

MUSASHI Sustainability Report 2019



CEO message

Starting Line of Musashi Group Challenge and Passion for “*Monozukuri*”

The Musashi Group started its business by manufacturing carburetor parts for aircraft in 1938 and changed over to manufacturing sewing machine parts after World War II. In 1956 Musashi started manufacturing motorcycle parts, and transferred to the automobile industry where development was anticipated. Grasping the needs of the times, Musashi has established an original “*Monozukuri*” system with an integrated production system, precision forging technology and a global production/ sales system, and an R&D capability which has developed unique products such as maintenance free ball joints and MS diff*. We have been carving out a history for more than 80 years.

Throughout our history, we have been concerning about sincerity in development of human resources and *Monozukuri*, and passion for contributing to the development of people’s living as well as society through *Monozukuri*.

* Lightweight differential assembly with bevel gears developed by Musashi.

Musashi Seimitsu Industry Co.,
Ltd. President & CEO

Hiroshi Otsuka



Creating Values through Sustainability Initiatives MUSASHi Innovation Lab CLUE

Recently, the technology and impact of private companies has been expected and required more to contribute to solve social issues. Solving the social problems and contributing to the sustainable development of society are becoming essential elements for corporate growth and development. We have to contribute to sustainable development throughout the entire business activities including the supply chain and throughout the product life cycle. Based on the above background, we have resolved the “Basic Policy of Musashi Group for Realization of Sustainable Global Society” in the Board of Directors in 2016. Based on our corporate mission under the Policy, we have decided to promote activities to realize sustainable global society from the perspectives of “creating shared values” and “social responsibility as a global company”.

Stronger “Product Liability,” “Human Rights,” “Labor Practice,” and “Environment”

For us, “creating shared value” means supporting production and proliferation within the automotive industry by producing and supplying parts, and contributing to the improvement of automotive functions, such as fuel efficiency and safety, through designing/developing parts. As part of our approach, we are improving our ability to develop new products compatible with automobile electrification and making parts more compact and lightweight by leveraging our unique development capabilities. We have started integrating rapidly-advancing AI and deep-learning technologies at production sites. In addition, based on the concept of “human jobs for humans,” we are pursuing innovative advancements in manufacturing. Also, we are creating new types of business, not bound by our existing areas of business. In 2018, we opened “MUSASHi Innovation Lab CLUE,” a platform for generating innovation.



Musashi AI Press Release

Additionally, as part of social responsibilities of a global company, we recognize the need to work together with our global stakeholders: employees, customers, business partners and local communities for realizing a better society. Although there are various social issues related to our business such as product liability, human rights, labor practice, and environment, we are steadily tackling each of them by adopting the SDGs (UNDP Sustainable Development Goals) to discharge our group responsibility in society. We are undertaking various activities to contribute to the sustainable development of the global society and to be trusted by stakeholders throughout the world. This report, has been issued to inform our global stakeholders about these activities and to give the reader a fully understanding of the Musashi Group’s activities in this regard.



“Talking about the Future” with Young Associates

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■ Period Covered
This report mainly covers the activities in FY2018.

■ Organization
Information in this report refers to all consolidated organizations.
Report on activities in Japan refers preliminary to Musashi Seimitsu Industry Co., Ltd.

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■ Referred Guidelines
IIRC: International Integrated Reporting Framework
GRI: GRI Standards
ISO: ISO26000 :2010 Guidelines on Social Responsibilities
Ministry of Environment, Government of Japan: Guidelines on Environmental Report

Company Profile

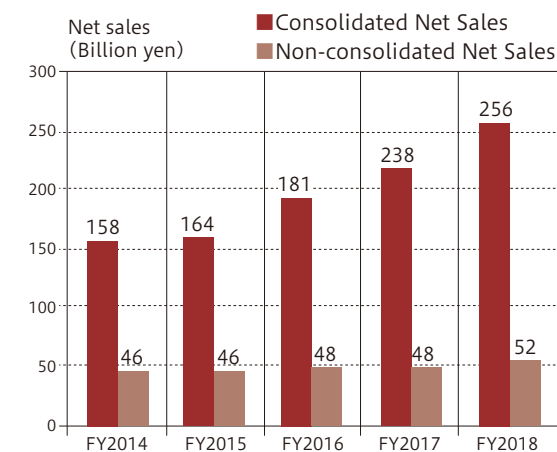
Company Name	Musashi Seimitsu Industry Co.,Ltd.
Head Office	39-5, Daizen, Ueta-Cho, Toyohashi, Aichi
Founded	April, 1938
Incorporated	January 22, 1944
Capital	5,326 million yen (As of April, 2019)
Employees	Group: 16,839 (As of March 2019) Japan: 1,315 (As of March 2019)

【FY2018 Financial Result】

(Million yen)

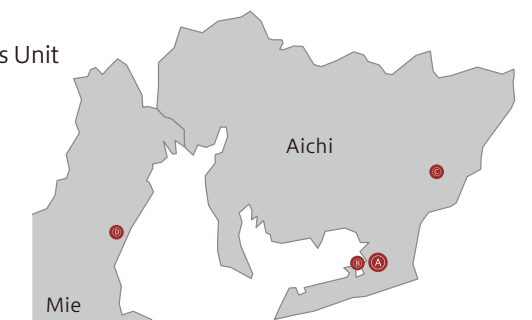
Consolidated/ Non-consolidated	Consolidated	Non-consolidated
Net sales	255,934	52,077
Ordinary income	14,791	5,546
Net income	9,885	4,333

【Closing date】










【Location of Musashi Seimitsu Industry Co., Ltd.】

- Ⓐ Head Office / Ueta Plant
- Ⓑ Akemi Plant #1
- Ⓑ Akemi Plant #2
- Ⓑ Machinery & Tools Business Unit
- Ⓒ Horai Plant
- Ⓓ Suzuka Plant



Product Lineup

We provide high-value-added products which are trusted by customers in the world with the integrated production system backed up by our unique technology development and know-how.

	Outline of major products		
Power Train			
	Differential Assembly	Planetary Assembly	Camshafts
	Linkage & Suspension		
Suspension Arm Assembly		Suspension Ball Joints	Steering Ball Joints
Motorcycle			
	Transmission Assembly	Camshafts (for mid-/small-size motorcycles)	Camshafts (for large-size motorcycles)

Transmission Gear/Planetary Assembly: Parts that convert and transmit the engine revolution to the rpm adequate for driving.

Differential Assembly: A mechanism that absorbs a rotational difference between right and left tires during cornering to distribute the torque.

Camshaft: The heart of a car which controls intake and exhaust engine valves.

Ball Joint: A critical part used for steering and suspension which connect a handle, tires and body.

Musashi Philosophy

Musashi Philosophy is a key trinity which consists of 3 elements: “Spirit of Foundation”, “Corporate Mission” and “Guidance for Conduct.”

Guidance for Conduct

一、お得意様本位で
二、誠実を尽くし
三、工夫をこらして
四、努力をおしまず
五、みんなで力を合わせ
六、権利義務を忘れずに

1. Customer first
2. Integrity
3. Resourcefulness
4. Hard work
5. Cooperation for the common goal
6. Remember our rights and responsibilities

Spirit of Foundation

至誠一貫
質実剛健

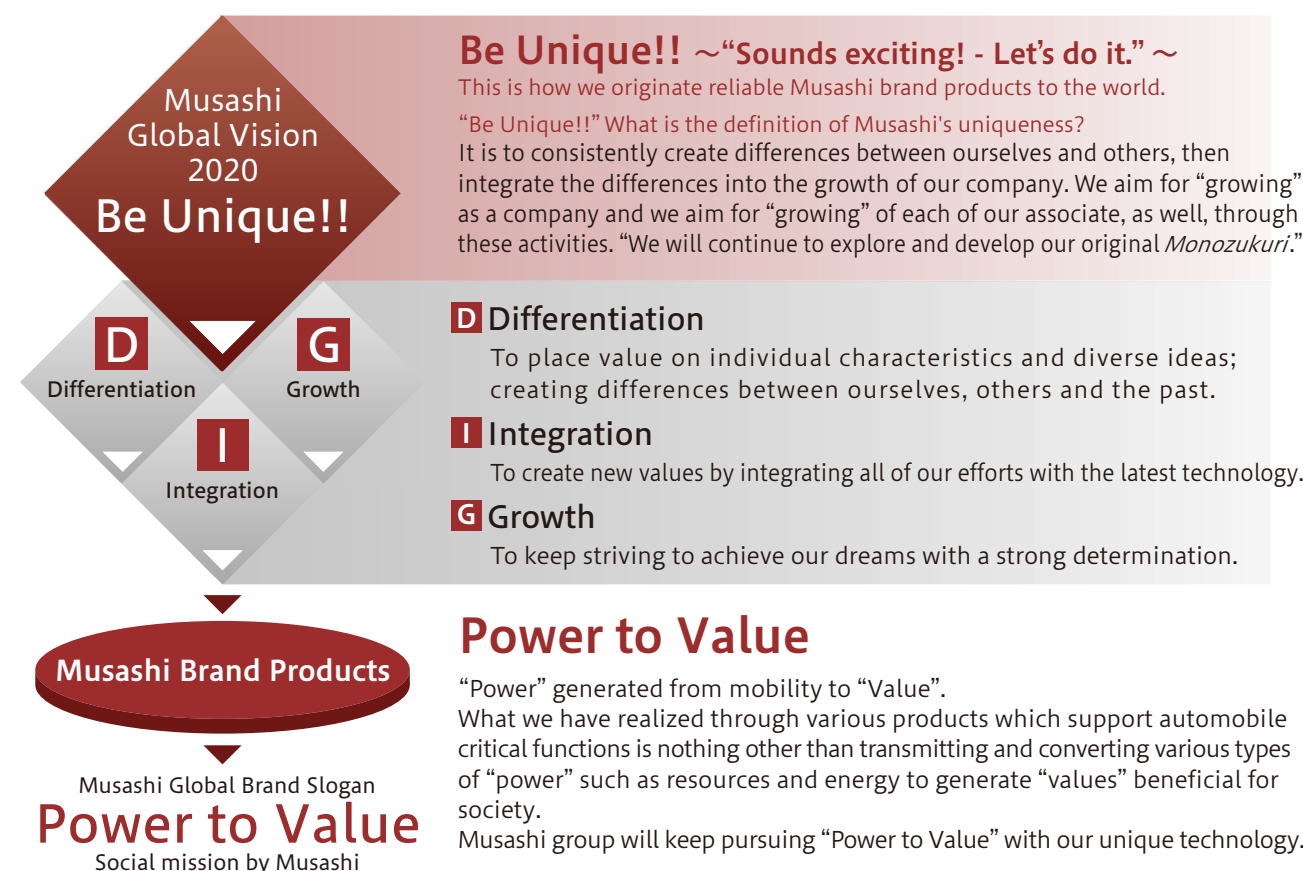
Shitsujitsu-Goken
(Simple and Sturdy)
Shisei-Ikkan
(Consistent Sincerity)

Corporate Mission

わたしたちは
独創的なものづくりを探究し
世界のみなさんに信頼される
魅力的な商品の提供を通して
地球社会の発展に貢献します

We will continue to explore and develop our original *Monozukuri* and thereby contribute to the global society by providing trusted and attractive products.

Musashi Global Vision 2020



Be Unique!! ~“Sounds exciting! - Let’s do it.”~

This is how we originate reliable Musashi brand products to the world.

“Be Unique!!” What is the definition of Musashi’s uniqueness?

It is to consistently create differences between ourselves and others, then integrate the differences into the growth of our company. We aim for “growing” as a company and we aim for “growing” of each of our associate, as well, through these activities. “We will continue to explore and develop our original *Monozukuri*.”

D Differentiation

To place value on individual characteristics and diverse ideas; creating differences between ourselves, others and the past.

I Integration

To create new values by integrating all of our efforts with the latest technology.

G Growth

To keep striving to achieve our dreams with a strong determination.

Power to Value

“Power” generated from mobility to “Value”.

What we have realized through various products which support automobile critical functions is nothing other than transmitting and converting various types of “power” such as resources and energy to generate “values” beneficial for society.

Musashi group will keep pursuing “Power to Value” with our unique technology.

Musashi Group’s Approach to Sustainability

Musashi Group resolved the “Basic Policy of Musashi Group for realization of sustainable global society” in the Board of Directors.

While the economic and social impact of corporations is increasing, providing society with values continuously and discharging corporate responsibilities for realization of sustainable society are the key issues for the mid/long term growth of Musashi group.

Musashi Group will promote activities for realization of sustainable society as a company trusted by people in the world and as a company contributing to the sustainable development of global society.

“Basic Policy of Musashi Group for realization of sustainable global society”

“We will continue to explore and develop our original *Monozukuri* and thereby contribute to the global society by providing trusted and attractive products.”

This corporate mission is expressing basic attitude of Musashi Group for realization of sustainable global society. Based on this corporate mission, we will contribute to sustainable development of the global society through our overall business activities from these two aspects below.

Creating Shared Value

We will continue developing “our original *Monozukuri*” and providing “attractive products” which can contribute to sustainable “global society” development.

Social Responsibility as a Global Company

To be a company which is “trusted” by people around the world, we will positively contribute to develop better society.



Creating Shared Value

~Contribution to the social development through business activities~

Musashi’s strength originates in “Unique *Monozukuri*”: an integrated production system, precision forging technology and a global production/sales system. The core of Musashi business is to develop/provide “attractive products” for improvement of the mobility comfort and safety, and for a lower environment load through “Unique *Monozukuri*”.

