

DAIHEN REPORT 2020

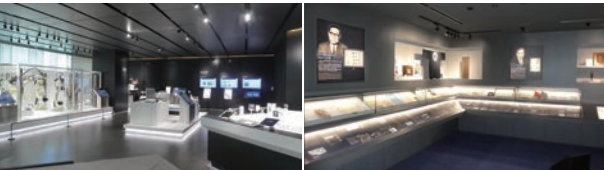


Corporate data

Company name	DAIHEN Corporation
Date established	December 1, 1919
Capital	¥10,596 million
Sales	¥145,044 million (March 2020, consolidated)
Employees	3,876 (As of March 2020, consolidated)
Business	Manufacture, sale and servicing of power equipment, welding machines, industrial robots, RF generators for semiconductor manufacturing, wireless transfer systems, etc.
Head office location	2-1-11 Tagawa, Yodogawa-ku, Osaka 532-8512 Japan Tel: +81-6-6301-1212
Business offices and plants	Juso Business Office (Osaka), Rokko Business Office (Kobe), Mie Business Office (Taki-cho, Mie), Kanehira Plant (Osaka), Chitose Plant (Chitose, Hokkaido)
Regional offices	Hokkaido Regional Office, Tohoku Regional Office, Tokyo Regional Office, Chubu Regional Office, Chugoku Regional Office, Kyushu Regional Office
Website	www.daihen.co.jp



Head Office (Juso Business Office)



Showrooms (1F Head Office)



Our Head Office Building is registered with Osaka City as a Tsunami Evacuation Building.

Executive officers (As of June 25, 2020)

Directors and operating officers

President and Chief Executive Officer	Tetsuya Tajiri
Senior Executive Vice President and Member of the Board	Shigekazu Koshino
Executive Vice President and Member of the Board	Kazuo Kamo
Senior Vice President and Member of the Board	Keiki Morimoto
Senior Vice President and Member of the Board	Shoichiro Minomo
Senior Vice President and Member of the Board	Haruhisa Kimura
Member of the Board	Kusuo Sanjo
Member of the Board	Keiichi Ando

Auditors

Standing Auditor	Naoki Urai
Standing Auditor	Keitaro Takahashi
Auditor	Haruo Urata
Auditor	Masayuki Furusawa
Auditor	Masashi Yoshida

Operating officers / Fellows

Senior Vice President	Shingo Wada	Vice President	Tadashi Kuriyama
Senior Vice President	Kentaro Kaneko	Vice President	Yasuhiko Fujitomi
Senior Vice President	Ichiro Yamano	Vice President	Tong Hongjun
Senior Vice President	Yasuhiro Ohnishi	Vice President	Hideki Imura
Vice President	Yasuhiro Nishimori	Vice President	Kohei Funada
Vice President	Tomoyuki Ueyama	Vice President	Tatsuya Iba
Vice President	Hiroaki Oichi	Vice President	Masana Morioka
Vice President	Ryohei Tanaka	Fellow	Tatsuo Ota
Vice President	Toshiyuki Arai	Fellow	Yuji Yoshizako

Editorial policy

We publish this report to let all of our stakeholders know the kind of business activities we are conducting in the DAIHEN Group and, by doing so, build trust between us. A lot of effort has gone into editing the layout so that people of all walks of life will find the content easy to read and will gain a proper understanding of what we do.

Since last year, we have added more information about our sustainability activities and disclosures, and changed the title from “CSR Report” to (the) “DAIHEN Report”. Going forward, we will continue to upgrade the content of the report by adding information that our stakeholders expect and want.

[Opinions and requests are welcome!]

Your opinions and requests are great sources of information that help us to improve not only this report but also our business activities. Let us know what you think.

DAIHEN Website >> Contact Us >> Other inquiries >> Inquiry form

Reporting period

This report covers fiscal year 2019 (April 1, 2019 to March 31, 2020). This report also contains some information from before fiscal 2019 and after April 2020.

Scope of organizations covered

In principle, this report spans the initiatives of the DAIHEN Group, which comprises DAIHEN Corporation and its consolidated subsidiaries. The environmental report contained herein presents the environmental initiatives of our Group plants — in Tottori, Oita, Matsudo, Eniwa, Hirosaki, Kagawa, and Izumiotsu — that are participating in the environmental management system of DAIHEN Corporation.

Reference guidelines

- Guidelines 2013 of the Global Reporting Initiative (GRI)
- Environmental Reporting Guidelines (Fiscal 2012 Version), Ministry of the Environment, Japan
- Environmental Accounting Guidelines (Fiscal 2005 Version), Ministry of the Environment, Japan
- JIS Z 26000, Japanese Standards Association

Next issue

The next issue of this report is scheduled for summer 2021.

Disclaimer

This report includes our plans and prospects as of the date of publication; projections based on management plans and management policies; and past and current data on the DAIHEN Group. The reader is advised that these projections are assumptions or judgments based on the best information available at the time, and the possibility exists that future business performance may differ due to changes in various conditions, unforeseen results, and changes to forecast business activities.

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Doing what we can to shape a sustainable world

Through its business activities, the DAIHEN Group is making concerted efforts to solve a diversity of social issues and shape a sustainable world.

Since the company's founding in 1919, DAIHEN has helped to improve the electrical infrastructure that powers modern life and elevate manufacturing around the world to new heights by developing and marketing products that society needs — like transformers, welding machines, industrial robots, high-frequency plasma generators, wireless transfer systems and more.

From the very beginning, we have purposely sought to “please our customers and serve society” through the business we do. It was then and is still now our mission to create and deliver products that meet and exceed customer expectations. This drives us to better understand what customers need and do everything within

our power to provide them with greater benefit and added-value.

Within the DAIHEN Group, we also understand society's growing expectations that businesses should be doing more to achieve the SDGs (Sustainable Development Goals) advocated by the United Nations. Viewing it as a top priority, we are looking squarely at societal issues like the damage being caused to the global environment, the labor shortages that are predicted to come from falling birthrates and the need for stronger national resilience, and searching for promising solutions through product development and new business creation.

All of these thought processes underscore our push as a “development-driven

company” and are guiding us, in the last year of our DAIHEN Value 2020 medium-term business plan, to go beyond current product categories to create unique products of future growth potential and, at the same time, transition business from making standalone products to offering complete system solutions. Whether it means to develop products and systems that will build more smart communities or put more EVs on the road, or supply equipment that automates entire factories, we will be making a concerted effort through our business activities at DAIHEN to solve society's woes and shape a sustainable world.

I ask for your continued understanding and support of what we do here at DAIHEN.



田尻 哲也

Tetsuya Tajiri

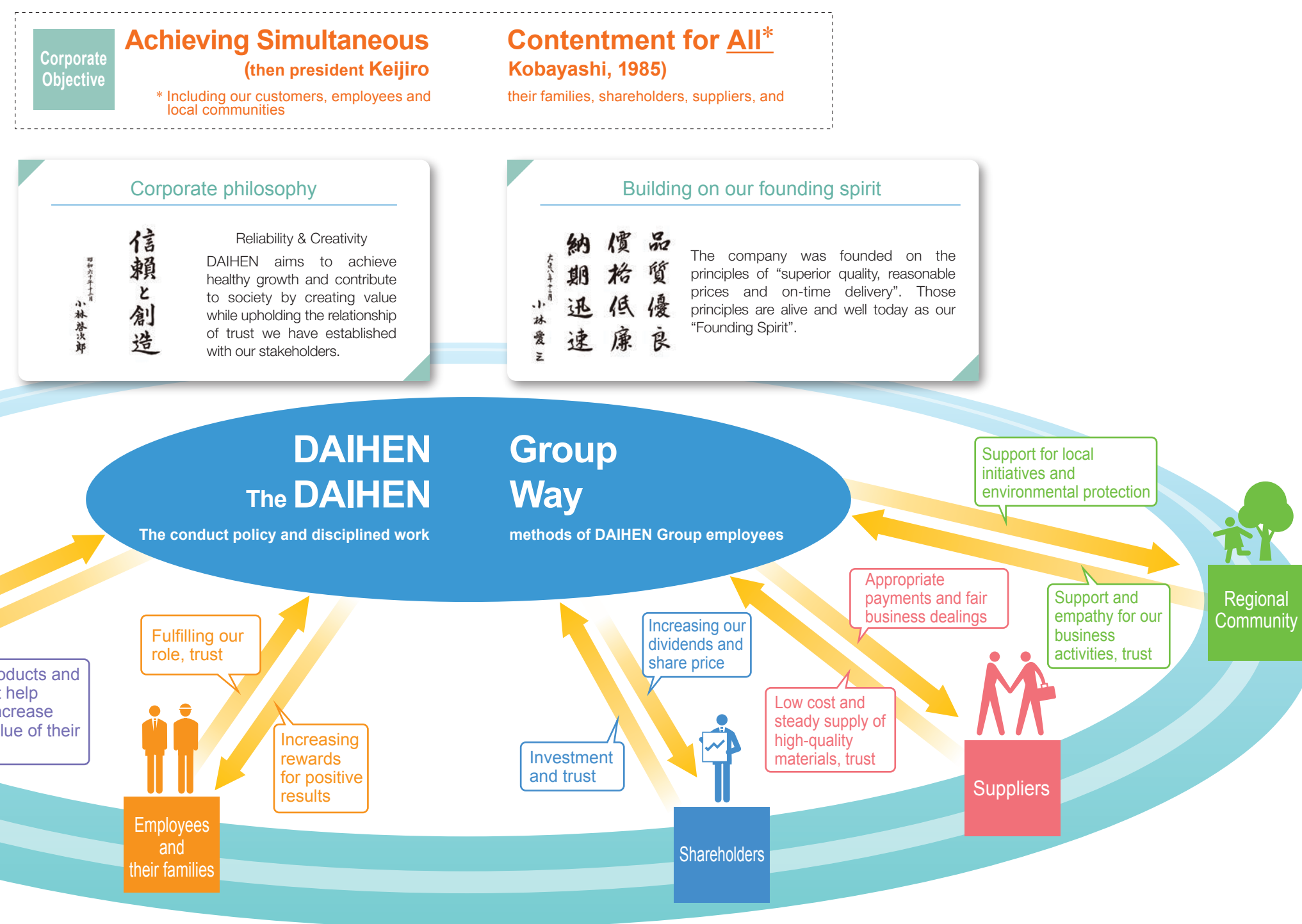
President and Chief Executive Officer

DAIHEN Corporation

The DAIHEN Group is committed to achieving simultaneous “contentment for all”.

Though it may sound like a juggling act, our prime objective in the DAIHEN Group is to make all of our stakeholders – customers, employees and their families, shareholders, suppliers and hosting communities – happy at the same time. We call it “simultaneous contentment for all”. (For an explanation of respective returns we target for each category of stakeholder, see page 10.)

All of the people that work for the DAIHEN Group play an important role in achieving that objective. It requires a concerted effort of our entire workforce and their adherence to the work disciplines and code of conduct we define as the “DAIHEN Way”.



DAIHEN's Action Charter

For the market

- We shall provide safe, high-quality products that meet customer needs and satisfy our customers with timely services and a straightforward response. In this way, we shall win the confidence of our customers through our business activities.
- We shall remain sensitive to change and enthusiastically create new products and technologies while developing new markets.

With our fellow workers

- We shall nurture an environment in which our employees are highly motivated to maximize their abilities and we shall properly evaluate the performance of our employees.
- We shall voice our frank opinions and shall jointly develop a vision for the future as well as an innovation plan. With a strong will, we shall prevail against our competitors.

To win the confidence of shareholders

- We shall continuously develop a stable business so that we can earn profits and increase our corporate value. In addition, we shall publicly disclose accurate information as necessary.

For all our suppliers

- We shall conduct honest trade with our suppliers so that they receive appropriate payment for the products and services they provide.

As members of society

- When we do business, we shall observe the laws and regulations of the corresponding country or region and shall respect their cultural norms and customs. In addition, we shall strive to protect the environment so that we can maintain good relations with society.
- We shall respect human rights and shall treat all people equally. We shall not intrude on personal privacy and shall act sensibly as a member of society.

Doing our part to achieve SDGs

Advocated by the United Nations since 2015, SDGs raise 17 goals societies around the world should strive to achieve with regard to social issues such as poverty, inequality and climate change. As a corporate citizen whose prime objective has long been the “simultaneous contentment for all”, the DAIHEN Group has innately contributed to the sustainable development of society for some time by using our technological abilities to create unique products that fulfill a useful purpose. In fact, every aspect of the businesses we undertake can be tied to goals that are expressed in one way or another by SDGs. Going forward, we are intent on proving ourselves useful to specific causes and making further contributions to sustainable development through even closer correlations between our business activities and SDGs.



Correlations between DAIHEN Group business activities and SDGs

Breakdown		Recent important activities of the DAIHEN Group	ESG qualification	Related SDGs	Read more
DAIHEN's "Contentment for all" prime objective	Customers	<ul style="list-style-type: none">Building a product portfolio of a minimum 40% unique useful products that help customers develop business value and address social challengesInvesting 5% of sales in development in order to continue creating unique useful products	<div>Environment</div> <div>Society</div>	<div>7</div> <div>8</div> <div>9</div> <div>11</div> <div>12</div> <div>13</div> <div>17</div>	Pages 5 and 6
	Employees and their families	<ul style="list-style-type: none">Providing performance-based pay as a "3rd bonus" * Assuming 5% or greater year-on-year increase in operating income: 1 month's pay if ¥8 billion – 2 months' pay (max.) if ¥12 billion	<div>Society</div>	<div>8</div> <div>17</div>	
	Shareholders	<ul style="list-style-type: none">30% dividend ratio against 3-year average profit		<div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>16</div> <div>17</div>	
	Suppliers	<ul style="list-style-type: none">Returning 50% of cost reductions			
	Regional community	<ul style="list-style-type: none">Building a product portfolio of a minimum 75% environment-friendly productsDonating 1% of operating income to child welfare/protection in communities that host important business sites			
3 rd medium-term business plan (fiscal 2018 – 2020)	Development of unique products for new domains and system solutions business	<ul style="list-style-type: none">"Smart Energy Management" Providing products and systems for controlling and managing the growing diversity of decentralized power sources, and products and systems that contribute to the spread of new power applications like EVs, etc.	<div>Environment</div> <div>Society</div>	<div>7</div> <div>8</div> <div>9</div> <div>11</div> <div>12</div> <div>13</div> <div>17</div>	Page 9
		<ul style="list-style-type: none">"Smart Factory Automation" Providing products and systems that help automate entire factories			
		<ul style="list-style-type: none">"Material Fine Processing" Providing new processes for bonding, cutting and processing metals, resins and other materials using high-precision control			
	Group-wide "Loss Cutting (Cost Optimization) Initiative"	<ul style="list-style-type: none">Automating production across the groupImproved productivity of transformers for private sector businesses by introducing straight-through production.Automating back-office operations and eliminating simple jobs using RPA* * RPA (Robotic Process Automation) means to replace and automate repetitive work performed by humans on PC by programming software to do the job.	<div>Environment</div> <div>Society</div>	<div>7</div> <div>8</div> <div>9</div> <div>11</div> <div>12</div> <div>13</div> <div>17</div>	Page 10
Corporate governance	Establishing "D-Servicing" practices via stronger engineering sales	<ul style="list-style-type: none">Monitoring the state of IoT roboticsProduction/Operation management and remote supportLaunched "Remote Maintenance Service"	<div>Society</div>	<div>8</div> <div>12</div> <div>17</div>	Page 10
	Compliance	<ul style="list-style-type: none">Created a Compliance Committee.Imparting compliance education using the DAIHEN Code of Ethics and Guide to Compliance with Laws and RegulationsProviding learning opportunities focused on contracting and individual laws and regulationsEstablished a "Helpline" to prevent and discover illegal acts before they go too far.	<div>Environment</div> <div>Governance</div>	<div>4</div> <div>8</div> <div>9</div> <div>10</div> <div>12</div> <div>16</div>	Page 27
	Risk management	<ul style="list-style-type: none">Strengthening information security (Creation of an Information Security Committee, enforcing an information security policy, promoting awareness activities, etc.)Intellectual property activitiesZero-defects quality activities under our quality policy (Creation of a Quality Management Committee, acquisitions of ISO 9001, implementation of education activities, etc.)Preparations for natural disasters and accidents (Creation of a Health & Safety Committee, registering business sites as Tsunami Evacuation Buildings, stocking emergency supplies, etc.)Internal audits		<div>3</div> <div>4</div> <div>5</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> <div>11</div> <div>12</div> <div>13</div> <div>16</div> <div>17</div>	Page 28

Breakdown		Recent important activities of the DAIHEN Group	ESG qualification	Related SDGs	Read more
Information disclosures to shareholders/investors	Improvements to IR activities	<ul style="list-style-type: none">Personalized IR activities (direct phone calls, telephone surveys and reporting, etc.)Staging IR briefings for institutional investorsReleasing useful information above and beyond legal disclosure requirements swiftly, fairly and accurately via our website and other media	<div>Society</div> <div>Governance</div>	<div>8</div> <div>12</div> <div>16</div> <div>17</div>	Page 31
Materials procurement	Promoting business with suppliers that is mutually beneficial to all parties	<ul style="list-style-type: none">Posting desired materials on our websiteAdopted a basic policy on materials procurement.Holding meetings to explain our procurement policy and practices to suppliers (honoring outstanding suppliers)Promotion of green procurement activities that overtly protect the global environmentCost-reduction activities that emphasize VE/VA proposals	<div>Environment</div> <div>Society</div>	<div>3</div> <div>8</div> <div>9</div> <div>11</div> <div>12</div> <div>13</div> <div>15</div> <div>17</div>	Page 32
Employees (Personnel)	Motivating personnel systems	<ul style="list-style-type: none">Personnel rating system with clear evaluation criteriaFair, acceptable treatmentCareer self-discovery and plotting program and mentoring program for new employeesImplementing level-based training by position/roleAssigning personnel to positions that match their skills and desires (Internal FA system, self-declared career goals)Systems for stimulating the urge to learn (Online learning, support programs for acquiring qualifications/licensing)Promotion of work-life balance	<div>Society</div> <div>Governance</div>	<div>4</div> <div>5</div> <div>8</div> <div>10</div>	Pages 33 and 34
	Creating workplace environments where people of all nature can enjoy working	<ul style="list-style-type: none">Support systems that allow employees to both work and raise children / provide care to family membersHiring persons with physical challengesHiring and proactively using more women in line with the Act on the Promotion of Women's Participation and Advancement in the WorkplaceImparting education on harassmentStrengthening communications (DAIHEN Group Heart Festival etc.)			
Health & Safety	Enforcement of health and safety activities	<ul style="list-style-type: none">Adopted a basic policy of "prioritizing health and safety in all business activities".Improving health and safety levels via audits by expertsReducing our exposure to risks by tracking and managing major risks with ledgersEnforcing the practice of heads-up meetings before starting workStrengthening 6 S (seiri [sort], seiton [keep orderly], seiso [clean], seiketsu [standardize the 3 foregoing activities], shitsuke [sustain the practices] and seibi [service]) activitiesImplementing thorough measures to prevent heat exhaustionEstablished and implemented "Safety Check Day".Improving workplace environments (Earthquake reinforcing work, planting, etc.)	<div>Society</div>	<div>3</div> <div>4</div> <div>8</div> <div>11</div> <div>12</div> <div>15</div> <div>16</div>	Pages 35 and 36
Symbiosis with hosting communities	Communication with hosting communities	<ul style="list-style-type: none">Staging of DAIHEN festivalsHaving business offices partake in and sponsor local eventsDonations to groups that promote public interestsCerezo Osaka Platinum SponsorFactory tours for nearby schools, shadowing and internship opportunitiesDisaster evacuation support for community residentsSocial welfare support (Donating items to community groups for bazaars)Support for education/academics (Dispatching employees to teach at universities)Support for culture/arts (Support activities for philharmonic orchestras etc.)Cleanup activities around business offices/plantsDonations to administrative subrogations regarding waste that contains high concentrations of PCB	<div>Environment</div> <div>Society</div>	<div>1</div> <div>3</div> <div>4</div> <div>8</div> <div>11</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div>	Pages 37 and 38
Promotion of environmental-friendly management	Environmental actions (Volunteer plan of action)	<ul style="list-style-type: none">Keeping EMSs compliant with ISO 14001:2015 or betterPromotion of green procurement activitiesZero tolerance for accidents that harm or impact the environmentCreation of environment-friendly productsExpansion of environment-friendly product lines/businessValue creation for customers via environment-friendly productsImprovements in recycle ratesPractical contributions to preventing climate change (Reductions in CO₂ emissions)Promotion of efforts to protect biodiversity (Reductions in water consumption)Waste reduction (Sorting, efforts with packaging, etc.)Prevention of air pollution (Reductions in emissions of PRTR substances)	<div>Environment</div>	<div>3</div> <div>4</div> <div>5</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> <div>11</div> <div>12</div> <div>13</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div>	Pages 41–43
	Environmental management systems	<ul style="list-style-type: none">Responding to environmental complaints, prevention of reoccurrencesIncreasing opportunities to learn about the environment and implementing internal awareness activitiesInternal environmental audits			Page 45
	Environmental accounting	<ul style="list-style-type: none">Promoting environmental protection activities based on appropriate cost-sharing			Page 46
Energy/Resource-saving activities		<ul style="list-style-type: none">Reductions in energy consumptionUsing our own products to manage and visualize electricity consumptionIntroduction of LED lighting and energy-saving equipmentOperation of solar power systemsThermal insulation for roofs and walls of plantsImplementation of "Cool Biz" and "Warm Biz"Reductions in paper consumption, promotion of paperless practicesPromotion of recycling, recovery and reuse			Pages 47–49

The pages indicated under "Read more" report on DAIHEN Group activities we think represent our best contributions to SDGs.

As a development-driven company that creates products of future growth potential and new values for customers via system solutions

“DAIHEN Value 2020” (3rd medium-term business plan, fiscal 2018 – 2020)

Basic targets (Fiscal 2020)		Basic strategy	1	Promote product development in new domains and develop business in system solutions.
Sales	180 billion yen	Basic strategy	2	Optimize costs group-wide.
Operating income to sales	8%	Basic strategy	3	Strengthen sales engineering capabilities.
ROE	10%			

Basic strategy 1 Promote product development in new domains and develop business in system solutions.

New domains and directions of development

Smart energy management field	Provide products and systems for controlling and managing the growing diversity of decentralized power sources, and products and systems that contribute to the spread of new power applications like EVs, etc.
Smart factory automation field	Provide FA products and systems that help automate entire factories.
Material fine-processing field	Provide new processes for bonding, cutting and processing metals, resins and other materials using high-precision control.

Fiscal 2019 results

Smart energy management field

Increased sales of energy management products

We delivered self-contained solar power systems configured with our proprietary “Synergy Link” control technology to large factories that want to generate electricity themselves and consume the electricity they generate.

Moreover, we increased projects involving our “V2X System” for smart communities that integrates a grid-tied step-down transformer, heavy-duty storage batteries and rapid charging stations for EV/PHEV, and our “Extra-High-Voltage Transformer Package” that greatly downsizes transformer substations on extra-high voltage lines.



Smart factory automation field

Greater support for the FA robot and system business

In addition to expanding the lineups of our handling and transfer robots that efficiently automate operations in limited floor space, we strengthened support for processing, assembly, inspection and other applications.

Moreover, we continue to work with robot system integrators, which led to our purchase of LASOtech Systems GmbH of Germany in December 2019 in order to strengthen support for automated arc welding and upstream/downstream handling in the European market.

Application examples

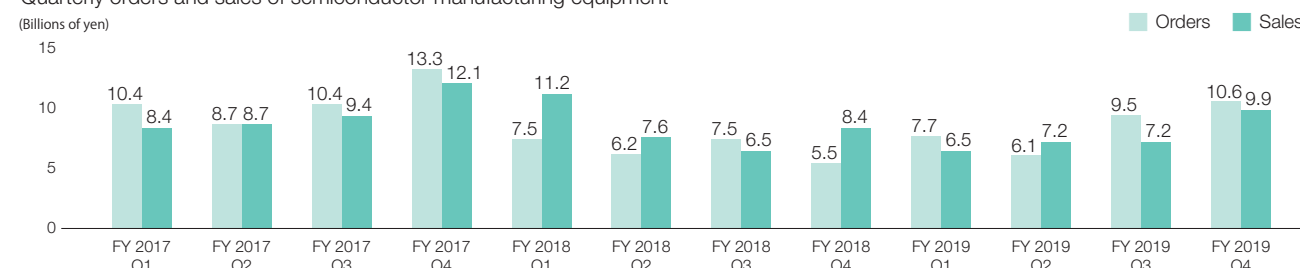


Material fine-processing field

Demand trends for semiconductor equipment (RF generators)

Investment in semiconductor equipment slumped during the first half of fiscal 2019, but recovered in the second half of the year as businesses readied for 5G. Early in 2020, there were fears of supply chain disruptions and falling demand for smartphone and automotive semiconductors because of the spread of COVID-19, but demand for computers is expected to grow because of the increase in teleworking and online learning, and demand for data centers is projected to rise alongside the expansion of 5G networks. Therefore, with all things considered, investment in semiconductor equipment is expected to be robust.

