



Overview of Catalysts and Fine Chemicals Business

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Corporate profile

Corporate profile



Name JGC Catalysts and Chemicals Ltd.

Head office Kawasaki, Kanagawa Japan

Business Development, production, and sales of catalyst products used in petroleum refining, chemical, and environmental applications
Development, production, and sales of fine chemical products

Established 1958

Capital 1.8 billion yen (wholly owned subsidiary of JGC Holdings Corporation)

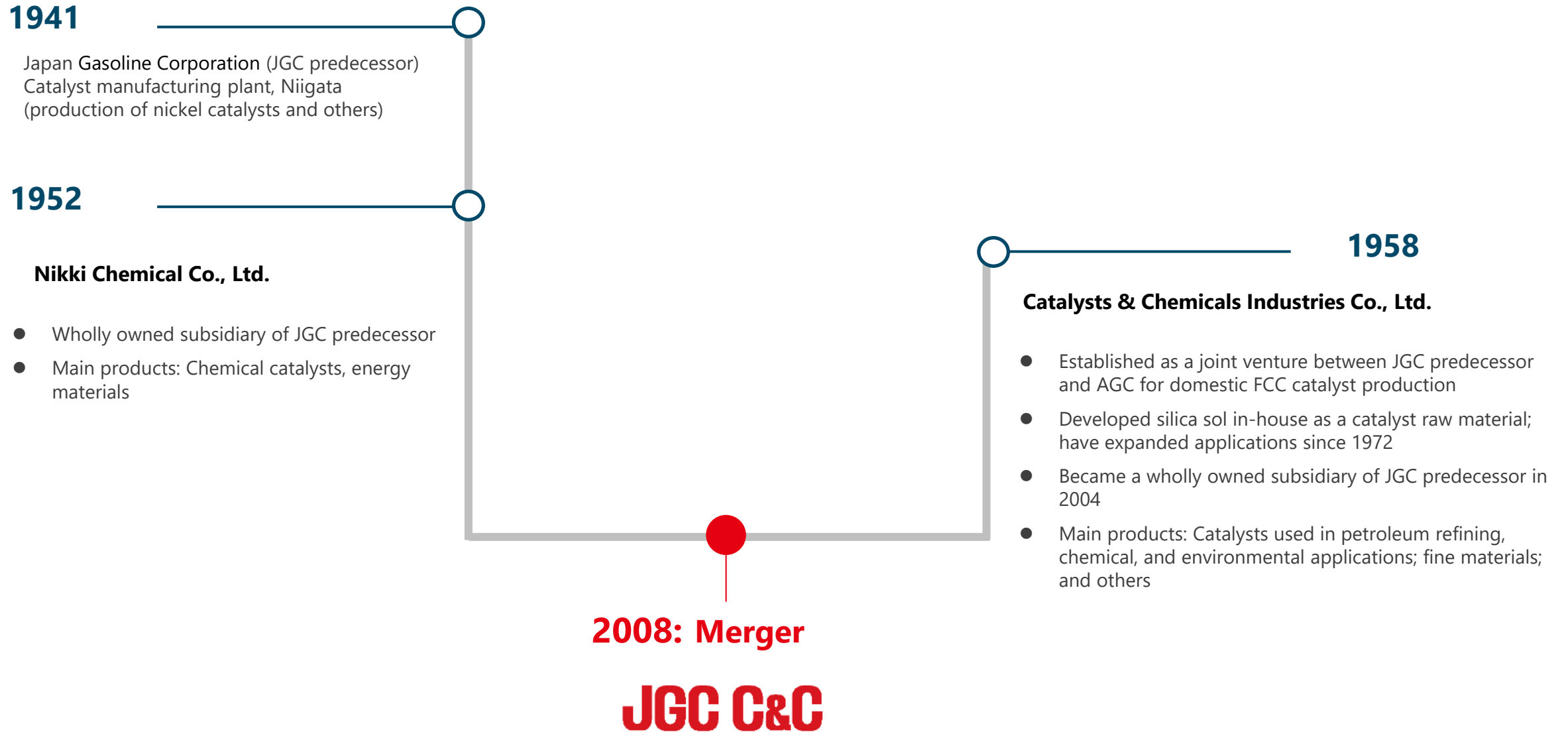
Employees Approx. 500
By field: 180 members in production, 160 in research, and 160 in sales and other roles

Offices Kitakyushu Operation Center
Niigata Operation Center



Head office





02

Overview of main products: Catalysts

A closer look at catalysts

A small amount of these substances change the rate of a chemical reaction without being affected by the reaction. Specifically, the substances can lower the activation energy required for the chemical reaction.

