



C O R P O R A T E P R O F I L E

N.E. CHEMCAT CORPORATION

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Our catalysts are the result of such a vast collection of knowledge and are often described as a “composite art.” Our mission is to harness the full power of our many years of experience and expertise to innovate and develop solutions for issues facing society.

CORPORATE PHILOSOPHY

- We contribute to achieving a sustainable and quality global environment and affluent society through chemistry.
- We at all times strive to develop technologies and provide high-quality products to our customers, and bring about the creation of new value.
- We respect human rights and fulfill corporate social responsibilities, seek to co-exist with the environment and society around us, and aim to become a company that is trusted by stakeholders.
- We promote transparent and sound management, develop the potential of each employee, and foster a culture that maximizes the achievement of the entire company.

N.E. CHEMCAT
EXcite the Imagination

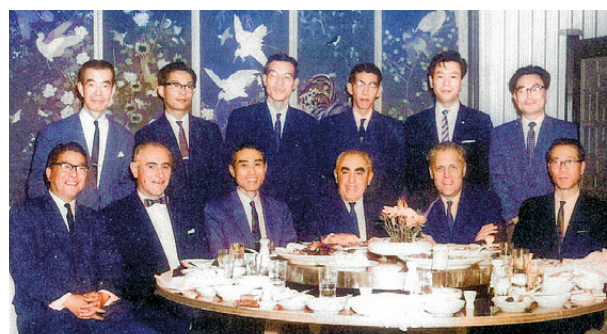
“Excite the Imagination” expresses the company’s aspiration to bring about new innovation by spurring the imagination. It conveys a passion for building an even better future by fostering excitement and motivation in all employees.

History of N.E. CHEMCAT

Over Half a Century Contributing to the Japanese Chemical Industry and Environmental Conservation

We have been providing a wide variety of support to society since our founding in 1964 by developing and manufacturing precious metal catalysts for use in environmental conservation, recycling, and other areas.

In recent years, we have stepped up new initiatives to develop catalysts for fuel cells and technologies aimed at attaining carbon neutrality.

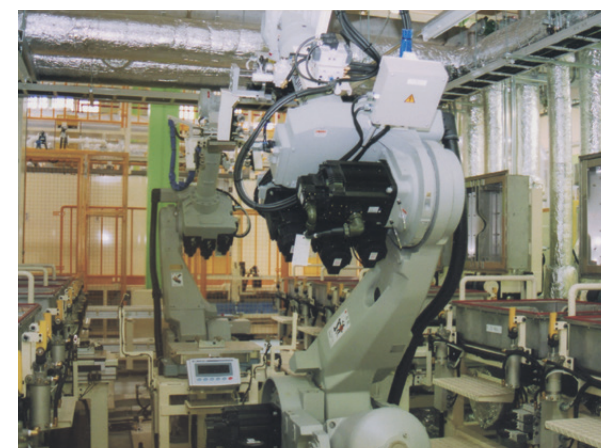


Developing Japan's Chemical Industry and Fueling Rapid Economic Growth

N.E. CHEMCAT CORPORATION was established as a fifty-fifty joint venture between Sumitomo Metal Mining Co., Ltd. of Japan and Engelhard Corporation of the United States, with 37 employees in 1964 during the height of Japan's period of rapid economic growth. That same year, we established Ichikawa Research Institute. Numazu Plant began operations in 1970 and remains a key manufacturing and R&D base. We have been providing catalysts and playing an active role in the development of the Japanese chemical industry for over half a century.

Expanding the Exhaust Catalyst Business with the Emerging Mobility Society

We began manufacturing catalysts for automobile exhaust systems in 1979 when automobile ownership spread and it became clear that harmful substances contained in exhaust gas, including carbon monoxide (CO), hydrocarbons (HC), and nitrogen oxides (NOx), were affecting human health. Our exhaust catalyst business expanded rapidly as emission regulation become increasingly strict.



Expanding Catalyst Applications to Meet emission regulations

In preparation for tighter regulations on diesel vehicle auto exhaust, we constructed Tsukuba Plant in 2002 to give us a mass production structure for diesel auto exhaust catalysts that reduce particulate matter (PM) emission volume. We have also initiated an R&D project of electrode catalysts for potential use in fuel cell vehicles (FCVs).

A New Corporate Philosophy and Vision for the Sustainability Era

We have adopted sustainability management practices to further enhance our ability to help address social issues. In 2021, we updated our Corporate Philosophy and adopted our Vision 2030 as guides for our business direction. In addition, we declared our commitment to applying our business activities to contribute to finding solutions for social issues.



1964-1979

1964

- Founding of Nippon Engelhard Ltd. (headquartered at Akasaka, Minato-ku, Tokyo / primary businesses: production and sale of process catalysts, precious metal coating chemicals, liquid gold etc., and recovery and refining of precious metal based on technologies introduced from Engelhard Corporation) as a joint venture between Sumitomo Metal Mining Co., Ltd. and Engelhard Corporation (currently BASF Corporation).

