

Inheriting the Ideas of “Long-term Continuity” and “Pursuit of the Ultimate Limits”

The phrase, “The Deeper, the Newer,” has been passed down as a key phrase at Toray Group, and has become part of the Group’s DNA. The concept underlying this is that when you dig deep into something and pursue it to its ultimate limit, the result will be new discoveries and inventions. An example of this would be the pursuit of the ultimate limits of film surface formation technologies. In the past, inorganic particles were added to the entirety of the film to create random projections on the surface, but Toray Group developed a technology that thinly laminates particle-based polymers on the film surface, with the particles aligned and the protrusion height carefully controlled. This technology contributed greatly to the success of the Company’s high-quality resolution video film business. While the appearance of DVDs signaled the end of the videotape market, the technology itself has been applied to other applications, including for data tape film and in support of the manufacturing process for polarizers and ceramic capacitors. Our focus on

Cultivating Business Seeds with the Potential to Create New Value

VALUE CREATION

Toray’s
Strengths

01

Research and Development

pursuing advanced technology stems from our belief that over time, the most advanced technology will likely be used in an increasing number of applications.

While it is true that it takes a certain amount of time to develop and commercialize advanced materials, the steadfast commitment to long-term continuity which is inextricably linked to the pursuit of the ultimate limits has become a hallmark of Toray Group. As an example, reverse osmosis membranes used in water purification and carbon fiber composite materials, which are among the Company’s mainstay products, took nearly a half century from initial research to large-scale market formation.

The strength of our R&D stems from the ability of the Group to recognize the long-term value of materials and the will to follow through, i.e., adhering to the concept of long-term continuity and the pursuit of the ultimate limits. This focus is the source of our hard-to-imitate competitive advantage and the wellspring of true innovation.

Toray Group has continued to invest in R&D without regard to fluctuations in the economy, and for many years has seen no substantial change in R&D costs as a percentage of sales, which serves to illustrate that innovation at the Group is based on the idea of long-term continuity and pursuing the ultimate limits.

Technology Center

Technical departments in
Business Divisions

Development Center

New Projects
Development Division

Technical departments in
Manufacturing Division

Engineering Division

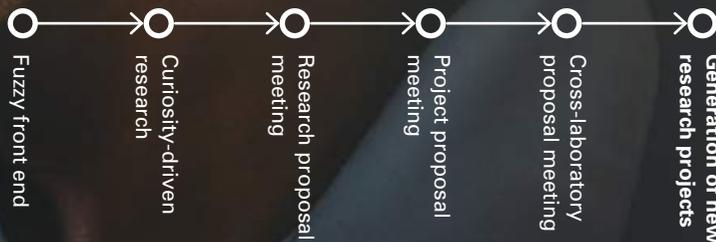
Research & Development
Division



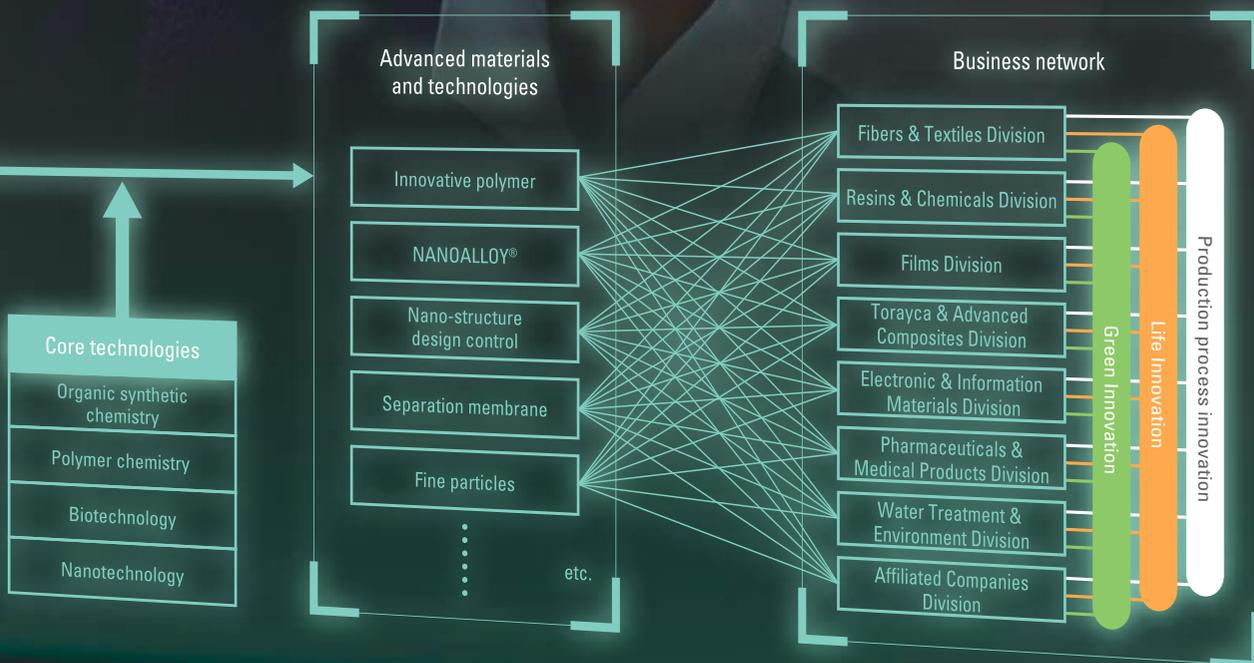
Curiosity-driven Research Producing the Seeds of New Technologies

