

# Nabtesco

CORPORATE PROFILE  
Nabtesco Corporation

1925

+

1944

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## What is Nabtesco?

Nabtesco Corporation was founded in 2003 by the integration of NABCO, Ltd. and Teijin Seiki Co., Ltd. The former, established in 1925, had fluid and pneumatic control technologies and the latter, established in 1944, had cutting and assembly technologies. Since its founding, Nabtesco has expanded its technological foundation and businesses centering around motion control technology and now conducts business operations in a wide range of fields.

2003

# History of Nabtesco

## NABCO

NABCO, Ltd.

1925 Established  
(originally as Nippon Air Brake Co., Ltd., with corporate name changed to NABCO., Ltd. in 1992)

1925 Began manufacture and sale of air brakes for railway vehicles



1949 Began manufacture of hydraulic equipment



1953 Began manufacture of door engines for railway vehicles

1956 Began manufacture of automatic doors for buildings



1963 Began manufacture and sale of marine vessel control systems

## TEIJIN SEIKI

Teijin Seiki Co., Ltd.

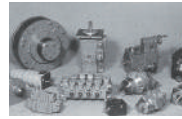
1944 Established  
(originally as Teijin Aircraft Industry Co., Ltd., with corporate name changed to Teijin Seiki Co., Ltd. in 1945)

1945 Began manufacture and sale of textile machinery

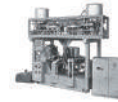
1955 Began manufacture and sale of aircraft equipment

1959 Began manufacture and sale of machine tools

1961 Began manufacture and sale of hydraulic equipment



1966 Established Toyo Jidoki Co., Ltd. to manufacture and sale of packaging machines



1986 Began manufacture and sale of precision reduction gears targeting industrial robots



# Nabtesco

Nabtesco Corporation

2003 Established

2004 Established Nabtesco Automotive Products (Thailand) Co., Ltd. (Commercial vehicle equipment)

2008 Established Nabtesco Power Control (Thailand) Co., Ltd. (Hydraulic equipment)

2009 Established Nabtesco Automotive Corporation (Commercial vehicle equipment)

2011 Joined Gilgen Door Systems AG through M&A (Automatic doors and platform doors)

Established Jiangsu Nabtesco KTK Railroad Products Co., Ltd in China (Railroad vehicle equipment)

2013 Established Nabtesco Marine Machinery (Shanghai) Co., Ltd. in China (Marine vessel equipment)

Joined Nabtesco Oclap S.r.l. in Italy through M&A (Railroad vehicle equipment)

2015 Established Nabtesco (China) Precision Equipment Co., Ltd. (Precision reduction gears)

2016 Joined NABCO Systems Co., Ltd. to a consolidated subsidiary (Automatic doors)

2017 Joined OVALO GmbH to a consolidated subsidiary through M&A

Established Nabtesco Europe GmbH as European management company

Established Nabtesco R&D Center



For details regarding our history, please visit:





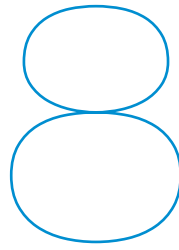
## Where has Nabtesco established a presence?

The Nabtesco Group's products and technologies are used in precision reduction gears for industrial robots, hydraulic equipment, transportation equipment and automatic doors as well as other products in daily use. The Group's high-precision motion control technology provides the basis for these products and technologies.

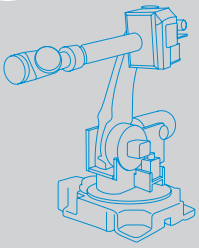
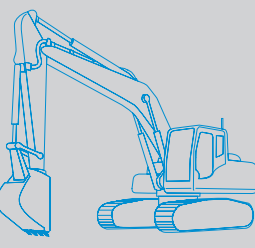
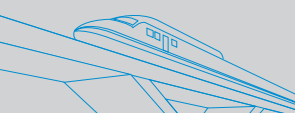
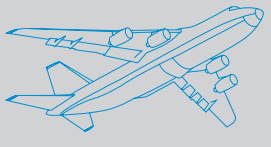
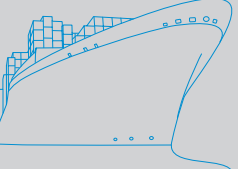
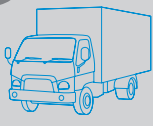
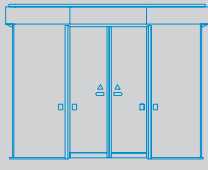
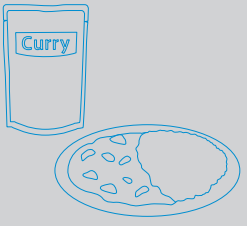
By providing high-quality products and services that meet the needs of our customers, we have earned large market shares in these respective fields.

