



Greener World & Better Life



**Filter Application In Purification And
Recovery of Catalyst**

■ **Regeneration of Catalyst**

Catalyst in the modern chemical industry plays an important role. According research, about 80% to 85% of the chemical production process uses catalysts to accelerate the reaction rate, increase the efficiency of production. As most catalyst are loss during the process of production, the cost of production is increased.

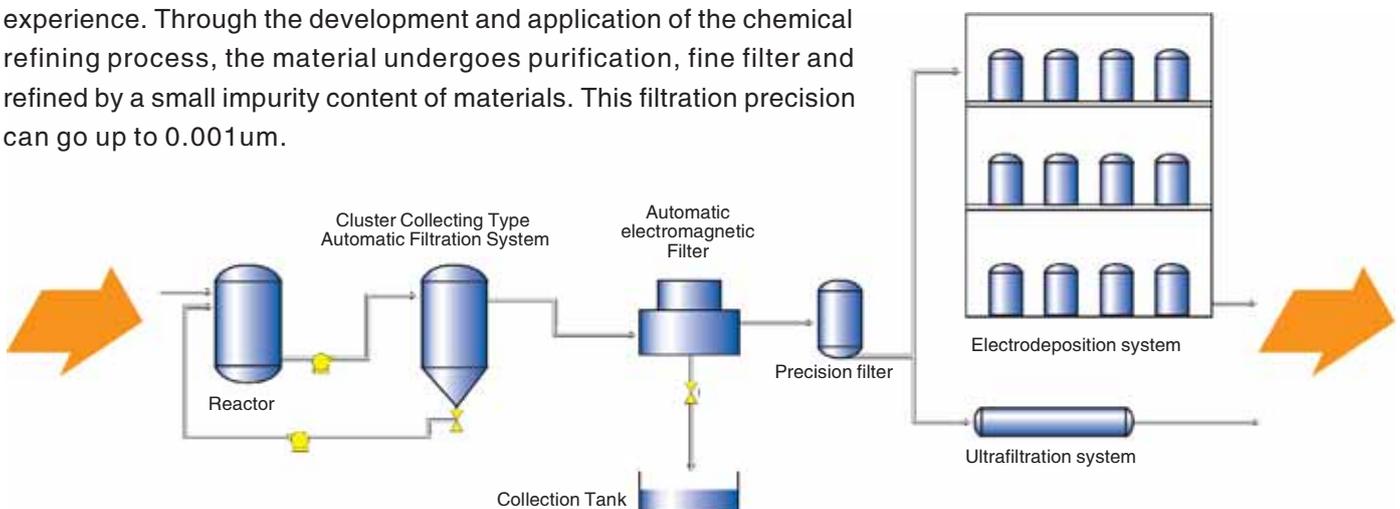
Advantages of Feature–Tec's Product

- Reduce the loss of expensive materials
- Improve product quality
- Reduce waste emissions and meet environmental protection standards
- Cycle and reduce maintenance costs
- Reduce energy consumption
- Improve the rate of recovery and purification

Flow chart of the catalyst recycling purification system:



Feature–Tec has many years of BDO, TDI and other chemical application experience. Through the development and application of the chemical refining process, the material undergoes purification, fine filter and refined by a small impurity content of materials. This filtration precision can go up to 0.001um.



■ Stage One Purification—Cluster Collecting Type Automatic Filtration System

Cluster collecting type automatic filtration system can regenerate filtration elements without production stoppages or interruptions. It has the following features: fully automatic, no breaking of elements, no manual cleaning and no replacement of filtration element etc. It's widely used under continuous and high-risk operating conditions and in circumstances where impurity is viscid and unsuitable to adopt an automatic back flushing filtration system with normal metal filtration element.



Cluster Collecting Type Automatic Filtration System

Working Principle

A Stream of reaction mixture is continuously fed to the top of the filter. Where it is split into a solid-free filtrate stream and a concentrated slurry underflow recycled to the reactor. The flow of filtrate out of the reactor/ filter aggregate is controlled for stable liquid inventory. Filtrate flow control is also used to yield the desired product conversion via residence time in complete automated fashion.



