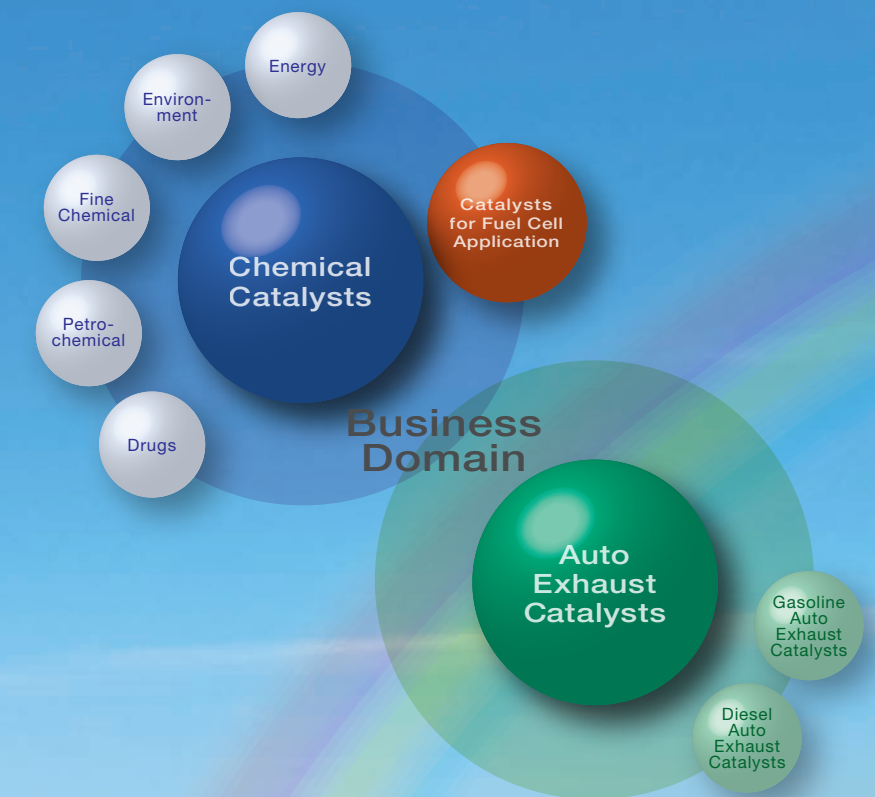


**N.E. CHEMCAT**  
CORPORATE PROFILE

We aim to make a difference...  
to the planet, to society,  
and to people's everyday lives