Quarterly orders and sales of semiconductor manufacturing equipment (Billions of yen)



Prime objective of the DAIHEN Group

Simultaneous Contentment for All

Returns targeted for each category of stakeholder

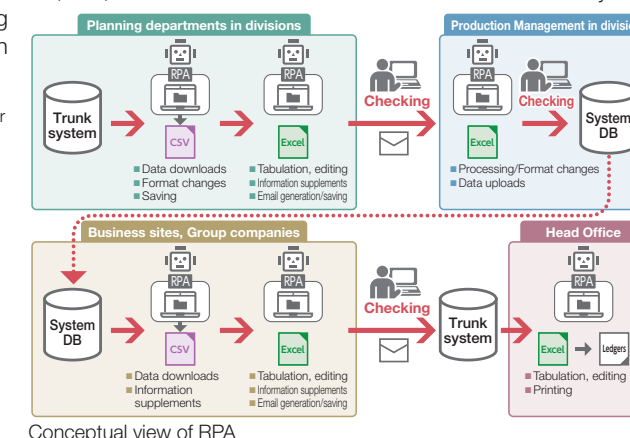
Customers	<ul style="list-style-type: none"> Build a product portfolio of a minimum 40% unique products that help customers develop business value and address social challenges. Invest 5% of sales in development in order to continue creating unique products. 	Shareholders	<ul style="list-style-type: none"> 30% dividend ratio against 3-year average profit
Employees and their families	<ul style="list-style-type: none"> Provide performance-based pay as a “3rd bonus”. * Assuming 5% or greater year-on-year increase in operating income: 1 month's pay if ¥8 billion – 2 months' pay (max.) if ¥12 billion 	Suppliers	<ul style="list-style-type: none"> Return 50% of cost reductions.
		Regional Community	<ul style="list-style-type: none"> Build a product portfolio of a minimum 75% environment-friendly products. Donate 1% of operating income to child welfare/protection in communities that host important business sites.

Basic strategy 2 Optimize costs group-wide.

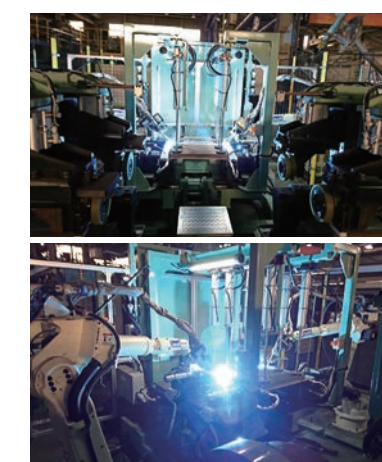
Fiscal 2019 results

The entire DAIHEN Group is engaged in automating production. Producer of pole-mounted transformer cases, Minami Electric Co., Ltd., slashed 2,900 man-hours from their operations by automating processes for circumferentially welding corrugated transformer cases for private sector businesses, while OTC Industrial (Qingdao) Co. Ltd., which makes welding machines and RF generators, eliminated 1,800 man-hours from their operations by automating cutting and welding work for core windings for welding machine power supplies. Moreover, 29,000 man-hours were reduced across trunk system processes by replacing manual work with RPA*.

* Robotic Process Automation: Technology for replacing human-operated computer tasks with software that automates such tasks.



Conceptual view of RPA



Minami Electric Co., Ltd.



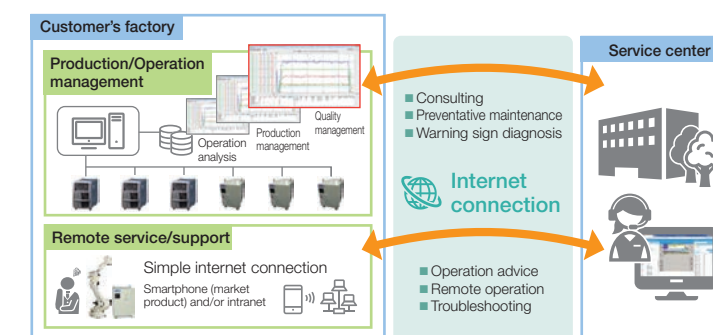
OTC Industrial (Qingdao) Co. Ltd.

Basic strategy 3 Strengthen sales engineering capabilities.

Fiscal 2019 results

Launch of Remote Maintenance Service

We began offering “Remote Maintenance Service” so that customers, especially those who are not versed in robot handling, could use their robots with less stress and worries. By monitoring robot status and operations remotely, we can provide customers with advice on timely recovery operations and equipment installations that helps them to swiftly resolve troubles.



Conceptual view of Remote Maintenance Service

Lighter vehicle chassis realized with the world's first dissimilar materials welding technology and the precision robotic systems that wield it

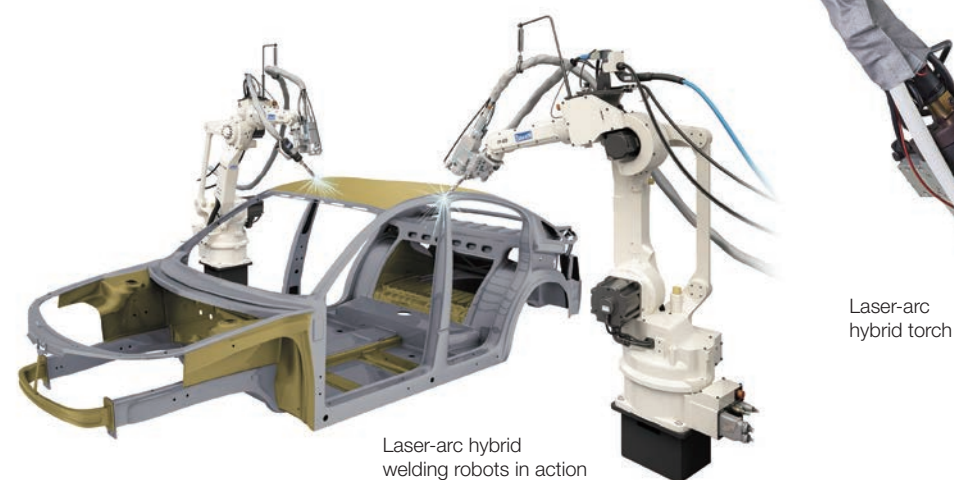
Technology that was believed impossible

Automotive manufacturers around the world are earnestly developing electric vehicles (EV) as part of a greater effort to realize a carbon-free society, but the lower mileage per charge than gasoline-powered vehicles and high manufacturing overhead are major hurdles to putting more EVs on the road. Since the high-capacity battery needed to extend travel ranges is heavy, the vehicle body has to be lighter in order not to detract any mileage gains. There are several materials that are helpful in this regards like high tension steels, aluminum alloys, magnesium alloys and carbon fiber-reinforced plastic, of which aluminum alloys are the mainstream because of the ease with which they can be processed. This has also led to all-aluminum vehicle proposals, though a multiple material approach that selectively uses both steel and aluminum alloy is commonly adopted for cost reasons. To join these materials, mechanical riveting or adhesives are employed, but both of those directions drive up manufacturing costs as well, giving engineers the impetus to seek a way to weld iron and aluminum alloys to road-worthy strength through the widespread use of fused bonding.

Products and technologies intended to solve social issues

Laser-arc hybrid welding

Laser-arc hybrid welding overcomes the brittleness issues associated with welding steel and aluminum alloy by realizing welds of practical strength. This is done by integrating a laser with precision heating control that we developed specifically for joining dissimilar materials, into our "Synchro-Feed Welding Method" that we have tuned over the years for ultra-low heating and spatter. It helps keep the cost of welding materials down because widely available aluminum alloy wire can be used to weld aluminum alloy to the galvanized steel plate (GI) that the automotive industry often uses because of the anti-corrosion benefits. Moreover, it requires about half the processing time of mechanical joining or adhesive bonding, which also helps to significantly reduce manufacturing costs.



Future expectations

To further expand the scope of application of our laser-arc hybrid welding technology, development is underway on a new heating control method that will make it possible to weld aluminum alloy not just to GI but also to galvanized steel alloys (GA) that are advantageous when it comes to press-forming. At DAIHEN, we remain committed to developing products that will help revolutionize manufacturing in ways that will realize a carbon-free world, by expanding the possibilities of dissimilar materials joining.



FD-A20 high precision robot for laser welding system

Our FD-A20 high precision robot pairs well with our laser-arc hybrid welding technology to realize high quality welding. It is a good choice for laser welding and cutting that require consistently high path accuracy across the full movement range, something that posed challenges with earlier robots. The FD-A20 reduces vibrations that occur at the tool-end of the robotic arm during operation by as much as 60%, with an in-house developed multi-link that makes the arm more rigid. Moreover, it increases path accuracy in tight-radius arching motions that can considerably deviate off course 6-fold over earlier levels, with a new control method for correcting minute arm flexing in high-speed operations.

Column

Robotic packages* for automating entire factories

A factory has all sorts of operations going on inside from handling and processing to assembly and inspections, which makes it necessary to bundle the various robots that perform those jobs into a package, in order to automate the entire factory. To do that, DAIHEN is packaging robots with expanded scopes of application into full production lines featuring our signature arc welding operations flanked by upstream and downstream processes.

* Robotic package: Turnkey project of robots and functions developed to control tools and sensors needed for factory operation.

Example robotic package

Process	Job	Figure	Description
Handling	Picking and transfer	1	Automated picking by a robot fitted with a hand. A visual sensor is used to select randomly stacked materials and transfer them to the welding tool in the next process.
Processing	Laser cutting	2	Automated cutting by a high-precision robot fitted with a laser torch. Capable of 3D cutting.
Inspection	Bead appearance inspection	3	Automated inspection of weld beads by a robot mounted with an image sensor. Improves product quality by standardizing inspection criteria.
Assembly	Engagement and assembly	4	Automated engaging and assembly of parts by a robot fitted with a force sensor. Assembles motors and braking gears by carefully adjusting force.
	Screw tightening	5	Automated screw tightening by a robot fitted with a nut runner (tightening tool). Improves product quality by managing tightening torque.

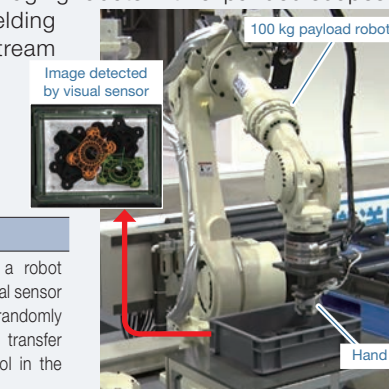


Fig. 1 Picking and transfer

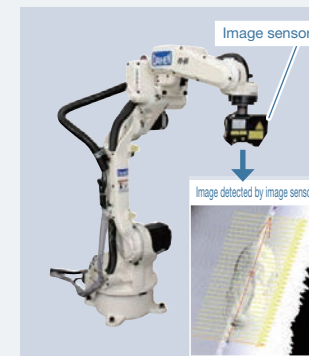


Fig. 3 Bead appearance inspection

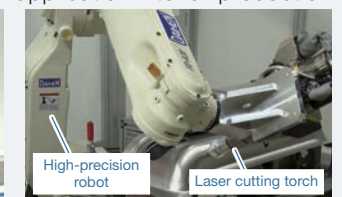


Fig. 2 Laser cutting

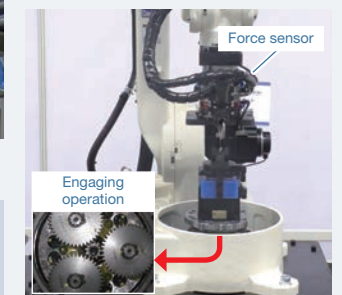


Fig. 4 Engagement and assembly



Fig. 5 Screw tightening

Wireless charging systems

Helping to put more EVs on the road, realize a carbon-free society and revitalize local communities

What wireless charging offers

Amidst the growing awareness of environmental issues, electric vehicles (EV) are drawing attention around the world because they do not emit CO₂, the primary cause of climate change. Self-driving versions of the EV are also being looked at as a hopeful means for elderly persons and other non-drivers to cover the “last one mile” between public transportation and home. But, to put more EVs on the road, they will have to be more convenient for users – longer travel ranges on a single charge, widely available recharging infrastructure and lower costs. DAIHEN's wireless charging systems are moving things in that direction. Since they are wireless and do not need someone to operate, these systems are a viable solution for extending the travel range of EVs and, in conjunction with self-driving technologies, automating the whole process from charging to driving. They are helping to put more EVs on the road and make communities more pleasant and eco-friendly.

Products and technologies intended to solve social issues

Wireless “D-Broad EV® Charging Dock” for sub-compact EV

At DAIHEN, we developed a wireless charging system for the sub-compact Mobility EV using energy conversion, control and a number of other elemental technologies that we have honed over the years. Dubbed the “D-Broad EV® Charging Dock”, the system can tolerate a considerable amount of docking misalignment and is one of the most efficient charging methods in the industry. No cables need to be plugged in to charge the vehicle; charging starts automatically when the Mobility is parked in the appropriate position and detected by the system. Moreover, if combined with a solar power system, users can build a completely grid-independent charging system and never emit even a breath of CO₂ while charging or driving.



EV being charged on the “D-Broad EV® Charging Dock”

■ Social demonstration and road tests of the self-driving Mobility and wireless charging system

Our wireless charging system was selected as charging infrastructure for road tests of the self-driving Mobility conducted in Sakai City, Osaka Pref. in October 2019. The road tests were part of a community revitalization project in Senboku New Town aimed at making the elderly and other non-drivers more mobile and subsequently encouraging them to get out and about on a regular basis. More specifically, a route was mapped out on public roads within the Makizukadai Housing Complex and residents were given rides to identify their transportation needs between places of activity and explore a shuttle service business model using the self-driving Mobility.



Shuttle service between complex entrance and nearest bus stop



Self-driving and self-charging demonstration

As the power source for the wireless charging systems we provided for the road tests, the “Aozora Consent” solar power system made by T. Plan Inc. was used, which demonstrated how this charging infrastructure can help realize a carbon-free society by emitting absolutely no CO₂ while either charging or driving.

■ Roads tests at Expo'70 Commemorative Park

In February 2020, we jointly conducted road tests for a mobility service in Expo'70 Commemorative Park with the Kansai Electric Power Co., Inc. and the Road Test Promotion Team Osaka organized by the Osaka Prefectural and Municipal Governments and the Osaka Chamber of Commerce and Industry. The tests involved shuttling visitors around from their present location to a desired destination that they input into a dedicated app. Upon receiving the information, a 5-person electric cart developed by DAIHEN would pick up and drop off the riders. The cart mounted a wireless charging system that enabled wireless charging by simply parking at a charging dock. Results will be applied toward creating mobility services for suburban residential districts and more.



E-cart driving in Expo'70 Commemorative Park

Future expectations

In order to accelerate the debut and diffusion of our wireless charging systems for EV, research and road tests in cooperation with governmental authorities and business partners are underway in a number of locations. As a result, we are increasingly involved in discussions on cooperation aimed at creating new business. Going forward, we will be working with automotive manufacturers on standardizing and mass-producing wireless charging products for EV, and developing technologies and products that make EVs more practical and help solve social issues, such as in-driving charging and use with drones and other non-EV applications.

Synergy Link

Products configured with our “Synergy Link” autonomous cooperative control technology for decentralized power sources are helping to solve problems in energy management and make communities disaster-resilient.

Hurdles to EMS introduction

Renewable energies like solar power and efficient use of electricity are important toward realizing carbon-free society and securing power sources in a disaster. A promising means for achieving that is an energy management system (EMS) that manages and visualizes energy consumption by appliances, units and other equipment so that users know exactly where their power is going. The only problem, though, is that current EMS are a costly investment because they require high-performance centralized monitoring and control equipment and complex, high-speed control computations that are communicated to each of the loads.

Products and technologies intended to solve social issues

Solving EMS issues with “Synergy Link”

“Synergy Link” is a new control technology developed by DAIHEN to optimize energy usage by synergically linking units and systems, instead of relying on high-performance centralized monitoring and control equipment. Based on autonomous cooperative control of decentralized power sources, Synergy Link installs a small module on each load that allows it to autonomously determine its own output and keeps output of the entire system at the best level by having the loads cooperate amongst themselves. It makes expensive equipment that was conventionally used to centrally monitor and control power systems unnecessary, which greatly brings down initial costs.

■ Maximized solar power for factory self-consumption

Normally, factories that generate solar power for their own consumption turn down system output ahead of holidays and other days of low expected demand so as not to trip the system's reverse power relays*, but this misses out on a golden opportunity to generate power. However, a system configured with Synergy Link maximizes the amount of solar power that the factory can have at its disposal by optimally charging and tapping stacks of storage batteries that are included in the system, according the demand situation at the factory.



* Reverse power relay: A device that prevents any surplus of generated power from flowing backwards into the power grid. Users that generate solar power for their own consumption are required to fit their system with a reverse power relay at the grid tie-in point to prevent electric power from flowing backwards into the power grid.

■ Preparing for disasters with our V2X System* and EV

Interest is growing in business continuity planning for the purpose of securing power sources in a disaster. Our V2X System is an emergency power system comprised of storage batteries and 2-way charging stands that can stably supply power over an extended period of time during an emergency. In ordinary times, it is used as a charging station or supplemental power system during peak hours of demand.

Furthermore, if configured with Synergy Link, a V2X System can control and virtually operate a number of storage battery units and up to five EVs as a single large-capacity storage battery system. During widespread blackouts and other emergencies, it ensures a stable supply of power not only for lighting and air-conditioning at evacuation shelters but also for infrastructure that requires a high-voltage 3-phase supply such as elevators and water pumps, thus playing a key role in maintaining living conditions until power grids are restored.



* V2X System: Acronym for “Vehicle to Everything”. Collectively refers to technologies and systems that share power between vehicles with batteries like an EV and homes, buildings and power grids. Also refers to the technologies and systems that vehicles use to exchange information.

Future expectations

An EMS is key to building a virtual power plant (VPP)*, a concept that is currently undergoing verification testing. Besides the financial merits it offers by sidestepping investment in large power generating infrastructure, it is also promising from the perspective of realizing a carbon-free society. DAIHEN is participating in diverse national projects where Synergy Link is being promoted in technology development, verification testing and social system design for the realization of VPP.

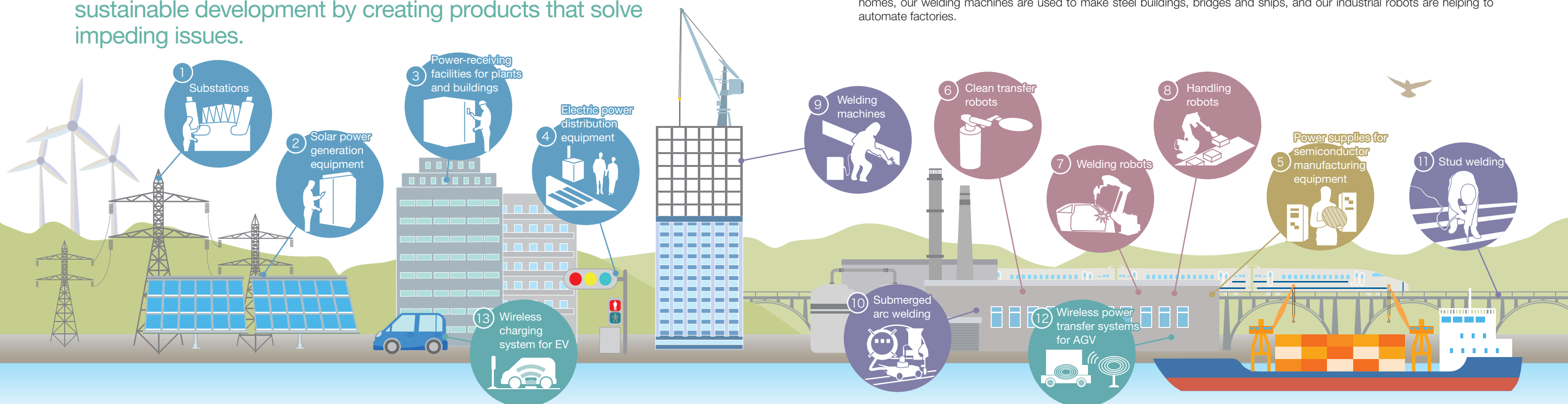
* VPP: A new concept in power system that uses IoT to virtually control and operate multiple small power plants and energy sources dispersed across a power grid like solar power systems, storage batteries and EVs, as a single power plant.



Large-scale storage battery system

The DAIHEN Group is helping to reshape human society for sustainable development by creating products that solve impeding issues.

Just about anywhere you look, you can see how products from the DAIHEN Group have been used to make communities, industries and ways of life better. Our electrical power equipment supplies electricity to factories, buildings and homes, our welding machines are used to make steel buildings, bridges and ships, and our industrial robots are helping to automate factories.



Power transmission & distribution products



1 Power transformers

Developed for long service-lives, low power loss, low noise emissions and compact sizes, DAIHEN's high-quality power transformers are contributing to stable power supplies wherever they are used.



2 Power conditioners

DAIHEN has greatly reduced power consumption compared to earlier air-conditioned systems, by incorporating the industry's first air-cooled heat exchanged cooling system into these power conditioners (Awarded the Energy Conservation Grand Prize by the Energy Conservation Center, Japan in 2015).



2 3 Solar power generation package with built-in storage batteries

These package systems combine a solar power system with a series of storage batteries. The electricity generated by the solar power system is efficiently consumed by optimally charging and tapping the storage batteries, which is helping factories, buildings and other sites to lower both their electricity bills and CO₂ emissions.



3 V2X Systems

These systems cleverly integrate EV/PHEV charging stations and a series of storage batteries. They are helping to make communities more disaster-resilient by supplying electrical power from the EVs and battery set to important loads such as evacuation shelters during outages and other emergencies.



3 Top-runner transformer

Because it operates very efficiently with minimal electricity loss and reduces CO₂ emissions, this transformer is classified as a top-runner.



4 Step voltage regulator

These units support a stable supply of power through optimal voltage control in order to overcome voltage fluctuations on the transmission lines, such as those resulting from interconnection with dispersed power sources.



4 Pad-mounted transformer

Supports effective underground power distribution as well as landscape conservation in urban areas while preventing disasters and securing space for roads.



4 Pole-mounted transformer

Our pole-mounted transformers step down the high-voltage electricity carried over the power lines to a practical voltage that people and businesses can use, making them an integral part of stable power supplies.

RF generator for plasma applications



5 RF generator

These generators stably produce the high-quality plasma essential to manufacturing semiconductor devices. They are designed and built to sustainably develop industries that drive technological advances like IoT and AI.

5 Microwave supply system

Industrial robots



6 Wafer transfer robot

These robots speedily and accurately transfer silicon wafers in clean environments where not even a speck of dust is tolerable. They are helping to improve the productivity of semiconductor devices that underscore an energy-saving smart society.



7 Arc welding robot

Highly articulate and agile, our welding robots are a big contribution to factory automation and the higher quality welding targeted with that.



8 Handling robot

Robots are increasing productivity and making up for labor shortages by nimbly and correctly performing simple factory jobs like transferring, assembling and processing parts and materials.

Welding machines



9 Digital inverter welding machine

Because our welding products are designed to save power and ensure safety on top of delivering the world's highest level of welding and cutting performance, DAIHEN is helping industries to increase productivity and protect the global environment at the same time.



10 Submerged arc welding machine

Wireless charging



11 Stud welding machine

Stud welding is method for joining steel beams and concrete using wedge-like pins known as "studs". It is widely used in the construction industry to erect buildings and bridges. DAIHEN's stud welding machines are used for building projects all across cities.



12 Wireless power transfer system for AGV (Automated Guided Vehicle)

These systems enable highly efficient charging without any cables. They are helping to automate factory operations, reduce labor and improve productivity.



