

Leveraging its advanced technology capabilities in specialty steel, the Daido Steel Group conducts a proactive program of research and development (R&D) to expand new products and businesses and strengthen the foundations for existing businesses.

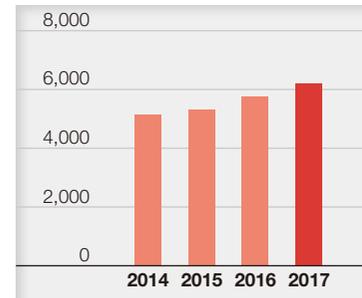
We are pursuing R&D for new products, materials and technologies, primarily through the Daido Corporate Research & Development Center, which houses the Special Steel Research Lab, Electromagnetic Material Research Lab, and Process Technology Research Lab. We employ a total of 281 researchers throughout the Daido Steel Group.

R&D expenses for the Daido Steel Group during the fiscal year under review amounted to ¥6,205 million. An explanation of our R&D efforts by segment, including purpose, major achievements, and expenditures follows.

R&D EXPENDITURES

Years ended March 31

(millions of yen)



(1) Specialty Steel

In this segment, R&D includes basic material development, such as automotive structural materials and tool steel, and process innovations ranging from steelmaking, refining and solidification to quality assurance.

R&D costs for the fiscal year under review in this segment totaled ¥1,524 million. The following are major achievements in this area.

- **High-strength hot forging steel with superior processing features**

One challenge faced by automakers when using high-strength materials to reduce the weight of automotive parts is that these materials present problems in terms of processing features, such as machining capabilities.

Compared with conventional untempered steel, steel with superior processing features can be achieved by controlling the low-carbon bainitic structure, and hardness can be dramatically increased by using the age hardening phenomenon. This has enabled Daido Steel to achieve both lower processing costs and high strength.

Going forward, Daido Steel will work to achieve practical application of this technology in order to contribute to the miniaturization and weight reduction of automotive parts that use untempered steel, such as crankshafts, connecting rods, and fuel injection parts.

- **Phased array ultrasonic testing technology**

Daido Steel uses ultrasonic testing to assure the internal quality of specialty steel products. In order to fulfill customer requests for strict quality control, Daido Steel has developed high-precision testing technologies for all steps within the manufacturing process.

Daido Steel aims to achieve practical application of testing technologies for steel billets and steel bar products. We have already increased our quality assurance capabilities by

introducing high-precision automated testing equipment for titanium bars for medical applications.

(2) High Performance Materials and Magnetic Materials

In this segment the Daido Steel Group conducts R&D focusing on developing materials that resist corrosion and heat, high-grade strip steel, welding materials, magnetic materials and electronic devices.

R&D costs for the fiscal year under review in this segment totaled ¥3,086 million. The following are some of our major achievements in this area.

- **High-nitrogen stainless steel DSR40N**

The element nitrogen can be used effectively to improve both the strength and corrosion resistance of stainless steel.

By maximizing these benefits of nitrogen, Daido Steel has successfully developed stainless steel with a hardness of over 58 HRC and a corrosion resistance equivalent to SUS 630.

This high-nitrogen stainless steel can be used in highly corrosive environments where the use of conventional steel was previously impractical. In fact, this stainless steel is already being used for machine blades and bearings.

Going forward, Daido Steel's high-nitrogen stainless steel is expected to be used in a wide range of applications, such as automotive parts, for which there is growing demand for highly corrosion-resistant materials.

- **Heavy rare earth-free magnet for HEV**

Daido Electronics Co., Ltd., a member of the Daido Steel Group, manufactures ring magnets using its proprietary hot deformation method. Daido Electronics has developed a new plate magnet by applying this technology.

The new plate magnet features high heat resistance made possible by controlling the structural properties of the material. Without adding any heavy rare earth elements, the magnet can

be used in the primary motors of hybrid vehicles.

Encouraged by the adoption of this new magnet by Japanese automakers, Daido Steel will seek to expand its use going forward.

(3) Parts for Automobile and Industrial Equipment

R&D in this segment concentrates on development of turbochargers, engine valves and other automotive parts, as well as parts for various types of industrial machinery.

R&D costs for the fiscal year under review in this segment totaled ¥1,449 million. The following is one of our major achievements in this area.

- **Welding technology for water-cooled wall panels**

In order to improve the corrosion and wear resistance of water-cooled wall panels applied to the interior walls of furnaces exposed to high temperatures at thermal power plants, waste incinerators and other facilities, Daido Steel has developed a technology for welding high-alloy steel onto the panel surfaces through an on-site installation process.

Daido Steel employs the Plasma Powder Welding (PPW) method, which enables installation with a lower dilution ratio and a thinner layer than the metal inert gas (MIG) method using welding wires. Daido Steel has established a technology for smoothly forming a welding layer on panel surfaces in an upright position by properly controlling the powder supply.

(4) Engineering

Engineering R&D focuses on the development of environmental conservation and recycling equipment and a variety of energy-saving industrial furnaces.

R&D expenditures in this segment during the fiscal year under review amounted to ¥145 million.