DENOX
ENVIRONMENT GROUP
Stock Code : 01452

Catalyst

Manufacturer

Stationary Catalyst:

SCR(Plate, Honeycomb, Corrugated, Coated SCR)

CO, VOCs， NMHC&HCN

Automotive Catalyst:

DOC, cDPFs, Oxidation, ASC

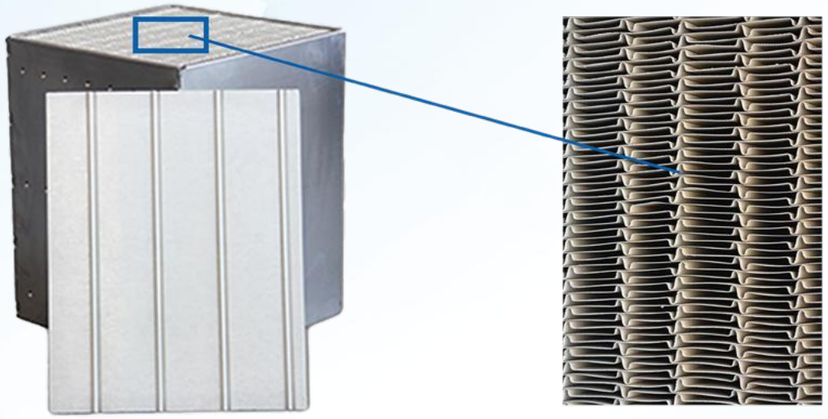
DeNOx Environmental Group.

SCR Catalyst Manufacturer

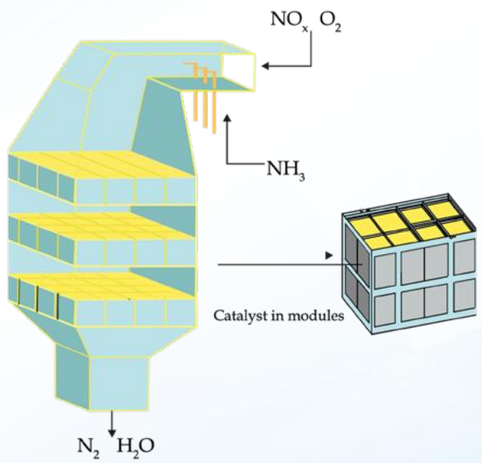
DENOX ENVIRONMENT GROUP

Plate Catalyst

Denox Environment Group has supplied plate type NOx removal catalyst since 2010. The plate catalyst uses stainless steel mesh plate as the substrate, with V_2O_5, WO_3 (or MoO_3), and TiO_2 as the main components. The active components are pressed onto the stainless steel mesh plate, cut and calcined according to a certain length, and assembled into specific modules and used to remove nitrogen oxides in flue gas. Plate catalysts have advantages such as low pressure drop and strong anti clogging performance.



Reaction Principle



Main Reactions

$4NO+4NH_3+O_2 \rightarrow 4N_2+6H_2O$ $6NO_2+8NH_3 \rightarrow 7N_2+12H_2O$ $NO+NO_2+2NH_3 \rightarrow 2N_2+3H_2O$

Product Specifications

Composition	V-Mo-Ti
Operating temperature(℃)	150-420
Denox efficiency%(%)	⩾ 90
Pitch(mm)	5/6/7
SSA(m^2 /m^3)	390/350/300

Product Advantages

- High efficiency, and excellent anti clogging performance
- High dust tolerance, ＜100g/m^3
- Wide temperature window, 150-420℃
- Low SO_2 conversion rate,
- Excellent anti poisoning ability, with excellent resistance to substances such as As, Hg, Tl, etc.
- Low pressure drop
- High mechanical strength and long service life