- Nippon Engelhard executed a technology cooperation agreement for process catalysts and other products with Engelhard Corporation.

- Construction of Ichikawa Laboratory completed.

1970

- Head Office relocated to the World Trade Center Building in Hamamatsu-cho, Minato-ku, Tokyo.

- Construction of Numazu Factory (currently Numazu Plant) completed, manufacturing of precious metal catalysts, and recovery and refinement of precious metals began.

1978

- Nippon Engelhard executed a non-exclusive license agreement for auto exhaust catalyst production technology in Japan with Engelhard Corporation.

1979

- Nippon Engelhard launched production of auto exhaust catalysts in Numazu Factory (currently Numazu Plant).

1980-2002

1989

- Corporate name changed to N.E. CHEMCAT CORPORATION.

- N.E. CHEMCAT shares registered on the over-the-counter market in Tokyo.

1991

- N.E. CHEMCAT executed an exclusive distribution agreement for base metal catalysts with Engelhard Corporation.

1996

- ISO 9002 certification registered for the manufacturing of Chemical Catalysts and Chemicals at Numazu Factory (currently Numazu Plant).

1997

- Development of electrode catalysts for fuel cell vehicles began.

2000

- N.E. CHEMCAT sold business rights pertaining to liquid gold for decoration (for ceramics, glass etc.).

2001

- ISO 14001 certification registered for Numazu Plant.

- ISO 9001 certification registered for Numazu Plant.

2002

- Construction of Tsukuba Plant completed.

2003-2011

2003

- Tsukuba Plant launched high-volume production of diesel auto exhaust catalysts.

2004

- QS-9000 certification registered for the Numazu Plant, Tsukuba Plant and Head Office for auto exhaust catalysts.

- ISO 14001 certification registered for Tsukuba Plant

2006

- JISHA OSHMS certification of the Numazu Plant.

- Shutdown of Ichikawa Laboratory (internal sections transferred to Numazu Plant and Tsukuba Plant).

- TS 16949:2002 certification registered for Numazu Plant, Tsukuba Plant and Head Office for auto exhaust catalysts.

2008

- JISHA OSHMS certification of Tsukuba Plant.

2010

- N.E. CHEMCAT delisted from JASDAQ and reverted to a 50-50 joint venture between BASF Group and Sumitomo Metal Mining Co., Ltd.

2011

- N.E. CHEMCAT sold its Coating Chemical Business.

- N.E. CHEMCAT acquired BASF Japan-Process Catalyst business.

2012-

2015

- N.E. CHEMCAT executed a corporate agreement on auto exhaust Catalyst Business of Four-Wheel Automobile with BASF.

2016

- All auto exhaust catalyst production facilities consolidated into a single facility at Tsukuba Plant.

2017

- Business corporate agreement with BASF expanded to include auto exhaust catalysts for motorcycles.

2018

- Diesel auto exhaust catalyst production capacity at Tsukuba Plant expanded.

- IATF 16949:2016 certification registered for Numazu Plant, Tsukuba Plant and Head Office for auto exhaust catalysts.

2019

- Corporate agreement with BASF was further expanded to include diesel auto exhaust catalysts.

2021

- N.E. CHEMCAT headquarters moved to the World Trade Center Building South Tower in Tokyo.

Creating New Value of Catalysts to achieve a Sustainable Earth and Society

Our objectives are to use the power of catalysts to address and resolve social issues and do our part to create a flourishing society and comfortable global environment and achieve sustainable growth as a company that society depends on.

Core Business and Strengths

We are one of Japan's leading manufacturers of precious metal catalysts and believe catalysts have the potential to solve a wide range of industrial and social issues. Our business is steadily expanding as we apply our catalyst technology to a growing range of applications. We have grown our business by constantly pursuing innovation and new applications for catalyst technologies.



Vision 2030

To provide new value in catalysts to society and thereby contribute greatly to the development of a sustainable society and protection of the global environment.

Finance

Strengthen our financial foundation focusing on ROIC

To build a lean internal process that helps to increase throughput, allocate assets needed for business operations in a planned manner on the basis of return on invested capital (ROIC), and thereby support the sustainable growth and development of our business and strengthen the financial foundation.

Business

Explore new business domains to contribute to resolving social issues

To develop new catalyst technologies and business domains that contribute to solving such social challenges as those addressed by the SDGs, on the basis of the catalyst technologies and customer relations we have built over the years, and thereby achieve sustainable growth.

Management Infrastructure

Promote ESG management

To practice sound business management, based on the principles of environment, social, and governance (ESG) management, build an environment and structure that allows employees to share the joy of working for N.E. CHEMCAT and constantly breed innovation in collaboration with stakeholders, and thereby increase our corporate value.

Long-Term Vision —Vision 2030—

The world is facing increasingly severe and critical environmental issues, including global warming, marine pollution, and deforestation. Social issues are also emerging, such as widening poverty and human rights issues. We formulated Vision 2030 to present a clear image of what we want to be as a company in the year 2030—a company that is sustainably growing its business by helping to solve environmental and social issues. We will fulfill our Vision 2030 through corporate transformation and by creating new value for society.