	Cluster Collecting Type Automatic Filtration System	Disc Vacuum Filter
Filter cake	> 3cm Uniform thickness	Uneven thickness Easy to crack
Filter cloth	Long life	Easy to break
Backwash	Automatic bachwash	Filter cake Discharge problems
Blockage	Filter hole will not be block	Easy to cause blockage

Involving Patent

- 200820057362.4 A catalyst recovery filter
- 200620046959.X Multi-row-type combination filter tube
- 200720046612.X Support the filter cloth with a set of pipe

Product Advantages

- Effectively deal with high impurity content, high viscosity impurities;
- Adjustable Filtering precision;
- Closed operation and able to handle corrosive
- Dry cake possible, cake for treatment and recovery requirements
- Minimum Fluid loss;
- No residue.

Product Application

- Catalyst recovery
- Amine Filtration
- PVC Recycling

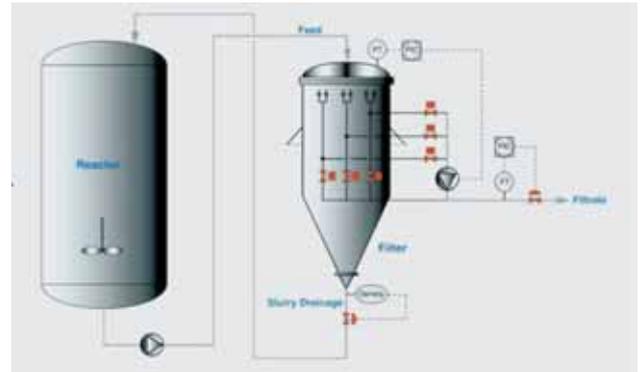


■ Continuous Thickening Machine

By slightly modifying Cluster Collecting Type Automatic Filtration System, it can be operated as a continuous thickener. In semi continuous operation, the flow is stopped for a brief period to backwash and discharge the solids, while continuous flow is maintained by sequential back flush of the individual filtrate groups during the filtration.

Working Principle

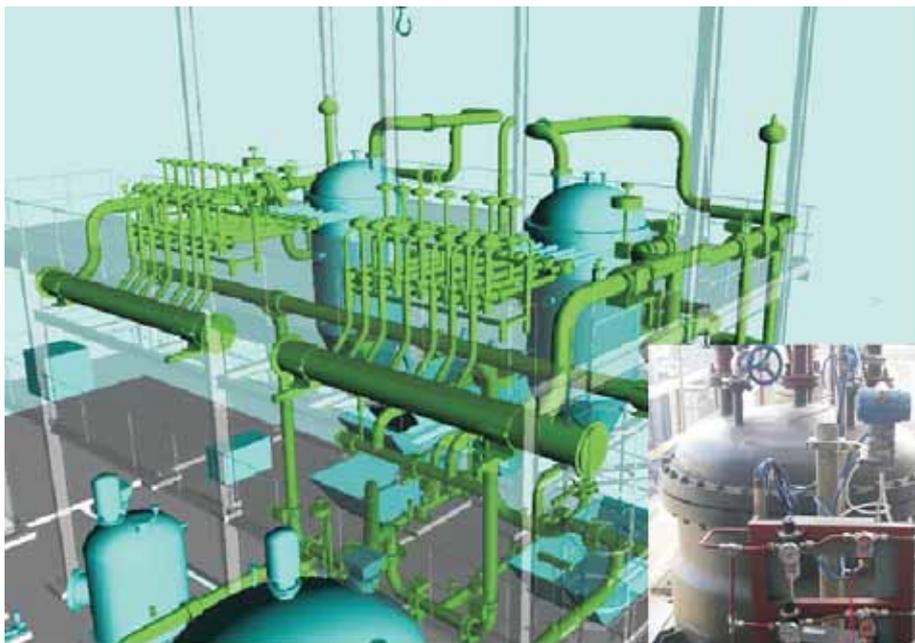
A clear filtrate is obtained by the use of finely woven media, felts or membranes of fine porosity. For difficult to filter product streams, short filtration cycles build up very thin cakes, which keep the filtration rate high. During filtration all but one filtrate group are in filtration mode, while one group of filter elements is backwashed. The freed filter cake of this group sediments rapidly into the conical bottom of the filter from where it is discharged. Once this group has regenerated, it commences filtration while at the same time the next group jump into regeneration.



