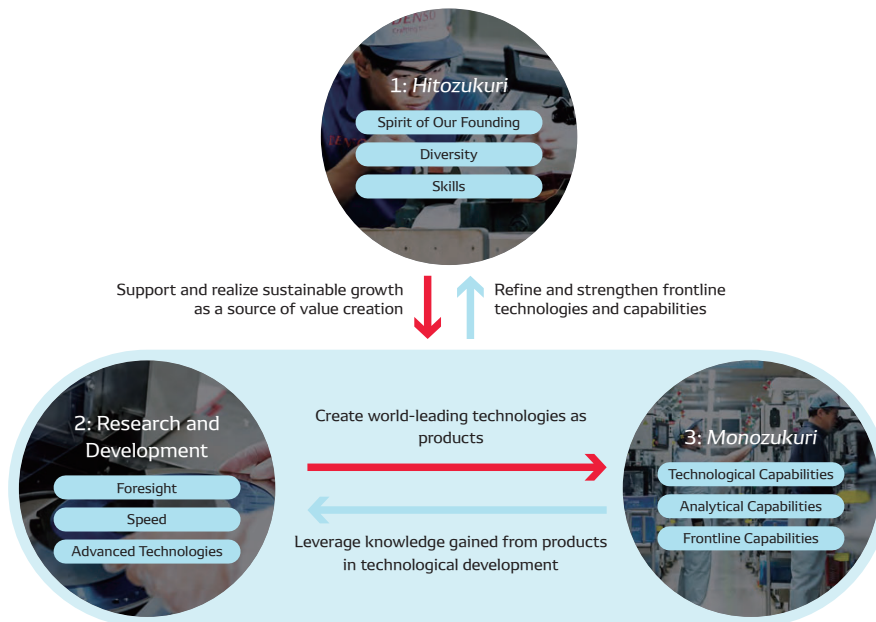


The Greatest Strengths That Have Driven DENSO's Growth Our Three Cultivated Strengths

Over its 70-year history, DENSO has cultivated various unique strengths. These strengths have been passed down since DENSO's founding and further refined through the Company's DNA, the DENSO Spirit, which permeates the actions of all DENSO employees around the world. The connections between these strengths have driven DENSO's growth over the years. Amid a challenging business environment going forward, DENSO will further enhance these strengths as the driving force behind value creation that is uniquely DENSO.

Relationship Between Our Three Strengths



Initiatives That Combine Our Three Strengths

Significantly Enhancing the Performance of BEVs through a Highly Efficient Eco Heat Pump—A World-First Technology
Our highly efficient eco heat pump system, which is adopted in the Toyota bZ4X and the Subaru Solterra, is a new product that helps increase the practicality of BEVs. This system makes effective use of energy in BEVs, which do not have an engine to provide a heat source, by extracting heat from outside air and using it as a heat source.

To significantly increase cooling and heating performance compared with conventional products, we used advanced heat control technologies to simplify the refrigeration cycle into a receiver cycle. By doing so, we successfully improved cooling and heating performance while reducing the number of required components. In addition, the heat pump system is equipped with the world's first defrosting function that activates when the BEV is moving, utilizing driving exhaust heat. This function helps improve the energy efficiency of BEVs. Furthermore, through DENSO's ultrafine processing technologies, a strength of our *Monozukuri* activities, we realized the system's high-performance compact chiller, which contributes to greater battery cooling performance.

Through the introduction of model-based control development, we have significantly reduced the development period and working hours required to develop these kinds of new products, which bring together our strengths and world-first technologies. In addition, the development project for this heat pump system was made possible by the comprehensive knowledge and capabilities of the project's diverse team members, comprising personnel from four Toyota Group companies and 16 divisions of DENSO. Going forward, we will continue to create attractive products for BEVs together with our customers by bringing together our three strengths of *Hitozukuri*, R&D, and *Monozukuri*.

1: Hitozukuri

"The best products are made by the best human resources." DENSO has positioned human resources as its most important management resource. Accordingly, the Company has focused on the training and skill development of employees based on the idea that human resource development supports R&D and *Monozukuri* (manufacturing). We are also globally promoting a broad range of initiatives to develop leaders who can take charge of new businesses and oversee the future of DENSO so that we can continue to achieve continuous growth going forward.

Roots of Our Strengths

- 1954 Established the Technical Training Center. This center fostered the principles of "Monozukuri is Hitozukuri (Our performance relies on our people)" and "Engineering and technique go hand in hand." These principles continue to be passed down within the Company.
- 1961 Received the Deming Prize, the most prestigious award for quality control. Winning this prize laid the foundations for the "Quality First" approach and corporate culture that we still adopt to this day.
- 1977 Received our first gold medal in the WorldSkills Competition. Receiving this medal was the result of our skills training on which we have been focusing our attention since our founding.
- 2001 Commenced the Technology Discussion Forum, which encourages healthy competition among our engineers through group discussion and interaction.
- 2005 Established DENSO Training Academy Thailand, our first overseas regional training center. This center helped us build a structure for educating engineers and technicians on a global basis.

