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Huachangfeng Equipment Inc.



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分离 净化 回收

Separation Purification Recovery



北京华昌丰机电技术研究开发中心  
Huachangfeng Equipment Inc ( HAF )



## 公司简介

北京华昌丰机电技术研究开发中心（HAF）位于北京石化新材料科技产业基地，在美国费城设有分支机构，是集研发、设计、试验、制造、专业工程承包为一体的专业化公司，HAF以中国北京为中心，产品远销韩国，美国，中东等多地，迄今已出口260000件产品无一投诉，拥有丰富的业绩，资质及专利，拥有ISO9001，ISO45001，ISO14001等认证，HAF主要经营范围：

- 聚结器；
- 分离器；
- 废气治理；
- SpotLesser洁粒器；
- 模头尾气处理MT-5干式深度分离净化系统；
- 在线自洁在线出渣过滤器；
- 在线加热炉炉管外壁清灰技术；
- 液态化工品高精度脱水/干燥系统；
- 风送系统；
- 水质处理；
- 洁粒装置；
- 油气回收；
- 过滤器和各种滤芯各种滤芯。

HAF是中国石化、中国石油、中国海洋石油、日本三菱、巴斯夫、台塑集团、大唐集团等企业供应商，为行业内大量的瓶颈问题提供了有效的解决方案。

HAF本着“精湛快捷、创新图强”的企业精神，“用先进可靠的技术和及时周到的服务，让顾客满意”的服务方针，与用户真诚合作，谋求共同发展，实现新的跨越。

## Company Profile

Huachangfeng Equipment Inc.(HAF) is located in Beijing Petrochemical New Material High-tech Industry Base, with branch office in Philadelphia, U.S.A., and distributors in Canada, Mexico, Ecuador, Italy, Germany, Pakistan, Kazakhstan, Azerbaijan, Australia, Nigeria, USA, Russia and many other countries and regions in the middle east. HAF is a professional company focusing on the R & D, design, test, production, and EPC. With Beijing as the headquarters, HAF has exported over 260,000 sets/pieces of products worldwide without any product returns. The company owns many patents, qualifications, experience, and many international certifications like ISO9001, ISO45001, ISO14001.

HAF provides a broad range of products and services as follows:

- Coalescers;
- Separator;
- Exhaust Gas Treatment;
- SpotLesser;
- Mold Head Tail Gas Separation & Purification;
- Coke Removal Unit;
- Online Heater Cleaning Technology for External Tube Wall
- Liquid Chemical Products High-Precision Dehydration/Drying System
- Pneumatic Conveying System;
- Water Purification;
- Pellet Cleaning;
- Vapor Recovery;
- Filters and All Types of Filter Elements.

As main supplier of China Petroleum and Chemical Corporation(SINOPEC), China National Petroleum Corporation(CNPC), China National Offshore Oil Corporation(CNOOC), Mitsubishi,BASF,Formosa Plastic Group, China Datang Corporation(CDT) etc. HAF provide many effective solutions for the bottlenecks problems in the mentioned industries. “Satisfying the Customers with superb and reliable technology and timely service “, HAF will sincerely cooperate with our customers for common development.

## HAF资质证书

HAF Certificates





## 主要产品和服务 Products and Services

### 一、过滤器

1. 列管式反冲洗过滤器
2. 筒式自清洗过滤器
3. 板刷自清洗过滤器
4. 自动脉冲袋式过滤器
5. 高效纤维球过滤器
6. 自动纤维反冲洗过滤器
7. 活性炭过滤器
8. 气体过滤器
9. 油品过滤器
10. 母液过滤器
11. 刚性过滤器
12. 贫富液过滤器
13. 膜过滤系统
14. 其它过滤器
  - 多级过滤器
  - 脱液机
  - 水质过滤器
  - 砂滤器
  - 干燥器
  - 中效过滤器
  - 管道过滤器
  - 航煤过滤器
  - 粗效过滤器
  - 烟气除尘
  - 精密过滤器
  - 烟气脱氮过滤器
  - 空气净化器
  - 烟气脱硫过滤器
  - 车用四滤（机油，汽油，空气，净化过滤器）
  - 船舶用过滤器（柴油，气体，油水净化过滤器）
  - 天然气过滤器
  - 各类医药过滤器
  - 饮料脱渣过滤器
  - 篮式过滤器

### 二、聚结分离器

1. 除雾器
2. 叶片分离器
3. 旋风分离器
4. 筒式聚结器

### 三、油气回收

1. 加油站油气回收
2. 油库栈台油气回收

### 四、废气治理

1. 火炬气有机气体回收系统
2. 尾气中氢气回收系统
3. 合成氨弛放气中氢气回收
4. 石油化工及炼厂气中的氢回收
5. 甲醇弛放气中的氢回收
6. 制氢厂的氢气回收
7. 焦炉煤气中氢气的回收
8. 烟气除尘脱硫脱氮系统
9. 混合气体中有机气体分离系统

### 五、气体净化

1. 天然气净化脱液系统
2. 室内空气除尘、脱味、杀菌

### 六、气体提纯

1. 膜法富氧系统
2. 膜法富氮系统

### 七、油田气田设备

### 八、除尘器

### 九、水质处理

### 十、各种滤芯

### 十一、洁粒器

### 十二、洁料系统

### 十三、在线加热炉炉管外壁清灰技术

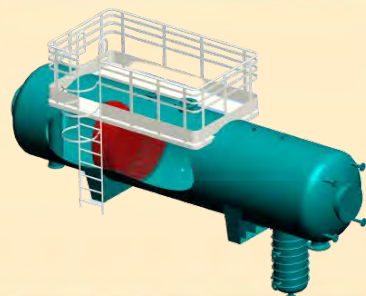
### 十四、在线自洁在线出干渣过滤器

### 十五、模头尾气处理MT-5干式深度分离净化系统

### 十六、风送系统

### 十七、液化化工品高精度脱水/干燥系统

### 十八、设备的检修和维护



### I .Filters

1. Shell and tube back-flush filter
  2. Self-cleaning cartridge filter
  3. Scraper filter
  4. Auto-pulse pocket filter
  5. High efficiency fiber ball filter
  6. Automatic back-flush fiber filter
  7. Carbon filter
  8. Gas filter
  9. Fuel filter
  10. Mother liquid filter
  11. Rigid filter
  12. Lean/Rich solution filter
  13. Membrane filtration system
  14. Other filters
    - Multi-stage filter
    - Liquid expeller
    - Water filter
    - Sand filter
    - Desiccator
    - Medium filter
    - Pipe strainer
    - Aviation kerosene filter
    - Coarse filter
    - Flue gas dust filter
    - Precision filter
    - Flue gas denitrifying filter
    - Air purifier
    - Flue gas desulfurizer
    - The four filters for cars(motor oil, petrol, air filters and the purifying filter)
    - Filters for ships(diesel,gas,oil and water filters)
- 
- Natural gas filters
  - Pharmaceutical filters
  - Beverage cleaning filter
  - Basket filter

### II .Coalescing Separation Unit

1. Demister
2. Vane separator
3. Cyclone separator
4. Cartridge coalescer

### III .Vapor Recovery

1. Vapor recovery at filling station
2. Vapor recovery on the loading platform at oil depot

### IV .Exhaust Gas Treatment

1. Organic flare gas recovery system
2. Systems recovering hydrogen from tail gas

## 主要产品和服务 Products and Services

3. Recovering hydrogen from synthetic ammonia purge gas
4. Recovering hydrogen from refinery gases and petrochemical industrial gas
5. Recovering hydrogen from methanol purge gas
6. Hydrogen recovery in hydrogen plants
7. Hydrogen recovery from coke oven gas
8. Flue gas dedust,desulfurization and denitrification system
9. Organic gas separation system for mixed gas