**We make people's lives better  
by pursuing the boundless potential of "Chemistry".**

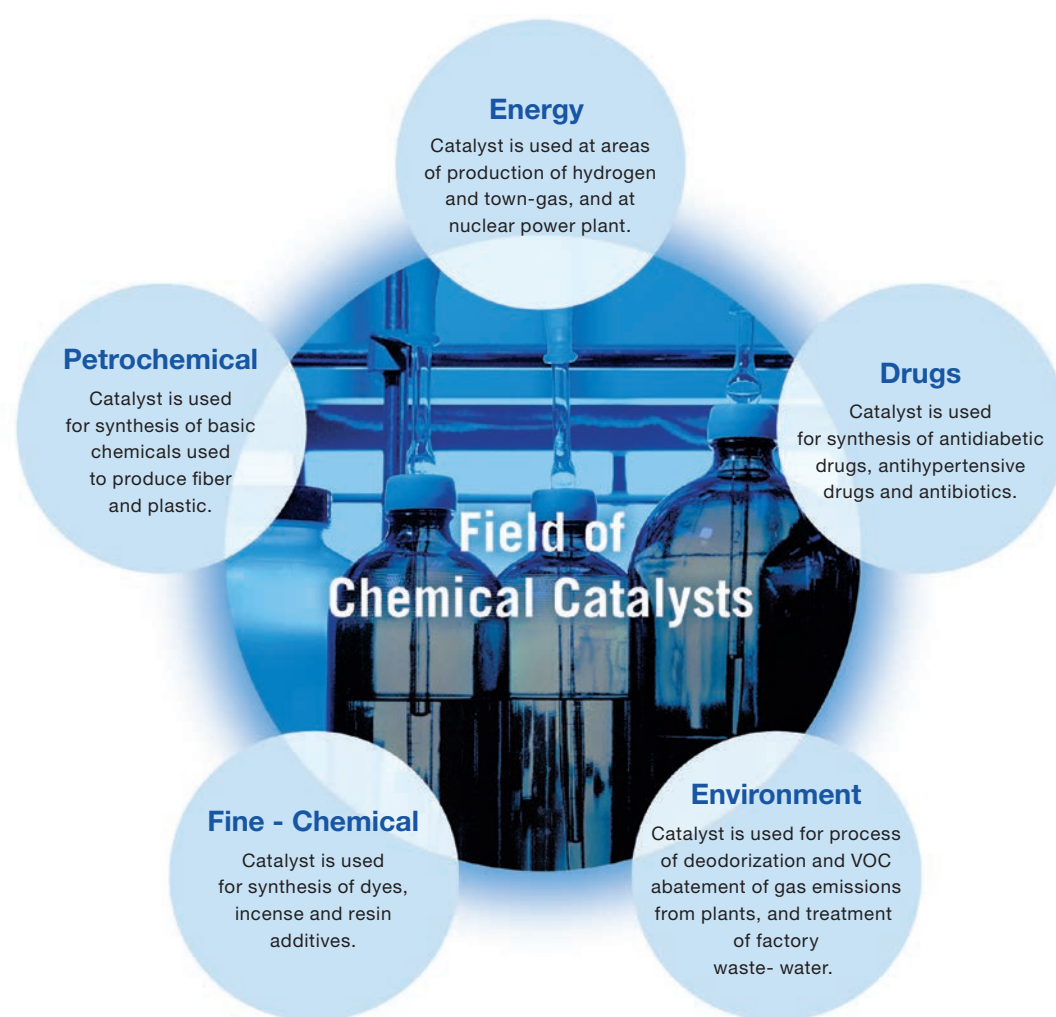
As a member of the BASF group, the world's leading chemical company, and also as Japan's leading precious metal chemical compound manufacturer, NECC develops and produces catalysts. These catalysts are used in fields such as energy, automotive, petrochemical, fine chemical, pharmaceutical, and environmental protection. Catalysts produce bright clothes from petroleum, make valuable energy more efficiently, and contribute to a cleaner environment. In the years to come, catalysts are sure to perform an even more essential role as initiators of chemical reactions that contribute to our society. NECC benefits society through "Chemistry".



# Chemical Catalysts

We supply catalysts that are essential to the production of various industrial goods such as chemical fibers, plastic bottles and medical products.

Catalysts now play an indispensable role in our lives, from petroleum processing, fine chemicals (such as petrochemicals, incense and food), nuclear, space industry and environmental conservation. We invest heavily in R+D for new catalysts and are committed to complete quality management.



## CATALYST

Following are our standard catalysts categorized by type and application. ※For chemical reactions, please refer our chemical catalysts production catalogues or our web- site.

### Catalyst Type

PRECIOUS METALS CATALYST	[ Heterogeneous catalyst ] Pd Catalysts / Pt Catalysts / Ru Catalysts / Rh Catalysts
	[ Homogeneous catalyst ] Pd Catalysts / Pt Catalysts / Ru Catalysts / Rh Catalysts / Ir Catalysts / Au Catalysts

### Application

PETROCHEMICAL	Hydrogenation / Dehydrogenation / Oxidation / Acetoxylation / Other Reactions
PETROLEUM PROCESSING	Hydrogenation
OTHER CHEMICAL FACTORIES	Pharmaceutical or Pesticid Intermediates/ Electrical Components/Silicon/Other Areas
CATALYSTS FOR CONSUMER APPLICATIONS	Batteries/Other Purposes
ENVIRONMENTAL CONSERVATION	Processing of Exhaust Gas
PRODUCTION AND REFINING OF GAS	Production of High Purity Gas

## PRECIOUS METAL RECOVERY

### Recoverable Metals

<b>Pt</b> Platinum	<b>Pd</b> Palladium	<b>Rh</b> Rhodium	<b>Ru</b> Ruthenium*	<b>Au</b> Gold
min. 99.95%	min. 99.95%	min. 99.9%	*Ruthenium is refined with a form of ruthenium trichloride	min. 99.95%

### Precious Metal Recovery

Precious metal is rare and expensive. Recently its industrial importance has been recognized and its recycling by recovery is indispensable. We develop and distribute precious metal catalysts and compounds, and also carry out precious metal recovery from spent catalysts. Spent catalysts containing precious metal are delivered from various industries.