13 Wireless charging system for EV

This system can quickly and efficiently charge EVs up to a max. 11 kW. It makes charging easier for users, which should help promote the spread of EVs and, in turn, steer societies toward lower consumption of carbon-based fuels.

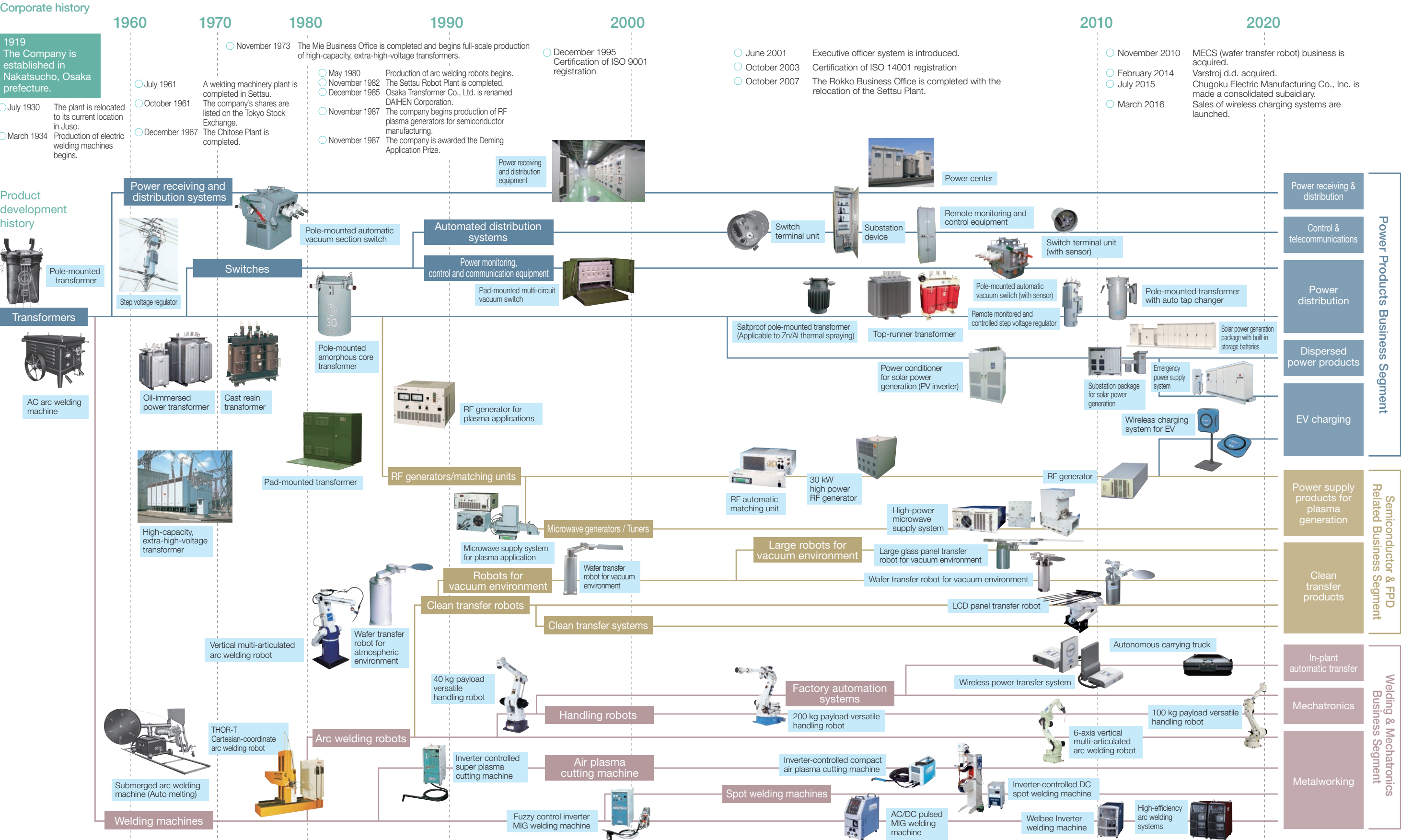


13 Wireless charging system for sub-compact EV

By promoting the spread of EVs, this charging station will not only help communities to shrink their carbon footprint but also to offer eco-friendly means of transportation for covering the "last one mile" in an aging society.

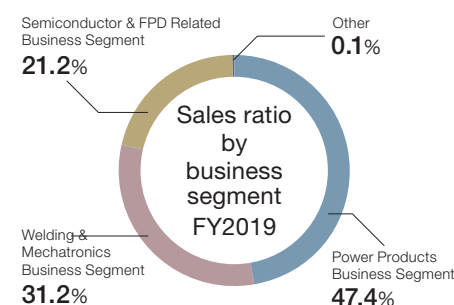
Since our founding, we have continuously pursued technological innovation in order to meet the needs of society. Here are some of the big moments of the DAIHEN Group.

Since the company's founding in 1919, DAIHEN has always sought the latest technologies in order to create values that meet the needs of society – those values manifested in the form of transformers, welding machines, industrial robots, semiconductor manufacturing equipment and a plethora of other products. With diligence and commitment, we have helped to improve the electrical infrastructure that powers modern life and elevate manufacturing around the world to new heights. Going forward, we want please our customers and serve society to even greater degrees by building original values that address society's woes into the products and services we provide.



Three business fronts where we are helping to improve the electrical infrastructure that powers modern life and elevate manufacturing around the world to new heights

Though DAIHEN began by making solely transformers at first, we quickly got a rhythm for developing products and technologies that society has needed, e.g., applying what we knew about transformers to developing welding machines, responding to the needs to robotize welding work, and transitioning welding control into RF generators for manufacturing semiconductors. The trust and technologies we have cultivated in these three areas of business are the foundations we cite in our “DAIHEN Value 2020” medium-term business plan for continuously creating unique products that improve the social value of our customers’ business, transitioning our own business from standalone products to system solutions and seeking ways to solve issues that burden society through business.

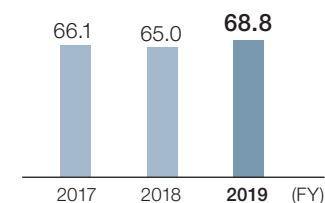


Power Products Business Segment



“V2X System”
emergency power supply package

Sales (Billions of yen)



Overview

Power equipment is where DAIHEN got started. The company began by making pole-mounted transformers in the 1910s when the first electrical grids were branching out across Japan. Ever since then, we have been a leading manufacturer of transformers and supplied vast numbers of highly reliable products, thus making a major contribution to ensuring the stable supply of electricity society cannot do without.

Today, we are proactively engaged in developing products that meet the additional social demands of the new era, namely resource conservation, energy-savings and environmental friendliness. When completed, these products not only deliver electrical power safely and assuredly but they are also better for the environment.

Performance in fiscal 2019

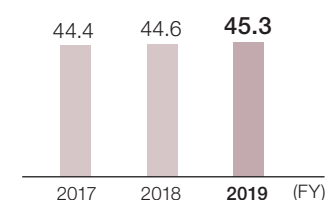
In the power products business segment, sales of high-capacity transformers increased on robust investment in stronger electrical grids and the delivery of 500 KV class transformers overseas to power companies in Thailand. As a result, sales were 68,812 million yen (up 5.9% from the previous year). Moreover, copper prices dropped from the previous year, which, coupled with the effect of improved sales, resulted in operating income of 6,234 million yen (up 2,437 million yen from the previous year).

Welding & Mechatronics Business Segment



Synchro-feed welding system

Sales (Billions of yen)



Overview

Welding is one of the elemental technologies that modern manufacturing cannot do without. It has played a principle role in building everything from cars, trains and ships to megastructures like bridges and towers. Over the years, DAIHEN has masterfully wielded its proprietary control technologies to make and supply welding machines that meet the needs of production sites. And, we have integrated mechatronics into those technologies to develop welding robots. As one of the top manufacturers of welding equipment in the world, we are helping customers to automate their welding processes and improve their productivity and quality so that they can successfully globalize their business.

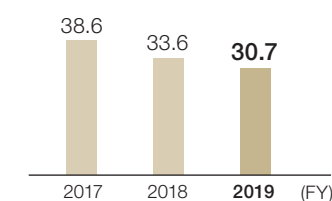
Performance in fiscal 2019

In the welding and mechatronics business, sales were 45,324 million yen (up 1.5% from the previous year), owing to strong investment from domestic auto manufacturers and efforts to strengthen business in Europe. Nevertheless, because of the trade friction between the USA and China, we were met with fierce competition on the Chinese market, which led to operating income of 4,011 million yen (down 483 million yen from the previous year).

Semiconductor & FPD Related Business Segment



Sales (Billions of yen)



Overview

Life in many parts of the world today is comfortable and affluent because of LCD-TVs, smartphones and tablets. DAIHEN’s plasma generators and clean transfer robots are hard at work in the clean rooms and factories that are manufacturing the semiconductor devices and flat panel displays that are instrumental to these products. Our advanced technologies are helping to keep production plants around the world running 24 hours a day, 365 days a year.

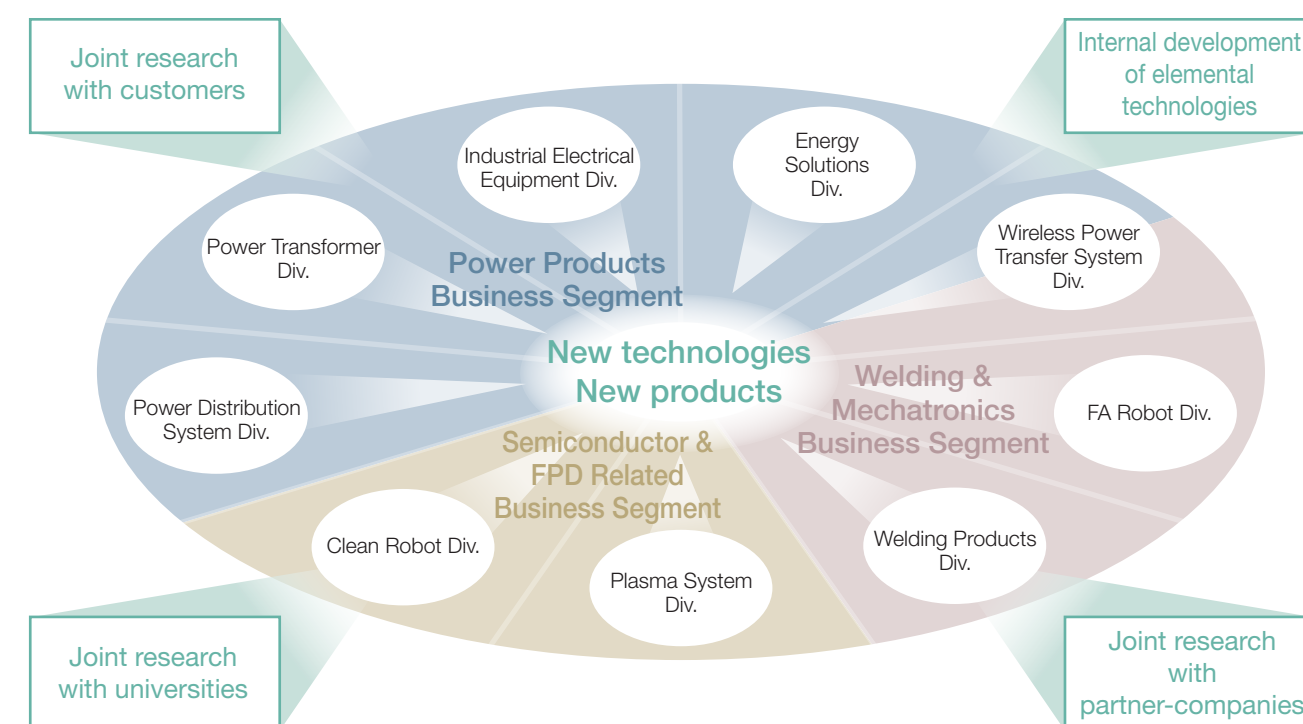
Performance in fiscal 2019

In the semiconductor and FPD related business segment, investment in semiconductor manufacturing equipment recovered in the second half of the fiscal year, as businesses readied themselves for the next generation 5G high-speed communication networks, resulting in orders of 33,872 million yen (up 26.6% from the previous year). However, the slump in investment during the first half of the year kept both sales and operating income down at, respectively, 30,780 million yen (down 8.5% from the previous year) and 3,271 million yen (down 681 million yen from the previous year).

Sales and operating income from real-estate leasing and other business did not change much from the previous year at, respectively, 200 million yen and 63 million yen.

New business (R & D)

DAIHEN has cultivated and refined the power transformation and control technologies it has accumulated over the years into original core technologies by organically integrating them with the technological advances that emerge from the processes of social and scientific evolution. From this base of power electronics and mechatronics, we are aggressively promoting research and development both internally on our own and jointly in cohort with universities, private research institutes and other interests in an effort to create and foster new pillar businesses of the next generation.



DAIHEN creates value as a consolidated group of companies that do it all from manufacturing to sales and servicing.

●:Consolidated subsidiary

●:Non-consolidated subsidiary accounted for by equity method

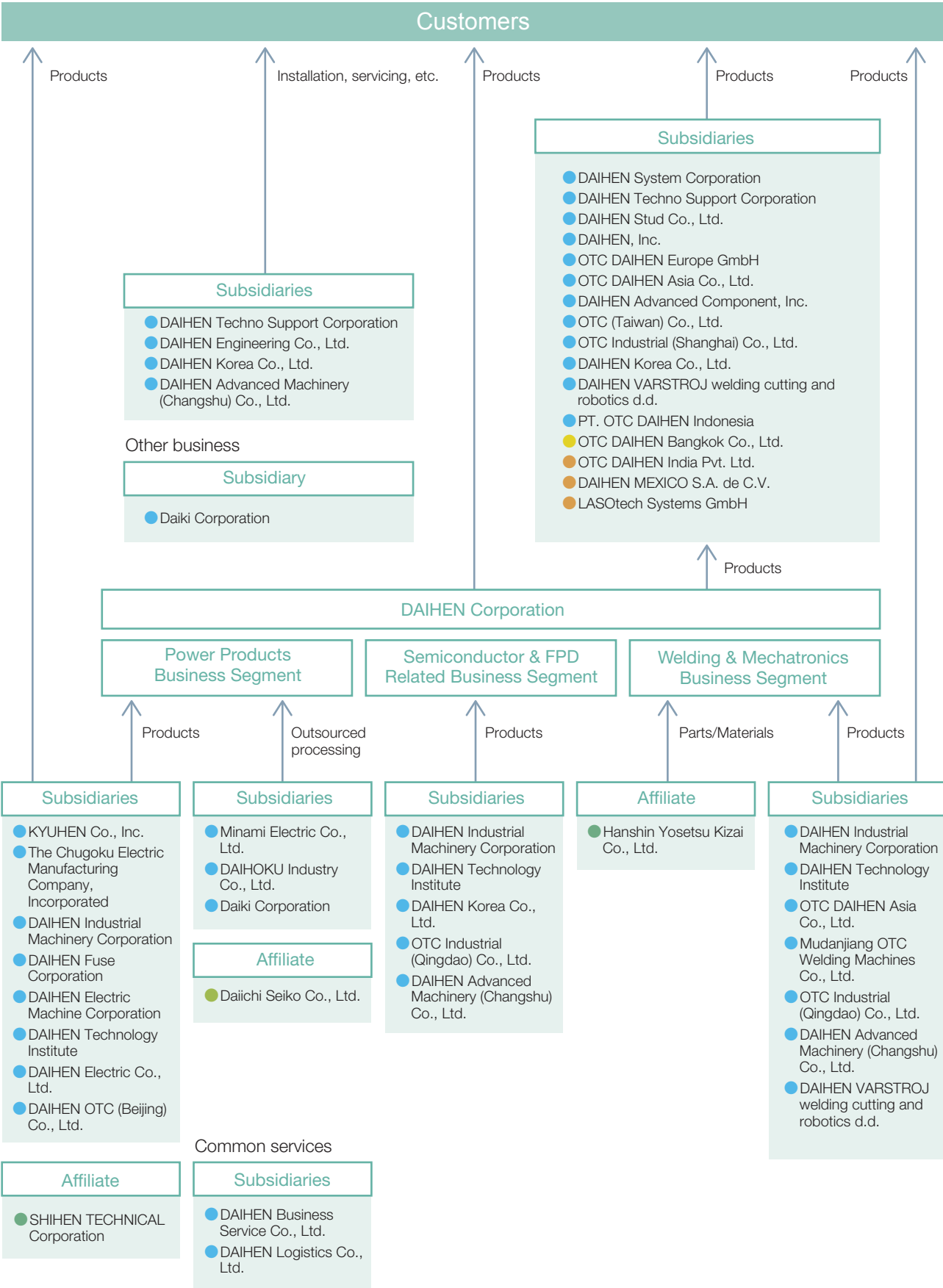
●:Non-consolidated subsidiary

●:Affiliated company accounted for by equity method

●:Affiliated company not accounted for by equity method

Segment ... Main products	Manufacturing	Sales, servicing, etc.
<div>Power Products Business Segment</div> <div>Power transmission and distribution products</div>	<div>DAIHEN Corporation</div> <div>● KYUHEN Co., Inc.</div> <div>● The Chugoku Electric Manufacturing Company, Incorporated</div> <div>● DAIHEN Industrial Machinery Corporation</div> <div>● DAIHEN Fuse Corporation</div> <div>● DAIHEN Electric Machine Corporation</div> <div>● Minami Electric Co., Ltd.</div> <div>● DAIHEN Technology Institute</div> <div>● DAIHOKU Industry Co., Ltd.</div> <div>● Daiki Corporation</div> <div>● DAIHEN Electric Co., Ltd.</div> <div>● DAIHEN OTC (Beijing) Co., Ltd.</div> <div>● SHIHEN TECHNICAL Corporation</div> <div>● Daiichi Seiko Co., Ltd.</div>	<div>DAIHEN Corporation</div> <div>● KYUHEN Co., Inc.</div> <div>● The Chugoku Electric Manufacturing Company, Incorporated</div> <div>● DAIHEN System Corporation</div> <div>● DAIHEN Techno Support Corporation</div> <div>● DAIHEN Engineering Co., Ltd.</div> <div>● DAIHEN Electric Co., Ltd.</div> <div>● SHIHEN TECHNICAL Corporation</div>
<div>Welding & Mechatronics Business Segment</div> <div>Welding machines, industrial robots, wireless charging systems</div>	<div>DAIHEN Corporation</div> <div>● DAIHEN Industrial Machinery Corporation</div> <div>● DAIHEN Stud Co., Ltd.</div> <div>● DAIHEN Technology Institute</div> <div>● OTC DAIHEN Asia Co., Ltd.</div> <div>● Mudanjiang OTC Welding Machines Co., Ltd.</div> <div>● OTC Industrial (Qingdao) Co., Ltd.</div> <div>● DAIHEN Advanced Machinery (Changshu) Co., Ltd.</div> <div>● DAIHEN VARSTROJ welding cutting and robotics d.d.</div> <div>● LASOtech Systems GmbH</div> <div>● Hanshin Yosetsu Kizai Co., Ltd.</div>	<div>DAIHEN Corporation</div> <div>● DAIHEN Techno Support Corporation</div> <div>● DAIHEN Stud Co., Ltd.</div> <div>● DAIHEN, Inc.</div> <div>● OTC DAIHEN Europe GmbH</div> <div>● OTC DAIHEN Asia Co., Ltd.</div> <div>● OTC (Taiwan) Co., Ltd.</div> <div>● OTC Industrial (Shanghai) Co., Ltd.</div> <div>● DAIHEN Korea Co., Ltd.</div> <div>● PT. OTC DAIHEN Indonesia</div> <div>● DAIHEN VARSTROJ welding cutting and robotics d.d.</div> <div>● OTC DAIHEN Bangkok Co., Ltd.</div> <div>● OTC DAIHEN India Pvt. Ltd.</div> <div>● DAIHEN MEXICO S.A. de C.V.</div> <div>● LASOtech Systems GmbH</div>
<div>Semiconductor & FPD Related Business Segment</div> <div>RF generators for semiconductor manufacturing</div>	<div>DAIHEN Corporation</div> <div>● DAIHEN Industrial Machinery Corporation</div> <div>● DAIHEN Technology Institute</div> <div>● DAIHEN Korea Co., Ltd.</div> <div>● OTC Industrial (Qingdao) Co., Ltd.</div> <div>● DAIHEN Advanced Machinery (Changshu) Co., Ltd.</div>	<div>DAIHEN Corporation</div> <div>● DAIHEN Techno Support Corporation</div> <div>● DAIHEN Advanced Component, Inc.</div> <div>● DAIHEN Korea Co., Ltd.</div> <div>● DAIHEN Advanced Machinery (Changshu) Co., Ltd.</div>
<div>Real-estate leasing, etc.</div>		<div>● Daiki Corporation</div>

The DAIHEN Group is composed of the parent DAIHEN Corporation, 38 subsidiaries and six affiliates. As our main line of business, we manufacture, sell and service power transmission and distribution products, welding machines, industrial robots, RF generators for semiconductor manufacturing and wireless charging systems. The group is organized by line of business, business segment and affiliation as shown below.

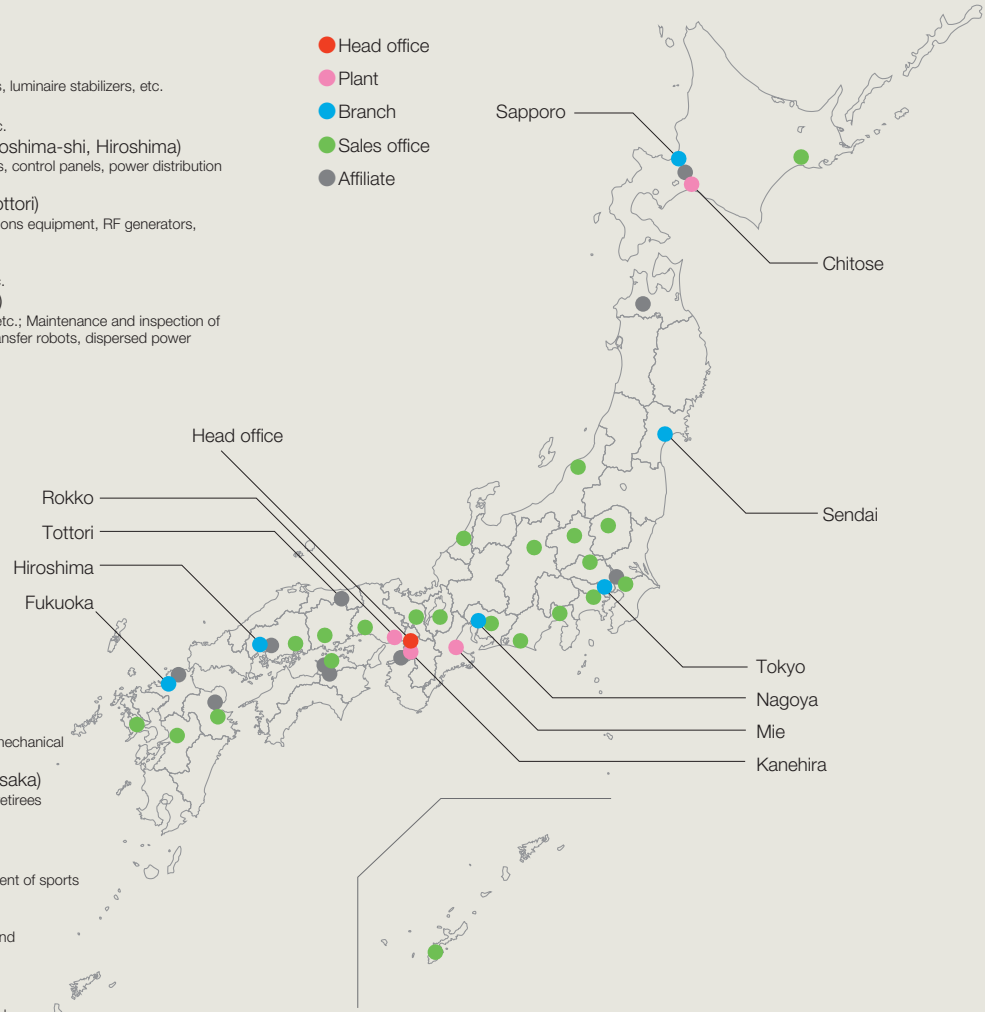


The DAIHEN Group tailors its services to each specific market and uses every strength it can muster from across the group to help customers solve their issues.