### V. Gas Cleaning

1. Natural gas purification and dehydration system
2. Indoor de-dusting,deodorization,disinfection and air-cleaning

### VI. Gas Purification

1. Membrane Systems for oxygen enrichment
2. Membrane nitrogen-enrichment system

### VII. Oil&Gas Fields Equipments/Systems

### VIII. Dust Collector

### IX. Water Purification

### X. All Types of Filter Elements

### XI. Spotless

### XII. Spotless System

### XIII. Online Heater Cleaning Technology for External Tube Wall

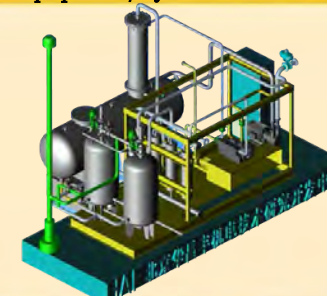
### XIV. Coke Removal Unit

### XV. Mold Head Tail Gas Separation & Purification

### XVI. Pneumatic Conveying System

### XVII. Liquid Chemical Products High-Precision Dehydration/Drying System

### XVIII. Equipment/System Overhaul and Repair







## 液-固分离(分离过滤器) L-S Separation(Separating filter)

液固分离是指将离散的固体颗粒从液体中分离出来的机械方法。

基本机理是，根据生产工艺及工况的要求，选择适合的工艺要求的分离设备及过滤介质，当物料经过具有一定的过滤精度的过滤介质时，那些对工艺生产无用或者有害的固体颗粒被过滤介质截留并排除，从而实现物料的交流及分离。当然，这结果离不开一个特定的分离环境。

HAF在液固分离设备及技术已相当成熟，其产品包括箱式、离心式、转鼓式、刮刀式、板式、三足式等等形式。还有筒式过滤器，它包括自清洗式和非自清洗式，压力和真空式，其它过滤元件所采用的过滤介质有透膜、金属纤维毡、布、金属丝网、金属粉末烧结毡；非金属纤维毡、棉、丝网、纤维布、陶瓷；以及其它无机物、纤维、棉、麻、布等等。其过滤精度从0.01微米到几十目、几百目、甚至几公分不等。HAF所生产的液固分离机械主要用于石油化工、环保、制药、冶金、食品饮料、矿山、航空航天、科研、制漆等领域。

HAF公司制作生产的反洗式芯过滤介质有：金属粉末烧结毡、金属烧结纤维、金属丝网、金属滤布、金属孔板及非金属（包括有机和无机）滤网和滤布。它适合于固体含量较大的场合和那些不能经常拆换的场合应用。可以满足不同过滤精度和不同工况的要求场合。其纳污能力强、强度好、并具有很高的孔隙率和较小的压力降。滤芯可以反复清洗重复利用，它可以用液体也可以用气体或超声波等方法清洗。这样设备维护周期长、成本低、提高了劳动生产率。

一次性过滤芯的过滤介质有：各种有机聚合物纤维、无机滤纸、玻璃纤维布、无纺棉、毡、布等等。它适合于固体浓度较低的场合，可以有效而经济的把固体从液体中分离，是提高产品品质的最好途径，更适用于工厂最终产品和过程液体中微量固体的滤除。它纳污能力强大，使用寿命长、强度高、经久耐用、具有很好的化学和热相容性、维护操作方便、安全可靠。

L-S Separation aims to remove the solid from liquid. Working principle: when the mixture goes through the filter elements, the impurities/contaminants will be trapped and separated from the mixture. The separation results is related to the given separation condition.

HAF has proven technology and manufacture capability in this field, our products include box-type, centrifuge, drum, scraper, plate, three-leg type etc, as well as cartridge type. The cartridge filters are divided into pressure/vacuum type, self-cleaning and non self-cleaning. The material of the filter elements includes fiber, cloth, metallic wire mesh, sintered metallic powder felt, non-metallic fiber felt, cotton, wire mesh, fiber cloth, ceramic etc. The size of particles can be removed from 0.01 micron to hundreds of microns. HAF L-S filters are widely used in many industries, such as petroleum and petrochemical, metallurgy paints production, pharmaceutical, aviation, food and beverage, environment protection, wastewater treatments, useful material recycling and so on.

The materials of the back washing filter elements include: metallic powder, metallic fiber, metallic wire mesh, metallic filter cloth, metallic orifice plate, non-metallic wire mesh and filter cloth (include organic and inorganic). They are widely used in the applications with high dust level or where dismantling and replacement is difficult. It may be used in different applications with various filtration rating. With good dirt holding capacity, high strength, high porosity and lower pressure drop, the filter elements may be reused and washed repeatedly by liquid, gas or with ultrasonic. This will increase productivity with longer interval and lower cost for maintenance.

The material of construction for the disposable filter elements includes: various organic polymer fiber, inorganic filter paper, fiber glass cloth, nonwoven cotton, felt, cloth etc. It is suitable for the applications with high solids level, and the solids in the liquid will be separated and removed economically with high efficiency. It is the best solution for enhancing product quality, it is most suitable to be used for the filtration and removal of trace impurities from the end products and the process fluids. The product highlights includes high dirt holding capacity, longer service life, high strength, durable, good chemical and thermal compatibility, easy maintenance, safe and reliable.

## 气-固分离(分离过滤器) G-S Separation(Separating filter)

气固分离系统中的核心元件是过滤元件，它一般是由金属烧结纤维、烧结粉末、金属丝网、布、陶瓷、以及有机聚合物制成的布、网、毡、纤维，还有无机的纤维、毡等。HAF所设计的气固分离系统的设备有箱式、袋式、离心式、旋风式、筒式分离器等。

该系统广泛应用于冶金、环保、石油化工、电子、微电子、医学科研、航空航天及其它领域。



对于气固分离系统中固体含量较高的场合，HAF设计生产了内置旋风分离器袋式过滤器。这样的组合更趋于合理和经济。因为这样能够反复利用反复清洗，而且系统压力较小，纳污能力高，过滤精度高。而对于系统中固体含量较低的场合，HAF专门生产了一次性过滤芯，成本低，且实用性很强，纳污能力更强，化学相容性也好，维护方便，系统工作稳定。

The key component of the G-S Separation system is filter element, the material of construction generally includes: sintered fiber metal, sintered metallic powder, metallic wire mesh, cloth, ceramic, as well as the doth, mesh, felt and fiber made of organic polymer, inorganic fiber, felt etc. The types of HAF G-S separating equipment include: box-type, bag, centrifuge, cartridge and so on. This system is mainly used in metallurgy, environment protection, petrochemical, electronic, microelectronic, pharmaceutical research, aviation and other industries.

HAF also designs and manufactures cyclone bag filter for the dust laden application. This design is more reasonable and economical, as it can be used and cleaned repeatedly. The features of this filter include: lower system pressure, higher dirt holding capacity and higher filtration precision. HAF also developed a disposable filter element, its characteristics include lower cost, higher performance, better chemical compatibility, easier maintenance and more stable operation.





