	96	6500
Φ89	82	98	1580

贝它环
Beta Ring

它是由科赫格里奇公司发明的。内弧舌片将增加气体和液体的不间断流动，同时提供额外的滴点以增强液膜表面更新用以改善传质效率。

It was invented by Koch-glitsch. Inner arc tabs will increase uninterrupted flows of gas and liquid while providing additional drip points to enhance liquid film surface renewal for improved mass and heat transfe.

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ63	92	94	6200

拉鲁环
Ralu Ring

这是一个改进的鲍尔环。主要的改进是增加两端翻身和壁厚。在不改变分离效率的情况下，可以降低床高，从而降低压降。

This is an improved pall ring. The main improvement is to increase the turning over and wall thickness at both ends. Without changing the separation efficiency, the bed height can be reduced. So as to reduce the pressure drop..

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ15	320	94	170000
Φ25	190	94	53500
Φ38	150	95	15800
Φ50	110	95	6500

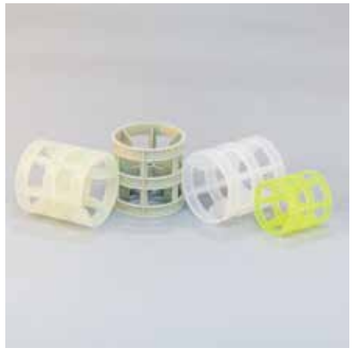
RANDOM PACKING
散堆填料

射流环
Jet ring

射流环填料产品主要是在鲍尔环填料的基础上经模具加工改进，它伸向环内的肋片，使窗口形成两个方向相反的开口锥体，由于锥体导液流与气流在环内聚集和分散，产生强烈的扰动。

Jet ring products are mainly based on pall ring packing by mold processing improvement. It extends to the rib in the ring, which makes the window form two open cones with opposite directions. Because the cone guides the liquid flow and the air flow to gather and disperse in the ring, it produces strong disturbance.

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ50	90	94	6450
Φ65	86	92	3030
Φ76	72.3	90	1880
Φ90	68	89	1200



八四内弧环
VSP Ring

它的结构与 Nor-pak 非常相似。它是气液洗涤的理想填料。

Its structure is very similar to the Nor Pak. It is a ideal replacement of gas & liquid scrubbing.

尺寸 Size mm	比表面积 Surface area m² /m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	185	93	55000
Φ38	138	94	16000
Φ50	121	95	5500
Φ90	78	97	1100

金属八四内弧环
Metal VSP ring

VSP 环又称内弧环，通常由 304、316 不锈钢材料制成。金属 VSP 环具有合理的几何对称性，内弧沿轴向均匀折叠，交替排列。

VSP ring also called inner arc ring. It is commonly made of stainless steel 304, 316 materials. Metallic VSP rings has reasonable geometric symmetry, which the inner arc are folded evenly along the axial direction and replaced alternated arranged.

尺寸 Size mm	比表面积 Surface Area m²/m³	空隙率 Void Fraction %	堆积个数 Bulk Number Pieces/m³
Φ25	250	93	59200
Φ38	138	94.7	14000
Φ50	121	95	7000
Φ76	75	95	1950

扁环
Flat Ring

扁环简称 SMR（Super Mini Ring ），是塔填料中一种先进的随机填料。顶部和底部没有翻边结构。通过调整内叶片的圆弧，可以提高填料的强度。它具有合理的流动结构、较低的压降和较高的传质性能。扁环有两种类型，分别为 QH-1 和 QH-2。

Flat ring is also called SMR(Super Mini Ring), It s an advanced random packing in the column tower packing. It has similar structure with cascade mini ring, There is not flanging structure at the top and bottom. It can improve the packing strength through adjust the arc of internal blade. It has reasonable flow structure, low pressure drop and high mass transfer performance. Super mini ring has two main types, which names as QH-1 and QH-2.

塑料材质： PP， HDPE, PVC, PPH, CPVC, PTFE, PVDF, PFA
Plastic material: PP, HDPE,PVC,PPH,CPVC,PTFE,PVDF,PFA

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
38 × 12 × 1.2	145	92	46000
50 × 17 × 1.5	128	93	21500
76 × 26 × 2.5	116	93	6500

金属材质：碳钢，不锈钢，铜，铝，钛材，哈氏合金
Metal Material: Carbon steel,stainless steel,copper,Alumina,titanium,hastelloy

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
16 × 5.5 × 0.5	348	92	630000
25 × 9.0 × 0.6	219	94	160000
38 × 12.7 × 0.7	228	95	48000
50 × 17 × 0.8	150	97	21500

陶瓷材质 Ceramic material

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
16 × 10 × 1.5	250	87	300500
25 × 16 × 2.0	180	85	87040
30 × 18 × 2.5	170	85	55000
38 × 23 × 3.5	140	85	27600
50 × 30 × 4.5	110	84	10100

RANDOM PACKING
散堆填料

Q帕克
Q-PACK

等边八角形设计是最显着的特点。这种设计使洗涤效率非常高，同时最大限度地减少所需的介质和填料深度。同时，均匀间隔的杆设计可以很大程度上消除堵塞。这种结构通过滴点和大气湍流产生数以百万计的小液体，可以提供最高的传质效率和最低的压降

Equilateral octagonal design is the most prominent feature. This design allows very high washing efficiency while minimizing the required medium mass and filler depth. At the same time, This structure creates millions of small liquid through dropping point and atmospheric turbulence, which can supply highest mass transfer efficiency and lowest pressure drop

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³	堆积重量 Bulk density Kg/m³	点滴数 Drip point
95x82.5	60	96.3	1165	30	388.000

兰派克
Lanpac

创新的几何设计，轴对称分布，横向条纹和纵向条纹交叉分布兰帕克的突出特点。

Innovatively Geometric design , axisymmetric distribution, the horizontal stripes & vertical bar cross distribution is Lanpac’ s outstanding feature.

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ60	222	89	7060
Φ90	144	92.5	1765

筛网填料
Multi-layer Filter Block

它被认为是一种革命性的聚结介质，可以从含有悬浮颗粒的水中分离油脂。大的表面积使其非常适合作为生物载体介质。每层致密的孔隙分布和层的互锁将促使小的无油分子与亲脂性表面快速接触 ，最终形成大油滴，大大缩短油水分离时间。

It was recognized a revolutionary coalescing media which can separate oil from water containing suspended particulate.Large surface area makes it very suitable as a biological support media.Each layer’ s densely pore distribution and layers’ interlocking will promote small oil free molecular rapidly contacts with lipophilic surface, finally form a big oil droplet.it will large shorten oil & water separating time.

尺寸 Size mm	比表面积 Surface area m²/m³	滴水点 Drip Points	堆积比重 Bulk Density Kg/m3	最小网格开口 Smallest Grid Opening
305×305×305	132	2122m³	120	0.4×0.4
40×40×40	612	No data	170	0.17×0.17

多面空心球
Polyhedral Hollow Ball

塑料多面体空心球也称为多面体空心球，是一种新型高效填料。它是由耐热和化学稳定的塑料材料制成。它由两个半球组成，形成一个完整的球形。每个半球表面有几个半扇形叶子，上下叶交错排列。这种设计使得多面体空心球重量更轻，风阻和流动阻力更小，表面亲水性好。

Plastic polyhedral hollow ball also called multiaspect hollow ball. It is a new type of high efficient random packing. It is made from heat resistant and chemical stable plastic material. It is composed of two hemispheres to form a whole ball shape. Each hemisphere surface has several half fan-shape leaves, the upper and lower leaves are staggered arranged. This design makes the polyhedral hollow ball lighter weight, smaller wind and flowing resistance and good hydrophilic surface.

