

Everyday Everywhere

EcoPro^{HN}

RCS







Large Capacity PFC Catalytic Abatement



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RE-USE TECHNOLOGY

1. Technical Overview

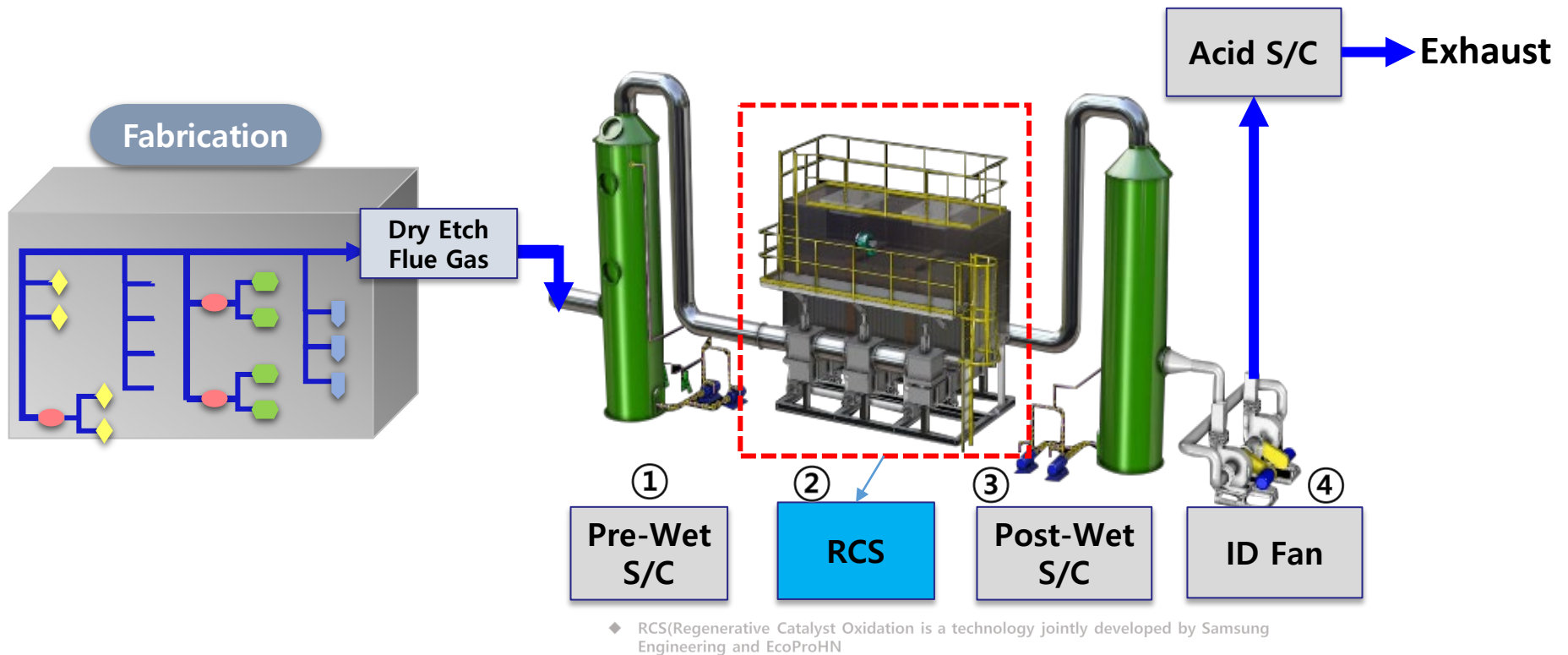
Green House gases(GHG) & Global Warming Potential(GWP)

6 Major GHG	 CO ₂	 CH ₄	 N ₂ O	 HFCs	 PFCs	 SF ₆
Sources of Emission	Fuel use	Waste, Agriculture, Landfill	Fertilizer use, Nitric acid, Caprolactam	Refrigerant, Foaming agent	Semiconductor manufacturing	LCD Electrical insulator
GWP	1	21	310	140 ~ 11,700	6,500 ~ 9,200	23,900
Green House Effect(%)	55	15	6		24	

* Global Warming Potential

GWP is a measure of how much heat a greenhouse gas traps in the atmosphere up to a specific time horizon, relative to carbon dioxide. It compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide and is expressed as a factor of carbon dioxide (whose GWP is standardized to 1).

