

# Corporate Profile

**English version**



# Realize your dreams

At IHI Group, we design and build progressive engineering solutions for people and planet.

Our heritage is built upon a shared culture of striving for the highest standards in every facet of our business. This approach commits all relationships to our management philosophy of contributing to the development of society through technology.

We work alongside customers, stakeholders and fellow employees to deliver outcomes that positively affect the world and its inhabitants.

This powers our relationships to greater outcomes, and also makes good commercial sense. At our core, we are people who apply forward thinking to find lasting solutions to the toughest problems.

IHI Group. Realize your dreams.

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## Management message

### Seeking to become a more trusted corporate group by strengthening our earnings foundations

It is a pleasure to overview the activities of the IHI Group, which I am honored to lead.



President and Chief Executive Officer  
**Tsugio Mitsuoka**

IHI was established as Ishikawajima Shipyard in 1853. We have since evolved into a comprehensive heavy industry manufacturer that can contribute to social progress by relentlessly pursuing technological excellence and by cultivating advanced engineering capabilities.

#### Accommodating Diverse Needs

The global business landscape is transforming at lightning speed. The global economy has become increasingly more complicated as the economic climates of emerging nations have diversified, international economic partnerships have progressed, and as the industrial structure has changed. Swift progress in information technology has made it even more important to be innovative in our products and services offering, while incorporating information and communication technologies that keep pace with advancements in manufacturing. Social infrastructure demands are diversifying around the globe. The focus for emerging nations is to tackle urbanization and industrialization. The priorities for developed countries include addressing the challenges of population decline and aging infrastructure. It is more important than ever for IHI to identify and cater to the diversifying customer value requirements that stem from such transformations in our operating climate.

#### Initiatives to strengthen our earnings foundations

We deployed Group Management Policies 2016 against this backdrop. Through this initiative, we seek to create a structure to reinforce business strategy implementation and ensure consistent profitability in construction. We also aim to supply solutions that create customer value and deliver advanced products and services so we can strengthen our earnings foundations. We are therefore prioritizing the following three initiatives in our drive toward tomorrow:

- Accelerate business concentration and selection by undertaking new portfolio management approaches to clarify the direction of business strategies
- Enhance estimate processes and risk reviews as part of efforts to strengthen the project implementation structure, creating a setup that enables us to stabilize earnings
- Employ shared Group functions that we reinforce by concentrating resources and integrating capabilities, thereby transforming our business model while making our operations more competitive

## Realize your dreams

Our management principles are “Contribute to the development of society through technology” and “Human resources are our single most valuable asset.” Our corporate message of “Realize your dreams” epitomizes the mission we embarked on more than 160 years ago to leverage our technology and human resources to help humankind’s greatest dreams come true.

We look forward to your ongoing support and encouragement as the IHI Group endeavors to fulfill its mission by growing sustainably and enhancing corporate value while building trust among all of its stakeholders.

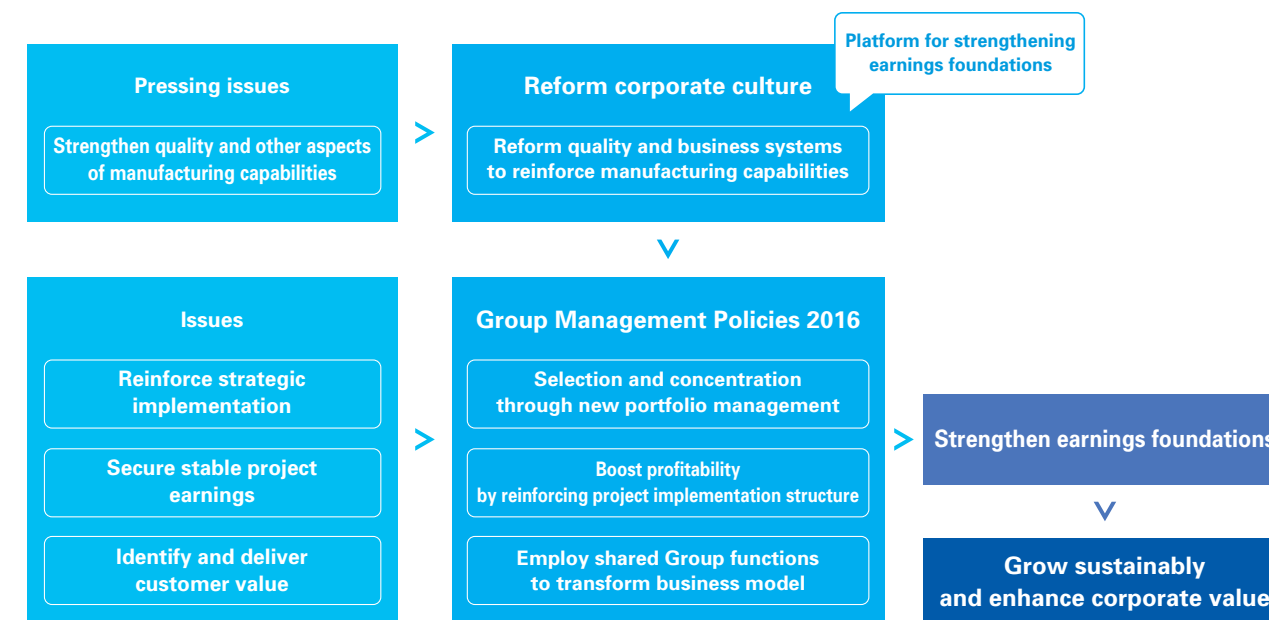
### Positioning of Group Management Policies 2016

#### IHI Group Vision

The IHI Group seeks to solve the various environmental, industrial, social, and energy related problems of the 21st century, through using engineering expertise to focus on “Monozukuri” technology. In striving towards these goals, IHI is becoming a global enterprise offering the safety and security for the benefit of both the environment and humanity.



### Overview of Group Management Policies 2016



\* For details about Group Management Policies 2016, refer to “About IHI > Management Policy > Group Management Policy” on the IHI website.



# Business Areas

## Resources, Energy & Environment Business Area

### Minimizing Environmental Impact

We maintain stable supplies of energy that are essential to industrial progress and comfortable lifestyles while aiming to minimize global warming. We leverage our expertise and proprietary technologies in coal, natural gas, nuclear power, and in renewables to optimize product and service mixes while minimally affecting the environment.



- Boilers
- Power system plants
- Large power systems
- Power systems for land and marine use
- Process plants
- Pharmaceutical plants
- Environmental response systems
- Nuclear energy
- Asian base EPC

Large-scale tower type boiler  
(Photo is provided by J-POWER (EPDC))

## Social Infrastructure & Offshore Facilities Business Area

### Underpinning the Essentials of Modern Living

In social infrastructure, security, offshore and urban development, as well as in other fields, we leverage our technological capabilities and experience to ensure that nations and societies are safer and more secure.



- Bridges and watergates
- Shield systems
- Concrete construction materials
- Transport systems
- Urban development

Osman Gazi Bridge across Izmit Bay

## Industrial Systems & General-Purpose Machinery Business Area

### Transforming the World's Industrial Infrastructure

We offer innovative systems/technologies and optimal solutions to help transform industrial infrastructure around the world. We are helping companies enhance manufacturing processes and create more sophisticated products so they can continue to satisfy their customers in the years ahead.



- Rotating machinery
- Turbochargers for vehicles
- Heat treatment and surface engineering
- Agricultural machinery and small power systems
- Transport machinery
- Parking
- Logistics and machinery

Turbochargers for vehicles

## Aero Engine, Space & Defense Business Area

### Opening New Horizons

We draw on world-class technologies and organizational strengths to help make air travel more comfortable and safer and better for the environment while expanding space exploration to benefit humankind.



- Aircraft engines
- Defense equipment and systems
- Rocket systems and space exploration

GE9x turbofan engine

# Shared Group Functions

IHI has four business areas, namely Resources, Energy & Environment Business Area; Social Infrastructure & Offshore Facilities Business Area; Industrial Systems & General-Purpose Machinery Business Area; and Aero Engine, Space & Defense Business Area. Its three shared Group functions are corporate business development & solution, intelligent information management, and global marketing & sales. We will properly identify diversifying customer value and strengthen collaboration on shared Group functions while both business operation divisions and the shared Group functions co-create values to accelerate a transformation of our business model and create customer value.



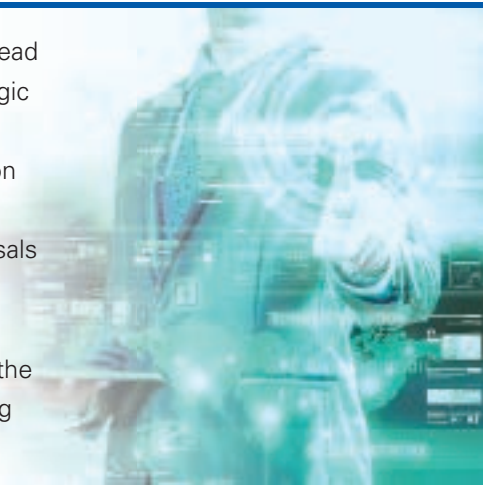
## Corporate Business Development & Solution

Corporate business development & solution which is cross-department function resolves groupwide business issues and creates businesses in response to diversifying customer values and changes in the social environment. We accordingly develop businesses by combining products, services, and technologies of within and outside IHI group in light of market needs.



## Intelligent Information Management

The shared function "intelligent information management" takes the lead in driving IHI's digital transformations with business areas and strategic business units, using the Internet of Things, artificial intelligence, machine learning, and other advanced information and communication technologies. This function develops a common Internet of Things platform within the Group to provide predictive diagnostics and proposals on optimal operations and product designs and supply information related to customer product usage and operations. It aims to create new value with business areas and strategic business units through the sophistication of products, manufacturing, and services by harnessing information and communication technology.