# Nabtesco's Presence

Contributing to society through



core product items

<p><b>Precision reduction gears business</b></p> <p>◆ Precision reduction gears for the joints of medium- and large-payload industrial robots</p> <p>Global Market Share <b>60%</b></p> 	<p><b>Hydraulic equipment business</b></p> <p>◆ Traveling units for hydraulic excavators</p> <p>Global Market Share <b>25%</b></p> 	<p><b>Railroad vehicle equipment business</b></p> <p>◆ Door operators for railroad vehicles</p> <p>Domestic Market Share <b>60%</b></p> <p>◆ Brake systems for railroad vehicles</p> <p>Domestic Market Share <b>50%</b></p> 	<p><b>Aircraft equipment business</b></p> <p>◆ Flight control actuation systems</p> <p>Share for aircraft made in Japan <b>100%</b></p> 
<p><b>Marine vessel equipment business</b></p> <p>◆ Remote control systems for marine vessels</p> <p>Global Market Share <b>40%</b></p> 	<p><b>Commercial vehicle equipment business</b></p> <p>◆ Air dryers for commercial vehicles</p> <p>Domestic Market Share <b>70%</b></p> <p>◆ Wedge brake chambers for commercial vehicles</p> <p>Domestic Market Share <b>75%</b></p> 	<p><b>Automatic door business</b></p> <p>◆ Automatic doors for buildings</p> <p>Global Market Share <b>20%</b></p> <p>Domestic Market Share <b>55%</b></p> 	<p><b>Packaging machine business</b></p> <p>◆ Automatic fill/seal machines for retort pouch foods</p> <p>Domestic Market Share <b>85%</b></p> 

\* For source of the market share, please visit Nabtesco's website.

## Taking the leading position in niche markets

No. 1

As a specialist in brakes for railroad vehicles for more than 90 years and in precision reduction gears for more than 30 years, Nabtesco has long been leading these markets and working for technological innovation.

In pursuit of excellence in terms of quality, cost, delivery and services (QCDS), we have honed our abilities developing technologies, manufacturing products and making proposals to customers, thereby earning deeper trust from customers in Japan and abroad. We are taking a leading position in each of the markets.