Supporting Industrial Development and Flourishing Lifestyles

We develop and produce process catalysts used in manufacturing processes of industrial products, including pharmaceutical, fertilizer, organic EL, and energy products.



Fine Chemical Catalysts

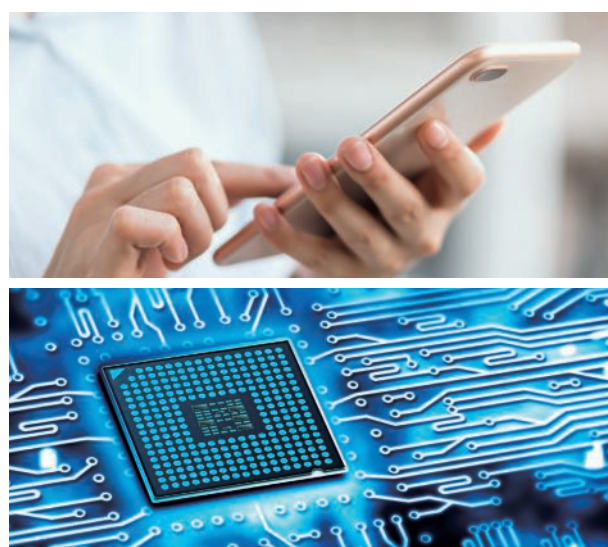
We produce fine chemical catalysts, which are essential to the production processes of pharmaceuticals, agrochemicals, and other high value-added chemical products.

- **Hydrogenation reaction catalyst (STAF-1M)**
STAF-1M is a platinum (Pt) carbon catalyst that selectively hydrogenates target functional groups while suppressing dehalogenation reactions.
- **New Ru Alumina Powder Catalyst (HYAc-5E S-Type)**
HYAc-5E S-Type is a ruthenium (Ru) alumina powder catalyst that efficiently hydrogenates aromatic rings under relatively mild conditions in the nuclear hydrogenation reaction process for forming saturated cyclic hydrocarbons.



Electronic Materials Solution

Cross-coupling reactions are one of the most commonly used reactions in organic synthesis when manufacturing pharmaceuticals, agrochemicals, organic electronic materials such as organic EL, and liquid crystal materials. We are supplying highly active palladium complexes for cross-coupling reactions such as NECO295 and NECO296. We also develop ammonia decomposition catalysts and other catalysts for processing hydrogen (H_2) and ammonia (NH_3) used in the semiconductor manufacturing process.



Gas Purification Catalysts

We have been producing and selling gas purification catalysts since our founding. In recent years, we have been developing catalysts for ultra-high purity gases, for which there is a growing need in the chemical, steel, and machinery industries. We are also focusing on developing carbon neutral fuel such as e-fuel and other synthetic fuels. In addition, we are developing a variety of carbon recycling technologies. For example, methane is a promising alternative to natural gases, and we are formulating methanation catalysts to produce synthetic methane from hydrogen and carbon dioxide derived from renewable energy.



Petrochemical Catalysts

We produce and sell catalysts needed to synthesize basic chemicals for the manufacture of petrochemical products, such as textiles and plastics. One of our products is a catalyst for vinyl acetate monomer (VAM), which has been attracting attention in recent years as a raw material for gas barrier films and are widely used as food packaging. We also offer a wide range of technologies for the petrochemical industry, including palladium catalysts used to make Nylon 6, a synthetic fiber for clothing and other products.



Eliminating Substances Harmful to People and Nature, and Enabling Hydrogen Energy to Protect our Environment

We develop and produce catalysts that render harmful substances from exhaust gas into safer by chemical reactions and catalysts that are essential to for fuel cells to function.