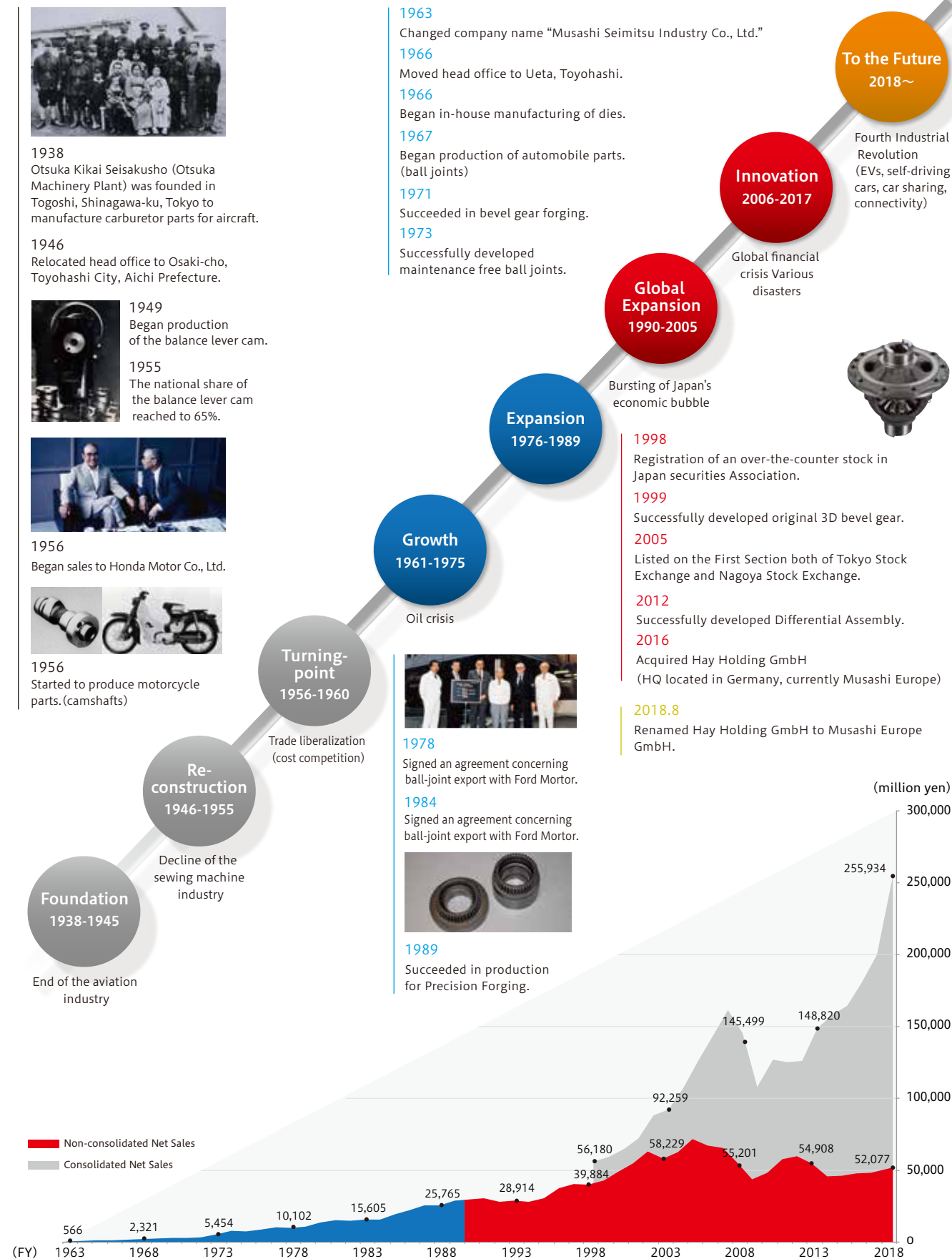
Creating and providing beneficial “values” for society through our business is the realization of “Power to Value.” And that is essential for Musashi to contribute to the sustainable development of global society and to be needed by society.

Social responsibility as a global company ~CSR promotion~

As the base of business practices, striving for solving various problems such as climate change in global society and communities is one of the important corporate responsibilities.

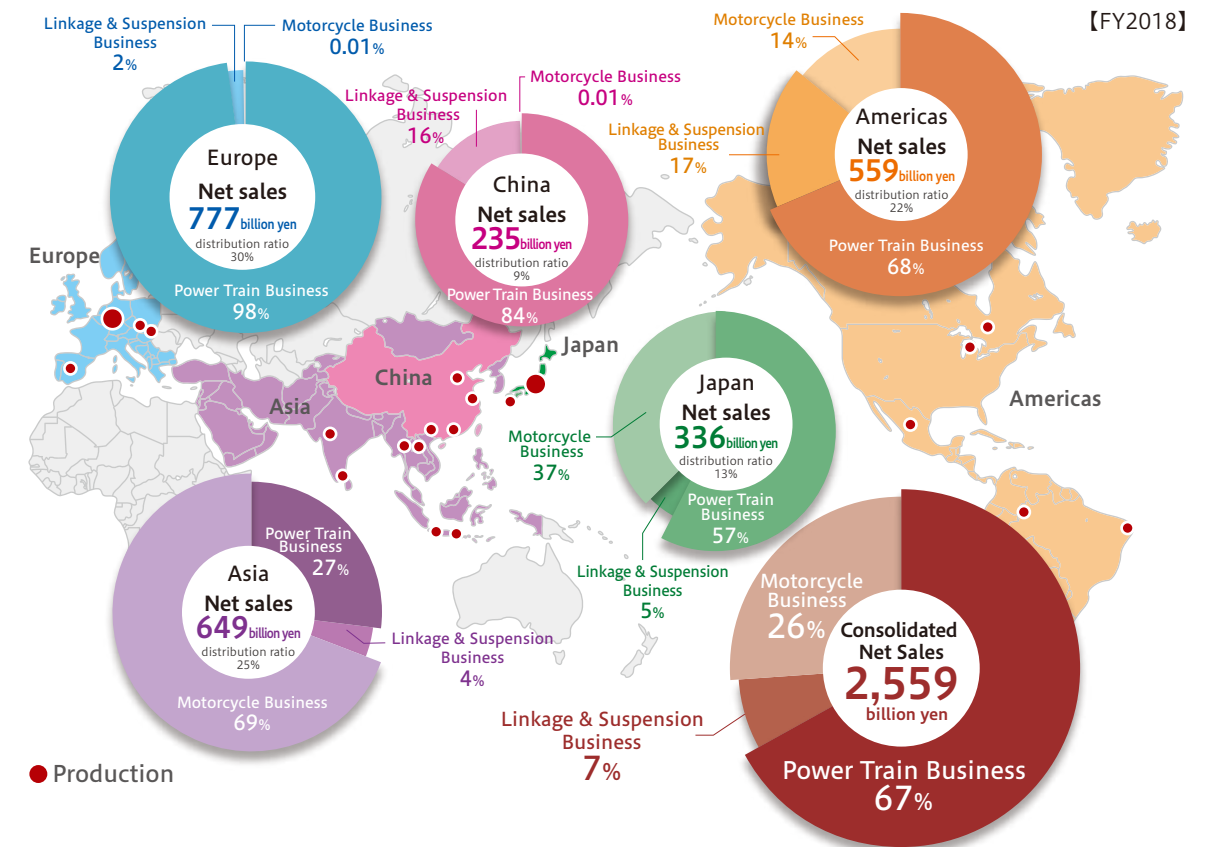
To discharge our responsibilities, we adopt the ISO26000 as the guidance to see the current condition of sustainability activities and to sort out issues. And we promote activities for a better society with our employees, customers, suppliers and local communities.

Growing History (Steps in the Past 81 Years)



Global Development

Our 33 production bases in 14 countries are responding to the need of global customers.



Region	Major group companies				No. of production units	No. of employees
	No. of companies	Company name	Location	Abbrivation		
Japan	3	Musashi Seimitsu Industry Co., Ltd. (this company)	Aichi	MSI	9	2,147
		Kyushu Musashi Seimitsu Co., Ltd.	Kumamoto	KMS		
		Asadakatan Chutetsusho Co.,Ltd.	Kyoto	ASADA		
Americas	5	Musashi Auto Parts Michigan Inc.	USA	MAP-MI	5	2,550
		Musashi Auto Parts Canada Inc.	Canada	MAP-CA		
		Musashi Auto Parts Mexico, S.A. de C.V.	Mexico	MAP-MX		
		Musashi do Brasil Ltda.	Pernambuco, Brazil	MSB		
		Musashi da Amazonia Ltda.	Amazonia, Brazil	MDA		
Asia	4	Musashi Auto Parts Co.,Ltd.	Thailand	MAP-TH	7	7,375
		P.T. Musashi Auto Parts Indonesia	Indonesia	MAP-IN		
		Musashi Auto Parts India Pvt. Ltd.	India	MAP-ID		
		Musashi Auto Parts Vietnam Co.,Ltd.	Vietnam	MAP-VN		
China	3	Musashi Auto Parts (Zhongshan) Co., Ltd.	Guangdong	MAP-CH	3	1,711
		Musashi Auto Parts (Nantong) Co., Ltd.	Jiangsu	MAP-NT		
		Musashi Auto Parts (Tianjin) Co., Ltd.	Tianjin	MAP-TJ		
Europe	2	Musashi Europe GmbH	Germany	MEU	9	3,056
		Musashi Hungary Manufacturing, Ltd.	Hungary	MHM		
Total	17				33	16,839

Value Creation Process

The automobile industry is facing a once in a hundred year shock. The technology advancement such as CASE* ushers in an era that the existing automobile industry is affected significantly. Now, in the phase of transition, is the perfect timing for us to take a new challenge for the future. We are striving for a long-term growth by enhancing the existing business as well as by creating new one.

*CASE stand for "Connected", "Autonomous", "Shared", and "Electric."

Realization of Musashi 2020 Vision and Contribution to SDGs



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Resources Supporting Musashi Group



Financial capital (Sound financial foundation)

Consolidated net assets: 108.3 billion yen
Equity ratio: 37.43%



Human capital (Global and diverse HR)

Consolidated No. of associates: 16,839
Associates working outside Japan: 87.9%
Non-Japanese top management: 40.2%



Intellectual capital (Technology)

Technology accumulated in a history of 80 years
No. of patents: 168 (Japan), 200 (outside Japan) (registered or pending) page24
R&D cost: 2.8 billion yen
Development : 3 bases (Japan, Canada, and China)
AI development : 3 bases (Japan, Canada, and Indonesia)



Manufacturing capital (Monozukuri foundation)

Production: 33 plants in 14 countries
Capital investment: 16.2 billion yen



Social and relation capital (Collaboration with external bodies)

Steel suppliers: 5 (Japan), 29 (outside Japan)
Business-academia: Comprehensive collaboration agreement with Toyohashi University of Technology

Business Activities Supporting Value Creation



Organizational Governance

page21~

Environment

page25~

Labor Practices

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Human Rights

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Fair Operating Practices

page35~

Consumer Issues

page35~

Community

page37~

7 core subjects of ISO26000

Musashi Philosophy

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4 approaches for creating new business

Human development & theme creation

AI project page11~
Internal start-up



Creating environment

MUSASHI page14
Innovation Lab CLUE



Open innovation

Networking (CVC activities)



Maximum use of technology and know-how

Robot page20
Proto business



FY2018 Results



Financial capital (Better capital efficiency)

Consolidated sales: 255.9 billion yen
ROE:11.3%



Financial capital (Return to stakeholders)

Dividend ratio: 27%
Corporate tax: 410 million yen



Human capital

Skill exam: 45 members certified page32
Paid leave acquisition: 69% page33



Intellectual capital (Technology)

No. of patents: 17 (Japan), 9 (outside Japan)
AI visual inspection in production page12



Manufacturing capital (Supply to customers)

Motorcycle transmission share: 32%
(checked by Musashi) page18
PoC services for AI visual inspection page12
Neural Cube development page13
Machinery business: 15 items page20



Social and relation capital (Collaboration with external bodies)

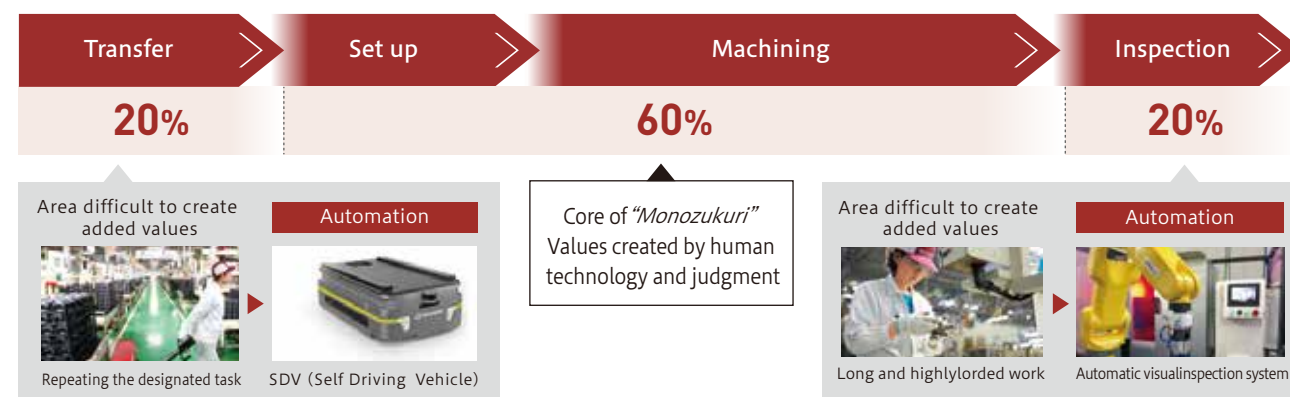
Global contribution to local communities page37~
MUSASHI Innovation Lab partners: 6 corporations and 7 individuals page14
Joint venture: Musashi AI established page12
Start-up investment : 5 companies (as of Aug 2019)
Partnership with Israel Innovation Center

Innovation for Human

Drive innovation in production with “*Monozukuri* × AI”

Based on the concept “human jobs for human”, we are innovating manufacture by implementing AI in production fields. Our products are delivered to customers through the process of transfer, machining, and inspection. Machining, in particular, is the core of *Monozukuri* that values are added by human technology and judgment. The process of transfer and visual check, on the other hand, is repetitive routine work without producing added values and is highly loaded work. Human beings, however, are supposed to be creative in nature. Repetitive work can be automated so that people can create something new and keep developing their work. We are taking a challenge of creating environment allowing people to take meaningful and human jobs. We aim to keep providing our group plants as well as global manufacturers with a wide range of technologies.

Manufacturing flow



1 Establishment of Musashi AI Ltd.

Musashi has seized the market opportunity, bringing Industry 4.0, and has collaborated with Poliakine Innovation to develop AI technology to realize a smart For the purpose of accelerating the technology development, implementation at manufacturing sites, and global expansion, Musashi has agreed with SixEye Interactive Ltd. which is represented by its founder, Mr. Ran Poliakine, to establish a joint venture, Musashi AI Ltd. global expansion. Musashi AI realizes collaboration between humans and machine, and provides customers with new value created by optimization of manufacturing process.



Visual Inspection Automated by Deep Learning!

■Development and Verification of Auto Inspection System

We are working on automating visual check by deep learning. In 2018 we started the development and on-site verification of an automatic inspection system which detects spatters on welded gears as well as dents on bevel gears we have been tackling. Also, we are working together with SixEye to develop a general-purpose inspection system for providing a versatile AI auto check solution in the future.

