



EFFICIENT ENERGY-SAVING
ULTRA LOW PURIFICATION
GREEN ENVIRONMENTAL PROTECTION

高效节能 ○ 超低净化 ○ 绿色环保



中天威尔环保科技有限公司

Zhong Tian Weldking Green Technology Co.,Ltd

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中天威尔环保
科技有限公司

Zhong Tian Weldking
Green Technology Co.,Ltd

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公司简介 COMPANY PROFILE

2015年
公司成立

2016年
核心产品引入中国

2017年
国内首个国家示范性工程

2019年
打造产业化基地

2022年
拟定将蓝盾威尔打造为全球最大陶瓷滤管产业化基地

中天威尔环保科技有限公司 成立于2015年，是一家大气治理集工程设计、建设、运维于一体的国家高新技术企业。
2016年，中天威尔公司是国内首家将德国CLEAR EDGE陶瓷催化滤管核心产品引入中国。
2017年，中天威尔公司打造了五粮液玻璃窑炉陶瓷催化滤管脱硫脱硝除尘一体化烟气超低净化技术国内首个国家示范性工程。
2019年，通过自主研发打造了陶瓷催化滤管制造-河北蓝盾威尔纳米科技有限公司产业化基地。
2022年，中天威尔公司是中能建控股集团等战略投资者共同孵化的重点企业，拟定将蓝盾威尔打造为全球最大陶瓷滤管产业化基地。

Zhong Tian Weldking Green Technology Co.,Ltd., founded in 2015, is a national high-tech gas treatment company including design, construction, and operation.
In 2016, We are the first company which introduce the ClearEdge ceramic catalytic filter tubes from German to China.
In 2017, We have built the first national demonstration project in China for the glass furnace of Wuliangye, which is a ultra-low emission gas treatment project using ceramic catalytic filter tubes ,with integrated techniques for desulfurization, denitrification and dedust.
In 2019, We have archived the core technologies with independent intellectual property of ceramic catalytic filter tube , and built the R&D and production site in Hebei.
In 2022, We have reached an agreement with China Energy Construction Holding Group, to build us into the world's largest production site for cermaic catalytic filter tube.

Product Introduction

产品介绍

Powfrax陶瓷纤维滤管

滤管本体是采用轴向叠加布料成型工艺，实现孔径梯度均匀分布，孔隙率大于80%以上，以及纳米级造孔技术。

产品用途：主要用于窑炉烟气超低尘净化及酸性组分去除。

产品特征：耐高温，最高温可达900℃，寿命长，完全替代电除尘及布袋除尘。

Powfrax Ceramic Fiber Filter Tube

The tube body is produced using an axial layering fabric-forming process, which ensures a uniform distribution of pore size gradients. With ano-scale pore-forming technique, the porosity exceeds 80%.

Application: Mainly ussed for ultra-low dedust and acidic ingredient removal of glass furance.

Features: High-temperature resistance (up to 900°C), long service life, fully replaces electrostatic precipitators and bag filters.

Powfrax陶瓷纤维滤管



CeraCAT陶瓷催化滤管

产品用途：用于烟气高效脱硫脱硝除尘及其他酸性组分净化

净化效果：除尘 < 10mg/Nm³、脱酸≥95%，脱硝≥95%

适用温度：适用于窑炉烟气温度260-400℃范围内

CeraCAT Ceramic Catalytic Filter Tube

Application: Used for desulfurization, denitrification, dedust, and acidic ingredient removal in gas treatment.

Purification effect: Dedust to < 10 mg/Nm³, desulfurization % ≥ 95%, and denitrification rate ≥ 95%.

Temperature: Gas temperature from 280 to 400°C of industrial furnace.

CeraCAT陶瓷催化滤管



Frequently Asked Questions

常见问题

FAQ 陶瓷滤管常见问题



问题：法兰压碎或折断

原因：法兰强度低

Question: Flange crushing or fracture

Cause: Low flange strength.



