

## Cement Industry



General diagram of a Cement ESP and Nitrate Integrated Project in Henan, China

### High-Temperature Low-Dust SCR Denitrification Integration Project

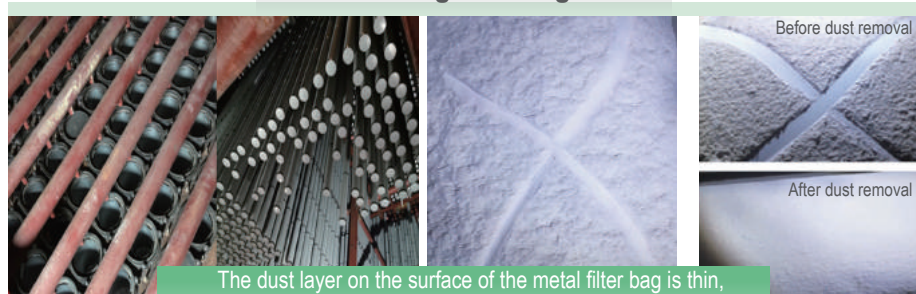
#### Operating Effect

1. High-Temperature Low-Dust SCR Denitrification Integration equipment has stably operated for more than 3 years, with significant effect.
2. Emission concentration of bag house: less than 10mg/Nm<sup>3</sup>.
3. The nitrogen oxide concentration emission is stably below 30mg/Nm<sup>3</sup>, and the denitration efficiency is above 95%.
4. The total differential pressure between the inlet and outlet of the equipment is less than 1300Pa, and the differential pressure in the bag area is stabilized at 900Pa.
5. Ammonia slip concentration is less than 2.5mg/Nm<sup>3</sup>.
6. Ammonia water consumption is reduced by more than 60%.

#### Dust Collection Effect

After dust collection, the dust reaches the level of ultra-clean emission, creating a stable micro-dust environment for the denitrification catalyst. The test block catalyst removed is basically no different from before-use, with clean internal and external surfaces.

#### Back-Blowing Cleaning Effect



The dust layer on the surface of the metal filter bag is thin, and the cleaning effect is outstanding

#### Catalyst Effect of High-Temperature Low-Dust SCR Denitrification Integration Equipment

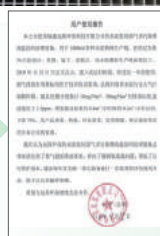


#### Application Effect of High-Temperature Low-Dust SCR Denitrification Integration Equipment

Third-party Test Report



User Usage Report



## A 5000-Ton Cement Project in Shanxi, China (Completed in November 2021)

|                                      |   |
|--------------------------------------|---|
| Standard flue gas volume             | 380000Nm <sup>3</sup> /h<br>(working condition 820000m <sup>3</sup> /h) |
| Flue gas temperature                 | 310°C   |
| Inlet dust concentration             | 100g/Nm <sup>3</sup>  |
| Outlet dust concentration            | 10mg/Nm <sup>3</sup>  |
| Inlet SO <sub>2</sub> concentration  | 200mg/ Nm <sup>3</sup>  |
| Outlet SO <sub>2</sub> concentration | 20mg/ Nm <sup>3</sup>   |
| Inlet NO <sub>x</sub> concentration  | 500mg/Nm <sup>3</sup>   |
| Outlet NO <sub>x</sub> concentration | 50mg/Nm <sup>3</sup>  |
| Ammonia slip                         | 2.5mg/Nm <sup>3</sup>   |



## Biomass Industry

|  |  |
|--|--|
| Flue gas at the outlet of the equipment          | NO <sub>x</sub> concentration < 50mg/Nm <sup>3</sup>             |
| Flue gas at the outlet of the equipment          | SO <sub>2</sub> concentration < 30mg/Nm <sup>3</sup>             |
| Flue gas at the outlet of the equipment          | Dust concentration < 10mg/Nm <sup>3</sup>                        |
| Pressure drop of the equipment                   | < 1800Pa, 600Pa lower than that before the transformation        |
| Amount of ammonia injection                      | 0.2t/h, 50% lower than that before the transformation            |
| Design life of equipment catalyst and filter bag | ≥ 5 years  |
| Use of main structure                            | Service life is 30 years, and the annual operation is 8000 hours |