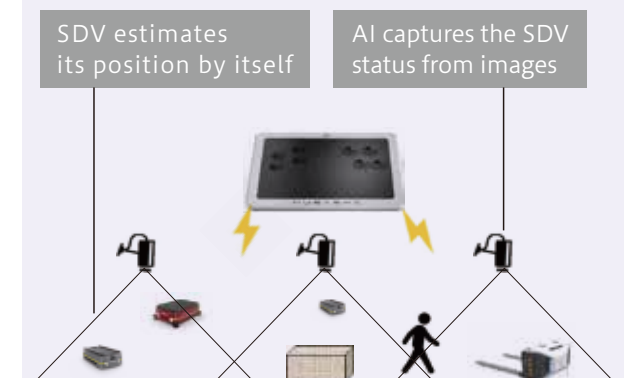


Currently, it takes 7 seconds per bevel gear to check dents. We are now developing a general-purpose inspection system which checks one or more models at once to reduce checking time per product.

Automatic Route Setting for Efficient Transfer!

■Development of SDV (Self Driving Vehicle)

We are developing SDVs (Self Driving Vehicles). In addition to an autonomous driving transfer system, we are working with SixEye to develop a centralized system which controls one or more SDVs for more efficient *Monozukuri* with an optimal line.



2 Order Receipt of PoC Services for AI Visual Inspection System



Automated visual inspection of precision forging parts

We have received an order of PoC services* from Nippon Steel Precision Forge, INC., for an AI visual inspection system to be used for yoke joints. It is our first time to sell an AI visual inspection system which identifies images of dents and galling generated from yoke joint manufacturing. Completing the testing phase with a tester, PoC services have been started to introduce an AI visual inspection system in production.

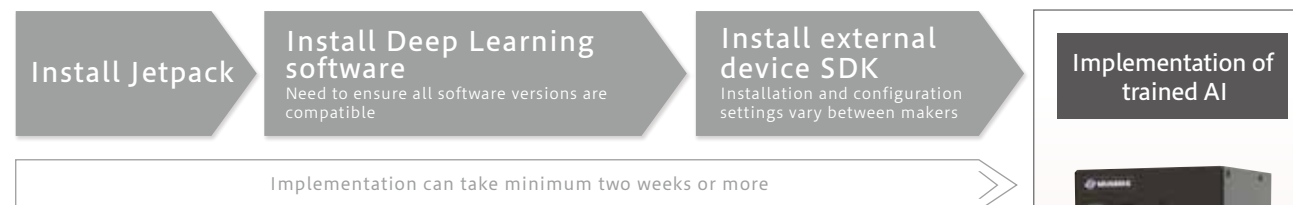
*PoC: Verification to introduce an AI system

3 Development of “Neural Cube” – Hardware to Mount AI in Manufacturing

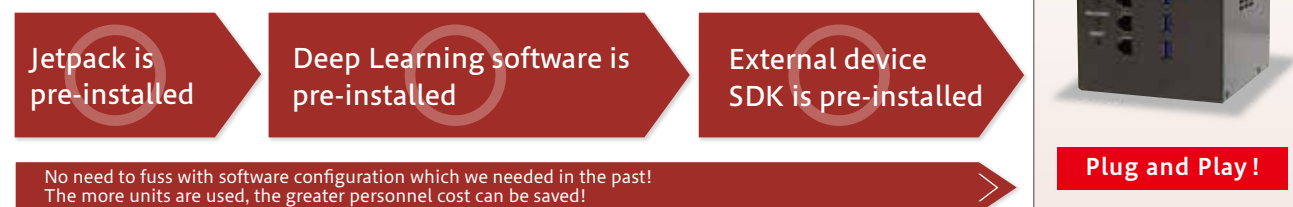
■ Easiest AI introduction for manufacturing sites

We have developed “Neural Cube,” hardware to mount AI in manufacturing sites. This can eliminate software setting which normally takes 2 weeks or longer for AI mounting. We offer customers not only with “Neural Cube” itself but with processes to be installed in production.

■ In general...



■ But with Neural Cube...

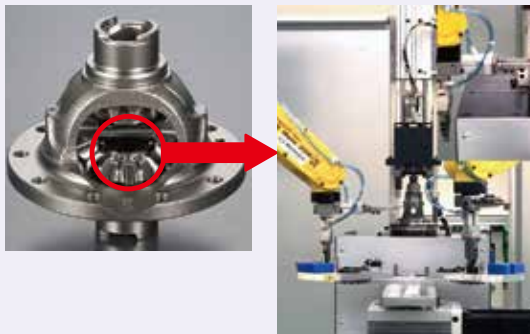


4 Activities for Factory Automation

Adopting latest technologies, not limited to AI, we are making an improvement in our struggles in production.

Sensitive Fingertip Movement by Robot! – Automatic Diff Assembly

A “differential assembly”, our major product, needs processes installing 10 case components. Sensitive fingertip movement is required for the long and high-load processes. Two robots are used to replicate the movement of human arms and fingers. We will keep working on cycle time reduction and defect elimination for more advanced equipment.



Products Recognized by Robot! – Automatic Hanger Shot

Hanger shot is a process of polishing the steel surface. It is a long and high-load process by hanging and removing many steel products. Automation has been made possible by seeing products with a 3D camera. Products can be hung automatically. Also, products not hung stable can be recognized.



1 MUSASHi Innovation Lab CLUE

In December 2018, we opened “MUSASHi Innovation Lab CLUE”, a platform of creating innovations in front of Toyohashi Station. With industry-government-academia collaboration, CLUE aims to offer encounters of various people who take a challenge for innovations and to drive unique, technical, and fresh ideas from such encounters for solving social issues. Since its opening, in addition to our startup team, 6 corporate and 7 private members have used CLUE to get involved in innovations (as of August 2019). CLUE also hosts seminars and pitch* events to support generating ideas for innovation and operationalization.

*Pitch: Brief presentation of business ideas for gaining fund, partners, and advice



Mission: Bring encounters of “genuine people” to drive innovations which contribute the development of global society

Values to Offer: Ecosystem for Creating Innovation



Space remote from daily life



Chemical reaction from diversity



Design thinking and pitch event

Place

This is a place remote from daily life which provides space of working on innovations seriously with passionate corporate partners, private members and students.

People

People gathering at CLUE build their business models, interact each other, and get inspired to trigger chemical reaction from diversity.

Process

Work shops mainly on “design thinking”, consulting by mentors, and lectures by global innovators are held to drive logical innovations from Toyohashi. Periodic pitch events for partner companies and venture capital (investment fund) can provide opportunities for operationalization.

2 Start-up of In-house Recruitment Project

In 2017 we started the “Musashi Innovator’s Gate 2017”, an in-house recruitment project of creating new business which is not on an extension of our existing business, for the purpose of launching new business responsible for the next generation. This project recruits voluntary innovators who study new business from scratch and bring it into reality. Currently, 2 teams born from the project are working full-time on commercializing their business ideas.



Human resource services matching farmers and individuals



Social issues: Aging of agricultural workers, lack of workforce



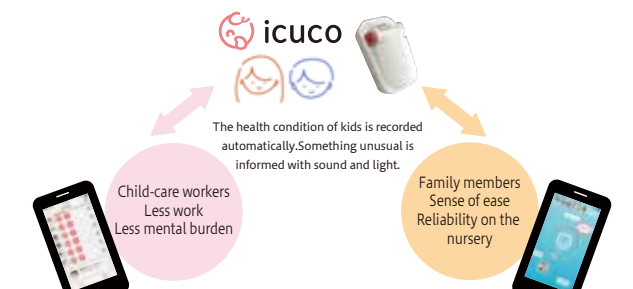
Connect farmers who need manpower and individuals who want to work, revitalize the community, and offer an exciting life!



Watching over the health condition of kids with child-care workers



Recognized Social Issues: More women in labor force, fewer children, lack of child-care workers



“Visualize” to eliminate concerns about child rearing and create the exciting family experience!

Business Value

Contribution to Sustainable Development of Mobility and Global Society

In order to contribute to the sustainable development of the global society by creating a “shared value” with society, through the production and supply of automobiles parts, we support the popularization of the automotive industry and contribute to the improvement of automotive functions such as fuel efficiency and safety.

■ Response to Change in Automobile Mechanism (Electrical Driven Specs)

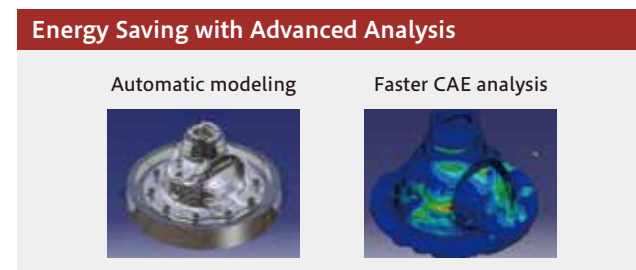
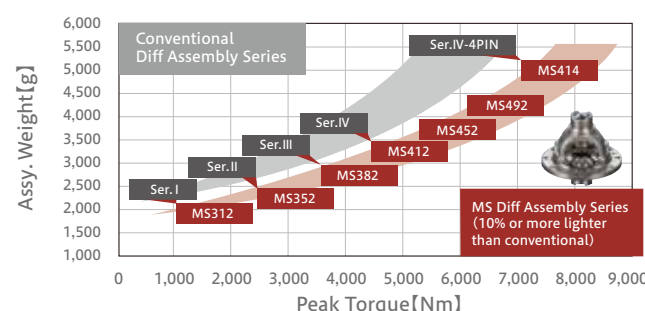
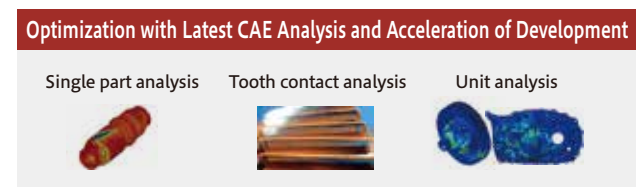
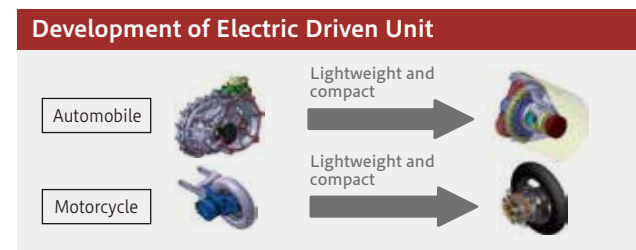
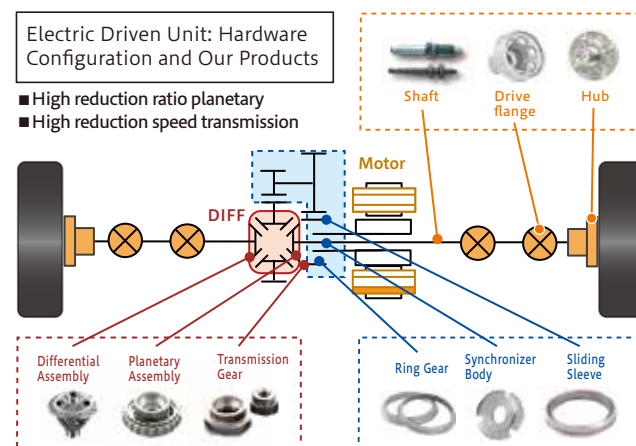
Like electrical driven specs, while changing the automobile mechanism rapidly, we take such environmental change as a chance. It is feasible for us to manufacture key transmission components from electric motors to right before the tire including diff and planetary assembly. In the development area, installation of testing equipment for unit and assembled products and introduction of CAE analysis technology enhance the capacity of proposal, development and assurance for unit and assembled products.

〈Development of Unique Electric Driven Unit Essential for Electric Vehicles〉

We are promoting the development of unique electric driven units essential for electric vehicles and motorcycles. We are developing electric driven units as well as element technologies necessary for the units in parallel to achieve lightweight, compact and low-noise products. Simulating with the latest CAE (computer-aided engineering) optimizes specs and accelerates development. Also, our environment for research and development has been enhanced; equipment for testing unit and assembly products have been introduced for offering and developing products by unit and assuring the function. We will keep contributing to the advancement of mobility; commoditize customer needs by paying attention to changes in what customers want; and design a system which forms technologies, products and services to fit with the times.

■ Environment for Research and Development

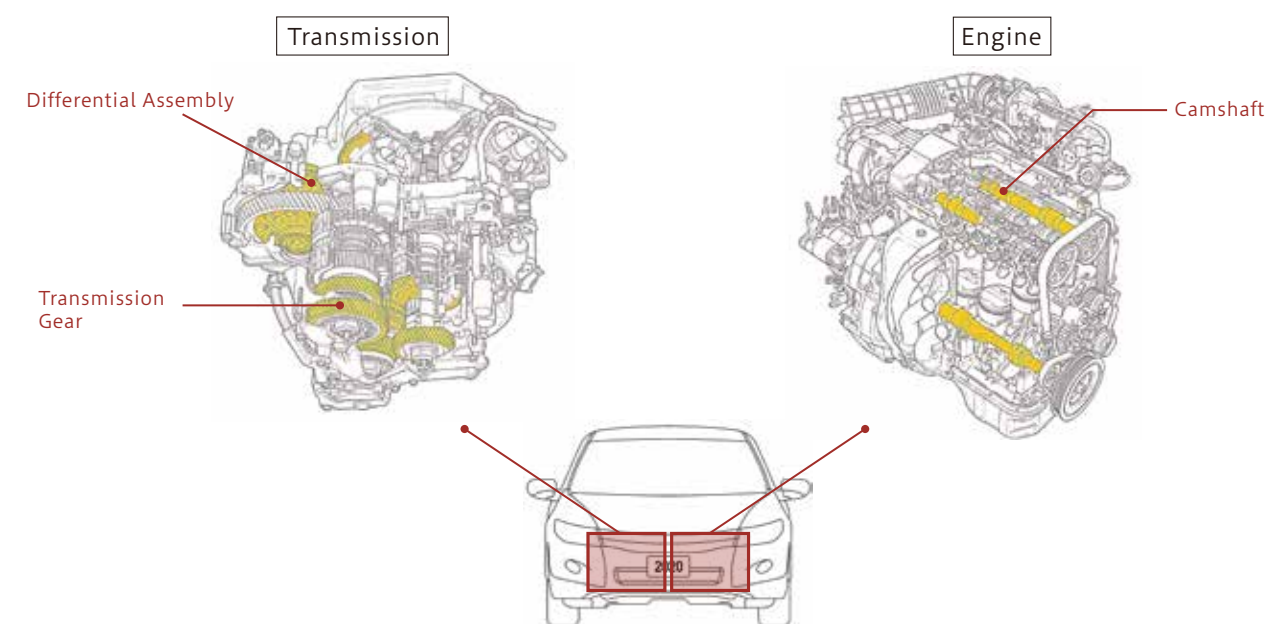
The lightweight diff assembly (MS Diff) with self-developed bevel gears achieves 10% or lighter than the conventional. The MS Diff Series reduce vehicle weight and improve fuel economy in every torque bands from compact to large vehicles. Currently, we are promoting new technology development to improve the competitiveness. To ensure a competitive edge of our compact and lightweight differential gears, we are optimizing specifications with the technology of welding, compact-structure, and materials. Also, we are working on the fastest means of CAE analysis for better efficiency to speed up development. This can reduce the development time as well as energy and resource consumption required for prototype and verification significantly. Seizing changes in the function required for electrification, we will keep working on lightweight products to contribute to reducing environment load.