Network in Japan

Main group companies

- Shihen Technical Corp. (Tadotsu-cho, Kagawa)
Manufacture and sale of power transformers, electronic devices, luminaire stabilizers, etc.
- Kyuhen Co., Inc. (Fukutsu-shi, Fukuoka)
Manufacture and sale of power transformers, water heaters, etc.
- The Chugoku Electric Manufacturing Co., Inc. (Hiroshima-shi, Hiroshima)
Manufacture and sale of power transformers, distribution panels, control panels, power distribution equipment, monitoring and control systems, etc.
- DAIHEN Industrial Machinery Corp. (Tottori-shi, Tottori)
Manufacture of welding machines, control and telecommunications equipment, RF generators, dispersed power equipment, etc.
- DAIHEN System Corp. (Osaka-shi, Osaka)
Sale of industrial transformers, dispersed power equipment, etc.
- DAIHEN Techno Support Corp. (Kobe-shi, Hyogo)
Sale of welding machines, cutting machines, industrial robots, etc.; Maintenance and inspection of welding machines, cutting machines, industrial robots, clean transfer robots, dispersed power equipment, etc.
- DAIHEN Stud Co., Ltd. (Kobe-shi, Hyogo)
Sale of welding machines; Manufacture and sale of welding materials; Welding work
- DAIHEN Electric Machine Corp. (Osaka-shi, Osaka)
Manufacture of industrial transformers
- DAIHEN Fuse Corp. (Izumotsu-shi, Osaka)
Manufacture of fuses, power distribution equipment/parts and surge protective devices
- DAIHEN Aomori Corp. (Hirosaki-shi, Aomori)
Manufacture of fuses and power distribution equipment
- Minami Electric Co., Ltd. (Tadotsu-cho, Kagawa)
Manufacture and processing of cans, sheet metal and related mechanical fittings
- DAIHEN Technology Institute (Kitsuki-shi, Oita)
Manufacture of clean transfer robots, dispersed power equipment, wireless power transfer systems, etc. Development of software.
- Daihoku Industry Co., Ltd. (Eniwa-shi, Hokkaido)
Manufacture and processing of cans, sheet metal and related mechanical fittings
- DAIHEN Business Service Co., Ltd. (Osaka-shi, Osaka)
Human resource placement by rehiring former DAIHEN Group retirees
- DAIHEN Logistics Co., Ltd. (Osaka-shi, Osaka)
Shipping and storage of DAIHEN Group products
- Daiki Corp. (Osaka-shi, Osaka)
Processing of transformer parts; Real-estate leasing; Management of sports facilities
- DAIHEN Engineering Co., Ltd. (Osaka-shi, Osaka)
Installation, testing, servicing, and remodeling of transformers and power receiving and distribution equipment
- DAIHEN Welfare Enterprise Co., Ltd. (Osaka-shi, Osaka)
Health and welfare services for employees of DAIHEN Corp. and subsidiaries



● Head Office (Juso Business Office)
Manufacture and sale of power transmission and distribution products and semiconductor devices



● Rokko Business Office
Sale of welding machines; Manufacture and sale of industrial robots etc.



● Mie Business Office
Manufacture of power transformers



● Chitose Plant
Manufacture of power transmission and distribution products



● Kanehira Plant
Servicing of pole-mounted transformers

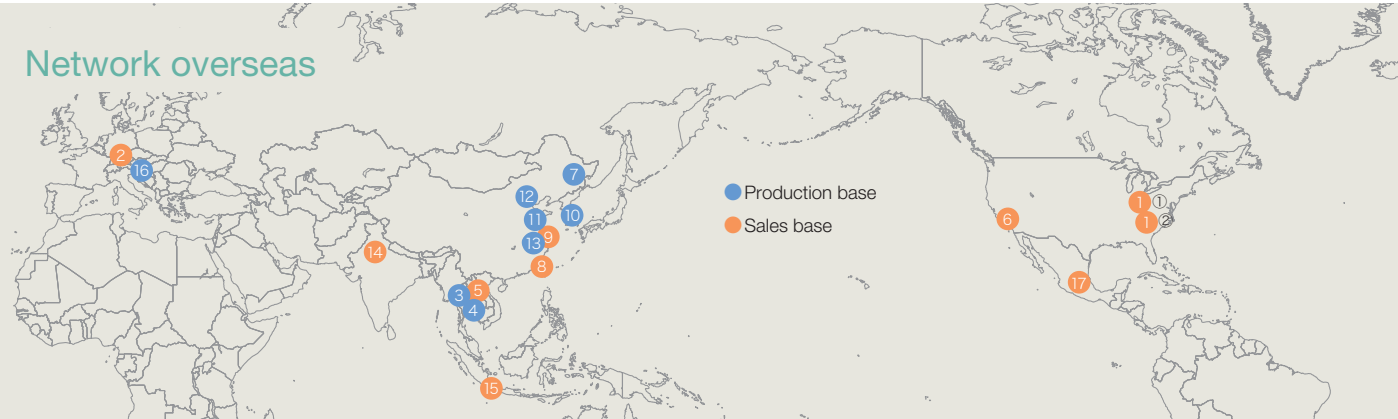


● DAIHEN Industrial Machinery Corp.
Manufacture of welding machines, control and telecommunications equipment, RF generators, dispersed power equipment, etc.



● DAIHEN Technology Institute
Manufacture of clean transfer robots, dispersed power equipment, wireless power transfer systems, etc. Development of software.

Network overseas



DAIHEN, Inc. (USA) ① Dayton Office
Sale of welding machines, cutting machines, industrial robots, etc. in North, Central and South America



DAIHEN, Inc. (USA) ② Charlotte Office
Sale of welding machines, cutting machines, industrial robots, etc. in North, Central and South America



OTC DAIHEN Europe GmbH (Germany)
Sale of welding machines, cutting machines, industrial robots, etc. in Europe



OTC DAIHEN Asia Co., Ltd. (Thailand)
Manufacture and sale of welding machines, cutting machines and related parts in Southeast Asia and Oceania



DAIHEN Electric Co., Ltd. (Thailand)
Manufacture and sale of power transformers, etc.



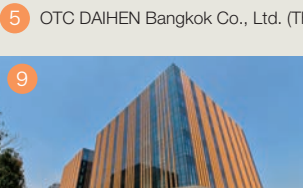
DAIHEN Advanced Component, Inc. (USA)
Sale of RF generators, clean transfer robots, etc.



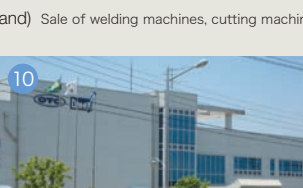
Mudanjiang OTC Welding Machines Co., Ltd. (China)
Manufacture of welding machines and related parts



OTC (Taiwan) Co., Ltd.
Sale of welding machines, cutting machines, industrial robots, etc.



OTC DAIHEN Bangkok Co., Ltd. (Thailand)
Sale of welding machines, cutting machines, welding/cutting torches, industrial robots, etc.



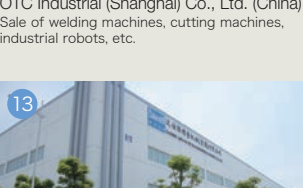
DAIHEN Korea Co., Ltd.
Manufacture, sale, maintenance and inspection of welding machines, cutting machines, industrial robots, RF generators, clean transfer robots, etc.



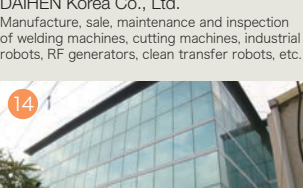
OTC Industrial (Qingdao) Co., Ltd. (China)
Manufacture of welding machines and related parts, RF generators, etc.



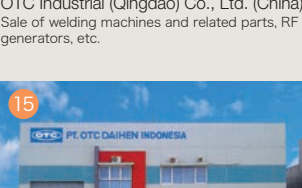
DAIHEN OTC (Beijing) Co., Ltd.
Manufacture and sale of transformers, etc.



DAIHEN Advanced Machinery (Changshu) Co., Ltd. (China)
Manufacture, sale, maintenance and inspection of clean transfer robots, etc.



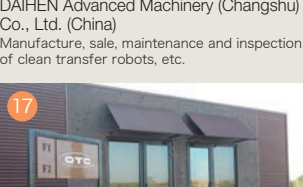
OTC DAIHEN India Pvt. Ltd.
Sale of welding machines, cutting machines, industrial robots, etc.



PT. OTC DAIHEN INDONESIA
Sale of welding machines, cutting machines, industrial robots, etc.



DAIHEN Vastroj welding cutting and robotics d.d. (Slovenia)
Manufacture and sale of welding machines and system products in Europe



DAIHEN Mexico S.A. de C.V.
Sale of welding machines, cutting machines, industrial robots, etc.



Osaka Transformer Co., Ltd.
OTC is the brand name DAIHEN uses outside of Japan.

To please our customers and contribute to the world, we remain focused on developing DAIHEN products that offer unique added value.

Fiscal 2019 results for DAIHEN Corporation and consolidated subsidiaries

In the latter half of fiscal 2019, investment in semiconductor manufacturing equipment regained some ground from the sluggishness that had characterized the first part of the year, which resulted in a slight increase for the DAIHEN Group over the previous year to 145,044 million yen (up 1.1% from the previous year).

On the profit front, operating income was up 8.3% from the previous year at 9,065 million yen (up 696 million yen from the

previous year), thanks to cost reductions from “Loss Cutting Initiatives” like automating production processes and making efficiency improvements to indirect operations. Ordinary income was 9,356 million yen (up 638 million yen from the previous year), while profits attributable to the owners of the parent were 6,672 million yen (up 506 million yen from the previous year).



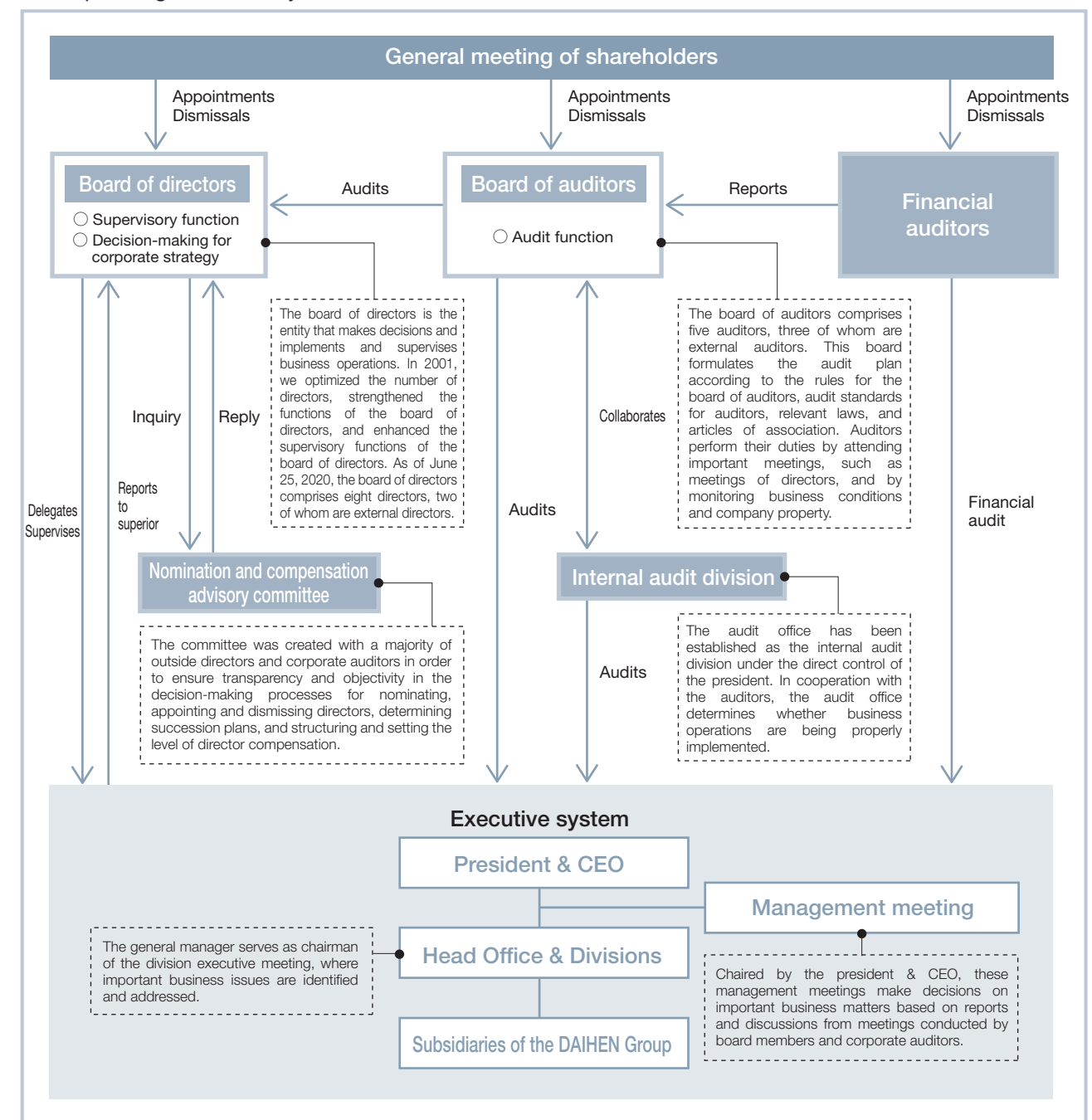
Ensuring management transparency and thorough compliance

An underlying principle of all our operations is to win the trust of our customers and all elements of society. The DAIHEN Group is striving to enrich its corporate governance in order to improve the transparency of management and ensure full compliance.

Efforts in corporate governance

The DAIHEN Group maintains a board of auditors that monitors the business undertaken by the board of directors. In June 2001, we adopted an executive officer system and enhanced the decision-making and supervisory functions of the board of directors to ensure the efficient operation of our business.

Corporate governance system



Compliance and Risk Management Initiatives

In addition to fulfilling our corporate social responsibility, we continue to seek ways to improve compliance awareness among all our employees. We are addressing this issue by implementing various initiatives intended to ensure that we do not betray the trust of the public.

In the area of risk management, we streamlined our manuals and regulations and instituted training in preparation for natural disasters and accidents; moreover, we have developed a system to serve as a framework for ensuring compliance in relation to risks associated with misconduct and legal violations.

As for risks related to rapidly developing information systems and the intellectual property field, we are addressing risk management through workshops, enacting various rules and regulations, and keeping employees informed throughout the company.

A Compliance Committee up and running

We created a Compliance Committee in order to build, put into action and maintain a compliance management system. It is chaired by the Director of Compliance and composed of planning department managers from the respective divisions, department heads from the head office, etc. As a committee, they plan and promote compliance activities of the DAIHEN Group, and report and discuss issues that occur.

The DAIHEN Code of Ethics

As the basis for our internal regulations, this manual includes the rules with which we must comply as a corporation as well as all relevant laws and regulations. We have adopted the DAIHEN Code of Ethics, which specifies methods of compliance. It also indicates how we are to operate our business according to the key concepts of our corporate philosophy, "Reliability & Creativity."

A pocket-size version of this publication has been distributed to all Group employees to support appropriate behavior and decision-making according to the highest ethical standards.



DAIHEN Code of Ethics

Guide to Compliance with Laws and Regulations

As a means of preventing legal violations resulting from a lack of recognition or ignorance of the law, we have developed a compliance guide that summarizes the laws and regulations that all employees must follow. It also presents specific incidents involving violations of the law. This guide can be viewed or printed from any computer on the corporate network.

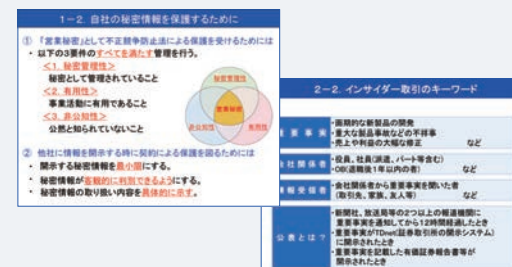
Establishment of a counselor's office for the compliance, "Helpline"

We established a "Helpline" to prevent, detect and correct potentially illegal acts before they go too far. It gives employees a channel for reporting compliance concerns internally to a designated department or, if need be, to a law firm outside the company. Our Whistleblower Protection Rules state expressly that any persons who report an incident will receive full protection and guarantee them that the matter will be kept strictly confidential and that they will not be treated adversely because they consulted the Helpline.

Column

Compliance training

Compliance training is imparted to ensure the DAIHEN workforce is fully aware of and acts in line with corporate ethics, laws and regulations. The importance of upholding these social and legal obligations is repeatedly driven home by putting into perspective the serious consequences that compliance violations by the company can have for customers, shareholders, suppliers, local communities that host our business sites and the company itself. Moreover, we are making our workforce aware that they are always representing the company and helping them to better understand the laws, regulations and rules that govern our business through internal workshops and e-learning that focus on contracts and specific laws and regulations, and periodically explain the DAIHEN Code of Ethics and Guide to Compliance with Laws and Regulations. Through these programs, we are trying to establish a proper understanding of compliance and diffuse that amongst the entire workforce so that everyone "acts in line with corporate ethics".



E-learning modules used in compliance training

Strengthening information security

In light of the growing importance of information security, the entire DAIHEN Group has adopted a variety of initiatives to enhance our information security system.

Creation of an Information Security Committee

Our Information Security Committee (ISC) improves the information security policy for maintaining and managing information security from a single unified perspective. The ISC also promotes awareness activities such as required security training and education, in order to make the DAIHEN workforce conscious of the importance of information security, and introduces tools for preventing leaks and illegal access to confidential information, etc.

Compliance with our information security policies

The Group has established information security policies, such as the "Basic Policy for Information Security", "Rules on Information Security Measures" and "Rules on the Protection of Personal Information", and organized them to facilitate compliance. In order to verify that the information security measures are working properly, we conduct internal audits every year and, if inadequacies are detected, improvement plans are crafted and implemented.

Promotion of information security awareness activities

Information security measures are explained to the workforce in an educational session, in order to raise employee awareness. Specifically, awareness activities such as training and education are conducted to alert employees to targeted email attacks aimed at businesses and organizations.

To promote compliance at our overseas business sites as well, we explain our policies, rules and measures through educational sessions similar to Japan and provide guidance for the use of information security tools.

Strengthening our information security infrastructure

To avert the risk of information being leaked due to the theft, loss, unauthorized access or other misfortune to befall PCs and external storage devices, we scrupulously encrypt PC hard disks, log operating histories and manage external storage devices. Moreover, we have introduced various systems to strengthen our information security infrastructure such as an automatic system for generating passwords for email attachments and a thin client system that prevents files from being saved to PC disks.

Main activities for fiscal 2019

We will strengthen information security across the entire Group by improving awareness and establishing measures.

- Reminding our workforce of information security procedures
- Imparting training in information security through e-learning
- Strengthening security measures with all company servers

Initiatives to protect our intellectual property

In the area of intellectual property, we are implementing a variety of initiatives to support risk management and legal compliance. For example, we comply with applicable laws and regulations relating to intellectual property rights before we undertake to develop, manufacture, or sell a product; in addition, we always confirm that we are not infringing the intellectual property of another company (to prevent the risk of infringement). This approach ensures that our customers can use our products in full confidence.

Proper stewardship of intellectual property rights

In order not to infringe upon the intellectual property rights of other companies, we regularly read through public gazettes that report on new patents and the like. We also conduct design reviews and patent clearances when developing new products or modifying designs to make sure we steer clear of rights that belong to others.

On the reverse side of that topic, we build patent networks around our best technologies to clearly differentiate our products from competitor products, and use these legal protections to gain a competitive edge and stabilize business.

For all of that to happen requires us to be at the best of our abilities, therefore we provide and regularly upgrade education on intellectual property rights, management and protection via a combination of level/purpose-based internal training that is structured by the number years of experience an employee has, and outside learning opportunities organized by the Japan Intellectual Property Association.

Training in contracting

The open innovation that is defining these times is steering businesses such as DAIHEN to cooperate more and more with other businesses, universities and institutes both at home and abroad. This is making how confidentiality, joint research and development, and results are contracted that much more important. Therefore, as a part of our employee training program, we hold seminars on contracting every year. We held those seminars at our regional offices last year because our local sales forces are often the first point of contact in business processes that require contracting. Those seminars are structured as presentations with practical exercises using actual contracts, so that participants get a better grasp of the material. These programs are intended to continuously elevate knowledge of contracting processes amongst our workforce.



Seminar on contracting

Earning the confidence of our customers by providing high-quality goods and services

DAIHEN's quality policy is just the beginning of concerted efforts to provide customers with products and services they trust and like.

Earning the confidence of our customers

Quality policy

As reflected in our corporate philosophy of "Reliability & Creativity" and our founding spirit of "Superior Quality, Reasonable Prices, and On-Time Delivery," DAIHEN has been striving since its establishment to provide customers with reliable products and services. A key part of that has been a strong emphasis on quality.

We have earned our customers' trust because a common mindset that settles for nothing less than the "Best Quality" is shared amongst everyone on the DAIHEN workforce. In order to retain that trust, DAIHEN has adopted a quality policy and is continuously taking steps to heighten quality in cooperation with our suppliers.

Quality policy

In accordance with our founding spirit and corporate philosophy, we are winning the confidence of our customers by providing outstanding products.

Each division is addressing "customer satisfaction" as an indicator of customer trust. We intend to further increase our efforts in this regard.

Words from the frontline of quality control

It's about gaining customer trust and satisfaction.

The Industrial Electrical Equipment Division supplies transformers, power conditioners, surge protectors and IH inverters. Our transformers are used by factories, buildings and public facilities and are classified as top-runners, meaning that they meet the secondary judgment criteria of the Act on the Rational Use of Energy of 2014 and consequently are helping to protect the global environment and prevent climate change.

Amongst our products, we have both one-off products that are built to customer needs and standard products that are designed and manufactured to common specifications. To ensure all of these products are high quality, we are pursuing standardization wherever practical, strengthening our design and production reviews, and auditing suppliers for quality and providing them guidance intended to weed out defects. The division as a whole remains united and committed to further improving quality because that is how the unique environment-friendly products from DAIHEN earn the customer's trust.

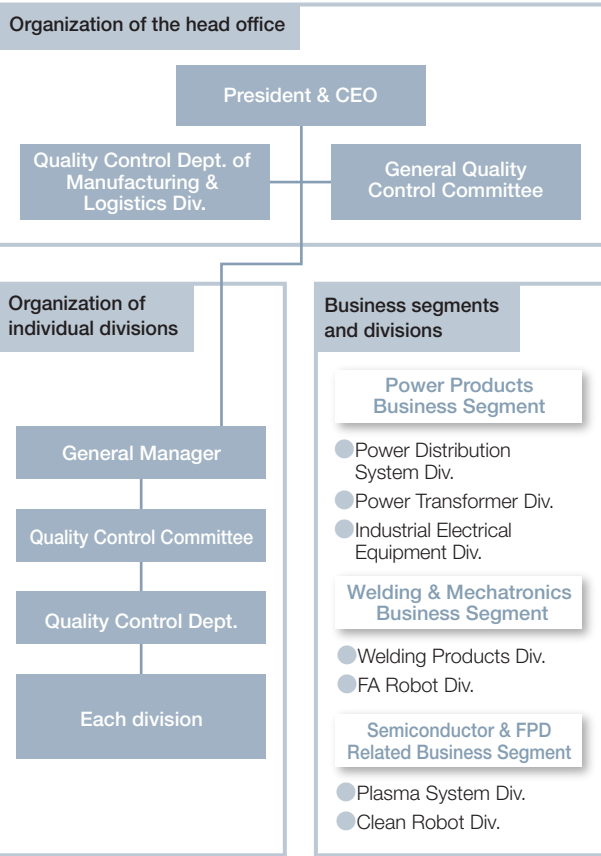


Satoshi Akita
Manager, Quality Control Dept.
Industrial Electrical Equipment Div.

Quality assurance system

At DAIHEN, there is a separate quality management system for every business segment and a Quality Control Committee that reports and discusses quality issues in every division. There is also a General Quality Control Committee that discusses problems common to all divisions, as well as corrective solutions for serious quality issues that arise in a given division. Decisions are fed back to the divisions.