Applications

◆ Thermal power industry

◆ Biomass boiler

◆ Steel industry

◆ Petrochemical industry

◆ Glass industry

◆ Cement industry

Catalyst Manufacturer

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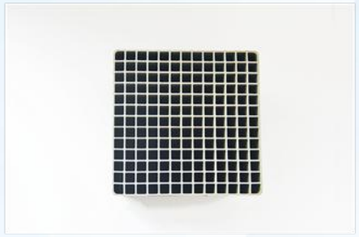
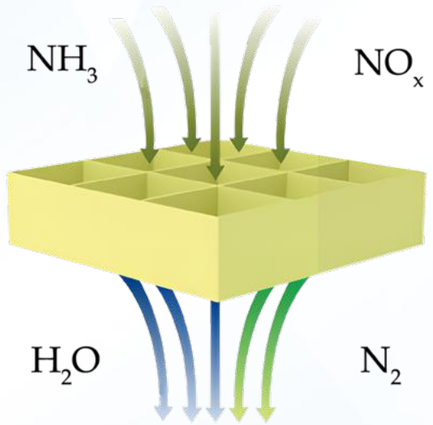
Honeycomb Catalyst

The Honeycomb catalyst is a monolithic catalyst used for removing nitrogen oxides from flue gas. The entire catalyst unit is composed of uniform catalytic materials, and the active components of the catalyst are evenly distributed. The production process of honeycomb catalyst is to mix the catalyst raw materials, then extrude and cut them into a certain length.After drying and calcination, they are assembled into various specifications of catalyst modules as needed.



Reaction Principle



Main Reactions

$4NO+4NH_3+O_2 \rightarrow 4N_2+6H_2O$

$6NO_2+8NH_3 \rightarrow 7N_2+12H_2O$

$NO+NO_2+2NH_3 \rightarrow 2N_2+3H_2O$

Product Specifications

Cell	Cpsi	Pitch (mm)	Inner wall thickness (mm)	Surface area (m^2/m^3)
11×11	3	13.4	1.44	257
13×13	5	11.41	1.30	303
18×18	10	8.2	0.85	423
20×20	12	7.4	0.80	470
22×22	14	6.73	0.75	514
25×25	18	5.92	0.70	583
30×30	26	4.95	0.65	688
35×35	35	4.25	0.60	794
40×40	46	3.73	0.45	933
55×55	87	2.71	0.35	1270
60×60	100	2.5	0.32	1396
70×70	140	2.1	0.30	1524
108×108	334	1.1	0.24	2250

Product Advantages

- Multiple product types：11～108 cell, suitable for various industry application;
- Excellent sulfur resistance, low SO_2 conversion rate,
- Wide temperature window, 150-500℃;
- High geometric specific surface area：300-1000m^2/m^3, low loading volume;
- Adjustable catalyst height: 100-1300mm;
- Wide range of fuel adaptability: coal, oil, gas.

Applications

◆ power industry

◆ Biomass boiler

◆ Ceramics industry

◆ Coking industry

◆ Glass industry

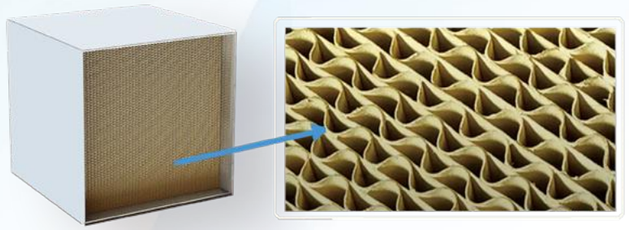
◆ Cement industry

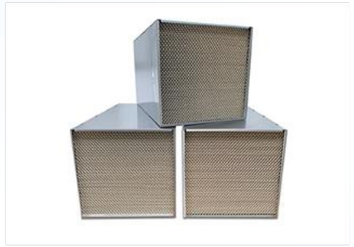
SCR Catalyst Manufacturer

DENOX ENVIRONMENT GROUP

Corrugated Catalyst

Our advanced corrugated SCR catalysts are designed specifically for low dust environments, making them an excellent choice for applications in gas turbines, gas and diesel engines, and the petrochemical industry. Constructed from glass fiber reinforced carrier, these catalysts offer superior durability and efficiency. The unique impregnation of V_2O_5 ensures optimal performance in reducing nitrogen oxides (NOx) emissions. With a unique three-state pore structure, our innovative SCR catalyst a provide reliable, cost-effective solutions for your emission control needs.