1. Technical Overview



① Pre-Wet SCR	② RCS	③ Post-Wet SCR	④ ID Fan
Catalytic poisoning Removal (HF, Cl ₂ Gas, Dust, etc.)	CF ₄ , SF ₆ etc.. PFCs Gas decomposition Eff. : 95% based on CF₄ Operation Temp. : 780℃	Treatment of by-product of PFCs (HF, SO _x , etc.)	Maintain Process flow and static pressure

2. System Configuration

Differences from Existing Technologies

List	Burn / Electric Heat Type	Central RCS
Characteristic	<ul style="list-style-type: none">· Degradation of greenhouse gases at high temperature above 1,300 °C	<ul style="list-style-type: none">· Degradation of greenhouse gases at high temperature above 700 °C
Remark	<ul style="list-style-type: none">· High operation cost· Excessive energy consumption· Maintenance and fire hazard ↗	<ul style="list-style-type: none">· Low operation cost (Amount of energy generated ↘)· Implemented large capacity integrated processing on the roof and ground· Eliminating the fluorine compound, environment friendly equipment· NOx Emission minimized· Much less risk on fire hazard· Available for RCS installing at existing FAB running 24 hours

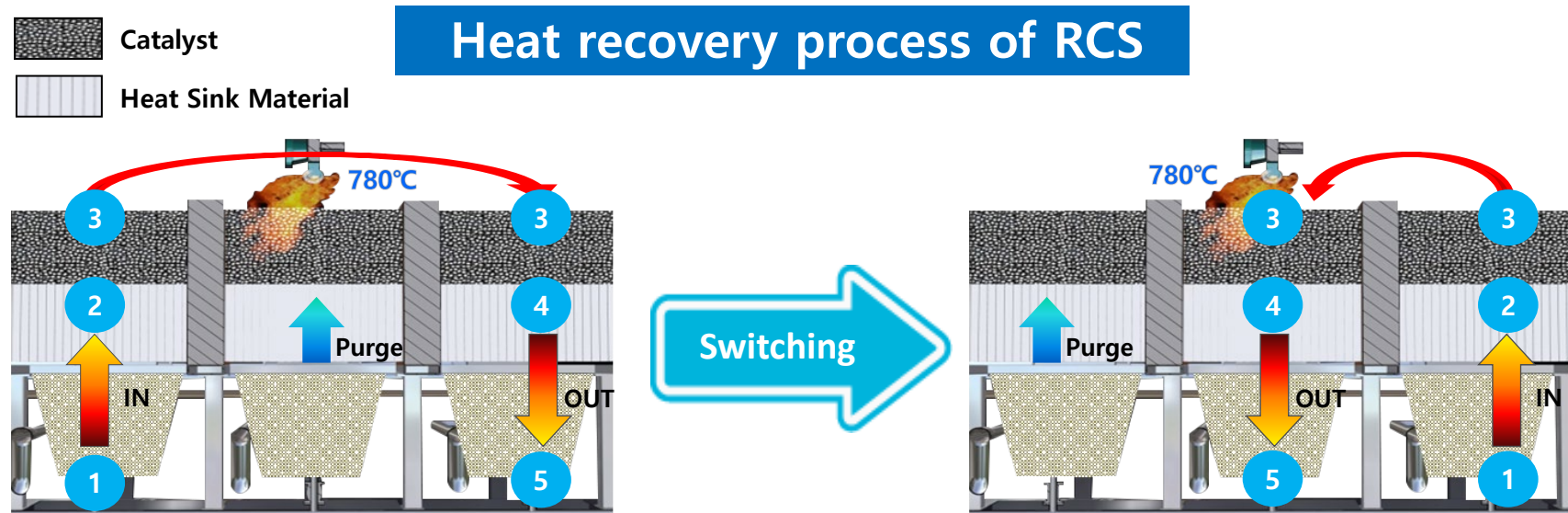
2. System Configuration

Consist of RCS and Function

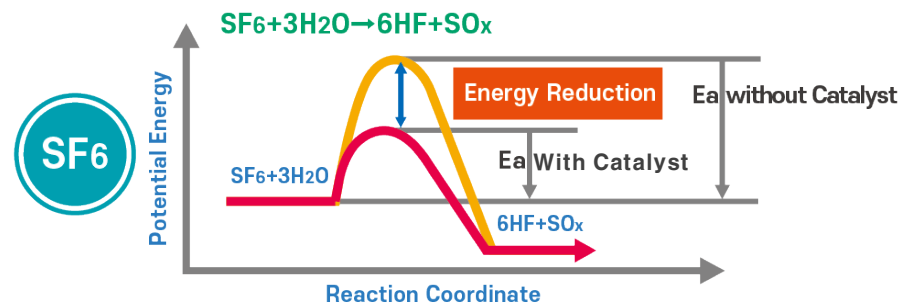
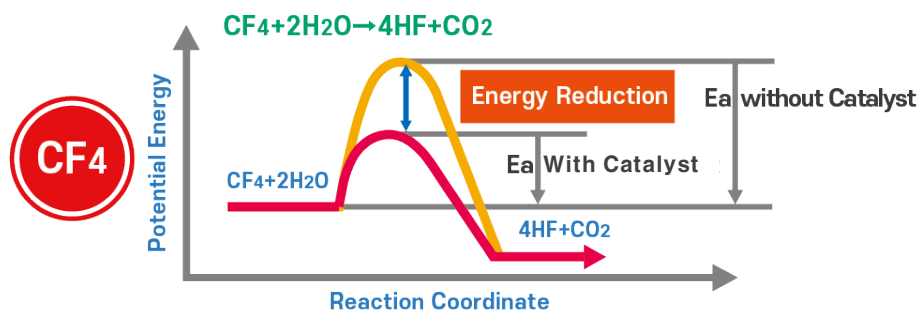
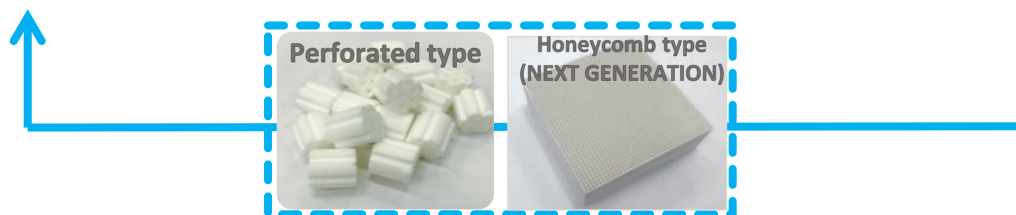
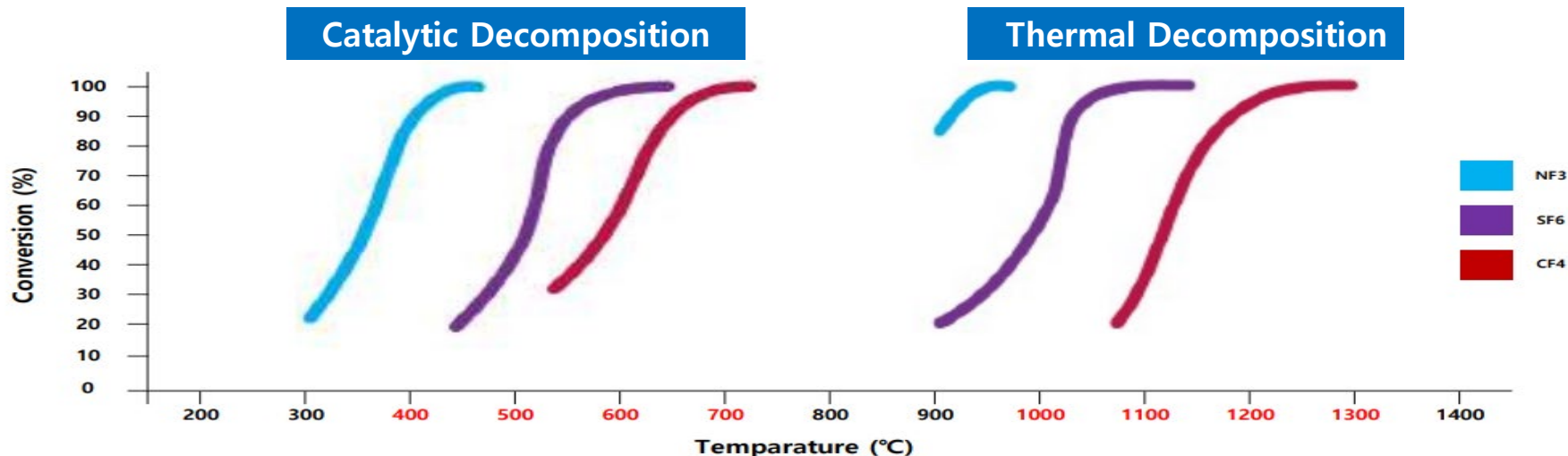