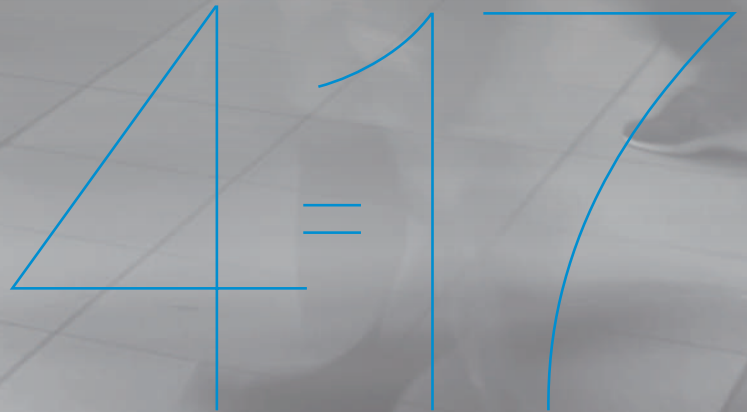


# How does Nabtesco contribute to society?

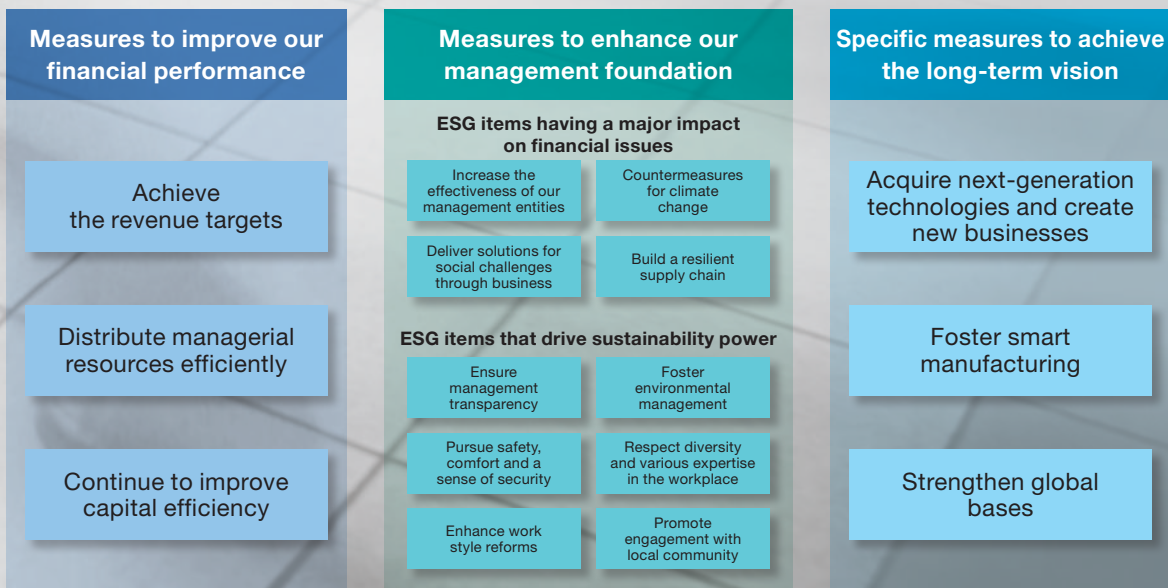
With its precise technology, the Nabtesco Group aims to provide people with safety, comfort and a sense of security in daily life. By fulfilling our corporate social responsibility, we are also increasing our corporate value in a sustainable way.

Through the materiality (material issues for management to achieve the long-term-vision) examination process, we verify the relevance of our material issues to the SDGs\* so that we can efficiently and effectively invest resources by recognizing the potential impact of each item on our business activities thereby contributing to the attainment of the SDGs.

\* The Sustainable Development Goals (SDGs) were adopted at the United Nations Sustainable Development Summit as goals to be attained by the international community by 2030. They consist of 17 goals such as Zero Hunger, Quality Education, Climate Action, and Economic Growth.



## Management materiality



# Manufacturing and Infrastructure

Nabtesco will contribute to society through its **precise, accurate and exquisite** technology.

## Component Solutions

[Transport Solutions](#)

[Accessibility Solutions](#)

[Manufacturing Solutions](#)



## Precision Reduction Gears

### Expanding industrial robot market

In developed countries, where the working-age population is decreasing due to demographic aging and declining birthrates, the use of industrial robots to save labor and increase productivity is expanding, especially in the manufacturing industry. Also, China and other emerging markets are increasingly facing the need to improve quality as well as to save labor and foster automation in light of rising wages. Against this backdrop, the industrial robot market is expanding globally.

In the general industrial sector, the need for manpower saving and automation, which accelerated with the Corona disaster, is expected to increase and industrial robots and automated equipment will be installed more frequently.

In addition, the need for manpower saving and automation, along with the non-contact nature of the corona disaster, will accelerate, and the introduction of industrial robots and automation equipment is expected to increase in the general industrial sector as well.

### ▼ Nabtesco's Approach ▼

#### Boasting a large market share for precision reduction gears used in industrial robot joints

In around 1985, when we released the Precision Reduction Gear RV™, industrial robots had problems, including vulnerability to shocks and the excessive vibration of arms. Our products, which provided high rigidity and precision, helped solve the problems and were rapidly adopted for use in industrial robots in and outside Japan. Capitalizing on the technological superiority of the products, Nabtesco won the trust of both domestic and foreign manufacturers of medium- and large-sized industrial robots and has since been maintaining a high share of the market.

The use of industrial robots helps reduce dangerous manual labor and addresses labor shortages while contributing to stable quality, higher productivity and innovation at production sites.

Not limited to use in industrial robots, Nabtesco's Precision Reduction Gear RV™ products are used also in the medical, food, semiconductor and logistics domains and contribute to the resolution of social challenges in a range of fields.



Precision Reduction Gear RV™

### Related SDGs



<https://www.nabtesco.com/en/products/robot.html>





## Hydraulic Equipment

### Globally expanding demand for hydraulic excavators

Construction machines including hydraulic excavators are used at various locations, including urban construction sites and resource exploration sites, where they need to perform at the highest level under harsh conditions.

Presently, China and other emerging markets are facing the tremendous challenge of building basic infrastructure for industrial development, including roads and railways as well as water supply and sewage systems. To meet this challenge, demand for hydraulic excavators, which are indispensable for the establishment of infrastructure, is expanding in these countries.