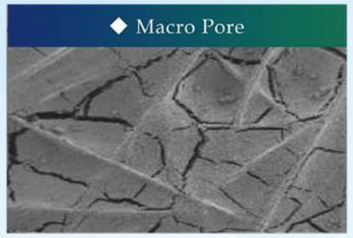


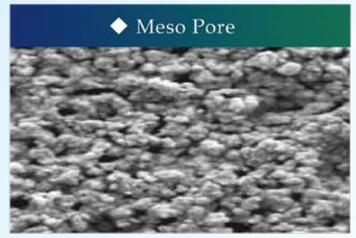
Product Specifications

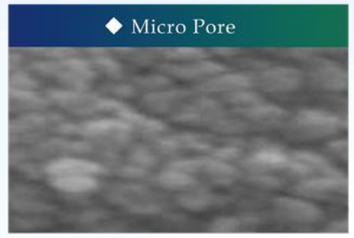
Type	Wave length (mm)	Wave width (mm)	Wall thickness (mm)	Opening ratio (%)	Surface area (m^2/m^3)	Volume density (g/L)
DNS15	16	9	1.0	74	460	290
DNS18	15.5	8	0.8	73	540	290
DNS25	10	5.5	0.6	75	660	290
DNS35	7.9	3.9	0.4	76	887	300
DNS40	7.8	3.8	0.4	76	1010	300
DNS45	5.8	3.1	0.3	75	1150	300
DNS50	5.0	2.8	0.3	75.5	1250	300

Product Advantages

- High geometric specific surface area
- Light weight per unit volume
- Low SO_2/SO_3 conversion rate
- Excellent anti-poisoning performance

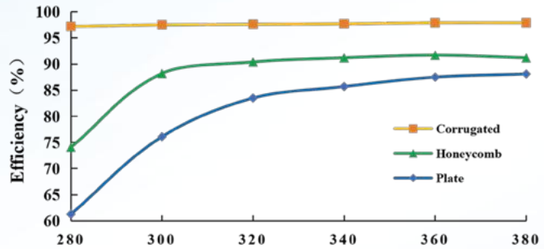






◆ Unique three-state pore structure

Thanks to its unique three-stage pore structure and high surface area, the corrugated catalyst offers superior catalytic activity compared to honeycomb and plate-type catalysts. This design also ensures a lower pressure drop, making it particularly advantageous for applications in the power industry.



Applications

◆ Petrochemical

◆ Waste incineration

◆ Diesel engine

◆ Gas turbine

Catalyst Manufacturer

DENOX ENVIRONMENT GROUP

Carbon Monoxide(CO) Oxidation Catalyst

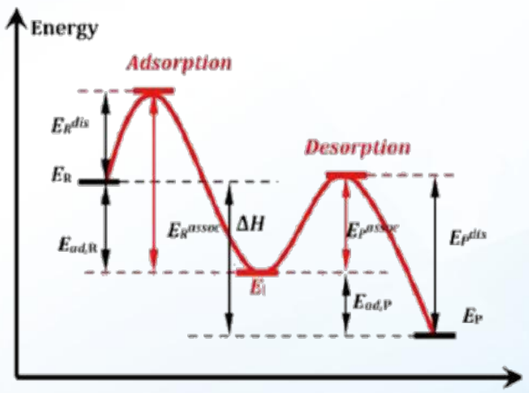
Leveraging our extensive expertise in catalyst coating technology for automotive industry Denox Environment is now offering CO oxidation catalysts for stationary applications. By applying precious metal coatings to substrates via our advanced coating technology, we ensure enhanced performance and efficiency for a wide range of industrial applications.



Reaction Principle and Catalyst Specification

CO oxidation with precious metal-coated catalysts involves the catalytic conversion of carbon monoxide (CO) to carbon dioxide (CO_2) through an exothermic reaction. In the presence of a catalyst, this reaction occurs at lower temperatures, increasing the rate of CO oxidation while minimizing energy consumption.