- Petrochemical, petroleum refinery
- Pharmaceutical intermediates, incense, fine chemical
- Treatment of emission gas, deodorization equipment

### Handling of Recovered Previous Metals

#### Reprocess Realizing Cost-reduction

We keep recovered precious metal and reprocess those when necessary to

- precious metal catalysts
- precious metal compounds

We name such method as Pool Account. We will report each customer deposit amount of such precious metal.

#### Return and Purchase of Precious Metal

We can return recovered actual metal or purchase those at the market prices.

## JOINT RESEARCH & TOLL MANUFACTURING

For a chemical company, the choice of catalyst for its own processes needs extremely high-level technical know-how. We conclude a confidentiality agreement or joint development and research agreement with customers at first and then take steps meeting customers needs from joint research to sample preparation with established preparation method at catalyst factories, toll manufacturing of catalysts by customers' methods. We invite you to use our industrial catalyst production technologies. We also have long experience in production of industrial catalysts.

### Joint Research

**Confidentiality agreement or joint development and research agreement**

For a chemical company, a choice of catalyst for its own process is an extremely high-level technical decision. We will take all possible measures to maintain secrecy and carry out joint research with customers.

### Searching for Causes of Deactivation

Catalyst may become deactivated over time. Its solution is an important key to catalyst development. We analyze possible causes of deactivation and support customers to develop catalysts that are more effective and long lasting.

### Toll Manufacturing

We support development of customers' catalysts mass production systems. We produce catalysts meeting customers' needs by using our own production and analysis system.



# Auto Exhaust Catalysts

We offer catalysts that are essential to reduction of harmful substances contained in auto exhaust gas.

The rapid growth of motorization, and in particular private automobile ownership in emerging economies such as China, has brought with it an urgent need to control exhaust emissions. Governments around the world are recognizing the environmental harm caused by untreated automobile exhaust and are imposing increasingly strict regulations and controls. N.E. CHEMCAT is one of the world's leading producers of auto exhaust catalysts that act to neutralize harmful exhaust emissions. N.E. CHEMCAT works closely with the world's leading automakers and supplies them with products of superior durability, conversion, light off performance.

**Gasoline Auto Exhaust Catalysts**  
Development and production of catalysts to reduce harmful substances emitted from gasoline engines.

**Auto Exhaust Catalysts**

**Diesel Auto Exhaust Catalysts**  
Development and production of catalysts derived from gasoline engine catalyst technologies.

## HOW AUTOMOBILE EXHAUSTS ARE PURIFIED

Automotive exhaust emissions contain components that are harmful to human health. N.E. CHEMCAT develops and produces auto exhaust catalysts reducing harmful substances contained in exhaust emission gas.

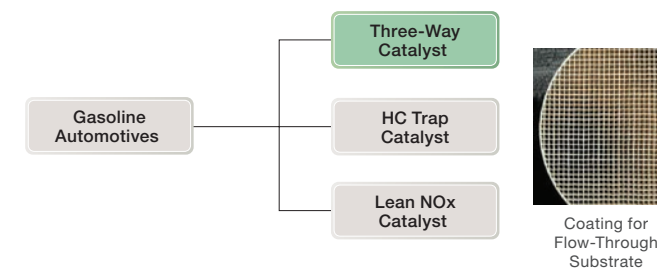
### Main Components of Automotive Exhaust Emission

<p><b>CO</b> Carbon Monoxide</p> <p>Carbon monoxide is generated from <b>incomplete combustion</b> and binds with blood hemoglobin to <b>interfere with the delivery of oxygen</b> through the circulation system.</p>	<p><b>HC</b> Hydrocarbons</p> <p>Hydrocarbons is generated from <b>incomplete combustion</b>. It associated with <b>liver damage</b>, and is toxic as well as carcinogenic.</p>	<p><b>NOx(NO/NO<sub>2</sub>)</b> Nitrogen Oxides</p> <p>NOx is generated as <b>thermal NOx</b> in burners. Its photochemical effects are high. It is associated with <b>smog and acid rain</b>.</p>	<p><b>SOF</b> (Soluble Organic Fraction)</p> <p><b>ISOF</b> (Insoluble Organic Fraction)</p> <p>SOF and ISOF are generated as the result of <b>incomplete combustion</b> of fuels and lubricant. Those are principle causes of <b>disturbance of pulmonary function</b>.</p>	<p><b>Sulfate</b></p> <p>Sulfate is produced from <b>oxidation</b> of sulfur in fuels.</p>
--	---	---	--	--

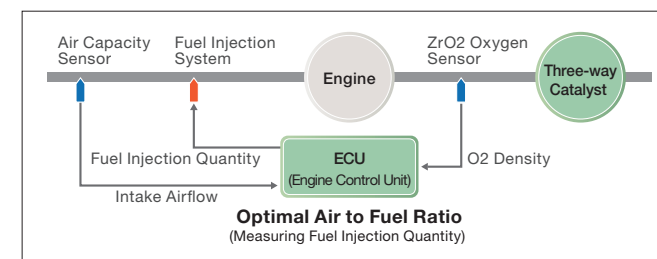
Diesel engines discharge PM (Particulate Matter) in addition to CO, HC and NOx. PM is composed of SOF, ISOF and Sulfate.