Name	Description
① Catalyst	Catalytic reaction degrades PFCs GAS decomposition temperature Over 1300°C ► Over 700°C (Energy Saving)✓
② Heat Sink Material	PFCs gas recovers high-temperature heat after passing through catalyst ,so that saving operating costs even at high temperatures Heat recovery efficiency 95% ↑ (Energy conservation)✓
③ Refractory Material	Uses special refractory materials with high corrosion resistance against PFC and HF
④ Casing	Application of strong corrosion resistant material Casing to HF
⑤ In/Out Damper	Poppet type damper with the best durability applied for periodic switching operation

3. Heat Recovery Technology



4. Performance (Lab. Data)

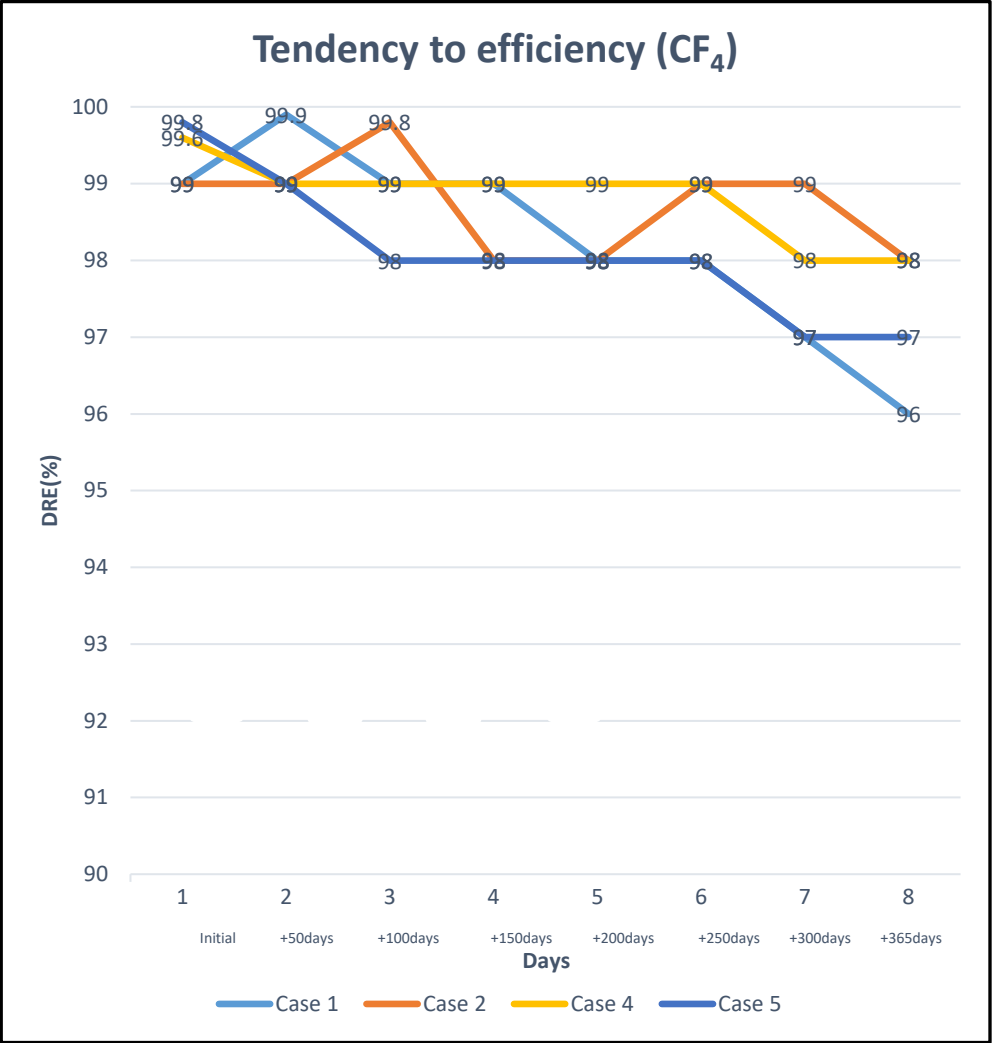


5. Field Data for PFCs Gas Removal Efficiency

1. Possibility and Effectives on RCS treatment


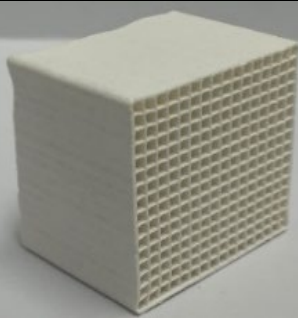
2. Field Data for 1 year

Design Parameter		Possibility of RCS Treatment	Effectives on RCS
HF, BCl ₃ , Cl ₂ , HBr		X	Catalyst performance degradation
CF ₄		O	
C-F compound	C ₄ F ₆	O Proposing to ≥95%	
	C ₄ F ₈		
	CH ₂ F ₂		
	CH ₃ F		
	CHF ₃		
SF ₆		O Proposing to ≥95%	
NF ₃		O Proposing to ≥95%	Occur NOx
CO		O	
Sulfur compounds (COS, SO ₂)		X	No problem RCS itself (Cause catalyst performance decrease)