尺寸 Size mm	比表面积 Surface Area m²/m³	空隙率 Void Fraction %	堆积个数 Bulk Number Pieces/m³
Φ25	460	90	64000
Φ38	325	91	25000
Φ50	237	91	11500
Φ76	214	92	3000
Φ100	193	80	2800

环保球
Tri-Pack

环保球是一种散堆填料，具有空心、球形结构。塑料环保球有对称的几何形状，这是由一个独特的网络肋骨，支柱和滴水杆。它由注塑塑料制成，包括 PP、PE、PVC、PVDF 等材料。

Plastic tri-pack ring is a type of random tower packing, which has hollow, spherical structure. Plastic tri- pack has a symmetrical geometry, which is made from a unique network of ribs, struts and drip rods. It is made of injection molded plastic, including PP, PE, PVC, PVDF and other materials.

尺寸 Size mm	比表面积 Surface area m²/m³	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
Φ25	150	90	81200
Φ50	105	93	11500
Φ60	102	94	8400
Φ65	146	94	4800
Φ80	106	94	3050
Φ95	85	95	1800

液面覆盖球
Liquid-surface Covering Ball

液面覆盖球以聚丙烯 pp 为原料，经发泡、收缩生产的圆形塑料填料，分为带边液面覆盖球与不带边液面覆盖球两种型号，带边液面覆盖球具有重心稳定，边与边重叠，覆盖效果好等特点，其作用是抑制酸雾挥发，保护操作人员健康，减少大气污染和空气对水质的污染，有效提高凝结水质量，有利于发电机组、供热机组的安全运行。

Adopting PP as material, it was produced by foaming and contracting method,which divided into edge or without edge covering ball.When covering ball floats onto water, the overlapped edge will short Floating cover’ s void fraction so as to reduce heat loss and evaporation rate.It is not only reduce acid-mist mostly and improve the pollution of CO2 in air ,but also protect water’ s quality, purify environment and so on.

产品名称 Item name	尺寸 Size (mm)	密度 Density G/m3	使用温度 Application Temperature℃	抗压强 Anti-pressure Mpa	堆积个数 Bulk number Pieces/m²	空隙率 Void rate %	覆盖率 Covering rate %
覆盖球 Covering ball	Φ40	0.5	≤120	≤0.4	720	95	91
覆盖球 Covering ball	Φ50	0.5	≤120	≤0.4	500	95	91
带边覆盖球 Covering ball with border	Φ40	0.3	≤120	≤0.4	600	93	97
带边覆盖球 Covering ball with border	Φ80	0.5	≤120	≤0.36	230	95	99
液面覆盖球 Liquid-surface covering ball	Φ40	0.3	≤120	≤0.4	666	93	97
液面覆盖球 Liquid-surface covering ball	Φ80	0.5	≤120	≤0.36	232	95	99
菱形覆盖球 Lozenged covering ball	Φ50	0.3	≤120	≤0.4	500	95	91

空心浮球
Plastic Hollow Floating ball

塑料空心浮球又称塑料浮球。其空隙率高，过滤能力好，耐化学腐蚀性好。它可以最大限度地减少酸雾和热量损失。塑料空心浮球填料重力稳定，传质单元高度低，覆盖效果好。

Plastic hollow floating ball also called plastic hollow floatation ball packing, It has high void ratio, good filtration capacity and good chemical corrosion resistance. It can minimize acid mist and heat loss. Plastic hollow floatation ball packing is characterized by stable gravity, low mass transfer unit height and good coverage effect.

尺寸 Size mm	比表面积 Surface Area m²/m³	空隙率 Void Fraction %	堆积个数 Bulk Number Pieces/m³
Φ25	200	40	41500
Φ38	150	40	22000
Φ50	120	40	10500

惰性氧化铝填料球
Inert Alumina Ball

惰性氧化铝填料球广泛用于石油、化工、化肥、天然气及环保等行业，作为反应器内催化剂的覆盖支撑材料和塔填料。它具有耐高温高压，吸水率低，化学性能稳定的特点。能经受酸、碱及其他有机溶剂的腐蚀，并能经受生产过程中出现的温度变化。其主要作用是增加气体或液体分布点，支撑和保护强度不高的活性催化剂。

Inert alumina packing ball is widely used in petroleum, chemical industry, chemical fertilizer, natural gas and environmental protection industries, as the support material of catalyst in reactor and tower packing. It has the characteristics of high temperature and high pressure resistance, low water absorption and stable chemical properties. It can withstand the corrosion of acid, alkali and other organic solvents, and can withstand the temperature change in the production process. Its main function is to increase the distribution point of gas or liquid, support and protect the active catalyst with low strength.

种类 Type		普通瓷 Ordinary Alumina ball	低铝瓷 low Alumina ball	中铝瓷 Medium Alumina ball	高铝瓷 high Alumina ball	刚玉瓷 99% Alumina ball
化学成份 Chemical composition %	Al_2O_3	20-30	31-45	46-70	71-90	≥90
	$Al_2O_3+SiO_2$	≥90				
	Fe_2O_3	≤1				
吸水率 water absorption %		≤5				≤8
莫氏硬度 / 级 Grade		7	7	7	7	7.5
耐酸度 Acid resistance %		≥98				
耐碱度 Alkali resistance %		≥80	≥82	≥85	≥90	≥95
耐热温度 Heat resistance ˚C		1000	1200	1300	1400	1500
抗压强度 N/ 颗 Compressive strength KN/pcs						
Φ3		≥0.2	≥0.25	≥0.30	≥0.35	≥0.40
Φ6		≥0.50	≥0.60	≥0.65	≥0.70	≥0.80
Φ8		≥0.70	≥0.80	≥0.90	≥1.00	≥1.20
Φ10		≥0.85	≥1.00	≥1.20	≥1.50	≥1.90
Φ13		≥1.80	≥2.30	≥3.00	≥4.00	≥5.80
Φ16		≥2.30	≥3.00	≥4.50	≥6.00	≥7.00
Φ20		≥4.30	≥5.00	≥6.00	≥7.50	≥9.00
Φ25		≥6.20	≥7.00	≥8.00	≥10.00	≥12.00
Φ30		≥7.00	≥8.00	≥10.00	≥12.00	≥14.00
Φ38		≥8.50	≥10.00	≥12.00	≥16.00	≥8.00
Φ50		≥12.00	≥13.00	≥15.00	≥18.00	≥21.050
Φ75		≥16.00	≥18.00	≥20.00	≥22.00	≥25.00
堆积重量 Bulk weight kg/m3		1300-1400	1400-1500	1500-1600	1600-1800	≥1800

ALUMINA BALL SERIES
瓷球系列

开孔瓷球
Open Hole Ceramic Ball

开孔瓷球是在惰性氧化铝瓷球的基础上开发的新产品，它以球体直径为轴心进行开孔，既具有一定的机械强度、化学稳定性和热稳定性，又增加了比表面积和空隙率，从而增加了物料的分散性和通量，降低了系统的阻力。可广泛用于石油、化工和天然气等行业替代惰性氧化铝瓷球作催化剂的覆盖支撑填料。

Open hole ceramic ball is a new product developed on the basis of inert alumina ceramic ball. It has certain mechanical strength, chemical stability and thermal stability, and increases the specific surface area and porosity, so as to increase the dispersion and flux of materials and reduce the resistance of the system. It can be widely used in petroleum, chemical and natural gas industries to replace the inert alumina ceramic ball as the covering support filler of catalyst.

