

# Catalyst Foundry

Toll manufacturing | Catalyst Co-Development | Scale-Up



## Heesung Catalysts

Founded in 1983, Heesung Catalysts is a leading catalyst specialist delivering eco-friendly, catalyst-based solutions that help customers enhance productivity and competitiveness across multiple industries.

### Technology for a Sustainable Future

Our catalyst technologies reduce harmful emissions and greenhouse gases while improving energy efficiency in industrial processes. By optimizing catalysts for specific reaction conditions, we help customers meet environmental regulations, achieve ESG goals, and transition toward carbon neutrality.

### Integrated Solutions with Proven Expertise

We manage the full catalyst lifecycle—from development and mass production to application and performance analysis—using real industrial data. This enables continuous technology advancement and creates a virtuous cycle that drives next-generation products and process innovation.

### Trusted Partnership & Circular Value Creation

Through long-term collaborations with leading companies, we deliver customized design, joint development, and mass production capabilities. In addition, our precious metal recovery and recycling services further contribute to a circular economy.

## From Catalyst to Solution — partnering for sustainability and growth.

### Business Areas



#### Chemical Catalysts

Process & Chemical catalysts  
Carbon-neutral & clean energy catalysts



#### Environmental Catalysts

GHG reduction catalysts  
Industrial catalysts



#### Automotive Catalysts

Vehicle emission control catalysts



#### Electrode Catalysts

Fuel cells,  
Water electrolysis, MEA



#### Precious Metal Materials

Electroplating materials,  
Dental materials

### Vision & Core Values



#### VISION

Catalyst-based  
green technology leader  
enabling a carbon-free society



#### Core Values



Harmony



Collaboration



Challenge



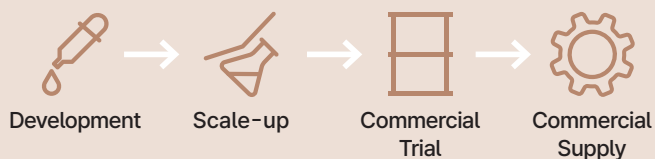
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## What is Catalyst Foundry?

Catalyst Foundry refers to a business that provides integrated services covering the entire lifecycle of catalyst development, from catalyst design to commercial production, within industries requiring catalysts

## Catalyst Commercialization Stages



From laboratory-scale catalyst development to commercial mass production, we provide all process of catalyst commercialization services



## Catalyst Foundry Service

Business model	Collaboration Overview	Work Scope	
		Customer	Heesung Catalyst
Joint New Development	Develop New Catalyst → Commercial Supply	Process Development / Catalyst Evaluation	Catalyst Development   Scale-Up   Commercial Production
Catalyst Improvement	Catalyst Improvement → Commercial Supply	Catalyst Evaluation	Catalyst Development   Scale-Up   Commercial Production
Scale-Up	Customer-Developed Catalyst Scale-Up → Commercial Supply	Catalyst Development	Scale-Up   Commercial Production
Toll Manufacturing	Toll Manufacturing of Customer-Developed Catalyst	Catalyst Development / Scale-Up	Commercial Production

## Advantages of Catalyst Foundry Collaboration

- Specialized Catalyst Technology & Know-how**  
 Accumulated expertise and synergistic capabilities in catalyst development, manufacturing, and quality control
- Economic Efficiency**  
 Utilization of development, analysis, evaluation services, provide reduction of catalyst investment costs
- Faster Commercialization**  
 Shortened development and commercialization timelines in rapidly changing market environments
- Enhanced Trust and Reliability**  
 Strict protection of customer confidentiality, business secrets, and intellectual property

## Core Technologies & Competencies

- Catalyst design / development
- Scale-up expertise
- Large-scale production facilities
- Quality management
- Analytical infrastructure
- Raw material sourcing
- Cost reduction in materials and processes

Core technologies & competitive strengths across all commercialization stages, from catalyst development to commercial supply

## Core Foundry Competitiveness of Heesung Catalysts Corp.

### Catalyst Technology



Over 40 years of know-how from catalyst development to commercialization



### Raw Material Sourcing



- Precious metals
- Carriers
- Additives
- Chemical materials



### Development & Quality Process



Operating global-standard development and quality management processes specialized in catalysts



### Analysis & Evaluation Technology



More than 200 kinds of catalyst evaluation and analysis facilities



### Catalyst Commercial Production Facilities



Extensive Portfolio of Commercial Catalyst Production Lines



### Material & Environmental Compliance



- Authorization for catalyst products and raw materials
- Material Safety Data Sheet (MSDS) management
- Environmental assessment



