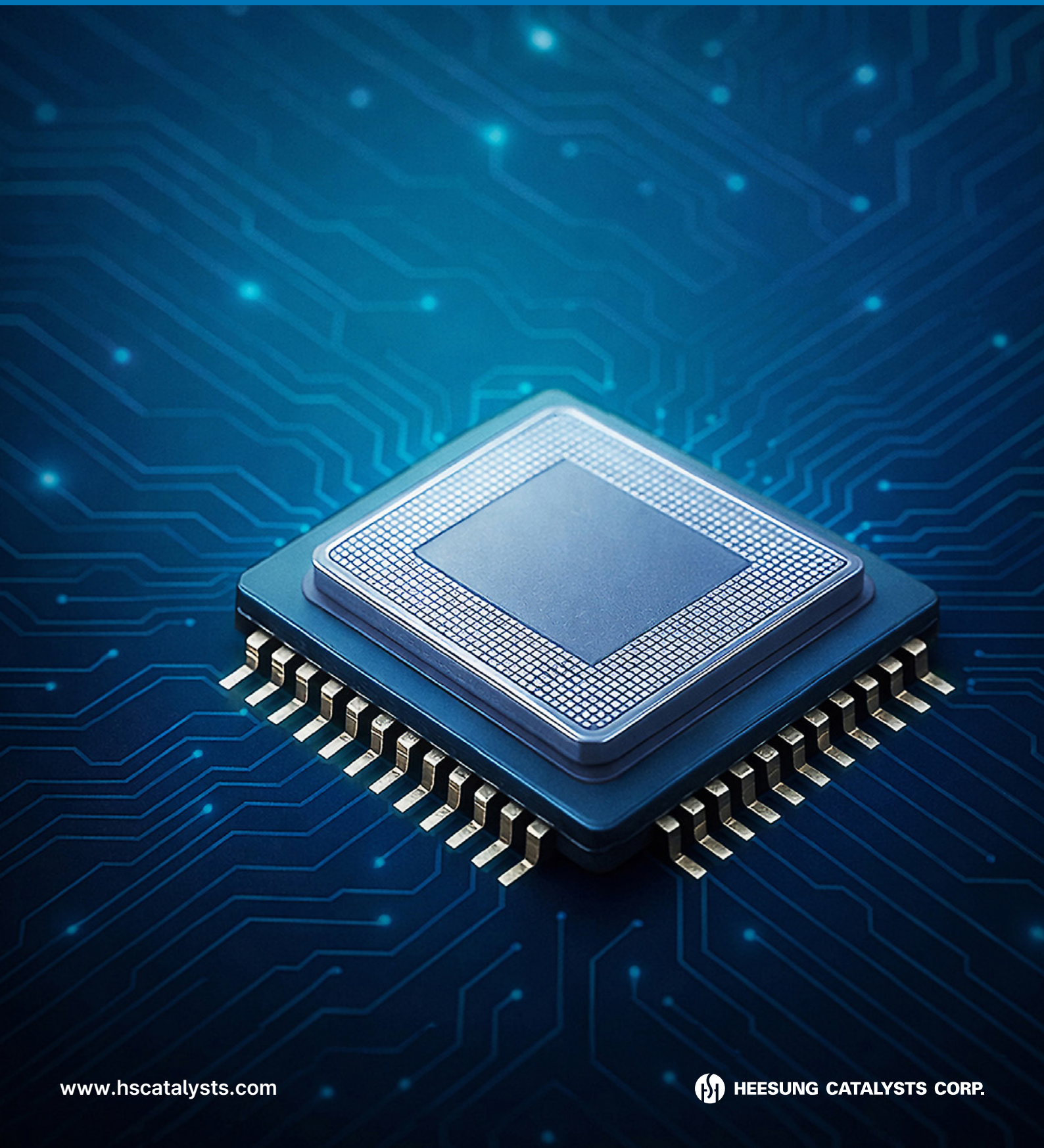
Environmental Catalysts

Semiconductor Catalysts

Advanced Catalysts for Semiconductor Green Process



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HEESUNG CATALYSTS CORP.