## Global Marketing & Sales

The global marketing & sales shared function accelerates the Group's globalization and transforms its business models through direct and dynamic communication between domestic and overseas business units through integrated operations. Stronger collaboration with Business Areas through integrated marketing function and comprehensive sales accelerates formation of private-public projects and localization to create value with customers and secure quality orders that reflect a swift responsiveness from lifecycle perspectives.





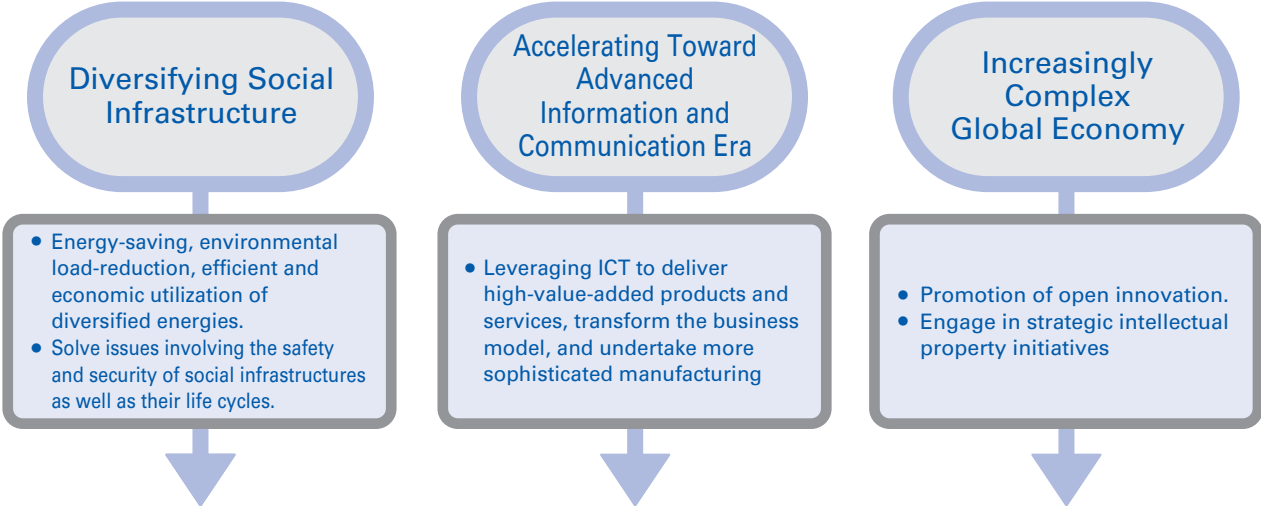
# Research and Development

The IHI Group has formulated a clear strategy to develop technologies by drawing on its collective strengths while sharing the medium- to long-term R&D direction throughout the Group.

This strategy focuses R&D based to the three megatrends of “Diversifying Social Infrastructure,” “Accelerating toward advanced information and communication era,” “Increasingly Complex Global Economy,” and also encompasses technological areas that are group-wide priorities.

Social development will be led by the efforts to increase the production efficiency, to reduce the environmental load, and to create new business model using advanced ICT. IHI Group continues to cultivate new contributions to society.

R&D underpins a technology-driven IHI Group.



**IHI Group Technology Focus Areas**

**Applied Technologies to Enhance Products and Services**  
ICT and Robotics / Energy Management Technology / Numerical Analysis and Optimization Technology / Advanced Manufacturing and Productive Process Innovation Technology / Rotating Machinery Technology / Chemical Process Technology

**Fundamental Technologies**  
Structural Strength Technology / Material Technology / Combustion Technology / Heat and Fluid Technology / Vibration and Machine Element Technology / Welding and Bonding Technology / Control and Electronic Technology

**Technology Focuses for the Future**

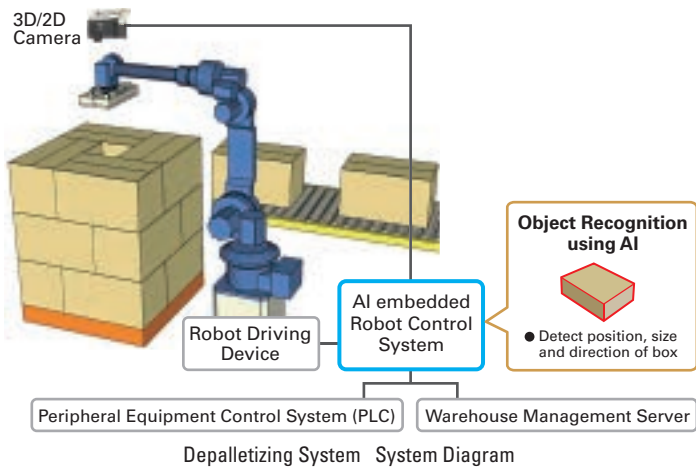
- Developing core technologies and product lines for the hydrogen and ammonia value chains to cater for the needs of a low-carbon society
- Using robotics, the Internet of Things, and Artificial Intelligence to integrate predictive and learning technologies to materialize smart factories, systems, and societies that optimally accommodate demand and supply, climate change, and production efficiencies

# R&D Topics

## Application of deep-learning to logistic robots

Among the work in logistics, unloading corrugated cardboard boxes on a pallet (depalletizing) is such heavy work that its automation had been strongly requested. But the conventional robot systems needed detailed information of the boxes such as image data to be registered in advance, and this prevented the adoption of them.

IHI and IHI Logistics & Machinery Corp. worked with Kinema Systems Inc. (U.S. start-up) to successfully develop an deep-learning-based depalletizing system, without the advance registration of image data of cardboard boxes. In addition, based on a lot of data already learned, this system recognizes cardboard boxes with various kind of shapes and printed patterns. It enables flexible operations based on recognition using deep-learning, and this improves its performance.

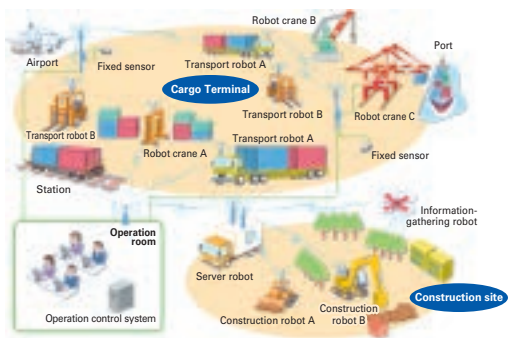


AI-based depalletizing robot system

## Robotics change outdoor work sites

At outdoor work sites such as logistics, construction and civil engineering, human workers manually operate various machineries and vehicles. In recent years, these kinds of works require further security and safety at these sites, and at the same time, shortage of labor and skilled operators is getting more serious.

As a tackle on these social challenges, IHI is developing technology to retrofit remote control and autonomy capability onto such machinery and vehicles. It provides a system that can operate multiple machineries and vehicles with few operators from a safe operation room. Some part of the systems, based on the remote control, has already been put to practical use, and IHI also aims to commercialize the autonomous operation technology earlier by verifying the practicability of such technology at actual work sites.

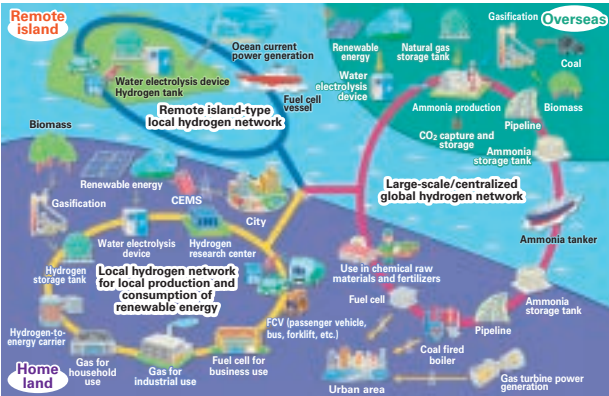


Developed system and a scene of on-site verification

Research on hydrogen energy produced from renewable energy

For realizing a low carbon society, people expect to effectively use carbon-free hydrogen produced from renewable energy. Although hydrogen does not emit CO<sub>2</sub> when used, it is hard to be liquefied and is expensive in transportation and storage. IHI focuses on ammonia, whose transportation cost is relatively low as a hydrogen carrier, and aims to create a value chain from production to utilization. We have developed a technology to use ammonia

as a fuel for power production in order to reduce CO<sub>2</sub> emission. Because ammonia is difficult to be burned, burner design to co-fire ammonia directly with conventional fuels is the key technological point to achieve stable operation. This time, we have succeeded to co-fire ammonia with pulverized coal or natural gas in our test facilities for coal fired boiler and gas turbine. The realization of a low carbon society is certainly approaching.



Carbon-free energy supply chain targeted by IHI



Coal firing test furnace (in Aioi works of IHI)

Ocean current power generation system: new renewable energy technology using the Kuroshio Current

In July 2017, IHI and the New Energy and Industrial Technology Development Organization (NEDO) have completed a 100kW class prototype subsea floating type ocean current power generation system “Kairyu,” which is a new renewable energy technology that utilizes the energy in ocean currents. In August, “Kairyu” was installed into the waters of the Kuroshio Current off the coast of Kuchinoshima, Kagoshima Prefecture and the demonstration test was conducted. Consequently, the world’s first

subsea floating type ocean current power generation system succeeded to generate power from the Kuroshio Current. The demonstration test proved that “Kairyu” can display the performance as designed and that the subsea floating type ocean current power generation system can be operated and can generate power in the waters. We could acquire a lot of data and know-how for the future practical application.