The Key to Our Strengths



Further Enhancing Our Strengths

Promoting "DENSO Culture DX" through the Cultivation of AI-Savvy Human Resources

DENSO is promoting "DENSO Culture DX" activities, which involve maximizing the performance of its approximately 170,000 globally diverse human resources and fully utilizing the on-site know-how and data that it has cultivated for over 70 years. As part of the foundation to support these activities, we are accelerating efforts to provide AI-related training to all employees so that they can begin working in a manner that offers more added value. Specifically, we provide a wide range of educational content in accordance with employees' level of AI understanding and individual position. These educational activities help employees not only improve their own individual work and the work performed by their respective department but also realize operational and business reforms in collaboration with external shareholders. Through the promotion of these activities, we aim to enhance the AI literacy of all employees at DENSO CORPORATION (training of 15,000 employees already completed as of June 2021) so that they are able to properly utilize AI within their work. In addition, by the end of fiscal 2023, we aim to cultivate 2,000 AI-savvy human resources who can fully leverage AI in their duties.

2: Research and Development

By accurately ascertaining social needs, DENSO has created competitive products with a commitment to world-first and world-best offerings. In our R&D activities, which have been the starting point for the value creation that allows us to create such products, we are planning technologies in a wide range of fields with a focus on five to 20 years in the future and strengthening our R&D structure. Additionally, to create optimal products in each region, enhance the appeal of mobility, and contribute to the future mobility society, we operate technical centers and laboratories around the world.

Roots of Our Strengths

- 1953** Commenced a technical cooperation agreement with Robert Bosch GmbH. Under this agreement, we established a technological and production base with the aim of becoming a comprehensive manufacturer of automotive parts that can keep pace with global companies.
- 1985** Established Nippondenso America, Inc., with which we jointly created our first overseas technical center. Through this center, we built an optimized structure for the development, production, and supply of local products.
- 1991** Established the Fundamental Research Center (currently the Advanced Research and Innovation Center). At this center, we have carried out R&D activities on future technologies that cover a wide range of fields. Today, this center continues to create a large number of innovative technologies that lead to the development of world-first and world-best products.
- 2014** Completed the establishment of technical centers in seven regions across the globe. Through these centers, we have set up a structure to create competitive products that can promptly meet diversifying local needs.
- 2020** Established the Electrification Innovation Center (EIC), which promotes efforts to strengthen our development and production of products powered by electricity, and Global R&D Tokyo-Haneda, which conducts the development of automated driving and other technologies. By doing so, we have accelerated our R&D activities in the domains of green and peace of mind.

The Key to Our Strengths

Foresight

Speed

Advanced Technologies

Commitment to world-firsts

Global Development Network

Advanced research with a view to the future

Creating Over 130 World-First Products

We have established "contributing to a better world by creating value together with a vision for the future" as the DENSO Philosophy. By keenly ascertaining social changes, we have been engaging in product development with a commitment to world-firsts since our establishment. We have created over 130 world-first products, including gas injection heat pump systems, common rail systems, millimeter-wave radar sensors, and ejectors, which have provided us with a driving force for growth.

Number of world-first products:
Over 130

Technical Centers in Seven Regions throughout the World and Laboratories in Epicenters of Innovation

We have established technical centers in seven regions across the globe, in addition to laboratories in Canada, Israel, Silicon Valley, and other epicenters of innovation. We also promptly incorporate diversified regional needs into our development process to create competitive products, which are subsequently delivered to our customers.

Number of global R&D bases: 13

Advanced Research That Estimates and Anticipates the Future Mobility Society

Since its establishment in 1991, DENSO's Advanced Research and Innovation Center contributes to an advanced automotive society through the creation of innovative technologies. Guided by this mission, the laboratory led the way with advanced technologies such as semiconductors, electronic materials, AI, and ergonomics. By integrating such technologies with the skills of DENSO's R&D personnel, the Advanced Research and Innovation Center has created innovative technologies that help resolve social issues.

Number of new patent registrations in the automotive industry (fiscal 2022):
Japan, 4; United States, 7

Further Enhancing Our Strengths

Enhancing Development Efficiency and System Proposal-Making Capabilities through Model-Based Development

The importance and complexity of software development has been rising with the progression of CASE. Amid these circumstances, it is necessary to enhance the added value of products and significantly reduce the development period through *Monozukuri* activities that link hardware with software. To that end, we have adopted the highly effective method of model-based development (MBD), which involves utilizing simulated models in order to enhance the efficiency and reduce the time of complex system development. Through the utilization of MBD, extensive system inspection can be executed via computers from the initial design phase. In addition, MBD enables simulations to determine specifications and performance of the entire vehicle, including electrified powertrain systems and air-conditioning and cooling systems.

By doing so, MBD eliminates the need for repeated prototype development and testing, thereby reducing the burden of reworking designs. In these ways, MBD allows us to strengthen our engineering capabilities and offer optimized proposals for overall systems to our customers as a comprehensive system supplier.