种类 Type		普通瓷 Ordinary Alumina ball	低铝瓷 low Alumina ball	中铝瓷 Medium Alumina ball	高铝瓷 high Alumina ball	刚玉瓷 99% Alumina ball
化学成份 Chemical composition %	Al_2O_3	20-30	30-45	45-70	70-90	≥90
	$Al_2O_3+SiO_2$	≥90				
	Fe_2O_3	≤1				
吸水率 water absorption %		≤5				
耐酸度 Acid resistance %		≥98				
耐碱度 Alkali resistance %		≥80	≥82	≥85	≥90	≥95
耐热温度 Heat resistance ˚C		≥1300	≥1400	≥1500	≥1600	≥1700
抗压强度 Compressive strength N/ 颗						
Φ6		≥480	≥520	≥600	≥620	≥650
Φ8		≥600	≥700	≥800	≥900	≥1000
Φ10		≥1000	≥1100	≥1300	≥1500	≥1800
Φ13		≥1500	≥1600	≥1800	≥2300	≥2600
Φ16		≥1800	≥2000	≥2300	≥2800	≥3200
Φ20		≥2500	≥2800	≥3200	≥3600	≥4000
Φ25		≥3000	≥3200	≥3500	≥4000	≥4500
Φ30		≥4000	≥4500	≥5000	≥5500	≥6000
Φ38		≥6000	≥6500	≥7000	≥8500	≥10000
Φ50		≥8000	≥8500	≥9000	≥10000	≥12000
Φ75		≥10000	≥11000	≥12000	≥14000	≥15000
堆积重量 Bulk weight kg/m3		1100-1200	1200-1300	1300-1400	1400-1550	≥1550

ALUMINA BALL SERIES
瓷球系列

研磨球
Grinding Ball

研磨球作为陶瓷体和釉料制备的研磨介质。由于出色的耐磨性和硬度，它既适用于搅拌磨又适用于球磨机的干磨。

Grinding ball as grinding media for ceramic body & glaze preparation. Due to the excellent wear resistance and hardness. It is suitable for both stirring mill and dry mill of ball mill.

指标 Index		高铝研磨瓷球 High alumina grinding ball		中铝研磨瓷球 Medium alumina grinding ball	碳化硅研磨瓷球 Silicon carbide grinding ceramic ball
化学成份 Chemical composition %	Al_2O_3	95	≧92	65-75	60-70
	SiO_2	3	3.81	30-15	20-15
	Fe_2O_3	0.05	0.06	0.41	0.5
	TiO_2	0.04	0.02	1.7	1.8
	其它 Other	1.9	2.53	5	10
堆积密度 Bulk density g/cm3		3.68	3.68	2.93-3.00	2.80-2.90
吸水率 water absorption%		＜0.005	＜0.01	＜0.01	＜0.05
莫氏硬度 级 Mohs hardness grade		9	9	≥8	≥8
抗压强度 Compressive strength Mpa		2100	≥2000	≥1000	≥1000
磨损率 Wear rate %		0.0084	0.01	0.011	0.08
成形方法 Forming method		均衡挤压 Balanced extrusion	均衡挤压 Balanced extrusion	挤压成形 Extrusion forming	手工制作 Handmake

ALUMINA BALL SERIES
瓷球系列

蓄热瓷球
Heat Storage Ceramic Ball

蓄热球具有强度高，耐磨损；导热率和容量大，蓄热效率高；热稳定性好，温度聚变时不易破裂等优点。特别适用于空气分离设备蓄热器和钢铁厂高炉煤气加热炉作蓄热填料，通过对煤气和空气进行双预热，是燃烧温度。

The heat storage ceramic ball has the advantages of high strength, wear resistance, large thermal conductivity and capacity, high thermal storage efficiency, good thermal stability, and not easy to crack in temperature fusion. It is especially suitable for the regenerator of air separation equipment and the heating furnace of blast furnace gas in iron and steel works as heat storage filler. Through double preheating of gas and air, it is the combustion temperature.

指标 Index		空分用蓄热瓷球 Air separation thermal storage ceramic ball	加热炉用蓄热瓷球 Regenerative ceramic ball for heating furnace
化学成份 Chemical composition %	Al_2O_3	20-30	60-65
	SiO_2	≥90	≥90
	Fe_2O_3	≤1	≤1.5
规格尺寸 size mm		Φ10-12 Φ12-14	Φ16-18 Φ20-25
热容量 Heat capacity J/kg.k		≥836	≥1000
导热系数 thermal conductivity w/m.k		2.6-2.9	-
耐急变温差 Resistance temperature ℃		800	100
耐火度 Fire resistance ℃		1550	1750
磨耗率 Wear rate %		≤0.1	≤0.1
莫氏硬度 级 Mohs hardness grade		≥6.5	≥6.5
抗压强度 compressive strength MPa		800-1200	1800-3200
堆重 Bulk weight kg/m3		1300-1400	1500-1600

耐火球
Refractory Porcelain Ball

耐火球是以工业氧化铝和耐火高岭土为主要原料，经科学配方、成形和高温煅烧制成的。耐火球通常在合成氨装置用于改变转换器和裂化炉。

Refractory porcelain ball are made of industrial alumina and refractory kaolin through scientific formulation, forming and high temperature burned. Refractory balls are usually used in ammonia plants to change converters and cracking furnaces.

性能 Property	单位 Unit	技术指标 Technical index
Al_2O_3	%	≥65
Fe_2O_3	%	≤1.6
显气孔率 Apparent porosity	%	≤24
耐压强度 Compressive strength	Kg/cm^2	≤900
耐火度 Fire resistance	℃	≥1800
堆积比重 Bulk specific gravity	Kg/cm^3	≥1386
真比重 True gravity	Kg/cm^3	≥2350
荷重软化温度 Softening temperature under load	℃	≥1500
重烧收缩 Reburning shrinkage	%	≥0.1

MOLECULAR SIEVES
分子筛

分子筛（又称合成沸石）是一种铝硅酸盐微孔晶体。它是由氧化硅、氧化铝四面体组成的基本骨架根据结构根据晶体结构的不同，分为 A 型、X 型、Y 型等。

Molecular sieve (also known as synthetic zeolite) is an aluminosilicate microporous crystal. It is composed of silicon oxide, aluminum oxide tetrahedron composed of the basic skeleton structure.According to the different crystal structure, it divided into A-Type, X-type ,Y-type and so on.