Prototype system “Kairyu” preparing on board a barge

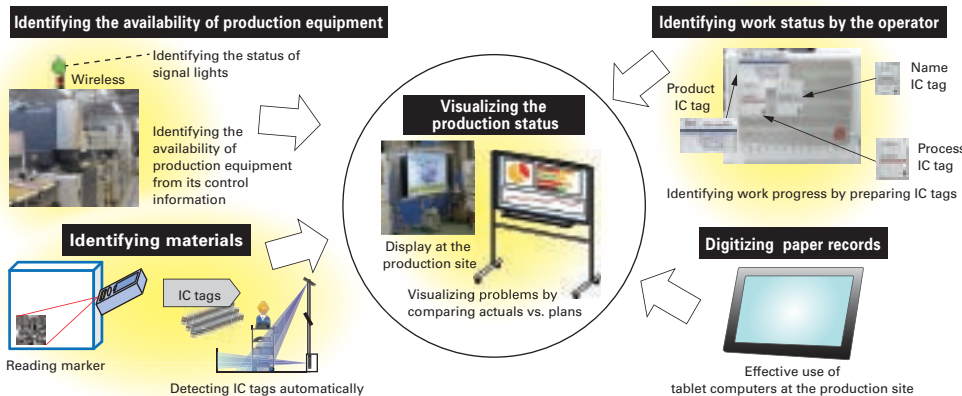


Preparing for Installation test off the coast of Kuchinoshima

Smart Factory

The IHI group is working on achieving a “smart factory” adapted to enhance factory productivity by fusing manufacturing technology and ICT together. The aims of this are: (1) to quickly grasp disturbance hampering production such as equipment failure to quickly take countermeasures against it; and (2) to improve output per person and equipment/energy utilization efficiency. For example, in a machine factory, by attaching various sensors to processing

equipment to analyze data, the signs of failure can be detected in advance. Also, by attaching IC tags, etc. to various components, processing time and waiting time in each processing step, and who is in charge can be grasped without taking time and effort. Analyzing the resulting data allows us to work on identifying processing steps problematic for improving productivity and on effectively improving them.

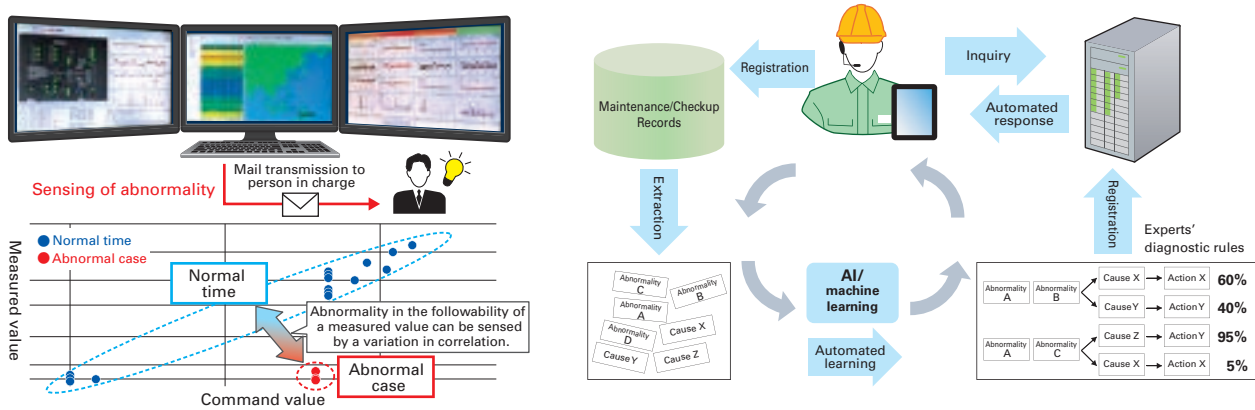


Sophistication of MONOZUKURI by Visualization and Improvement Utilizing ICT

Data analysis technology for utilizing ICT and IoT

The IHI group is advancing the sophistication of our products and services and manufacturing processes by collecting a lot of operating information on products delivered to our customers and on in-house equipment using our shared platform for utilizing ICT and IoT, called ILIPS (IHI group Lifecycle Partner System). We are developing failure sign sensing technology flexibly responding to changes in

operating environment such as seasonal variations and a technology allowing anyone to utilize experts’ knowhow using AI/machine learning on the basis of text information such as maintenance records. We are further working on creating customer value, such as planning optimum maintenance/operation and proposing new business.



Failure sign sensing technology

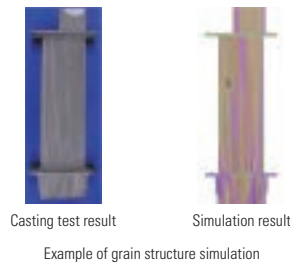
AI-based utilization of experts' knowhow



# Technologies Supporting IHI Products

## Materials technologies

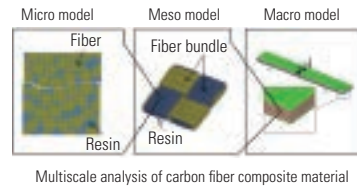
- New material development (light-weight / heat-resistant)
- Casting, forging, and powder metallurgy
- Material structure evaluation
- Strength properties and residual life evaluation
- Environment resistance evaluation
- Evaluation and development of coatings



We are working on developing new materials aiming to reduce weight and improve heat resistance and on developing shaped material processes such as casting, forging, and powder metallurgy. We are also advancing the development of technology for evaluating a material residual life and the understanding of a material deterioration mechanism by the aid of sophisticated analysis equipment.

## Vibration engineering and structural strength technologies

- Structural strength evaluation
- Structural test and measurement
- Nonlinear structural analysis
- Impact analysis / composite material analysis
- Steel-concrete evaluation
- Seismic resistance, seismic isolation, and vibration control



In the field of structural strength, structural analysis, and structural vibration technologies, we are working on the research and development of the evaluation of new material strength, new manufacturing processes, high-temperature strength prediction simulation, and also advancing the research and development of seismic resistance, seismic isolation, and vibration control technologies for supporting safety and security.

## Rotating machineries and reciprocating engine technology

- Aerodynamic design
- Mechanical vibration and machine elements
- Tribology
- Performance measurement / element test
- Combustion / flow numerical analysis
- Combustion / flow visualization



We are contributing to increasing the efficiency of, improving the reliability of, and reducing the environmental loads of turbochargers, industrial compressors, aero-engines, gas turbines, diesel engines, gas engines, and so on using advanced numerical analysis technology, element test and measurement technology.

## Thermal fluid and combustion technologies

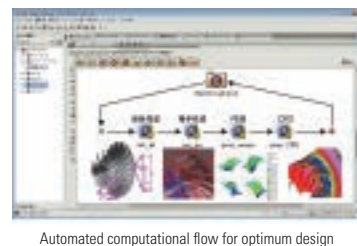
- Heat, fluid, combustion, and wind-tunnel testing
- Numerical analysis of heat transfer, phase change, multiphase flow, and combustion
- Heat and fluid measurement and control
- Next-generation energy



We are improving the performance of various types of equipment and developing new technology using new heat/fluid-related numerical analysis technology and test/measurement/control technologies. We are also focusing on developing next-generation energy technology including hydrogen and renewable energies.

## Numerical analysis and optimization technologies

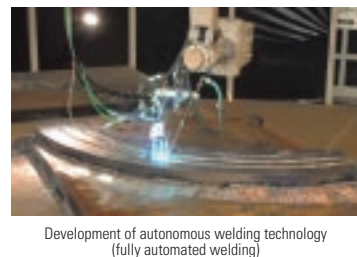
- Optimization
- Machine learning
- Mathematical modeling
- Large-scale parallel computation
- Multiscale analysis
- Multi-physics analysis



We are working on the research and development of a computational engineering method for performing efficient computation while faithfully reproducing a physical phenomenon on a computer, the latest optimization method, data mining based on machine learning, and a mathematical scientific method including mathematical modeling.

## Welding and joining technologies

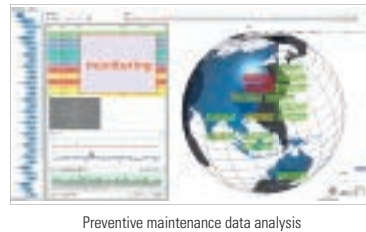
- Arc welding and automation
- Laser processing
- Solid phase joining
- Welding phenomena analysis
- Welding material and structural integrity
- Welding testing and evaluation



We provide a new joining process and new material welding technology to respond to the diversification of products and the adding of value to products. We also employ leading-edge measurement and observation technologies and evaluation methods even for conventional arc welding, and contribute to improving product quality and reliability using an autonomous process.

## ICT

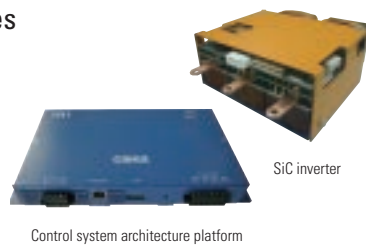
- IoT technology
- Big data analysis technology
- AI and machine learning technology
- Sensing technology
- Communication and network technology
- Information security technology



ICT is indispensable for products and services of the IHI group as well as for the sophistication of manufacturing. We analyze a lot of operating data on production equipment and products delivered to customers in accordance with our uniquely developed algorithm to provide new value to customers.

## Control and electronics technologies

- Advanced control and optimization
- Embedded software
- Power electronics
- Motor electromagnetic field analysis
- High-speed analog circuit
- Secondary cell application



We are working on control and optimization technologies for taking out the performance of the IHI group's wide range of products to the maximum extent possible, embedded software development for constructing control systems, as well as electric and electronic technologies applied with the latest power electronics, and energy technology.