## Catalyst Foundry Partner for Growth and Innovation: Heesung Catalysts Corp.

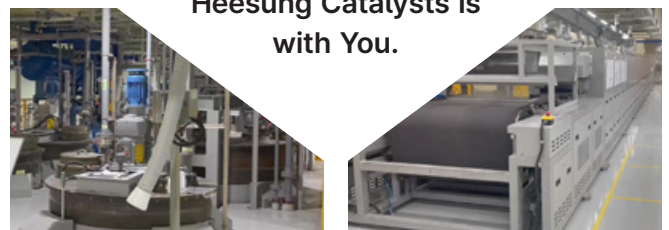


### Siwha Campus A World-Class Integrated Catalyst Technology Hub

- Korea's largest integrated catalyst technology campus with global-level competitiveness











Customer Success,  
Heesung Catalysts is  
with You.



## Go Together with Heesung Catalysts

Building a sustainable future together with Heesung Catalysts

<b>Quality Competitiveness</b>	 <b>Quality 5-Star</b> First in Korea to receive the Grand 5-Star Certification for Automotive Catalysts	 <b>Certifications</b> ISO, KOLAS, OSHA, GMP and other accredited certifications	 <b>Facilities</b> Global Top-Tier production and R&D facilities	 <b>Commercial Track Record</b> 40+ years of accumulated global business experience
	 <b>Customs / Tariff Advantage</b> Approx. 6.6% reduction in import duties	 <b>Manufacturing Efficiency</b> Optimized infrastructure and operational efficiency CAPEX and OPEX improvement	 <b>Delivery</b> Shortened lead time Improved supply stability	 <b>Recycling</b> Precious metal recovery through Heesung PMTech
	 <b>R&amp;D Center</b> World-class research centers	 <b>R&amp;D</b> Continuous technology development and improvement	 <b>Technical support</b> Global Technical support Monitoring of process performance trends	
	 <b>Minimal Impact from Global Geopolitical Risks</b>			

### Technical Service

Providing optimal solutions to customer needs



**Catalyst Design Proposal**  
Based on operating conditions



**Inspection Service**  
Loading / replacement / handling



**Catalyst Improvement & R&D**



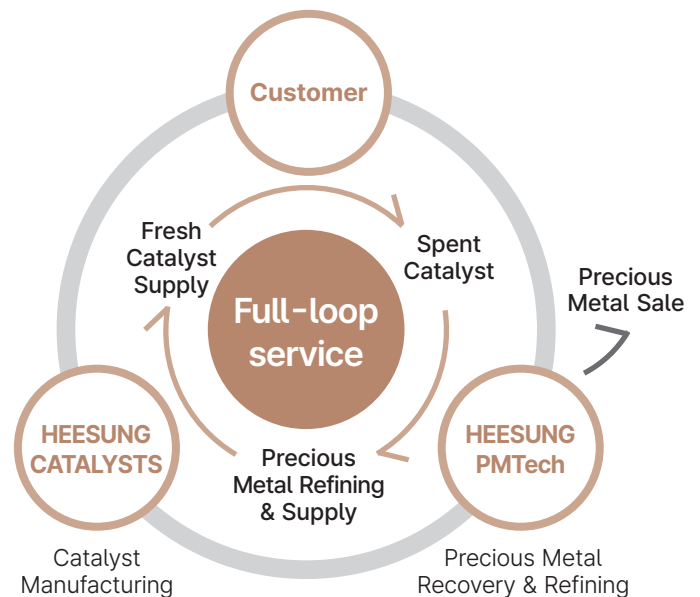
**Procedures & Guidelines**  
Loading, regeneration, handling



**Catalyst Analysis Service**  
Physical properties, precious metal & special property analysis, performance evaluation

### Resource Recycling

Full-Loop Precious Metal Recovery Service





# Catalyst Foundry

Toll manufacturing



Catalyst Co-Development / Scale-Up /  
Toll Manufacturing



**HEESUNG CATALYSTS CORP.**



[www.hscatalysts.com](http://www.hscatalysts.com)

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**Seoul Office** 18th Floor, Youngpoong Building,  
41 Cheonggyecheon-ro, Jongno-gu, Seoul

**Siheung Plant** 91 Somanggongwon-ro, Siheung-si,  
Gyeonggi-do, Korea