问题：陶瓷滤管出现窟窿

原因：反吹压力或壁厚不均，内壁强度差

Question: Holes in ceramic filter tubes

Cause: Excessive backblowing pressure, uneven wall thickness, or poor inner wall strength

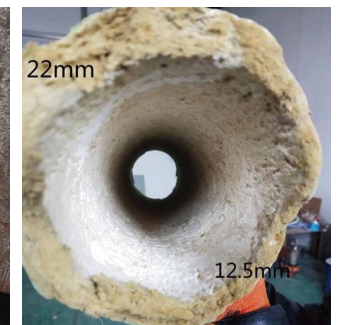


问题：主要在距离法兰30-60cm处出现断管

原因：工艺缺陷导致30-60cm位置处陶瓷滤管强度低

Question: Broken at 30-60 cm away from the flange

Cause: Produce defects



问题：内壁厚度偏差大

原因：工艺缺陷导致

Question: Large thickness deviation of the inner wall

Cause: Produce defects.

Product Advantages

产品优势

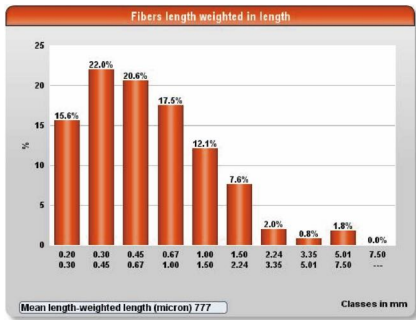
耐高温特性：采用高铝陶瓷纤维原料，非催化剂陶瓷纤维滤管适用于150-850℃范围

Resistance: Made with high-alumina ceramic fiber raw material, Non-catalytic ceramic fiber filter tubes are suitable for 150–850°C.

化学组份 | Chemical components

Al2O3 > 45-48%
SiO2 > 51-54%
Al2O3+SiO2 > 99.6%
Na、K、Mg、Ga < 0.3%

物理参数 | Physical Parameters



陶瓷纤维直径Fiber Diameter: 2.5-3.5um

纤维剪切比克值Settling Volume Ratio: 200±40

纤维渣球（212um）含量Fiber Shot Content: < 8-15%

长度分布 | Length distribution

Summary Array		
纤维(根数) Fiber (number of fibers)	10004	总数量 (milion/g)
纤维长度:算术平均和长度加权长 Fiber length: arithmetic mean and length weighted length	0.507 0.777	
宽度(微米) Width (micrometers)	8.5	
粗度(毫克/米) Coarseness (milligrams per meter)	0.0125	
扭结角(度) 扭结纤维(%) Twisted angle (degrees) Twisted fiber (%)	127 17.0	
弯曲(%) Bending (%)	7.8	
分丝帚化长度比(%) Length ratio of silk broom (%)	0.831	2804.383
折断纤维比(%) Broken fiber ratio (%)	6.67	
细小纤维(长度比%和长度加权比%) Fine fibers (length ratio% and length weighted ratio%)	61.8 55.16	
细小纤维面积比% Small fiber area ratio%	18.98	

与同类陶瓷催化管对比其性能，具有高强度、低阻力特征，不但大幅度降低断管率，且系统集成可以有效的降低其运行成本

Compared to competitive ceramic catalytic tubes, We have high strength and low resistance feature, which reduce breakage rates with large scale and operation cost.

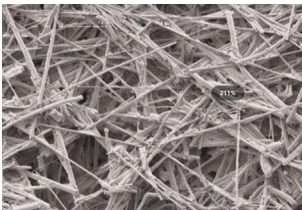
Powfrax陶瓷纤维滤管优势

Powfrax ceramic fiber filter tube advantages



超过滤特性：采用纤维浆液离心布料，通过外模具吸滤叠加达100层以上滤纸

Feature: Fiber slurry is subjected to centrifugal deposition, followed by suction filtration through an external mold, forming a stacked layer structure exceeding 100 layers.



陶瓷纤维叠加层孔径25-45nm
陶瓷纤维管孔隙率 > 80%
除尘过滤效果 < 1mg/Nm³
滤管阻力 < 260pa (1m/min)

Pore Size: 25-45 nm

Porosity: >80%

Dust Removal Efficiency:
<1 mg/Nm³

Filter Resistance: <260 Pa (at 1 m/min airflow velocity)