## Mechanical system technologies and robotics

- Special production / FA system
- Undersea and marine instrument design
- Mechanical design for special and clean environments
- Manipulation
- Intelligent and autonomous machinery
- Sensing



We are developing IHI group's production machinery, robot-based FA (factory automation) systems, and undersea and marine instrument on the basis of our mechatronics and system engineering technologies. We are also advancing the research of next-generation robot technology.

## Energy and chemical process engineering

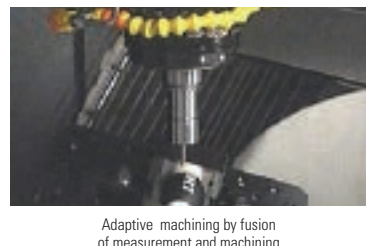
- Energy conversion and usage technology
- Catalyst creation and evaluation
- Process simulation
- Chemical reactor and culture apparatus design
- Application technology of algae and microorganisms
- Microbubble applications and water treatment



We deploy energy and chemical processing technologies in fields ranging from plants to manufacturing facilities. We are developing core catalysts for those processes with reactor design technologies, and advanced process optimization technologies, as well as advancing a wide variety of technology development.

## Advanced production engineering

- Machining and plastic forming
- Coating, corrosion prevention, surface modification
- Composite material processing
- Non-destructive evaluation and measurement
- Production system



In order to innovate IHI group manufacturing, we are developing various processing technologies indispensable for manufacturing, evaluation and measurement technologies for ensuring quality, and a production system for optimizing the entire production process using the latest ICT technology.

## Applied physics and chemistries

- Electromagnetic field application
- Plasma application
- Quantum beam application
- Chemical application
- Functional material invention
- Nano / micro scale analysis and evaluation



We are researching and developing advanced technologies mainly in the fields of applied physics and applied chemistry, which will be useful for developing IHI group's future products and making existing products competitive.



CSR Activities





The IHI Group is committed to meeting the expectations and earning the trust of all stakeholders, from customers, business partners, shareholders, and colleagues to communities everywhere while closely monitoring global issues. In doing so, we seek to deliver more value in the years to come.

CSR Structure

We established a CSR Committee in FY2013 to discuss and promote CSR-related matters, including basic Group policies and measures. The president chairs this committee, with the director in charge of CSR serving as vice chair. Committee members include directors and division heads. In the years ahead, we will step up efforts to integrate CSR and management in business activities, in keeping with one of our key management principles of contributing to social development through technology.

CSR in Business Activities

The IHI Group helps resolve social issues through monozukuri, the Japanese concept of meticulously planned and executed manufacturing. We developed four strategies to address key social issues, and are undertaking initiatives related to these strategies in each business area to resolve those issues.

Key Issues Addressed by IHI	Business Areas				
	Resources Energy Environment	Social Infrastructure Offshore Facilities	Industrial Systems General-Purpose Machinery	Aero Engine Space Defense	Pushing ahead with new businesses
<div><div><b>Realize low-carbon societies and reduce environmental burdens</b><ul style="list-style-type: none"><li>■ Addressing environmental issues</li><li>■ Providing environmentally-friendly products and services</li></ul></div></div>	●	●	●	●	●
<div><div><b>Provide stable energy supplies</b><ul style="list-style-type: none"><li>■ Providing products and technologies that transform diverse energy sources into electricity</li></ul></div></div>	●	●			●
<div><div><b>Responding to industrialization advancement and urbanization</b><ul style="list-style-type: none"><li>■ Enhance urban functions</li><li>■ Increase industrial productivity</li><li>■ Provide products and technologies that contribute to a safer society</li><li>■ Create and enhance manufacturing processes</li></ul></div></div>		●	●	●	●
<div><div><b>Develop medical, food and water solutions</b><ul style="list-style-type: none"><li>■ Providing products and technologies that help address issues relating to medical care, food and water</li></ul></div></div>	●	●	●		●

Environmental Activities

Part of IHI's mission is to reduce the environmental burden of its operations and protect the environment in whatever way possible. In FY2013, we formulated IHI Group Environmental Vision 2013 to guide our environmental efforts through FY2018. We are undertaking environmental initiatives under three-year plans to realize our vision.

**IHI Group Environmental Vision 2013 (FY2013 to 2018)**

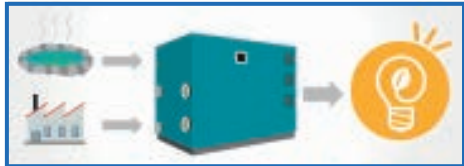
IHI, as a responsible global group, strives to help preserve the global environment on a continuous basis through cooperation with customers and business partners around the world.



Animated video featuring products and services at an IHI booth at an environmental exhibition.

Reduce environmental burdens through business activities

The IHI Group provides a range of products and services that help reduce environmental impact. We have internally certified offerings with outstanding environmental performance, publicizing them through our website and other channels. We have exhibited at Japan's largest environmental exhibition, and have showcased products and services that help tackle climate change.



Example of binary power generation



Example of a vehicular turbocharger

Community Service

The IHI Group provides value to society by making employees aware that they are part of society and by extending CSR beyond its operations. We undertake various community service based on five key themes.

**Five key themes**

Providing access to medical care, food and water

Nurturing future generations

Resolving problems in local communities

Promoting precision manufacturing and scientific technologies

Supporting environmental sustainability

Supporting Wheelchair Basketball

The IHI Group has been an official sponsor of the Japan Wheelchair Basketball Federation since 2015. We have held wheelchair basketball events for local residents at business sites around the nation, including exhibition match and games for people to experience playing basketball in wheelchairs. We also provide facilities for practice and training camps. We will draw on our headquarters location in Tokyo, host of the 2020 Olympics and Paralympics, to contribute to the success of tournaments and the popularity of wheelchair basketball.

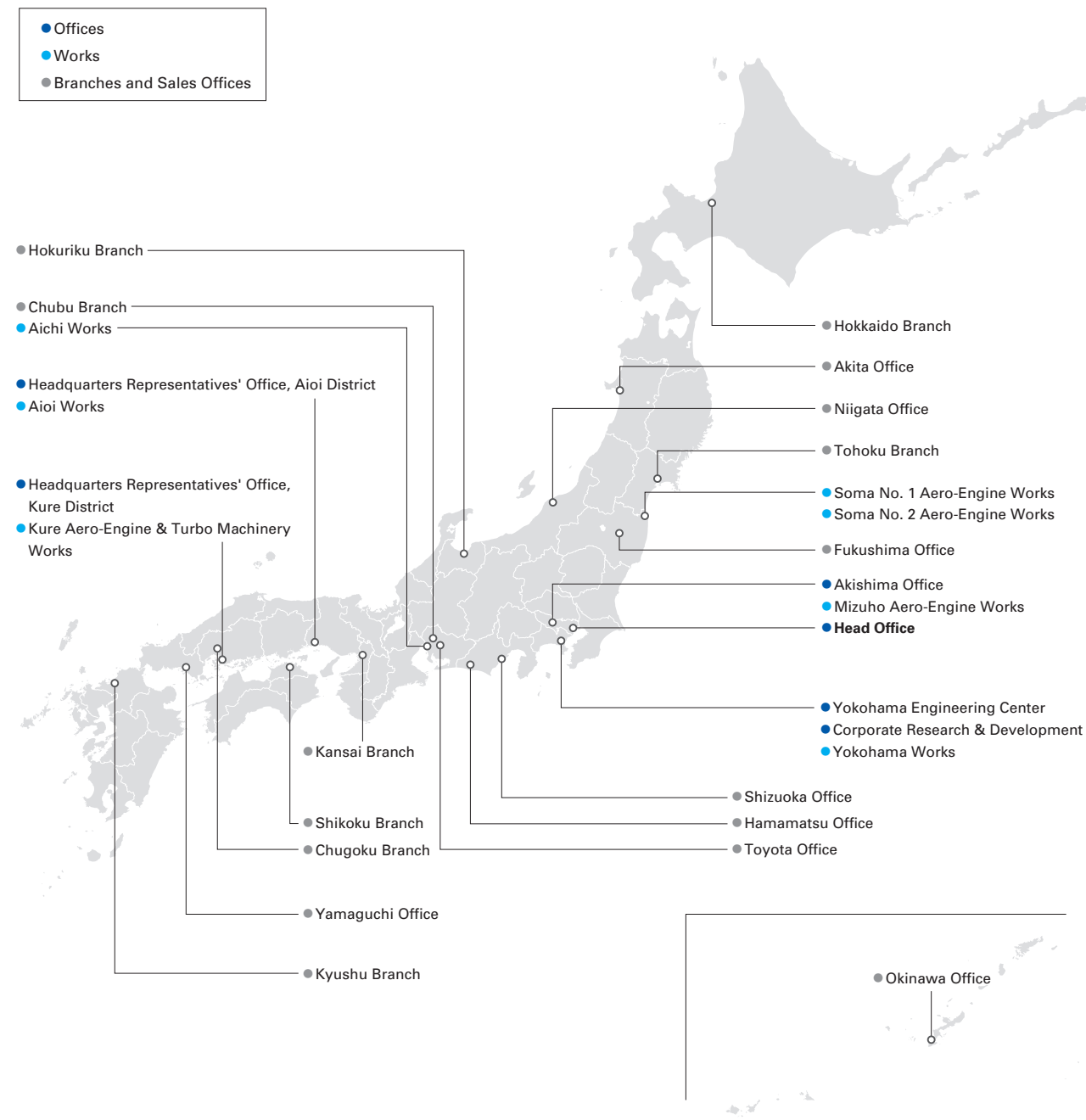


Community activity at the Aioi Works

► **CSR Information** <http://www.ihi.co.jp/csr/english/>

## Domestic Network and Main Works

As of March 31, 2018



Head Office

Toyosu IHI Bldg., 1-1, Toyosu 3-chome, Koto-ku, Tokyo 135-8710  
TEL: +81-3-6204-7800