#### ▼ Nabtesco's Approach ▼

### Contributing to industrial development throughout the world including China and other emerging countries

Since 1977, we have been producing our "GM Series" traveling units, in each of which a reduction gear, a hydraulic motor and other components are integrated. These traveling units are used in hydraulic excavators. The units are greatly appreciated by customers because they are highly efficient, compact but very powerful, and are also durable and reliable enough to be used under harsh conditions. Outside Japan, we also manufacture these units at locations near end-users, such as at our plants in China and Thailand, thereby building a global production system that can flexibly respond to customers' needs.

We will further expand the product lineup, strengthen hydraulic systems, research electric control technology, and create innovation that goes one step ahead of customers to contribute to industrial development throughout the world.



Traveling Unit

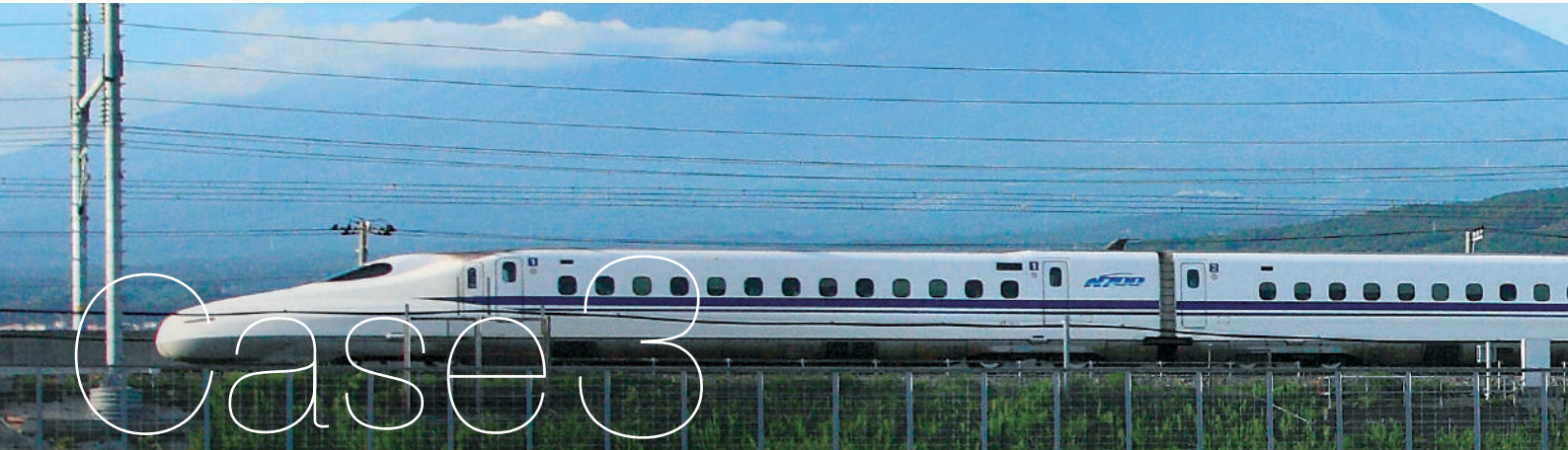
### Related SDGs



<https://www.nabtesco.com/en/products/powershovel.html>







## Railroad Vehicle Equipment

### Need to further increase the energy efficiency of railroad vehicles

Railroads represent a means of transportation with low environmental impact and contribute to the elimination/mitigation of road traffic congestion. Accordingly, the establishment of railroad infrastructure has been promoted worldwide.

Railroad vehicles need to become more energy efficient in the future. In Europe, countries with advanced railroad technologies are further promoting energy efficiency for railroad vehicles, as well as in Japan. Across the world, railroad vehicle manufacturers are therefore facing the challenge of producing lighter, smaller and more power-saving vehicles.

#### ▼ Nabtesco's Approach ▼

### Products that contribute to the establishment of railroad networks and reduction of CO<sub>2</sub> emissions

Nabtesco supplies brake control systems and electric door operating systems for use in railroad vehicles, taking advantage of the expanding demand for railroad infrastructure. We are thereby contributing to the on-time and safe operation of railroads in Japan and across the globe, including emerging market countries.

We are also proactively taking environmental measures. For example, we are in the process of developing a brake control unit whose size and weight are reduced by half relative to the conventional unit. By producing the unit lighter, we can reduce the electricity it consumes and contribute to reducing CO<sub>2</sub> emissions.

For electric door engines, we provide a product that is 15% lighter and consumes 50% less power, relative to the conventional product used in Japan and abroad.



AT300

### Related SDGs



<https://www.nabtesco.com/en/products/railway.html>



# Case 4

## Aircraft Equipment

### Forecast of the civil aviation market and challenges it faces

In the civil aircraft market, demand has been decreasing due to a drop in the number of passengers caused by COVID-19. Demand recovery to pre-Corona levels is expected to occur after 2024.

