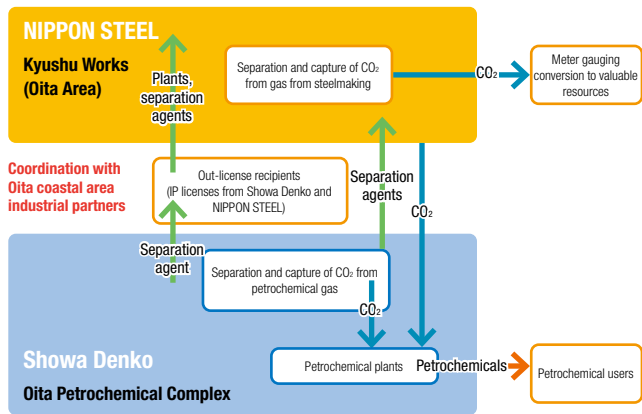


Chemicals

Initiatives for Resolving Social Issues as a “Co-creative Chemical Company”

Petrochemicals: CO₂ Capture and Use Initiatives to Achieve Carbon Neutrality

Showa Denko has teamed up with NIPPON STEEL CORPORATION in a co-creative venture to develop a low-concentration CO₂ separation system that employs an innovative separation agent. In May 2022, this initiative was adopted for the CO₂ separation and capture technology development project of NEDO under its Green Innovation Fund. Together with NIPPON STEEL CORPORATION, we are developing technologies for the low-cost separation and capture of low-pressure, low-concentration CO₂ from sources such as factory exhaust gas, while verifying the feasibility of technologies for producing chemical products from captured CO₂. We anticipate that these technologies will allow us to develop and grow CO₂ separation and capture plant operations and separation agent operations. The technology is also expected to give rise to chemical business models that use CO₂ and are thus not dependent on fossil resources, and thereby contribute to carbon neutrality.

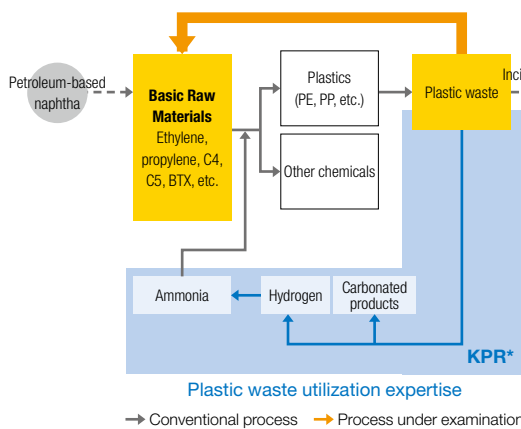


Basic chemicals and Industrial gases:

Co-creative Plastic Chemical Recycling and Large-Scale Hydrogen Use Initiatives

WEB

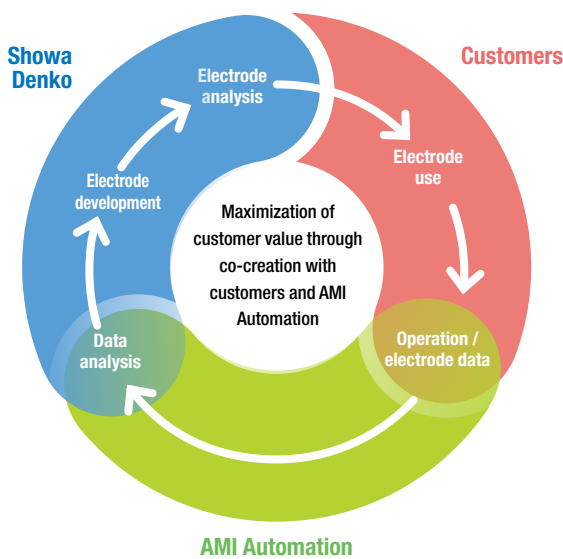
Showa Denko's Kawasaki Plant is developing its Kawasaki Plastic Chemical Recycling* operations through which it decomposes used plastics to extract hydrogen. The hydrogen collected in this manner is utilized for a variety of initiatives, including verification tests of supply for fuel cells for hotels. Showa Denko is a world leader in synthesizing ammonia by utilizing low-carbon hydrogen extracted from gas produced through the process of used plastic chemical recycling. We have been producing ammonia in this manner for many years, and as a result the total volume of used plastic recycled reached one million tons in January 2022. Moreover, the Company began examining the possibility of establishing a base in the coastal area of Kawasaki City to create a cycle for expanding supply and demand to use hydrogen in this manner. Under the envisioned scheme, we would coordinate with seven partners from various industries to form a carbon use network to track medium- to long-term hydrogen demand and supply network feasibility within the area.



* Kawasaki Plastic Chemical Recycling, plastic recycling business operated at the Kawasaki Plant

Graphite electrodes: Maximization of Customer Value in the Steel Recycling Process through Digital Transformation

Showa Denko is the No. 1 global manufacturer of the graphite electrodes that are indispensable to the electric furnaces used to melt iron scraps as part of the steelmaking process. To further build upon these operations, in 2021 we acquired a stake in Mexico-based AMI Automation, a global provider of sophisticated electrode elevation control systems and other services for optimizing the operation of electric furnaces. By strengthening our relationship with this company, we aim to contribute to the maximization of value for customers through a service lineup that expands beyond the sale of graphite electrodes to include operational support and the development of optimal electrodes. Moreover, in 2022 we began collecting operating data from customers' electric furnaces to perform big data analyses for use in proposing optimal electric furnace operating conditions, constructing optimized electrode development systems, and enhancing data science initiatives. In this manner, we will pursue ongoing improvements in the value that we provide to customers through co-creation with these customers and with AMI Automation.