The exothermic nature of the reaction also means that the catalyst helps drive the process without additional external energy, improving overall system efficiency and reducing operational costs.



$$CO + \frac{1}{2}O_2 \longrightarrow CO_2 \qquad \Delta H^{\theta} = -283KJ/mol$$

Specifications	
Shape	Square & Circle
Substrate	Cordierite or TiO_2/ glass fiber
Size(mm*mm*mm)	150*150*H 100*100*H 50*50*H
Operating temperature(℃)	200-400
Oxidation efficiency	CO/CO_2 ⩾ 95%

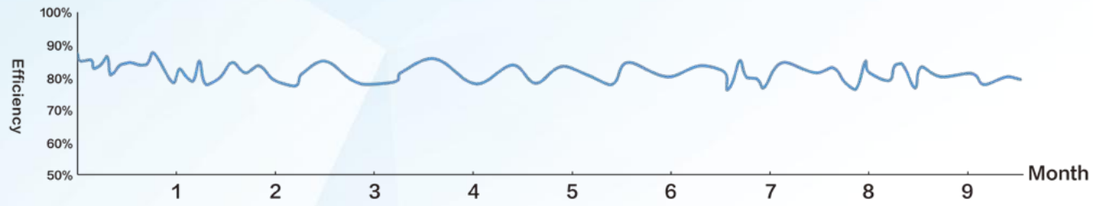
Advantages&Applications

◆ High efficiency ◆ Wide temperature window ◆ High mechanical strength ◆ Long service life

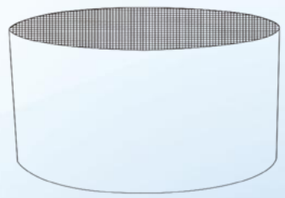



◆ Gas turbine ◆ Steel mill ◆ Incinerator ◆ CDQ flue gas

Example of references



Flue gas parameters	
Application	Steel mill
Flow rate(Nm^3/h)	17000
Temperature(℃)	⩾260
CO inlet(mg/m^3)	~8000
O_2(%)	~18
H_2O(%)	~10
Dust(mg/m^3)	20
Target	
CO/CO_2 Efficiency(%)	⩾ 80



cDPF and DOC

The main pollutants in diesel exhaust include carbon monoxide, hydrocarbons nitrogen oxides, particulate matter, etc. These pollutants can have negative effects on human health and the environment. our Denox Environment cDPF and DOC products can effectively treat pollutants in diesel engine exhaust.

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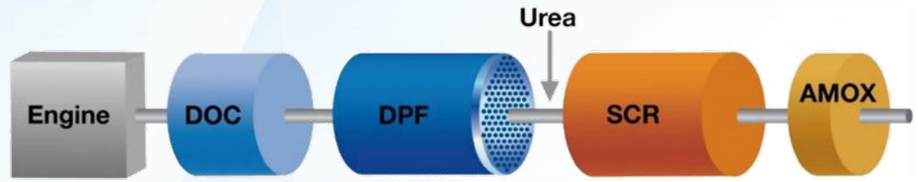
DOC and cDPF

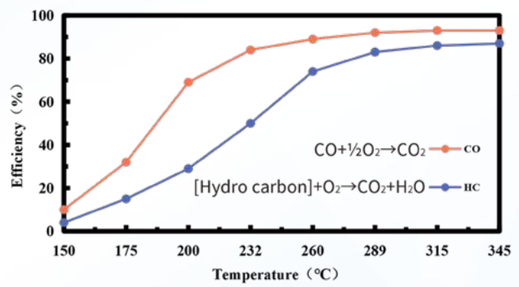
Product Introduction

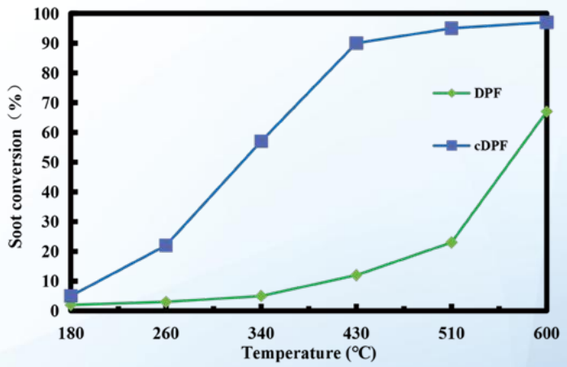
The DOC can convert hydrocarbons and carbon monoxide in diesel engine exhaust into carbon dioxide and water. The cDPF can effectively capture particles in diesel engine exhaust, reduce PM emissions, Oxidizes hydrocarbons and carbon monoxides and the catalyst component contained in cDPF can lower the regeneration temperature, achieving passive regeneration.