Civil aircraft must be safe enough to prevent any incidents and also must be highly energy efficient. Moreover, for civil aircraft, there are challenges for environmental conservation.

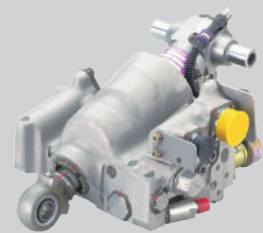
### ▼ Nabtesco's Approach ▼

#### Contributing to a sense of security, safety and reduction of environmental impact

Nabtesco supplies high-quality flight control actuation systems, which represent an important aircraft component, to civil aircraft manufacturers. The systems are essential to control the flying attitude and direction of aircraft, and we are contributing to safe and comfortable air travel by providing highly reliable products. In addition, we provide after-sale services, including offering preventive maintenance proposals, thereby helping airline companies increase their on-time performance.

Moreover, for use in the Boeing 787, which consumes more electricity than ordinary aircraft, we supply high-voltage electric power distribution units that reduce electric power consumption.

In the domestic defense field, we supply a range of equipment for use in rescue helicopters and rescue seaplanes to support safe flights and contribute to speedier rescue activities.



Flight Control Actuation System

#### Related SDGs



<https://www.nabtesco.com/en/products/aircraft.html>



## Case 5

### Marine Vessel Equipment

#### Latest tighter environmental regulations for marine vessels

In the marine vessel industry, air and marine pollution caused by air pollutants and ballast water discharged from vessels is recognized as a serious social challenge. In response, the industry is implementing measures to solve the issue, including regulating nitrogen oxide (NOx) emissions in 2016 and sulfur oxide (SOx) emissions in 2020, a program that was enhanced by the International Maritime Organization (IMO).

It is urgently required that exhaust gas from diesel engines—the core component of marine vessels—be made cleaner, and to meet this requirement, the industry will foster the electronic control of marine vessel engines, fuel conservation and the diversification of fuels. The industry is thus generating technological innovations against the backdrop of enhanced environmental regulations.

#### ▼ Nabtesco's Approach ▼

#### Measure to improve fuel conservation for marine vessels

Nabtesco supplies electronically controlled hydraulic valves for use in electronically controlled marine vessel engines. According to the operational situation of the main engines, the valves control the timing and amount of fuel injection as well as the opening and closing of the exhaust valves, significantly contributing to cleaner exhaust gas emissions.

We also offer maintenance, repair and overhaul (MRO) services, including providing a monitoring system for the condition-based management of electronically controlled hydraulic valves. By enhancing preventive measures including the detection of failures, we help customers use our products longer while contributing to the safe navigation of marine vessels.

Through these measures we contribute to the reduction of nitrogen oxide (NOx) and other emissions from marine vessels.



Electronically Controlled Hydraulic Valve

#### Related SDGs



<https://www.nabtesco.com/en/products/ship.html>





## Commercial Vehicle Equipment

### Automobile industry coming to a turning point

The automobile industry is coming to a turning point, facing tremendous changes as represented by CASE, which stands for Connected, Autonomous, Shared/Service and Electric. Amid these changes, the industry is working to solve social issues by pursuing innovation. For example, in response to the logistics crisis caused by the shortage of drivers in Japan, the industry is implementing an R&D and demonstration tests for the practical use of advanced self-driving and Mobility-as-a-Service (MaaS) systems under the leadership of the Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure, Transport and Tourism. Specifically, demonstration tests involving truck convoys are being conducted under the project. Except for the lead truck, the trucks in the convoy are fitted with self-driving systems and are linked together using communications technology.

#### ▼ Nabtesco's Approach ▼

### Solving social issues by supplying products that contribute to autonomous driving

In the R&D and demonstration tests for the practical use of advanced self-driving and Mobility-as-a-Service (MaaS) systems in society, Nabtesco is contributing to the activation of brakes by the use of electric signals. Against the background of an automobile industry that is facing great changes, we aim to contribute to increasing logistics efficiency by supplying products that help deal with the shortage of drivers.

By using the technologies developed through the project, we have also developed an emergency driving stop system (EDSS) that can be installed to buses as an additional component, thereby contributing to the safety of passengers and drivers.

Moreover, we provide products that prevent the discharge of oil for the reduction of environmental impact, thereby contributing to economic development and human comfort.