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PFC Abatement Catalyst

Product Overview

Product Name	PFC (Perfluorinated Compound) Abatement Catalyst
Application	Catalytic decomposition of PFCs—high GWP gases generated in semiconductor manufacturing
Key Reactions	≥ 650°C
Operating Temp.	CF_4, C_2F_6, SF_6, CHF_3, and other PFCs

Product Specifications

Item	Tablet Type	Honeycomb Type
Dimensions	15.2×15.2×10mm	150×150×150mm
Bulk Density	0.66kg/L	1.00kg/L
Destruction Efficiency (DRE)	≥ 95%	≥ 95%
Pressure Drop (ΔP)	100% (baseline)	83% (-17%)
Product Code	HE-1540	HE-1530

Key Features

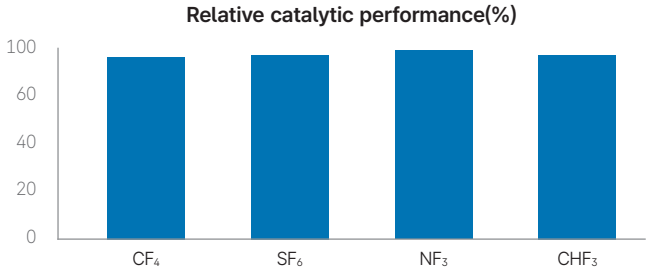
Advanced Catalyst Design
Optimized composition of precious and base metals for process-specific gas treatment (CVD/Etching)

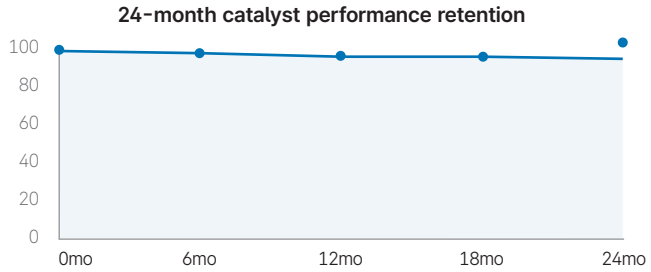
Superior Durability
Excellent resistance to fluorine and acid with stable performance
Over 1 year operational lifetime

High Abatement Performance
Achieves over 95% DRE
Efficient decomposition of various PFC gases

Customized Solutions
Applicable to semiconductor and LCD manufacturing processes
Compatible with POU and scrubber

Performance Data





Applications

Semiconductor Manufacturing
PFC abatement in CVD and etching processes

Display Manufacturing
PFC abatement for display fabrication processes

POU & Centralized Scrubber
Applicable to both POU equipment and centralized scrubber systems

Supporting Greenhouse Gas Reduction and ESG Goals through PFC Abatement

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POU N_2O Decomposition Catalyst

Product Overview

Product Name	POU (Point-of-Use) N_2O Decomposition Catalyst
Application	Catalytic decomposition of nitrous oxide (N_2O), a greenhouse gas generated in semiconductor CVD and etching processes, into environmentally benign gases
Reaction	$N_2O \rightarrow N_2 + ½O_2$
Operating Temperature	≥ 550°C
Destruction Efficiency	≥ 95%

Product Specifications

N_2O Decomposition Catalyst	
Type / Size (mm)	Honeycomb / 150 × 150 × H (50–150)
Bulk Density	1.00 kg/L
Operating Temp.	550°C (Typical range: 550–650°C)
Durability	≥ 6 months (depending on process conditions)

Key Features

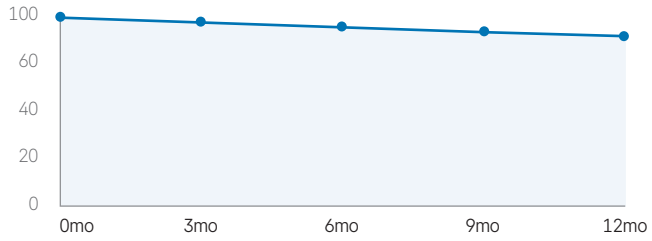
Cost-Effective Operation
Up to 40% reduction in operating costs compared to plasma systems

Excellent Durability
Stable long-term performance
Reduced maintenance cost

High N_2O Decomp. Efficiency
Over 95% abatement efficiency
Meeting greenhouse gas regulationsto plasma systems