In addition, the Japan Automotive Model-Based Engineering Center seeks to popularize MBD across the entire automotive industry. Through this participation, we are tackling such endeavors as standardizing interfaces in an effort to enhance the international competitiveness of Japan's automotive industry.

3: Monozukuri

Since its inception, DENSO's *Monozukuri* (manufacturing) has thoroughly integrated in-house technologies. Through *Monozukuri* positive steps are taken to design and manufacture equipment, production lines, materials, and processing methods. This enables us to provide society with the world's most advanced groundbreaking technologies and products conceived by our R&D team. We have striven to develop speedy and efficient production lines and compact unique facilities, as well as streamline distribution and inspection with our own production technology. In recent years, we have commenced efforts to digitalize the know-how we have accumulated over many years on the manufacturing front lines and leverage it as explicit knowledge. This has enabled us to also ensure high efficiency and high quality and offer competitiveness and added value to our products.

Roots of Our Strengths

- 1968** Created the IC Research Center to establish a structure for the production of semiconductors completely in-house in anticipation of the shift to the electronic control of automotive parts in the future.
- 1972** Established our first overseas production company. Since then, we have accelerated the establishment of additional overseas production companies, helping us gain an understanding of the needs in each region and begin production activities that meet those needs.
- 1979** Received the Okochi Memorial Production Prize. This prize was received in recognition of our highly accurate, high-quality *Monozukuri* that was realized through our comprehensive in-house manufacturing of production lines and equipment.
- 1984** Launched a project for the practical application of robots. Furthermore, the development of such technologies as barcode readers and RFID,* which we pursued in a similar manner as robots, helped establish the foundation of our current factory automation (FA) business.
- 1997** Commenced Excellent Factory (EF) activities. We began to expand activities on a global basis to improve our factories, led by personnel on the front lines of production. These EF activities represent the origins of DENSO's ambitious activities focused on quality improvements.

The Key to Our Strengths

Technological Capabilities

Analytical Capabilities

Frontline Capabilities

World-leading production and engineering

Production Structure That Enables Mass Production of World-First and World-Only Products

DENSO leverages world-class micro-processing, paying attention to detail down to the 1/1,000 mm, and an assembly line that improves production efficiency and quality. DENSO also supports world-first products and the world's highest level of product performance and quality through research on cutting-edge production, elemental, processing, and measurement technologies as well as through the development of production lines and systems that adopt such technologies.

Amount of capital expenditures (fiscal 2022): ¥353.9 billion

Factory-IoT (F-IoT) that leverages the knowledge of people to the greatest extent possible

Working to Improve Productivity That Connects People and Factories Globally

We take our abundance of data on people, products, and facilities and convert it into valuable information, such as information on signs of equipment flaws and information that contributes to expert know-how. We offer such information to people that desire it at the times they need it and in a format that they prefer. By doing so, we are accelerating activities aimed at making improvements and contributing to the growth of people. We aim to form global linkages between our 130 plants in an effort to improve productivity on a Groupwide basis.

Number of plants with F-IoT: 130

Excellent Factory (EF) activities that realize growth for both factories and people

Promoting EF Activities Focused on Eliminating Product Defects and Lost Operational Time

Our plant general managers lead the way with EF activities in which all factory workers participate. By focusing on making improvements to areas that are easily overlooked and establishing production lines that create high-quality products, EF activities make it easy to identify issues within our factories. Through the continued efforts of all employees to address issues when they do occur, EF activities cultivate human resources that are dedicated to making improvements and also help us realize a global-leading level of competitiveness.

Energy Conservation Grand Prize Award: Received for 12 consecutive years

Further Enhancing Our Strengths

Receipt of Energy Conservation Grand Prize Award in Recognition of Reducing Steam Amounts by Roughly 70% through the Reuse of Plant Waste Heat

In fiscal 2022, DENSO received the Energy Conservation Center Chairman's Prize, the Grand Prize, in the Examples of Energy Conservation Division of the Energy Conservation Center, Japan (ECCJ)'s Award Program, in recognition of the Company's efforts to reuse plant waste heat in order to reduce the amount of steam used to heat pure water for the cleaning of semiconductors. This marked the 12th consecutive year in which DENSO has won this award.

The cleaning process for semiconductors uses pure water that has had all impurities removed via a filtration device. During the filtering process, it is necessary to raise the temperature of the water, and steam is generally used as the means to do so. In our effort to reduce steam amounts, we were extremely adamant about reusing the waste heat that is dispersed throughout our plants, and by making efforts to reuse waste heat from such facilities as cooling towers, we were able to reduce the amount of steam needed for heating pure water by a total of 67%. This is equivalent to a 491.5-kl reduction in crude oil a year. Going forward, we will continue to pursue thorough energy-saving activities with the aim of realizing carbon neutrality within our *Monozukuri* (manufacturing) activities.

* RFID (radio frequency identification): A non-contact system that reads data from RF tags using electromagnetic waves