Emergency Driving Stop System (EDSS) that can be attached as an additional component

### Related SDGs



<https://www.nabtesco.com/en/products/automobile.html>





## Automatic Doors and Platform Screen Doors

### Increasing the value and applications of automatic doors

Automatic doors are installed at various facilities including office buildings for safe and comfortable use by large numbers of people. In addition to being used at public transportation facilities and residential buildings, automatic doors are also widely used at hospitals and food processing factories, where hygienic control is required.

Recently, automatic door manufacturers have increasingly been expected to enhance the safety and energy efficiency of their products to reduce environmental impact and to meet social needs, such as the need for barrier-free facilities.

#### ▼ Nabtesco's Approach ▼

### Providing optimal automatic doors for each location

Nabtesco has released the "NATRUS+e" automatic door that reacts only to people wanting to pass through it.

The door can identify those who actually want to pass through it from among those merely walking nearby by identifying the direction in which each person is walking. This allows the door to automatically open and close only when necessary. Compared with a conventional automatic door, the length of the time a door is left open has been reduced by about 45%\* and the electricity consumed for indoor air-conditioning has also been reduced by about 20%\*. The door thus contributes greatly to energy conservation.

As the first automatic door manufacturer in Japan and a pioneer in the industry, Nabtesco has been providing doors optimal for each location at office buildings, hospitals, shopping centers, airports and convenience stores within and outside Japan. We will continue to contribute to better indoor environments, energy conservation and the provision of barrier-free facilities through our automatic door business.

\* These are the results of monitoring tests carried out based on conditions set by the company and are subject to change depending upon the installation conditions, number of passers-by and other factors.

Logomarks for Nabtesco's automatic door brands "NABCO" and "GILGEN"

### Related SDGs



<https://www.nabtesco.com/en/products/automaticdoor.html>





## Welfare Equipment

### Toward normalization in society

Prosthetic knee joints, which are used by those who lost their legs due to illness or accident, have a great impact on level of independence, mobility and social participation.

With a shortage of caregivers, it is expected that people in need of care will be supported by welfare equipment to become independent and lead their lives in their own way. For all people to lead vibrant lives as active participants in society, it is indeed necessary to foster normalization.

#### ▼ Nabtesco's Approach ▼

### Technologies to make it easier for people to go out and walk

Nabtesco developed the world's first microprocessor-controlled intelligent prosthetic knee joint as a mobility assist tool. The microcomputer detects the walking speed of the user, adjusts the air cylinder, and automatically controls the swing speed of the knee joint for comfortable walking. For the latest model, named "ALLUX™," we have developed a function to prevent abrupt knee bending on slopes and stairs to mitigate the burden imposed on users, in addition to helping them walk comfortably, thereby encouraging them to participate more actively in society.

Furthermore, Nabtesco has developed a brake unit to be used in a rollator to control its speed. The brake automatically functions when the speed exceeds a certain limit. This braking system prevents the rollator from moving too fast on slopes or the like and helps to mitigate users' concerns about falling so that they can go out with their rollators safely with peace of mind.



"ALLUX™" Microprocessor-controlled knee

### Related SDGs



<https://www.nabtesco.com/en/products/welfare.html>





## Packaging Machines

### Increased food loss and waste volume of packaging materials

Nearly one-third of foodstuffs produced around the world\*, or about 1.3 billion tons of food, is wasted annually. It is important to reduce food loss and waste in society by offering foodstuffs in smaller, better-quality packages.

Also, due to the expanded use of plastic containers for chemical products, it is becoming increasingly necessary to reduce plastic waste and replace plastic packages with recyclable packaging.

\* Including food wasted and subsequently traded as feed as well as food lost due to dehydration.

#### ▼ Nabtesco's Approach ▼

### Products that help solve food-related social challenges

Nabtesco provides food manufacturers with super high-speed automatic fill/seal machines, which can be used for retort food as well as to pouch a range of food products, including soups and drinks. By supplying products that help producers present food in smaller packages and thus extend best-by dates, we are contributing to the reduction of food loss while also helping our customers achieve more efficient and labor-saving production.

Moreover, by providing automatic fill/seal machines that integrate a range of test equipment, including a system to check the printed dates and seal integrity, we also contribute to food safety and security.

Our automatic fill/seal machines are also used for refill packaging. It is said that the amount of plastic used to make a refill package is about 20% of that used to make a plastic-molded container, and so Nabtesco indirectly contributes to reducing the use of plastic with these packaging machines.

By globally supplying a range of packaging machines, we thus contribute to the solution of social challenges, including food loss and the need to reduce plastic waste.