Others

Life Science

Contribution to Healthy and Fulfilling Lifestyles



Minaris Regenerative Medicine, LLC, is a global provider of services specializing in regenerative medicines including clinical trials and contract manufacturing.



Minaris Medical Co., Ltd., has cultivated a solid operating foundation over its more than 40 years of operation and is able to supply in vitro diagnostic products for various fields including clinical chemistry and immunology.

Minaris is Showa Denko's life science brand.

Strategy for Realizing the Long-Term Vision

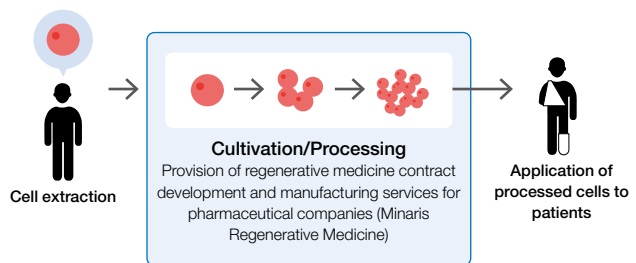
The life science business has been positioned as a pillar of Next-Generation businesses. In this business, we are engaged in manufacturing process development and contract manufacturing of regenerative medicines and the production and sale of in vitro diagnostic products. In 2020, the names of certain life science business Group companies and products were changed to unite them under the Minaris brand, to enable the development of global operations under a stronger brand.

	Results in 2021	Plan for 2022	Vision for the future (2030)
Regenerative medicine	<ul style="list-style-type: none">Establishment of a manufacturing base network encompassing three regions (North America, Europe, and Japan)Development of a manufacturing base network (start of the expansion of bases on the east coast of North America and construction of a second factory in Germany)	<ul style="list-style-type: none">Augmentation of production facilities to improve quality and efficiency (completion of the expansion of bases on the east coast of North America, advancement of construction of a second factory in Germany that is scheduled to commence operations in 2024, and the full-fledged start of regenerative medicine production in Japan)Construction a high-quality, high-efficiency manufacturing network through introduction of IT systems at bases	<ul style="list-style-type: none">Provision of high-quality regenerative medicine contract manufacturing services out of bases in North America, Europe, and Japan as a partner to pharmaceutical companies, to contribute to the development and popularization of regenerative medicine and subsequently healthy and fulfilling lifestyles for people around the world
Medical products	<ul style="list-style-type: none">Acquisition of approval for a new allergy diagnostic reagent panel from the U.S. Food and Drug Administration (FDA)Commencement of joint development with the National Cancer Center of a fast COVID-19 test using cellular immunity methodology	<ul style="list-style-type: none">Expansions of the share for cholesterol lipid and diabetes HbA1c reagentsStart of shipments of creatinine kidney disease reagents for overseas marketsAcceleration of new product development combining FDA approval processes and point of care testing technologies through coordination with the U.S. reagent subsidiary and a U.S. research institution	<ul style="list-style-type: none">Establishment of a position as a global company by bolstering operations in distinctive areas of strength and creation of diagnosis technologies and products to support prevention, diagnosis, and treatment, to realize personalized medicine

Initiatives for Resolving Social Issues as a “Co-creative Chemical Company”

Regenerative Medicine

With bases in North America, Europe, and Japan, Minaris Regenerative Medicine supplies contract manufacturing services, through which it produces reliable, high-quality regenerative medicine products on a global basis. These services can be used to produce regenerative medicines with the same level of quality as conventional pharmaceuticals, regardless of whether these medicines are derived from T-cells, mesenchymal stem cells, iPS cells, or some other type of cell, autologous or allogeneic. Contributions are made to Minaris Regenerative Medicine's pharmaceutical company customers through the supply of these medicines. Moreover, the provision of safe and effective regenerative medicines to patients through customers helps society to combat intractable and recurrent diseases that are difficult to treat with conventional methods, such as cancer and hereditary disorders.



Medical Products

It is expected that the role of clinical examinations will grow increasingly important in the years ahead, as examinations are used to treat diseases based on evidence and prevent pre-symptomatic lifestyle diseases, and thereby extend people's lifespans. Minaris Medical has a long history of providing diagnostic products, dating back to its commercialization of the enzyme-method reagent for measuring total cholesterol in 1975. In the years that followed, this company went on to provide a biochemical test for diseases such as hyperlipidemia and diabetes as well as in vitro diagnostic products such as allergy immunological tests and medical devices. Looking ahead, we will strive to create technologies, products, and services to support prevention, diagnosis, and treatment in order to realize personalized medicine. In this way, Minaris Medical will seek to become the company patients choose by contributing to healthy and fulfilling lifestyles through the supply of new value in clinical examinations.

