

R&D



*Research to realize a
“connected society”*

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Since its establishment in 1950, the main business of TAIYO YUDEN has been the development and production of capacitors and other electronic components. By contributing to the development of electronics technology and, as a result, improved quality of life for the public at large, we have created both economic and social value. Now used in a variety of daily electronic devices, such as smartphones and cars, electronic components are essential to all aspects of our lives. There are also anticipations for the future realization of a “connected society,” where all things are connected in real time via networks. This means that companies that make electronic components are required to have high research and development capabilities to overcome more difficult challenges.

Research and development at TAIYO YUDEN is characterized by the integration of everything from materials R&D to product development. Our commitment to quality in materials both helps us create competitive products as well as refine and accumulate core technologies needed to make new products. We split our research and development activities throughout our departments in order to ensure that our core technologies—materials, product systems, evaluation, design, packaging, and process technologies—stay one step ahead of our competitors. TAIYO YUDEN also has a Smart Product development system*, and we consider it the duty of the research and development team to continue to leverage core technologies to produce high added value Smart Products.

In light of this approach, we take a backcasting stance to setting development themes, not allowing ourselves to become absorbed by nearsighted goals but envisioning ten years from now, depicting five years from now, and setting concrete goals to be realized three years from now. To this end, we tell our researchers not to focus too much on the present or their own area of expertise, but to have the conceptual capabilities to see things from a higher perspective and come up with ideas for improvement. For example, if, ten years ago, you had depicted a world where smartphones became as advanced and embedded in daily life as they now are, that could be called a kind of conceptual capability. Going forward, I consider it important in our research to use our imagination to think of the future while continuing day-to-day research.

I consider research and development to be the source of power to realize the company’s mission and vision and create a better future by solving new problems. The COVID-19 pandemic and the resultant acceleration in speed of social change and technological evolution have given rise to changes to the external environment, which has created new challenges. I will raise the research and development capabilities of TAIYO YUDEN in order to contribute to the realization of a better future while dealing with these changes and challenges.

→ [p.30 Smart Product Development System](#)

Fundamental stance on research and development

The Foundation of Our Research and Development Activities

Hikohachi Sato, the founder of TAIYO YUDEN, was a researcher in ceramic materials, and since its establishment, has believed that product commercialization should start from the development of materials. This has been one of the strengths of TAIYO YUDEN, and has resulted in us creating

many products that have been “world firsts.” TAIYO YUDEN’s research and development activities are aimed at further honing the many elemental technologies it has so far developed to create products that contribute to the ongoing development of electronic devices.

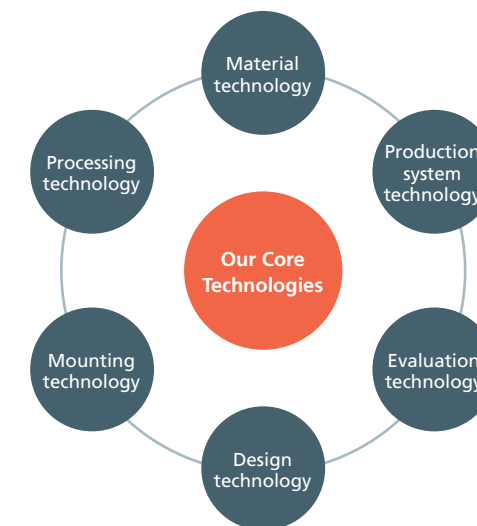
— Research and Development Principles —
“Innovative advance”

Technology precedence
Promote leading edge technological development as the precursory to innovative product development and become a global leader in technology

Reproducibility
Logically verify the reproducibility of the technology we develop

Technological applicability
Devise technologies which can be applied not only to specific products but also to other areas useful to the markets we serve

Environmental consideration
Develop technologies that are feasible and applicable economically to our manufacturing process and that meet critical environmental standards



Approach to research and development

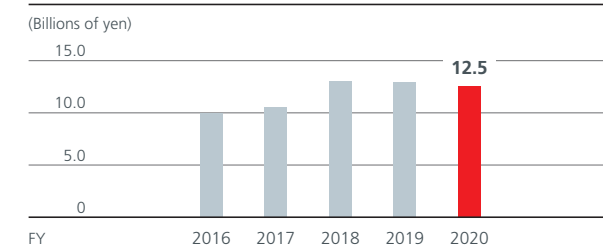
Achievement of Our Vision through Development of Smart Products

TAIYO YUDEN aims to manufacture “smart products” and is actively working to develop and supply steadily such products.