1.7-2.5mm

3-5mm

1.6mm

3.2mm

3A分子筛
3A Molecular Sieve

3A 分子筛，是一种碱金属铝硅酸盐，是钾形式的 A 型晶体结构。它的有效孔径约为 3 埃（0.3 纳米）。这足够大，可以容纳水分，但不包括可能形成聚合物的不饱和碳氢化合物等分子。

成分表： $0.4K_2O·0.6Na_2O·Al_2O_3·2.SiO_2·4.5H_2O$

3A Molecular Sieve, is an alkali metal alumina silicate. It is the potassium form of the type A crystal structure. It has an effective pore opening of about 3 angstroms (0.3nm). This is large enough to allow in moisture, but excludes molecules such as unsaturated hydrocarbons which can potentially form polymers.

Composition: $0.4K_2O·0.6Na_2O·Al_2O_3·2.SiO_2·4.5H_2O$

形状 Shape	直径 Diameter	质量比 Quality Ratio %	密度 Bulk Density g/ml	磨损 Abrasion Loss %	抗压强度 Compression Strength N	静态水吸收率 Static Water Adsorption %
条型 Pellet	1.5-1.7	≥96	≥0.60	≤0.20	≥30/piece	≥20.5
条型 Pellet	3.0-3.3	≥96	≥0.60	≤0.20	≥40/piece	≥20.5
圆形 Sphere	1.7-2.5	≥98	≥0.65	≤0.20	≥30/piece	≥20.5
圆形 Sphere	3.0-5.0	≥98	≥0.65	≤0.20	≥70/piece	≥20.5

MOLECULAR SIEVES
分子筛

4A分子筛
4A Molecular Sieve

4A 分子筛，是一种碱性硅酸铝。它是 A 型晶体结构的钠形式。它的有效孔径约为 4 埃（0.4nm）。它将吸附大多数动力学直径小于 4 埃的分子，排除那些较大的分子。

成分表： $Na_2O·Al_2O_3·2SiO_2·4.5H_2O$.

4A Molecular Sieve, is an alkali alumina silicate. It is the sodium form of the type A crystal structure. It has an effective pore opening of about 4 angstroms(0.4nm). It will adsorb most molecules with a kinetic diameter of less than 4 angstroms and exclude those larger.

Composition: $Na_2O·Al_2O_3·2SiO_2·4.5H_2O$.

形状 Shape	直径 Diameter	质量比 Quality Ratio %	密度 Bulk Density g/ml	磨损 Abrasion Loss %	抗压强度 Compression Strength N	静态水吸收率 Static Water Adsorption %	正己烷吸附率 Packing Water %
条型 Pellet	1.5-1.7	≥96	≥0.60	≤0.20	≥30/piece	≥20.5	≥14
条型 Pellet	3.0-3.3	≥96	≥0.60	≤0.25	≥50/piece	≥20.5	≥14
圆形 Sphere	1.7-2.5	≥98	≥0.65	≤0.20	≥35/piece	≥20.5	≥14
圆形 Sphere	3.0-5.0	≥98	≥0.65	≤0.20	≥70/piece	≥20.5	≥14

5A分子筛
5A Molecular Sieve

5A 分子筛可吸附小于该孔径的任何分子，一般称为钙分子筛。它除具有 3A，4A 分子筛所具有的功效外，还可吸附 C3—C4 正构烷烃，氯乙烷，溴乙烷，丁醇等，可应用于正异构烃分离、变压吸附分离及水和二氧化碳的共吸附。

成分表： $0.70CaO·0.3N_2O·Al_2O_3·2SiO_2·4.5H_2O$

5A molecular sieve can adsorb any molecule smaller than the pore size, which is generally called calcium molecular sieve. In addition to the functions of 3a and 4A molecular sieves, it can also adsorb C3-C4 normal alkanes, chloroethane, bromoethane, butanol and so on. It can be used in the separation of normal isomers, pressure swing adsorption separation and CO2 adsorption of water and carbon dioxide.

Composition: $0.70CaO·0.3N_2O·Al_2O_3·2SiO_2·4.5H_2O$

形状 Shape	直径 Diameter	质量比 Quality Ratio %	密度 Bulk Density g/ml	磨损 Abrasion Loss %	抗压强度 Compression Strength N	静态水吸收率 Static Water Adsorption %	正己烷吸附率 Packing Water %
条型 Piece	1.5-1.7	≥96	≥0.60	≤0.20	≥30/piece	≥21.5	≥10.5
条型 Piece	3.0-3.3	≥96	≥0.60	≤0.20	≥45/piece	≥21.5	≥10.5
圆形 Sphere	1.7-2.5	≥98	≥0.70	≤0.20	≥30/piece	≥21.5	≥11
圆形 Sphere	3.0-5.0	≥98	≥0.70	≤0.20	≥60/piece	≥21.5	≥11

13X分子筛

Molecular Sieve13X

分子筛 13x 是 X 型晶体的钠型，比 a 型晶体的孔径大得多。它将吸附动力学直径小于 9 埃（0.9 纳米）的分子，并排除那些较大的分子。通常用于分离氮和氧。

成分表： $Na_2O·1Al_2O_3·(2.8 \pm 0.2)SiO_2·6H_2O$

molecular sieve13X is the sodium form of the type X crystal and has a much larger pore opening than the type A crystals. It will adsorb molecules with a kinetic diameter of less than 9 Angstrom (0.9 nm) and exclude those larger molecular. It is commonly used to separate nitrogen and oxygen.

Composition: $Na_2O·1Al_2O_3·(2.8 \pm 0.2)SiO_2·6H_2O$

形状 Shape	直径 Diameter	质量比 Quality Ratio %	密度 Bulk Density g/ml	磨损 Abrasion Loss %	抗压强度 Compression Strength N	静态水吸收率 Static Water Adsorption %	二氧化碳排放量 CO2 Air Disposal NL/g
条型 Pellet	1.5-1.7	≥96	≥0.54	≤0.20	≥30/piece	≥25	≥14
条型 Pellet	3.0-3.3	≥96	≥0.54	≤0.25	≥45/piece	≥25	≥14
圆形 Sphere	1.0-1.6	≥98	≥0.60	≤0.20	≥25/piece	≥25	≥14
圆形 Sphere	3.0-5.0	≥98	≥0.60	≤0.20	≥60/piece	≥25	≥14

碳分子筛

Carbon Molecular Sieve

碳分子筛的主要成分为元素碳，外观为黑色柱状固体。因含有大量直径为 4 埃的微孔，该微孔对氧分子的瞬间亲和力较强，可用来分离空气中的氧气和氮气，工业上利用变压吸附装置（PSA）制取氮气。碳分子筛制氮量大、氮气回收率高，使用寿命长，适用于各种型号的变压吸附制氮机，是变压吸附制氮机的首选产品。碳分子筛空分制氮已广泛地应用于石油化工、金属热处理、电子制造、食品保鲜等行业。

The main component of carbon molecular sieve is elemental carbon, and its appearance is black columnar solid. Because of the large number of micropores with a diameter of 4 A, the micropores have strong instantaneous affinity for oxygen molecules, which can be used to separate oxygen and nitrogen in the air. In industry, pressure swing adsorption (PSA) is used to produce nitrogen. Carbon molecular sieve has the advantages of large amount of nitrogen production, high nitrogen recovery rate and long service life. It is suitable for various types of pressure swing adsorption nitrogen generator and is the first choice of pressure swing adsorption nitrogen generator. Carbon molecular sieve air separation has been widely used in petrochemical, metal heat treatment, electronic manufacturing, food preservation and other industries.