CeraCAT陶瓷催化滤管优势

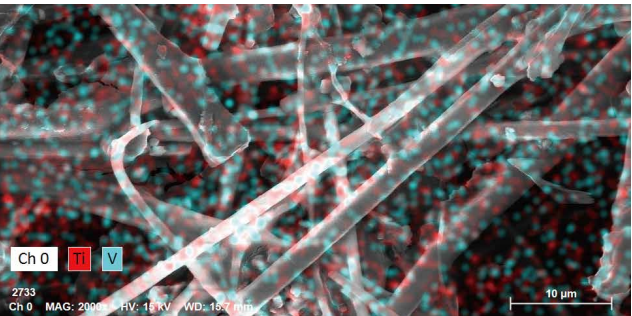
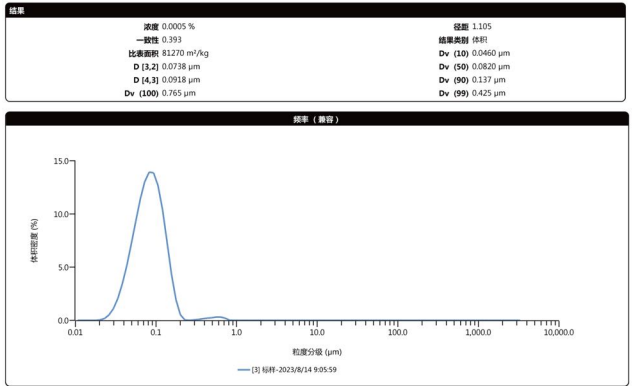
Advantages of Ceramic Catlyst Filter Tubes

采用纳米级催化剂浆液，对滤管进行深度浸渍，实现高效功能性滤料

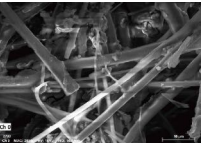
Resistance: Made with high-alumina ceramic fiber raw material, Non-catalytic ceramic fiber filter tubes are suitable for 150–850°C.

浆液特性：催化剂浆液采用钒钛纳米材料进行负载，形成均匀的悬浮液，活性组分粒径D50在100nm左右，其颗粒比表面积高达80m²/g

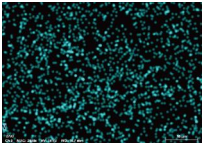
Feature: The catalyst slurry is impregnated with vanadium-titanium nanomaterials to form a uniform suspension, where the D50 particle size of the active component is approximately 100 nm, and the specific surface area of the particles reaches up to 80 m²/g.



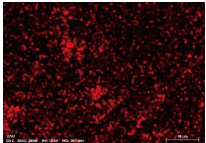
陶瓷催化滤管电镜与能谱图 (Ti、V)
SEM Micrograph and EDS Spectrum of Ceramic Catalytic Filter Tube (Ti, V)



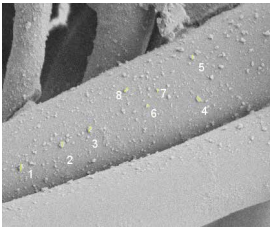
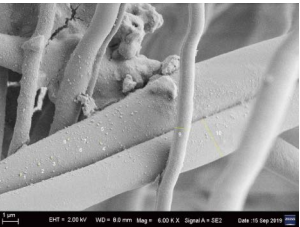
陶瓷催化滤管电镜与能谱图(纤维)



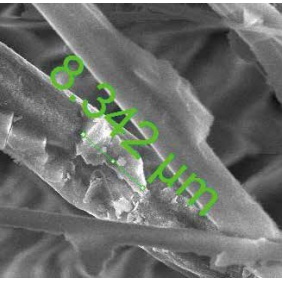
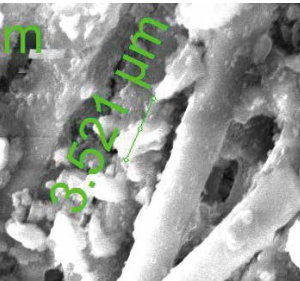
陶瓷催化滤管电镜与能谱图 (V)



陶瓷催化滤管电镜与能谱图 (Ti)



CeraCAT纳米催化剂浸渍技术
Nano-scale Catalyst Impregnation Technology



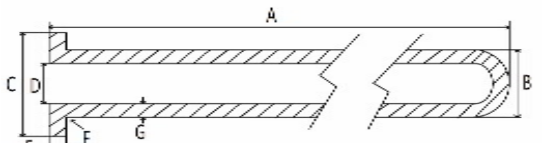
传统工艺微米催化剂浸渍技术
Traditional Micron-Scale Catalyst Impregnation Technology