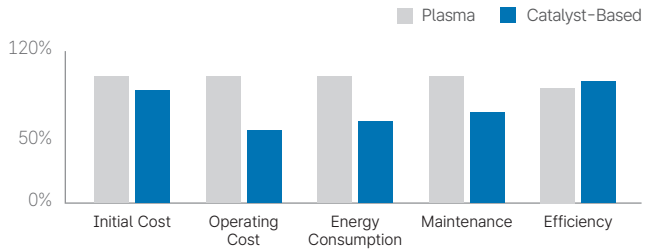
Low Pressure Drop
Honeycomb structure minimizes pressure loss

Performance Data



≥95% DRE within the design temperature window (≥550°C)

Plasma vs. Catalyst Comparison



Up to 40% lower operating cost compared to plasma systems

Applications

Semiconductor Memory Fabs
≥95% N_2O abatement

Display Manufacturing
LCD production processes

POU & Centralized Scrubber
Integrated POU modules

Contributing to Greenhouse Gas Reduction and ESG Goals

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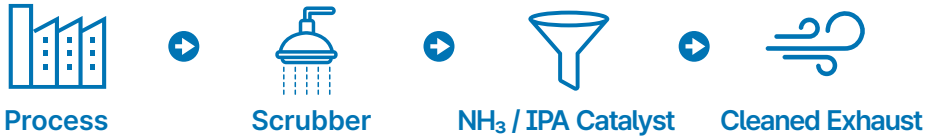
NH_3 & IPA Oxidation Catalyst

Product Overview

Product Name	NH_3 Oxidation (AOC) & IPA Oxidation Catalyst
Application	Removal of residual NH_3 (ammonia) and IPA (isopropyl alcohol) remaining after wet scrubber treatment in semiconductor processes
Operating Temperature	200–450°C
Conversion Efficiency	NH_3 ≥ 95%, IPA ≥ 90%
Technology	Precious metal-based active phase, optimized for secondary abatement systems



Product Specifications

Specifications	
Substrate	Cordierite honeycomb (100–300 CPSI), metallic substrate optional
CPSI Options	100 CPSI (60×60 cells), 200 CPSI (79×79 cells), 300 CPSI (100×100 cells)
Standard Dimensions	150 × 150 × T (50–100) mm
Operating Conditions	GHSV: 10,000–50,000 hr^{-1}, moisture tolerance: 5–20% H_2O

Key Features

Selective NH_3 Oxidation
High N_2 selectivity with minimized by-product formation
≥95% NH_3 conversion efficiency
Optimized design to minimize secondary pollutants

High IPA Oxidation Efficiency
≥90% IPA removal efficiency, Simultaneous treatment of VOCs

Low-Temp. Activity & Moisture Resistance
Stable operation at relatively low temperatures (200–450°C)
Maintains performance under humid conditions (5–20% H_2O)

Easy Process Integration
Seamless integration with scrubbers and CTO systems

Applications

Semiconductor Process Exhaust
NH_3 / IPA abatement from various fab processes

Scrubber-Integrated Systems
Minimized downstream emissions after scrubber

Etch / Wet Process Lines
Treatment of exhaust gases from etching and wet processes

CTO Systems
Catalytic thermal oxidation systems for exhaust gas treatment

Enabling Clean Manufacturing and ESG through Semiconductor Exhaust Abatement

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Company Overview

Global warming is driven by various greenhouse gases and remains a critical global challenge.
Global Warming Potential (GWP) is measured relative to CO_2 (baseline = 1), with PFCs up to 7,000 and N_2O at approximately 310.
In semiconductor and display manufacturing, emissions such as PFCs and N_2O require effective abatement.
Heesung Catalysts contributes to greenhouse gas reduction through advanced catalyst technologies.

Core Capabilities

PFC / N_2O Abatement Performance ≥95%
Guaranteed DRE ≥95%

ISO 9001 / ISO 14001
International quality certification

Enhanced Poisoning Resistance
Extended catalyst lifetime and stable operation

Energy-Efficient Design
Reduced power consumption and lower operating costs

Resource Circularity Services

Fresh Catalyst → Spent Catalyst → Precious Metal Recovery → Regenerated Catalyst

Customer Services

01 **End-of-Life Catalyst Replacement**

02 **Customized Catalyst Design**

03 **POU & Large-Scale Stack Configurations**

04 **Catalyst Analysis & Evaluation**

05 **Process & Equipment Consulting**

06 **T/S & A/S**

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