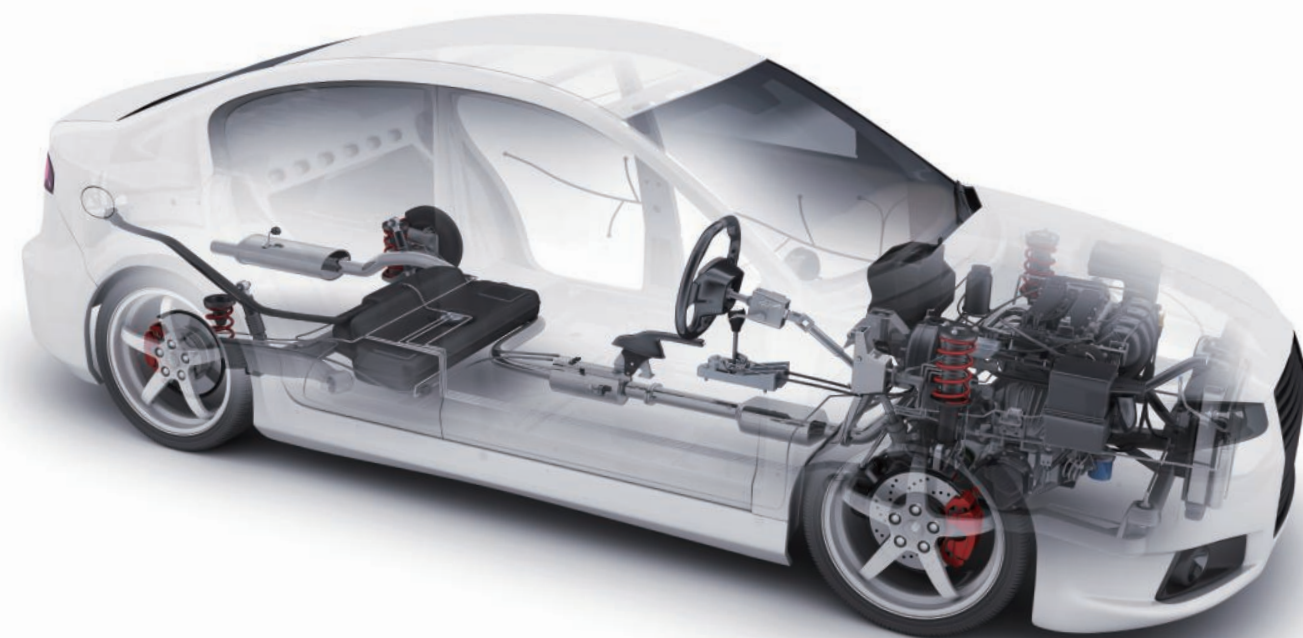
Stationary off-gas Treatment Catalysts

Manufacturing industries need highly energy efficient systems for removing air pollutants, particularly volatile organic compounds (VOCs). Our DASH catalysts remove pollutants such as VOCs and other contaminants in industrial exhaust gases while also capturing and effectively using thermal energy. We are also advancing solutions for attaining carbon neutrality, including methane decomposition catalysts that reduce greenhouse gas emissions and ammonia decomposition catalysts used in hydrogen generation.



Gasoline Auto Exhaust Catalysts

For gasoline automobiles, we provide three-way catalysts that detoxify harmful substances contained in exhaust gases, including carbon monoxide (CO), hydrocarbons (HC), and nitrogen oxides (NOx). We have also formulated a highly predictive reaction model to apply to the increasing variety of powertrain systems. Such as electric vehicles, which are rapidly evolving as emission regulations engines become stricter. We are working with automakers to develop and produce catalysts with superior durability, purification performance, low-temperature and high heat resistance performance.



Diesel Auto Exhaust Catalysts

Gasoline and diesel engine exhaust gas both contain carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxides (NOx). Diesel exhaust gas, however, also contains particulate matter (PM), such as sulfuric acid mist and soluble and insoluble organic compounds. Our catalysts for diesel-engine vehicles work together to eliminate or reduce the following harmful substances.

- DOC Reduce HC and CO, burn and remove PM
- CSF Collect PM, suppress CO emissions during PM combustion removal
- SCR Remove NOx using NH₃ generated from urea as a reductant
- AMOX Suppress NH₃ emissions to the atmosphere



Catalysts for FCVs

We develop and produce electrode catalysts that are the very core element in fuel cells used in electric vehicles. We have been particularly focused in recent years on developing next-generation electrode catalysts, specifically platinum alloy and core-shell catalysts.

•Electrode catalysts

Electrode catalysts play an essential role in accelerating the hydrogen reaction energy in fuel cells.

N.E. CHEMCAT Business Fields: Fuel Cell Catalysts

Facilitating the Adoption of Clean Energy and Promoting a Sustainable Society

We develop and produce catalysts used in the value chains of next-generation energies, such as hydrogen gas and ammonia.

Electrode Catalysts for Stationary Use

We develop and produce reforming catalysts and preferential oxidation (PROX) catalysts that are used in producing hydrogen gas.

•Reforming Catalysts

In hydrogen gas production processes, a reforming catalyst converts methane to hydrogen in both solid polymer electrolyte fuel cell (PEFC) and solid oxide fuel cell (SOFC) systems.

•PROX Catalysts

In hydrogen gas production processes, a PROX catalyst removes carbon monoxide in solid polymer electrolyte fuel cell (PEFC) systems.



Catalysts for Hydrogen Value Chain

We are developing catalysts for the hydrogen value chain involving production, storage, transportation and utilization.

•Production

Developing and producing reforming and PROX catalysts.

•Storage and Transport

We are developing catalyst technology for extracting hydrogen from large-volume hydrogen storage carriers that will become essential to an energy efficient society.

•Utilization

We are developing catalysts that will efficiently remove NOx and N₂O emissions and prevent ammonia leaks that occur when co-firing hydrogen or ammonia for power generation.

N.E. CHEMCAT Business Fields: Precious Metal Recycling

Promoting the Effective Use of Scarce Resources and Helping to Build a Recycling-oriented Society

We have developed our own processes to recover palladium, platinum, gold, and other precious metals from spent catalysts removing contained impurities and refining them to a high degree of purity.