Continuous thickening machine system flow chart

Product Advantages

- Clean, clear liquid: use dense filter media or felt or woven medium pore membrane to ensure good filtering effect.
- Large capacity: backwashing filter elements grouped in turn produce short-period thin Filter cake and ensure high liquidity.

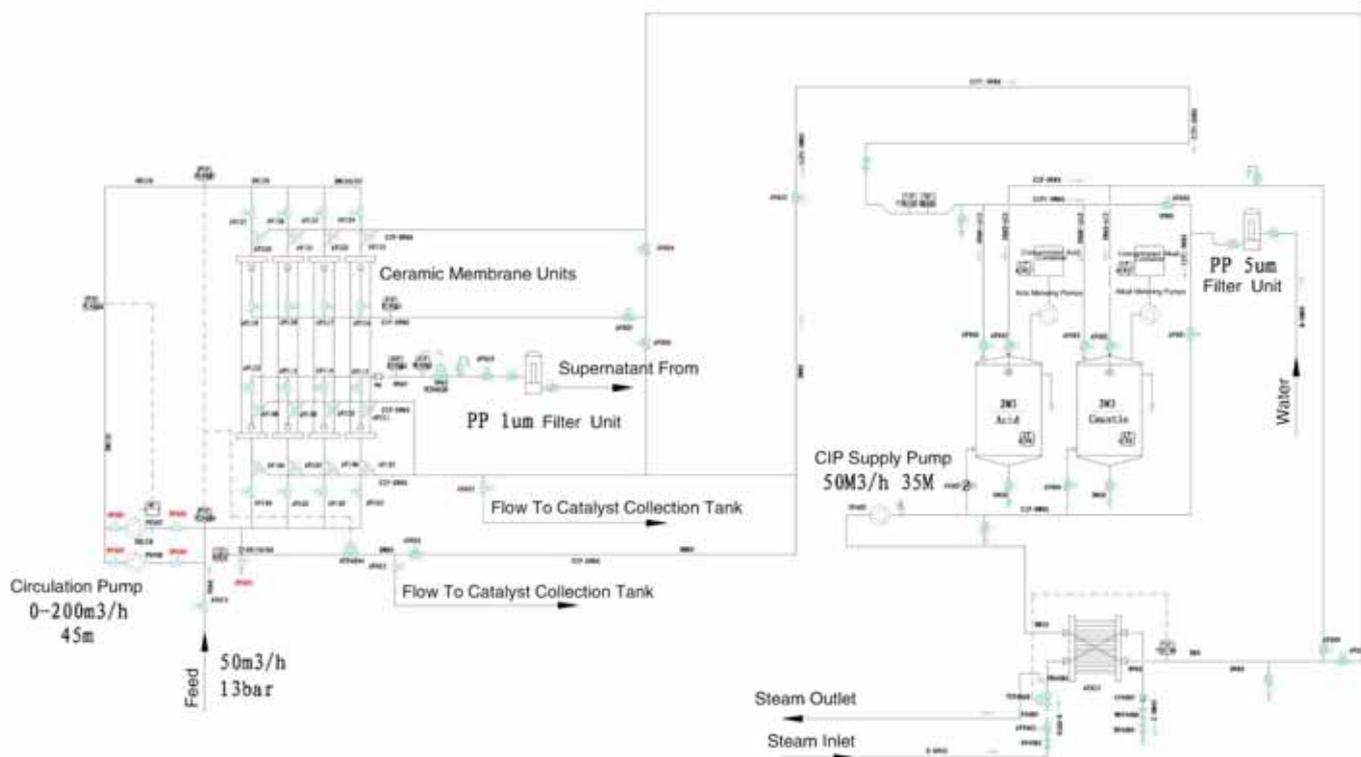


Continuous thickening machine system design



■ Ceramic Membrane Concentration System

Ceramic membrane filtration is a form of cross-flow filtration of fluid separation. After the fluid is adjusted by the booster pump, it will be sent to a tube coated with ceramic membrane. As the fluid is flowing at a high speed, the pressure drop will cause larger particles to be left behind. Then the clean fluid will flow out. As the flowing direction of the liquid is vertical with the direction of clean fluid, the cross-flow filtration is formed. This liquid flow will reduce the formation of pollutant.



Advantages of Ceramic Membrane Separation System

- Excellent membrane system design, reasonable and compact lay out, small floor area
- High weight concentration, increasing the product yield greatly
- High separation efficiency, stable performance, excellent quality
- Wide range of applications, strong matching and adjusting
- Wide applicability, can handle almost any strong oxidizing acid-base solution.
- Rigid pore, inert membrane, hard to be eroded and out of shape
- Suitable for long term usage under high temperature, easy to clean and be recycled
- PLC control system, easy and reliable operate, reducing labour intensity.



■ Stage Two Purification – Magnetic Separation

FerroClean™ II can remove ferromagnetic impurities more effectively. They are widely used for applications, such as recovery of noble metal, clarification of low magnetism media.



Magnetic Filter