外观 shape	Black/piece
直径 diameter	1.3mm; 1.6mm; 2.2mm; 或根据客户需求 according to customer requirement
抗压强度 compressive strength	100N/pcs
粉尘含量 Dust content	100PPM

型号 Type	吸附压力 Adsorption pressure MPa	产氮浓度 nitrogen application density N2%	产氮量 nitrogen application amou NM3/h.t)	空气消耗比 Air consumption ratio %
CMS-200	0.8	99.99	70	21
		99.9	140	27
		99.5	200	36
		99	260	41
		98	330	48
CMS-220	0.8	99.99	90	25
		99.9	160	34
		99.5	220	43
		99	290	48
		98	360	54
CMS-240	0.8	99.99	100	26
		99.9	175	35
		99.5	240	44
		99	300	46
		98	370	55
CMS-260	0.8	99.99	110	27
		99.9	190	36
		99.5	260	45
		99	310	50
		98	380	56

活性氧化铝
Activated Alumina

活性氧化铝，又名活性矾土，英文名称为 Activated alumina。在催化剂中使用氧化铝的通常专称为“活性氧化铝”，它是一种多孔性、高分散度的固体材料，有很大的表面积，其微孔表面具备催化作用所要求的特性，如吸附性能、表面活性、优良的热稳定性等，所以被广泛地用作化学反应的催化剂和催化剂载体。球形活性氧化铝变压油吸附剂为白色球状多孔性颗粒，活性氧化铝粒度均匀，表面光滑，机械强度大，吸湿性强，吸水后不胀不裂保持原状，无毒、无嗅、不溶于水、乙醇。活性氧化铝是一种微量水深度干燥的高效干燥剂，适用于无热再生装置。

Activated alumina, also known as activated bauxite, is called activated alumina. Alumina used in catalysts is usually called "activated alumina". It is a kind of porous, highly dispersed solid material with large surface area. Its microporous surface has the characteristics required by catalytic action, such as adsorption performance, surface activity, excellent thermal stability, etc., so it is widely used as catalyst and catalyst support for chemical reaction. Spherical activated alumina PSA is a white spherical porous particle. The particle size of activated alumina is uniform, the surface is smooth, the mechanical strength is high, and the moisture absorption is strong. After absorbing water, it does not expand and crack, and remains unchanged. It is non-toxic, odorless, and insoluble in water and ethanol. Activated alumina is an efficient desiccant for deep drying of trace water, which is suitable for heatless regeneration.

		吸附剂 Adsorbent	除氟剂 Defluoridation	双氧水专用 Special for hydrogen peroxide	脱氯剂 Dechlorination	催化剂载体 Catalyst carrier
外观形状 Shape		白色，球型 White, sphere				
晶相 Crystal phase		x-p	x-p	y	y	y
化学成份 Chemical composition %	Al_2O_3	≥93	≥93	≥93	≥90	≥93
	Na_2O	≥0.3	≥0.3	≥0.5	-	0.15-0.3
LOI%		6-8	6-8	≤8	≤8	5
堆积密度 Bulk density g/m		0.68-0.72	0.70-0.75	0.65-0.75	0.68-0.78	0.70-0.80
比表面积 Surface area m^2/g		≥280	≥280	200-260	≥300	≥200
孔容 Pore volume ml/g		0.30-0.45	0.30-0.42	0.40-0.46	0.30-0.50	0.4
静态吸附率 Static adsorption rate (RH=60%)		吸水 Water absorption 15-17	吸氟 Fluorine absorption 0.12	吸水 Water absorption 50	吸氯 chlorine 10-20	吸水 Water absorption 50-70
活性 Activity		56-62				
磨耗率 Wear rate %		≤1.0	≤1.0	≤1.0	≤0.7	≤0.4
抗压强度 N/ 颗 Compressive strength KN/pcs	0.4-1.2mm		≥30			
	1-2mm	≥40	≥40			
	2-3mm	≥60	≥60			
	3-5mm	≥100		≥100	≥100	≥100
	4-6mm	≥120		≥130	≥120	≥110

ADSORBENTS
吸附剂

活性炭
Activated Carbon

活性炭是一种经特殊处理的炭，将有机原料（果壳、煤、木材等）在隔绝空气的条件下加热，以减少非碳成分（此过程称为炭化），然后与气体反应，表面被侵蚀，产生微孔发达的结构（此过程称为活化）。由于活化的过程是一个微观过程，即大量的分子碳化物表面侵蚀是点状侵蚀 ，所以造成了活性炭表面具有无数细小孔隙。活性炭表面的微孔直径大多在 2 ～ 50nm 之间，即使是少量的活性炭，也有巨大的表面积，每克活性炭的表面积为 500~1500m2，活性炭的一切应用，几乎都基于活性炭的这一特点。

Activated carbon is a kind of specially treated carbon, which heats the organic raw materials (fruit shell, coal, wood, etc.) under the condition of isolating air to reduce the non carbon components (this process is called carbonization), and then reacts with the gas to erode the surface and produce the structure with developed micropores (this process is called activation). Because the activation process is a micro process, that is, the surface erosion of a large number of molecular carbides is pitting erosion, so there are numerous small pores on the surface of activated carbon. The diameter of micropores on the surface of activated carbon is mostly between 2 and 50nm. Even a small amount of activated carbon has a huge surface area, with a surface area of 500 ~ 1500m2 per gram of activated carbon. Almost all applications of activated carbon are based on this characteristic of activated carbon.

原材料 Raw material	椰壳 Coconut Shell	果壳 Nut Shell	煤质 Coal-Based	煤质 Coal-Based
形状 Shape	颗粒 Granular	颗粒 Granular	条状 Extruded	颗粒 Granular
碘值 Lodine value（mg/g）	900-1100	800-950	600-950	600-900
PH	7-11	7-11	7-11	7-11
硬度 Hardness（%）	≥95	≥90	≥95	≥90
孔容 Pore volume（cm^3/g）	~0.90	~0.85	~0.70	~0.75
堆积密度 Bulk density（g/cm^3）	0.50-0.60	0.45-0.58	0.45-0.65	0.45-0.65
甲基蓝 Methyl blue（mg/g）	≥130	≥105	≥150	≥150
比表面积 Specific surface area（m^2/g）	1200±50	900±50	800±50	800±50
灰份 Ash content（%）	≤13	≤13	≤10	≤13

HONEYCOMB CERAMIC
蜂窝陶瓷

蜂窝陶瓷
Honeycomb Ceramic

蜂窝陶瓷是一种多孔的工业陶瓷，主要特点是比表面积大、热容量大、热胀系数小、耐腐蚀强、耐热性能好，被广泛应用于冶金机械行业，如步进加热炉，热处理炉，锻造炉，熔炼炉等。在建材工业中，如陶瓷窑，玻璃窑等。在石化工业中，如管式炉，裂化炉。

Honeycomb ceramics is a kind of porous industrial ceramics. It mainly characterized by large specific surface area, large thermal capacity, small thermal expansion coefficient, strong corrosion resistance, good heat resistance. It widely used in metallurgical machinery industry, such as stepping furnace, heat treatment furnace, forging furnace, melting furnace and so on. In building materials industry, such as ceramic kiln, glass kiln and so on. In the petrochemical industry, such as tubular furnaces, cracking furnaces.