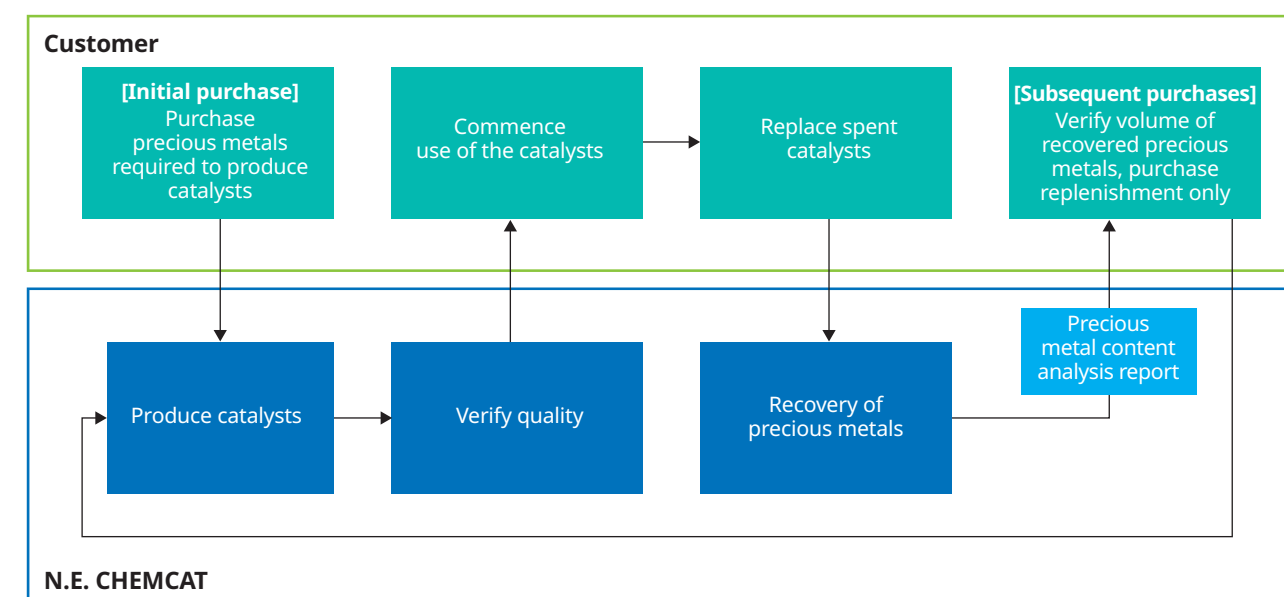
Precious Metal Recovery

Precious metals such as platinum (Pt), palladium (Pd), rhodium (Rh), ruthenium (Ru), and gold (Au) are limited resources. We have constructed our own process for separating and recovering precious metals from used catalysts, removing contained impurities, and purifying the metals to a high degree. We also have "precious metal reduction technology" to formulate catalysts that use fewer precious metals while offering performance that is equal to or better than conventional catalysts. We contribute to the preservation of scarce precious metal resources by offering comprehensive service through the complete process from developing and producing the catalysts to recovering and refining precious metals.



We provide content analysis reports when precious metals are recovered and refined.

- Analysis and management of the volume precious metal content and recovery percentage for each catalyst product (lot)
- Highly trustworthy and transparent service with detailed reports of precious metal analysis results to customers



Recoverable Metals

Each precious metal is recovered with minimum 99.9% purity.

Pt Platinum	Pd Palladium	Rh Rhodium	Ru Ruthenium*	Au Gold
Minimum 99.95%	Minimum 99.95%	Minimum 99.9%	*Recovered as ruthenium chloride	Minimum 99.95%

Focusing our Business Activities On solving Social Issues

We are constantly developing new technologies to protect the Earth and realize a better and flourishing society. We will continue using our chemical technologies and catalyst business to do our part to resolve social issues such as global warming and food shortages.

1

Sustainable food supply

2

ZERO HUNGER

We are using the power of chemistry to help solve food shortages, which are becoming more serious due to global climate change and population growth. In order to enhance the diets of people worldwide, we support the production of agricultural chemicals and fertilizers with catalyst technology, while also promoting the development of high-performance catalysts that enable long-term food storage and reduce food loss.

2

Supporting healthcare

3

GOOD HEALTH AND WELL-BEING

Our catalysts are also used in the production of pharmaceuticals and fine chemicals. The development of high-performance catalysts enables chemical synthesis with less impact on the environment. By promoting the development of sterilization and antibacterial applications, we are helping people to lead healthier lives worldwide.

3

Cleaner air and water

6

CLEAN WATER AND SANITATION

15

LIFE ON LAND

Catalysts are indispensable for decomposing and detoxifying harmful substances found in automobile and factory emissions and in industrial wastewater. In order to contribute to a more livable planet, we are advancing our purification technology to ensure cleaner air and water.