## 气-液分离(聚结分离器) G-L Separation(Coalescing separator)



在生产生活中，对于那些用气设备来说，当气体中含有液体或有害液体时，会造成设备的损害和生产的浪费，这是工艺过程和设备运转所不允许的。那么就得采用一种方法将其除去，而实现这一方法的设备就是聚结器。它是把小的液滴聚结成大的液滴，在气体压力的作用下随气体一道穿过几层过滤介质，每一层的平均孔径渐增，呈倒三角形，那么当液体向出口方向流动时，它们就越聚越大。通过连续不断的聚结过程，直到使液滴不断聚结得更大并靠其重力进入液体收集区，从而被排出系统，得到纯洁干净的可用气体。根据工况工艺的不同有多种形式，但其工作原理基本一样。像除雾器、叶片分离器、旋风分离器、筒式聚结器等都是实现这一功能的设备。

实现气液分离的过滤介质和设备有：疏水性或疏油性的络合物、聚合物、玻璃纤维以及其他涂有聚合物的金属纤维、陶瓷材料等。分离聚结元件的过滤面积大、分离效果好，其精度可达到0.5 ppm。

HAF气液聚结器及旋流式油水分离机广泛应用于石油化工、机械设备、科研、航空航天、环保以及化工业。

具体介绍详见HAF《高效聚结分离器》样本

The gas mixed with liquid or even harmful liquid will damage the facility and that's strictly forbidden in the process and the equipment operation. To avoid this problem, coalescer is required. Working principle: Firstly, it coalesces the smaller liquid drops into bigger ones, then under the pressure of the gas, the liquid with gas will go through several layers of filter media (the hole size increasing) until the drops grow big enough and enter the liquid accumulating area, and finally drained. A clean and usable gas is obtained.

In order to realize the gas liquid separation, HAF supplies several types of coalescers, such as mist eliminators, cartridge coalescers. Their processes are different, but the working principles are the same. Filter elements used include: polymer, glass fiber, ceramic, and metallic fiber with polymer coating. The larger the filtration area, the better the separation efficiency. The precision may reach up to 0.5 ppm.

The G-L separation is widely used in many fields, such as petroleum and petrochemical, mechanical machinery scientific research, aviation and environment protection.

For detail description of G-L separation, please refer to HAF's Coalescer brochure.



## 液-液分离(聚结分离器) L-L Separation (Coalescing separator)

随着科技进步，动力装置对其消耗的液体燃料品质要求越来越高，全球环境的日益恶化，环保也要求各类排放物的排放标准逐步提高。为解决此类问题，就出现了聚结器。其作用机理是利用特定过滤介质的极性和非极性基团，使那些物流中对使用效果有明显副作用的小液滴逐步形成大液滴，在液体压力作用下，越聚越大，最终被收集在一起排除出去，获得高品质的流体。

实现液液分离的过滤介质及设备有很多种，传统聚结器，静电捕集器、各类膜、沉降槽等等。介质不外乎有机聚合物及涂有聚合物膜的金属滤材、非金属滤材、无机滤材。这些过滤介质适应性强，不受其它物料存在与否的影响，并且分离精度达0.5ppm以下，寿命长，安全可靠，维护简便，具有很好的化学相容性。

液液分离技术广泛应用于各类油品中水的去除。或者水中油的去除，液化石油气中胺的去除等等。因而广泛应用于石油化工、冶金印染、机械、电力、航空、交通动力、环保等行业。

With the development of technology, the quality requirements of the liquid fuel consumed by power equipments is becoming higher and higher. Besides, as the deterioration of the global environment, the more strict emission standards are issued as well under the pressure of environment protection. In order to solve this problem, L-L separation equipments(Coalescers) are developed. The working principle of coalescer: this separation depends on the polar group and nonpolar group of the filtration media, the smaller drops in the mixed liquid that have negative effect for the application will be gathered into bigger ones, and the drop will become bigger and bigger under the pressure of the liquid, once the drop grows big enough, it will be drain out finally. Those left are the desired high quality fluid.

Many filter elements and equipments can be used for L-L separation, equipments like traditional coalescer, static catcher, membrane and settlers etc.; Filter elements like metallic and non-metallic filter elements, inorganic elements etc. With the advantages of long service life, high reliability, easy maintenance, good chemical compatibility, the mentioned media will not be affected by other materials and the precision can reach well below 0. 5 ppm.

This type of equipment is mainly used in removing water from oil products, removing oil from water; or removing amine from liquefied petroleum gas. It is widely used for the industries of petroleum and petrochemical, metallurgy, printing and dyeing, power plant, aviation, transportation and power, environment protection and so on.





## 气-气分离

### G-G Separation

气气分离是从两种或两种以上气体混合物中提取某种纯气体，或将混合物中各种气体组份完全分离开来。它能够将排放的混合废气进行回收利用。利用该设备还能达到净化、脱液、除尘、除味和杀菌的作用，并且还能从各种混合气及工业废气中回收提纯氧气、一氧化碳、二氧化碳、甲烷、脱除天然气中C<sub>2</sub>+烃、脱硫、利用空气制富氧、纯氮等。

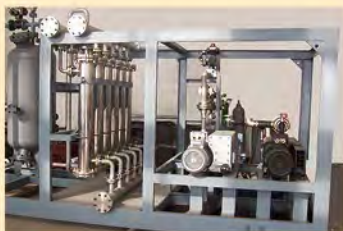
## 膜过滤

### Membrane Filtration

膜分离技术是对液液、气气、液固、气固体系中不同组分进行分离、纯化与富集的一门多学科交叉的新兴边缘科学技术。膜分离技术是用半透膜作为选择障碍层，在膜的两侧存在一定量的能量差作为动力，允许某些组分透过而保留混合物中其他组分，各组分透过膜的迁移率不同，从而达到分离目的。

膜分离技术的核心是膜，膜是具有选择性功能的材料。利用膜的选择性分离实现料液不同组分的分离、纯化、浓缩的过程称作膜分离。它与传统过滤的不同在于，膜可以在分子范围内进行分离，并且这是一种物理过程，不需发生相的变化和添加助剂。膜的孔径一般为微米级，依据其孔径的不同（或称为截留分子量），可将膜分为微滤膜、超滤膜、纳滤膜和反渗透膜，根据材料的不同，可分为无机膜和有机膜，无机膜目前只有微滤级别的膜，主要是陶瓷膜和金属膜。有机膜是由高分子材料做成的，如醋酸纤维素、芳香族聚酰胺、聚醚砜、聚氟聚合物等等。其分子、离子级的过滤精度，可以用于：

- A. 饮用水无菌净化
- B. 空气无菌净化
- C. 油水分离
- D. 海水、苦咸水淡化
- E. 药物提纯
- F. 酒、饮料的澄清
- G. 血液、乳制品的浓缩
- H. 氮气等制取
- I. 气体提纯
- J. 污水处理



Gas-Gas separation aims to extract one or more gas components from the gas mixture (at least two kinds of gases). This equipment could recover and reuse the effluent waste gas, it may also be used for gas cleaning, dedusting, deodorization, disinfection; Recovering and purifying the H<sub>2</sub>, CO, CO<sub>2</sub>, methane from various gas mixture, removing the C<sub>2</sub>+Hydrocaron from natural gas.



Membrane separation technology is an interdisciplinary novel technology, which aims to separate, purify and enrich different components in the mixtures, the separation includes liquid to liquid, gas to gas, gas to solid, and liquid to gas separation. The working principle is: the equipments adopt the semi-permeable membrane as the filtration layer. The driving force comes from the energy difference at both sides of the membrane; With different passing rate of each composition, the membrane will let some compositions pass while retaining other components. The key component of the membrane technology is the selective permeable membrane. Membrane separation is a process where different compositions of the fluid products are selectively separated, purified and condensated. The membrane filter differs from the traditional filter in that the membrane filter could realize the molecule level physical separation. It does not need any phase change or chemical additives. The membrane pore size is measured by micron. It can be divided into four types based on the different pore size: MF, UF, NF and RO membranes, it can also be divided into inorganic and organic membrane based on the material of construction. Inorganic membranes are MF level ceramic and metallic membrane. Organic membranes are made of high polymer materials, such as cellulose acetate, aromatic polyamide, PES, Fluoropolymer PTFE and so on. If filtration precision reach to molecule or ion level, it may be widely used in drinking water sanitation, air sanitation, oil-water separation, seawater/saltwater desalination, medicine extraction, wine and beverage fining, blood and dairy products inspissations, nitrogen generation, gas purification, wastewater treatment, waste gas treatment and so on.