Initiatives in Power Train Business

■ Products and Technical Features in PT Business

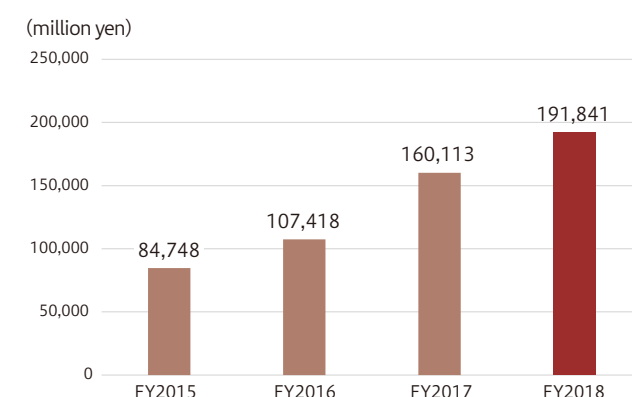
PT Business develops and manufactures camshafts which control the timing of opening and closing intake/exhaust valves of an engine; transmission gears, planetary assembly, and shafts which convert and transmit engine and motor revolutions to optimal driving revolutions; and differential assembly which receive engine torque on the input shaft and allocate it to 2 output shafts (on right/ left wheels) with an applicable difference in revolutions. The MS Diff with self-developed bevel gears achieves 10% or lighter than the conventional, and contribute for less vehicle weight and better fuel economy. By building a mass production system and expanding the MS Diff Series covering torque bands from compact to large vehicles, we provide customers globally with compact, lightweight, low-cost diff assembly for each vehicle.



■ Development and Forecast of PT Business

In the area of products and manufacturing, in addition to the established compact and lightweight MS Diff series, we are building a reputation “Musashi, high precision” by pursuing gear techniques good at strength and silence in large diameter gears such as final driven gear which is installed in diff assembly. In sales, the business regarding differential assembly, transmission gears, and gears and shafts for speed reduction functions are expanding. Chances for expansion of PT business are increasing along with the change of automobile mechanism to electric drive. We are expanding business in this growing market.

Sales Trend in Power Train Business



■ PT Business Topics

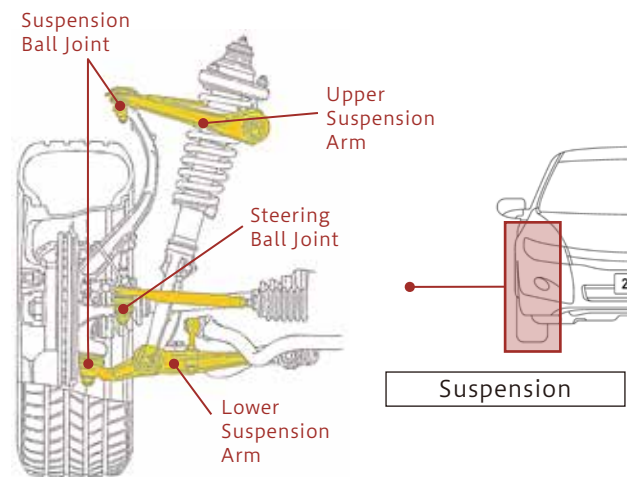
In October 2018, we acquired Asada Katan Chutetsusho (located in Kyoto), a casting material and machining supplier with a history of 100 years. Acquiring the casting infrastructure, we aim to strengthen the production system of differential cases, one of our main products; and to accelerate the acquisition of new business with better product development together with casting knowledge.



Initiatives in Linkage & Suspension Business

■ Products and Technical Features in L&S Business

L&S business covers ball joints, important security parts requiring high reliability, which are used in the joint between the tire and the vehicle. The ball joint works as a joint while steering or tire movement according to dents and bumps on the road and contributes to smooth steering and comfort driving. We are providing compact and light weight ball joints to our customers with an optimal shape and size for each vehicle. To achieve this, designing process by highly-accurate simulation technology and the integrated inner process through design to evaluation are established. By which, we are contributing to a better driving comfort and fuel efficiency. Compact, lightweight, and low-cost ball joints can be manufactured and provided globally with a highly-efficient production system based on the size series.



■ Development and Forecast of L&S Business

Applying optimal design with high precision simulation technologies and product evaluation with various test facilities, we are commodifying compact and lightweight ball joints and aluminum arms which contribute to the improvement of automobile fuel efficiency at a global level. Also, we are evolving simulation technologies more to promote the development of highly rigid and durable ball joints with good friction performance which can achieve stable steering, better driving comfort, and less noise.

Tension Test CAE Analysis



Tension Tester



■ L&S Business Topics

<“TLS” - First Ever Global Meeting>

Experts gathered in MAP-NT (Zhongshan, Nantong) from the L&S production bases to discuss current issues and exchange opinions. Building a strong solidarity not only in each function but also cross-functionally, it was a meaningful opportunity to share issues and to decide a direction for solution. TLS will be held continuously once a year.



<Ball Joint Production Started in MAP-IN (Indonesia)>

We started ball joint production in Indonesia, one of the glowing markets where our production base is located. We will keep building a production system which delivers products with high quality and high performance to meet customer expectations.

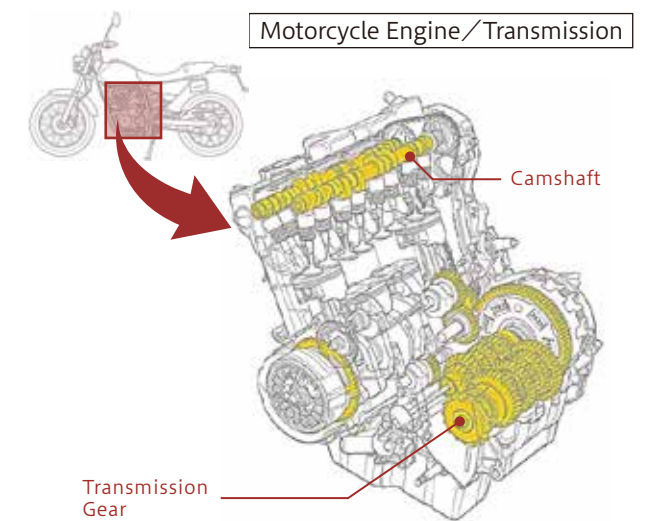


Initiatives in Motorcycle Business

■ Products and Technical Features in Motorcycle Business

Transmission gears, camshafts and other drive parts for motorcycles, general-purpose engines, and ATV* are manufactured and supplied to customers in the world. Utilizing the accumulated design and machining technology for the world-share No.1 production volume, we are promoting the development of new products for small-size motorcycles for the new developing countries. Technology developed in Japan is applied in large-size premium models actively for the local procurement to meet customer needs in the world. With a stronger analysis and evaluation system of noise and vibration, we work on responding to environmental regulations, growing as a critical issue recently.

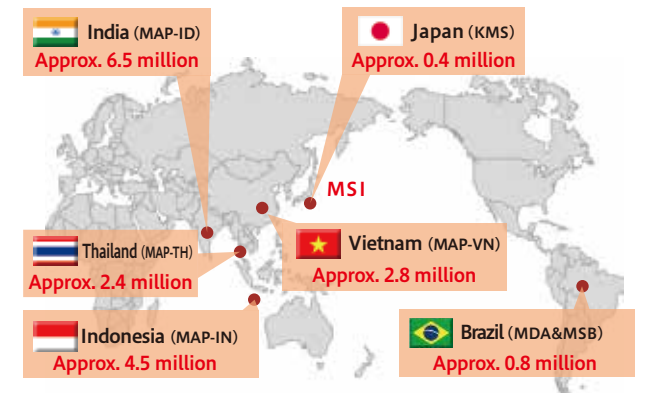
*An abbreviation for All Terrain Vehicle. “All Terrain Vehicles” are vehicles with engine or motor which designed to handle a wider variety of terrain than most other vehicles.



■ Development and Forecast of Motorcycle Business

Our precision forging technology and global production system help us to establish a system to ensure mass production capable of 1 million per model per year to keep expanding the motorcycle market. A synergy effect in the motorcycle business is also being created by the forging technology and customer network of Musashi Europe, as well as by high-speed forging technology with many Hatebur machines. In FY2019, we are starting business with new customers outside Japan. Accelerating the development of products responding to environmental regulations and electric specs and the establishment of new technology for a stronger competitiveness, we are expanding the market share and customer satisfaction.

World Annual Sales of Vehicles with the Group Products: 17.4 million



■ Motorcycle customers:

Honda, Suzuki, Kawasaki Heavy Industry, FCC, BMW Motorrad, Triumph Motorcycles Ltd., Hero Moto Corp Ltd.

■ Motorcycle Business Topics

<Start of Mass Production for BMW Motorrad>

Mass production of “BMW K5x GEARBOX Cover Assembly”, a module product, was started in July 2018. By expanding our assurance responsibility range from module and assembly products, we became able to provide greater additional value to our customers.



BMW K5x GEARBOX Cover Assembly

<Installation of HTEBUR press (HM35) in Indonesia>

HATEBUR press (HM35), a hot forming machine, was installed in Indonesia. 10 times higher production was realized by this forming machine compared to current hot forging. We strive to improve our forging technology by incorporating hot forming technology into Musashi group.



HATEBUR Press

Initiatives in Forging Technology Development

■ Outline and Features of Forging Technology

One of our Group strengths is an “integrated production system” from forging and cutting through to assembly. The first process is “Forging” which is a cornerstone of an optimal production system by taking a challenge of precision forging for complex gear and by eliminating complex and fine machining processes later.

In Global T-Forge* (Musashi Forging workshop), we exchange our opinions on forging methods and problem solving periodically with forging engineers across the world to equalize the high forging technology level as well as to keep innovating forging technology.

By unifying with Musashi Europe, the range of forging technology expanded significantly. We are striving to fuse the strength of Musashi Europe’s high-speed forging technology with Musashi’s high-precision forging.

*Forging experts from various sites and divisions get together to share and discuss deeply about latest technology, struggles, and development cases.

■ Basic Concept of Forging Technology Development

In the forging area, “load reduction” and “fewer processes” after forging are constantly required. We have been taking a challenge of saving machining to achieve both the reduction of environmental load and the improvement of productivity by reducing processes and allowance, regardless of new or existing production.

Main Improvement Points in Forging Engineering

- Process Design by Accumulated Forging Technology
- Formability Verification Through Simulation Technology
- Challenge to a Highly-Efficient Forging

■ Forging Technology Topics

〈Regional “Global T-Forge”〉

Regional “Global T-Forge” activities started as part of the forging group activity since 2016. Splitting the Musashi affiliates into three regions (North America, South America, and Asia), forging engineers meet in one place to discuss technical matters face-to-face, present struggles and improvements, and exchange opinions.

Regional “Global T-Forge” of this year was held in Thailand where 20 engineers gathered from Japan, Vietnam, Thailand, India and Indonesia to exchange technical opinions for 3 days. This provided the engineers with a good opportunity to raise their motivation and engineer level by visiting other plant and by bringing back their experience to their plant.



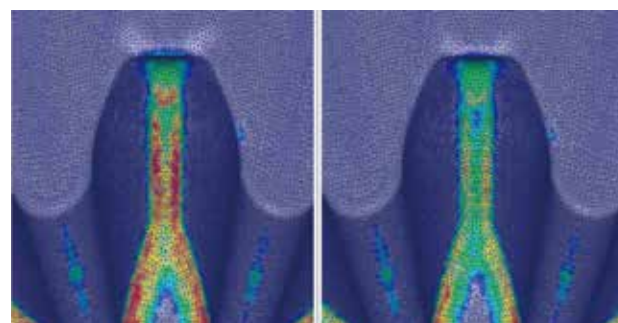
“Global T-Forge” in Thailand

〈More Accurate Forging Simulation〉

Forging technology focuses on a better forging simulation accuracy to achieve a smoother launch of new models and complex shape parts and less material waste generated from prototypes.

By effective use of the forging analysis, better middle process form and new die design could be adopted, realizing reduction of testing time by real machine and longer lifetime of the die.

Improving the analysis accuracy more, we are working on the product quality improvement by tool life forecast.



Example of Simulation of Stress Test
(Left: Before Improvement, Right: After Improvement)

Services Provided by Machinery & Tools Business Unit

■ Outline and Technology Features

Machinery & Tools Business Unit manufactures equipment, prototypes, dies and tools that support “*Monozukuri*” activities.

Dedicated machines

- ① Automatic transfer from material supply to unloading
- ② Automatic assembly: Automation of manual work conventionally completed by skilled workers
- ③ In-line inspection: Automatic measurement in the integrated process

Mechanical design



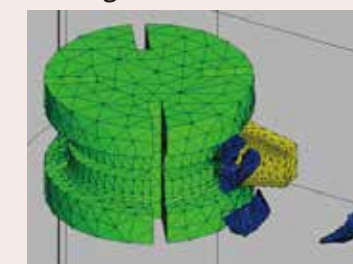
Automatic assembly machines



Prototype manufacturing

Using original jigs, tools and dies, the Unit provides prototypes meeting the need in a short time. Cutting simulations are used to realize highly efficient products with high quality.

Cutting simulation



Process design



Cutting tools

An image of optimal machining methods is created with precision cutting simulations. According to customer needs, the Unit provides highly efficient and long-life cutting tools including drills, end milling tools, and reamers which are not on brochures.

Original cutting tools

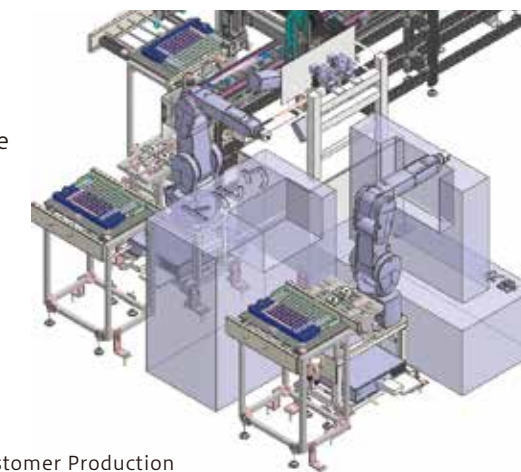


High-performance CNC tool grinding



■ Business Development and Future Vision

In 2018 Machinery and Tools Business Unit started solution-orientated business for external customers to solve their problems by utilizing *Monozukuri* support technologies which have been developed in house. Orders have been received from companies in other fields and equipment and jigs which fit to the production of each customer have been proposed and provided. We will target *Monozukuri* companies not only in the car industry but also in a wide range of industries.