4

Utilization of captured CO₂

7

AFFORDABLE AND CLEAN ENERGY

13

CLIMATE ACTION

Technology for capturing and recycling CO₂ is attracting attention as a contribution to the fight against climate change. We are improving the performance of catalysts used in the production of green fuels synthesized from CO₂ and hydrogen, which will further improve the efficiency of each process stage, from CO₂ capture to the green fuel production.

5

Next generation mobility

7

AFFORDABLE AND CLEAN ENERGY

13

CLIMATE ACTION

A major transformation is underway in the mobility sector as part of the effort to achieve carbon neutrality by 2050. N.E. CHEMCAT is working to develop advanced technologies to meet society's changing mobility needs, including vehicle electrification and the use of green fuels.

6

Building a hydrogen-society

7

AFFORDABLE AND CLEAN ENERGY

13

CLIMATE ACTION

Recently hydrogen has seen resurging interest as a next-generation energy source that does not emit CO₂. In order to promote a carbon-free hydrogen society, our company is working to develop the catalysts necessary for more efficient hydrogen production, storage, transport and utilization.

7

Technological innovation

9

INDUSTRY, INNOVATION AND INFRASTRUCTURE

Semiconductors are essential for the advancement of the technologies being adopted for the digital transformation of society, including AI, IoT, and 5G. In order for nations to achieve carbon neutrality, energy-saving and other sectors need semiconductors with higher performance and efficiency. We will continue to contribute to these technological innovations with the power of chemistry.

8

Resource recycling

12

RESPONSIBLE CONSUMPTION AND PRODUCTION

Precious metals are scarce and important resources. This is why N.E. CHEMCAT is helping to recycle these minerals by utilizing advanced technologies to recover them from spent catalysts. We are also promoting more effective resource use and waste reduction by developing catalyst technology for the chemical recycling of plastics.

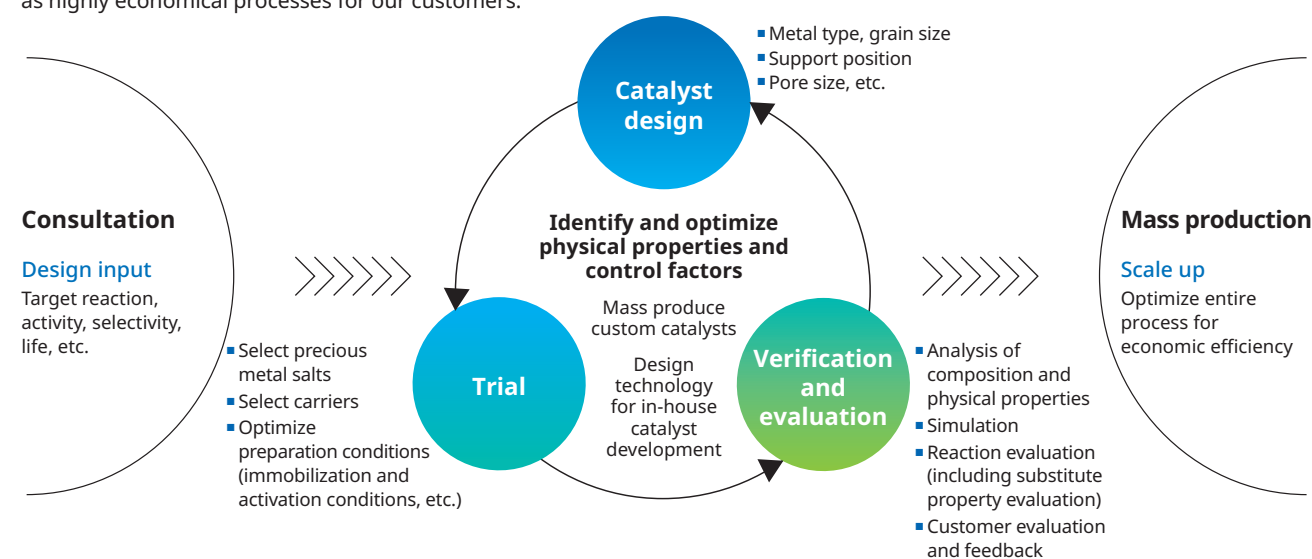
Four Strengths

Accelerating Development of Catalysts for Urgent Solutions

We have created a high-speed and high-level catalyst development structure using our fully integrated system, technical capabilities cultivated over many years, global technical cooperation, and human resources with diverse backgrounds.

Strength 1 In-house Integrated System from Catalyst Design, Mass Production, and Precious Metal Recovery

We have a structure for responding to every need at every development stage from catalyst design to trial, verification and evaluation, mass production, and precious metal recovery. Our fully integrated ecosystem accelerates all stages of the process from initial development to final delivery. In addition, our wealth of expertise enables us to propose the optimal catalysts as well as highly economical processes for our customers.



Strength 2 Advanced Catalyst Design and Analysis Technology

We have developed and honed our technical capabilities in precious metal chemistry, material science, and industrialization processes over many years. Backed by state-of-the-art analytical equipment, our technical capabilities encompass all aspects of catalyst media, including controlling the size of metal particles on the micro and nano scale, immobilizing particles in carriers, analyzing the composition and microstructure of chemical compounds, and analyzing the causal relationships of specific characteristics.