## 固-固分离

### S-S Separation

固固分离是根据工艺工况需求，将大小不同，密度不同的某种或某些物料或粉料，用细筛、粗筛筛分或借用气流、水流作为辅助手段将固体与固体分离，固固分离适用于各行各业中的粉状和颗粒状物料的分离。

HAF公司的固固分离产品有：振动筛、机械筛、离心筛、风力分选筛、旋流器、机械离心器等。分离精度从微米到几毫米、十几毫米、几百毫米不等。

固固分离广泛用于矿山、食品加工、石油化工、制药、建筑冶金、科研、农业等行业。



According to the process application requirements, solid -solid separation aims to separate the particles/fines based on the different size and density by different size of mesh screens(small, medium or large), or separate the fines/ particles using the air/ liquid stream as auxiliary. The S-S Separation is widely used in all the fields of fines and particles separation.

HAF's S-S separation products include the following types: Vibrating screen, power screen, centrifuge screen, pneumatic separating screen, cyclone, mechanical centrifuge etc. The filter precision can reach a wide range from several microns to dozens or hundreds of millimeters. S-S separation is widely used in various application: mining, food processing, petrochemical, pharmaceutical, construction, metallurgy, scientific research, agriculture and so on.

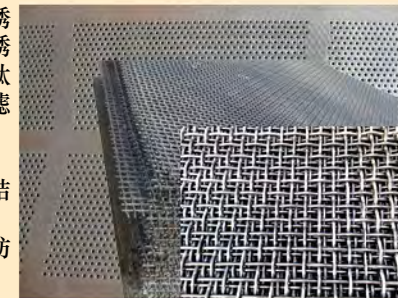
## 滤芯

### Filter Elements

HAF提供各种各样滤芯，过滤精度从0.05毫米到几百毫米不等。

主要滤芯有：

折叠式熔体滤芯、PP溶喷滤芯、陶瓷烧结滤芯、不锈钢烧结滤芯、纤维烧结滤芯、金属烧结滤芯、活性炭滤芯、线缠绕滤芯、微孔折叠滤芯、空气呼吸器滤芯、钛滤芯、全焊式烧丝筛管、油气分离滤芯、油水分离滤芯、盘式滤芯、单丝编绕滤芯、不锈钢折叠滤芯、不锈钢烧结滤芯、不锈钢烧结滤片、不锈钢烧结网滤芯、钛烧结滤芯、陶瓷滤芯、青铜烧结滤芯、铜粉烧结滤芯、玻璃纤维烧结滤芯、PE烧结滤芯、纸滤芯、无纺布滤芯、玻纤滤芯、聚结滤芯等。



HAF provides all kinds of elements. The filtration rating ranges from 0.05 micron to hundreds of microns.

The main filter elements are as follows:

Pleated melt filter elements, PP filter elements, sintered ceramic filter elements, sintered SS filter elements, sintered fiber elements, sintered metallic filter elements, active carbon filter elements, thread wound spiral filter elements, pleated millipore filter elements, filter elements for air breathing apparatus, titanium filter elements, all welded sintered screen tube, oil-gas separating filter elements, oil-water separating filter elements, plate filter element, single wired winding filter elements; pleated SS filter elements, sintered SS filter elements, sintered SS filter plate, sintered SS mesh filter elements, sintered titanium filter elements, ceramic filter elements, sintered bronze filter elements, sintered copper powder filter elements, sintered fiber glass filter elements, sintered PE filter elements, paper filter elements, non-woven fabric filter elements, glass fiber filter elements, coalescer filter elements etc.





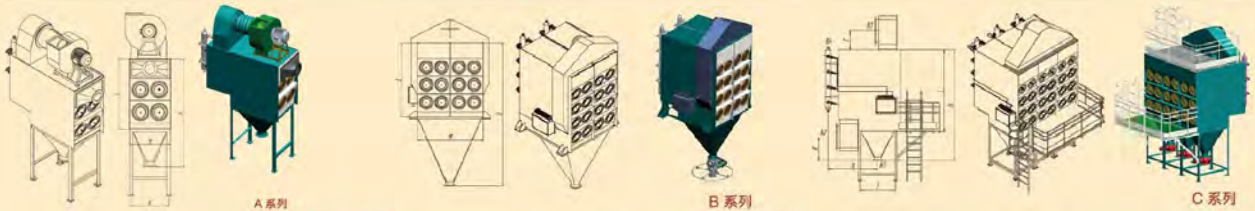
HMGXG脉冲刚性气体过滤设备
HMGXG Pulse Air Rigid Filter

H/TZGQ管道透平自洁过滤器
TZGQ Self-cleaning Turbine Filter

HMGXG脉冲刚性气体过滤设备型号及(设计)选型参数表
Specification of HMGXG Pulse Air Rigid Filter

规格型号:HMGXG-A231-5 /(a x b)-n
注: H(华昌丰)MGXG(脉冲刚性过滤器)ABCD(型式)231(结构布局)5(过滤精度微米)(a x b)(滤芯规格)-n(滤芯数量)
Model: HMGXG-A231-5 /(a x b)-n
Note: H(HAF)MGXG(pulse air )ABCD(type)231(Configuration)5(filter rating,micron)(a x b)(Specification)-n(No. of element)