## Akishima Office

IHI Akishima Bldg., 3975-18, Haijima-cho, Akishima-shi, Tokyo 196-8686  
TEL: +81-42-500-7250

## Yokohama Engineering Center

1, Shin-Nakahara-cho, Isogo-ku, Yokohama-shi, Kanagawa 235-8501  
TEL: +81-45-759-2111

Headquarters Representatives' Office, Aioi District

5292, Aioi, Aioi-shi, Hyogo 678-0041  
TEL: +81-791-24-2206

## Headquarters Representatives' Office, Kure District

2-1, Showa-cho, Kure-shi, Hiroshima 737-0027  
TEL: +81-823-26-2105

## Corporate Research &amp; Development

1, Shin-Nakahara-cho, Isogo-ku, Yokohama-shi, Kanagawa 235-8501  
TEL: +81-45-759-2213



Soma No. 1 Aero-Engine Works

Site Area	181,673m <sup>2</sup>
Products & Services	Parts of jet engines, gas turbines and space development equipment
Certificates	JIS Q 9100 & JIS Q 9001 (ISO 9001) JIS Q 14001 (ISO 14001) JIS Q 27001 (ISO/IEC 27001) Nadcap Pratt & Whitney LCS



Soma No. 2 Aero-Engine Works

Site Area	192,629m <sup>2</sup>
Products & Services	Parts of jet engines, gas turbines and space development equipment
Certificates	JIS Q 9100 & JIS Q 9001 (ISO 9001) JIS Q 14001 (ISO 14001) JIS Q 27001 (ISO/IEC 27001) Nadcap Pratt & Whitney LCS



## Mizuho Aero-Engine Works

Site Area	166,557m <sup>2</sup>
Products & Services	Assembly and overhauling of jet engines, gas turbines, space development equipment and defense systems
Certificates	JIS Q 9100 & JIS Q 9001 (ISO 9001) FAA Repair Station JCAB Repair Station EASA Maintenance Organization CAAC Maintenance Organization ISO 14001, JIS Q 27001:2014 (ISO/IEC 27001:2013), Nadcap



## Yokohama Works

Site Area	226,673m <sup>2</sup>
Products & Services	Reactor pressure vessels, containment vessels, heat exchangers for nuclear power plants, reactors and towers for chemical plants, steel structure, shield machines and industrial machinery
Certificates	ASME (N, NPT, NA, NS, U, U2, S) ISO 9001, ISO 14001



## Aichi Works

Site Area	733,767m <sup>2</sup>
Products & Services	Steel structures, offshore structures, and LNG tanks (SPB tanks)
Certificates	ISO 9001



## Aioi Works

Site Area	183,823m <sup>2</sup>
Products & Services	Boilers, LNG tanks, pressure vessels for chemical plants, prefabricated piping systems and casting products for machinery
Certificates	ISO 9001 ISO 14001 ASME (S, U, U2) Approval of Manufacturers



Kure Aero-Engine & Turbo Machinery Works

Site Area	47,797m <sup>2</sup>
Products & Services	Parts of gas turbine power plants, jet engines and gas turbines
Certificates	JIS Q 9100 & JIS Q 9001 (ISO 9001) JIS Q 14001 (ISO 14001) JIS Q 27001 (ISO/IEC 27001) Nadcap



# Main Group Affiliates and Works in Japan

## Resources, Energy & Environment Business Area

### Aomori Plant Co., Ltd.

Remodeling and maintenance in reprocessing facility etc.

### Diesel United, Ltd.

Design, manufacturing, sales, repair and maintenance of diesel/ dual fuel engines



Main Works [Aoi Works](#)  
Site Area 98,882m<sup>2</sup>  
Products & Services Diesel engines, dual fuel engines, industrial machinery and related equipment  
Certificates ISO 9001 (JIS Q 9001), ISO 14001 (JIS Q 14001)

### IHI Enviro Corporation

Services related to the designs, installations, maintenances, repair works, oprational insutructions, operation maintenance management and parts supply of the municipal solid waste and the industrial waste incineration facilities. And the waste treatment business, recycle business such as the PFI, including DBO scheme

### IHI Plant Construction Co., Ltd.

Engineering and construction of power generation facilities (thermal, nuclear, wind and solar), storage facilities, blast furnaces for steelworks and other types of equipment and facilities

### IHI Plant Engineering Corporation

Services related to the engineering, procurement, construction, commissioning, and maintenance of oil processing, petrochemical, chemical, power, pharmaceutical, and waste water treatment plants and plant equipment supply

### Japan Jurong Engineering Co., Ltd.

Plant engineering service (JEL Group's sales liaison in Japan), Engineer dispatching/recruiting service

### Kanamachi Purification Plant Energy Service Co., Ltd.

Power and steam supply to Tokyo Metropolitan Government Bureau of Waterworks

### Kotobuki Iron Works Co., Ltd.

Manufacturing of boiler and diesel engines parts



Site Area 19,000m<sup>2</sup>  
Products & Services Manufacturing of power and chemical plant components, turbine casing and diesel engine parts, etc.  
Certificates ISO 9001:2015 (JIS Q 9001:2015)

### NICO Precision Co., Inc.

Manufacture and sale of fuel injection equipment for diesel engine (for vessel, power plant)

### NIIGATA POWER SYSTEMS CO., LTD.

Manufacture, sale and other services for diesel engines for marine, power generation and rail-traction use, gas engines, gas turbines, and "Z-PELLER"<sup>®</sup> propulsion units



Main Works [Ohta Plant](#)  
Site Area 151,562m<sup>2</sup>  
Products & Services Diesel engines, gas engines, dual-fuel engines, and Azimuth Thruster (Z-PELLER<sup>®</sup>)  
Certificates ISO 9001, ISO 14001, NK, LR

### TOSHIBA IHI Power Systems Corporation

Fabrication of casing and nozzle diaphragm for steam turbines

## Social Infrastructure & Offshore Facilities Business Area

### Chiba Warehouse Co., Ltd.

Warehousing, real estate rental, and peripheral businesses

### IHI CONSTRUCTION MATERIALS Co.,Ltd.

Manufacturing and installation of pre-cast concrete materials

### IHI Construction Service Co., Ltd.

Engineering, maintenance and repair of bridge, gates and steel structures, pre-stressed concrete product manufacture and construction work design, execution, etc.

### IHI Infrastructure Systems CO., LTD.

Design, fabrication, construction, diagnosis, repair, and conservation of bridges, floodgates, and other steel structures, and manufacture, sale, and installation construction of disaster prevention devices



Main Works [Sakai Works](#)  
Site Area 170,145m<sup>2</sup>  
Products & Services Design, fabrication, construction, assessment, repair and maintenance of bridges, gates and other steel structures  
Certificates ISO 9001 (JIS Q 9001), ISO 14001 (JIS Q 14001), and OHSAS 18001

### JIM TECHNOLOGY CORPORATION

Design and sale of tunnel boring machines and equipment

### Livecon Engineering Co., Ltd.

Patent management and supervision for construction materials

### Niigata Transys CO., LTD.

Manufacturing and sale of rolling stock, industrial vehicles, snowplows, etc., and design, manufacture, and construction of automated guideway transit



Main Works [Niigata Works](#)  
Site Area 98,512m<sup>2</sup>  
Products & Services Rolling stock, automated people movers, light-rail vehicles, maintenance cars and snow plows  
Certificates ISO 9001 (JIS Q 9001)

### San-Etsu Co., Ltd.

Maintenance and repair of track maintenance machines, snowplows and construction equipment, and engines, etc.

## Others

### IHI Business Support Corporation

Real estate management, insurance agent business and data processing services and more

### IHI Inspection & Instrumentation Co., Ltd.

Inspections and measurements of plants and components. Chemical and environmental analysis. Development, engineering, design, manufacture, and installation of control and monitoring systems including various types of testing equipment and automotive environmental inspection and measurement equipment

### IHI Scube Co., Ltd.

Development, maintenance and support of computers and network systems related to information and communication, engineering, manufacturing, and others. Management service of computer systems operation maintenance

### IHI TRADING, INC.

Sales of equipment and machinery, turbochargers, parking equipment, concrete products, alcoholic beverages, and other products

### MEISEI ELECTRIC CO., LTD.

Manufacture and sale of devices and equipment for telecommunications, electrons, electrical measuring, and information processing, etc., construction design, contracting, and other incidental services, etc.

### MEISEI MANAGEMENT SERVICE CO., LTD.

Temporary staffing services, land and property cleaning, maintenance and security services, etc.