Working Principle

Liquids and pulps containing ferromagnetism impurities pass through a strong electromagnetic field. Particles are intercepted by a barrier in the filter housing. When the differential pressure reaches a predetermined value, the filter power will be cut off. The magnet field degaussed and back wash valve opened. Impurities will then be discharged by a drainage pipe.

Involving Patent

200520046899.7 Permanent magnet automatic magnetic separation device

Product Advantages

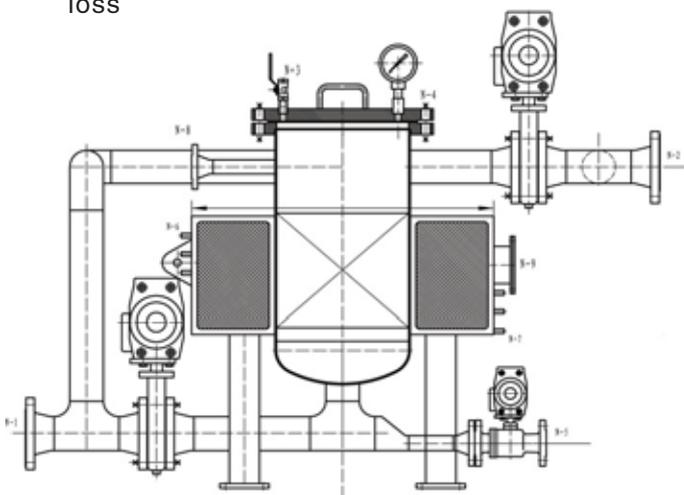
- Rugged, compact design
- Automatic regeneration and anti-washing, metal catalyst can be easily collected
- Treatment particle size 1um–1mm, to achieve precise control of parameters
- Recovery, high efficiency, good economic and environmental benefits
- Pipe pressure difference, the system pressure loss

Technical Specifications

- Filtration Flow: 10 ~ 100m²/h (this parameter is a single filter flow, multi-level parallel expansion)
- Fluid temperature: 120°C
- Magnetic strength: 0.3T ~ 2T
- Filtering precision: 1um or more weak ferromagnetic particles

Application Example

- Recovery of precious metal catalysts, such as nickel, chromium, molybdenum, palladium, platinum, etc.
- Removal of metal ions (nickel, chromium, molybdenum, iron, copper, etc.)
- Boiler condensate water reuse
- Rolling emulsion wastewater treatment



Schematic diagram of electromagnetic filter

■ Precise Filtration–Bag Filter

Our modular filtration system speedo™ is designed to meet variable flow rate requirements. Modular filtration system ensures continuous operation during filter element replacement. The system capacity can be expanded easily. The quick clamp rapid opening mechanism ensures simple, operator friendly and safe operation with minimal downtime to increase productivity and decrease running costs..