## Glass Industry

|                                      |                             |
|--------------------------------------|-----------------------------|
| Flue gas volume                      | 42000Nm <sup>3</sup> /h     |
| Flue gas temperature                 | 300°C                       |
| Inlet dust concentration             | 400mg/Nm <sup>3</sup>       |
| Outlet dust concentration            | 10mg/Nm <sup>3</sup>        |
| Inlet SO <sub>2</sub> concentration  | 500mg/ Nm <sup>3</sup>      |
| Outlet SO <sub>2</sub> concentration | 100mg/ Nm <sup>3</sup>      |
| Inlet NO <sub>x</sub> concentration  | 2200-3200mg/Nm <sup>3</sup> |



## Fields of Applications

Cement industry

01

02

Glass industry

Petrochemical industry  
(petroleum FCC)

03

04

Power generation industry  
(coal-fired power generation, biomass power generation, waste incineration power generation)

Non-ferrous metal smelting industry  
(alumina, copper smelting, lead and zinc smelting, titanium smelting industry, etc.)

05

06

Iron and steel metallurgy industry  
(submerged arc furnace, heating furnace, etc.)



Yuanfuxin (Xiamen) Energy-saving New Material Technology Co., Ltd.

Address: No. 223, Qishan North Road, Huli District, Xiamen City, Fujian Province, China

Tel: +86-592-6086975 +86-17812327780 E-mail: kevin@zestep.com

# Introduction of XM-TECH® Metal Membrane Filter Bag



Yuanfuxin (Xiamen) Energy-saving New Material Technology Co., Ltd.



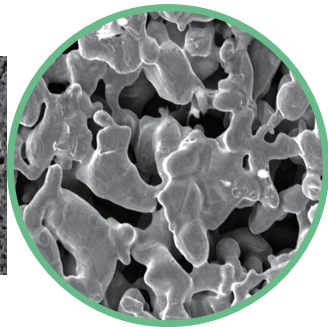
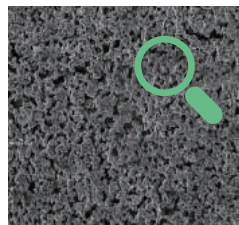
## About Us

Yuanfuxin (Xiamen) Energy-saving New Material Technology Co., Ltd. (YFX for short) is a new material company under ZEST Group. It is a high-tech enterprise integrating R&D, production, and sales of metal membrane filtration materials and its products.

Leading technology    Industrialization    Internationalization

## Core Product Introduction

YFX XM-TECH® Metal Micro-Nano Membrane is a composite structure porous metal membrane separation material prepared by sintering solid-phase particles with micron-level metal powder and metal wire mesh, which has the advantage of low-resistance and high-efficiency by using different particle size metal powder gradient composite into asymmetric gradient pore structure and is the most ideal dust removal material in the field of high-temperature flue gas dust removal.

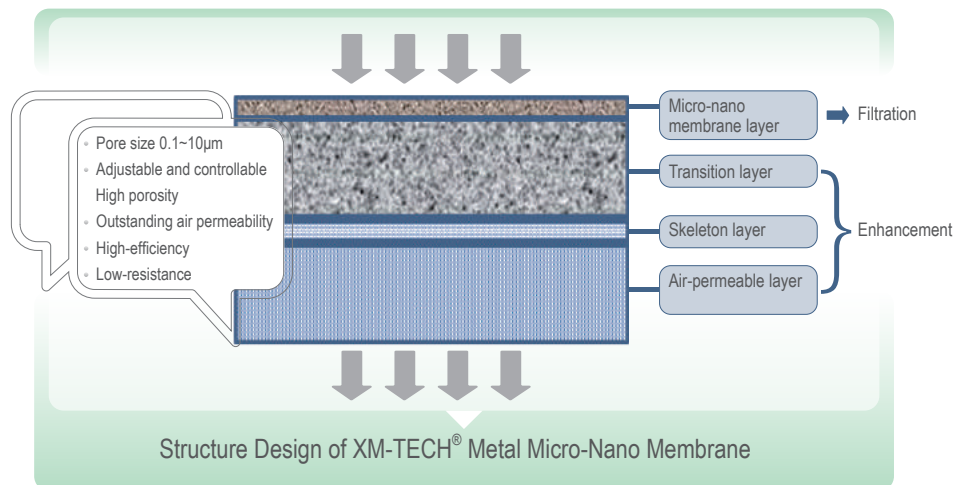


Material: 316L, 310S, nickel-based high-temperature alloy

Temperature resistance: up to 800°C

## Structural Design

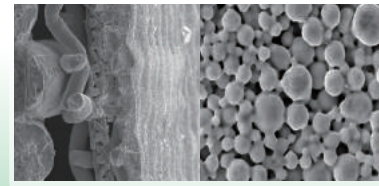
Based on sub-micron and micron metal powder, YFX XM-TECH® Metal Micro-Nano Membrane adopts an asymmetric gradient pore structure design, forming a continuous gradient layer structure consisting of micro-nano membrane layer, transition layer, skeleton layer, and air-permeable layer. Among them, the micro-nano membrane layer plays the role of filtration, while the transition layer, skeleton layer, and air-permeable layer play the role of enhancement.