### Seiban Development Co., Ltd.

Management of golf courses

### Takashima Giken Co., LTD.

Design, manufacture, sale, installation, repair, and maintenance of various types of non-destructive inspection equipment

### Toyosu Energy Service Co., Ltd.

Supply business operations; electric power, steam, hot water, and air conditioning

## Industrial Systems & General-Purpose Machinery Business Area

### CENTRAL CONVEYOR COMPANY, LTD.

Engineering, manufacturing and selling of logistic equipment and industrial machines

### Clover Turbo Co., Ltd.

Repair, design, manufacture, sales and service of after-market turbochargers

### IHI Agri-Tech Corporation

Engineering and manufacturing of small engines and agricultural machinery



Main Works [Matsumoto Works](#)  
Site Area 101,269m<sup>2</sup>  
Products & Services Engines, grass management machines  
Certificates ISO 9001 (JIS Q 9001), ISO 14001 (JIS Q 14001)



Main Works [Chitose Works](#)  
Site Area 90,634m<sup>2</sup>  
Products & Services Tractor implements, such as hay and grass harvesting equipment  
Certificates ISO 9001

### IHI Fuso Engineering Co., Ltd.

Designs, manufactures, installs, maintains and manages parking structures

### IHI Ionbond Japan Co., Ltd.

Coating services and coating equipment sales and services

### IHI Logistics & Machinery Corporation

Sales, design, fabrication, purchasing, construction, installation, modification, repairs of material handling systems, FA systems and industrial machinery, as well as the servicing and maintenance of devices and parts

### IHI Machinery and Furnace Co., Ltd.

Engineering, manufacture, sales, and service of vacuum and new material furnaces, vacuum degreasing machines, and other heat treatment equipment



Main Works [Kakamigahara Works](#)  
Site Area 16,084m<sup>2</sup>  
Products & Services Vacuum heat treatment furnaces, vacuum carburizing furnaces and vacuum degreasers  
Certificates ISO 9001

### IHI PACKAGED BOILER CO., LTD.

Sales and maintenance service of packaged boilers

### IHI Rotating Machinery Engineering Co., Ltd.

Manufacturing and maintenance services for compressors and other rotating machinery



Main Works [Tatsuno Works](#)  
Site Area 89,058m<sup>2</sup>  
Products & Services Compressors, marine turbochargers, hydraulic motors  
Certificates ISO 9001, ISO 14001, DNV, LR, ABS, BV, KR, CCS, JG, NK and CR

### IHI Technical Training Institution

Construction machinery and cranes operator training

### IHI Transport Machinery Co., Ltd.

Plan, development, design, manufacture, sales, lease, installation, maintenance, remodeling and operation and management services of parking systems and materials



Main Works [Numazu Works](#)  
Site Area 107,292m<sup>2</sup>  
Products & Services Tower parking system (pallet type), tower parking system (rotary type), super square parking, multi-storey parking system  
Certificates ISO 9001:2015

### IHI Turbo Co., Ltd.

Manufacture and sale of turbochargers for vehicles



Main Works [Kiso Works](#)  
Site Area 65,194m<sup>2</sup>  
Products & Services Automotive turbochargers and superchargers  
Certificates IATF 16949:2016, ISO 14001:2015, NK, JG

### Nishi-Nihon Sekkei Engineering Co., Ltd.

Design, drawing etc. of steel structures, such as transport machinery

### Paul Wurth IHI Co., Ltd.

Sales, design, provision, installation, and after-sales service of pig iron machinery and environmentally friendly machinery in the iron-making field

### Voith IHI Paper Technology Co., Ltd.

Design, manufacture, sale, installation, and maintenance and repair of paper manufacturing plants

## Aero Engine, Space & Defense Business Area

### IHI Aero Manufacturing Co., Ltd.

Manufacture of aircraft jet engine fan blades, compressor blades and vanes



Site Area 19,037m<sup>2</sup>  
Products & Services Manufacture of aircraft jet engine fan blades, compressor blades and vanes  
Certificates JIS Q 9100, ISO 14001, Nadcap

### IHI AEROSPACE CO., LTD.

Design, manufacture and sales of space equipment and defense machinery, and manufacture and sales of aircraft engine parts



Main Works [Tomioka Plant](#)  
Site Area 490,490m<sup>2</sup>  
Products & Services Rocket and other space related products, defense related products and aircraft engine parts  
Certificates JIS Q 9100 & JIS Q 9001 (ISO 9001), ISO 14001 (JIS Q 14001), JIS Q 27001 (ISO/IEC27001), OHSAS 18001

### IHI AEROSPACE ENGINEERING CO., LTD.

Design, research, and experiment subcontracting for space development equipment

### IHI CASTINGS CO., LTD.

Manufacture and sale of precision castings



Main Works [Soma Plant](#)  
Site Area 15,281m<sup>2</sup>  
Products & Services Precision casting for Aero engine & IGT  
Certificates JIS Q 9100 & JIS Q 9001, JIS Q 14001(ISO 14001), Nadcap

### IHI Jet Service Co., Ltd.

Gas turbine power plant & maintenance, engineering support (aero engine, space development), production support, sales of aero engine parts, ocean monitoring service (ioms)

### IHI MASTER METAL Co., Ltd.

Manufacture and sale of precision casting materials and special alloys and other products



Site Area 12,557m<sup>2</sup>  
Products & Services Steel and non-ferrous alloy melting stocks  
Certificates JIS Q 9100 & ISO 9001, JIS Q 14001 (ISO 14001), ISO/IEC17025, Nadcap

### INC Engineering Co., Ltd.

Consulting and engineering, manufacturing of sound and vibration control equipment, aircraft engine and aerospace test facilities

# Global Network and Works of Overseas Affiliates

## Overseas Representative Offices

- 1 PARIS
- 2 MOSCOW
- 3 ISTANBUL
- 4 ALGERIA
- 5 DUBAI
- 6 NEW DELHI
- 7 BANGKOK
- 8 HANOI
- 9 KUALA LUMPUR
- 10 JAKARTA
- 11 BEIJING
- 12 TAIPEI
- 13 SEOUL

## EUROPE, MIDDLE EAST

Regional companies  
U.K./ IHI Europe Ltd.

### Resources, Energy & Environment Business Area

- SPAIN/ Felguera-I.H.I., S.A.
- NETHERLANDS/ Niigata Power Systems (Europe) B.V.
- GERMANY/ IHI Power System Germany GmbH
- GERMANY/ Steinmüller Engineering GmbH

### Industrial Systems & General-Purpose Machinery Business Area

- U.K./ Perkins Shibaura Engines Limited
- NETHERLANDS/ IHI Hauzer Techno Coating B.V.
- SWITZERLAND/ IHI Ionbond AG
- GERMANY/ IHI VTN GmbH
- GERMANY/ IHI Charging Systems International GmbH
- GERMANY/ IHI Charging Systems International Germany GmbH
- ITALY/ IHI Charging Systems International S.p.A.
- TURKEY/ IHI DALGAKIRAN MAKİNA SANAYİ VE TİCARET A.Ş.

## ASIA

Regional headquarters  
SINGAPORE/ IHI ASIA PACIFIC PTE. LTD.

### Regional companies

- THAILAND/ IHI ASIA PACIFIC (Thailand) Co., Ltd.
- MYANMAR/ IHI ASIA PACIFIC PTE. LTD. Yangon Branch
- TAIWAN/ IHI Taiwan Corporation

### Resources, Energy & Environment Business Area

- SINGAPORE/ Jurong Engineering Limited
- SINGAPORE/ Niigata Power Systems (Singapore) Pte. Ltd.
- THAILAND/ IHI Power System (Thailand) Co., Ltd.
- MALAYSIA/ IHI POWER SYSTEM MALAYSIA SDN BHD
- MALAYSIA/ ISHI POWER SDN BHD
- INDONESIA/ PT. Cilegon Fabricators

## CHINA

### Regional headquarters

- CHINA/ IHI (Shanghai) Management Co., Ltd.

### Regional companies

- CHINA/ IHI (HK) Ltd.

### Resources, Energy & Environment Business Area

- CHINA/ Niigata Power Systems (Shanghai) Co., Ltd.

### Industrial Systems & General-Purpose Machinery Business Area

- CHINA/ IHI-Sullair Compression Technology (Suzhou) Co., Ltd.
- CHINA/ Changchun FAWER-IHI Turbo Co., Ltd.
- CHINA/ WUXI IHI TURBO CO., LTD.
- CHINA/ SHANGHAI STAR MODERN AGRICULTURE EQUIPMENT CO., LTD.
- CHINA/ Perkins Shibaura Engines (Wuxi) Co., Ltd.
- CHINA/ Jiangsu IHI Fengdong Vacuum Technology Co., Ltd.

## PACIFIC

### Regional companies

- AUSTRALIA/ IHI ENGINEERING AUSTRALIA PTY. LTD.

### Resources, Energy & Environment Business Area

- AUSTRALIA/ IHI Oxyfuel Australia Pty. Ltd.

- INDONESIA/ PT. IHI Gasification Indonesia
- PHILIPPINES/ IHI PHILIPPINES, INC.
- PHILIPPINES/ Niigata Power Systems Philippines, Inc.

### Social Infrastructure & Offshore Facilities Business Areas

- VIETNAM/ IHI INFRASTRUCTURE ASIA CO., LTD.
- MYANMAR/ I&H Engineering Co., Ltd.

### Industrial Systems & General-Purpose Machinery Business Area

- THAILAND/ IHI TURBO (THAILAND) CO., LTD.
- MALAYSIA/ IHI Transport Engineering Malaysia Sdn. Bhd.
- INDONESIA/ PT. IHI Transport Machinery Indonesia
- TAIWAN/ IHI System Technology Taiwan Co., Ltd.
- KOREA/ IHI Turbo Korea Co., Ltd.

## AMERICAS

### Regional headquarters

- U.S.A./ IHI INC.

### Regional companies

- U.S.A./ IHI Power Generation Corp.
- U.S.A./ IHI Power Services Corp.
- BRAZIL/ IHI do Brasil Representações Ltda.

### Resources, Energy & Environment Business Area

- U.S.A./ IHI Southwest Technologies, Inc.
- U.S.A./ IHI E&C International Corporation
- U.S.A./ NitroCision, LLC
- CANADA/ IHI Canada Projects Inc.
- MEXICO/ Contratistas IHI E&C México, S.A. de C.V.

### Social Infrastructure & Offshore Facilities Business Areas

- U.S.A./ IHI California Inc.

### Industrial Systems & General-Purpose Machinery Business Area

- U.S.A./ Perkins Shibaura Engines LLC
- U.S.A./ IHI Turbo America Co.
- U.S.A./ IHI Press Technology America, Inc.