A special tool (supplied) ensures simple effective operation. A counter–balanced spring assisted cover–lifting mechanism balances the cover perfectly giving it a weightless feel. Opening and closing of the cover with the "little finger" is a reality. Positive O–ring sealing offers easy and safe operation. side inlet and bottom outlet provides easy and full drainage, tangential outlet option available to reduce housing height.



Feature–Tec's Bag Filter

Involving Patent

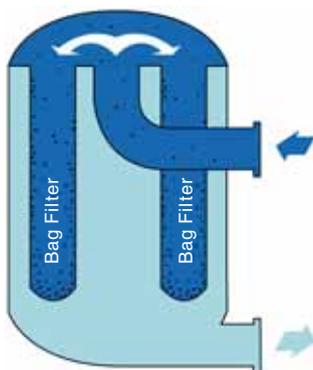
200710131994.0 Sealed filter cover fastening device body
200520017490.2 Opening and closing of the covers with the self–balancing device

Application examples

- Recovery of security as a catalyst filter or terminal filters
- Adsorption of trace catalyst recovery or interception
- Filtration solvent recovery

Product Advantages

- Fully mechanical lock V–hoop. Simple, safe and reliable
- Top cover can be easily open effortlessly with one hand
- Outlet design is optimal to allow easy drainage of the wastage
- It has unique 3–point hold down or bayonet fittings ensure high quality of seal between each filter bag and housing body.



Schematic diagram of filtration



Absolute Rating Filter Bag



Super Life Filter Bag



Polypropylene Filter Bags

■ Precise Filtration– Cartridge Filter

In addition to the filter bag, for > 0.1um minor impurities, cartridge filters are used for precision filtration of the particles.



ILC series of core-type filter is research and developed by Feature-Tec. It is mainly made up of filter cartridge, filter shell and other accessories. Fluid flows from the filter inlet into the filter housing, the impurities are trapped in the filter surface. Clean fluid will then flow out from the exit. The filter adopts the fastening bolt locking rings or Quick Opening installation which is easy and fast while operating. Unique multi-filter cartridge forces the seal or single seal design to ensure 100% no leakage. Filter can achieve the technical standards of safety and reliability quality of Welding Society in Hamburg, Germany. other features such as dimension of the equipment reduced operating, maintenance operation. Hence reduce labor intensity and increase the production efficiency.



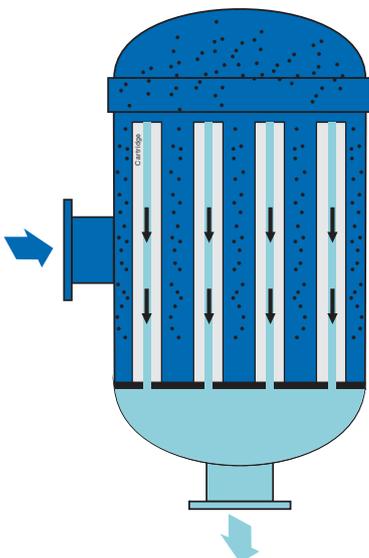
Feature-Tec's Cartridge Filter

Application examples

- Recovery of adsorbed catalyst
- Act a security terminal for catalyst recovery
- Filtration solvent recovery

