Research and Development & Intellectual Property

Research and Development

Basic approach

To achieve the Vision 2030 management guideline of "Creation of a prosperous society through business reform," Aichi Steel believes that conducting research and development in line with our business strategy, and helping to address social issues by reforming existing businesses and creating new businesses, will lead to sustainable growth for the company. For this reason, we have formulated the 2030 Development Vision and established a research and development policy, as well as promoting the effective use of intellectual property.

Areas of contribution through research and development

Our 2030 Development Vision was formulated to solve social issues through our business, and defines the priority areas as "autonomous driving," "vehicle electrification," "food," and "health and safety," with a focus on the development of next-generation mobility and products that enrich people's lives. By creating new highly functional products, we will contribute to the realization of a sustainable smart society.

Strengths of "integrated forging with steel making" and "material manufacturer"

Aichi Steel utilizes the strengths of its integrated forging with steel making processes, in which a wide variety of components are added to raw steel scrap to create specialty steel with properties and functions such as strength and heat resistance, and then finished into forged products, and the knowledge it has accumulated as a materials manufacturer since its founding, to develop products that address to changes in society and meet the needs of society.

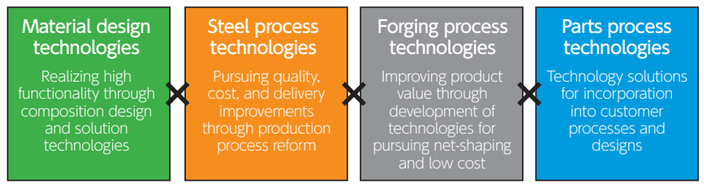
Launch of companywide cross-sectional standardization activities

Standardization activities to establish standards and specifications for new products and technologies are essential for ensuring quality and reliability, returning the fruits of research and development to wider society, and ensuring competitiveness in global business. In FY2023, we established the Standardization Promotion Committee, a companywide, cross-sectional organization. In FY2024, the committee is active in the electric furnace industry, reporting and discussing the status of activities, including environmentally friendly electric furnace steel materials, and making plans for the future.

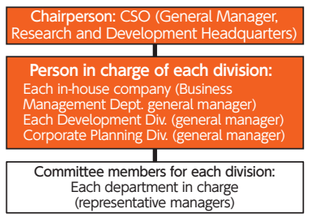
Standardization promotion structure

Our Standardization Promotion Committee is chaired by our head of R&D, the General Manager of the Research and Development Headquarters, who serves as CSO (Chief Standardization Officer) and oversees standardization, R&D, and intellectual property in an integrated manner. The general manager of each in-house company's business headquarters and the general manager of each development division are also placed in charge of divisions to ensure alignment with business strategies. A representative manager of each division that conducts standardization activities is appointed as a divisional committee member. Led by this committee, we carry out strategic standardization activities throughout the whole company, while focusing on raising in-house awareness and training personnel for standardization.

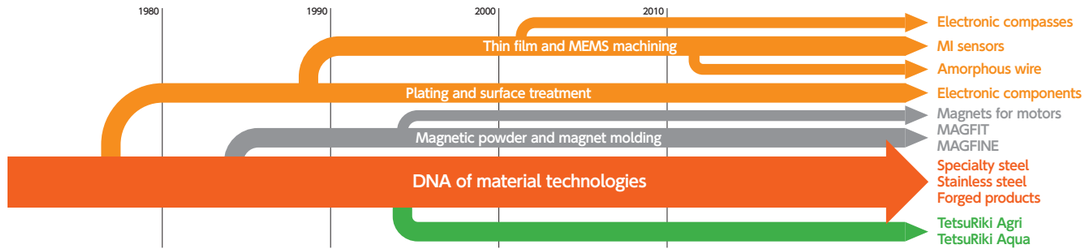
◆ Development based on integrating forging with steel making processes



◆ Standardization promotion structure chart



◆ Expansion of technology as a materials manufacturer



Intellectual Property

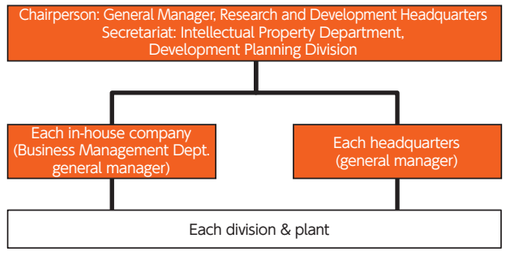
Basic approach

Aichi Steel has established proactive intellectual property (business expansion and challenges), defensive intellectual property (business stability), and basic activities (human resource development and structure building) as its priority policies, setting targets for each and working to promote intellectual property activities that lead to steady growth.

Promotion structure

Aichi Steel has established an Intellectual Property Committee to promote intellectual property activities. The committee is chaired by the Research and Development Headquarters general manager, with general managers of each in-house company, headquarters, and technology division as members.

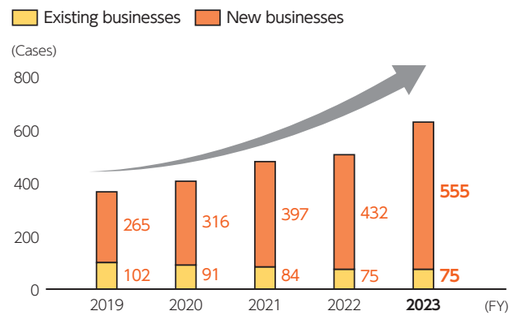
◆ Organization chart



Increase in new business patents and strengthening of patent system

The number of our related patents has increased in recent years as we have stepped up development in new business areas.Besides the conventional protection of intellectual property, our development and intellectual property divisions have strengthened their cooperation and established a system geared toward strategic patent applications that lead to the creation of new value, thereby improving the quality of our patents. We will continue to promote activities aimed at building a patent portfolio that will help us maintain and improve the competitive advantage of our business and expand new business.

◆ Changes in the number of patents held



New Business Field Development Initiatives

Autonomous driving enabled by GMPS

Aichi Steel is working toward the early commercialization of our Global Magnetic Positioning System (GMPS), an autonomous driving support system that uses our proprietary magneto-impedance (MI) sensors to detect magnetic markers placed on roads, enabling the estimation of automotive positions with high accuracy on the millimeter scale even in harsh environments. Since 2017, we have conducted more than 30 verification trials in various locations and environments with national and local governments, private companies, and organizations, and have received high ratings in terms of performance and reliability.In 2022, GMPS was adopted for use in an autonomous driving bus operating between Yanaizu Station and Rikuzen-Yokoyama Station on JR East's Kesennuma Line bus rapid transit (BRT). In 2023, it was on track to be put into practical use as an automated traction vehicle on factory premises. We have taken this opportunity to add the on-site logistics market to our focus areas, and are promoting commercialization of GMPS. Utilizing our advanced technical capabilities that have achieved things such as ultra-sensitive MI sensors, high-quality, low-cost, low magnetic-force markers, and our own magnetic field noise elimination system, we are contributing to building a safe and secure mobility society.

Development of materials and parts for next-generation electric axles

To address the growing demand for electric axles accompanying the electrification of automobiles and the risks of resources such as rare earths, we are developing materials and components for motors and reduction gears that will help make electric axles smaller, lighter, and more resource-efficient. We are the first company in the world to successfully verify the technology of a next-generation electric axle with high-speed rotation and high speed reduction by combining a compact, lightweight motor capable of 34,000 rpm and a compact, high reduction gearbox.Utilizing elemental and evaluation technologies obtained as a result of these efforts, such as material design and steel processes, we are promoting the development and commercialization of increasingly high functional parts and materials.