陶瓷滤管参数

Datasheet

尺寸规格 Dimensional Specification				
项目 Item	标号	尺寸size	单位unit	误差error
总长度 Length	A	3000	mm	±8
元件直径 Tube OD	B	150	mm	+0/-3
法兰外径 Flange OD	C	195	mm	±2
法兰内径 Flange ID	D	110	mm	±3
法兰厚度 Flange thickness	E	30	mm	±1
元件壁厚 Tube thickness	G	20	mm	±2
元件内径 Tube ID		110	mm	±3
重量 weight		11	Kg	±1
有效过滤面积 Filtration area per element	1.35m2			
最高耐温（白管） Maximum Temp	900°C			

物理性能 Physical Specification		
项目 Item	单位 Unit	参数 Parameter
管体密度 Density (Body)	Kg/m ³	360±40
压降 Pressure drop (1m/min)	Pa	350±100
烧失量 LOI.	%	1—4
孔隙率 Porosity	%	80±2
强度（C环检测） Strength(C-ring)	MPa	> 0.4

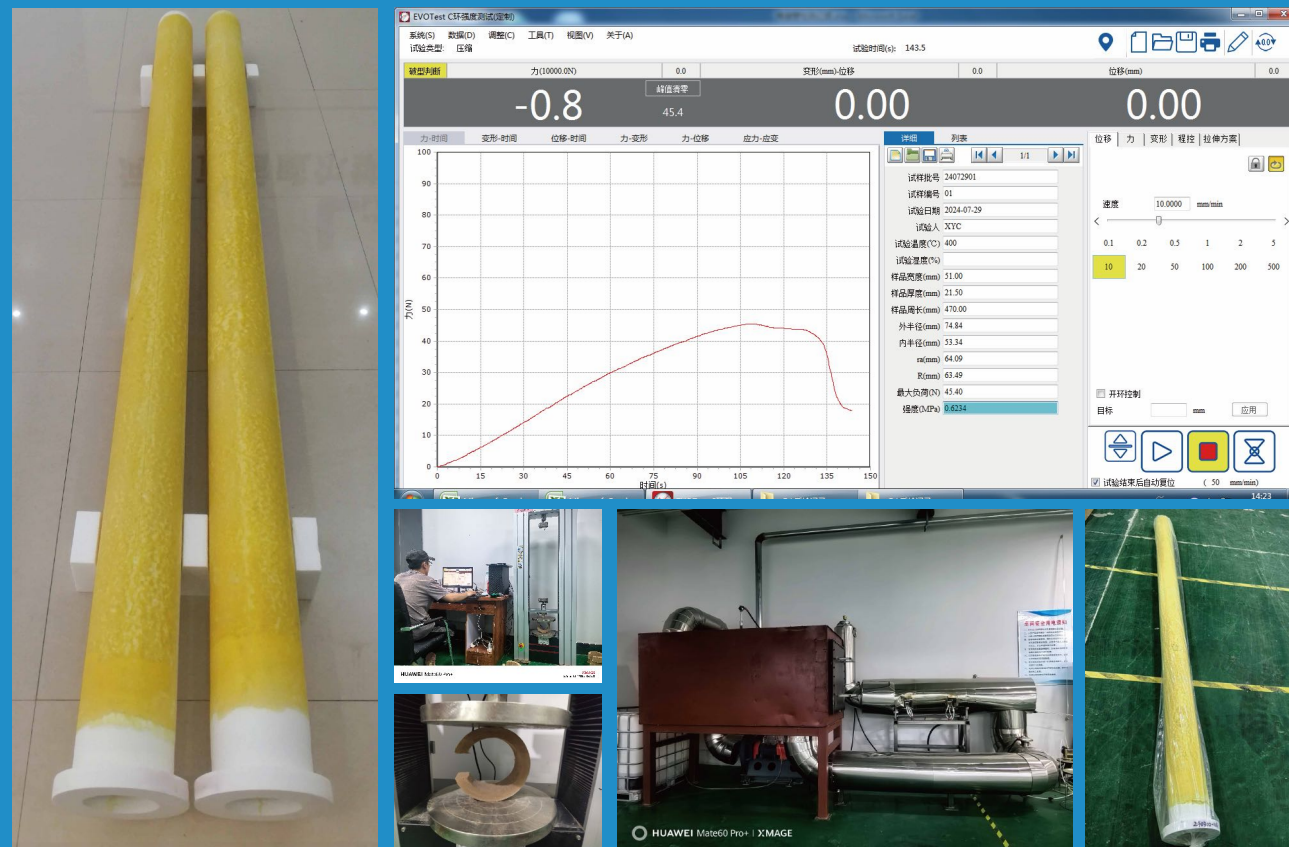


Quality Control

品质控制

我们对每批次陶瓷滤管强度、差压、孔隙率、密度、外观、尺寸等进行检测，并出具检测报告，确保陶瓷滤管品质。

Quality Control & Packaging: Strictly quality check with trackable test report of every batch ceramic filter tubes, including strength, pressure drop, porosity, density, appearance, and dimensions, etc.