Advantages of DOC & cDPF combination

1. Excellent oxidation efficiency
2. High PM Filtration Efficiency ⩾ 90%
3. Low operating temperature
4. Low passive regeneration temperature
5. Excellent high temperature resistance performance
6. Long service life.
7. Low pressure drop





Catalyst Manufacturer

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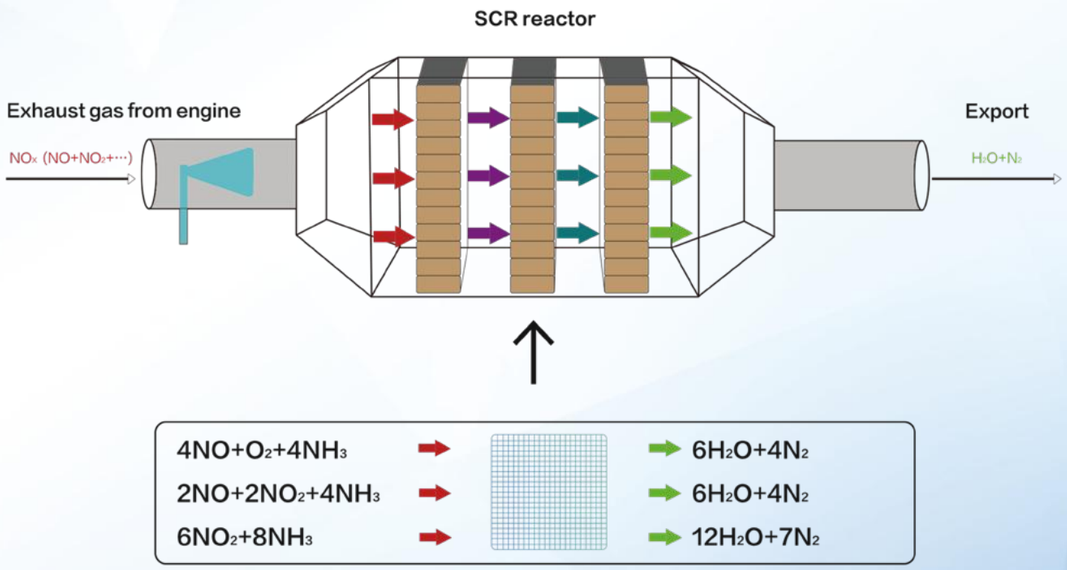
Fe Zeolite Catalyst

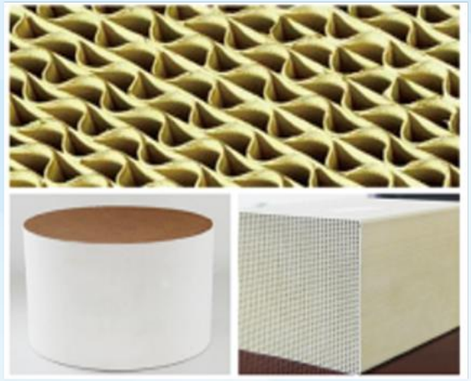
With the tightening of NO_X emission standards and the continuous expansion of industries requiring NO_X control, in addition to traditional industries such as coal and fuel oil, distributed gas turbine energy stations using natural gas, biogas, and rock gas as fuels have also put forward new requirements for NO_X control. The exhaust outlet temperature of traditional coal-fired and fuel industries is generally below 400 °C. The temperature of the exhaust gas from both gas fired units and engines is much higher than 400 °C, even exceeding 550℃, reaching a high temperature of 600℃. The high temperature conditions make traditional V/W/Ti catalysts (commonly used at temperatures below 400℃, and waste catalysts belong to hazardous waste) unable to meet the usage requirements. It is urgent to develop new SCR catalysts that will not cause se condary pollution and meet market demand.

Denox Environment relies on its own research and development platform, combined with years of experience in deve loping automative catalysts. Based on the characteristics of the flue gas emitted by distributed gas units, it has developed a high-temperature SCR catalyst using Fe-based molecular sieves as the basic active substance, with a usage temperature of 420~600℃, excellent anti poisoning performance, and no secondary pollution, effectively solving the industry's denitration problem.