Quality assurance system



Response system for significant quality problems

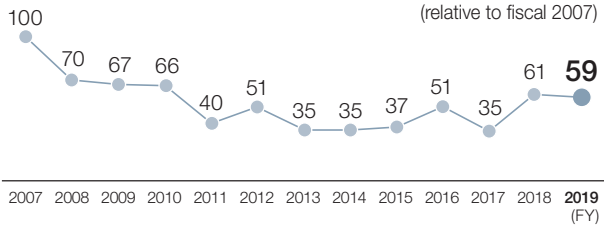
If a product of the DAIHEN Group were to cause or potentially cause physical harm to a customer or their property, or if minor trouble were to impact a number of customers, we would treat it as a "serious quality issue" and muster a response team. The response team would quickly collect information, troubleshoot the problem and devise and implement corrective measures. We also have a system in place to share the case information across the group in order to prevent any reoccurrence.

No one has ever filed a product liability suit against our company because of a non-conforming product. Nevertheless, it is very important that we root out any significant quality problems to win the confidence of our customers. The entire group, therefore, is always making efforts to discover and correct quality problems.

Enhancing customer satisfaction

The DAIHEN Group implemented an Absolute Quality Initiative between fiscal 2006 and fiscal 2008. During the three-year period beginning in fiscal 2009, we promoted further quality improvements through our Quality Initiative (Q Initiative). During the three-year period beginning in fiscal 2012, we promoted our new Quality Initiative with an emphasis on minimizing risks to quality. In fiscal 2013, we went back to basics and circulated PDCA activities to address individual quality problems and risks. We are steadily incorporating corrective actions and preventive measures. As a result, we have gradually improved our ratio of sales to the total cost of losses due to defects. Treating fiscal 2007 as 100, our score for fiscal 2019 was 59. To improve "customer satisfaction" and maintain their unwavering trust in us going forward, we will engage the entire group in strengthening activities that will prevent unexpected quality issues from arising in the first place.

Trend in total cost of defect loss ratio



Certification of ISO 9001 registration

Since 1995, the divisions within the DAIHEN Group have sequentially acquired ISO 9001 certification of their quality management systems. Currently, all divisions and overseas production sites other than those that were newly established are ISO 9001-certified.

Acquiring certification of ISO 9001 registration expands our foundation for doing more than just meeting customer requirements; it testifies to our commitment to comply with the original purpose of the ISO 9001 standard, which is to continuously improve our structure in order to ensure customer satisfaction.

ISO 9001-registered divisions and group companies

Fiscal year	Divisions, group companies
1995	Welding Products Division
1996	Power Transformer Division
1997	Power Distribution Products Division (Now Power Distribution System Division)
1998	Mechatronics Division (Now FA Robot Division)
1999	Power & Control System Division (Now Industrial Electrical Equipment Division)
2001	DAIHEN Electric Co., Ltd. Semiconductor & FPD Related Business Segment Mudanjiang OTC Welding Machines Co., Ltd.
2004	OTC DAIHEN Asia Co., Ltd. OTC Industrial (Qingdao) Co., Ltd.
2009	DAIHEN OTC (Beijing) Co., Ltd.
2014	DAIHEN VASTROJ welding cutting and robotics d.d.
2016	DAIHEN Stud Co., Ltd.
2018	DAIHEN Korea Co., Ltd.

Quality control exclusive training initiative

As part of a greater effort to maintain and improve quality, quality management training is imparted throughout the DAIHEN Group in Japan and abroad with a particular focus on developing human resources. The curriculum is designed to teach participants how to use and practice quality control methods, strengthen activities for preventing unexpected troubles and recurrences, and apply logical thinking processes to problem-solving. Participants train in QC methods, failure analysis, design reviews, human error analysis and solutions, and more. The program additionally teaches statistical analysis in relation to product design, development and manufacturing as a basis for developing ISO 9001 auditors who can improve product safety standards, enhance systems and processes, and raise the bar of our quality management systems.



Basic training in QC methods



Skill improvement seminars for ISO 9001 auditors



Practical training in QC methods

Small group activities

In the DAIHEN Group, many business activities directed at attaining policy objectives are conducted in small groups from a top-down approach (PS activities*). This kind of platform helps us to find better ways to look at and execute work, make improvements and efforts, and maintain and improve the quality of our products and services, because we can condense and piece that process together with a logical and scientific train of thought.

In support of these activities, we train each employee in the fundamentals: QC perspectives and approaches, seven QC tools, seven new QC tools, problem-solving procedures, target-attainment procedures, report-writing and the like. We also visualize the progress of our small group activities on our intranet while keeping everyone informed of the results of our initiatives. In this way, we are upgrading our job control and improvement capabilities while improving quality awareness.

*PS activities: Policy-based Small group activities

To win the confidence and meet the demands of shareholders

In order to meet the expectations of shareholders and investors and justify their confidence in us, we remain committed to the sound and transparent management of our business. Moreover, we are dedicated to business development and are engaged in dissemination of accurate and pertinent information.

Basic policy

The policy of the DAIHEN Group is to implement the corporate philosophy characterized by the keywords "Reliability & Creativity." We are upholding this policy by faithfully and honestly providing safe, high-quality products and services that meet the needs of our customers while continuing to demonstrate reliability through our business operations. Moreover, while remaining dedicated to creating value and developing markets with new products and innovative technologies, we are diligently contributing to social development.

In addition, by implementing comprehensive investor-relations initiatives to provide information on our Group's business and financial circumstances as required for sound investment decisions, we intend to earn the ever deeper confidence of shareholders and investors.

Increasing our corporate value

In today's business world, a company can no longer differentiate itself from competitors by pursuing just QCD* alone. As we see it, intangible assets — human resources, technologies, sales routes, intellectual properties, environmental protection, etc. — enhance corporate value and provide a basis for maintaining a competitive edge and achieving sustainable growth. In order to enhance the value of our intangible assets, we invest time, money and efforts into developing human resources, building patent networks around our core technologies and bettering relations with our stakeholders, while improving our internal cohesion and networking so that we are stronger as a group.

*QCD: Quality Cost Delivery

Paying good dividends

DAIHEN has adopted the important policy of continually paying a good dividend to our shareholders. We are committed to maintaining this policy of returning profits to shareholders subject to our profitability, financial circumstances, and the future development of our business.

○ Five-year record of dividend payments

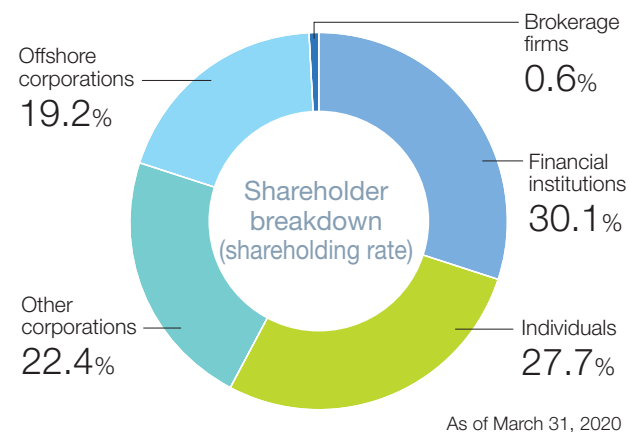
Fiscal year	2015	2016	2017	2018	2019
Dividend (in yen)	60	60	75	80	85
Payout ratio (%)	21.2	24.2	27.6	32.4	34.0

* DAIHEN executed a reverse stock split of 5 shares into 1 on October 1, 2018. For comparative purposes, dividend amounts are shown assuming the reverse stock split was executed in fiscal 2014.
 * We set a payout ratio of 30% against the 3-year average profit as a target in our 2020 medium-term business plan.
 Our payout ratio against the 3-year average profit in FY2019 was 32.2%.
 * Dividends for fiscal 2019 include a "100th Anniversary Commemorative Dividend" of 5 yen.

○ Stock data

As of March 31, 2020

Number of shareholders	9,831
Shares outstanding	27,103,291



Information disclosure

We disclose all information required by legal disclosure standards. In addition, if we determine that it is necessary to disclose additional information to increase shareholder understanding of our company, we will disclose such information immediately and accurately through various media, even if disclosure of such information is not required by any laws or regulations.

Moreover, we will continue to proactively release information about investor relations activities through our corporate website (www.daihen.co.jp) and IR conferences for institutional investors, etc.



Investor relations information available on our website (Japanese only)



IR briefing

As a partner to our customers, we seek to achieve mutual prosperity and outstanding customer satisfaction.

To provide our customers with excellent products, we are promoting green procurement to ensure fair and equitable trade with our suppliers in the interests of mutual development.

Basic policy regarding material procurement

To meet customer demand by providing valuable products and services to our customers, we depend on the cooperation of suppliers offering excellent products and technologies. The DAIHEN Group believes that one of the most important elements of manufacturing competitive products is the procurement of high-quality materials. Therefore, on our website, we always list the items we seek to procure. In addition, we have adopted a basic policy for material procurement so that we can maintain and develop partnerships with our suppliers.

— Basic policy regarding material procurement —

Offering openness and fairness of opportunities

We openly provide opportunities for all our suppliers to participate in trade, regardless of nationality, region, business scale, or business experience.

Fair evaluation

We adhere to principles of competition as the basis on which we select suppliers. We generally take management reliability and technical development capability into consideration and make a fair evaluation in addition to evaluating quality, price, and delivery date.

Mutual development

We maintain sound trade relations based on mutual trust with suppliers and strive to support reciprocal corporate development.

Compliance with the law

We faithfully meet our contractual obligations with our suppliers, negotiate according to laws and regulations, and maintain healthy business practices.

Our policy is not to use conflict minerals that serve as a source of funds for warlords who violate human rights.

Communication with our suppliers

So that we and our suppliers are on the same page, we hold policy briefings where we explain our business and procurement policies, and the annual plans of each of our divisions. We also use the opportunity to award exemplar suppliers based on performance numbers from the preceding year. Moreover, because the briefings gather so many suppliers under one roof, we conduct a survey of how satisfied they are of their business dealings with DAIHEN and their thoughts of our procurement policy and practices. In turn, we apply this information back to our procurement activities in order to improve business processes and build stronger relations with our suppliers.

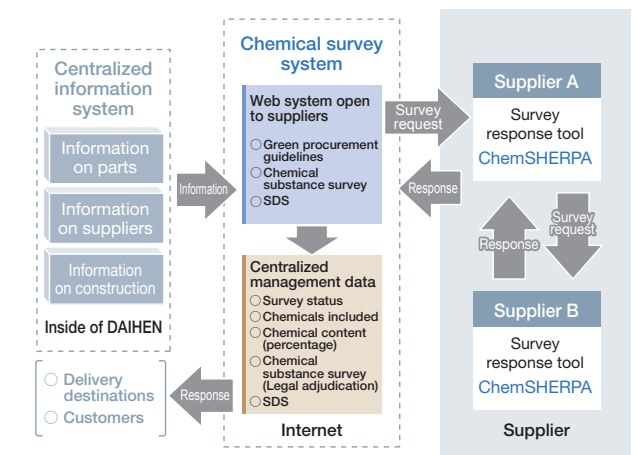


Policy briefing session for suppliers

Green procurement initiatives

In step with global trends in chemical management and the push for standardization inside Japan, we revised the Green Procurement Guidelines of the DAIHEN Group into a seventh edition that brought our management processes closer in line with the newly unified chemSHERPA platform for sharing information on chemicals contained in products. Moreover, to promote green procurement, we also upgraded the system we had been using to investigate chemical substances so that we could use data across our global supply chains and share environmental data. The new system has made our environmental assessments faster and easier, and given us yet another tool for making environment-friendly products in the DAIHEN Group.

○ Outline of green procurement and surveys taken

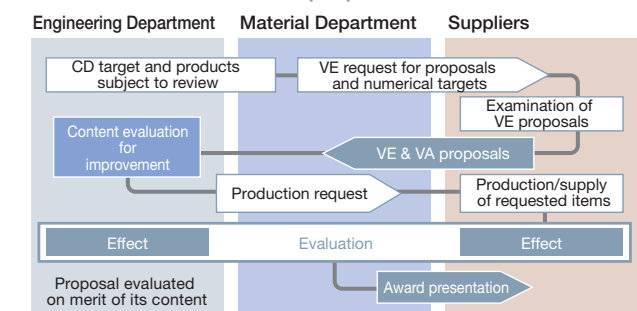


Working together with our suppliers to raise productivity

The DAIHEN Group aims to ensure quality and improve market competitiveness while streamlining our manufacturing processes and enhancing ease-of-manufacturing by actively implementing cost reductions focused on Value Engineering/Value Analysis (VE/VA) proposal initiatives.

Through these activities, we jointly participate in improvement proposals together with those who place and receive orders, and we share the results with both parties. We believe this is a desirable way to operate our business while earning reasonable profits.

○ The flow of VE and VA proposals



Establishing an active workplace and improving our personnel system by providing rewarding work

We are establishing an active workplace and improving our personnel system by providing rewarding work. Moreover, we are supporting our employees' choice of varied working styles.

“Inspiring” and “motivating” our workforce

The underlying principle of DAIHEN's personnel system is to “inspire” and “motivate” each and every employee to go beyond what is expected of the role he/she plays in helping the company achieve its objectives. This is done by considering suitability and capabilities in job assignments, developing aggressive target-management skills, clarifying performance evaluation criteria, and providing fair and acceptable treatment. When “inspired” and “motivated”, our employees are more likely to demonstrate their skills and feel satisfied with what they are doing, which in turn should translate into better performance and corporate growth. We additionally think that will improve the work environment, which will then further “inspire” and “motivate” our workforce, creating a positive “personnel cycle” that benefits both the employee and the company.

Awarding employees with a 3rd bonus for efforts

The DAIHEN Group is adamant about balancing returns amongst its stakeholders. Since employees are stakeholders, too, a “3rd bonus” is paid in addition to regular bonuses to reward employees for their efforts in product development and cost reduction that enable the company to attain financial targets.

Conditions for 3rd bonus

When 5% or more increase in operating income over the previous year:
1 month's pay if ¥8 billion or more to
2 months' pay (max.) if ¥12 billion or more

Career self-discovery and plotting program

Because of social changes and newly accepted work patterns, corporate development going forward is underscored by the thinking that an organization grows only as much as the people it employs grow. At DAIHEN, we have long believed that our employees are and should be in charge of their own personal growth and, with a forward-looking attitude about what learning and experiences that requires and by liking one's job and going about it enthusiastically, their growth will lead to better results. This is why we put so much effort into our human resource development programs.

One such program is a career self-discovery and plotting program for young employees in their first three years with the company. Here, the purpose is not to have employees acquire knowledge or develop a certain mindset that goes with their position and duties like in hierarchical training. Instead, the program aims to get each individual to look down the road, think about and put in writing why he/she is working, what he/she wants to achieve and become, and then translate what he/she has discovered through this process of introspection, OJT and Off-JT, and interviews on target management, into everyday action. It is a midrange activity of some three years that is supported and steered by one's superiors, therefore we feel that it is more actively integrated into everyday responsibilities.



Group discussions during the career self-discovery and plotting program

Developing new recruits as a workplace activity

A “mentoring program” has been introduced in order to systematically guide new recruits in the right direction and get them up to speed in their assigned workplaces as quickly as possible. Rather than managers or supervisors, mentors are someone who can steer the new recruits through daily tasks and counsel them on life issues from a common ground approach. The primary purpose of the program is to help the new recruits settle into their jobs as soon as possible and promote their growth so that they can execute their work smoothly.

To make the program more effective, not only is one mentor assigned to each new recruit but also the entire workplace is tasked with aiding the new recruits. This idea of an entire workplace developing its new recruits is intended to create a constructive atmosphere in which everyone instinctively assists the new recruits in the same way they themselves received help and guidance when they were new.



Mentoring program

Supportive of new lifestyle choices: Employee programs for our 100th anniversary

New lifestyles demand new workstyles. At DAIHEN, we understand that.

Support for balancing work with childcare and nursing care responsibilities

In the DAIHEN Group, we have improved the employment options for individuals with small children or family members who need looking after so that they can continue to work while caring for loved ones. These options offer employees considerable flexibility above and beyond legal requirements, beginning with shorter shifts and reduced workweeks of just 4 days a week. Not only are these systems in place but we are also reshaping workplace environments so that employees can easily make use of these systems. Going forward, we will continue to look for ways to support workstyles that allow for the things that our employees value and want to prioritize.

Support for study abroad and business startups

Healthy life expectancies in Japan are the longest in the world and are flirting with the 100-year mark. To make the most of those good years, it is wise to put a life plan with future goals on paper and develop a workstyle that agrees with one's personal values and priorities. That most likely involves challenging oneself, which begins by finding an interest one would willfully pursue and then setting about doing it. It might be studying abroad to gain certain qualifications or skills, or launching a business in something you are good at and are motivated to take a step further. At DAIHEN, we have programs in place to support employees who want to embark on new challenges.

Long-term disability insurance

Health is a fundamental component of corporate life. Being healthy allows one to choose a workstyle that agrees with one's values and priorities. However, if stricken with an illness or infirmity that causes one to miss work, one may no longer be able to support the lifestyle he/she desires and plans he/she had may have to be changed. So that our employees can be prepared for that, DAIHEN's corporate insurance plan gives employees access to proper medical care and pays compensation for lost wages due to illness or infirmity to a degree that permits one to maintain a certain lifestyle.

Workstyle reform and motivating workplaces

For an individual to grow personally and lead a rewarding life, it is important to work efficiently and use the time gained therefrom to better one's skills and knowledge, and to make one's life more fulfilling. To help our employees balance work and life choices, we are always looking for ways to develop a productive mindset that knows not to waste time and reshape the workplace into a motivating environment where employees can perform to the best of their abilities.

Productivity enhancements with innovative business processes

All across the DAIHEN Group, Loss Cutting Initiatives are replacing manual jobs with automation and reducing overtime work. RPA is also being constructively introduced to automate repetitive clerical tasks.

Efforts to manage work time

Activities are underway to spur employees to consciously manage their work time such as to declare the first day of the week “No Overtime Day” and require everyone to leave work at the same time, as well as shutting all lights off at a set time every day in offices.

Financial aid for self-improvement

At DAIHEN, we encourage our workforce to obtain qualifications that they can apply to their jobs and have a financial aid program that can cover those expenses in order to incentivize them to learn.

DAIHEN Group Heart Festival

The DAIHEN Group Heart Festival is a big field day event that brings together group employees, their families and people from cooperating companies across Japan.

Held every year since 2007, it was planned and created as a place and opportunity for building teamwork by channeling energy toward a shared goal, and for brewing a sense of belonging as a member of the DAIHEN Group, through competitive events between divisions, family challenges, soccer lessons for kids imparted by guest players from Cerezo Osaka and other contests. Moreover, through the process of forming teams, practicing and actually competing with employees from cooperating companies as well as their families, the festival aims to improve communications beyond organizational boundaries.

2019 marked DAIHEN's 100 anniversary, so the Heart Festival was bigger than usual with over 2,000 participants and several special moments like the below group photo that included everyone!

Because of the energy and enthusiasm the Heart Festival brings out in people, we will continue to shape and stage the event so that everyone connected to the DAIHEN Group will feel more attached and happier to be a part of the Group, and have this wonderful day to show appreciation to their families.



DAIHEN Group Heart Festival

Promoting employment of persons with disabilities

Daiki Corporation became a special subsidiary of DAIHEN in 1983. Daiki is now promoting employment of persons with physical and mental disabilities while improving the working environment for these individuals.

Corporate Action Plan under the Act on Promotion of Women's Participation and Advancement in the Workplace

We established an exploratory committee of labor and management representatives to find ways for women to demonstrate their skills and play more active roles in the workplace. In June 2019, they formulated and submitted the below “Corporate Action Plan” to the Equal Employment Office of the Osaka Labour Bureau. We will take more action like this going forward so that women are given the same job opportunities as their male counterparts.

- Period
June 1, 2019 – May 31, 2024 (5 years)
- Situation at DAIHEN
In our recruiting practices every year, we look primarily for engineering graduates, however about 90% of the applications for technical positions come from men, because women represent only about 10% of that category. Moreover, about 70% of the applications we receive for office positions come from men. As a result, women account for a small percentage of our workforce.
- Target
Raise the percentage of women amongst new recruits (graduates and midcareer transfers) to 10% or higher.
- Activities and timeline for recruiting and hiring more women

June 2019	Explore policies and targets for hiring more women.
October 2019	Explore ways to hire more women.
December 2019	Explore proposals on deploying women in cohort with divisions/departments.
January 2020	Formulate recruiting plans for the next year with higher numbers of women.
March 2020	Implement measures to hire more women.
August 2020	Assess efforts and explore ways to solve outstanding issues.

Our health and safety initiatives

Group Policies

Safety is the underlying pretext to our corporate prime objective of “simultaneous contentment for all”. To stand by that commitment, we have made it a basic policy of the DAIHEN Group to place “top priority on health and safety”. This compels us to create workplace environments where our employees are reassured of their health and safety, and to establish a corporate culture and mindset where managers and supervisors take the lead in promoting health and safety activities in the workplace as an important first step toward preventing on-the-job accidents, and all employees actively participate in these activities conscious and aware that they are ultimately responsible for their own health and safety.

Highlighted activities

Stronger countermeasures to statistically important accidents

Looking at records over the last five years, over 70% of the accidents that occurred were due to being “sandwiched or trapped”, “cut or grazed”, “hit by toppled objects”, “falls” or “electrocution”. Therefore, we focused countermeasures on

these five kinds of events and conducted patrols with safety and health consultants to identify and mitigate risks at business offices, plants, regional offices and group companies.



Patrols with safety and health consultants



Interactive programs for improving risk awareness

Wanting to make our workforce more wary of job site risks and dangers, interactive awareness programs were planned for the workplace environment at each business site.

Employees participated in large numbers. Of course, every consideration was given to ensure safety.



Drum can being used to show what it is like to be sandwiched



Imagining what it might be like to be hit by a falling object

Strengthening the 6 S's activities

We continue to practice and improve the 6 S's (*seiri* [sort], *seiton* [keep orderly], *seiso* [clean], *seiketsu* [standardize the 3 foregoing practices], *shitsuke* [sustain the practices], *seibi* [service]) defined by the DAIHEN Group as the basis of work

safety and health activities, by incorporating the practices into group annual plans. Exemplar activities are shared within the group to promote improvements.



Safe orderly workplaces begin with 6 S activities



Using stress test results to improve workplace environments

To help reduce job stress and prevent mental health issues, training programs on line healthcare were organized for department heads who play key roles in the workplace.

Participants did group analyses of stress test results and discussed workplace improvements.



Opinion exchange during a group discussion



Training class in line healthcare

“Safety Check Day”

Since 2018, December 15 has been known as “Safety Check Day” at DAIHEN. On that day, everyone at DAIHEN checks just how safe they are based on the way they think

and act. Once again, this year, everyone looked carefully at their workplaces for dangerous jobs and equipment, and unsafe actions and situations.



“Safety Check Day” announcement. Activities were pushed up to 12/13 because 12/15 was a holiday.



Meeting prior to patrolling the whole business site

Seeking symbiosis with the local community and cooperation with society

As a member of the local community, each business office or plant is deepening its interchange and establishing a positive relationship with community residents while fulfilling its corporate social responsibility through various support initiatives.

Communication with the local community

Keeping the community in focus

In August, we open up a part of the Juso Business Office site in Osaka and DAIHEN Industrial Machinery site in Tottori City to the general public for classic summertime festivals. Our employees man booths and run raffles and other events that give us a fun and entertaining platform for deepening interaction with the residents of the surrounding community and amongst group employees and their families.

On a slightly different note, group company Daihoku Industry joins the local community in Eniwa-shi, Hokkaido in bringing a little warmth amidst the snow and cold of February via the city's "Candle Night".



Summertime festival at the Juso Business Office site



Summer festival hosted by DAIHEN Industrial Machinery



Eniwa Candle Night

Neighborhood schools participate in plant tours

At the Juso Business Office, Rokko Business Office in Kobe and DAIHEN Industrial Machinery, we give tours of our offices and plants to elementary schools, daycare centers and technical colleges from the nearby area, and, as a more in-depth look into what we do, offer internships and shadowing opportunities to junior high school students. Through these activities, we try to convey what it means to work in manufacturing and why we think the DAIHEN Group is so interesting.



Elementary school students touring the showroom at the Juso Business Office



Internship at the Rokko Business Office



Tour at DAIHEN Industrial Machinery

Supporting social welfare, education, and cultural initiatives

Support for social welfare

The Hakuaisha, a social welfare service corporation that carries out social welfare activities in Yodogawa-ku, Osaka, holds a regular event known as the Hakuaisha Carnival. Employees wishing to make donations provide numerous items for the fundraising bazaar.