Product Advantages

- No. Of filter cartridge 1–183 and length of 20"–50"
- Variety of seals, suitable for different fluid media
- High-strength bolts and nuts rings
- Fixed support
- The main material SS304 \ SS316 stainless steel
- Maximum operating pressure 4–10 bar
- Inner surface passivation, the outer surface of sand matt (standard)



Schematic diagram of filtration



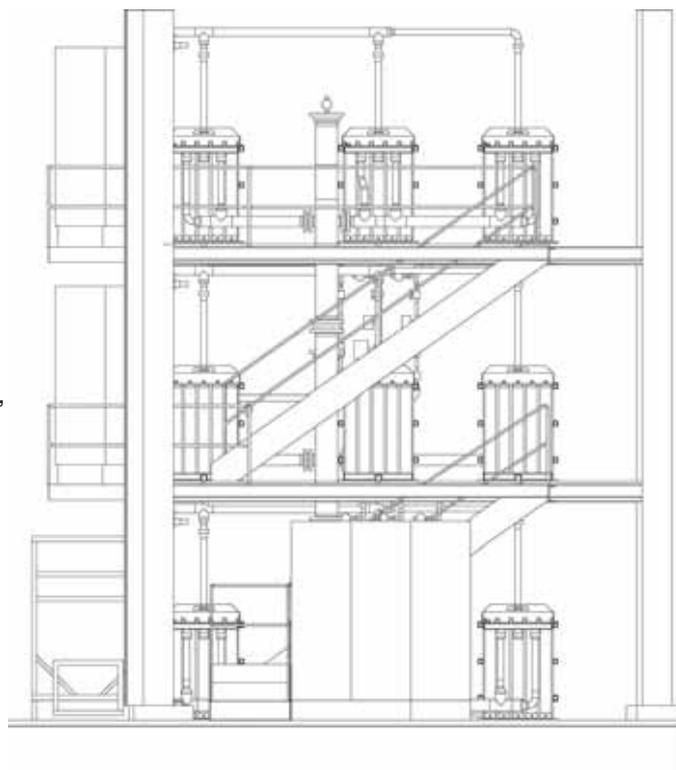
■ Electrodeposition Separation

Feature–Tec uses the latest technology in removing electrodeposition by electrolysis of heavy metal ions in wastewater treatment. Feature–Tec's electrochemical processing method using multi–level, can remove heavy metal ions, metal ion content to less than 0.5PPM.

Application:

Common metals: copper, zinc, separated, iron, cobalt, nickel, etc.

Precious metals: silver, gold, palladium



Three stages Electrodeposition treatment systems
 Flow: 5m³/h
 Water: 40mg / l Cu
 Water: <0.5mg / l Cu

Working Principle

Wastewater containing heavy metals and dissolved oxygen molecules in the surface will cause many micro–electrolysis reactions. Continuous good reaction will ensure heavy metals and low–hazard pollutants hazardous substances to be removed during the process.

System features

Foreign electrolysis technology is more well establish, especially in heavy metal ions removal during waste water treatment. This is because their technology is highly efficient and stable. Feature–Tec made a further development, and gain practical application experience, so that investment and operating costs is significantly reduced.

Electrodeposition system water quality test results

The total project	pH	SS	COD	Total Ni	Total Cu	Total Zn	Cr 6+	Fuel Type
Raw water	2.4	84.6	220.3	14.9	15.7	3.1	0.34	19.8
Water	6.8	14	66.7	0.24	0.21	0.13	0.002(Y)	0.2(Y)
Removal	/	83.50%	69.70%	98.40%	98.70%	95.80%	99.40%	99.00%
Emission standard	6~9	≤70	≤90	≤0.5	≤1.0	≤2.0	≤0.5	≤5.0