## GASOLINE AUTO EXHAUST CATALYSTS

N.E. CHEMCAT automotive catalysts which neutralize or reduce carbon monoxide, hydrocarbons and nitrogen oxides in automotive emissions. We work with the world's leading automakers to develop the world's most advanced catalytic converters and component materials.

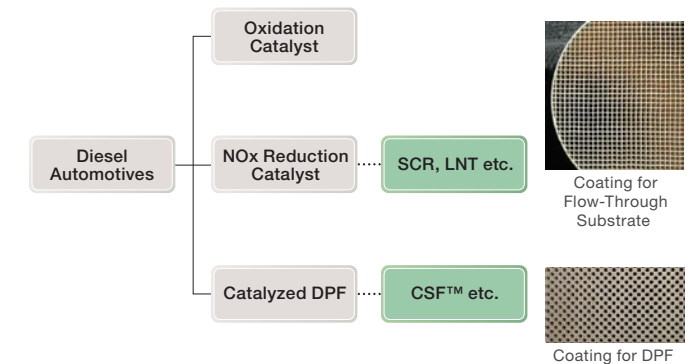


### BASIC THREE-WAY CATALYST SYSTEM



## DIESEL AUTO EXHAUST CATALYSTS

Diesel engine automotive emissions gases include diesel particulates that are harmful to the human body, including carbon-monoxide, Hydrocarbons, Nitrogen compounds and particulate matter. In order to address these harmful components, regulations governing diesel engine automotive emission gases have become stricter. To comply with such regulations, improvements in engine performance and emission purification will be necessary. N.E. CHEMCAT, building on our technologies and experience in gasoline auto exhaust catalysts, are developing and manufacturing catalysts meeting these demands.



# Branch

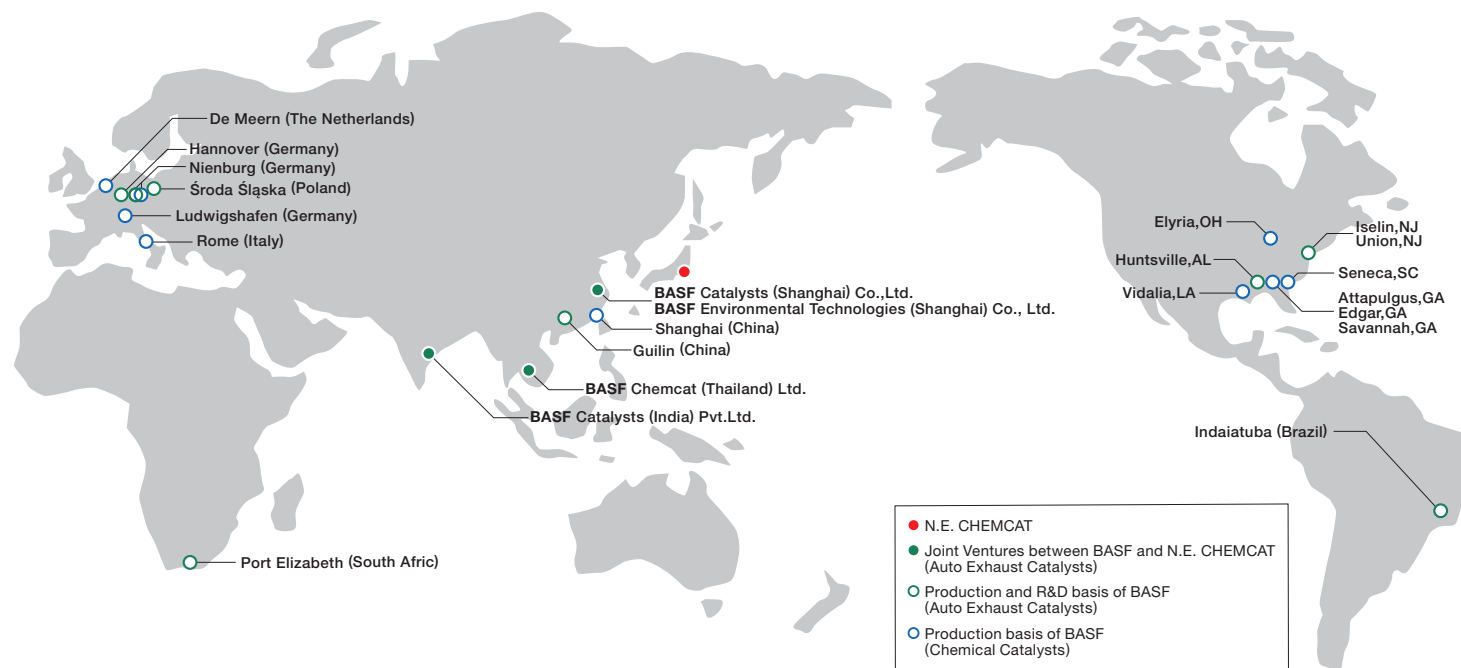
With our broad base in Asia, our product development and Production are going global.