Research for innovative new materials starts with the creation of themes in “fuzzy front end” (it literally means vague and uncertain world, and here defined as the period between when a product is first considered and when it is formally judged ready to enter development). Somewhat similar to trying to dig a well in the vast desert first, it is important in this process not only to have a strong will, but also to have a system that promotes research activities that respect the creativity of those conducting the research.

Toray Group has since its founding encouraged independent research. At present, we believe about 20% of research time should be spent on curiosity-driven research, with each person focused on original basic research with the aim of creating a large-scale theme. This system has been effective in motivating research and has resulted in the creation of a variety of technologies. Researchers focused on this kind of curiosity-driven research were also one of the main reasons Toray Group was able to identify the value of carbon fiber before others and move into full-fledged research in the field. Curiosity-driven research also contributed to the development of highly profitable mainstay products such as thin layer laminated polyester film and artificial leather.

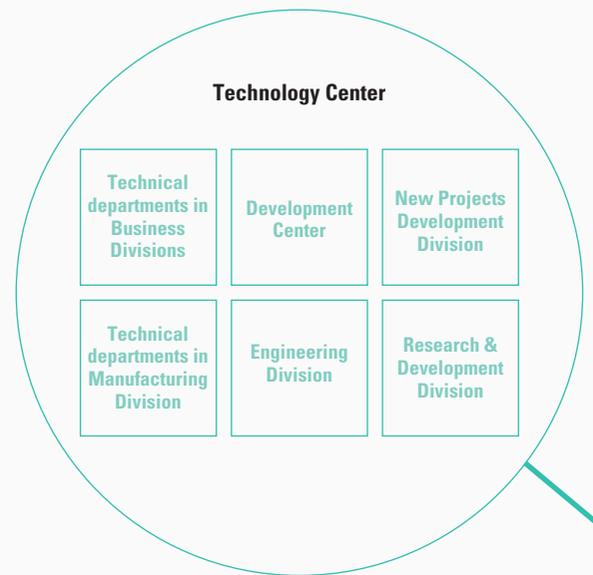


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Everything Derived from “four core technologies”

At first glance, it could appear that Toray Group business portfolio is diversified across a wide range of segments. However, all of these segments are built on our four core technologies. In addition to the organic synthetic chemistry, biotechnology, and polymer chemistry technologies the Company has focused its efforts on since its founding, Toray Group has added nanotechnology, the pursuit to the ultimate limits, as a fourth core technology. Using these four technologies, Toray Group is promoting greater depth and fusion of fundamental technologies such as polymerization, spinning, fibers application processing, film processing, and organic synthesis. The Group is also creating advanced materials and developing businesses in the fields of textiles, films, resins, chemicals, electronic & information materials, carbon fiber composite materials, pharmaceuticals, medical devices, and water treatment. All of these products have the four core technologies in common, which contributes to the likely emergence of technological synergies, and Toray Group is able to produce materials with even higher added value thanks to its various businesses combining the innovative technologies and advanced materials derived from these four core technologies.