品质控制与包装 Quality Control and Packaging

陶瓷催化剂管式过滤器结构

Structure of Ceramic Catalytic Filter Tube

高温除尘 High-temperature Dedust

滤料具有耐高温特实现烟尘的超低净化
适用温度150-400°C

Function: Purifies dust using high-temperature-resistant filter media.

Operating Temperature: 150–400°C.

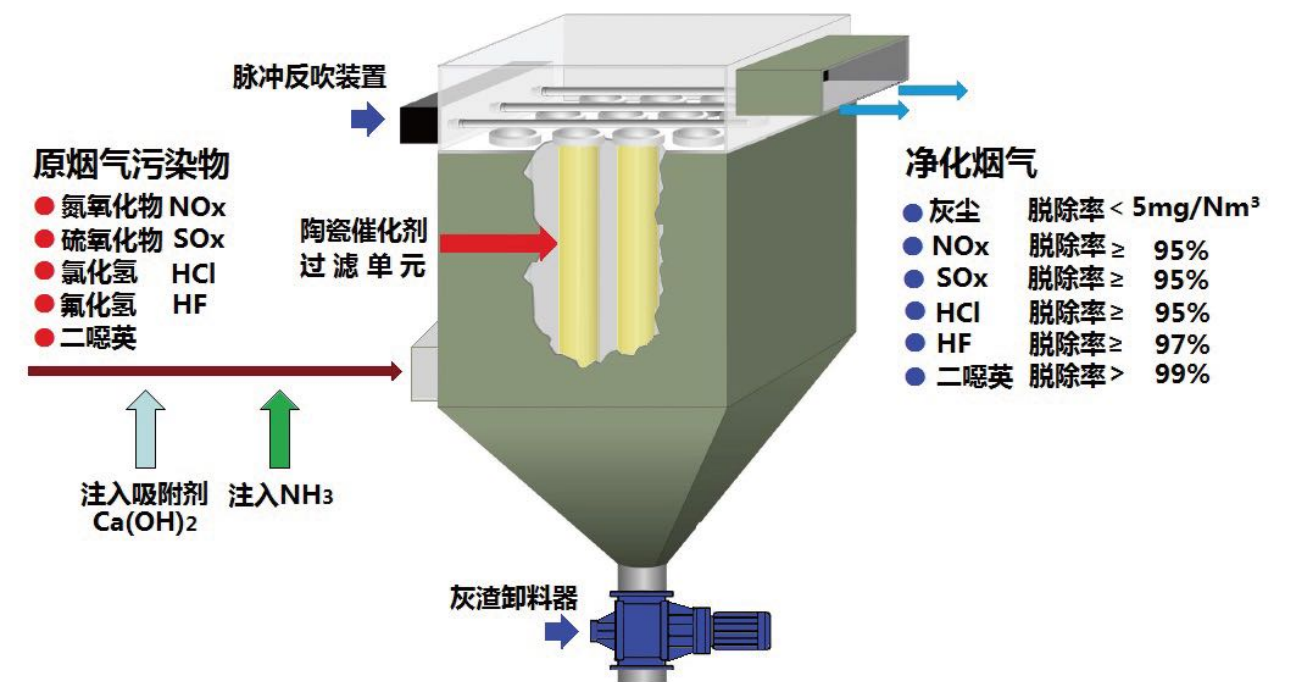
高效脱硝 High-Efficiency Denitrification

高比面积纳米催化剂
实现脱硝率97%以上
适用温度260-400°C

Technology: High-specific-surface-area nano-catalysts

Performance: Achieves >97% NO_x removal rate.

Operating Temperature: 260–400°C.