Source: Catalyst Manufacturers Association website

Petroleum Refining

Fluid catalytic cracking (FCC) catalysts

Used in reactions to obtain gasoline and other medium or light fractions from crude oil distillation



Hydro-treating catalysts (HTC)

Used in reactions to remove sulfur, nitrogen, or other harmful substances in subsequent distillation processes



Chemicals

Chemical catalysts

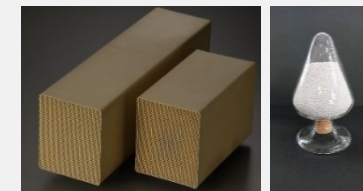
Used in synthetic reactions for various chemical products and to remove impurities



Environmental Protection

Denitrification catalysts, fuel cell desulfurization material

Used in decomposition of nitrogen oxides to harmless substances in various exhaust gas and as desulfurization material for household fuel cells.



01

Petroleum refining catalysts are produced in volume, and sales expansion will target a broad range of customers.

02

Chemical catalysts will be developed in-house and made-to-order for specific chemical reaction processes identified by customers.

03

Environmental catalysts will be expanded in the field of environmental purification, which includes decomposition and removal of NO_x from thermal power plants and industrial incinerators.

Market



Main clients

Oil companies and refineries in Japan and overseas



Competitors

Catalyst manufacturers in Japan and overseas



Conditions

Lower fuel demand, due to the pandemic. Domestic and overseas refineries are also operating at reduced capacity, and sales are declining.

Strengths

- Original catalysts can be jointly developed with oil companies or refineries. No exclusivity contract or capital relationship with specific process licensor applies.
- JGC C&C is the only domestic catalyst manufacturer offering both FCC and desulfurization catalysts. We can meet the diverse needs of refineries.
- R&D expertise on catalyst raw materials and petroleum refining catalysts built up over more than half a century of production and sales.



Market



Main clients

Chemical manufacturers in Japan and overseas



Competitors

Catalyst manufacturers in Japan and overseas



Conditions

Weak chemical demand from the impact of the pandemic and U.S.-China trade friction. Chemical catalyst sales will remain a concern.

Strengths

- Each manufacturing process has its own separate production equipment, which enables us to make a wide variety of products in line with client needs.
- R&D and production expertise built up over more than half a century of production and sales.
- With techniques and products for both petroleum refining catalysts and chemical catalysts, we can satisfy a broad range of petrochemical needs.



Market



Main clients

Utility companies, manufacturers of heavy electrical equipment



Competitors

Catalyst manufacturers in Japan and overseas

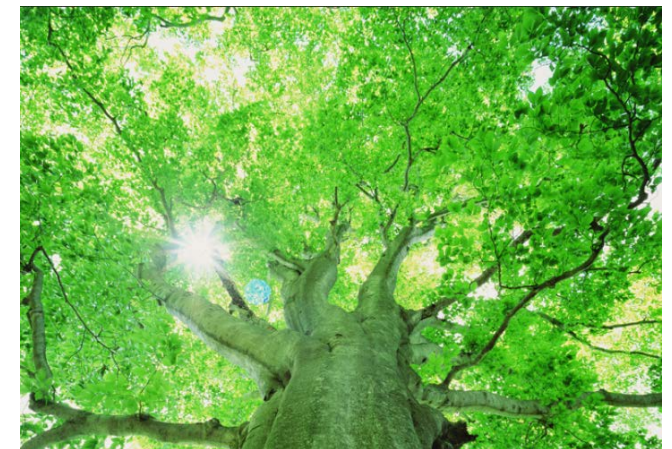


Conditions

With the decline in coal-fired power generation, there has been contraction in Japan's denitration catalyst market for this purpose. Meanwhile, growth is seen domestically and overseas in the denitration market for biomass power generation and waste incineration. Growth is expected in desulfurization materials for household fuel cells.