设备型号 Model	流量 Flow rate ft <sup>3</sup> /m <sup>3</sup> /min	脉冲阀 规格/数量 Pulse valve Spec/Qty	风机运行 状态 (静压) opercond. of fan (Static)	过滤面积 m <sup>2</sup> Filtration area, m <sup>2</sup>	配用 动力 KW Power KW	设备外型尺寸(mm) Outline dimension (mm)								管口 (25m/s) Nozzle(25m/s)		重量kg Weight kg
						C	H	L	M	N	T	K	N1 N2	N3/N4		
HMGXG-A221-5 /(6"x17.2")-4	194/5.5	1/8"-4	10"H20	4.4	1.5	640	1126	735	429	633	448	394	3"	3"-1/8"	660	
HMGXG-A221-5 /(8"x22.8")-4	441/12.5	1/4"-4	10"H20	10	1.75	854	1501	980	571	843	597	526	4"	3"-1/4"	880	
HMGXG-A231-5 /(8"x22.8")-6	662/18.75	1/4"-6	10"H20	15	2.0	1165	1813	1276	571	843	597	526	6"	4"-1/4"	1050	
HMGXG-A221-5 /(10"x28")-4	795/22.5	1/2"-4	10"H20	18	2.5	1067	1877	1224	714	1054	746	657	6"	4"-1/2"	1100	
HMGXG-A231-5 /(10"x28")-6	1192/33.75	1/2"-6	10"H20	27	3.0	1457	2266	1614	714	1054	746	657	8"	4"-1/2"	1320	
HMGXG-A221-5 /(12"x34.4")-4	1625/46	3/4"-4	10"H20	37	5.0	1281	2252	1469	857	1265	895	789	8"	4"-3/4"	1325	
HMGXG-A231-5 /(12"x34.4")-6	2472/70	3/4"-6	10"H20	55.8	7.5	1748	2719	1936	857	1265	895	789	10"	6"-3/4"	1585	
HMGXG-A221-5 /(14"x40")-4	2648/75	3/4"-4	10"H20	60	8.5	1494	2628	1714	1000	1476	1050	925	10"	6-3/4"	1550	
HMGXG-A231-5 /(14"x40")-6	3973/112.5	3/4"-6	10"H20	90	10.0	2039	3173	2259	1000	1476	1045	920	12"	6-3/4"	1850	
HMGXG-A232-5 /(14"x26.4")-12	5297/150	1"-6	10"H20	120	17	2039	3391	2271	1000	1761	1276	925	14"	6"-1"	2000	
HMGXG-A242-5 /(14"x26.4")-16	7063/200	1"-8	10"H20	160	22	2584	3936	2816	1000	1761	1276	925	16"	6"-1"	2350	
HMGXG-B431-5 /(14"x40")-12	7945/225	3/4"-12	10"H20	180	25	431	4394	2275	2018	1476	1394	2319	18"	6"-1"	3700	
HMGXG-B432-5 /(14"x26.4")-24	10594/300	1"-12	10"H20	240	40	431	4394	2275	2018	1786	1841	2319	20"	8"-1"	4000	
HMGXG-B442-5 /(14"x26.4")-32	14125/400	1"-16	10"H20	320	45	431	4948	2828	2018	1786	1841	2319	24"	8"-1"	4450	
HMGXG-B452-5 /(14"x 26.4")-40	17657/500	1"-20	10"H20	400	50	431	5493	3416	2018	1786	1841	2319	26"	8"-1"	5150	
HMGXG-C642-5 /(14"x 26.4")-48	21188/600	1"-24	10"H20	480	55	684	3963	2907	3012	1773	1276	925	28"	8"-1"	7300	
HMGXG-C652-5 /(14"x 26.4")-60	26486/750	1"-30	10"H20	600	65	684	4508	3452	3012	1773	1276	925	32"	8"-1"	8350	



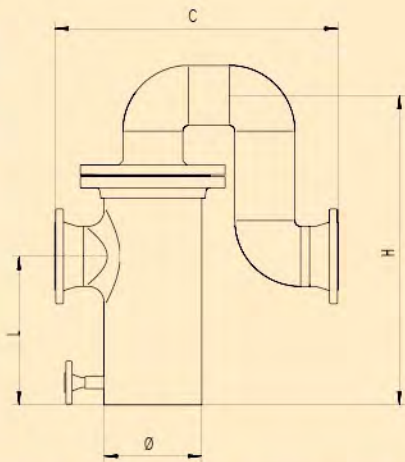
H/TZGQ管道透平自洁过滤器型号及(设计)选型参数表
Model and Design Sizing Datasheet of H/TZGQ Self-cleaning Turbine Filter

注: H(华昌丰)TZGQ (透平自洁过滤器) -T (形式) A (管口尺寸) -X (标准过滤精度-目)
Note: H (HAF) TZGQ(Self-cleaning Turbine Filter) -T (Type) A (Nozzle size) -X (Standard Filtter rating-mesh)

规格设备 型号 Specification & Model	适用 介质 Applicable Media	管口(流速 1.5-3m/s) Nozzle (velocity 1.5-3 m/s)		有效过滤面积与 管口截面积倍数n Effective filtration area to Nozzle cross section area ratio, n	设备外型尺寸(mm) Outline Dimension (mm)							
		N1/N2	N3		Ø	H	C	L	备注 Remarks			
									滤芯数量Element Qty	法兰标准 Flange Standard	压力等级 Pressure Rating	
H/TZGQ-T1-40	L	1" (DN50)	1/2"	1.5	89	185	160	85	1	通用 General	低中高L.M.H.	
H/TZGQ-T2-40	L	2" (DN50)	1/2"	1.5	114	310	285	150	1	通用 General	低中高L.M.H.	
H/TZGQ-T3-40	L	3" (DN80)	1/2"	1.5	159	460	420	220	1	通用 General	低中高L.M.H.	
H/TZGQ-T4-40	L	4" (DN100)	1/2"	1.5	219	590	540	285	1	通用 General	低中高L.M.H.	
H/TZGQ-T6-40	L	6" (DN150)	3/4"	1.5	273	865	795	420	1	通用 General	低中高L.M.H.	
H/TZGQ-T8-40	L	8" (DN200)	1"	1.5	355	1130	1050	545	1	通用 General	低中高L.M.H.	
H/TZGQ-T10-40	L	10" (DN250)	1"	1.5	457	1410	1290	680	1	通用 General	低中高L.M.H.	
H/TZGQ-T12-40	L	12" (DN300)	1-1/2"	1.5	525	1675	1535	805	1	通用 General	低中高L.M.H.	
H/TZGQ-T14-40	L	14" (DN350)	1-3/4"	1.5	610	1835	1680	885	1	通用 General	低中高L.M.H.	
H/TZGQ-T16-40	L	16" (DN400)	2"	2.5	660	2010	1920	1010	1	通用 General	低中高L.M.H.	
H/TZGQ-T18-40	L	18" (DN450)	2"	2.5	762	2356	2160	1135	1	通用 General	低中高L.M.H.	
H/TZGQ-T2040	L	20" (DN500)	3"	3.5	863	2620	2400	1260	3	通用 General	低中高L.M.H.	
H/TZGQ-T22-40	L	22" (DN550)	3"	3	914	2885	2640	1385	3	通用 General	低中高L.M.H.	
H/TZGQ-T24-40	L	24" (DN600)	3"	3	1016	3145	2880	1510	3	通用 General	低中高L.M.H.	
H/TZGQ-T26-40	L	26" (DN650)	3"	3	1066	3405	3115	1635	3	通用 General	低中高L.M.H.	
H/TZGQ-T28-40	L	28" (DN700)	3"	3	1168	3665	3355	1765	3	通用 General	低中高L.M.H.	
H/TZGQ-T30-40	L	30" (DN750)	3"	3	1270	3930	3600	1890	3	通用 General	低中高L.M.H.	

注:
1. 以上选型数据仅适用于液体的品质净化、标准过滤精度40-80目的管道过滤器的选型, 高于80目的选型与厂家联系确认其型号;
2. 气体选型数据参照气体管道透平自洁过滤器的造型样本。

Note:
1.The above data are only used for the sizing of filter with 40 to 80 mesh rating, which are suitable for liquid purification. For the filter sizing above 80 mesh, please consult HAF;
2.Please refer to the Self-cleaning Turbine Filter Sizing brochure for gas sizing data.