Research Facilities



STEM

- Observation and qualitative analysis of nano-size materials
- Stereoscopic viewing of the 3D structures of nano-size materials



XPS

- Identifies electronic states (chemical bonding and/or valence numbers) of an element in samples
- Capable of acquiring information of composition on the outermost surface (a few nanometers) of sample

Strength 3 Global Technical Cooperation System

Our technology transfer enables us to produce at our overseas production plants without impairing their performance of exhaust gas purification and other catalysts developed by us. We are also of constantly improving our technical capabilities by creating opportunities to bring in the latest technologies, such as via technical exchanges with the BASF Group.



Strength 4 Expert Personnel with Extensive Knowledge

Our R&D Center accounts for roughly 30% of our employees and boasts a staff with wide-ranging backgrounds in such areas as chemistry, biology, pharmacology, and agriculture. In this fertile environment and motivated by our core principle to "take on challenges," our researchers use their expansive knowledge in areas like material science and precious metal chemistry to constantly pursue R&D that is ahead of its time.



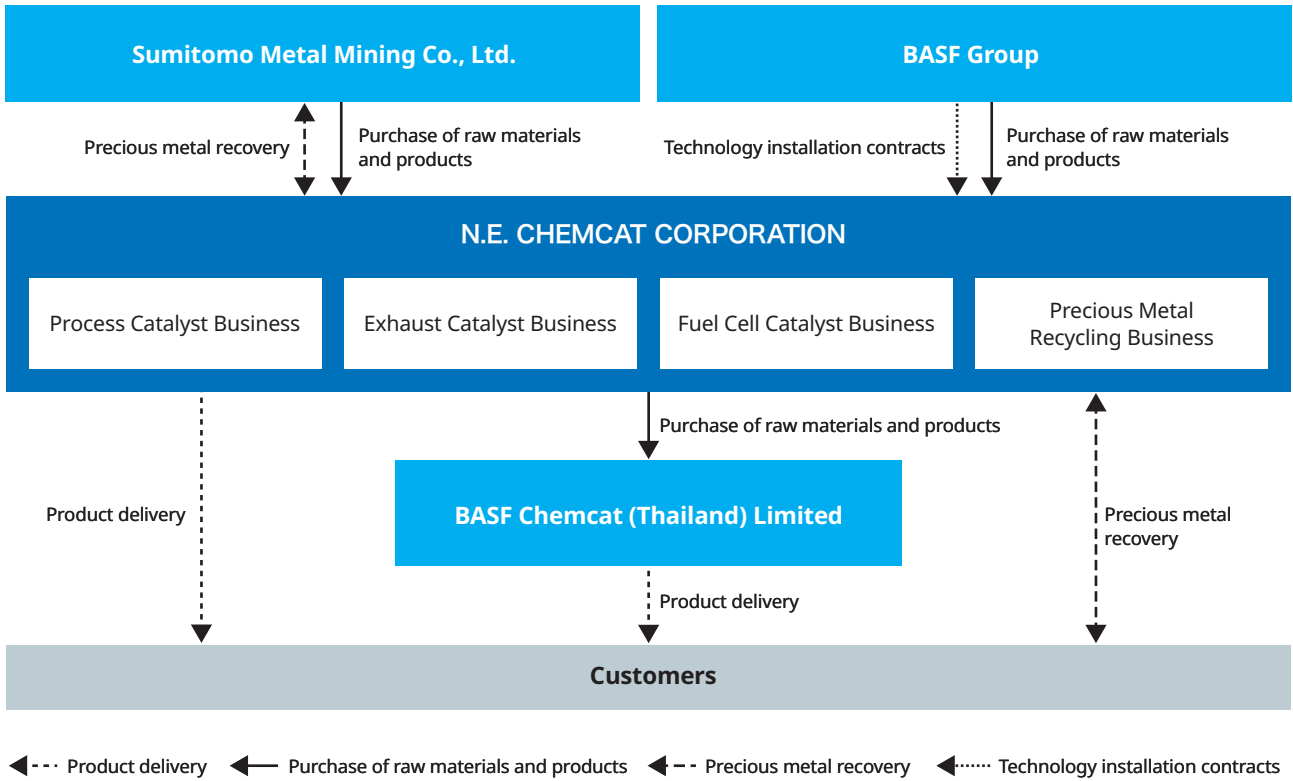
Company Data

Company Outline

Company name	N.E. CHEMCAT CORPORATION
Capital	3.4235 billion yen
Founding date	April 9, 1964
Representative	President: Susumu Endo
Website	https://www.ne-chemcat.co.jp/eg
Offices and factories	[Head Office] 27th floor, World Trade Center Building South Tower, 2-4-1 Hamamatsu-cho, Minato-ku, Tokyo 105-5127 [Numazu Plant] 678 Ipponmatsu, Numazu City, Shizuoka Prefecture 410-0314 [Tsukuba Plant] 25-3, Kohshindaira, Bando City, Ibaraki Prefecture 306-0608
Banks	Sumitomo Mitsui Banking Corporation, Sumitomo Mitsui Trust Bank, Mitsubishi UFJ Bank