Strengths

- As a pioneer in production of honeycomb denitrification catalysts, we have licensed these manufacturing techniques worldwide.
- With JGC C&C technology across the board from raw material selection to production, we offer sales of both raw materials and finished products.
- A leading share in adsorptive fuel cell desulfurization material, applying catalyst and fine chemical material technology.



03

Overview of main products:

Fine chemicals

A closer look at fine chemicals

Generally refers to highly value-added chemical products in the chemical industry from high-mix, low-volume production, in contrast to mass production (bulk chemicals).

Source: JOGMEC oil and natural gas glossary

Storage Devices, Industrial Materials

Silica sol

Widely used in many applications, including polishing slurry for hard disks and silicon wafers, alumina fiber* additives, steel coating additives, and more.

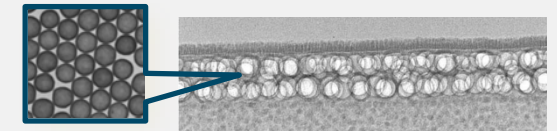
*Alumina fiber: Used for thermal insulation and cushioning in vehicle exhaust systems (mufflers)



Display and Semiconductor Materials

Hollow silica sol transparent conductive material and more

Applications include FPD film (providing lower reflectivity, antistatic, hard-coating, or other properties), liquid crystal cell spacers, insulating film, and low- κ semiconductor film.



Cosmetics Materials

Silica beads as optical cosmetics materials

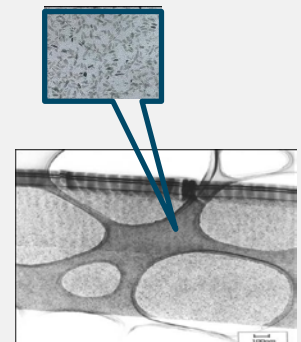
Used as a cosmetic material to improve texture, conceal wrinkles, and block UV rays.



Optical Materials

Titania sol lacquer material

Used as a coating material for plastic eyeglass hard-coating to enhance the refractive index of coatings.



01

We will expand in high value-added niche segments with unique and unmatched materials applying nanoparticle preparation and control technologies.

02

Materials development will play a central role, and we will also bring downstream products to market (such as paints and liquid coatings) that reflect our understanding of market needs and our evaluation of materials.

03

Expansion will be pursued in both the electronics/display and industrial segment and the lifestyle segment (cosmetics materials and eyeglass/optical materials) to hedge risks of economic fluctuations.

Market



Main clients

Manufacturers of industrial materials for electronics and automotive applications



Competitors

Fine chemical manufacturers in Japan and overseas



Conditions

Automotive and steel plate demand has dropped in the wake of global economic stagnation. In contrast, the storage device market has been relatively strong, as more people work remotely. We will continue to monitor the impact of U.S.-China trade friction.

Strengths

- Leading domestic share as a manufacturer of silica hard disk polishing
- Control technology for control over a broad range of SiO_2 particle diameters (5 nm–10 μm), shapes, and particle size distribution

Strengths in all fine chemical products

- Advanced core nanotechnology development, evaluation technology
- A framework for collaborative product/material development with clients, rapid production start-up, and stable production control technology
- Volume production and technical services with a sense of speed, integrating production, research, and sales



Market



Main clients

FPD, electronic film, and printing manufacturers



Competitors

Fine chemical manufacturers in Japan and overseas



Conditions

Remote work during the pandemic has led to solid performance in the FPD and semiconductor markets.

Strengths

- Unmatched transparent optical and electronic materials applying nanotechnology
- Unmatched materials: Low-refractive index hollow silica particles, chain ATO nanoparticles, low dielectric constant liquid coatings

Strengths in all fine chemical products

- Advanced core nanotechnology development, evaluation technology
- A framework for collaborative product/material development with clients, rapid production start-up, and stable production control technology
- Volume production and technical services with a sense of speed, integrating production, research, and sales



Market



Main clients

Cosmetics manufacturers



Competitors

Fine chemical manufacturers in Japan and overseas



Conditions

Cosmetics demand has dropped sharply as people regularly wear masks and refrain from going out. The market is expected to expand in response to growing needs for microplastic alternatives.