## 在线自洁在线出干渣过滤器 Coke Removal Unit

### 工艺描述:

1) 急冷油进入旋流器入口, 进行高速旋转, 由于碳粒的比重大于急冷油, 因此碳粒被趋向旋液的外边缘, 即旋流器的旋液段的边缘。而脱去了碳粒的纯净急冷油则处于旋流的中心, 由旋流器的中心管将此导出, 并有旋流器的出口N2排出。

2) 旋流器内碳粒含量较高浓度的急冷油, 聚集于旋流器的旋液段下部, 由旋流器的底部的底流排放口N3排除旋流器。

由此可见:

a) 旋流速度越高, 分离效果越好, 我们的旋流器可以将密度差为5%的物质分开。

b) 高度旋转的液体和碳粒会对旋流段有很大的摩擦, 对此, 我们按旋流的速度, 在不同的旋流段采用了不同的耐磨设计, 比如在高速旋流段, 我们采用了耐磨合金。

c) 在低流口, 为了减少磨损, 我们有减流措施。

d) 旋流器的底流必须要能可靠地将含高浓度碳粒

的急冷油 (下称: 脏急冷油), 排出急冷油, 否则碳粒会从旋流器的中心管随着干净的急冷油由旋流器出口排出, 而失去分离碳粒的意义。

3) 旋流器的低流 (脏急冷油) 由旋流器的底部出口, 脏急冷油含有旋流器全部分离出来的固体颗粒物, 进入底流过滤器。

4) 脏急冷油有底流过滤器入口进入过滤器后, 经过一定过滤精度 (可选) 的约翰逊网过滤后, 干净的急冷油由过滤器出口N2流回极冷塔。

5) 过滤器过滤出来的碳粒等固体杂质, 暂存于过滤器内部。

a) 通常过滤器可存放数月的碳粒, 当碳粒达到一定容积时, 将过滤器暂停, 打开过滤器下的卸渣口, 将碳粒卸在卡车上拉着的渣槽里 (如: 2米\*3米\*2.5槽子)。

b) 也可将过滤器做成两部份, 一部分过滤、一部分盛碳粒渣, 这样出渣时就不必暂停过滤器, 但这样会增加安装高度及增加阀门, 会加大投资。



### Process Description

1. The quench oil enters the cyclone via the inlet and rotates in high velocity. As the specific gravity of coke is larger than the quench oil, the coke is driven to the outer edge (the edge of cyclone section). After removal of coke, the cleaned quench oil is in the center of the rotation flow, which flow out via outlet of cyclone (N2) through the center pipe of the cyclone.

2. In the cyclone, the quench oil with high content of cokes gathers at the lower part of the vortex section, and flows out of the cyclone via the underflow drain (N3 at the bottom of cyclone). Hence we can see that:

a) The higher the rotation velocity, the better the separation efficiency. Our cyclone could separate the material with 5% density difference.

b) The high velocity rotating liquid and coke could have great abrasion on the vortex section, we adopt different wear resistance designs for sections with different velocity. For example, we use wear resistance alloy for the high velocity section.

c) To reduce the wear and tear, we have the flow reducing measure at the nozzle of the underflow.

d) The underflow must be capable of discharging the quench oil with high content of coke (herein after referred to as dirty quench oil) with high reliability, or else the coke will be entrained with the cleaned quench oil via the center pipe in the cyclone, in that way the removal of the coke is meaningless.

3. The underflow (dirty quench oil) of the cyclone containing all the solid particles removed from the cyclone, enters the underflow filter.

4. The dirty quench oil enters the underflow filter via the inlet, after filtration by the Johnson Screen (with different filtering rating options available), the cleaned quench oil flow back to the quench tower via the filter outlet (N2).

5. The removed solid dirt like coke etc. are temporally stored in the filter.

a) Generally the capacity of the filter could retain the cokes for several months, when the coke reach certain volume, the filter could be temporally stopped, open the coke removal port below the filter and discharge the coke onto the coke tank of the truck (e.g., 2m\*3m\*2.5m tank).

b) The filter could also be constructed into two parts, one part for filtration and the other for coke storage, in this way the filter could discharge the coke without temporally shutting down the filter, but this will increase the installation height and need additional valves, it will increase the investment.

### 产品特点:

过滤器可在线自动除滤饼

碳粒会粘附在约翰逊网上形成滤饼, 滤饼达到一定厚度后就会形成压力降, 减少流量, 甚至会无流量而中断过滤, 因此有必要及时清除滤饼, 由于进入过滤器的粘急冷油的颗粒含量浓度很高, 所以, 不停机的自动除滤饼是非常必要的。根据用户要求我们的设计还可以在线不停机, 边运行、边卸焦渣的运行模式 (最新一代产品), 压降达到0.05MPa时就启动自动除滤饼, 或常开连续除饼。

我们的除饼系统很过关, 中国石化及中国石油的已超过17年不损坏, 几乎无检修, 最长无检修连续运行已超过17年连续运行的业绩。

我们的过滤器设计, 可以做到出干碳粒或半干半湿的碳粒, 当然这需要消耗一点点现场的氮气等。根据用户要求还可以, 卸焦渣, 不必开设备的盖, 开阀门即可卸渣, 非常HSE, 操作工人清渣时, 体力劳动小, 安全, 而不要操作工人用铁掀去装卸碳粒, 那样是不符合HSE的, 会伤害工人。我们的急冷油旋流+过滤系统, 是先进的、精度高的、方便的、可靠的、维护量少的、不会堵的、HSE的。



## 在线自洁在线出干渣过滤器 Coke Removal Unit

### Features and advantages

The filter could remove the filter cake online automatically

The coke could stick to the Johnson Screen and form filter cake, when the filter cake accumulates to a certain thickness, pressure drop will be created, causing the reduction in flow rate, or even no flow rate and the filtration process would be stopped. Thus it is necessary to remove the filter cake in time. When entering into the filter, as the content of coke in the viscous quench oil is very high, the automatic removal of filter cake without shutting down is essential. In our design, the automatic removal of filter cake will be started once the pressure drop reaches 0.05 MPa, or the system could be operated with continuous removal of filter cake.

Our filter cake removal system is very reliable, they have track records of continuous operation in Sinopec and CNPC for over 17 years without damages, no maintenance is required.

Our filter design could achieve the discharge of dry coke or semi-dry semi wet coke, of course this requires some consumption of nitrogen etc. on site, this eliminates the needs of operators to load and unload the cokes with spades, that will hurt the operators, it is not in conformity with HSE standard.

Our quench oil cyclone + filtration system is advanced, features in high precision, high reliability, easier operation, less maintenance, without clogging problem, in compliance with HSE etc..





## 天然气(伴生气)干燥器

Natural Gas(Associated gas) Filter Dryer

天然气(伴生气)的干燥有很多办法,这里介绍的是一种适合于炉前天然气(伴生气)干化的设备。

主要功能:

- 去除天然气中的, 1) 微小雾状物及机杂;  
2) 低聚物;  
3) 重烃, 等。

主要目的:

使天然气更纯净和干燥, 以确保燃烧炉的“长, 满, 优”运行。

主要特点:

- 1) 多级处理, 效果好;  
2) 技术经济性好;  
3) 操作简单;  
4) 维修量小;  
5) 安全, 可靠等等。



There are many solutions for Natural gas (Associated gas) drying in the world, here we introduce a solution which is suitable for Natural gas (Associated gas) drying before driving them into the furnace.

Key functions:

removal of

- 1) mist or mechanical impurities;  
2) oligomer;  
3) heavy Hydrocarbons etc.

Main purpose:

To obtain more purified and dryer Natural gas to guarantee the long term, full load and stable operation of the furnace. Main features:

- 1) Multi-stage treatment with satisfactory results;  
2) Economical good technology;  
3) Easy operation;  
4) Less maintenance work;  
5) Safe and reliable operation, etc.

## 油/煤田伴生气回收

Associated gas recovery in the oil& coal fields

油/煤田伴生气回收的方案有:

- 1) 压缩、管输;  
2) 压缩液化;  
3) 就地燃气轮机发电;  
4) 就地制甲醇。

将伴生气制成甲醇, 国内尚无, 是HAF的美国合作者的新技术。甲醇是液态的较稳定安全, 储存和运输比较便利。

主要设备构成是:

蒸馏塔, 闪蒸罐, 涤气器, 反应器, 换热器, 压缩机等。

主要原料可以是: 伴生气, 煤层气, 沼气, 天然气等等。

特点是:

- 1) 可以小型化, 成小型移动撬装;  
2) 无需催化剂;  
3) 不消耗水;  
4) 对原料, 如伴生气, 要求不高;  
5) 操作简单, 等等。



Technologies for associated gas recovery in the oil/coal fields include:

- 1) Compression, pipeline transportation;  
2) Compression and liquefaction;  
3) On site power generation with turbine;  
4) Convert gas into methanol on site.