Support for scientific education

We dispatch company employees as part-time university lecturers to provide support and help students improve their abilities. This effort includes providing students with an introduction to leading-edge robotic and welding technologies.

Support for art and culture

We participated in initiatives in support of the Osaka Symphony Orchestra, the Osaka Philharmonic Orchestra, the Kansai Philharmonic Orchestra, Kobe Luminarie, and Nagashibina Maranic (marathon and picnic) event in Mochigase (Tottori-shi).

Cleanup activities surrounding our business offices and plants

Each location of the DAIHEN Group is proactively engaged in cleanup campaigns and is contributing to regional beautification initiatives. Going forward, we intend to participate in future regional beautification and vitalization efforts such as these.



Juso Business Office (Osaka-shi, Osaka)



Rokko Business Office (Kobe-shi, Hyogo)



Mie Business Office (Taki-cho, Mie)



Chitose Plant (Chitose-shi, Hokkaido)



Kanehira Plant (Osaka-shi, Osaka)



DAIHEN Industrial Machinery (Tottori-shi, Tottori)



DAIHEN Technology Institute (Kitsuki-shi, Oita)



DAIHEN Stud (Matsudo-shi, Chiba)



Daihoku Industry (Eniwa-shi, Hokkaido)



DAIHEN Aomori (Hiroaki-shi, Aomori)



Minami Electric (Tadotsu-cho, Kagawa)

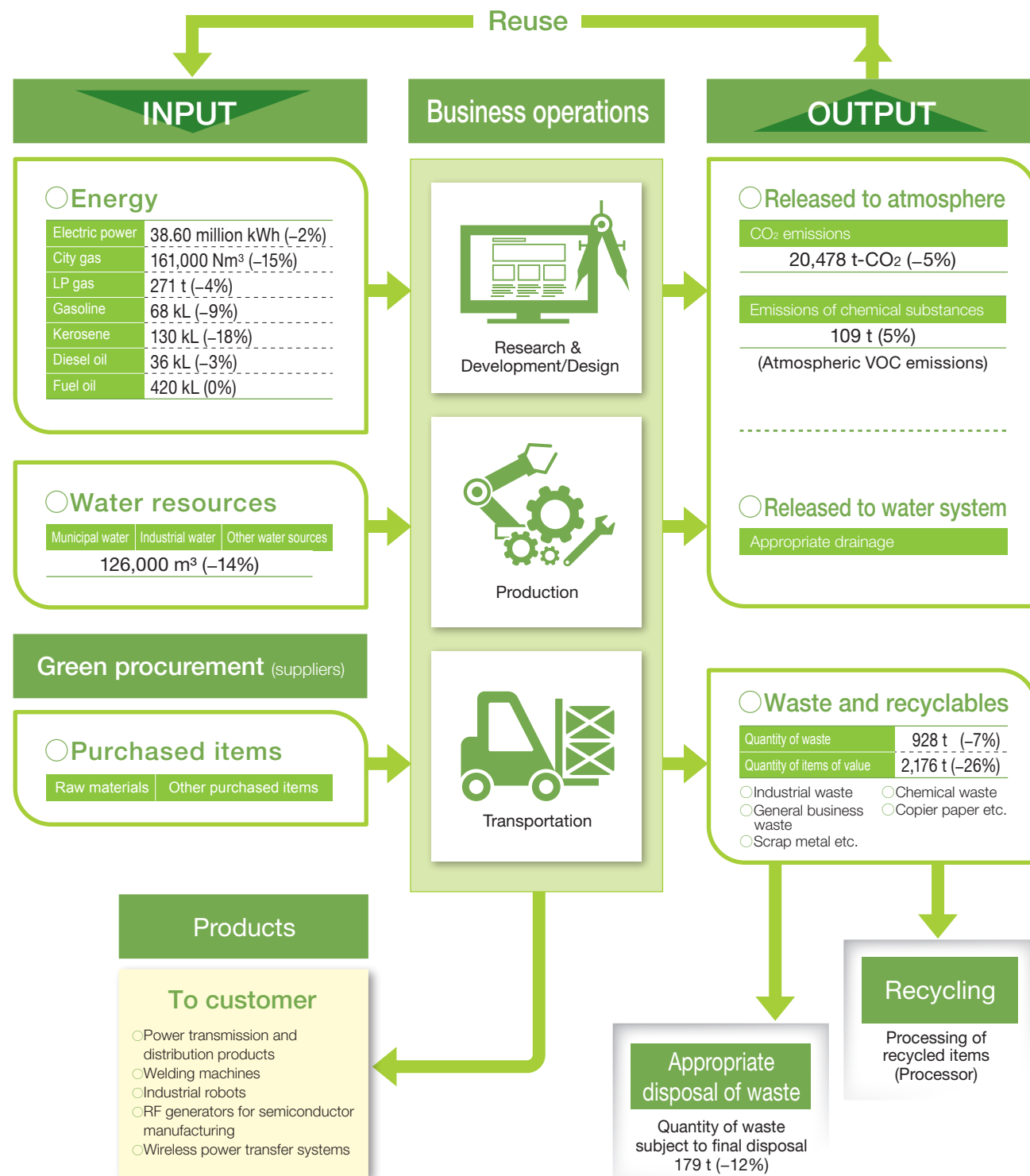


DAIHEN Fuse (Izumitsu-shi, Osaka)

The environmental impact of our business activities

In addition to determining the environmental impact of our business activities, the DAIHEN Group is working hard to reduce its overall environmental impact from every angle by remaining constantly aware of all phases from planning, development, manufacture and use to discard.

Relation between the DAIHEN Group's environmental impact and business operations



Notes:

- Scope of data: DAIHEN Corporation (Juso Business Office, Rokko Business Office, Mie Business Office, Chitose Plant, and Kanehira Plant) and Group production bases (Tottori Plant, Oita Plant, Matsudo Plant, Eniwa Plant, Hirosaki Plant, Kagawa Plant, and Izumiotsu Plant), OTC DAIHEN Asia Co., Ltd., DAIHEN Electric Co., Ltd., Mudanjiang OTC Welding Machines Co., Ltd., OTC Industrial (Qingdao) Co., Ltd., DAIHEN OTC (Beijing) Co., Ltd., DAIHEN Advanced Machinery (Changshu) Co., Ltd.
- Figures apply to fiscal 2019. Figures in parentheses are relative to fiscal 2018.

Environmental management at the DAIHEN Group

In the DAIHEN Group, we want to be the “company of choice of many”. We figure that begins by building better relations with stakeholders through our environmental protection activities. So, we treat environmental protection as one of the top priorities in the way we go about business. This “pro-environmental” approach to business management guides us in formulating and implementing strategies and actions that are helping to reshape the world for sustainable development, and protecting the environment from our corner of society.

Contributing to society's sustainable development is, in our view, a social responsibility of the DAIHEN Group. This requires us to develop sustainably as a business as well and makes “pro-environmental” management a key factor in steering us along that path.

Because we are a manufacturer, we recognize how important it is that we reduce the environmental loads of our products at every stage of the product lifecycle from conception to discard and that, by doing so, we can fulfill our

responsibility as a business to society. Therefore, within the DAIHEN Group, we want to use the environmental management systems (EMS) we built for the purpose of reshaping society for sustainable development, to hone our own sustainable development, first and foremost in the ways illustrated below.

Contributing to the emergence of a sustainable society

Implementation of environmental management at the DAIHEN Group



Environmental initiatives: plans and results

The DAIHEN Group takes an organized approach to environmental protection that begins with a Voluntary Environmental Action Plan where we set medium- to long-range goals and targets. 2019 marked the start of our 6th such plan, which tasks 18 business sites in Japan and abroad with promoting activities under three common objectives — addressing climate change, reducing waste and preventing air pollution.

Targets for fiscal 2019 were based on the achievements we

made in fiscal 2018 and activities were spiritedly implemented on the divisional, office and plant level. We missed some targets set forth in the plan, but departments attained their targets for the most part as we steadfast improved our environmental performance record.

On the management side of things, we maintained our certifications under ISO 14001:2015 and promoted environmental contributions in cohort with suppliers.

We also continued helping customers reduce their CO₂

emissions by creating and marketing more green products.

Regarding our own CO₂ emissions and water consumption, both increased due to the scorching heat, but not to be beaten, offices and plants still made bold efforts to curb consumption.

As waste reduction activities, we pushed recycling and recovery of reusable materials, and expanded use of our returnable steel shipping containers overseas.

As part of our efforts to prevent air pollution, we explored

ways to reduce emissions of harmful substances such as switching to VOC-free paints.

For fiscal 2020, we are setting targets even higher and will be addressing risks and opportunities with an eye to weave environmental activities into our line of business as is required under ISO 14001:2015, and retooling our EMS to stay on top of whatever changes impact the environment.

Fiscal 2019 targets in the DAIHEN Group's 6th Voluntary Environmental Action Plan and Results of Initiatives

Corporate objective	Medium-term plan	Stage	Activities	Targets for fiscal 2019		Results of initiatives in fiscal 2019	Initiatives in fiscal 2019	Evaluated by DAIHEN	Related SDGs
Simultaneous contentment for all	—	Management	Improving environmental management systems (EMS)	Improve the EMS under ISO 14001:2015 requirements.		Maintained 2015 certifications	• Internal audit: June 3 – July 23 • Audited: August 20 – October 10 → Decided to maintain 2015 certification: December 5 • Training of internal auditors	○	
			Green procurement	Promote green procurement with suppliers to broaden our environmental contribution. (Increase reply rate to survey on chemicals contained in products.)		Increased response rate	• Procurement Dept. asked suppliers to return DAIHEN's "Ecoduce" chemical survey. • Briefing on Ecoduce held on August 20: 75 participants from cooperating companies • Survey response rate: 29.9% as of April 1, 2019 → 87.0% as of March 31, 2020	○	
			Reducing environmental risk	Zero environmental accidents* (* An accident that causes environmental damage [soil, water quality, etc.] to DAIHEN or third parties, or seriously impacts the natural environment)		Zero environmental accidents	• Conducted emergency response drills at all business offices and plants. • Disposed of low-concentration PCB equipment.	○	
	Create value with products unique to DAIHEN	Products	Developing green products	Percentage of new products certified as "green" 90% or more		97.1% of new products "green" certified	• Certified products ... Power Distribution: 5, Power Transformer: 3, Industrial Electric Equipment: 2, Welding Product: 13, FA Robot: 3, Plasma System: 3, Clean Robot: 5 • Percentage of green products amongst new products: 97.1% (34 of 35 products)	○	
			Expanding green products and businesses	Percentage of all sales accounted for by green products/businesses 70% or more		70.7% of all sales accounted for by green products	• [Total green products] Super Eco Products: 22, Eco Products: 299 Sales of green products 75,617 million yen/ Sales of all products 106,968 million yen = 70.7%	○	
			Creating values that customers themselves recognize	Reduce CO ₂ emissions by 50,000 tons/year via green (energy-saving) products.		50,500 tons	Expansion of qualifying energy-saving products • Contribution to CO ₂ reduction 50,533 tons	○	
			Conversion of waste to valuable resources	Increase allowable recycled material content of products.		Tracked progress numerically	• Numerically tracked product environmental impact using scoring sheet	○	
	Promote our Loss-Cutting Initiative	Processes	Preventing global warming	Reduce CO ₂ emission intensity of business sites and in distribution by 1% from fiscal 2018 levels.		Reduced by 6.3%	● Automated production. ● Updated to LED lighting and power-saving equipment. CO ₂ emissions intensity result: 0.141 t-CO ₂ /million yen FY2019 target: 0.149 t-CO ₂ /million yen → Compared to FY2018: 6.3% reduction Reference: Total CO ₂ emissions: 20,478 t-CO ₂	◎	
			Preservation of biodiversity	• Reduce water consumption intensity by 1% from fiscal 2018 levels. • Promote efforts to preserve biodiversity at each business site.		Reduced by 14.5%	● Introduced cooling water recirculating system for inspections. ● Introduced paint run-off collecting system. ● Participated in community-organized river cleanup. Water consumption intensity result: 0.87 m ³ /million yen FY2019 target: 1.01 m ³ /million yen → Compared to FY2018: 14.5% reduction	◎	
			Waste reduction	Reduce waste disposal intensity (reusable resources excluded) by 1% from fiscal 2018 levels.		Reduced by 7.6%	● Increased and enforced sorting. ● Converted waste into valuable resources. ● Reduced wood waste. ● Used returnable shipping containers. Waste disposal intensity result: 6.40 kg/million yen FY2019 target: 6.86 kg/million yen → Compared to FY2018: 7.6% reduction Reference: Waste discharged (Excluding converted resources): 928.0 t	◎	
			Air pollution control	Reduce PRTR substance emission intensity by 1% from fiscal 2018 levels.		Increased by 8.0%	● Changed to non-PRTR thinner. ● Use of organic substance dispersal prevention system. PRTR substance emission intensity result: : 0.75 kg/million yen FY2019 target: 0.69 kg/million yen → Compared to FY2018: 8.0% increase Reference: Total atmospheric emissions: 109,180 kg	△	

The DAIHEN Group's 6th Voluntary Environmental Action Plan

We formulated our 6th Voluntary Environmental Action Plan with medium-term activity targets for 2019-2020 in the areas of "Management", "Products" and "Processes".

In the "Management" area, we will retool our environmental management systems so as to effectively merge them into business activities under ISO 14001:2015 requirements.

In the "Products" area, we will continue to create and market green products that closely mirror customer values, and contribute to society at large with low-energy (high-efficiency) products that add to the fight against climate change.

In the "Processes" area, we will take a global approach to protecting the environment by sharing the environmental and biodiversity conservation activities and results of our business sites in Japan to our overseas production sites.

With regards to climate change prevention, biodiversity conservation and waste reduction, since we attained our 2020 targets in fiscal 2019, we raised them.

The DAIHEN Group will continue its social contributions to global environmental protection and will further speed up those activities to achieve "simultaneous contentment for all".

Fiscal 2020 targets in the DAIHEN Group's 6th Voluntary Environmental Action Plan

Corporate objective	Medium-term plan	Stage	Activities	Target for Fiscal 2020	Related SDGs
Simultaneous contentment for all	—	Management	Improving environmental management systems (EMS)	Improve the EMS under ISO 14001:2015 requirements.	
			Green procurement	Promote green procurement with suppliers to broaden our environmental contribution. (Increase reply rate to survey on chemicals contained in products.)	
			Reducing environmental risk	Zero environmental accidents	
	Create value with products unique to DAIHEN	Products	Developing green products	Percentage of new products certified as "green" 90% or more	
			Expanding green products and businesses	Percentage of all sales accounted for by green products/businesses 75% or more	
			Creating values that customers themselves recognize	Reduce CO ₂ emissions by 60,000 tons/year via green (energy-saving) products.	
			Conversion of waste to valuable resources	Increase allowable recycled material content of products.	
	Promote our Loss-Cutting Initiative	Processes	Preventing global warming	Reduce CO ₂ emission intensity of business sites and in distribution by 1% from fiscal 2019 levels.	
			Preservation of biodiversity	•Reduce water consumption intensity by 1% from fiscal 2019 levels. •Promote efforts to preserve biodiversity at each business site.	
			Waste reduction	Reduce waste disposal intensity (reusable resources excluded) by 1% from fiscal 2019 levels.	
			Air pollution control	Reduce PRTR substance emission intensity by 2% from fiscal 2018 levels.	

Environmental preservation initiatives: policies and systems

In the DAIHEN Group, we base our Environmental Policy on a Basic Philosophy and Conduct Policy and implement activities to protect the environment from diverse angles, including building environmental management systems.

The DAIHEN Group Environmental Policy

Basic Philosophy

Conduct Policy

The DAIHEN Group responds to the trust of society by developing technologies and providing products that place a value on people and resources under the DAIHEN corporate philosophy "Reliability & Creativity". The DAIHEN Group seeks to contribute to an abundant future and a healthy environment as a corporate group that fills a role as the popular choice of society.

In an effort to implement its basic philosophy, the DAIHEN Group will voluntarily adopt proactive global environmental conservation initiatives according to the following guidelines in all our business operations including power transmission and distribution products, welding machines, FA products, semiconductor equipment, dispersed power systems, and other products in the energy and power electronics field.

1 Reduce environmental impacts resulting from business operations.

We shall address the following initiatives by considering all steps encompassing product design, development, procurement, manufacturing, and distribution as well as product use and disposal.

- Promote energy-efficiency initiatives and take steps to help mitigate the risk of global warming.
- Promote resource conservation, waste reduction, and recycling.
- Reduce the environmental impact of the use of chemical substances.
- Offer green products.
- Promote green procurement.

2 Comply with laws and other requirements.

We shall comply with the relevant legal and environmental requirements and other requirements that we decide to adopt. We shall also adopt and administer voluntary management standards and implement pollution controls to prevent any occurrence of environmental pollution.

3 Establish environmental objectives and targets and periodically review them.

Each division of the DAIHEN Group shall establish environmental targets and promote environmental preservation initiatives. Moreover, each division shall periodically review its targets, and continually seek to improve its environmental management system in ways that ultimately enhance its environmental performance.

4 Raising environmental awareness

We shall enrich environmental education and deepen understanding of environmental policy among all who are working for or within organizations and seek to increase environmental awareness through initiatives intended to contribute to society.

5 Enhancing environmental public relations

We shall provide stakeholders with timely environmental information, collect a broad range of environmental data, review our environmental preservation initiatives, and transmit information in a clear manner.

Environmental Management System

The DAIHEN Group has established and implemented the DAIHEN Group Environmental Management System under the President & CEO of DAIHEN Corporation as the EMS Head Director and the Environmental Officer as the General Director Responsible for the Environment. The DAIHEN Group promotes a variety of environmental conservation initiatives through its business operations and according to its environmental policy.

The DAIHEN Group has established a system that supports environmental protection initiatives from two directions; each office and plant implements environmental conservation related to its business operations, and each division develops plans for eco-friendly products and services. The Eco Product Working Group and the DAIHEN Group Environmental Board Meeting, organizations under the auspices of the DAIHEN Group Environmental Committee, have been established in an effort to promote group-wide initiatives.

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Environmental management system

The DAIHEN Group has proactively established an effective environmental management system and continuously improves it in order to strengthen environmental management group-wide. We intend to continue promoting environmental preservation initiatives in the future.

Certification of ISO 14001 Registration

We have established and implemented a group-wide environmental management system compatible with the ISO 14001 international standard as part of our environmental preservation initiative under our Environmental Policy. Moreover, because we are committed to continually reducing the impact of our business operations and products on the environment, we transitioned our environmental management system to ISO 14001:2015 in fiscal 2017.

Group Company sites that have acquired certification of ISO 14001 registration

Companies in Japan

Company name	Site
DAIHEN Corporation DAIHEN Electric Machine Corporation DAIHEN System Corporation DAIHEN Logistics Co., Ltd. DAIHEN Engineering Co., Ltd. DAIHEN Technos Support Corporation	Head Office / Juso Business Office Rokko Business Office Mie Business Office Chitose Plant Kanehira Plant
DAIHEN Industrial Machinery Corporation	Tottori Plant
DAIHEN Technology Institute	Oita Plant
DAIHEN Stud Co., Ltd.	Matsudo Plant
Daihoku Industry Co., Ltd.	Eniwa Plant
Minami Electric Co., Ltd.	Kagawa Plant
DAIHEN Fuse Corporation	Izumiotstu Plant
DAIHEN Aomori Corporation	Hirosaki Plant

Companies outside Japan

Company name	Country
OTC DAIHEN Asia Co., Ltd.	Thailand
DAIHEN Electric Co., Ltd.	Thailand
Mudanjiang OTC Welding Machines Co., Ltd.	China
OTC Industrial (Qingdao) Co., Ltd.	China
DAIHEN OTC (Beijing) Co., Ltd.	China
DAIHEN Korea Co., Ltd.	Korea

Environment-related incidents and complaints

We had zero environment-related accidents in fiscal 2019. We did receive the below two complaints, but they have been addressed and measures taken to ensure they do not reoccur.

Environment-related complaints received in fiscal 2019

Complaint	Location	Our response
The wicket in the gate on the south of a midsize transformer plant was loud when opened and closed.	Juso Business Office	Instructed departments that use the wicket to open and close it gently. Attached rubber cushions around the wicket frame where contact is made. Posted a sign on the wicket to quietly open and close the wicket.
Truck engine noise by residents of a nearby apartment.		Requested divers to shut off their engines when at the site. Posted signs along driving routes to call attention to the issue.

Other than the above complaints, we received requests from neighborhoods to pick up fallen leaves and remove crow nests, which we were more than willing to do.

Environmental training and internal awareness initiatives

We provide wide-ranging environmental training in an effort to improve the environmental awareness of all employees, enable them to recognize their responsibilities, and translate their duties into action.

Expansion of environmental training opportunities

We provide three levels of environmental training targeted at specific groups: all the Group employees; various employee segments such as new hires; and employees requiring specific expertise such as personnel undergoing internal audit training and personnel assigned environmental protection duties. Training materials and the relevant data used for various training courses are published internally on the Web and are used for training and for improvement of knowledge within divisions.

Publication of Eco News

The house journal Eco News is published periodically on the company intranet for all of our employees to read in order to raise the environmental awareness of our workforce.

Environmental cards distributed

We distributed a pocket card to all our Group employees and temporary workers that contains the text of “My Environmental Declaration” and lists our environmental policies and targets.

Internal environmental audits

We conducted internal audits of all 94 departments of the DAIHEN Group in 2019.

The audits emphasized the following three points.

- Whether or not environmental impacts resulting from changes in business activities or situations are sampled and assessed in a timely manner
- Whether or not issues within or outside of the organization and the needs and expectations that share interest in those matters are understood and the risks and opportunities identified
- Whether or not environmental targets are set to attain an “intended result” for the circumstances at hand and environmental management programs are implemented and continuously improved, and obligations met



Internal audit under ISO 14001 in fiscal 2019

Results of internal audit for fiscal 2019:
14 items identified (all corrective measures completed)

DAIHEN Group environmental accounting in fiscal 2019

As a group of manufacturers, the DAIHEN Group engages in an extensive range of environmental initiatives. We adopted environmental accounting because we believe that cost-benefit analysis supports effective and appropriate initiatives. We continue to allot sufficient funds where needed and engage in additional environmental initiatives by expanding the scope of application of environmental accounting.

* Environmental accounting is a tool that organizations such as businesses use to identify their environmental loads and the costs and effects of their environmental actions, in order to efficiently promote environmental protection actions.

Elements of environmental accounting

Accounting period: Fiscal 2019 (April 1, 2019 to March 31, 2020)

Reporting workplaces:

Juso Business Office (including the head office), Rokko Business Office, Mie Business Office, Chitose Plant, Kanehira Plant of DAIHEN Corporation, DAIHEN Group production sites (Tottori Plant, Oita Plant, Matsudo Plant, Eniwa Plant, Hirosaki Plant, Kagawa Plant and Izumiotstu Plant)

Note: This report has been compiled according to the DAIHEN Group Environmental Accounting Guidelines. These guidelines are in conformity with the Environmental Reporting Guidelines published by the Ministry of the Environment, Japan.

Costs of environmental initiatives

- Costs are calculated by separating investment expenditures and expenses.
- Expenses include labor costs, but do not include depreciation.
- Costs including objectives (combined costs) excluding environmental costs are calculated proportionally by our criteria.

(Millions of yen)			
Classification	Major initiatives	Investment	Cost
Business area costs		71	98
Breakdown	1. Pollution control	9	19
	2. Global environmental preservation	62	31
	3. Resource recycling	0	48
Upstream and downstream costs	Green procurement promotion activities, etc.	0	6
Management activities	Management of environmental preservation organizations, environmental education, information disclosure, construction and maintenance of environmental management systems, etc.	2	70
R&D	Promotion of green products R&D, etc.	142	240
Community activities	Community environmental preservation initiatives, donations to environmental organizations, etc.	0	16
Environmental remediation	Environmental remediation cost	0	0
Miscellaneous	Participation in industry groups, information exchange meetings with affiliated companies, etc.	0	6
Total		215	436

Benefits of environmental initiatives

Classification	Item (unit)	FY2018	FY2019	Difference
Resource inputs	Total energy input (kL in crude oil equivalent)	7,776	7,550	226
Global warming prevention	Greenhouse gas emissions (t-CO ₂)	13,972	13,509	463
Waste reduction	Total waste and other emissions (t)	789	747	42
	Waste final disposal amount (t)	4	5	-1
Air pollution control	Atmospheric emissions of VOCs (kg)	22,503	20,509	1,994

Economic benefits of environmental initiatives

Monetary benefits (Millions of yen)

Item	Details of effects	Amount
Income	Business income by sale of valuables resulted from business activities	31

Estimated effects (Millions of yen)

Item	Details of effects	Amount
Sales of green products	Power products Top Runner transformers, transformers for power companies, PV inverters, and other products	12,062
	Welding & Mechatronics products Energy-efficient, gas-saving, low-spatter welding machines, welding robots, and other products	3,214
	Semiconductor & FPD related products RF/microwave generators and matching boxes, wafer/glass substrate transfer clean robots and other products	4,359

Note: The above were calculated using the environmental preservation objectives ratio.