Automatic Transfer Designed for Customer Production

Corporate Governance

Musashi Group is working on full corporate governance to respond to social expectations and responsibilities towards us.

Concept and System of Corporate Governance

■ Musashi Corporate Governance

The Group considers full corporate governance as one of the critical elements for management. In October 2015, to clarify the policy for our activities and to improve our corporate value, the “Basic Policy for Musashi Corporate Governance” was defined according to each principle specified in the “Corporate Governance Code” issued by the Tokyo Stock Exchange. To respond to our stakeholders both inside and outside, we will strive to fulfil corporate governance more for the sustainable growth of the company and for the improvement of the mid/long term corporate value.

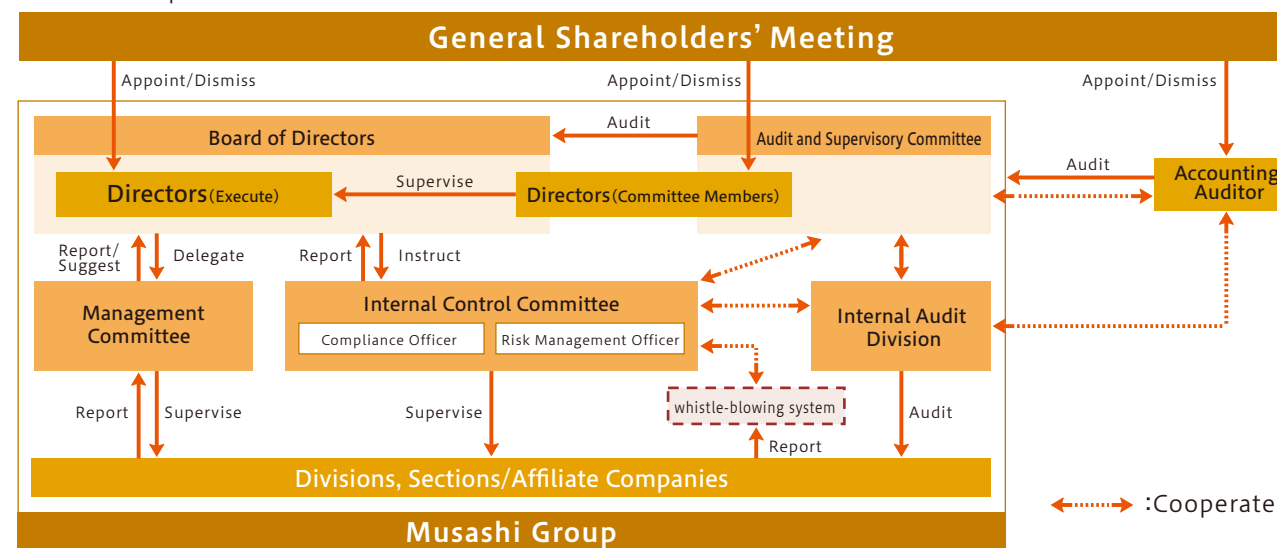
■ Corporate Governance System

The Company adopts an Audit and Supervisory Committee system. This enhances the auditing and supervising function of Directors to the business executions. Additionally by involving outside Directors, including the members of the Audit and Supervisory Committee, in decision making, the transparency and soundness of management is improved. Decisions can be made and implemented promptly by delegating authority of some items resolved by the Board of Directors to the Management Committee, etc. to improve the flexibility in management judgment.

Basic Concept of Corporate Governance

Based on “Musashi Philosophy” consisting of “Spirit of Foundation,” “Corporate Mission” and “Guidance for Conduct,” the Musashi Group develops its business and defines the “Basic Policy for Musashi Corporate Governance” to fulfil corporate governance which is considered as one of the critical elements for management.

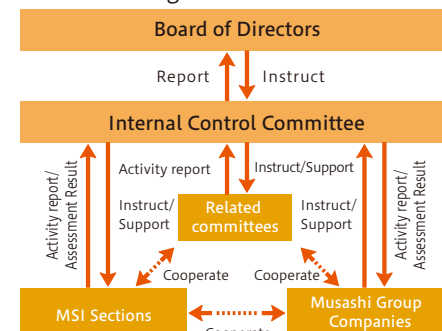
Scheme of Corporate Governance



Basic System of Internal Control

The Company has the Internal Control Committee consisting of Directors and Executive Officers which deliberates internal control matters including corporate ethics and compliance. The Internal Control Committee receives reports from related sections, committees and subsidiaries on the status of design/operation of systems and policies in terms of compliance, information control, risk management, efficiency of business execution, and group governance. The Committee deliberates global internal control matters. Each section and subsidiary conducts self-assessment on internal control every year to clarify issues for the continuous improvement in internal control.

Schematic diagram of Internal Control



Compliance System

■ Basic Concept of the Compliance System

While the global business of the Group developing, to discharge corporate responsibilities including corporate ethics and compliance, each of us should be aware of society through our daily work and take initiatives. To respect culture and customs of various countries and regions and develop global business more at the same time, “Musashi Compliance Guidelines” have been defined as shown below to specify our daily efforts. “Musashi Compliance Guidelines” written in Japanese and English as principle languages have been translated into the language of each region and country to share the understanding with all of the Officers and employees of each Group company through various education and training opportunities.

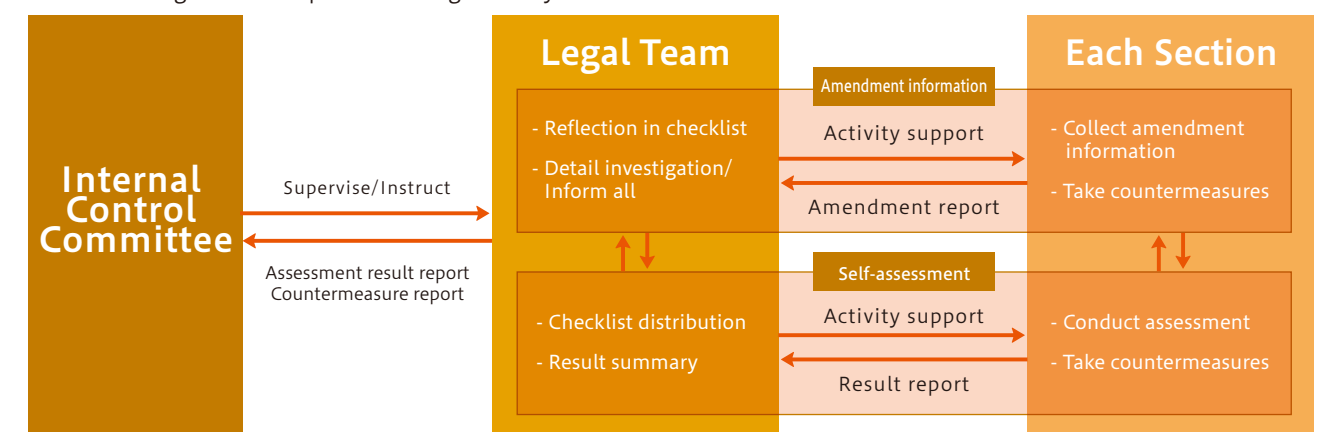
Musashi Compliance Guidelines

- I. We will actively participate in activities that contribute to the well-being of society.
- II. We will freely and willingly comply with all laws and regulations.
- III. We will seek ways to protect the environment.
- IV. We will strive to provide a safe and healthy working environment.
- V. We will abide by all traffic rules and regulations and drive safely.
- VI. We will respect and embrace the uniqueness and differences of each individual. We will respect human rights and will not tolerate forced or child labor, or any form of harassment.
- VII. We will do our utmost to respect and protect each individual's privacy.
- VIII. We will pay the utmost attention to the appropriate handling of confidential information including drawings, documents, information and data.
- IX. We will conduct fair and sound transactions. We will not enter into any improper trade agreements or cartels, or abuse any dominant bargaining positions.
- X. We will reject all contacts with organizations involved in activities in violation of laws or accepted standards of responsible social behavior and safety.

■ Compliance System

The Company promotes a systematic approach: the appointment of a Compliance Officer who promotes compliance, and the deliberation of corporate ethics and compliance matters in the Internal Control Committee. An annual self-assessment is conducted with a checklist to see the status of compliance. Measures are taken against high risk items according to plans. The Company also sets a section in charge of grasping information on the amendment of laws related to our business, which informs the legal amendment company-wide immediately and reflects the self-assessment checklist.

Schematic diagram of Compliance Management system



■ Whistle Blowing System

The Company provides Musashi corporate ethics window, a whistle blowing window, (so called “Open Door”) to receive suggestions on corporate ethics and compliance. This system is designed to preserve the privacy of the person who made the proposal and to protect him/her so as not to suffer disadvantage by proposing. And anonymous proposal can be accepted. To make it more effective, there are 3 windows; an internal window, Audit & Supervisory, and an external lawyer to provide a better environment for making suggestions.

Open Door

3 windows to receive compliance matters such as violation, misconduct and harassment

Open Door windows

- Musashi suggestion (internal)
- Musashi suggestion (Audit & Supervisory)
- External lawyer

Group Governance System

■ Application / Report on Business Executions

The Company has the “Regulation on Control of the Affiliate Companies” to ensure appropriate executions of its Group companies. Based on the Regulation, the Management Committee and the Board of Directors receive application/report on executions by degree of importance.

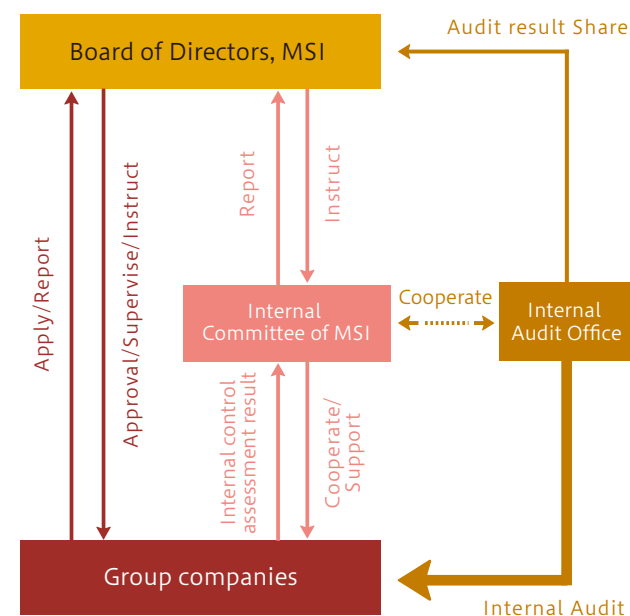
■ Self-Assessment

Each Group company conducts an annual self-assessment on internal control based on the checklist provided by MSI. Results and issues are shared by the MSI Internal Control Committee and section in charge of internal control to improve the entire group system continuously.

■ Audit Conducted by MSI Auditor

The “Internal Audit Office” independent from business executions conducts a periodic audit on the Group companies.

Scheme of Group Governance

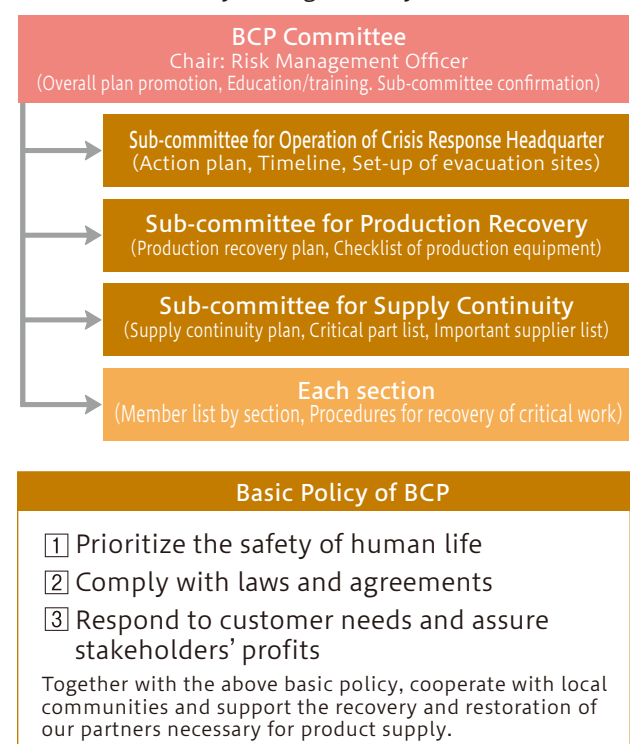


Business Execution Functions

Business Function		Regional Operation
Sales	Manufacturing Engineering	
R&D	Quality Assurance	Europe
Forging Engineering	Purchasing	America
Production Management	PT Business	Japan
IT	L&S Business	Asia
Human Resource	Motorcycle Business	China

*CEO, COO, CFO are appointed in each region.

Business continuity management system



System to Ensure the Efficiency of Business Execution

For an immediate and optimal management judgment, officers are appointed dividedly for business strategic functions and regional business operation functions. Regional operations are deployed to each regions, and CEO, COO, CFO are appointed basically in each region to establish efficient operation system. Also, to improve the optimization and efficiency of the entire group, the GTM (Global Top Meeting) is held to share policies with the group companies, to identify issues for the realization of management plans, and to discuss how to respond to it.

Risk Management and Business Continuity Management

■ Risk Management System

The Company has establish a risk management system appointing one of the Officers as a Risk Management Officer who promotes a systematic risk management activities.

Risk management at ordinary times includes measures by each section for risk reduction/moderation and preparation of procedures in case of risk. Self-assessment is conducted on a regular basis to see the status of management for continuous improvement.

■ Crisis Response and Business Continuity Management

The Company has regulations which define what the organization and employees should do in case of crisis. Also, the regulations have been applied in the Group companies.

In Japan, the Company has created a Business Continuity Plan (BCP) intended for a large-scale earthquake as one of the biggest risk in business continuity. Education and training based on BCP is provided on a regular basis. We reflect drill results and update/revise BCP periodically to improve the capability against risk in business continuity.

Information Management System and Security Control

The Company defines regulations on documentation control and storage period to control/store work related information.

The system of security control is in place by defining a basic policy on handling. The regulation on security control clarifies “10 items to comply” including the “Need-to-Know principle” to specify rules of each item so that access, usage, copy, storage or taking out of confidential information can be limited and controlled. Training programs on security control are provided for all of the employees to ensure their understanding and a proper operation of rules/system. The Company also prepared the “Social Media Guidelines” summarizing what to be focused in official/private use of social media which has become common recently. The Group companies also apply the Guidelines to protect them and their employees from risk such as slander through social media, security violation, and lawsuit.