N.E. Chemcat was founded as a joint Venture between Sumitomo Metal Mining Co.,Ltd and Engelhard Corporation(US), the world's largest general catalyst manufacturer(currently BASF Corporation). We were called Nippon engelhard Corporation Ltd. at the time the company was founded, which was changed to N.E. Chemcat Corporation in 1989. " N.E." of our current company reflects the initial letters of the original company name, while "Chemcat" combines "chemicals" and "catalysts" As an international company in a global environment, we develop and produce high quality, ecologically friendly products reflecting multinational perspectives.

## OVERSEAS BASE

N. E. CHEMCAT provides automakers around the world with technologies it has developed, with technical support from BASF. In Japan, N. E. CHEMCAT is a direct supplier. In other Asian countries except South Korea, joint ventures between BASF and N. E. CHEMCAT, in areas other than Asia, production bases of BASF are responsible for supplying the technologies developed by N. E. CHEMCAT.

N. E. CHEMCAT continues to provide the world's top level technology through the technical cooperation with BASF, both aiming to improve their respective technologies. Moreover, we can address our customers' needs for chemical catalysts by taking advantage of our overseas production hubs.



## DOMESTIC BASE



### HEAD OFFICE Minato-ku, Tokyo

Our head office is located on the 27th floor of World Trade Center Building South Tower in Hamamatsu-cho, Minato-ku, Tokyo. The World Trade Center Building South Tower is conveniently located, with direct access to Hamamatsucho Station of JR Line and the Tokyo Monorail Line. It is also just a 5-minute walk from Daimon Station of Toei Asakusa Line and the Oedo Subway Line. Our head office contains our principal sales organization.



### NUMAZU PLANT Numazu- City, Shizuoka- Prefecture



Numazu Plant is located in Numazu- City, Shizuoka Prefecture which is richly endowed with nature, overlooking Mount Fuji north and Suruga Bay. Since its initiation of operations in 1970, Numazu Plant has been contributing to our business as a base of production and development of chemical catalysts and auto- exhaust catalysts.



### TSUKUBA PLANT Bando-City, Ibaraki- Prefecture



Tsukuba Plant, founded in 2002, is located in Bando-City, Ibaraki Prefecture. Bando- city is surrounded by verdant nature despite of its location within 50km from Tokyo Metropolis. Having cutting-edge production and analysis equipment for catalysts, it has contributed to the Company as the second production base together with Numazu Plant.



# Corporate Philosophy



Under ESG-oriented management policies, N.E. CHEMCAT strives for continuous growth and development together with our stakeholders.

Since its foundation in 1964, N.E. CHEMCAT has grown and developed, contributing to a wide variety of industries through catalyst businesses, including the development, production, distribution and recovery of precious and base metal (general-purpose metals) catalysts. Catalysts are vital for countless chemical reactions, supporting our daily lives through their use in many industrial production processes as well as the purification of exhaust gas to protect the global environment.

N.E. CHEMCAT is committed to continuously developing and providing high-performance and high-quality products based on our expertise in chemistry, and to contribute in achieving the Sustainable Development Goals adopted by the United Nations (SDGs).

In addition, N.E. CHEMCAT strives for continuous growth and development together with our stakeholders under our ESG (Environment, Society and Governance)-oriented management policies.

## Corporate Philosophy

- We contribute to achieve 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, and 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 potentials of each employee, and foster a culture that maximizes the achievement of the entire company.