陶瓷催化剂反应釜示意图

Schematic Diagram of Ceramic Catalyst Reactor for Gas Treatment

干法脱酸 Dry Desulfurization

滤料吸附氢氧化钙粉
实现酸性物高效净化
适用温度260-400°C

Function: Adsorbs sulfur oxides (SO_x) via calcium hydroxide (Ca(OH)₂) powder.

Operating Temperature: 260–400°C.

脱二噁英 Dioxin Removal

催化剂脱二噁英特性
净化二噁英99%以上
适用温度220-260°C

Function: Utilizes catalytic properties to achieve >99% dioxin removal.

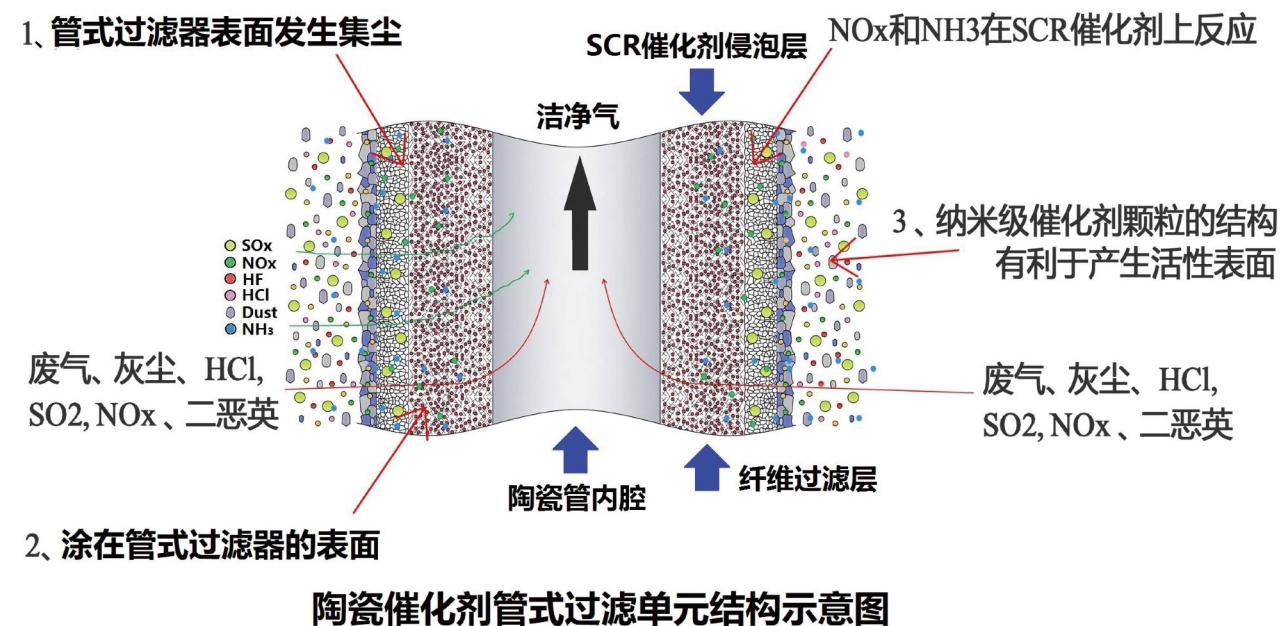
Operating Temperature: 220–260°C.

陶瓷催化滤管过滤器可实现在单一设备内，同时清除硫氧化物、氮氧化物、氯化氢、氟化氢、灰尘和二噁英。

Ceramic catalytic filters can remove the NO_x, SO_x, HCl, HF, Dust, Dioxin at a signal system with limited space.

反应机理

Mechanism

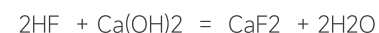
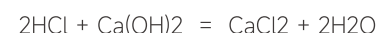
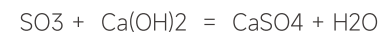
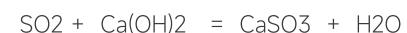


1、通过管式过滤器表面去除烟气中的灰尘。

Gas dedust bu the surface of the filter.

2、使用石灰或碳酸氢盐，通过在催化剂管式过滤器上的预涂层去除SOx。

SOx and acidic ingredient are removed through a pre-coating of calcium hydroxide powder on the filter.



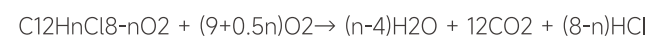
3、使用NH3或尿素作为还原剂在通过20mm的催化层时实现脱硝，因为烟气在通过20mm的催化层时进行脱硝反应，脱除率高，且NH3逃逸效率低。

Using NH3 or urea as a reducing agent, denitrification is achieved by the 20mm catalytic layer.with a high NOx removal rate and low NH3 slip.