Basic Policy for Security Control	10 items to comply
<p>Information is our precious property.</p> <p>Based on the “Musashi Philosophy,” we protect confidentiality of the Musashi Group and customers.</p> <ol style="list-style-type: none"> 1 Recognize that information in the Company is precious property and act accordingly. 2 Make full efforts to prevent risk of leak of internal / external information (including occurred). 3 Share the common recognition with all Musashi Group companies to work on security control. 	<ol style="list-style-type: none"> 1 Need-to-Know principle 2 Confidentiality rank setting and control according to the rank 3 Prohibition of use of confidential information apart from work (including the retired) 4 Control of external use of confidential information 5 Copy/Distribution/Sending control of confidential documentation 6 Storage/Saving/Disposal control of confidential information 7 Control of outsourcing confidential information 8 Control of internal computers/networks 9 Control of PC/communication devices/media 10 Control of entry/exit

Measures for Information Security

Based on the ISO27001 concept, we issue our own security guidelines. We conduct PDCA to understand the current status and take measures through a periodic audit. We are improving our operation and action against threat at a global level.

[People]

The mind-set of each associate is important to protect information. Sharing the latest trend and examples on security, we are providing the associates with knowledge and initial action to be taken.

[Structure]

Establishing multi-layered preventive invasion systems, we protect information from the leak due to human errors and from cyberattacks.

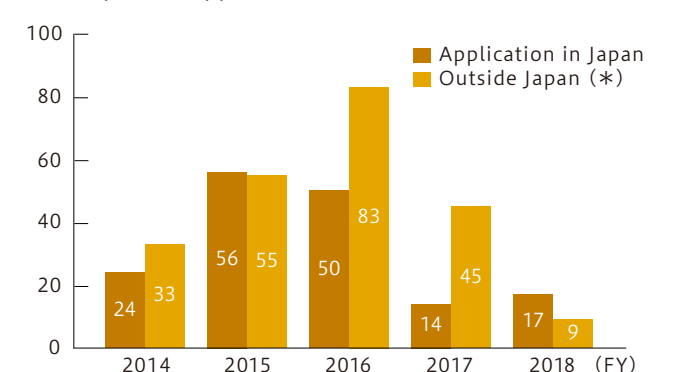


Management of Intellectual Property

We are applying for patents domestically and internationally to utilize intellectual property effectively in global business. Also, we are working on the comprehensive protection and utilization of trademark registration and management of trade secrets.

*Patents held as of March 2018
Japan: 45 patents registered, 123 patents pending
Outside Japan: 39 patents registered, 161 patents pending

No. of patents applied



*PCT international applications and EPC European applications are counted as applications made outside Japan as of application and counted as patents of each company after transition.

Environment

Musashi considers stakeholders' requests and expectations include developing and providing products which contributes to the prevention of global warming and the reduction of environmental impact throughout the product life cycle. Each of the global affiliates is working on the reduction of environmental impact from both "products" and "production" perspectives.

Environmental Issues Surrounding Musashi Group

In December 2015, the 21st Conference of the Parties (COP21) for the United Nations Framework Convention on Climate Change adopted the Paris Agreement, a new framework of greenhouse gas emissions after 2020. The Paris Agreement is a legally binding international framework since the Kyoto Protocol adopted 18 years ago. The Agreement specifies "holding the increase in the global temperature to well below 2 °C and to pursue efforts to limit the temperature increase to 1.5 °C."

The Kyoto Protocol obligated only the developed countries to reduce green house gas emissions; however, the Paris Agreement concluded all countries including developing countries should reduce green house gas emissions too. The Agreement recognised that global warming is now a world-common issue. Under such circumstances, Musashi Group which develops its business globally recognizes that measures against global warming are one of the critical group-wide issues. Not only saving energy and reducing environmental impact in production processes, but also our stakeholders including customers are requesting and expecting us to develop and supply products which contribute to reduce energy consumption and environmental impact while these are in use. To respond to their requests and expectations and to be a "company trusted by people around the world," our global production sites are working on the reduction of environmental impact including energy and resource saving from "product" and "production" perspectives.

Basic Principle

Musashi recognizes that environmental preservation is one of the most important problems as a member of society. We preserve the global environment and enhance mankind's prosperity through its corporate activities for the society and the environment. We set the following guidelines toward achieving the goal to maintain the spirit of innovation.

Basic Policy

We will continue to explore and develop our original *Monozukuri* and thereby contribute to the global society by providing trusted and attractive products.

To realize this corporate mission, we globally establish environmental management system based on the guidelines stated below.

- Not only complying with law regulations, Musashi establishes the necessary self-imposed environmental targets for meeting social and stake holders requirements. Musashi promotes environmental preservation activities, including reduction of Green House Gas, Waste water, Air pollutant, Noise, Odor, Vibration, Waste, Hazardous materials, Soil contamination.
- Musashi reduces environmental load as much as possible in all business area of the organization. Musashi shall continuously endeavour to maintain and improve our environmental management system to improve our environmental performance.
- Musashi ensures the effective use of energy and other resources and pursues the appropriate management of chemical substances and reduction of waste, in every lifecycle stage of our products and all aspects of business activities.
- To protect and preserve our global environment, Musashi implement environmental conservation actions and endeavour that all individual working in or for our organization keep awareness of environmental protection.

We establish objectives, targets and action plans to achieve these policies. And, we review and revise them for every fiscal year according to the law regulation, environmental aspects of our business and opinion and requirement of stakeholders.

Also, we ensure that all individuals working in or for our organization are fully aware of these environmental policies by posting and disclosing these policies. And, we make these policies available to all stakeholders.

April 1, 2018

Global Environmental Management Promotion System

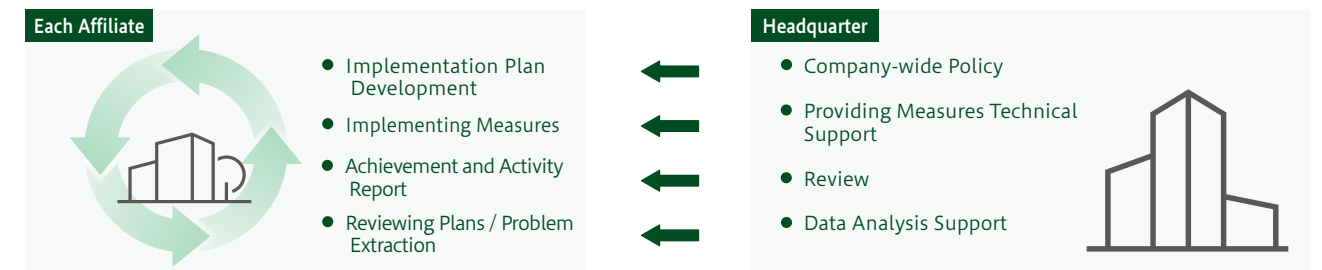
Musashi Group is advancing environmental management under the ISO14001 standard. Based on the standard, we have conducted activities, the quantitative grasp of the environmental data, and information sharing regarding technologies and measures for environmental impact reduction.

Various environmental data in each region is shared between the affiliates and headquarters each month and its achievement and activities are reviewed at the "Global Top Meeting*" represented by all management.

Collection of actual cases of environmental improvement reported from each region has been published on the company intranet. We also share advance improvement activities in each region at the Global QC Circle Convention. These measures and activities for reducing environmental impact are planned and promoted continuously across the Group.

* A meeting attended by management of all global sites to share group policies, identify issues for realizing management plans, and discuss actions to be taken.

Global Environment Management Promotion System



Environmental Management in Japan

Current Status of Environmental Issues and Future Responsibilities in Japan

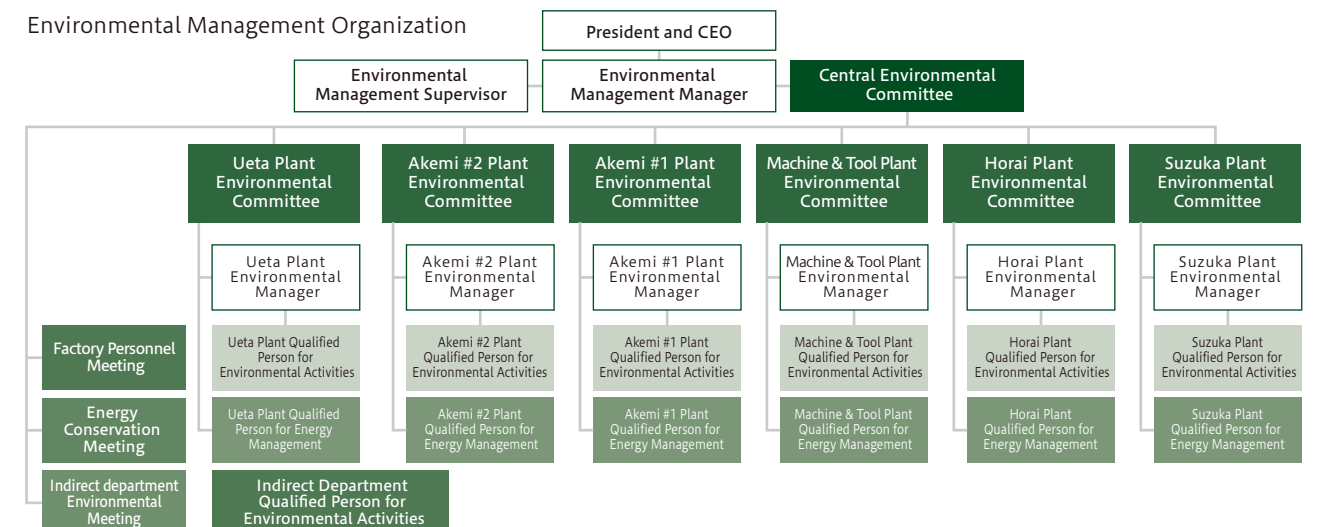
In Japan, "climate change and energy issues" stay as a key environmental matter and various initiatives have been taken.

With the expansion of our business on a global scale, the efficiency is much required in the domestic business. From environmental perspectives, cutting-edge activities of the reduction of environmental energy conservation, saving resources and pollution prevention are expected to be taken as well as developing these in the world.

Remaining as a frontrunner of environmental activities for all production sites, we will step up Musashi's global activities for all production sites, we will step up Musashi's global environmental activities.

Environmental Management Organization

To establish a company-wide environmental management, Musashi has formed the Central Environment Committee to orchestrate a company-wide response to the environmental issues. Also, to improve environmental management, an audit has been conducted twice by an external certification body and by an internal audit team since the acquisition of ISO 14001 certification in August 1998. In FY2017, 2nd and 3rd periodic external audit was taken in July 2017 and February 2018. None of the items were identified as non-conformity and the certification was maintained. Additionally, in July 2017, external audit for migration to the new standard (ISO14001:2015) was taken, and we acquired the certification of ISO14001:2015.



■ Environmental Laws/Regulations and Risk Management

To ensure the compliance of environmental laws and regulations, we conduct a periodic check of the measurement of regulatory values, the notification to government, and the status of equipment. For any equipment which may impact significantly on environment, possible accidents are anticipated. We are prepared for emergency by defining procedures and contact routes, and conducting/reviewing periodic training programs and drills. Our business partners also participate in such drills.

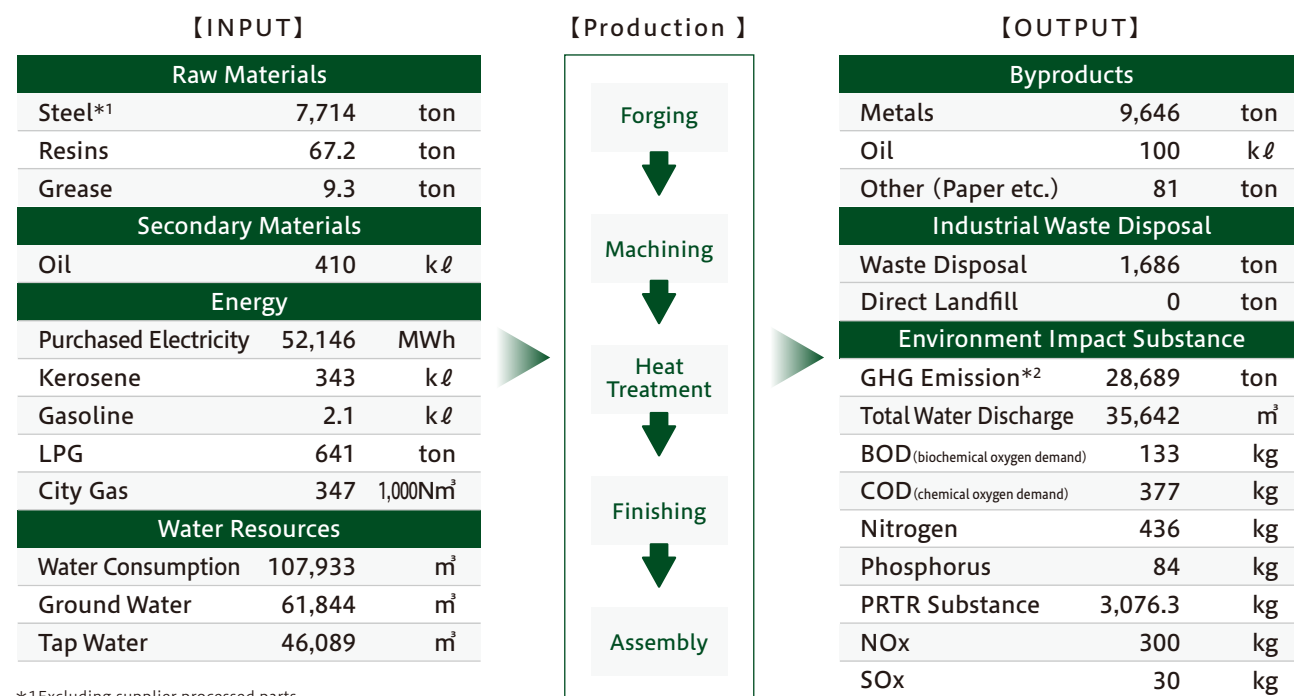
■ Material Flow

To see the overall environmental impact, we ascertain the balance (material flow) of annual raw materials, energy, and waste. The data is used to set target for reduction of CO2 and waste.

■ Environmental Accounting

Environmental accounting calculates investment and cost of environmental conservation. “Investment” is the investment for tangible fixed assets in FY2018, “Expense” is the expense for environmental measures in FY2018.

FY2018 Resource Input and Output



*1 Excluding supplier processed parts.

*2 The subjects of CO2 emissions have been those under the Energy Saving Act. Accordingly, the actual emission factor in the “CO2 Emission Factors of Each Electricity Utility” publicized by the Ministry of the Environment of Japan in November 2018 was used.