## Product Line

### YFX XM-TECH® Rigid Metal Micro-Nano Membrane

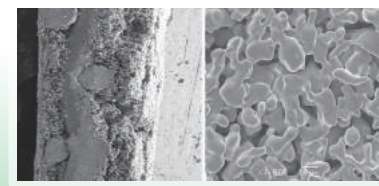
Multi-layer wire mesh + micron powder sintered separation layer, multi-layer wire mesh as the support body, composite 50-200µm powder separation layer with high-flux, high-precision, and easy-to-clean characteristics, applied to liquid-solid, gas-solid separation in various fields such as polysilicon, coal chemical, and fine chemical industry.



XM-TECH

### YFX XM-TECH® Flexible Metal Micro-Nano Membrane

Single-layer wire mesh + micron powder sintered separation layer, mesh as the support body, composite 500µm powder separation layer, with low-resistance, high-flux characteristics, applied to cement, iron&steel, metallurgy, glass kilns, waste incineration, and other fields of high-temperature flue gas dust removal.



XM-TECH

## Performance Comparison Table of Metal Filter Media by Manufacturers

| Test Items                    |                            | Metal Fibre Felt | Other Metal Powder Felts in the market | XM-TECH® Membrane |
|-------------------------------|----------------------------|------------------|--|-------------------|
| Weight Per Unit Area          | g/m <sup>2</sup>           | 1853             | 2037                                   | 1340              |
| Air Permeability              | L/dm <sup>2</sup> /min     | 65               | 20                                     | 32                |
| Pressure Drop                 | Initial Pressure Drop Pa   | 80               | 210                                    | 223               |
|                               | Residual Pressure Drop Pa  | 745              | 841                                    | 429               |
| Dust Cleaning Characteristics | Ratio of dustcake removing | 28               | 18                                     | 73                |
|                               | The first Cycle s          | 559              | 725                                    | 599               |
|                               | The last Cycle s           | 33               | 166                                    | 504               |
| Filtration Efficiency         | %                          | 99.983           | 99.995                                 | 99.999            |

## Core Advantages

- Stability** YFX XM-TECH® Metal Micro-Nano Membrane has excellent tensile strength and flexibility, to reduce the thickness of the membrane material under the premise of ensuring the mechanical performance of the membrane material and filtration precision, which in turn improves the quality of the weld seam when welding, ensuring the stability of the product, significantly reduce the chance of bag breakage.
- High-efficiency** High filtration precision, dust interception efficiency reaches 99.999%, dust concentration at the outlet can reach less than 5mg/m<sup>3</sup>.
- Low pressure drop** Low filtration resistance, high surface finish, strong regeneration ability of back-blowing, 3-7 times longer dust cleaning cycle than similar products, residual pressure drop saving 260-420Pa, significant energy-saving and consumption-reducing during operation.
- High-temperature resistance** Excellent high-temperature mechanical performance and high-temperature corrosion resistance (maximum use temperature 800°C), stable system operation.

## Technical Appraisal Results

The research on integrated technology and equipment of High-Temperature Low-Dust SCR Denitrification integration and its application in cement kilns



Technical appraisal by Science and Technology Department of China Building Materials Federation

### Appraisal Results

The main technology of the project achievements reached the international-advanced level. Three-dimensional Continuous Gradient Structure Metal Filter Bag and Integration Process reached the international-leading level.

## Qualifications and Honors

The National Ministry of Ecology and Environment released the "National Advanced Pollution Prevention and Control Technology Catalogue (Air Pollution Prevention and Control, Noise and Vibration Control Field)" in 2021, and ZEST High-Temperature Low-Dust SCR Denitrification Integration Technology was selected as a demonstration technology in the catalog.



### Demonstration technology enterprises

The "Best Contribution to the Development of Science and Technology in Cement Industry in 2021 Award" is selected by China Cement Association after screening a number of enterprises with innovative products and technologies, reflecting the innovation and application competitiveness of the selected enterprises in the cement industry chain.



### Hard core technology strength in cement industry

By virtue of "Innovation and Research of High-Temperature Low-Dust SCR Denitrification Integration Technology and Equipment", ZEST Group was fully recognized by various industries and won the second prize of "science and technology in building materials machinery industry in 2021".



### Won the second prize of science and technology in building materials machinery industry in 2021