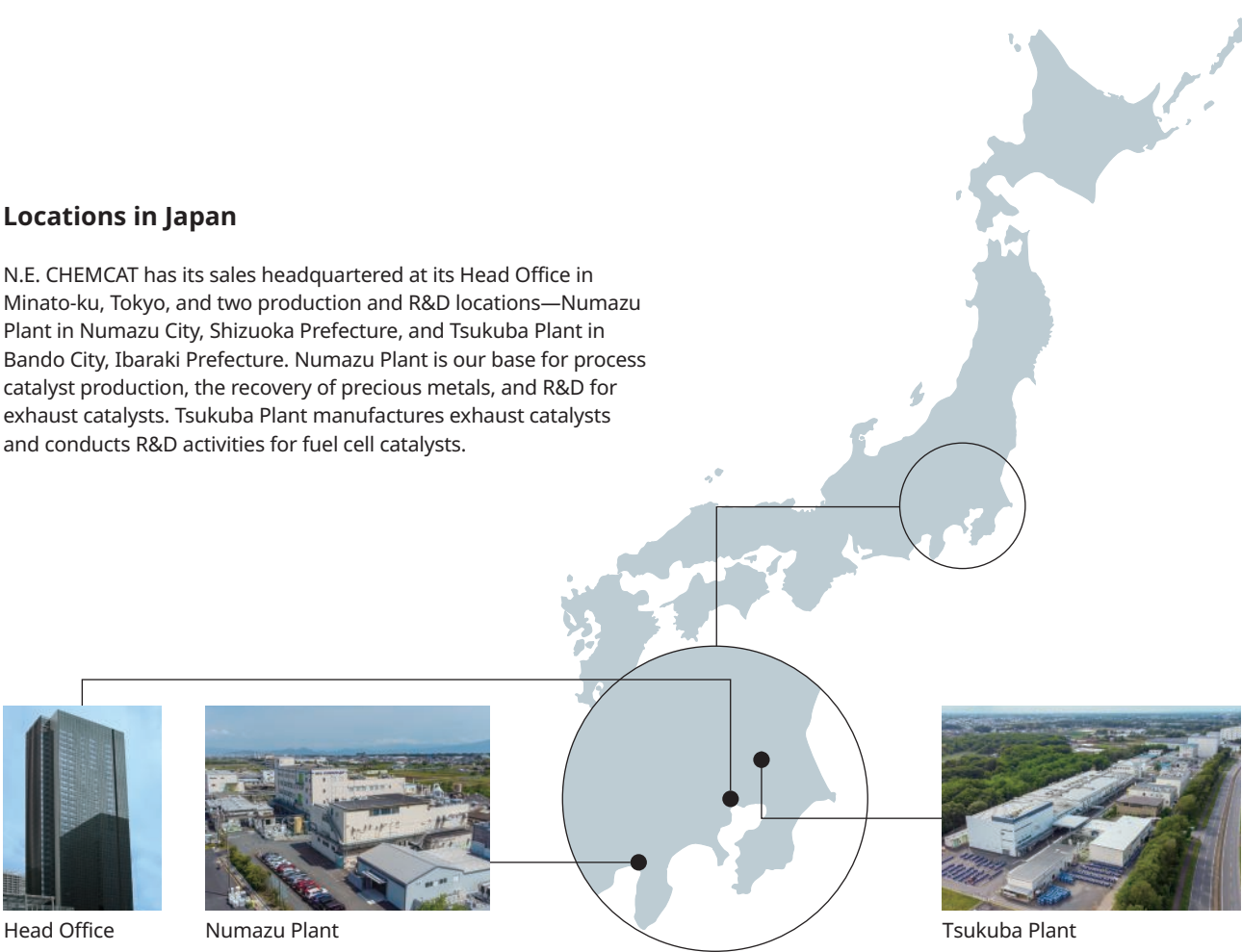
Related Companies

The N.E. CHEMCAT Group consists of our Company, one affiliated company, and two other companies. N.E. CHEMCAT is an affiliate company of Sumitomo Metal Mining Co., Ltd. and the BASF Group, each of which own fifty percent of the Company's issued shares.



Locations in Japan

N.E. CHEMCAT has its sales headquarter at its Head Office in Minato-ku, Tokyo, and two production and R&D locations—Numazu Plant in Numazu City, Shizuoka Prefecture, and Tsukuba Plant in Bando City, Ibaraki Prefecture. Numazu Plant is our base for process catalyst production, the recovery of precious metals, and R&D for exhaust catalysts. Tsukuba Plant manufactures exhaust catalysts and conducts R&D activities for fuel cell catalysts.



Overseas Sites

We operate jointly with the BASF Group in Asia and utilize the BASF Group's manufacturing bases in other areas.