主要物理性能 Main Physical Properties

		铝质瓷 Aluminous Porcelain	莫来石瓷 Mullite Porcelain	致密堇青石瓷 Dense Cordierite Porcelain	疏松堇青石瓷 Porous Cordierite Porcelain	莫来石Mullite 堇青石瓷 Cordierite Porcelain	Stoneware Porcelain
化学成份 Chemical composition %	Al_2O_3	48-55	66-72	32-36	32-37	55-65	20-26
	SiO_2	40-45	25-30	4-552	46-52	28-36	68-75
	MgO	-	-	5-8	8-12	2.5-3.2	0.2-0.3
	K_2O+Na_2O+CaO	4.0-5.5	≤1.2	≤3.0	≤2.0	≤1.0	2.5-4.0
密度 g/cm³		2.7	2.9	2.4-2.6	1.9-2.0	2.9-3.2	2.3-2.5
热膨胀系数 (20-1000℃),×10⁻⁶·℃		5-7	5.5-6.5	2-.5-3.5	1.3-2.5	2.5-4.0	5-7
热容量 (20-1000℃),j/kg·℃		800-900	1100-1300	800-1200	750-900	850-110	840-920
热导率 (20-1000℃)W/m·℃		1.5-2.5	1.5-2.0	1.5-2.58	1.3-1.5	1.5-2.3	1.0-1.2
耐热冲击℃ Thermal Shock Resistance (℃)		⩾150	≥350	≥250	≥360	≥250	≥150
最高工作温度℃ Max. Operating Temperature (℃)		1300	1600	1300	1300	1400	1300

主要技术参数 Main Technical Parameters

端面孔数 Number of End Face Holes	5×5	13×13	20×20	25×25	40×40	50×50
孔密度 Pore density cm²	0.15	1	2	3	7	11
孔径 mm Aperture diameter	26.3	9.2	6.4	4.9	3.0	2.3
壁厚 Wall Thickness mm	2	1.5	1.2	1.0	0.7	0.7
比表面积 Surface area m²/m³	117	278	455	540	825	1005
开孔率 Porosity %	77	74	73	67	65	75
规格尺寸 Size	标准型(Standard Type:)：150×150×600/450/300/150/100/50 标准型(Standard Type:)：100×100×100/40					

FOAM CERAMIC FLITER PLATE
泡沫陶瓷过滤片

泡沫陶瓷过滤片
Foam Ceramic Filter Plate

泡沫陶瓷过滤片是一种十分有效的液体金属过滤器，其三维连通的曲孔网状骨架结构和极高的空隙使其有集渣表面积大，过滤内表面积大，流通阻力小，过滤效果好等优点。

Foam ceramic filter plate is a very effective liquid metal filter. Its three-dimensional connected curved mesh framework and extremely high voids make it have the advantages of large surface area, large surface area, low flow resistance and good filtration effect.

原料 Material	氧化铝 Al_2O_3	碳化硅 SiC	氧化锆 ZrO_2	氧化镁 MgO
颜色 Color	白色 White	黑灰色 Black grey	黄色 Yellow	暗黄色 Dark yellow
孔密度 Pore density	8-60ppi	8-60ppi	8-60ppi	8-60ppi
孔隙率 Porosity	80-90%	80-90%	80-90%	80-90%
耐火性 Fire resistance	≤1100℃	≤1500℃	≤1700℃	≤1000℃
抗弯强度 Bending strength	>0.6Mpa	>0.8Mpa	>1.0Mpa	>0.6Mpa
抗压强度 compressive strength	>0.8Mpa	>0.9Mpa	>0.1.0Mpa	>0.6Mpa
容重 Bulk density	0.3-0.45g/cm³	0.35-0.5g/cm³	0.9-1.5g/cm³	0.35-0.5g/cm³
耐热震性 Thermal shock resistance	6times/1100℃	6times/1100℃	6times/1100℃	6times/1100℃
应用 Application	铝合金及其它有色金属合金 Aluminum alloy and other nonferrous metal alloys	球墨铸铁 Ductile iron 可锻铸铁 malleable iron 灰铸铁和其他铸铁 Grey cast iron and other cast iron	高熔点金属合金，如钢 A high melting metal alloy, such as steel 合金钢， 不锈钢等 Alloy steel,s tainless steel	镁和高活性合金 Magnesium and high activity alloys

生物陶粒滤料
Ceramisite

生物陶粒滤料主要用于曝气生物池（BAF）的污水二级生化处理，可用于普通生物滤池和高负荷生物滤池，包括塔式滤池，加速生物滤池，通气滤池等。

Biological ceramsite filter material is mainly used for secondary biochemical treatment of wastewater in biological aerated tank (BAF). It can be used in ordinary biological filter and high load biological filter. Including tower filter, accelerated biological filter, ventilation filter, etc.

尺寸 Size：φ1-2，φ2-4，φ3-5，φ4-6，φ6-8，

成分 Ingredient	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	K_2O+Na_2O	Other
含量 Content %	60-65	18-21	7-9	3-4	1-4	3-5	Trace

流化床生物载体
MBBR

这是一种污水处理工艺，由哈尔瓦德教授 20 世纪 80 年代末，德加德在科技大学工作。

MBBR 系统由一个曝气池（类似于活性污泥池）和特殊的塑料载体组成，该载体提供一个生物膜可以生长的表面。载体由密度接近水密度（1g/cm3）的材料制成。例如，密度接近 0.95 g/cm3 的高密度聚乙烯（HDPE）。曝气系统将载体混合在池中，从而使进水废水中的基质与载体上的生物量有良好的接触。

It is a type of wastewater treatment process that was first invented by Prof.Hallvard Degaard at University of Science and Technology in the lates of 1980s.
The MBBR system consists of an aeration tank (similar to a activated sludge tank) with special plastic carriers that provide a surface where a biofilm can grow. The carriers are made of a material with a density close to the density of water (1 g/cm3). An example is high-density polyethylene (HDPE) which has a density close to 0.95 g/cm3. The carriers will be mixed in the tank by the aeration system and thus will have good contact between the substrate in the influent wastewater and the biomass on the carriers.

规格 Specification	孔数 Hole Quantity	比重 Density g/cm³	比表面积 Surface area m²/m³	孔隙率 Porosity %	挂膜时间 membrane-forming time day	硝化效率 gNH4N/M3.d
Φ25*12	19	＞0.96	＞500	＞90	3-15day	400-1200
Φ25*4	64	＞0.96	＞1200	＞85	3-15day	400-1200
Φ10*10	4	＞0.98	＞900	＞85	3-15day	400-1200

瓷砂
Porcelain Sand

瓷砂滤料它具有比表面大，截污能力强，产水量高，水质稳定，过滤周期长等特点。能满足各种成份复杂的工业废水和城市污水的深度处理。针对传统滤料存在的缺陷，并根据国内新型滤料研制的经验，采用优质高岭土，粘结剂、成孔剂、抗腐蚀剂等经高温煅烧而成，外观白色，质地坚硬，颗粒均匀，微孔发达，孔隙率高。

广泛应用于单层，双层，三层滤池及其它形式滤池（慢滤池，快滤池，吸虹滤池，重力式无阀滤池，压力滤池，体外循环滤池，普通滤池），机械过滤器，离子交货器等作为介质，处理各种有机，无机工业污水，自来水，纯水，软水，并特别适宜于锅炉化学水处理和超纯水制备。

Porcelain sand has the characteristics of large specific surface area, strong pollution interception capacity, high water yield, stable water quality and long filtration period. It can meet the requirements of advanced treatment of industrial waste water and urban sewage with complex components. In view of the defects of traditional filter media and according to the domestic experience in the development of new filter materials, high-quality kaolin, binder, pore forming agent and anti-corrosion agent are used to calcine at high temperature. It has white appearance, hard texture, uniform particles, developed micropores and high porosity.It is widely used in single-layer, double-layer, three-layer filter and other types of filter (slow filter, fast filter, siphon filter, gravity valveless filter, pressure filter, extracorporeal circulation filter, ordinary filter), mechanical filter, ion delivery device, etc. as media, it can treat all kinds of organic and inorganic industrial sewage, tap water, pure water, soft water, especially suitable for chemical water treatment of boiler And ultrapure water.