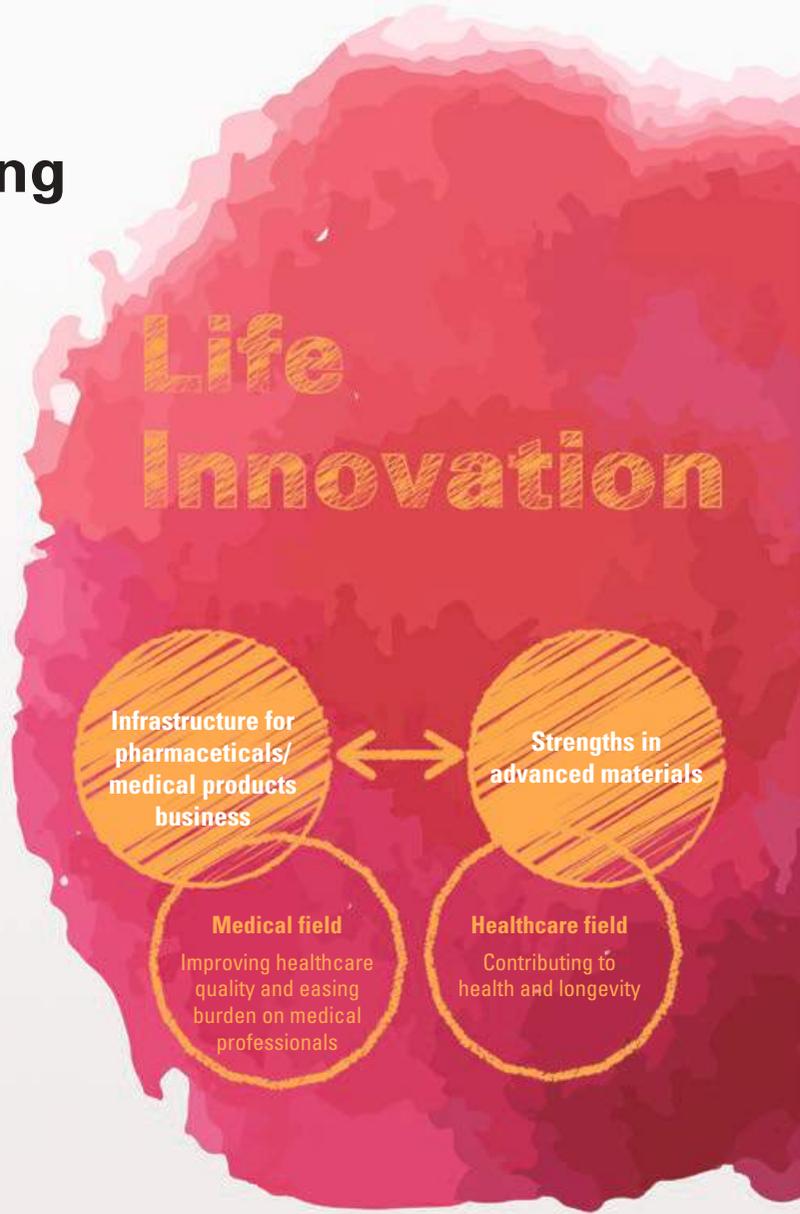


Solving Problems Using the Results from Core Technology Research and Development

An Undivided R&D Organization

Toray Group has centralized all of its R&D functions into a single organization called the Technology Center. Bringing together specialists from many fields in this undivided R&D organization makes it easier to create new innovations by integrating technologies. Moreover, the system enables the Group to exhibit combined strength by actively exploiting techniques and knowledge from many fields to solve problems in a single business area. It also enables various advanced materials and technologies to rapidly apply to multiple businesses.

With a focus on solving some of the issues facing the world, we are also developing Green Innovation Business and Life Innovation Business as Group-wide projects, based on the fusion of technologies. Using a one-package system centered on the Technology Center as a hub, we are focused on promoting the use of innovative technologies and advanced materials derived from our four core technologies in other fields, with the goal of maximizing returns on annual R&D investment of about ¥70 billion.



Green Innovation

Creation of Non-petroleum Materials

High-efficiency in Energy Use

New Energies

Water Treatment Membranes

Organic Synthetic Chemistry

Polymer Chemistry

Core Technologies

Nanotechnology

Biotechnology

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