

Initiatives for Clean Tech

Materiality

① Provide new values to realize a prosperous and sustainable society

Sustainability Report ▶ P.008-010

Policy (our fundamental view)

To achieve both a sustainable society and economic growth, NOF is focusing on the development of clean tech (technologies in the three prioritized fields of the NOF Group). We are flexibly responding to changing market needs in the three fields of Life/Healthcare, Environment/Energy, and Electronics/IT, as well as further accelerating the development of new products and technologies and improving productivity.

In this era with 100-year life expectancies, there is a strong need to solve social issues related to health, such as reducing social security costs by extending healthy life expectancy and improving the quality of life of elderly people. In addition, the level of performance required of electronic materials is increasing, such as higher picture quality for audio visual devices and smartphones, faster speed and larger capacity for telecommunications

technology, and acceleration of the shift to electric automobiles (EVs). Based on these social needs, the Corporate R&D Division plans and proposes company-wide research strategies and focuses efforts on the creation of new business.

In recent years, we have accelerated external co-creation initiatives such as public calls for collaboration and industry-academia-government collaboration to discover businesses that help solve social issues. In 2023, the “NOF call for commissioned industry-academia research,” a project aimed at business creation through an external open call, was issued in four areas among materials and technologies in the medical care and medical device fields for which future market growth and NOF’s technology utilization are anticipated. As a result of evaluation and screening, including for commercialization potential at NOF,

we decided to select three materials and technologies. Selected organizations are provided with commissioned research funds to conduct research toward contributing to society.

In January 2024, we also invested in a venture capital fund managed by Universal Materials Incubator Co., Ltd. We nurture promising technologies as a partner to investee companies. Furthermore, in April 2024, we jointly established the NOF-AIST Smart Green Chemicals Collaborative Research Laboratory with the AIST Group (National Institute of Advanced Industrial Science and Technology and AIST Solutions Co.). By combining the technologies of both parties, we promote the development of environmentally friendly products. These collaborations enable us to create new technologies beyond existing domains.

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Initiatives for Clean Tech

Promotion of R&D in our three prioritized business fields

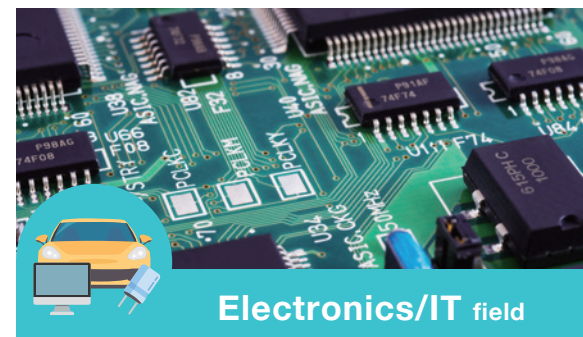
Amid growing expectations for innovation in the chemical materials field, we are working to develop new technologies and products in the three prioritized business fields.



As demand for air conditioners and refrigerators increases due to global warming, we expect to see demand for base materials for refrigerating oils and polybutene for air conditioner putty. In addition, as offshore wind power generation gains momentum for development, particularly in Asia, there is a growing need for products that contribute to the environment, such as biodegradable lubricants made from raw materials derived from natural oils and fats and rust inhibitors for bolts, to prevent marine pollution. Furthermore, as EVs become the norm, there are expectations for development of products with advanced functions, including anti-fog agents for LED headlamps and noise reduction agents in order to maintain a quiet car interior.



For pharmaceuticals, we are developing functional lipids and activated PEG as DDS materials for biopharmaceuticals through means such as precision synthesis and advanced refining technologies. We are developing monodispersed PEG and ionic lipids for nucleic acid delivery for antibody and nucleic acid drugs. In the area of medical care, we are developing the LIPIDURE® Series for use in eye care, diagnostic pharmaceuticals, and medical devices, as well as highly functional materials for regenerative medicine. For cosmetics, we have a wealth of expertise in areas such as biocompatible materials, natural bioavailable substances, interface control technology, and mix design technology. We use this expertise to respond rapidly to functional advances.



In the telecommunications field, the need for curing agents for low-dielectric materials is increasing as the speed and capacity of telecommunications increases. Demand for highly photosensitive materials and additives for electronic components is also increasing as electronic components undergo miniaturization. The shift to EVs in automobiles also requires miniaturization of electronic components, and we are working to add more value to these products. In addition, the increase in number and larger size of displays in EVs is expected to raise demand for overcoat materials for LCD color filters.

Co-Creation with External Partners: Establishment of the NOF-AIST Smart Green Chemicals Collaborative Research Laboratory

We are actively promoting open innovation activities in line with our vision of co-creating new value through the power of chemistry.

NOF-AIST Smart Green Chemicals Collaborative Research Laboratory



On April 1, 2024, NOF and the AIST Group (National Institute of Advanced Industrial Science and Technology (hereafter “AIST”) and AIST Solutions Co.) established the NOF-AIST Smart Green Chemicals Collaborative Research Laboratory at AIST’s Tsukuba Center.

At this collaborative research laboratory, we integrate NOF’s proprietary technologies with the AIST Group’s fundamental technologies and expertise to develop environmentally friendly chemical manufacturing processes and create functional chemicals (smart green chemicals) that contribute to decarbonization and prosperous lives. In addition, we promote the organic exchange of personnel and technologies between the two organizations to foster the next generation of technical talent. Through these efforts, we aim to continuously deliver new value to society through the power of chemistry, while contributing to the realization and development of a sustainable chemical industry.



NOF

We aim to continuously create new value with the power of chemistry in the three fields of Life/Healthcare, Environment/Energy, and Electronics/IT.

Realizing sustainability

- Transitioning from petroleum-based raw materials to low-environmental-impact materials such as biomass
- Establishing environmentally friendly manufacturing processes that save energy and resources

Creating green chemicals that contribute to both decarbonization and prosperous lives



AIST GROUP

AIST is a public research institution that conducts research and development in science and technology to contribute to economic and social development, with a mission of “solving social problems” and “strengthening Japan’s industrial competitiveness.”

Leveraging comprehensive knowledge of materials

- High potential in cutting-edge catalyst creation technology and materials development through digital transformation (DX)
- Development hubs equipped with Japan’s most advanced facilities for bio-manufacturing and materials diagnostics

Products that Contribute to the Environment

In response to global issues such as climate change and biodiversity, the NOF Group is conducting R&D in technologies (clean tech) in our three prioritized business fields and creating a variety of products that contribute to the environment.

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Among the NOF Group's products, those that (directly or indirectly) contribute to solving issues related to the natural or social environment, such as climate change and biodiversity