### Aero Engine, Space & Defense Business Area

- U.S.A./ IHI-ICR, LLC.



IHI Charging Systems International Germany GmbH (GERMANY)

Site Area	20,000m <sup>2</sup>
Products & Services	Automotive turbochargers
Certificates	IATF 16949 ISO 14001, ISO 50001



IHI Charging Systems International S.p.A. (ITALY)

Site Area	18,900m <sup>2</sup>
Products & Services	Automotive turbochargers
Certificates	IATF 16949, ISO14001



PT. Cilegon Fabricators (INDONESIA)

Site Area	250,000m <sup>2</sup>
Products & Services	Boilers, steel structures, container cranes, piping and pressure vessels, HRSG
Certificates	ISO 9001:2015, ASME (S, U, PP, R), OHSAS 18001



IHI INFRASTRUCTURE ASIA CO., LTD. (VIETNAM)

Site Area	140,000m <sup>2</sup>
Products & Services	Manufacturing, installation, repair and maintenance of steel structures, concrete products and industrial equipment
Certificates	ISO 9001



IHI TURBO (THAILAND) CO., LTD. (THAILAND)

Site Area	53,353m <sup>2</sup>
Products & Services	Automotive turbochargers
Certificates	ISO/TS 16949, ISO 14001, OHSAS 18001



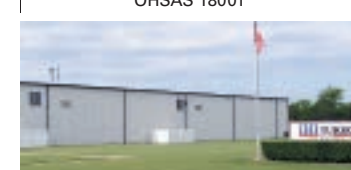
Changchun FAWER-IHI Turbo Co., Ltd. (CHINA)

Site Area	43,000m <sup>2</sup>
Products & Services	Automotive turbochargers
Certificates	ISO/TS 16949, ISO14001, OHSAS 18001



WUXI IHI TURBO CO., LTD. (CHINA)

Site Area	16,000m <sup>2</sup>
Products & Services	Automotive turbochargers
Certificates	ISO/TS 16949, ISO 14001, OHSAS 18001



IHI Turbo America Co. (U.S.A.)

Site Area	64,750m <sup>2</sup>
Products & Services	Automotive turbochargers and superchargers
Certificates	IATF 16949



IHI-ICR, LLC (U.S.A.)

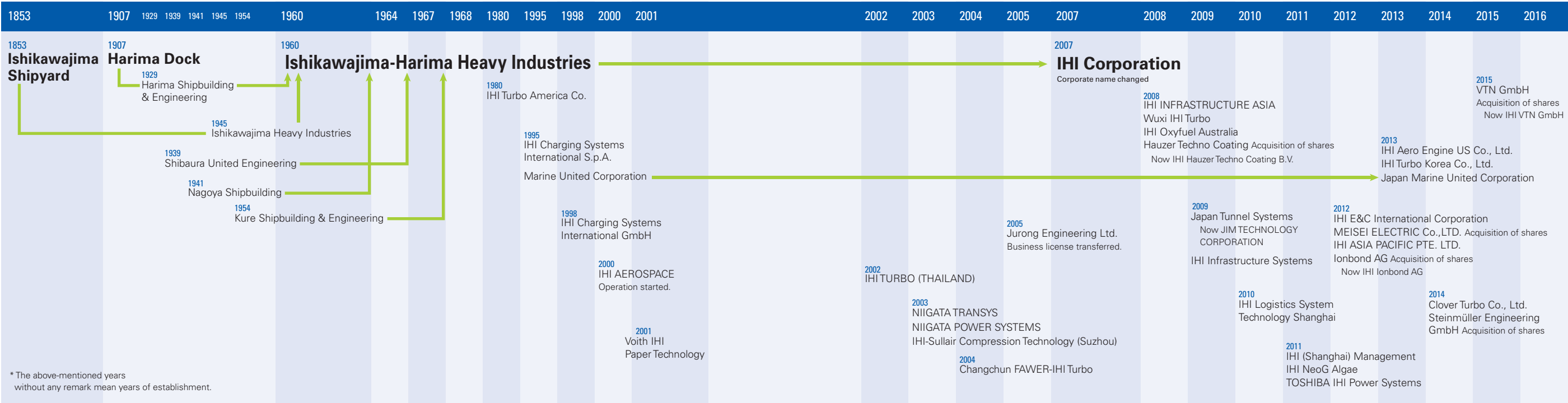
Site Area	3,825m <sup>2</sup>
Products & Services	Repair of jet engine parts and accessories
Certificates	FAA Repair Station



# Historical Highlights

IHI helped pioneer Japan's heavy industry. We started out by accumulating shipbuilding technology that we applied to industrial machinery, plant manufacturing and construction. Now we are a key provider of massive elements of industrial and social infrastructure.

Our products underscore our management philosophy of contributing to the development of society through technology.



**1853**  
Ishikawajima Manufacturing Shipyard established to protect from invasion of western countries, after a fleet under U.S. Commodore Matthew Perry arrived. The Mito clan set up this facility on instructions from Japan's feudal government.



**1866**  
Completed the Chiyodamaru, Japan's first steam-powered warship. This vessel employed the first naval steam engine manufactured in Japan.



**1876**  
Established Ishikawajima Hirano Shipyard. Tomiji Hirano set up the nation's first private sector shipyard.



**1907**  
Established Harima Dock Co., Ltd. Seitaro Karahata, the head of Aioi village (now Aioi City) in Hyogo Prefecture, established that firm.



**1911**  
Completed steel structures for Tokyo Central Station (now Tokyo Station). The company broke away from the convention of erecting a scaffold, winning accolades among architects by using two movable cranes instead.



**1945**  
Produced the Ne20, Japan's first jet engine. The engine powered the successfully maiden flight of Japan's first jet.



**1959**  
Established Ishikawajima do Brasil Estaleiros in Brazil. This was the first Japanese-owned shipyard overseas and heralded the overseas expansion of Japanese companies.



**1960**  
Established Ishikawajima-Harima Heavy Industries Co., Ltd. This was the fruit of a merger between onshore machinery leader Ishikawajima Heavy Industries Co., Ltd., and Harima Shipbuilding & Engineering Co., Ltd., a top player in its sector.



**1978**  
Built the world's first barge-mounted pulp manufacturing plant specifically for Brazil. IHI built this 230-meter facility, mounted it on a barge, and towed it to Brazil.



**1997**  
Constructed large shield tunneling machine for Tokyo Bay Aqualine. With a diameter exceeding 14 meters, this machine dug a 2,853-meter tunnel under Tokyo Bay.



**2002**  
Delivered Japan's first tower boiler. We delivered this 600MW boiler to the Isogo Thermal Power Station. The second boiler that we delivered to that facility, in 2009, attained the world's highest steam condition. (Photo provided by J-Power (EPDC))



**2007**  
Company name changed from Ishikawajima-Harima Heavy Industries Co., Ltd., to IHI Corporation. Group seeks to become an advanced global brand.



**2011**  
Participating in a project for an advanced GEnx jet engine. We have a roughly 15% share in the international program for this jet engine, which offers significantly improved fuel economy.



**2013**  
Epsilon Launch Vehicle. This solid, next generation propellant launch vehicle delivers high performance and low cost. (photo courtesy of JAXA)



**2015**  
Reached total production of 50 million turbochargers for vehicles. The IHI Group's total production of turbochargers reached 50 million units. We will expand production and sales activities worldwide while meeting various needs based on our highly reliable development and production technologies.

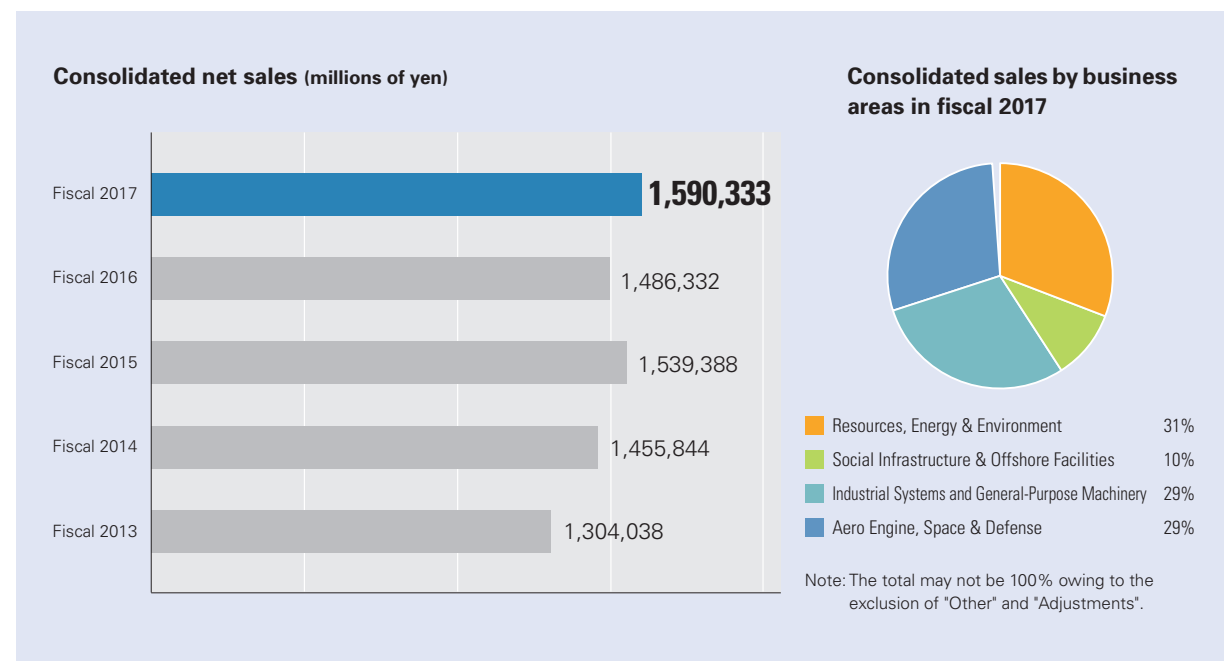


**2016**  
Osman Gazi Bridge, Turkey's longest suspension bridge, opens to provide a crossing over Izmit Bay. Crossing western Turkey's Izmit Bay from south to north, the 1,550-meter structure is the world's fourth-longest suspension bridge.