Super High-Speed Automatic Fill/Seal Machine

### Related SDGs



<https://www.nabtesco.com/en/products/packing.html>

# Products

## Manufacturing and Infrastructure

### • Precision Reduction Gears •



#### Precision Reduction Gears RV™

Precision reduction gears RV are compact and lightweight with outstanding rigidity and overload resistance. With these features, the reduction gears serve to provide excellent accelerating capabilities, smooth motion, low backlash and accurate positioning precision, leading to enhanced robot controllability.



#### Gear Head Type (Table Type)

This table-type series is designed for accurate positioning. The low-profile products with large and hollow shafts are easy to use and are widely adopted for index tables as well as for pivots of various devices.

### • Hydraulic Equipment •



#### Traveling Unit

This series is used as a traveling unit for crawlers and the wheels of excavators, crawler drills, cranes and aerial work platforms.



#### Control Valve

This product is a sectional-type multi-control valve developed specially for mini excavators, and is ideal for various needs such as action control of excavators. The series is popular for its compact size, versatility and strong lineup. It has captured a large market share in Japan.

## Transportation of People and Goods

### • Railroad Vehicle Equipment •



#### Brake Operating Units for Railroad Vehicles

This system is configured as a unit featuring a brake operating device that plays the core role in the electronically controlled air brake system and air brake valves that provide the brake cylinder pressure output for service and emergency braking.



#### Door Operators for Railroad Vehicles

We provide a wide variety of door operating systems for use in all types of vehicles including high-speed trains such as the Shinkansen, commuter trains and ultra-low-floor light rail vehicles (LRVs).

### • Aircraft Equipment •



Actuator



Actuator Control System

#### Flight Control Actuation System

Nabtesco is the leading Japanese manufacturer of this system, which controls the aircraft's attitude. This system is used to move panels such as the ailerons on the main wings and elevators on the tail surface. Nabtesco has a solid reputation as a global leader in the commercial aircraft market.



#### High-Voltage Electric Power Distribution Unit

The Rack and Panel is an electric power distribution unit, which enables the compact storage of power supply devices. This product has been newly developed for Boeing 787 aircraft, which require far more electric power than other existing aircraft. This product contributes not only to aircraft weight reduction but also to the improvement of aircraft maintenance by significantly reducing the amount of electric wiring used in the aircraft.

### • Marine Vessel Equipment •



#### Main Engine Remote Control System (M-800-V)

This system enables the remote control of the vessel's diesel engine from the ship's bridge and/or control room, with functions for outputting commands to control the engine speed (rpm) and for monitoring the engine status. Equipped with advanced network functions and a liquid crystal display, the system provides excellent operability and expandability.



#### Electronically Controlled Hydraulic Valves

Mounted on each cylinder of a diesel engine, these valves control the timing and amount of fuel injection, as well as the opening and closing of the exhaust valves, thereby contributing to cleaner exhaust gas emissions. The valves are attracting great attention as an environmentally friendly component.



## • Commercial Vehicle Equipment •



### Air Dryers for Commercial Vehicles

This product removes any water or oil present in compressed air to increase the durability and reliability of air control systems. It is used by all Japanese heavy-duty truck manufacturers.



### Wedge Brake Chambers for Commercial Vehicles

Mounted in the wheels of heavy-duty trucks, these chambers use air pressure to push pistons to apply the brakes.

## Daily Lives and Welfare

### • Automatic Doors and Platform Screen Doors •



### Automatic Doors for Buildings and Industrial Use

Our high-quality automatic doors are made by using advanced technologies and installed at various public and commercial facilities, such as office buildings, to help people move with safety, a sense of security, and comfort. Our doors are also widely used at industrial facilities, such as factories and waste treatment plants.



### Platform Screen Doors

The use of platform screen doors is globally expanding to ensure the safety of passengers. Our platform screen doors are widely used in major markets, including Japan, Asia and Europe.

### • Welfare Equipment •



### "ALLUX™" Microprocessor-controlled knee

It is the world's first knee joint made by combining a hydraulic electronic control system with a four-link mechanism. Its sensor and microprocessor instantly check the situation for automatic control of the hydraulic cylinder, which functions to change the swing speed of the knee joint according to the walking speed of the user and to prevent sudden falls.



### Speed Control Unit for Rollator

The world's first wheel unit for rollators has a built-in automatic braking system that functions when the speed of the rollator exceeds a certain limit, thereby ensuring its safety. This unit enables even those with concerns about rollators due to the risk of excess speed and falls to go out with rollators safely with peace of mind.