Presently there is no technology available in China to convert associated gas into methanol, it is HAF partner's new technology from the U.S.A..

Methanol is a stable and safe chemical in liquid phase, it is convenient for storage and transportation.

The equipments consist of: Distillation tower, Flash tank, Scrubber Reactor, Heat exchanger, Compressor etc.

Main features include:

- 1) Small footprint, transportable and mobile skid;  
2) No catalyst required;  
3) No water consumption;  
4) Less requirement on the raw material, such as the associated gas;  
5) Simplicity of operation/reliable, etc.

### 二相分离器 (单级或二级或多级)

HAF提供各种类型的二相分离器。根据不同组分密度不同的原理, 从混合物中分离两种组分。过滤/分离效率高达到99.999%。

### 三相分离器

HAF三相分离器处理气量高达100百万标准立方英尺/天, 液体流量高达200000桶/天, 并满足从采出水分离气体和油所需的必要的条件, 分离效率高达99.9%。15年来, HAF推进概念试验, 设计和生产三相分离器, 着重客户满意。通过整合分离效率, 无需维护设计以及耐用性。

### 干气过滤器

HAF提供高效干气过滤器, 在相对低的压降下从天然气中有效去除粉尘和其他固体。从而保护下游设备, 干气过滤器用于从天然气中去除固体颗粒, 如金属锈, 尘土和管垢。过滤器分为立式或卧式。可开式干气过滤器便于检修滤芯。

### 旋流器

HAF提供的旋流器可以处理大范围流量的液体。旋流分离是一种从空气, 气体或液体流中去除颗粒的方法, 通过涡流分离而无需使用过滤器。分离固体和流体混合物时需要用到涡轮效应和重力。此方法也可用于从气流中分出细微液珠。有时候, 旋流器可以替换立式二相分离器。

### 脱水/甜化装置

从井内开采出来的天然气都含有水蒸气。伴随天然气还可能产生游离水或液态水。当气体沿着井口向上到达表面时, 会因减压以及与低温的地层热传导而冷却。当气体温度降低时, 气体保持水蒸气的能力降低, 因此当天然气达到地面时几乎总是与水蒸气饱和。饱和气过度冷却会造成水冷却。如果气体进一步冷却, 会形成水合物(固体, 结晶水/烃化合物)。

详见HAF《油田气田分离净化设备》样本

## 油田气田分离净化设备

Filtration, Separations Purification Systems in the Oil/Gas Field

### Two Phase Separator (single stage or two or more stages)

HAF supplies different types of two phase separators aims to separate two components from the mixture based on the different component densities. The filtration/separation efficiency can reach up to 99.999%.

### Three Phase Separator

For professional of all fields, HAF three phase separators handles gas flow rate upto 100 MMSCFD and liquid flow rate upto 200000BBL/D and fulfill all of the prerequisites necessary for separation of gas and total liquid from a production steam, the separation efficiency could reach to 99.9%. For more than fifteen years, HAF has been advancing these concepts, engineering and manufacturing three phase separators that emphasize complete customer satisfaction. HAF got the API 12J(oil and gas separator) in 2010. With their combination of removal efficiency, maintenance free design and durability.

### Dry Gas Filter

HAF dry gas filters offer high efficient and effective removal of dust and other solids from natural gas at relatively low pressure drop. It is designed to remove solid particulate such as rust, dirt, and pipe scale from nature gas to protect downstream equipment. The filters are manufactured either in a vertical shell or in horizontal shell. HAF dry gas filter with flanged of quick opening closure to facilitate the access to the filter element.

### Cyclone

HAF offers the cyclones with a wide range of capacity. Cyclonic separation is a method of removing particulates from an air; gas or liquid stream, without the use of filters, through vortex separation. Rotational effects and gravity are used to separate mixtures of solids and fluids. The method can also be used to separate fine droplets of liquid from a gaseous stream. Sometimes, the cyclone could replace the vertical two phase separator.

### Gas Dehydration/Sweetening System

All natural gas well streams contain water vapor as they leave the reservoir. Free or liquid water may also be produced with the natural gas. As the gas travels up the well bore to the surface, it cools due to pressure reduction and heat conduction to cooler formations. The ability of gas to hold water vapor decreases as the gas temperature decreases, so natural gas is nearly always saturated with water vapor when it reaches the surface. Additional cooling of saturated gas causes condensation of water. If the gas is further cooled, hydrates (solid, crystallized water/hydrocarbon compounds) can form.

Detail information please refers to Filtration, Separations Purification systems in the Oil/Gas Filed



## SpotLesser洁粒器洁料系统 Spotless System

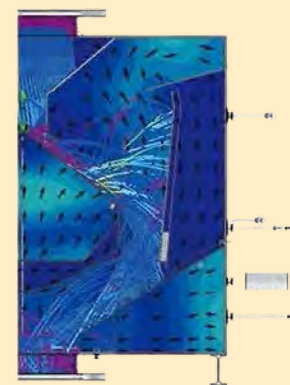
塑料粒料中的粉尘，会对塑料加工业带来诸多问题。粉尘含量高，会降低粒料品质影响价格，粒料在加工的过程中，粉尘发飞散的空气中造成空气污染，粉尘还会粘附传送螺杆，造成堵塞并减少设备使用寿命。粉尘携带静电容易吸附灰尘，会使注塑成品表面粗糙影响玩具等产品的美观和质感，使塑料薄膜出现瑕疵透明度不理想等质量问题，粉尘甚至会影响内部结构，破坏阻燃防火塑料的安全性能。

SpotLesser洁粒器是专门用于清洁颗粒类物料的成套设备，具有多级分离洁粒单元，洁粒层级高达19级，针对黏结态粉尘特性，通过气流、P/N波、S/N波、磁力等多种手段消除粉尘与颗粒间的引力（静电力等4种引力），并针对难处理丝带进行多重拦截，通过对空间的特殊设计，使洁粒器空间内任何一点都有4-6种处理手段，对粒料进行全方位立体式的反复净化处理，有效清除颗粒料里的粉尘、碎屑、绒毛、丝带等杂质，洁粒精度 $\leq 5$  ppm，丝带脱除率： $>99.9\%$ 。

SpotLesser洁料器本质安全，不会因为使用洁粒系统而影响正常下料。

Some dust, streamer and other contaminants occur during the production, processing and transportation of natural or fabricated resins, the impurities is a threat to the health of operators and could cause product quality problem and threaten the safety of the downstream processing equipments.

SpotLesser is specially designed for cleaning granular materials, with multi-stage separation and cleaning unit, the purification stage up to 19 phases, for the characteristics of the sticky dust, through airflow, wave, magnetic and other means to eliminate the attraction force between dust and granular (force like electrostatic force etc.), and for streamers that are difficult to deal with, multiple interception is realized through the ingenious design of space, so that the SpotLesser has 4-6 treatment measures at any point, which can purify the granule material repeatedly in a comprehensive three-dimensional way, effectively removing the dust, debris, fluff, streamer and other impurities in the granule material, Pellet Cleaning Precision  $\leq 5$  ppm, streamer removal rate:  $>99.9\%$ . SpotLesser is intrinsically safe, the application of pellet cleaning system would not affect the normal operation of material flow.