Period: April 1, 2018 to March 31, 2019

FY2018 Environmental Accounting

Cost Classification		Main Initiatives	Investment	Expenses
Cost within Business Area			12.4	153
Break down	(1)-1 Pollution prevention	Air/water/soil pollution prevention	2.1	26.9
	(1)-2 Global environmental preservation	Heat treatment process integration, Compressor update	10.3	23.0
	(1)-3 Circulation of resources	Waste treatment, recycling	0	103.1
Upstream/Downstream Cost		Investment in product recycling	0	0
Management Activity Cost		ISO regular inspection, environmental education, environmental labor cost etc.	4	47
R&D Cost		R&D of products for energy saving (compact, lightweight)	3	71
Social Activity Cost		Community clean-up activities Musashi woodland project	0	10
Environmental Damage Cost			0	0
Other			0	0
Total			19.4	281

FY2018 Environmental Goals and Achievements

In 2018, we set targets for each of the following categories and worked on environmental improvement.

Category	Environmental Activity	Control Item	FY2018			FY2019 Target
			Target	Result	Achievement	
Global Warming Measures, Energy Saving	Green-House Gas Reduction	CO2 Emissions per Unit (CO2 ton/million yen)	2% Reduction (baseline:2016)	0% Reduction	×	3% Reduction (baseline: 2016)
	Reduction of Transportation-Related CO2 Emissions	CO2 per Unit (CO2 ton/million yen)	2% Reduction (baseline:2016)	8.3% Reduction	◎	3% Reduction (baseline: 2016)
Resource Saving	Water Consumption Reduction	Water Consumption (m)	2% Reduction (baseline:2016)	9.7% Reduction	×	3% Reduction (baseline: 2016)
	Industrial Waste Reduction	Waste Volume per Unit (ton/million yen)	2% Reduction (baseline:2016)	3.7% Reduction	◎	3% Reduction (baseline: 2016)
	Promotion of Waste Recycling	Direct Landfill (%)	Maintain 0% Landfill	0%	○	Maintain 0% Landfill
Less Environmental Impact	Reduction of Chemical Substances	PRTR*-Listed Substances(ton)	85% Reduction (baseline:2000)	94% Reduction	◎	85% Reduction (baseline: 2000)

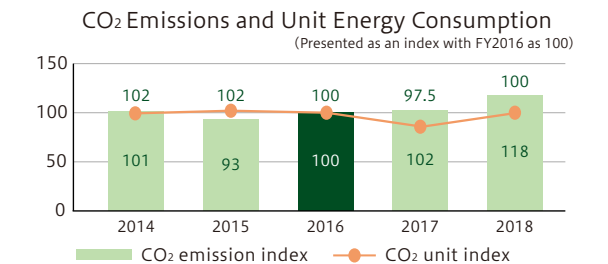
<Target achieved> ◎:105% or higher, ○:95% to 105%, △:80% to 95%, ×:80% or lower

*A PRTR (Pollutant Release and Transfer Register) is a national or regional database of information on the environmental release and off-site transfer of potentially hazardous chemical substances from industrial and other facilities.

Reduction of GHG Emissions

FY2018 CO2 emissions per unit was 0% compared to FY2016 due to energy loss in new model launch. The target was not achieved.

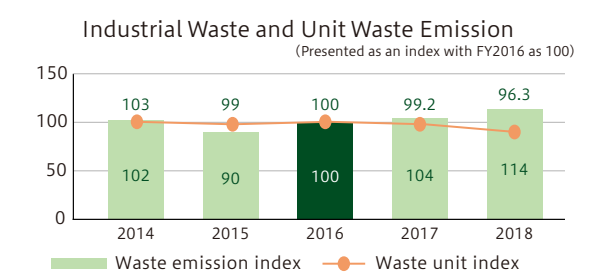
We will improve processes and production efficiency more and take countermeasures against energy loss for better energy efficiency.



Reduction of Industrial Waste

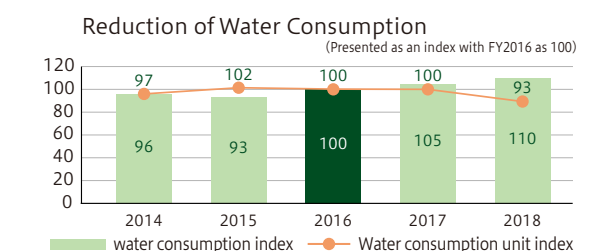
The industrial waste per unit in FY2018 was reduced by 3.7% from FY2016. The target of 2% was achieved. We maintain 0% of external direct landfill.

We will control waste generated from each process and reduce the volume of industrial waste with water-based cutting fluid and internal sludge treatment.



Reduction of Water Consumption

FY2018 water consumption was increased by 9.7% from FY2016, the baseline. However, the unit was decreased by 7%. We will keep reducing water consumption by implementing water saving activities; by replacing old pipes for leakage prevention; and by monitoring waste and loss.

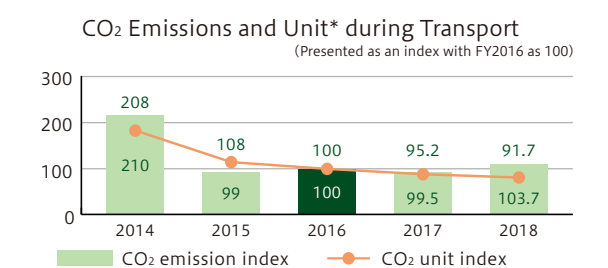


Highly-efficient Transportation

To reduce CO2 emissions during shipping, Production Management Division is focusing on the highly-efficient transportation by working closely with customers and transport companies.

In FY2018, we continuously worked on the improvement of loading efficiency for shipping and the expansion of “pick-up transportation” applied to reduce CO2 in the entire supplier chain logistics.

This helped to reduce CO2 emissions generated from transportation by 8.3% compared to the base year of FY2016.



*CO2 Unit : CO2 Emissions (t-CO2) / Sales (Million yen)

Product Responsibility & Quality Assurance

As described in our motto, “Generate trust and prosperity through quality” and “Provide products pleased by our customers,” we work on quality assurance to provide our customers with better products by setting “control/criteria not to occur defects” and “control/criteria not to flow out defects.”

Basic Policy for Quality Assurance Activity

Based on the Quality Policy as shown below, we defined our action policy as “Challenge to the ‘Number 1’ –aiming to be a truly global company–”. Based on the action policy, we promote continuous improvement of our duties and qualities for much customer satisfaction.

In FY 2017, we were able to improve quality and production index indicator for the entire group by promoting various initiatives to prevent recurrence of defects.

We globally keep improving quality management system and promoting preventive actions towards defects to provide our stakeholders including customers with products which can be used with peace of mind.

Quality Policy

Meet customer needs accurately, respond to a change flexibly and speedily, and provide top level products in the world to gain customers’ trust from Quality, Cost and Delivery perspectives.

Quality Management System, Preventive Action, and Constitution Improvement

Quality Management System

Establishing quality management based on the IATF16949 requirements, we have a system to provide products which satisfy customer quality requirements. Not only in Japan, our production sites in the world are promoting the establishment of a quality management system to meet the IATF16949 standards. In this way, we are promoting to establish group wide quality management system.

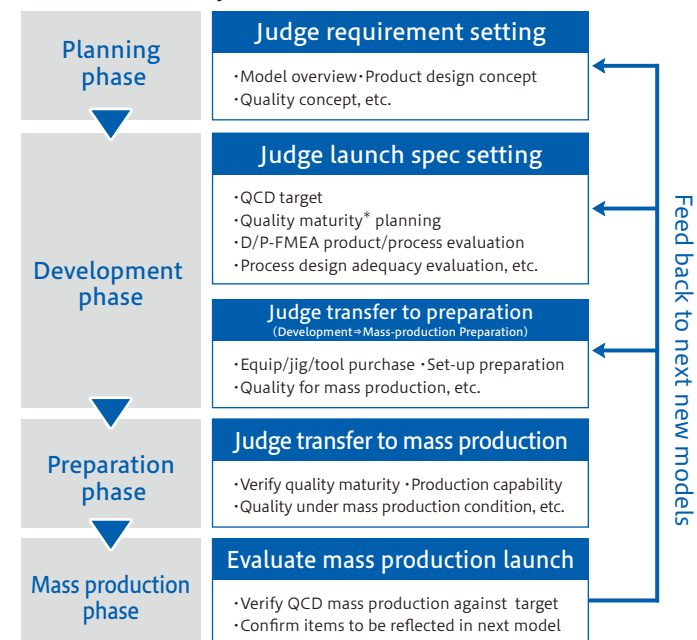
Quality Assurance for New Model Launch (M-FLO)

We adopt M-FLO, a management flow for new model development/ launch in all production sites. In accordance with the M-FLO, we carry out council for evaluation/ judgment on quality, production capability, and cost in each phase from planning to mass production. Quality, in particular, is evaluated and judged in each phase to make sure preventive action against quality defects is studied fully for preventing the recurrence of defects.

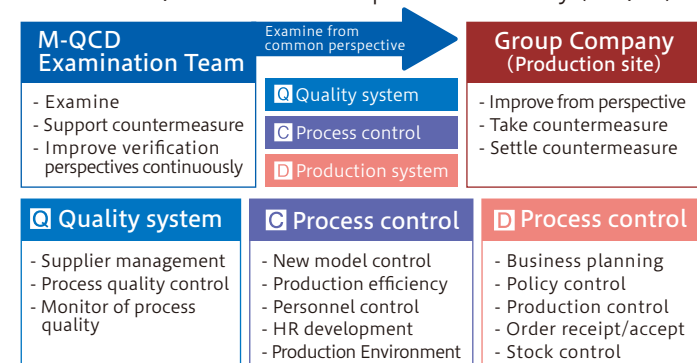
QCD Constitution Improvement Activity (M-QCD)

For a stronger “Monozukuri” or manufacturing, we are working on improving the corporate constitution to level our strengths by examining a quality/production system and process control from a common and objective perspective and by strengthening potential weaknesses.

Overview of Quality Assurance for New Model Launch (M-FLO)



Overview of QCD Constitution Improvement Activity (M-QCD)



Quality Training

The Company provides the employees with quality training programs according to their internal qualification and duties. Since 2019 TQM training has been provided for all administrators and supervisors to strengthen human development and circle activities.

The associates not only of Quality but also of other sections throughout the Company are supported for the Quality Control (QC) exam. The number of the qualified has been increasing every year. We will establish our original quality examination system and promote the development of quality human resources at a global level.

Annual training plans

- IATF Training: Understanding of standards, internal auditor training, core tools
- Quality control training:
 - TQM training
 - Junior Course
 - Foreman Course
- QC Circle activity training: for promoters and leaders
- Quality training for new members: basics of quality, practice of measurement instruments



Global MM Circle (QC Circle) Activities

The Group has 456 circles (3,694 members) working on the improvement for the purpose of creating, expanding, and succeeding small-group activities as well as making a more lively and stronger workplace and corporate constitution. Outcomes of their activities are highly acclaimed in conventions held by our customers in the various countries.

The “MM Circle World Convention” is organized every year to invite representative circle members from all over the world to Japan. Not only sharing kaizen know-how between attendees, but also exchanging with global associates makes the Group more cohesive and contributes to improve the competing power.



FY 2018 Excellent Circle
“Establishment of Diff Pinion Measuring Methods” (MSI, Japan)



FY2018 Excellent Circle
“Less Die Damage in Crankshaft Forging” (MDA, Brazil)

Human Resource・Labor Practices・Human Rights

Considering the “development of creative human resources” as the foundation of realizing “Be Unique!!” and creating values continuously, Musashi works on the development of human resources. Based on the concept “valuing human resources is a corporate basis,” we works on the improvement of worksite environment, the health management of our employees, and the prevention of discrimination and harassment.

Basic Concept of Human Resource Development

Based on the concept of “developing independent individuals as well as standing on the foundation of fairness and trust to bring out the total power,” our human resource development allows each of our employees to grow with “free ideas,” “initiatively action,” and “responsibility for outcome.”

Our employees are provided with various training opportunities according to their position and role in order to deepen their understanding of “Musashi Philosophy” and to bring it to action.

Basic Concept of Human Resource Development

Develop independent individuals as well as stand on the foundation of fairness and trust to bring out the total power

Boost-up to Strengthen Expertise and Boss-Subordinate Communication

■ Target Setting and Measurement of Competence

To bring out the employees’ competence in their expertise and to boost up their growth, the Company has a clear definition of the required competence of each area. The employees set their target based on the definition and improve their competence in their work and learning. The annual measurement of their competence can show their current competence level to allow them to set a new target for continuous development.

■ 2WAY

The Company has a “2WAY” meeting every half year to strength the reliability between boss and subordinate, to promote the growth of subordinate, and to understand personnel assessment in a more satisfied and transparent way. Through 2WAY, boss conveys his/her expectations and advise for growth, subordinate conveys his/her carrier plan and request, and both set the work/competence target to achieve an interactive communication.

Dialogue with Labor Representatives

The Company considers it essential to listen to its employees and exchange opinions for the sustainable development, thus dialogue with the labor union as labor representatives is a key. To accept employee needs and develop a better labor environment, the Company discusses honest opinions in monthly labor and management meetings and periodic committees to improve/apply labor conditions and various welfare systems. Employee survey is taken periodically to reflect its results in business plans of each division.



Coaching training for stronger 2WAY communication



Labor and management meeting

Training System (Overview)

Category Title	By Position/ Responsibility	Special Knowledge/ Skill	Global Communication	Language	Other	
General Manager	- Strategic Management Training	[Applied] - Quality - Safety/Environment [Basic] - Quality - Safety/Environment National trade certificate training OJT (by area/section) Compliance Education	Expat with responsibility	English skill English learning support program Mental health	Life plan	
Section Manager	- Management - Assessor training		Expat training			Global mind Coaching skill
Supervisor	- Management candidates - Leadership training - Training at promotion					
General	- Young leader training - Orientation					

Training by Position

To improve knowledge and capability required by position or title, training programs including orientation, promotion, and management are provided.



Young leader training

Global training

Cross-cultural communication and English learning programs are provided for global work as well as self-development.



English learning program

Engineering /Skill Training

Focusing on engineering and skill training essential for a manufacturing company, we are training our employees to get certified. (140exam takers,45 certified in 2018)



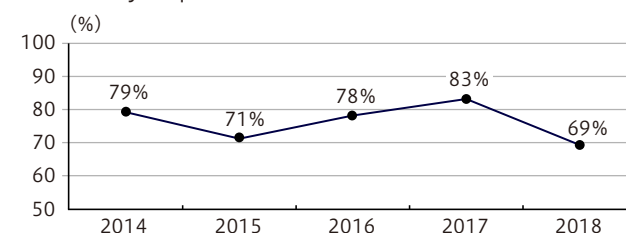
Skill exam certification ceremony

Support for Diverse Work Style

■ Promotion of Paid Holiday Acquisition

Labor and management are working together to ensure a high level of take-up of paid holiday entitlement. A special system for “paid holiday caring” has been set up. In the system, paid holidays which are not used are carried over each year and then could be used for either that individual’s own sickness benefit, or for caring of another family member.