Strengths

- Silica particle texture control enables textures of all kinds, from silky to moist
- Unique optical design imparts properties to conceal pores or wrinkles or block UV rays

Strengths in all fine chemical products

- Advanced core nanotechnology development, evaluation technology
- A framework for collaborative product/material development with clients, rapid production start-up, and stable production control technology
- Volume production and technical services with a sense of speed, integrating production, research, and sales



Market



Main clients

Eyewear and lacquer manufacturers



Competitors

Fine chemical manufacturers in Japan and overseas



Conditions

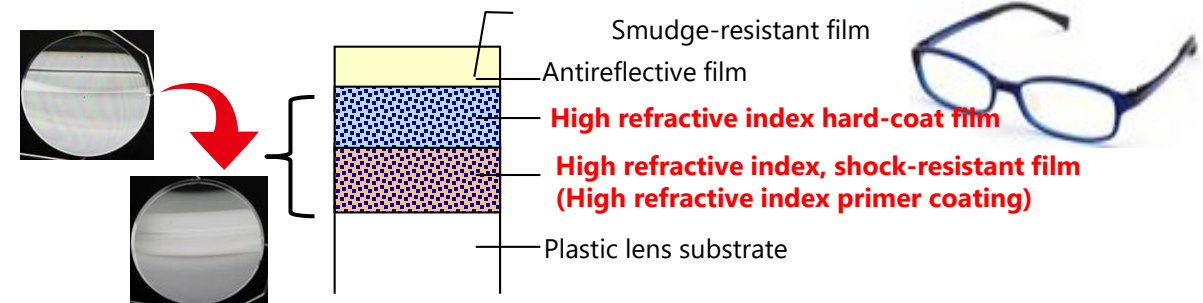
Despite a sharp temporary decline in eyeglass demand as people refrained from going out, the market is now recovering.

Strengths

- Supplying unmatched material – high refractive index, low-photoactivity TiO_2 particles – for plastic lenses with a high refractive index of 1.67 or higher
- Broad product line for plastic lenses with a medium or low refractive index of 1.64 or less

Strengths in all fine chemical products

- Advanced core nanotechnology development, evaluation technology
- A framework for collaborative product/material development with clients, rapid production start-up, and stable production control technology
- Volume production and technical services with a sense of speed, integrating production, research, and sales



04

Future policies

Petroleum Refining Catalysts

Strengthen overseas expansion of catalyst materials and products

Consider post-peak demand in oil refineries in advanced economies
Asian markets will drive demand; establish a base of operations serving India
Promote joint R&D on catalyst materials with overseas clients

Supply catalysts for high value-added petroleum refining

Enhance profitability in conversion of heavy oil into lighter fractions, and in petrochemical raw materials

Supply new chemical refining catalysts for petroleum refineries

Develop solutions by combining chemical catalyst technologies

Chemical Catalysts

Expand contract manufacturing for domestic clients and explore new markets

Expand domestic market share through stronger proposal capabilities, venture into carbon recycling and chemical recycling catalysts

Expand catalysts developed in-house overseas

Encourage collaboration of domestic clients in overseas process development; expand JGC C&C catalysts overseas

Environmental Catalysts

Higher performance to meet stricter environmental regulations

Expand to denitrification of exhaust gas from biomass power generation, garbage incinerators, and the like

Concerted efforts to expand into overseas markets

Capture demand in response to stricter regulations overseas

Semiconductor/Equipment Materials: Silica Sol

Expand polishing business

Develop compelling polishing slurry in the chemical mechanical polishing (CMP) market

Display/Semiconductor Materials: Hollow Silica Sol and Others

Expand applications, cultivate new markets

Cultivate markets for low-reflection materials for high-resolution displays (TVs, in-vehicle systems), gearing up for 5G, and camera lenses

Cosmetics Materials: Silica Beads, Optical Materials

Enhance productivity, enlarge overseas expansion

Develop unique optical materials

Expand plastic microbead alternatives

Use of plastic microbeads is restricted in the EU, and the use of alternatives will expand worldwide in the future

Eyeglass Material: Titania Sol

High performance of high refractive index materials

Demand for thinner, premium lenses is growing in emerging markets

Develop applications for optical materials

Venture into new markets other than eyewear

Cultivating New Segments

Develop new business segments such as life sciences

Explore new areas based on existing antibacterial and dental materials