We develop smart products to eliminate the three M’s— muda (wastefulness), mura (inconsistency) and muri (overburden)— over their entire life cycle from design through production, sales, and incorporation into the final product right up to final disposal, to add value for customers and local communities we serve as well as our employees. We believe that our research and development activities aimed at creating a higher standard of smart products will enable us to realize our vision of “To be an excellent company that enjoys the trust and highest regard from all stakeholders.”

R&D Expenses

We recognize that continuing innovations and advancement in our technologies through R&D is the foundation for TAIYO YUDEN to create the future. With this belief, we will continue to invest in R&D activities.



R&D Themes

At the Research and Development Laboratory, our core concept is “envisioning ten years from now, depicting five years from now, and setting concrete goals to be realized three years from now.” The following two basic policies underpin our development activities:

- 1. Developing outstanding materials technologies to become a No.1 player**
 - 2. Proposing solutions that meet the needs of society**
- Specific research themes include dielectric materials for

cutting-edge multilayer ceramic capacitors and the development of and other activities relating to new materials for our metal power inductor MCOIL™. We are also stepping up our initiatives that address research themes such as contributing to the creation of new value through items including all solid-state batteries and smell sensors as well as the creation of social value that contributes to reductions in greenhouse gas emissions.

TAIYO YUDEN's Research Facility

As we were committed to continuing to create the world's best products and uphold our claim to be "the TAIYO YUDEN of technology and the TAIYO YUDEN of development," we opened the R&D Center (Takasaki City, Gunma Prefecture) in 1998. The R&D Center has accelerated our proactive R&D activities, and still drives development and technological progress of the TAIYO YUDEN Group and takes a role of a foundation of creativity focusing on the future.

In November 2020, the new research base Shin-Kawasaki Center SOLairoLab (Kawasaki City, Kanagawa Prefecture) was established in the aim of promoting collaboration with internal organizations such as the New Business Planning and Development Division as well as collaboration and partnership with external bodies. With this, we will further enhance our information gathering, marketing, and application/solution development capabilities.



R&D Center

Activities on Intellectual Property Rights

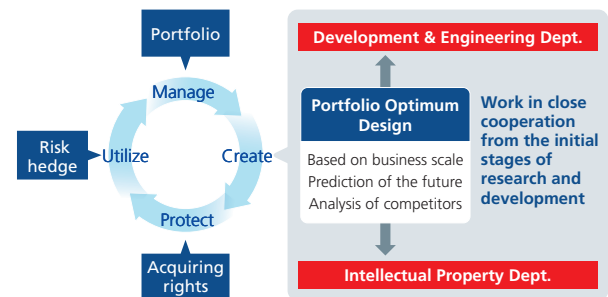
Basic Policy

We, TAIYO YUDEN, endeavor to obtain, maintain and protect intellectual property rights for proper use, and also to respect the intellectual property rights of third parties, in accordance with our CSR Code of Conduct.

Protection of Intellectual Property Rights

At TAIYO YUDEN, the Intellectual Property Department and the Development and Engineering Department work in close cooperation with each other from the early stages of developing new technologies and obtaining intellectual property rights. In addition, we pursue a unique management

approach in a way that is optimized for each of our businesses to create, protect, and utilize intellectual property.



Topics

Raising awareness of Sustainable Development Goals through intellectual asset creation activities

In its Medium-Term Management Plan 2025, TAIYO YUDEN aims to enhance corporate value through the combination of economic and social value. To date, we have contributed to the enhancement of economic value by increasing business competitiveness through the creation of intellectual property by allocating most of our intellectual property resources to our core businesses such as multilayer ceramic capacitors. Going forward, we would like to apply for patents with an eye to creating social value.

TAIYO YUDEN conducts its activities with Sustainable Development Goals (SDGs) targets that address Environment, Social, and Governance materialities. We also enact measures to encourage engineers to consider which targets their development relates to when seeking to obtain patents. Specifically, in order to encourage engineers to be mindful of SDGs in the technical challenges they address on a day-to-day basis, we have designed a system that takes SDGs into account when calculating incentives, with the number of points for patent incentives linked to patent applications that relate to the 169 targets. This helps engineers become more aware of how their activities tie in to the realization of a sustainable society and, at the same time, enhances the invention of products and services under development. We hope that this will help engineers in their activities to generate both economic and social value through patent applications.