Paid Holiday Acquisition Rate



■ Support of Both Work and Family

A “shorter working hour program for child care,” which can be used for any period under certain conditions, is provided for the employees raising school kids. Also a “nursing leave program” has been set up separately from annual paid holiday acquisition to allow the employees to acquire a holiday for nursing pre-school kids. Like child care, “shorter working hour,” “holiday caring” and “caring leave” programs are provided for caring of another family member. Additionally, in 2017, “reemployment system” and “work-from-home system” for employees caring and supporting children or elders were introduced to manage both work and family support.

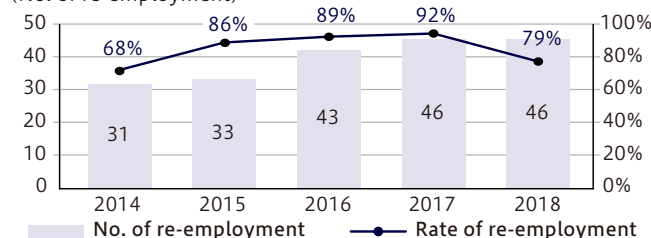
Child-care Leave

	2014	2015	2016	2017	2018
Female employee child-care leave (%)	100	100	100	100	100
Return to work after child-care leave (%)	100	100	100	100	100

■ Re-employment after Retirement

The company sets the retirement age as 60; however, a “re-employment after retirement” system is in place to allow the employees with good health and mentality to work continuously. Both the number and the rate of re-employment are increasing. Employees can work up to 65 years old in full-time base or some days a week. Their skills built in a long time can be utilized after their retirement.

Re-employment after Retirement (No. of re-employment)



Respect for Human Rights and Harassment Prevention

■ Concept and training against discrimination and harassment

The “Musashi Compliance Guidelines,” common code of conduct that the employees are kept informed, clearly indicate the basic concept of respect for human rights and harassment prevention. Using the “Musashi Compliance Guidelines” as main training materials, basic training programs on human rights and harassment prevention are provided for new members at their entry. Training programs at promotion are also provided according to the position or rank of the employees to deepen their understanding.

Basic Concept of Respect for Human Rights and Harassment Prevention – from “Musashi Compliance Guidelines”

IV We will respect human rights and embrace diversity and differences of each individual. We will not tolerate any discrimination or harassment.

[Basic Concept]

As a responsible company which conducts business activities around the world, the Musashi Group will respect the human rights of every individual and will not accept forced labor, child labor or any form of discrimination. Additionally, the Musashi Group will strive to avoid complicity in human rights violations. To create the work environment where each associate is able to work with integrity and maximize their worth and ability, the Musashi Group will respect and embrace the diversity and differences of each individual and will not accept any form of harassment.

Prohibiting Forced Labor: We will not accept forced labor and ensure that all labor is on a voluntary basis such that each employee is able to leave his or her job freely. We will never take any actions that restrict freedom of movement or leaving the company’s employment, such as keeping a government-issued identification card (including passport, work permits etc.) at the company.

Prohibiting Child Labor: We will not employ children who are under the legal working age in the country or region of operation.

Avoidance of Complicity:

- We will not conduct business with companies which accept human rights abuse.

- We will strive to avoid and prevent adverse impacts against human rights which may indirectly occur as a result of our business activities, including avoiding the use of “conflict minerals” from unverified sources.

[Action Guide]

● We will not discriminate against those working for Musashi or its suppliers for any reason including family background, nationality, race, ethnicity, belief, religion, gender, sexual orientation, age, intellectual or physical disability, disease, academic background or social status.

● We will not use words or expressions which are, or could be deemed as discriminatory or could violate human dignity.

● We will not tolerate any kind of harassment (including bullying, sexual harassment, power harassment etc.) in our workplace which could violate human dignity of others, put others at unfair disadvantage, make others feel threatened or uncomfortable.

Industrial Health/Safety Management

■ Basic Concept of Industrial Health/Safety

Based on “No safety, no production,” the basic philosophy of industrial health and safety, we consider that corporate continuation starts from creating a safe and healthy workplace. To eliminate industrial accidents, we are promoting various safety training programs to reduce serious industrial disasters or accidents not only by sharing preventive action, but also by training internal prediction trainers to improve their awareness.

■ Prevention of Industrial Accidents and Safety/Health Activities

To prevent industrial accidents and to improve work environment, the Central Safety/Health Committee, consisting Production Officer as its Chair, is promoting company-wide safety and health activities for “safe work environment.” In addition to Safety/Health and Accident Prevention Committees set in each plant, the head office has sub-committees in manufacturing, engineering and administration areas to develop activities according to each level and area, to take countermeasures, and to share information. Union members attend all of the committees to reflect employees’ opinions.

■ Occurrence of Industrial Accidents

Based on the basic philosophy “No safety, no production,” we make sure that preventive action is applied and taken against similar serious accidents of pinching or trapping in past. Also, safety/health risk assessment is conducted from multiple perspectives of production and safety/health when new equipment is installed to make sure no serious risk of safety which cannot be identified in the phase of process design to create a safe production environment.

■ Keeping the Employees Healthy

The Company provides its employees with continuous health support through the following:

■ Full medical check-up

- Additional X-ray on stomach and check of bowel cancer
- Additional blood test at age of 30
- Vaccination against flu in the Company

■ Support for individual health improvement

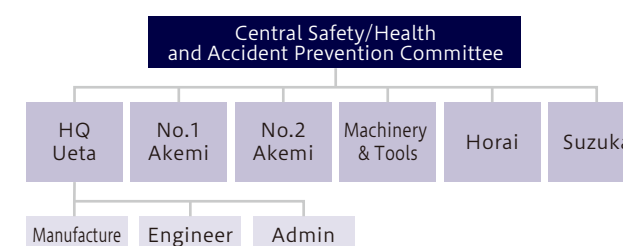
- Lecture on health
- Support for half-marathon runners

■ Support for employee’s mental health

- employee’s mental stress diagnosis on a regular basis
- Work environment improvement initiatives based on stress diagnosis results
- Support and counseling by industrial counselor

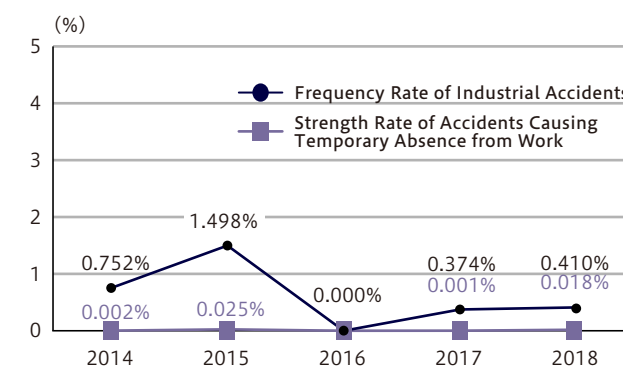
■ Prevention of passive smoking

Organization Chart for Safety/Health



Safety/Health Walk-through

Frequency Rate of Industrial Accidents



Half-marathon Runners

Supply Chain

Musashi business cannot be run without the cooperation of its business partners in the world. Based on the mutual benefit concept, we are building a reliable relationship with our business partners to promote sustainability activities in the entire supply chain.

Basic Concept of Purchasing

We develop our global purchasing activities in the world. Based on compliance and equal and fair business with our business partners in the various countries and regions who provide “products with good quality at appropriate prices”, we are aiming for mutual benefit. Specifically, we are developing the QCD structure and activities in ways that provide a safe and healthy working environment, and also minimize our impact on the global environment. We will contribute to finding ways to develop our local and global society in a sustainable way.

For Equal and Fair Business

We provide our business partners with an equal and fair opportunity regardless of their nationality, corporate size or business history, and establish a sound partnership with them. We are developing a strong and thorough governance and compliance system, and set up an “Open Door” system to allow all stakeholders, including the employees of our business partners, to make a suggestion to us.

■Full Anti-Bribery

We never pursue profits from bribery or other improper methods. The “Musashi Compliance Guidelines” clearly indicate the basic concept of fair business to keep the employees informed. Also, all of the business partners involved in our business are kept informed periodically not to make profits for Musashi with improper ways.

■Corporate Ethics Window

Also from the employees in our business partners, “The Musashi corporate ethics window” receives consultation and suggestion on (possibility of) actions violating laws or corporate ethics in the business with us. By internal regulation, the privacy of the person/company who made the proposal is preserved and business partners are protected so as not to suffer disadvantage by proposing. And anonymous proposal can be accepted. Our business partners are informed on the “Open Door” contact through a periodic meeting.

Basic Policy for Purchasing

- ① Stronger governance and compliance
- ② Stronger structure of Quality, Cost and Delivery
- ③ Compliance with the Green Purchasing Guidelines

Basic Concept of Fair Business from “Musashi Compliance Guidelines”

IX To establish sound relationship with our customers and suppliers, we will provide honest and precise information and conduct fair and sound transactions.

【Basic Concept】

The Musashi Group will provide honest and precise data to our customers and conduct faithful promotion activities based on facts and data.

The Musashi Group will conduct fair and sound business transactions complying with all applicable legislation for fair-trade including anti-monopoly, anti-corruption and anti-bribery in each country and region of operation and our internal policies regarding them.

【Action Guide】

- To avoid misunderstandings and misleading our customers, we will ensure that we fully understand our product related information by using precise information and product data, and use this as a basis for conducting fair and honest promotional activities.
- We will preserve product related information and data in accordance with internal policies, we will strive to provide information and data which our customers require.
- We will comply with all fair trading and anti-monopoly legislation applicable in the country or region of operation and our internal policies. We will not seek to create private monopolies, use improper trading restraints or any other unfair methods of business, such as improper agreements, cartels or bid-rigging, nor will we seek to abuse any dominant bargaining positions which may arise.
- We will comply with all anti-corruption and anti-bribery legislation applicable in the country or region of operation and our internal policies. We will not receive or offer improper or excessive facilities including money, gifts, services or entertainments from or to interested parties such as suppliers.
- When sourcing products or services, we will compare the terms and conditions from at least two suppliers in order to fairly determine which one to use.

■Training session on “Subcontractors Act”

To ensure thorough compliance in transactions with subcontractors, a periodic training session on the Subcontractors Act (Subcontractors Delayed Payment Prohibition Act) is co-organized by our Purchasing Section and Legal Section every year. In the 2018 session, 103 associates in charge of ordering operation participated.



Session on Subcontractors Act Co-organized by Purchasing and Legal Section

Stronger Cooperation with Our Business Partners

We hold a periodic meeting with our business partners to share the latest information on the business environment and to take action for the changing environment. In the meeting we present the annual policies for “Purchasing”, “Quality” and “Environment” and so on, to keep our business partners understood on our various global activities. Additionally, we hold internal exhibitions and seminars organized by our business partners to develop the new Musashi brand together with business partners.

■Dialogue with Our Business Partners (Meetings/Panels)

In the annual meeting with our business partners, we provide information on the business environment surrounding us and our basic policy. In addition to our overall policy, we inform our business partners on sustainability, purchasing, quality, and environmental policies for their understanding and cooperation.

■Initiatives for New Business Values

We hold internal exhibitions and seminars organized by our business partners. In the exhibitions, our business partners can propose their new technologies, materials etc. New business values are developed together with our business partners through these activities.



Business partners gathering

■Quality Management Initiatives

In order to provide products that customers can use with reliance, we are working on quality control and improvement activities throughout the supply chain, aiming at “0” quality defects, in collaboration with suppliers. Based on our own quality assessment method, we constantly confirm the quality status of each business partner, plan improvement program collaborating with our business partners, and promote quality improvement activities.

■Environmental Initiatives

We are working to reduce the environmental impact throughout the supply chain in cooperation with suppliers. In order to manage chemical substances contained in products together with suppliers, we issue Green Purchasing Guidelines. Additionally, to reduce CO₂ emissions, we are working to conduct periodic surveys of CO₂ emissions at business partners and sharing examples of CO₂ reduction measures.



Internal exhibitions and seminars organized by business partners

| Living with Local Communities

As a global company to be trusted by its local communities, based on the concept of mutual development in society, we will continue efforts towards social contribution activities tailored to the needs of communities in each region.

■ Stable Water Supply by Dam Maintenance (MAP-TH: Thailand)

MAP-TH associates planted 500 trees and built a small sand-trap dam in Nakhon Nayok Province. This made water supply stable for residents in the community.



■ Offering Gifts to the Needy and the War Wounded (MAP-VN: Vietnam)

MAP-VN supports and contributes to its local communities every year by offering gifts to the needy and the war wounded and donates blood in events organized by the industrial park.



■ Event for Kids in Need (MAP-CH: China)

MAP-CH organized a recreation event for kids whose life is challenging due to various reasons. 15 kids enjoyed playing games and making moon cakes in the event.



■ Mangrove Planting (MAP-IN: Indonesia)

To prevent a serious ocean issue in Karawang, MAP-IN started mangrove planting in 2014. 5000 trees were planted in 2018.



■ Local Event Organized for Kids and Women (MAP-ID: India)

Based on the concept of mutual harmony and benefit with local communities, MAP-ID hosts art competition and yoga camp for women on the children's day and the international yoga day.



■ Sponsorship for Traffic Safety Event (MHM: Hungary)

As a company manufacturing transportation equipment, MHM sponsors a local traffic safety event that demonstrates first aid and traffic safety competition.



■ Supporting Christmas Event (MEU: Germany)

For kids suffering from disease or disability, MEU supports a wishing tree campaign to make their wishes come true. MEU associates also joined the event to leave gifts around the tree.



■ Community Garden Now Open (MAP-CA: Canada)

As a place to meet local people, MAP-CA made a community garden. Local people are expected to be invited to bring their plants here in 2020.



■ Musashi Summer Festival (MSI: Japan)

MSI organizes "Musashi Summer Festival" every year. The festival is open to everyone including its local residents and the family members of the employees. This festival attracts more than 1,500 people with various food stalls, spectacular firework, and many events organized by the employees. It provides a good opportunity for interacting with the local residents.



■ Supporting Youth Event (MAP-MI: USA)

MAP-MI supports a mentorship program for young people as the development of the next generation which educates participants on fairness and responsibility through sports.



■ Collaboration with Local Educational Institute (MAP-MX: Mexico)

For co-existence and co-prosperity as well as for the development of the next generation, MAP-MX raises awareness of environment by planting trees with kids in a kindergarten and paints a school play yard.



■ Tideland conservation program (MSI: Japan)

This project started in 2017 for raising biodiversity and the employees' awareness on environment. This project is held yearly and many Employees and their family members join, and clean up the tideland and observe creatures living in tideland.





Sustainability Report 2019

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