## Production of Daily Commodities

### • Packaging Machines •



### TL-AX2 Super High-Speed Automatic Fill/Seal Machine

A high-speed automatic continuous motion fill/seal machine that delivers high performance in a compact space. This equipment is not only used for retort pouch foods but also for soups, sauces and other food products as well as for refills for liquid detergents. It contributes to reducing the costs of mass production.



### TT-10CW High-Speed Automatic Fill/Seal Machine

This 10-process rotary fill/seal machine can be used to pack a range of foods, including not only liquids but also products containing both liquid and solid substances. Moreover, this machine allows simultaneous filling and sealing of two bags, giving it the production capacity equivalent to that of two conventional machines, while requiring the floor space and support equipment of one. Further, a range of test equipment can be mounted on the machine. The fill/seal machine also supports deaeration using steam.

## Research and Development

### R&D based on “Motion control technology”

We always implement comprehensive measures to foster innovation and promote open innovation to increase our R&D efficiency.



Nabtesco R&D Center

### Measure to create new products and businesses

In response to the diversification and sophistication of customer needs, Nabtesco is promoting a shift from supplying components to proposing solutions. To this end, we are developing mechatronic and systematized products through various methods, including conducting joint research with companies, universities and research institutes in Japan and abroad, supporting co-creation with startups via corporate venture capital and carrying out M&A projects. In Japan, we are fostering open innovation at the Nabtesco R&D Center.

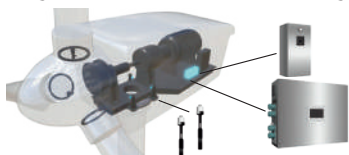
Through these measures we will adopt diverse technologies, increase our development speed, develop human resources in globally important technological fields and press forward with the creation of new products and businesses.

## New Business Creation Activities

### Combining Nabtesco's Unique Motion Control Technologies

Contributing toward prolonging the life of wind turbines and providing safety and a sense of security through future-predicting technology

Outer appearance of the CMFS and diagnostic service(illustrative image)



CMFS is composed of an external load detection sensor, a controller, and a power supply device.



Diagnostic service: Visualization of diagnostic information

### CMFS Equipment for Wind Turbine

Nabtesco launched offering for sale a failure preventive monitoring system for yaw devices used in wind turbines (“Condition Monitoring system with Fail-Safe: CMFS”), along with the launch of a CMFS-based diagnostic service. Wind power is regarded as a promising renewable energy source, and an increasing number of wind turbines are being introduced in Japan and abroad. These turbines are now also being installed in harsh environments, such as on windswept hills in cold areas and in offshore locations.

The yaw device, which optimizes the movement of the wind turbine wings according to wind direction, is constantly subject to external forces. Accordingly, it is necessary to implement measures to prevent the device from quickly becoming worn or damaged.

To meet this requirement, Nabtesco developed the CMFS by making full use of its unique motion control technologies. By controlling the yaw drive unit with high responsiveness through the use of a sensor, the CMFS helps to prevent wind turbine failure and prolong its life. For the CMFS-based diagnostic service, Nabtesco will visualize analytical data on external forces as well as the record of past abnormalities in real time, with an eye toward providing warnings about any abnormalities to users of the system and offer predictions on the remaining life of the drive units, which will in turn help to maintain the reliability of the wind turbines for many years.



<https://www.nabtesco.com/en/products/windpower.html>

For details of Nabtesco’s activities, please visit our website.

Integrated Reports



<https://nabtesco.disclosure.site/en/themes/141>

Sustainability website



<https://nabtesco.disclosure.site/en>

*Innovation In Action*

# Leaders in Innovation for the Future

By contributing to the solution of social challenges through our business operations, we will continue to increase our corporate value.

Nabtesco was founded in 2003 by the integration of two companies: NABCO, Ltd. and Teijin Seiki Co., Ltd., both with long histories. Since then the Company has achieved steady growth by expanding business on a global scale and by producing a range of products and services taking the top spot in the market.

For Nabtesco to achieve sustainable growth toward the future based on "The Nabtesco Way," we need to take environmental, social and governance (ESG) measures proactively. Based on this recognition we are working to increase customer satisfaction and contribute to the sustainable development of local communities with a view to providing all our stakeholders with value, while enhancing our corporate governance and increasing our management transparency.

Nabtesco is steadily increasing its corporate value over time.

## The Nabtesco Way



As an Honorable Company  
Established in the 21st Century

For details regarding  
The Nabtesco Way, please visit:  
<https://www.nabtesco.com/en/company/greeting.html>



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Chairman of the Board

**Kazumasa Kimura**  
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