洁粒器分离示意图  
SpotLesser SEPARATION SCHEMATIC DIAGRAM



洁料前  
The Material Before Cleaning



洁料后  
The Material After Cleaning

具体介绍详见《SpotLesser洁粒器及洁料系统》样本

Please refer to the SpotLesser Brochure for details

## SpotLesser洁粒器洁料系统 Spotless System

大型移动洁料系统整套系统主要包括一台洁粒器、一台向洁粒器供风的风机、一台从气体中分离粉尘的旋风分离器、一台从气体中分离细微粉尘的精密过滤器、一套支撑定位各部件的钢结构以及一台移动的驱动底盘。

Mobile Pellet Cleaning System, the system consists of one set of SpotLesser, one blower to supply air to SpotLesser, one cyclone separator to separate dust from air, one HEPA filter to separate fine particulate from air, one steel structure to support all components and an omni-directional mobile chassis.

- 洁净精度高;经优化后丝带脱除率可达99.9%,经优化后粉尘小于30ppm;
- 颗粒夹带低,物料无破损;
- 规格型号齐全,处理量30公斤/小时至100吨/小时;
- 主机高度低,适用范围广;
- 可根据现场进行旧设备设计升级改造;
- 安全性高,自主设计大型开环系统,拥有10年以上的安全运行记录;
- 无电磁辐射,无磁场辐射,无电场辐射,噪音水平低全面符合HSE标准;
- 可连续长周期运行,无需停机维护;
- 国产研发,完全自主知识产权,无外贸壁垒;
- 提供多种功能选配,用户可根据自身要求进行定制。
- 已获得CE认证并拥有产品质量保证保险。

- Cleaning with high precision, streamer removal rate up to 99.9% after optimization, dust removal down to 30 ppm;
- Lower pellets carryover rate, no degradation of pellet particles;
- Full range of models, capacity from 30 kg/hour up to 100 ton/hour;
- Upgrading of existing equipments as per site conditions;
- The SpotLesser is compact in height and could be used in a wide range;
- High safety level, innovative open loop system with over 10 years of safe operation records in China;
- No electromagnetic/magnetic field radiation, no electric field radiation, Low noise level, fully compliance with HSE;
- Long term continuous operation;
- With complete knowhow and intellectual property right;
- Multiple featured option for customer's selection, tailor made as per specific requirements on site.
- CE certified, with warranty of product quality from insurance company.



扬子巴斯夫46吨每小时移动式洁粒器现场



远程app操作界面





模头尾气处理MT-5净化处理系统  
Mold Head Tail Gas Separation & Purification

模头尾气通常包含油类物质及少量VOC和大量空气，微小液珠直径很小，如机械性生成的微小液珠的直径在1.0~150μm之间，而凝聚性产生的微小液珠直径在0.10~30μm之间。

分离净化的机理至关重要，综合要素又决定着工艺过程，每种工艺路线都有各自的特点和适用范围，因地制宜的安全、稳定、可靠、低成本等是选择决策的关键。

解决的技术路线  
模头尾气的排放治理技术路线很多，大类可分为：

- 1)湿式： 主要是溶液吸收法
- 2)干式：

- A.传统燃烧法、催化氧化法、吸附法等；
- B.HAF首创干式深度分离净化法。



The exhaust in mold contains VOC, air and oil-like substances with small droplet diameters, e.g. mechanically generated droplets between 1.0 and 150 μm, and coalesced droplet between 0.10 and 30 μm.

The mechanism of separation and purification is crucial and the process is determined by a combination of elements, each with its own characteristics and scope of application. Optimized safe, stable, reliable and cost competitive are critical during selection.

Technical Solution

There are many technical routes for treating mold head emissions, the broad categories can be divided into:

- 1) Wet method: mainly solution absorption;
- 2) Dry method:
- A.Traditional methods includes Combustion, Catalytic oxidation, Adsorption methods etc..
- B.Dry depth separation and purification by HAF



模头尾气处理MT-5净化处理系统  
Mold Head Tail Gas Separation & Purification

我公司设计开发的MT-5干式尾气深度分离净化系统，专用于模头尾气治理的分离净化，下称：MT-5。MT-5采用吸附、聚结等多种机理的有机结合来高精度、大深度地分离净化模头器尾气，气液分离效率可达99.9%。  
We have developed the MT-5 system dedicated to the separation and purification of mould head exhaust gas, hereinafter referred to as: MT-5. MT-5 combines adsorption and coalescing mechanisms to purify mould head tail gas, with a gas-liquid separation efficiency up to 99.9%.

MT-5系统为一般为立式，主要由如下四大单元构成：一级分离、二级聚结、三级吸附、四级拦截等综合组合方式。四个单元综合作用。  
The MT-5 system is generally vertical and consists of four integrated units: primary separation, secondary coalescence, tertiary adsorption and quaternary interception. The four units work in combination.

设备构造合理，占地小，耗能低，安全性高、无需维修。分离净化精度高，安全性好、系统稳定、操作简单、投资少、环保效果好。  
Reasonable construction, small footprint, low energy consumption, high safety and no maintenance. High separation and purification precision, safe and stable system, simple operation, low investment and environmental friendly.



ABS装置MT5系统测试报告  
Test Report of MT5 system in ABS Unit

2020.6.17	2020-J102-8-001	本体 AES 除雾器排放口 1	非甲烷总烃	排放浓度	5.91	mg/m <sup>3</sup>	100mg/m <sup>3</sup>
				排放速率	1.69×10 <sup>-2</sup>	kg/h	/
			颗粒物	排放浓度	≤20	mg/m <sup>3</sup>	30mg/m <sup>3</sup>
				排放速率	/	kg/h	/
			乙苯	排放浓度	1.48	mg/m <sup>3</sup>	100mg/m <sup>3</sup>
				排放速率	4.23×10 <sup>-3</sup>	kg/h	/
			苯乙烯	排放浓度	0.299	mg/m <sup>3</sup>	50mg/m <sup>3</sup>
				排放速率	8.55×10 <sup>-4</sup>	kg/h	/
			丙烯腈	排放浓度	0.150	mg/m <sup>3</sup>	0.5mg/m <sup>3</sup>
				排放速率	4.29×10 <sup>-4</sup>	kg/h	/
标干流量				2860	m <sup>3</sup> /h	/	





## 在线加热炉炉管外壁清焦灰技术 Online Heater Cleaning Technology for External Tube Wall

加热炉炉管外壁积灰、结焦问题：

- 积灰、结焦会大幅降低热效率；
- 增加燃料成本；
- 高温腐蚀导致炉管破裂；
- 缩短运行周期。

在线炉管除焦技术工艺原理：

通过向炉膛内喷射除焦剂改善结焦的物理和化学结构，使得结焦灰从炉管外壁脱落而改善炉管的表面状况，从而实现在线除焦灰。

Dust accumulation and coking on the outer wall of the heating furnace tube:

- Dust accumulation and coking can greatly reduce thermal efficiency;
- Increase fuel costs;
- High temperature corrosion leads to furnace tube rupture;
- Shorten the operating cycle.

Process mechanism of coke removal agent:

Improve the surface condition of the furnace tube by increasing the melting point of alkali/metal compounds. The transformation of compound at different temperatures promotes the removal effect, to achieve online dust and coke removal



## 液态化工品高精度脱水/干燥系统 Liquid Chemical Products High-Precision Dehydration/Drying System



我公司产品以其卓越的品质被广泛应用于电厂、食品、医药、石油、化工、钢厂、冶金、采矿、环境保护以及工业环保水处理等工程……

Our products are widely used in the petrochemical and petroleum, food, pharmaceutical, metallurgy and mining industries, power plant, environment protection, industrial water treatment etc.