尺寸 Size：φ1-2，φ2-4，φ3-5，φ4-6，φ6-8，

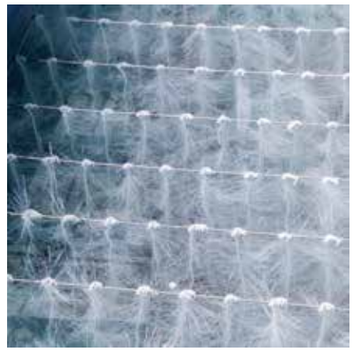
成分 Ingredient	SiO_2	Al_2O_3	Fe_2O3	CaO	MgO	K_2O+Na_2O	Other
含量 Content %	68	20	0.1	1	0.7	4	Trace

物理性质：Physical Properties

参数 Data	指标 Index	尺寸 Size	
		颗粒 Dust	滤层 Filtering layer
耐酸 Acid resistance	99.5%	0.5-1mm 0.6-1.2mm 1-2mm 2-4mm 4-8mm	1-2mm 2-4mm 4-8mm 8-16mm 16-32mm
耐碱 Alkali resistance	82.5%		
抗压强度 (N) Compressive strength	30-150		
莫氏硬度 Mohs hardness	Grade-7		
比重 Specific gravity	1.36-2.4g/cm3		
吸水率 Moisture absorption	0.5-2.21.0%		
磨损率 Wear ratio	≤0.5%		
空隙率 Void fraction	40-45%		

弹性填料
Elastic Filler

采用聚烯烃和聚酰胺为原料，均匀密集的带状分布，确保生物膜充分混合渗透接触交换，保持良好的活性和空间变异性。在实际应用中，密集条带可以进行多次碰撞和切割泡泡。这将大大提高氧气的利用率。因此广泛应用于好氧和厌氧处理过程。广泛应用于生物接触氧化池，水解酸化池。



Adopting Polyolefins & Polyamide as material, evenly and intensive strips distribution will ensure that bio film are fully mixed infiltration contact exchange so as to sustain good activity & space variability. In the actual application, intensive strips can be carried out many collisions and cutting against bubble. It will largely increase oxygen’ s utilization rate. Therefore, it widely used in aerobic and anaerobic treatment process. It is widely used in biological contact oxidation pool,hydrolysis acidification pool for packing.

尺寸 Size mm	每立方总米数 Total meters' quantity/ Cubic meter 米 m	立方重 Weight Kg/m³	立方挂膜重 Forming-film's weight/m³ Kg/m³	比表面积 Surface area m^2/m^3	材质 Material	空隙率 Void fraction %
120*0.35	77	3.6	84	380	PP/PE	90%
150*0.45	44	3.2	69	310	PP/PE	90%
180*0.45	30.8	3.1	57	265	PP/PE	90%
200*0.45	25	2.8	55	260	PP/PE	90%

组合填料
Combined Filler

组合填料是在软性填料和半软性填料的基础上发展而成的，它兼有两者的优点。其结构是将塑料圆片压扣改成双圈大塑料环，将醛化纤维或涤纶丝压在环的环圈上，使纤维束均匀分布；内圈是雪花状塑料枝条，既能挂膜，又能有效切割气泡，提高氧的转移速率和利用率。使水气生物膜得到充分交换，使水中的有机物得到高效处理。

Combined filler is developed on the basis of soft filler and semi soft filler, which has both advantages. Its structure is to change the plastic disc pressing buckle into a double circle large plastic ring, pressing aldehyde fiber or polyester fiber on the ring ring ring to make the fiber bundle evenly distributed; the inner ring is snowflake shaped plastic branch, which can not only hang film, but also effectively cut bubbles, and improve the oxygen transfer rate and utilization rate. The water gas biofilm can be fully exchanged and organics in water can be efficiently treated.

尺寸 Size mm	体积串数 Unit Bunches	单串重量 Unit weight g/piece	体积重量 Volume Weight Kg/m³	比表面积 Specific Area m²/m³
120*0.35	77	3.6	84	380
150*0.45	44	3.2	69	310
150*0.50	44	3.4	65	290
180*0.45	30.8	2.8	62	265
180*0.50	30.8	3.1	57	250
200*0.45	25	2.8	55	260

WATER TREATMENT
水处理

多孔悬浮球形填料
Porous Ball-Shaped Suspending Packing

该填料系列由聚丙烯材料注塑而成，分内外双层球体，外部为中空鱼网状球体，内部为PU海棉。主要起生物膜载体的作用，同时兼有截留悬浮物的作用，在使用过程中，微生物易生成、易更换、耐酸碱、抗老化、不受水流影响、使用寿命长，剩余污泥少，安装方便。

Porous ball-shaped suspend packing is divide into two parts. Outer structure is two net-shaped sphere. Inner structure is PU sponge. It mainly act as a biofilm carrier. At the same time intercept suspending solid. During the use process, microbes are easy to generate, easy to replace, acid and alkali resistant, anti-aging, and free from the influence of water flow. The utility model has the advantages of long service life, less excess sludge and convenient installation.

尺寸 Size mm	堆积个数 Bulk Number pcs	持续耐热温度 Continuous Heat Resistance ℃	脆化温度 brittle temperature ℃
Φ80	2000	69	-10
Φ100	1000	69	-10

生物球
Bio Ball

生物球为有益细菌的繁衍提供了广阔的生存空间，放置在过滤池或鱼缸中，它们有效地减少了氨氮和亚硝酸盐，有助于保持健康的水族馆鱼缸、鱼塘或养鱼场的水质状况以及鱼塘或养鱼场鱼类和植物的整体健康。

Bio balls provide large living area for beneficial bacterial to thrive , placed in a filter pond or tank. They efficiently reduce ammonia andnitrite to help maintain healthy aquarium tank, pond or fish farm water conditions and overall well -being of pond or fish farm and plants.

直径 Diameter mm	堆积个数 Bulk Number pcs	应用 Application
Φ36	21400pcs/m³	鱼缸 fish tank
Φ46	9800pcs/m³	鱼缸 fish tank
Φ56	5900pcs/m³	鱼缸 fish tank
Φ76	2280pcs/m³	鱼缸 fish tank

依格尔球
Igel Ball

依格尔球是一种常见的生物滤材，主要采用聚丙烯为原料经注塑工艺加工成具有刺猬型多针状塑料球体，细小柱状体在球体内分布均匀，增加了汽液的分布点，使之能充分的分散汽液。

Igel ball is a common biofilter material, which mainly uses polypropylene as raw material and is processed into a prickly multi needle plastic ball by injection molding process. The small cylindrical body is evenly distributed in the ball, increasing the distribution point of vapor and liquid, so that it can fully disperse vapor and liquid.