Estimated major (individual) effects (Thousands of yen)

Item	Details of effects	Amount
Energy conservation	Reduction in power consumption from replacing plant lighting with LEDs	24,320
	Control review of insulating oil vacuum pump	2,090
	Automation of fuse production	1,915
Waste reduction	Reuse of wood pallets after repair	8,700
	Reduction in filter paper waste by introducing a new type of oil filter	2,000
	Reduction in silicon steel plate defects	1,075
Water consumption reduction	Reduction in water consumption from introducing cooling water recirculating system for inspections	3,250

Note: Estimated benefits from the current year's investment and initiatives are appropriated as a five-year benefit because the benefits are longer term.

International environmental accounting

Accounting period: Fiscal 2019 (April 1, 2019 to March 31, 2020)

Reporting workplaces:

OTC DAIHEN Asia Co., Ltd. (Thailand); DAIHEN Electric Co., Ltd. (Thailand); Mudanjiang OTC Welding Machines Co., Ltd. (China); OTC Industrial (Qingdao) Co., Ltd. (China)

Costs of environmental initiatives

Investment	¥2 million
Costs	¥22 million

Note: Figures exclude payroll and depreciation.

Prevention of global warming

Controlling CO₂ emissions

Plan

DAIHEN Group
(18 business sites)

Reduce CO₂ emission intensity
by **1%** from fiscal 2018 levels.

Do

We are determined to reduce CO₂ emissions at the 18 sites of the DAIHEN Group, including six plants at production sites outside Japan. Some of those actions are listed below.

Introduction to initiatives of our business sites

- Replacing equipment with energy-saving products (LED lighting, air conditioning, compressors)
- Automation of production lines, efficient operation of equipment
- Operation of solar power systems
- Management and energy-saving of air conditioning



Solar power systems



Outer cylinder cap welding machine (Automated)

Check/Act

We reduced CO₂ emissions by 6.3% from last year by introducing low-energy equipment, automating production lines and following through with other planned actions. Our emissions are down 38.7% compared to fiscal 2010.

In fiscal 2020, we will implement energy-saving measures and take steps in the fight against climate change with a target of reducing emissions by 1% or more from fiscal 2019 levels.

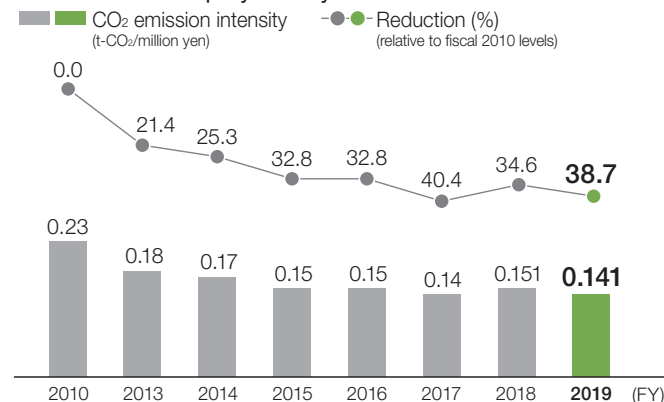
DAIHEN Group (18 business sites)

CO₂ emission intensity relative to fiscal 2010 levels

Reduced by **38.7%**
(Fiscal 2019 result: 0.141 t-CO₂/million yen)

Scope of calculation:
DAIHEN Corporation (Juso Business Office, Rokko Business Office, Mie Business Office, Chitose Plant, Kanehira Plant) and production sites of affiliated companies (Tottori Plant, Oita Plant, Matsudo Plant, Eniwa Plant, Hirosaki Plant, Kagawa Plant, and Izumiotsu Plant), and production sites outside Japan (Mudanjiang OTC Welding Machines Co., Ltd., OTC Industrial (Qingdao) Co., Ltd., OTC DAIHEN Asia Co., Ltd., DAIHEN Electric Co., Ltd., DAIHEN OTC (Beijing) Co., Ltd., DAIHEN Advanced Machinery (Changshu) Co., Ltd.)

CO₂ emission intensity and reduction rate of the DAIHEN Group by fiscal year



Waste reduction

Efficient use of resources

Plan

DAIHEN Group
(12 business sites in Japan)

Reduce waste disposal intensity
(reusable resources excluded)
by **1%** from fiscal 2018 levels.

Do

We are determined to reduce waste and use resources effectively at the 18 sites of the DAIHEN Group, including six plants at production sites outside Japan. Some of those actions are listed below.

* Every country overseas looks at waste processing differently, therefore the PLAN/CHECK/ACT data tabulated here is just for our 12 business sites in Japan.

Introduction to initiatives of our business sites

- Sorting of waste by material
- Waste reduction by improving work efficiency and work standardization (Painting work improvement, equipment tuning, outsourcing, etc.)
- Use of steel cases, improvements in packaging methods
- Use of returnable shipping containers for exports



Use of steel containers



Waste sorting

Check/Act

We reduced waste by 7.6% from last year by sorting waste and conducting little activities at our business sites. In fiscal 2020, we will continue to address waste reduction with a target of reducing disposal by 1% from fiscal 2019 levels.

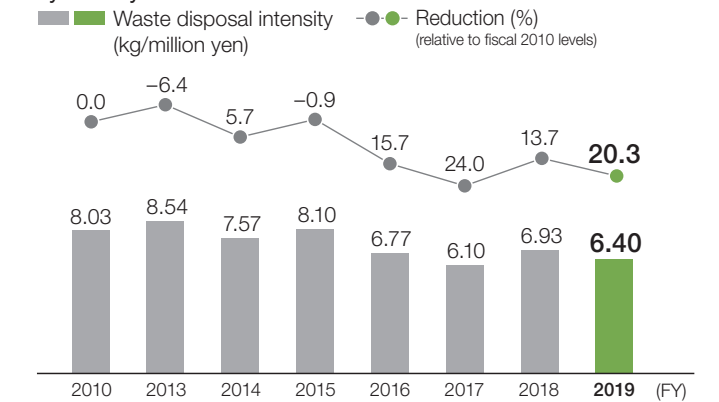
DAIHEN Group (12 business sites in Japan)

Waste disposal intensity relative to fiscal 2010 levels

Reduced by **20.3%**
(Waste disposal intensity in fiscal 2019: 6.40 kg/million yen)

Scope of calculation:
DAIHEN Corporation (Juso Business Office, Rokko Business Office, Mie Business Office, Chitose Plant, Kanehira Plant) and production sites of affiliated companies (Tottori Plant, Oita Plant, Matsudo Plant, Eniwa Plant, Hirosaki Plant, Kagawa Plant and Izumiotsu Plant)

Waste disposal intensity and reduction rate of the DAIHEN Group by fiscal year



Air pollution control

Management of chemical substances and control of emissions

Plan

DAIHEN Group
(18 business sites)

Reduce PRTR substance emission intensity
by **1%** from fiscal 2019 levels.

Do

We are determined to reduce emissions of PRTR substances at the 18 sites of the DAIHEN Group, including six plants at production sites outside Japan. Some of those actions are listed below.

Introduction to initiatives of our business sites

- Reduced consumption through quality improvements
- Use of organic substance dispersal prevention system
- Changed to non-PRTR thinner



Cleaning with a non-PRTR thinner



Performance test prior to changing thinner

Check/Act

We tried reducing PRTR emissions by improving quality and changing thinners, but failed to attain our target. In fiscal 2020, we will try even harder with a target of reducing emissions by 2% or more from fiscal 2018 levels.

DAIHEN Group (18 business sites)

PRTR substance emission intensity
relative to fiscal 2010 levels

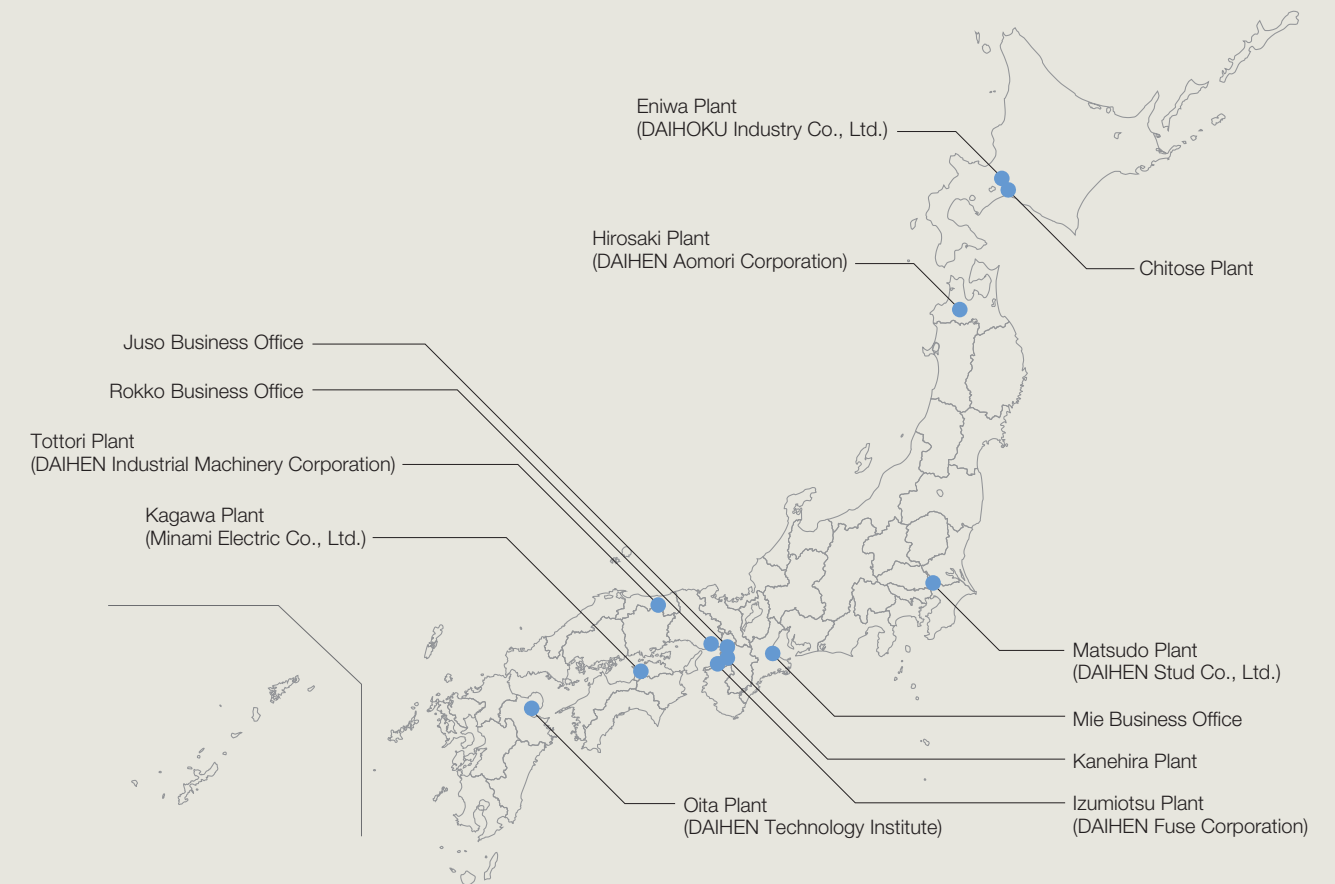
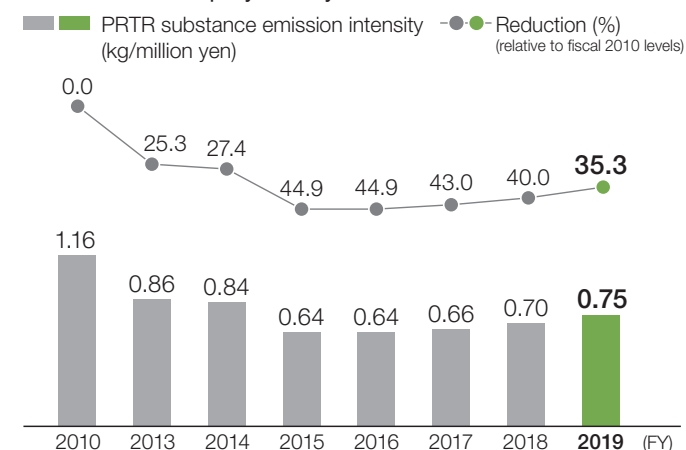
Reduced by **35.3%**

(PRTR substance emission intensity in fiscal 2019: 0.75 kg/million yen)

Scope of calculation:
DAIHEN Corporation (Juso Business Office, Rokko Business Office, Mie Business Office, Chitose Plant, Kanehira Plant) and production sites of affiliated companies (Tottori Plant, Oita Plant, Matsudo Plant, Eniwa Plant, Hirosaki Plant, Kagawa Plant, and Izumiotsu Plant), and production sites outside Japan (Mudanjiang OTC Welding Machines Co., Ltd., OTC Industrial (Qingdao) Co., Ltd., OTC DAIHEN Asia Co., Ltd., DAIHEN Electric Co., Ltd., DAIHEN OTC (Beijing) Co., Ltd., DAIHEN Advanced Machinery (Changshu) Co., Ltd.)

The DAIHEN Group will continue to promote green procurement in order to control the use of chemical substances in our purchased parts and materials before we incorporate them in our products.
For details, see "Green procurement initiatives" on page 32.

PRTR substance emission intensity and reduction rate of the DAIHEN Group by fiscal year

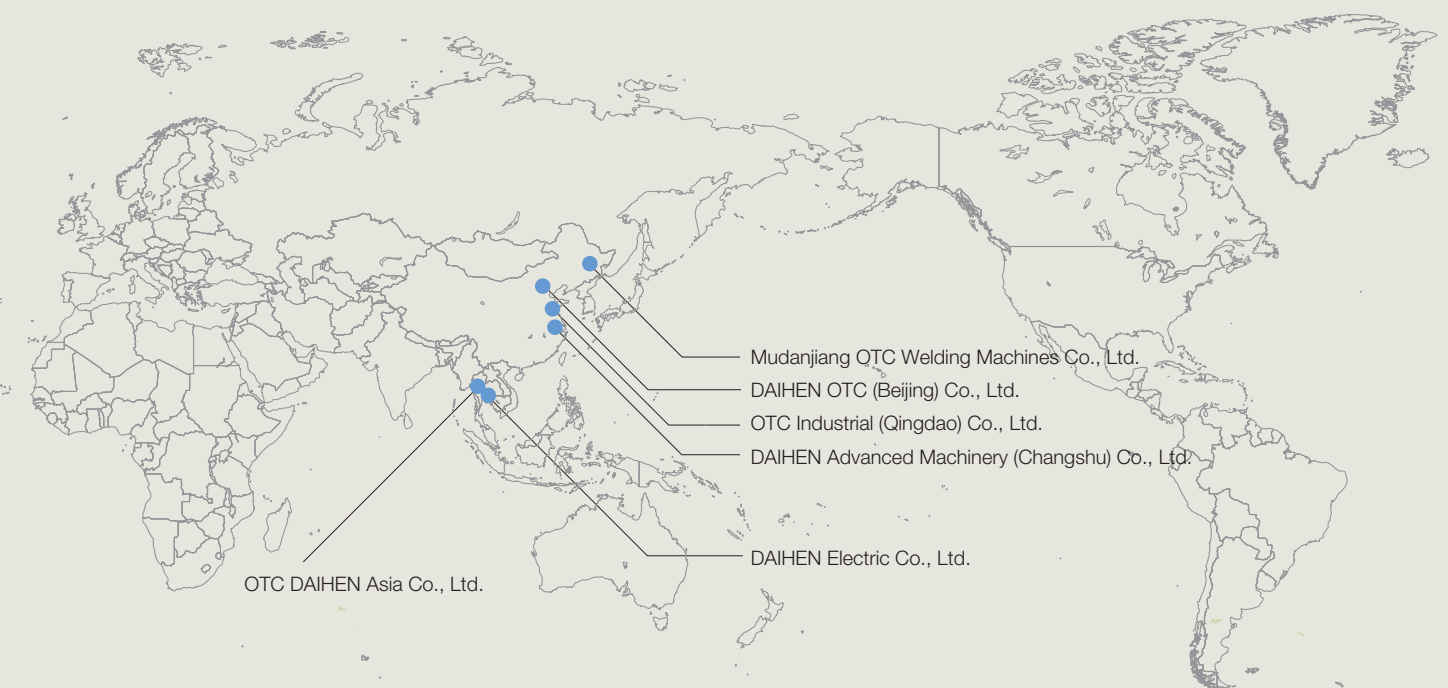


Environmental Protection Activities of Major Business Sites

* This section introduces the environmental protection activities of business sites that have acquired ISO 14001 certification.

Environmental Preservation Initiatives of Our Business Offices/Plants Environmental impact data for fiscal 2019 51 – 54

Environmental Preservation Initiatives of Plants Outside Japan Initiatives in fiscal 2019 55 – 56



Environmental Preservation Initiatives of Our Business Offices/Plants Environmental impact data for fiscal 2019

Juso Business Office

Principal business: Manufacture and sale of power transmission and distribution products and semiconductor devices

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record				Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.			Max	Min	Average	No. of meas.
pH	5.0-9.0	8.3	6.8	7.32	20	SS	600	36	<1	7.05	20
BOD	600	33	<1	4.2	20	Oil	Mineral oil: 5, animal & veg. oil: 30	16	<1	0.9	20

Numerical data on discharge of animal and vegetable oils (limited to 30) applies to the Juso Business Office.

○ Amounts of substances subject to the PRTR Law handled, released or transferred (kg/year)

Category	Substance number	Substance for inspection	Amount handled	Amount released		Amount transferred			
				Into atmosphere	Into sewage system	As refuse	Used in products etc.		
Class 1	53	Ethylbenzene	60.5	33.1	—	27.4	—		
	80	Xylene	176.5	63.3	—	112.7	—		
	186	Dichloromethane	293.8	293.8	—	—	—		
	265	Tetrahydromethylphthalic anhydride	1291.5	—	—	—	1291.5		
	296	1,2,4-trimethylbenzene	84.4	12.7	—	—	—		
	297	1,3,5-trimethylbenzene	29.2	7.7	—	—	—		
	300	Toluene	586.1	361.7	—	224.4	—		
	349	Phenol	21.8	21.8	—	—	—		
	384	1-Bromopropane	528	52.8	—	475.2	—		
	400	Benzene	14.7	5	—	—	—		
Specific Class 1	411	Formaldehyde	3.5	3.5	—	—	—		

Rokko Business Office

Principal business: Sale of welding machines; Manufacture and sale of industrial robots, etc.

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record				Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.			Max	Min	Average	No. of meas.
pH	5.0-9.0	8.5	7.2	7.65	6	SS	600	328	77.5	230.5	6
BOD	600	430	77	227.7	6	Oil	Mineral oil: 5, animal & veg. oil: 30	63.7	4.2	38.8	6

Numerical data on discharge of animal and vegetable oils (limited to 30) applies to the Rokko Business Office.

○ Amounts of substances subject to the PRTR Law handled, released or transferred (kg/year)

Category	Substance number	Substance for inspection	Amount handled	Amount released		Amount transferred			
				Into atmosphere	Into sewage system	As refuse	Used in products etc.		
Class 1	53	Ethylbenzene	441.7	375.4	—	66.4	—		
	80	Xylene	462.6	393.3	—	69.3	—		
	185	Dichloropentafluoropropane	1782	1782	—	—	—		
	300	Toluene	17.3	14.6	—	2.7	—		

Mie Business Office

Principal business: Manufacture of power transformers

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record				Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.			Max	Min	Average	No. of meas.
pH	5.0-9.0	8	6.9	7.35	2	SS	600	91	<1	17.5	2
BOD	600	44	<1	12.35	2	Oil	Mineral oil: 5, animal & veg. oil: 30	<1	<0.5	<0.5	2

○ Amounts of substances subject to the PRTR Law handled, released or transferred (kg/year)

Category	Substance number	Substance for inspection	Amount handled	Amount released		Amount transferred			
				Into atmosphere	Into sewage system	As refuse	Used in products etc.		
Class 1	53	Ethylbenzene	94.4	94.4	—	—	—		
	80	Xylene	506.5	506.5	—	—	—		
	83	Cumene	6.5	6.5	—	—	—		
	296	1,2,4-trimethylbenzene	112.3	112.3	—	—	—		
	297	1,3,5-trimethylbenzene	29.7	29.7	—	—	—		
	300	Toluene	904.5	904.5	—	—	—		
	349	Phenol	0.2	—	—	—	0.2		

Location: 2-11-1 Tagawa, Yodogawa-ku, Osaka 532-8512 Japan

At the Juso Business Office, we took steps within our environmental management program to reduce our power consumption, waste emissions and water usage like we did last year and attained targets we set for all three areas. One particular area that had presented us with challenges in the past but which we were very successful this year was to reduce our water consumption. Before, we simply discharged cooling water that had been used in product development and testing, but we introduced a chiller that allowed us to reuse that water, which reduced consumption 140% over our target.

In regards to our power consumption, though our plant ran at a high rate, we achieved our reduction target by efficiently operating heating equipment such as our annealing ovens and drying ovens, and replacing office lighting with LEDs.



Going forward, all of us at the Juso Business Office will continue to make concerted efforts to reduce our environmental load.

Shunji Okamura
Manufacturing Dept., Power Distribution System Div.
* Site Environmental Manager

At the Rokko Business Office, we looked at reducing our emissions of PRTR substances as a way to prevent air pollution. To do that, the FA Robot Manufacturing Dept. replaced the HCFC-225 fluorine-based thinner that was used to degrease products prior to painting. Not only is this particular thinner a named PRTR substance, but it was completely banned by the 1995 Montreal Protocol as an ozone-depleting agent and all production in Japan was discontinued at the end of 2019. The problem, however, was that it worked well and dried fast, and we had a hard time finding a replacement that performed just as well. So, we gathered information from international tradeshows and repeatedly tested and evaluated candidate products. At present, we are using Amolea AS-300 and have greatly reduced our emissions. But, we're not done. Going forward, we will continue searching for ways to reduce emissions of PRTR substances.



Toshitsugu Kawanishi
Manufacturing Dept.,
FA Robot Div.

Location: 800 Higashiikebe, Taki-cho, Taki-gun, Mie 519-2155 Japan

At the Mie Business Office, we joined the fight against climate change by taking steps to reduce our CO₂ emissions. In 2019, we reduced our power consumption by changing lighting at the site from mercury vapor bulbs to LEDs, and cut down on paper use by going paperless with our PLM (Product Lifecycle Management) records. We saved about 9,660 kWh of electricity a year by changing permanently lit lighting from 150 kWh bulbs to 120 kWh bulbs, and another 184,000 kWh or so a year by switching normal lighting from 130 kWh bulbs to 50 kWh bulbs, which added up to about 193,660 kWh a year in total savings. By going paperless with our records, we saved about 83,400 sheets (when converted to A4 size paper) compared to 2018.



We haven't finished replacing all of the lights at the site, so that will continue in 2020 with renewed efforts to reduce our power consumption. We will also continue with our paperless campaign by digitalizing manuals, etc.

Yuki Tsunoe
Engineering Dept.,
Power Transformer Div.