4、在反应釜中可一步式完成二噁英化合物分解全过程，而无需使用反应物及处置固体废物，也不必进行后续处理。

The dioxin is decomposed into CO2, H2O, and HCl, achieving a removal efficiency of over 99% in the reactor without any other additional post-process



Product Application

系统集成特点

系统集成优势

Advantages of System Integration

系统高效性—对高浓度NOx、H2S、SOx、尘、二噁英及重金属、碱金属组分高效脱除

使用寿命长—核心元件催化滤管使用寿命比传统SCR催化剂长，最长使用寿命达8年以上

运行费用低—陶瓷催化剂管式一体化系统运行费用相当于传统工艺运行费用的60-70%

High Efficiency: Efficient high-concentration removal of NOx, H2S, SOx, dust, dioxins, heavy metals, and alkali metals.

Long Service Life: The catalytic filter tubes have a longer lifespan than traditional SCR catalysts, with maximum service life exceeding 8 years.

Low Operating Costs: Compared to traditional SCR, the ceramic catalytic tubular integrated system operates at 60-70% of the costs

系统特点

System Features

高效的脱硫、脱硝、除尘一体化治理；

整套系统温损小，实现余热最大化利用；

运行维护成本低，最大化实现节能降耗；

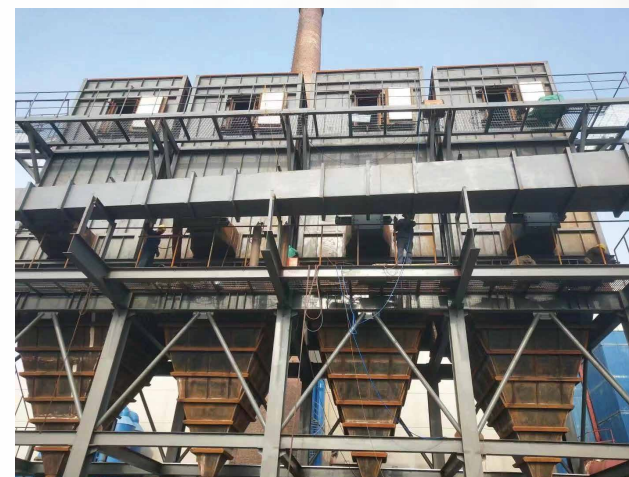
系统运行可靠，分腔室运行实现在线维护。

Integrated desulfurization, denitrification, and dedust in single system.

Minimal temperature loss, maximizing waste heat utilization.

Low operational and maintenance costs, achieving maximum energy conservation.

Reliable operation with compartmentalized design enabling online maintenance.



Application Industry

应用行业

焦化行业

Coking Industry

氮氧化物、硫氧化物、
氯化氢、颗粒物
(NO_x, SO_x, HCl, Particulate)



垃圾焚烧

Waste Incineration

氮氧化物、颗粒物、
二噁英、酸性气体
(NO_x, Particulate, Dioxins, Acid Gases)

玻璃行业

Glass Industry

氮氧化物、硫氧化物、
氟化氢、氯化氢、颗粒
(NO_x, SO_x, HF, HCl, Particulate)



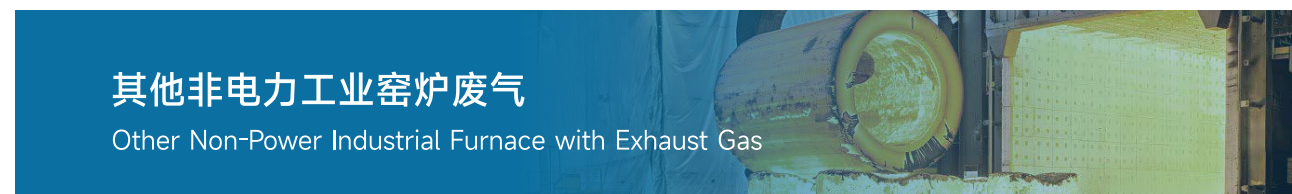
高氟行业

Glass Industry



其他非电力工业窑炉废气

Other Non-Power Industrial Furnace with Exhaust Gas



Engineering Case

工程案例