Reaction Principle

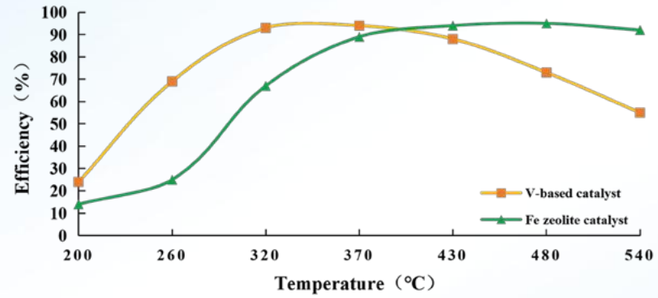


Performance Characteristics



Content	Parameters
Active substance	Fe zeolite catalyst
Physical carrier	Cordierite/Glass fibre
Production process	Coating or impregnation
Shape	Square, Circular
Operation temperature (℃)	420-600
Efficiency (%)	≥ 90
Unit size	150*150*H, 100*100*H, 464*464*H ϕ ≤ 13inch, non-standard

- ◆ Wide temperature window：420~600℃
- ◆ High efficiency: ≥ 90%
- ◆ Large SSA，Smaller volume
- ◆ Non- secondary pollution
- ◆ High compressive strength
- ◆ Lightweight per unit volume



Applications

◆ Automotive

◆ BHKW

◆ Gas turbine

◆ Distributed energy generation

SCR Catalyst

Selected Projects
Client References

DENOX ENVIRONMENT GROUP

Project location	Project industry	DeNOx efficiency
Netherlands	Thermal power	74.28
Germany	Thermal power	88.33
Poland	Thermal power	75.00
Denmark	Thermal power(biomass)	87.00
China	Metal sintering	80.23
Vietnam	Thermal power	80.00
China	Cement Plant	80.00
China	Incinerator	85.25
Vietnam	Thermal power	53.30
China	Steel Mill	84.56
Korea	Glass Plant	65.00
Indonesia	Glass Plant	86.67
Vietnam	Thermal power	60.00
Turkey	Thermal power	85.23
Germany	Waste to Energy	80.89
France	Biomass Plant	82.20
Spain	Diesel Engine	86.68
Korea	Waste to Energy	58.50
Italy	Gas Turbine	55.25
Italy	Waste to Energy	82.25

Atlas Enerji | Thermal power

Operation Conditions of SCR DeNOx Catalyst:

Flue gas flow:	8196018m³/h
Dust concentration:	26.33g/Nm³
Operating temperature:	300–420℃
DeNOx efficiency:	85.8%

Vietnam Duyen Hai Thermal Power Company | Thermal power

Operation Conditions of SCR DeNOx Catalyst:

Flue gas flow:	1921941Nm³/h
Dust concentration:	40g/Nm³
Operating temperature:	300–420℃
DeNOx efficiency:	80%

Indonesia KCC | Glass Plant

Operation Conditions of SCR DeNOx Catalyst:

Flue gas flow:	170000Nm³/h
Dust concentration:	50mg/Nm³
Operating temperature:	320–420℃
DeNOx efficiency:	86.67%

Vattenfall energy group Sweden | Thermal power

Operation Conditions of SCR DeNOx Catalyst:

Flue gas flow:	2050000Nm³/h
Dust concentration:	21.5g/Nm³
Operating temperature:	320–430℃
DeNOx efficiency:	88.33%

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ENVIRONMENT GROUP

Denox Holdings Founded in **2010**

European Branch of Denox

Address: MILANO (MI) VIA BORROMEI 2 CAP 20123, ITALIA

Italy office :	Tel : +39 3468 459083	Email :Matteo@denox-europe.com
Denmark office :	Tel : +45 2275 4627	Email :a.nielsen@denox-europe.com
	Tel : +45 2275 4585	Email :Elena@denox-europe.com
Germany office :	Tel : +49 1520 4002877	Email :Peter@denox-europe.com

Web:DeNOx-Europe.com

USA Branch of Denox

Address: 5900 Balcones dr #100 Austin, Tx. 78731

Tel : +1 704 737 7722 Email : info@Denoxus.com

Web : www.DeNOxUS.com

Beijing Denox Environment & Technology Co.，Ltd

Address: Room 1506-1 12th Floor Building 2 No.128 South Fourth Ring West Road Fengtai District Beijing

Tel : Mr zhang 18810810506 Email : Zhangx@China-denox.com

Fax :+86 10-8858 0859 Web : http://www.China-denox.com