Chitose Plant

Principal business: Manufacture of power transmission and distribution products

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record				Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.			Max	Min	Average	No. of meas.
pH	5.0-9.0	7.7	6.3	7	2	SS	600	14	3	7	2
BOD	600	160	<1	100.5	2	Oil	Mineral oil: 5, animal & veg. oil: 30	<1	<1	<1	2

○ Amounts of substances subject to the PRTR Law handled, released or transferred (kg/year)

Category	Substance number	Substance for inspection	Amount handled	Amount released		Amount transferred			
				Into atmosphere	Into sewage system	As refuse	Used in products etc.		
Class 1	53	Ethylbenzene	0.42	0.42	—	—	—		
	80	Xylene	2.09	2.09	—	—	—		
	132	Cobalt and its compounds	1.248	—	—	—	1.248		
	186	Dichloromethane	171.73	171.73	—	—	—		
	297	1,3,5-trimethylbenzene	7.06	7.06	—	—	—		
	300	Toluene	4.43	4.43	—	—	—		
	349	Phenol	35.25	35.25	—	—	—		
	354	Di-n-butyl phthalate	0.38	0.38	—	—	—		
	413	Phthalic anhydride	0.027	0.027	—	—	—		

Kanehira Plant

Principal business: Servicing of pole-mounted transformers

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record				Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.			Max	Min	Average	No. of meas.
pH	5.0-9.0	7.5	6.7	7.15	48	SS	600	2	<1	1.17	12
BOD	600	8	<1	2.5	12	Oil	Mineral oil: 5, animal & veg. oil: 30	<1	<1	<1	72

○ Amounts of substances subject to the PRTR Law handled, released or transferred (kg/year)

Category	Substance number	Substance for inspection	Amount handled	Amount released		Amount transferred			
				Into atmosphere	Into sewage system	As refuse	Used in products etc.		
Class 1	53	Ethylbenzene	154.6	110.4	—	—	—		
	80	Xylene	815.8	584.8	—	—	—		
	300	Toluene	17.8	11.9	—	—	—		
	349	Phenol	3.8	3.8	—	—	—		

Tottori Plant (DAIHEN Industrial Machinery Corporation)

Principal business: Manufacture of welding machines, control and communications equipment, high-frequency plasma generators, dispersed power equipment, etc.

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record				Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.			Max	Min	Average	No. of meas.
pH	5.0-9.0	7.5	6.7	7.125	4	SS	600	3.7	<1	1.83	4
BOD	600	1.8	<0.5	1.075	4	Oil	Mineral oil: 5, animal & veg. oil: 30	<0.5	<0.5	<0.5	4

○ Amounts of substances subject to the PRTR Law handled, released or transferred (kg/year)

Category	Substance number	Substance for inspection	Amount handled	Amount released		Amount transferred			
				Into atmosphere	Into sewage system	As refuse	Used in products etc.		
Class 1	53	Ethylbenzene	7.792	7.792	—	—	—		
	80	Xylene	8.1	8.1	—	—	—		
	82	Silver and its water-soluble compounds	21.78	—	—	21.78	—		
	87	Chromium and chromic compounds	0.09	—	—	—	0.09		
	151	1,3-dioxolane	1.55	1.55	—	—	—		
	296	1,2,4-trimethylbenzene	33.8	33.8	—	—	—		
	297	1,3,5-trimethylbenzene	11.69	11.69	—	—	—		
	300	Toluene	101.35	101.35	—	—	—		
	302	Naphthalene	22.4	22.4	—	—	—		
	392	n-hexane	1.52	1.52	—	—	—		
	305	Lead compounds	596.33	—	—	238.53	357.8		

Location: 770-7 Kitashinano, Chitose-shi, Hokkaido 066-0075 Japan

The Chitose Plant mostly makes and repairs pole-mounted transformers for power companies.

As part of our environmental protection activities for 2019, we paused plans for our core continuous annealing ovens, which account for over half the plant's entire power consumption, and avoided peak demand hours when using our drying ovens, in order to attain our targeted CO₂ emission reductions. These efforts worked well in winter.

In 2020, we will continue the activities from the previous year and try to reduce our CO₂ emissions even further by covering our drying ovens in heat shielding paint as one energy-saving measure and conserving power in each process through other means. Moreover, to reduce waste, we will take sorting and management of waste and reusable resources to a higher level, which will include exploring and implementing ways to recycle discarded glass and other materials.

These and other activities will be undertaken as plant-wide efforts.



Tetsuo Tominaga
Manufacturing Sect.,
Chitose Plant,
Power Distribution System Div.

Location: 6-2-10 Noda, Fukushima-ku, Osaka 553-0005 Japan

The Kanehira Plant specializes in servicing pole-mounted transformers for power companies, but since we have been seeing a decline in servicing orders for a while, we started producing top-runner transformers this past June. With that has come plastic packaging for new parts, which needs to be dealt with. Therefore, we are looking for ways to reduce this waste by converting it to other uses or recycling it into reusable resources. The new direction we've taken has also brought an increase in wooden pallets for shipping, but they tend to get damaged and discarding them was becoming an issue. So, it is a bit of a hassle, but we are replacing the damaged planks so that we can reuse the pallets, which is helping to reduce waste.

In 2020 as well, we will continue to work in ways that do not increase waste so as to achieve our reduction targets.



Kazushige Hatanaka
Kanehira Distribution Center,
DAIHEN Logistics Co., Ltd.

Location: 1041 Azo, Mochigase-cho, Tottori-shi, Tottori 689-1227 Japan

At the Tottori Plant, we updated our heating and cooling equipment with energy-saving models to achieve our target of reducing CO₂ emissions by 1% (11 t-CO₂) from fiscal 2018 levels. The air-conditioners at the Kunigiwara Plant (older area of the plant) were already 22 years old when we began combing through the selection of energy-efficient products. Eventually, we replaced the kerosene-fueled absorption type units with package units. That reduced our kerosene consumption by 42.92 kL/year, which translated into a large 106.9 t-CO₂ reduction. Our power consumption has stayed the same as the previous year owing to the power management features of the units themselves that operate around peak demand hours and our meticulously turning individual units ON and OFF. We no longer risk shutting down the whole plant just because of air-conditioner trouble and can maintain a comfortable work environment.

Looking ahead, all employees are united on implementing environmental protection activities that will keep Mother Nature beautiful.



Mikihiro Fujiwara
Manufacturing Engineering Group,
Semiconductor Manufacturing Dept.

Environmental Preservation Initiatives of Our Business Offices/Plants Environmental impact data for fiscal 2019

Oita Plant (DAIHEN Technology Institute)

Location: 1660-7 Mizoi, Kitsuki-shi, Oita 873-0025 Japan

Principal business: Manufacture of clean transfer robots, dispersed power equipment, wireless power transfer systems, etc. Development of software

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.
pH	5.0-9.0	7.3	6.8	7.5	12
BOD	600	9.9	1.3	3.85	12
SS	600	19	4.8	8	12
Oil	Mineral oil: 5, animal & veg. oil: 30	No measured result for fiscal 2019			

Oita Plant did not handle any substances subject to the PRTR Law.

Environmental protection activities are an integral part of daily operations at the Oita Pant. More specifically, to reduce waste and CO₂ emissions, we use energy-efficient plant equipment, reuse packaging materials and conduct work in efficient ways that cut back on power consumption.

Currently, as part of manufacturing wireless power transfer systems, which I am in charge of, we have shortened inspection time by automating testing, lessened the number of assembly steps via an improvement proposal for the casing sheet metal process and reduced power consumption by decreasing the number of processing steps at cooperating companies. As we move forward, we will continue to address environmental issue as a concerted effort of the entire plant.



Kenji Isayama
Manufacturing Dept.

Matsudo Plant (DAIHEN Stud Co., Ltd.)

Location: 6-8-12 Minoridai, Matsudo-shi, Chiba 270-2231 Japan

Principal business: Sale of welding machines; Manufacture and sale of welding materials; Welding work

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.
pH	5.0-9.0	6.6	6.5	6.55	2
BOD	600	17.5	6	11.75	2
SS	600	12.5	8.8	10.65	2
Oil	Mineral oil: 5, animal & veg. oil: 30	<1	<1	<1	2

Matsudo Plant did not handle any substances subject to the PRTR Law.



Hidenori Matsushita
Operation Section

The Matsudo Plant comprises a stud bolt production plant and the Eastern Japan Sales Department. Here, everyone is working to improve quality, honor delivery deadlines and reduce costs. The biggest environmental protection activity at the site in fiscal 2019 was to reduce CO₂ emissions. The plant achieved a 10% reduction against the previous year by making further improvements to automatic equipment and shortening equipment downtime. Moreover, we reduced electricity consumption by using the surplus hot air from compressors to remove moisture from sawdust used in the headed stud bolt cleaning process, instead of resorting to a hot air dryer. In the Sales Department, we made efforts to reduce energy consumption by using elevators less and making sure that lights, air conditioners and computers are not left ON. Going forward, we will continue to undertake environmental protection activities as a concerted site effort.

Eniwa Plant (Daihoku Industry Co., Ltd.)

Location: 347-11 Toiso, Eniwa-shi, Hokkaido 061-1405 Japan

Principal business: Manufacture and processing of cans, sheet metal and related mechanical fittings

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record				Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.			Max	Min	Average	No. of meas.
pH	5.0-9.0	7	6.6	6.85	4	SS	600	9	2	6.15	4
BOD	600	92	3.9	53.3	4	Oil	Mineral oil: 5, animal & veg. oil: 30	2.9	2	2.45	4

○ Amounts of substances subject to the PRTR Law handled, released or transferred (kg/year)

Category	Substance number	Substance for inspection	Amount handled	Amount released		Amount transferred	
				Into atmosphere	Into sewage system	As refuse	Used in products etc.
Class 1	1	Water-soluble zinc compounds	536	—	—	536	—
	7	N-butyl acrylate	9.9	9.9	—	—	—
	30	Linear alkylbenzene sulfonic acid	4.9	—	—	4.9	—
	53	Ethylbenzene	259.6	259.6	—	—	—
	71	Ferric chloride	5781.3	—	—	5781.3	—
	80	Xylene	1303.1	1303.1	—	—	—
	132	Cobalt and its compounds	3.2	—	—	—	3.2
	239	Organic tin compounds	188	—	—	37.6	150.4
	240	Styrene	13.7	13.7	—	—	—
	275	Sodium dodecyl sulfate	0.7	—	—	0.7	—
	296	1,2,4-trimethylbenzene	1.8	1.8	—	—	—
	297	1,3,5-trimethylbenzene	132.2	132.2	—	—	—
	300	Toluene	370.6	370.6	—	—	—
	302	Naphthalene	9.1	9.1	—	—	—
	349	Phenol	1.6	1.6	—	—	—
	354	Di-n-butyl phthalate	9.9	9.9	—	—	—
	405	Boron compounds	67	—	—	67	—
	407	Poly (oxyethylene) alkyl ether (alkyl C=12-15)	78.9	—	—	78.9	—
	409	Sodium poly (oxyethylene) dodecyl ether sulfate	2.5	—	—	2.5	—
	412	Manganese and its compounds	134	—	—	134	—
	420	Methyl methacrylate	9.9	9.9	—	—	—
Specific Class 1	309	Nickel compounds	67	—	—	67	—
Class 1	411	Formaldehyde	24.9	24.9	—	—	—



Haruhiko Miyazawa
Manufacturing Section

The Eniwa Plant has the only closed-loop line in Hokkaido for canning and coating, which we use to make casings for pole-mounted transformers that are assembled at the Chitose Plant. We do mostly pressing, welding, thermal spraying and coating work.

For our environmental activities, we set two targets: to reduce CO₂ and VOC emissions. I am in charge of promoting the environmental protection activities.

Up until now, we directed our contributions to the environment through "Loss Cutting Initiatives" and "Quality Improvements", and, since acquiring ISO 14001 certification in fiscal 2006, we have greatly reduced our CO₂ emissions by 28% (per million yen) and VOC emissions by 66% (per million yen) against fiscal 2006 levels. We will continue to promote "Loss Cutting Initiatives" and "Quality Improvements" as an effective way to contribute to the environment.

Hirosaki Plant (DAIHEN Aomori Corporation)

Location: 1-5-1 Iwaka, Hirosaki-shi, Aomori 036-8073 Japan

Principal business: Manufacture of fuses and power distribution equipment

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record				Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.			Max	Min	Average	No. of meas.
pH	5.0-9.0	7.4	7.3	7.35	2	SS	600	2	2	2	2
BOD	600	5.1	2.5	3.8	2	Oil	Mineral oil: 5, animal & veg. oil: 30	3	<0.5	1.175	4

○ Amounts of substances subject to the PRTR Law handled, released or transferred (kg/year)

Category	Substance number	Substance for inspection	Amount handled	Amount released		Amount transferred	
				Into atmosphere	into sewage system	As refuse	Used in products etc.
Class 1	80	Xylene	0.04	0.04	—	—	—
	134	Vinyl acetate	0.81	0.81	—	—	—
	186	Dichloromethane	48.78	48.78	—	—	—
	300	Toluene	318.01	318.01	—	—	—
	405	Boron compounds	267.73	—	—	0.8	266.94

Kagawa Plant (Minami Electric Co., Ltd.)

Location: 15 Nishi-minatomachi, Tadotsu-cho, Nakatado-gun, Kagawa 764-0017 Japan

Principal business: Manufacture and processing of cans, sheet metal and related mechanical fittings

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record				Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.			Max	Min	Average	No. of meas.
pH	5.0-9.0	8.2	6.9	8.3	6	SS	600	51.8	21.8	38.7	6
BOD	600	98.5	38.9	65.8	6	Oil	Mineral oil: 5, animal & veg. oil: 30	3.4	<1	1.5	6

○ Amounts of substances subject to the PRTR Law handled, released or transferred (kg/year)

Category	Substance number	Substance for inspection	Amount handled	Amount released		Amount transferred	
				Into atmosphere	into sewage system	As refuse	Used in products etc.
Class 1	1	Water-soluble zinc compounds	622.9	—	—	—	622.9
	53	Ethylbenzene	2678.4	2678.4	—	—	—
	80	Xylene	3253.2	3253.2	—	—	—
	235	Water-soluble salts of bromic acid	48	—	—	48	—
	296	1,2,4-trimethylbenzene	771.9	771.9	—	—	—
	297	1,3,5-trimethylbenzene	163.2	163.2	—	—	—
	300	Toluene	2723.4	2723.4	—	—	—
	302	Naphthalene	148.3	148.3	—	—	—
	354	Di-n-butyl phthalate	0.3	0.3	—	—	—
	405	Boron compounds	51	51	—	—	—
	407	Poly (oxyethylene) alkyl ether (alkyl C=12-15)	17.5	17.5	—	—	—
	410	Poly (oxyethylene) nonylphenol ether	2.5	2.5	—	—	—
	412	Manganese and its compounds	15.3	—	—	—	15.3
	309	Nickel compounds	38.6	—	—	—	38.6
	411	Formaldehyde	2.4	2.4	—	—	—

Izumiotstu Plant (DAIHEN Fuse Corporation)

Location: 2-39 Shikintai-cho, Izumiotstu-shi, Osaka 595-0035 Japan

Principal business: Manufacture of fuses, power distribution equipment/parts and surge protective devices

○ Quality measurements of drainage water (mg/L except pH)

Item	Plant's regulated compliance value	Track record				Item	Plant's regulated compliance value	Track record			
		Max	Min	Average	No. of meas.			Max	Min	Average	No. of meas.
pH	5.0-9.0	7.6	6	7.25	6	SS	600	2	<1	1.15	6
BOD	600	18	2.2	11.2	6	Oil	Mineral oil: 5, animal & veg. oil: 30	1	<1	1	2

○ Amounts of substances subject to the PRTR Law handled, released or transferred (kg/year)

Category	Substance number	Substance for inspection	Amount handled	Amount released		Amount transferred	
				Into atmosphere	into sewage system	As refuse	Used in products etc.
Class 1	134	Vinyl acetate	1	0.04	—	—	—
	281	Trichloroethylene	700	700	—	—	—
	300	Toluene	45	30.6	—	—	—

To reduce CO₂ emissions, the Hirosaki Plant rolled out a number of measures centered on automating manufacturing processes again this year. This included adding more heat storage supply units and automating the silicon wiping process, which improved productivity and reduced overtime work. Moreover, we looked at how workplace air-conditioners were used (operated primarily as air-conditioners and secondarily as a kerosene heater with low temperature setting) for the purpose of decreasing our kerosene consumption, and ran the circulators continuously, which helped us to attain our fiscal 2019 targets.

In fiscal 2020, we will do more to automate manufacturing processes and, with construction of a new plant building and preparations underway for new products that are to come from a planned start of production in fiscal 2021, we will extract and assess environmental data and continue our environmental protection activities.



Megumi Miura
Administration

At the Kagawa Plant, we fabricate and paint a variety of transformer casings, and, like last year, we took steps in 2019 to reduce our CO₂, VOC and waste emissions. We achieved our reduction target for VOC emissions, but not so for our CO₂ or waste emissions, despite replacing plant lighting with LEDs, insulating roofs and introducing energy-efficient equipment.

In regards to CO₂ emissions, we will add more insulation, identify and repair air leaks and more scrupulously manage demand. As for waste, we will sort waste that results from equipment replacement and modifications, in an effort to reduce whatever processing costs and disposal volume we can. Going forward, our entire workforce will continue to get behind our environmental protection activities in order to ensure we are an Earth-friendly plant.



Shoji Baba
Manufacturing Dept.

At the Izumiotstu Plant, we reduced our CO₂ emissions by 0.5 t/year by continuing to replace fluorescent bulbs with LEDs. We also reduced our annual consumption of methylene chloride from 120 kg to 0 kg, which greatly reduced our VOC emissions, by redesigning some electrical wiring fuses and changing how we joined the cylindrical cap and fuse from methylene chloride to ultrasonic welding. With regards to protecting biodiversity and reducing waste, we far exceeded our targets for fiscal 2019.

In fiscal 2020, we will be designing and developing environment-friendly fuses and surge protectors with the hope of getting them certified. Besides that, everyone is united in taking our environmental protection activities to another level.



Kenichi Umehara
Quality Assurance Dept.

Environmental Preservation Initiatives of Plants Outside Japan Initiatives in fiscal 2019

Mudanjiang OTC Welding Machines Co., Ltd.

Location: No.18 Xingye Road, Yangming, Mudanjiang, Heilongjiang 157013, China

Principal business: Manufacture of welding machines and parts, etc.



Paperless work procedures



Paperless inspection procedures

Paper is one of the four great inventions of ancient China. It is over 2,000 years old and has played an important role in social development, but excessive use and waste in recent years has pinned it to deforestation and pollution. We, therefore, stopped using paper documents, having opted to project new and revised drawings on monitors in real-time and go paperless with work procedures and inspection procedures. As a result, we use about 30,000 sheets less of A4 size paper a year on just our production floor.

To make 1 ton of paper, it takes 0.875 ton of wood, 0.5 ton of coal and 375 ton of water. Burning 1 ton of coal emits about 2.7 ton of CO₂. In other words, by reducing paper consumption by 30,000 sheets, we are sparing about 115 kg of wood, 155 kg of CO₂ emissions and 43 ton of water.

Going paperless leads to improvements in both production efficiency and quality, while at the same time contributing to environmental protection, therefore we will expand the scope of this activity.



Tan Wujun
Production Engineering Dept.

OTC Industrial (Qingdao) Co., Ltd.

Location: 588 Sanjiang Road Economic & Technical Development Area, Qingdao 266555, China

Principal business: Manufacture of welding machines and parts, high-frequency power supply units, etc.



New air compressor

At the Qingdao Plant, there were two air compressors that had been used for the full 16 years since the plant first opened, but they consumed a lot of power, were loud and generated a lot of heat. Plus, they have broken down a lot in the last few years and fans were needed during the four months of summer to exhaust the heat. In order to lower our power consumption and improve the work environment, we replaced both units with a new model that could do the job of two. With it, we were able to reduce our power consumption and greatly improve noise emissions. Moreover, because it generates less heat, fans are no longer necessary to exhaust heat. There are additional power-savings to enjoy because the compressor is designed to stop compressing air when pressure inside the line reaches a certain level.



We expect to save 111,580 kWh of power a year. Going forward, we will continue to search for ways to lower our power consumption and improve the work environment.

Ding Mingqiang
Manufacturing Dept.

	Before	After
Power consumption	46.2 kW (Total for 2 units)	38.3 kW (1 unit)
Operating factor	100%	26%
Fan	7.5 kW	Not needed
Noise emission	85 dB	60 dB

OTC DAIHEN Asia Co., Ltd.

Location: 60/86 Moo19, Navanakorn Industrial Estate Phase 3, Tambol Klongnueng Amphur Klongluang, Pathumthani 12120, Thailand

Principal business: Manufacture and sale of welding machines, cutting machines and parts in Southeast Asia and Oceania



Entering data into the quality system



Rental cloths

We are located 50 km north of the Thai capital of Bangkok where we produce everything from parts to products for welding/plasma cutting torches, robot peripheral units and more.

In 2019, we introduced a quality system that enabled us to go paperless and boosted the efficiency of our operations by evolving us from manual data input to direct system input. This has saved us about 925,000 yen/year.

We are also putting efforts into reducing waste such as by using rental cloths.

OTC DAIHEN Asia is enhancing environmental awareness in all departments in accordance with the Environmental Policy of the DAIHEN Group and, this year, will be promoting activities to reduce power consumption and waste.

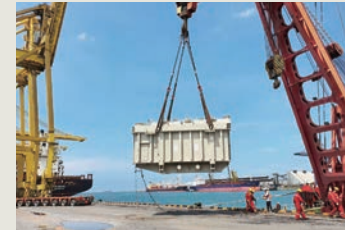


Nanthiwa Kanme
Project Department

DAIHEN Electric Co., Ltd.

Location: Thamboon Thasa-an, Bangpakong Chachoengsao, 24130 Thailand

Principal business: Manufacture and sales of power transformers



Transformer being loaded onto a container ship



Transformer stowed onboard a container ship

We are the first company in Thailand to produce high-capacity transformers for power applications. We are delivering them and other products to power companies in Thailand and other customers around the world.

In 2019, we materialized the idea of reducing our environmental load in shipping. To deliver high-capacity transformers overseas, we had long been using RORO ships (ships that transport the trucks and trailers along with the cargo they carry). These RORO ships are suited for large cargo, but cargo cannot be packed tightly, which means less spatial efficiency. To improve things, this time, we built a platform with the headroom of two 40-ft containers and anchored a high-capacity transformer to that platform for shipping. Accessories were stowed in a container, which improve the spatial efficiency



both ways. Because this approach took advantage of the good fuel efficiency of ships, we reduced CO₂ emissions by about 35% according to our calculations. We want to continue with creative efforts like this that help to reduce our environmental load.

Sirinnaporn Noichaiboon
Purchasing Department

DAIHEN OTC (Beijing) Co., Ltd.

Location: No. 5, Leyuan South 2nd Road, Yangi Economic Development Zone, Beijing 101407, China

Principal business: Manufacture and sale of transformers, etc.



Drying oven



Drying oven control panel

In China, people are growing more and more aware of the environment, which is increasing the importance of weaving environmental protecting into corporate business activities.

DAIHEN Beijing also promoted some activities in relation to energy conservation and the 3 Rs.

In manufacturing operations, transformer coils need to be dried, but a single run in our drying ovens requires about 15 hours from start to finish and consumes about 325 kWh of power. Thinking to cut losses and save energy at the same time, we coordinated oven operating plans and production plans in order to use the ovens more efficiently. This reduced the number of times we used the ovens, which equated to an estimated energy-saving effect of about 3,900 kWh/year.

Moreover, we are improving the work environment and conserving power by sequentially converting plant lighting to LEDs.

Looking ahead, we want to contribute to the sustainable development of society by undertaking environmental activities.

Zhu Zi Wen
Human Resources General Affairs Section



DAIHEN Advanced Machinery (Changshu) Co., Ltd.

Location: No.17 Maqiao Factory Area, Riverside Industrial Park, Jiangsu Changshu Economic Development Zone, Changshu City, Jiangsu 215513, China

Principal business: Manufacture, sale, maintenance and inspection of clean transfer robots, etc.



More efficient production line



Parts arranged in units of assembly

In fiscal 2019, we upped our production efficiency by changing our plant layout. To make production lines more efficient, we made the lines straight, shortened crane operating time and optimized the lines of flow of personnel and materials. Also, we rearranged how we stock parts from grouping everything in one place according to drawing number to positioning all the parts for a given assembly in front of the process where they are used. As a result, we saved 1 hour's worth of process steps and the fewer process steps has translated into less overtime work. Moreover, we reduced our monthly electricity consumption by about 4% compared to last year.

Under the guidance of the local environmental authorities, we are implementing stringent environmental protection measures and have pursued various activities in the past. We will continue to do so to do our part to ensure the local community is safe and healthy.



Zha Huaming
Manufacturing Dept.



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