尺寸 Size mm	比表面积 Surface area m^2/m^3	空隙率 Void fraction %	堆积个数 Bulk number Pieces/m³
40	300	87	17000

WATER TREATMENT
水处理

斜管
Tube Settler

水处理斜板材质有聚丙烯（PP）聚氯乙烯（PVC）和玻璃钢（FRP）三种。组装形式的斜管和直管两种形式。水处理斜板主要用于各种沉淀和除砂作用。是近十年来在给排水工程中采用最广泛而且成为一项水处理装置。适用于进水口除砂，一般工业和生活给水沉淀、污水沉淀、隔油以及尾张浓缩等处理，即适用于新建工程，又适用于现有旧池的改造，均能取得良好的经济效益。

There are three kinds of water treatment inclined plate materials: polypropylene (PP), polyvinyl chloride (PVC) and glass fiber reinforced plastics (FRP). There are two forms of assembly: inclined pipe and straight pipe. Inclined plate for water treatment is mainly used for various sedimentation and desanding. It is widely used in water supply and drainage engineering in recent ten years and has become a water treatment device. It is suitable for water inlet Desanding, general industrial and domestic water supply sedimentation, sewage sedimentation, oil separation and tail tensioning concentration. It is not only suitable for new projects, but also suitable for the reconstruction of existing old pools, which can achieve good economic benefits.

技术参数 The key technical indexes

型号 Type	内接圆直径 Inscribed circle’s diameter		单个单元外尺寸 Exterior’s size of Single Unit	斜角 Angle of bevel		管厚 Thickness of Pipe		单组重量 Weight / Single Unit Kg
	直径 Dimension	误差 Deviation	长 * 宽 * 高 Dimension	误差 Deviation	度数 Dimension	误差 Deviation	片厚 Dimension	误差 Deviation	
聚丙烯斜管 PP Oblique Pipe	25	±1.5	1000*500*1000	±10	60°	±2°	0.4-0.5	±0.05	19-30
	30	±1.5					0.45-0.55	±0.05	18-27
	35	±2.0					0.5-0.6	±0.05	18-25
	50	±2.5					0.6-0.8	±0.08	14-24

COOLING TOWER PACKING
冷却塔填料

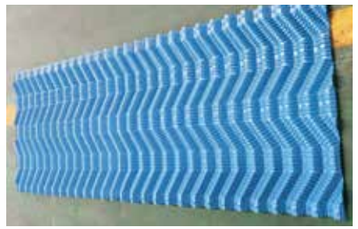
冷却塔填料
Cooling Tower Packing

冷却塔填料是冷却塔最重要的部分，它的效率高低，取决于冷却水与空气在填料中充分接触的程度。填料耐温 -20℃~70℃，耐老化，性能优良、抗紫外线，寿命长。

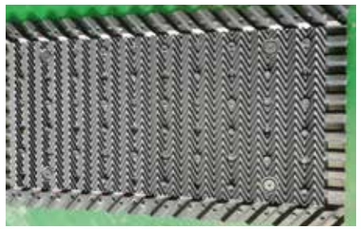
冷却塔填料分类：S波填料，（圆形填料）斜交错填料，大点波填料，小点波填料，双向波填料，斜折波填料（金日波填料），W/M 波填料，马利填料等

Cooling tower Packing is the most important part of cooling tower. Its efficiency depends on the degree of full contact between cooling water and air in the packing. The filler is resistant to - 20 ℃ ~ 70 ℃, aging resistance, excellent performance, UV resistance and long service life.
Cooling Tower have different type: “S” wave, Olique wave, “W/M” wave, round tower filler and so on.

圆形塔填料
Round tower filler



S波填料
“S”wave filler



“W/M”波填料
“W/M”wave filler

小点波填料
small point wave filler

斜折波（金日波）填料
Olique wave filler

亚太冷却塔填料
Asia Pacific cooling tower packing

Chemical Industry Company Flue Gas Desulfurization EPC Project

Textile Industry 5000 Tons/Day Wool Wastewater Treatment Project

32kt Continuous Phenol Unit, Tower Internals, and Structured Packing Project

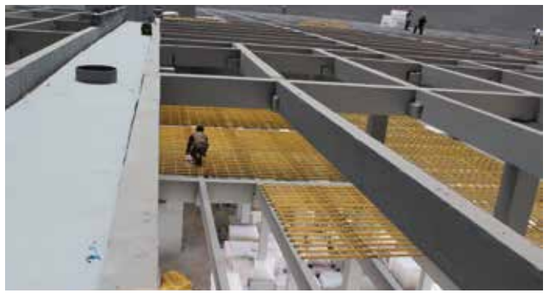
Tar and Ammonia Water Separation Project (Ceramic Tube Filter)

Coking Project Desulfurization Tower Light Ceramic Packing Installation Project

Regenerator Tower Installation Project

Solvent Recovery Unit Tower Internals and Packing Project

PVDF Bubble Cap Tray Replacement Project



Paper Industry Captive Power Plant Hyperbolic Cooling Tower Packing EPC Project

Plastic Tower Internals Installation Project

Annual Production of 100,000 Tons of Caprolactam and Utilization of Coke Oven Gas Annual Production of 400,000 Tons of Liquefied Natural Gas Project

2 Million Tons/Year Catalytic Cracking Unit Flue Gas Treatment Project

Caprolactam Workshop Quality Improvement and Capacity Expansion Project

Coal Fractionation Clean and Efficient Comprehensive Utilization Project (Phase I)

Equal Replacement 1.8 Million Tons Metallurgical Coke Chemical Relocation Project

Hydrogen Peroxide Project

1.2 Million Tons/Year PTA Project

Cooling Tower Packing Replacement Project

Nitric Acid Concentration Tower Internals Project

Reduction Furnace and Fuming Furnace Flue Gas Comprehensive Treatment Organic Amine Desulfurization Project

4.3m Coke Oven Upgrade Project

1.8 Million Tons/Year Coking Desulfurization Project

1.5 Million Tons/Year Coke Benzene Washing Tower Packing Project

800,000 Tons/Year Chlor-Alkali Project

Smelting Flue Gas to Sulfuric Acid System EPC Project

2×660 MW Coal-Fired Project Seawater Desulfurization Tower Packing Project

50,000 Tons/Year Crude Benzene Refining Project

100,000 Tons/Year Alcohol Distillation Tower Packing Project

160,000 Tons/Year Polypropylene Unit Engineering Project

Desulfurization and Dehydrogenation Tower Internals Installation Project

Phase I 30,000 Tons/Year Polysilicon Shared Project Rectification High-Boiling Cracking Packing and Internals

CPVC Tower Internals and Packing Installation Project

Municipal Waste Incineration Power Plant Flue Gas Desulfurization Expansion Project

300,000 Tons/Year Caprolactam Tower Internals and Packing Installation Site

Air Compression and Nitrogen Generation Project Molecular Sieve

Chlor-Alkali Chemical Subsidiary CPVC Pall Ring Packing Project