High-Temperature Gas Recovery

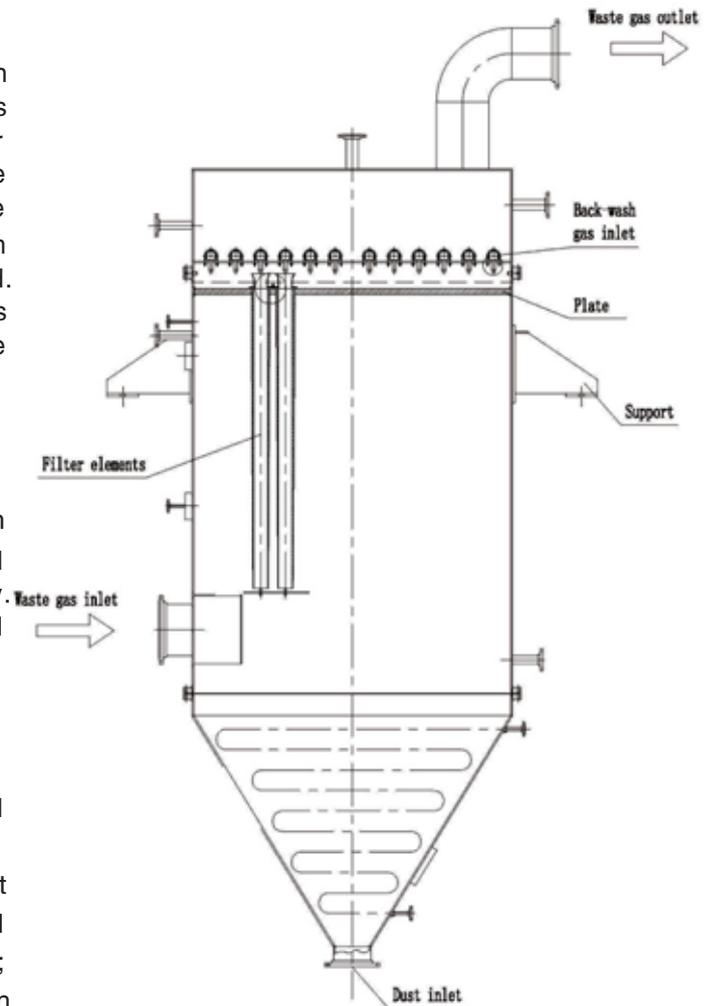
Industrial incineration flue gas moisture and oxygen concentrations are generally very high, the hardness and the volume of the particle will cause wear and tear and corrosion. In order to prevent condensation of flue gas cool burning gas the most appropriate filter temperature is generally 250 °C ~ 300 °C. The general gas-solid separation filter dust removal equipment cannot meet this demand. Hence, we suggested the use High-temperature gas filters, and recycling of valuable substances in the flue gas.

Working Principle

Flue gas is filter at high temperature to achieve maximum gas purification. This can maximize the use of physical gas sensible heat, chemical and latent heat effectively. The use of available gas resources, such as the solid catalyst can help to reduce the operating cost.

System Features

- Easy to operate, manual and automatic control, optional pressure, time, manual control in three ways;
- High temperature, thermal shock, stainless steel equipment and filter cartridge temperature, up to 560 °C, special alloys and ceramic filter cartridge resistant up to 800 °C;
- High precision filtration, small particles of dust filtration separation (minimum of 0.1 microns);
- High strength, corrosion resistance, high pressure, fire resistance, long service life. More suitable for high corrosive and dust, wear and tear of working conditions;
- High filtration efficiency, 99.9%, exports may be lower than the dust content 10mg/Nm³;
- Can withstand alternating load, impact load resistance, high strength, fatigue strength;
- Backwash effect, filter cartridge, high strength, can withstand high pressure backwash;
- Good safety performance, the filter in strict accordance with the technical parameters and provide the relevant national industry standards for design and manufacturing.



Application Examples

- SiO₂ recycling from polysilicon Waste gas treatment
- Heavy oil catalytic cracking unit
- High-temperature incineration of industrial waste gas filtration separation
- Heat recycling, can make use of components recycled

Metal powder sintered filter



Metal fiber felt filter cartridge



Ceramic membrane filter cartridge

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