Silica compounds (SiH ₄ , Si ₂ H ₆ , SiF ₄ , (SiH ₃) ₃ N)		X	Masking, (Cause catalyst performance decrease)
O2		X	X
Inert Gas (N ₂ , He, Ar, etc)		X	X

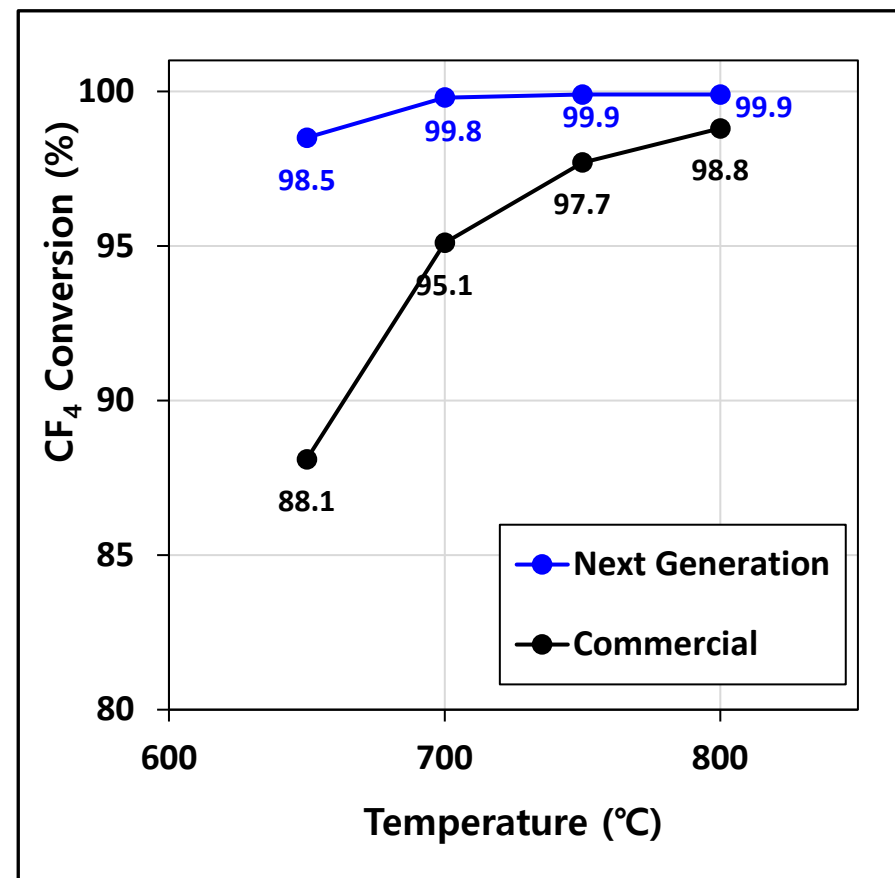


6. PFC Catalyst (Next Generation)

1. Physical Properties

Categories	Unit	ECOPRO HN	
		Commercial	Next Generation*
Type of catalyst	-		
Standard Size	mm	Φ16 x 18.8(H)	150 x 150 x 100
Surface Area	m ² /m ³	400	1,200
Pressure Drop		Normal	Low
DRE (CF ₄) (at 750°C)	%	95	98 expected

2. Efficiency %



Test condition : CF₄ 300ppm / Temp. 650~800°C

*** Field Test planned at Customer site in 2nd half 2024

7. WASTE <Catalyst / Heat Sink Material> RE-USE TECHNOLOGY

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Major Application ECOPROHN is working on



Customer



Additive



Al₂O₃ Cement



REFRACTORINESS / HIGH EARLY STRENGTH

Excellent heat resistance and high early strength

Calcium aluminate cement is inorganic binder that is resistant around 1400 ~ 1800°C for refining, smelting as well as fabricating and casting.
And after construction, it hardens fast and makes available to demold in a day.
Therefore, it is applied to facilities of not only heavy & chemical industry, but also boiler, incinerator etc. that claim high temperature conditions.

Heavy Chemical Industry,
Incinerator Etc



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