## Company Profile (as of March 31, 2018)

Year of establishment	1853
Capital	107,165 million yen
Number of employees (on consolidated basis)	29,706
Works	7
Branches in Japan	8
Overseas representative offices	13
Affiliated companies in Japan	70
● Subsidiary companies in Japan	52
● Affiliated companies in Japan	18
Overseas affiliates	147
● Overseas affiliated companies	120
● Associated companies overseas	27

## Net Sales



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# Resources, Energy & Environment Business Area

## Boilers

IHI has supplied the world with highly efficient and reliable coal-fired boilers that draw on its advanced technologies. With boilers based on our Clean Coal Technology, we contribute to the effective and economical use of valuable energy resources. We will continue to provide models employing coal and other fuels to customers around the world. We are augmenting flue gas treatment systems by pushing ahead with development to rapidly commercialize oxy-fuel combustion technology and CO<sub>2</sub> chemical absorption technology that lowers carbon dioxide emissions. We are also working on gasification and pre-dry technologies for lignite, a low-grade coal.



Large-scale tower type boiler  
Photo is provided by J-POWER (EPDC)

### Main Products

- Boilers
- Flue gas treatment systems



Boiler for IPP and PPS

## LNG receiving terminal / storage tank

IHI is Japan's leading provider of LNG receiving terminals and storage tanks. We are also active overseas, with a strong track record in India, Qatar, Mexico, Taiwan, the United States, and China. Particularly for LNG storage tank construction, we are able to handle all types of tanks including Double-walled metal tank, Pre-stressed concrete (PC) full containment tank and in-ground membrane tanks, with leading global market shares for such facilities.



LNG receiving terminal  
(Semptra's Cameron LNG receiving terminal in Louisiana, USA)  
Photo used with the permission of Semptra LNG  
©All rights reserved by Semptra LNG



World's largest capacity LNG underground tank (Membrane)  
Photo courtesy of Tokyo Gas Co., Ltd.



In-ground LNG storage tank

### Main Products

- LNG receiving terminal
- Above ground LNG storage tank
- In-ground LNG storage tank
- Underground LNG storage tank

## Processing & Pharmaceutical plants

In such diverse areas as natural liquefaction plants and oil refining, petrochemicals, LPG, and other process plants, and pharmaceuticals plants, we have a strong track record in Japan and internationally in integrating everything from construction engineering to equipment procurement, construction, and startups.



Natural Gas Liquefaction plants



LPG plant



Pharmaceutical plant

### Main Products

- Oil & Gas plants
- Chemical plants
- Natural Gas Liquefaction plants
- Pharmaceutical / Fine Chemical plants
- Wastewater treatment facilities

## Gas turbines, Gas engines & Diesel engines

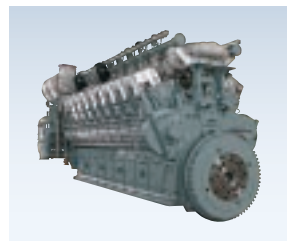
IHI provides wide variety of power generating products including gas turbines, diesel engines and gas engines with simple-cycle, co-generation and combined-cycle power systems. We also provide remote monitoring, engine maintenance, and other services throughout product lifecycles. We are achieving the reduction of NO<sub>x</sub> and CO<sub>2</sub> emissions by adopting high efficiency and low emission type of gas turbines. We supply gas turbines for high-speed ships and other marine vessels. We also supply a full range of diesel engines, from large engines capable of medium and low speeds to small and midsize models delivering low, medium, and high speeds. Our diverse lineup includes diesel engines for land-based power generators.

### Main Products

- Simple/combined cycle power generation systems
- Emergency power generation systems
- Co-generation systems
- Diesel engines (marine, land)
- Gas engines
- Gas turbines



Gas turbine power plant "LM6000"



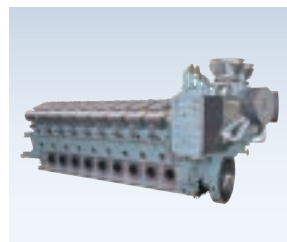
Gas engine "18V28AGS"



Dual-fuel engine "28AHX-DF"



DU-WIN GD W9X82 diesel engine



DU-S.E.M.T. PIELSTICK 18PC2.6BV diesel engine

## Equipment for plants

We provide an array of plant equipment, including heating furnaces, cooling towers, and chemical plant reactors.



Pressure vessels



Roller mills



Cooling towers

### Main Products

- Vertical pulverizing super-hybrid mills
- Furnaces
- Air-cooled heat exchangers
- Chemical plant equipment
- Cooling towers
- HTS reactors
- EO reactors
- IC reactors



## Environmental response systems

Our systems contribute greatly to environmental protection and remediation. We draw on our technologies and experience and emphasize product, thermal, and materials recycling to provide engineering, construction, operation and maintenance services for waste and industrial effluent as well as public sewage treatment facilities. IHI has a strong history in providing flue gas desulfurization and denitrification facilities for thermal power stations and industrial plants.



Biomass processing  
(Clean Association of TOKYO)



Flue gas treatment facility



Wastewater treatment facility

### Main Products

- Waste treatment facilities
- Biomass treatment facilities
- Flue gas treatment facilities
- Wastewater treatment facilities

## Nuclear energy

IHI supplies such key components as reactor pressure vessels, primary containment vessels, and piping systems. We develop and construct nuclear fuel cycle systems as well as supply components for conventional boiling water reactors (BWRs) and advanced boiling-water reactors (ABWRs). We also supply equipment for pressurized-water reactors (PWRs). Moving forward, we plan to engage in decontamination and decommissioning of nuclear power facilities.



Reactor containment vessel



Reactor pressure vessel for BWR nuclear power plant



Vitrification facility for high-level radioactive waste

### Main Products

- Components for nuclear power plants
- Facilities for nuclear fuel cycle related equipment
- Pressure vessels

## Propulsion systems

Our Z-PELLER® is the most propulsion system in the global tugboat market, and has earned an outstanding customer reputation for its high quality and durability. The diverse other applications for this system include fireboats, oil skimmer boats, and other disaster prevention vessels, as well as floating cranes, dredgers, drill rigs, and support vessels.



Azimuth Thruster (Z-PELLER®)

### Main Products

- Azimuth Thruster(Z-PELLER®)

## Social Infrastructure & Offshore Facilities Business Area

### Bridges, Water gates & Steel structures

IHI has constructed numerous major bridges worldwide. Included are the Seto Ohashi Bridges and the Akashi Strait Bridge in Japan, the Second Bosphorus Bridge and the Golden Horn Bridge in Turkey, the Carquinez Bridge in the United States, and the Binh Bridge and the Nhat Tan Bridge in Vietnam. We are Japan's top manufacturer of water gates for rivers and dams. Our capabilities extend from manufacturing and installation to inspection and maintenance. We contribute to water usage and flood control projects in Japan and overseas, particularly in Southeast Asia. We deliver large steel structures incorporating machinery and put a focus on the increase of hybrid structures, including caissons and pontoons that combine the strengths of steel and concrete. We have integrated steel structures, mechanical, sensor, control, and other technologies to develop active mass dampers and seismic isolation floor systems. These systems serve important disaster prevention roles in high-rise buildings and computer centers.

### Main Products

- Bridges
- Water gate equipment for rivers
- Water gate equipment for dams
- Floating breakwater
- Floating platforms
- Immersed tunnels
- Hybrid caissons
- Composite slabs
- Sound-absorbing panels
- Temporary assembling bridges
- Mass damper systems
- Seismic isolation floor systems



Osman Gazi Bridge across Izmit Bay



Cable-stayed bridge "Nhat Tan Bridge"



Arch bridge "Tsukiji Ohashi"



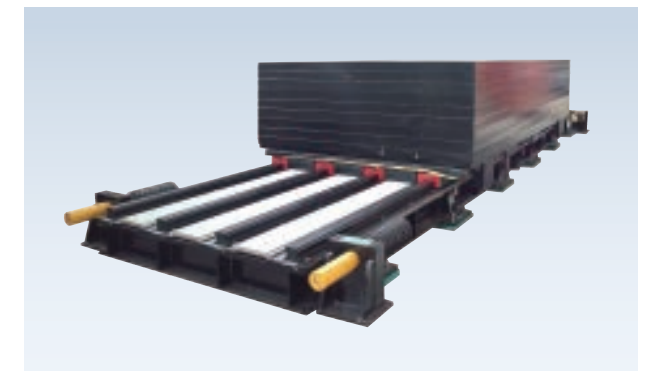
River gate



Dam gate



Hybrid caissons



Active mass dampers



## Transportation systems

IHI contributes to traffic safety, which is essential for daily life, in various ways. Furthermore, we supply various railway systems, including ultra-low floor streetcars, which are human- and environment-friendly and essential for building new towns, diesel cars to ensure local traffic, and maintenance vehicles to keep railway systems running.



200 series New Tram train system for the Osaka Municipal Transportation Bureau's High Speed Electrical Division

### Main Products

- Transportation systems
- Rolling stock
- Snowplows
- Maintenance vehicles



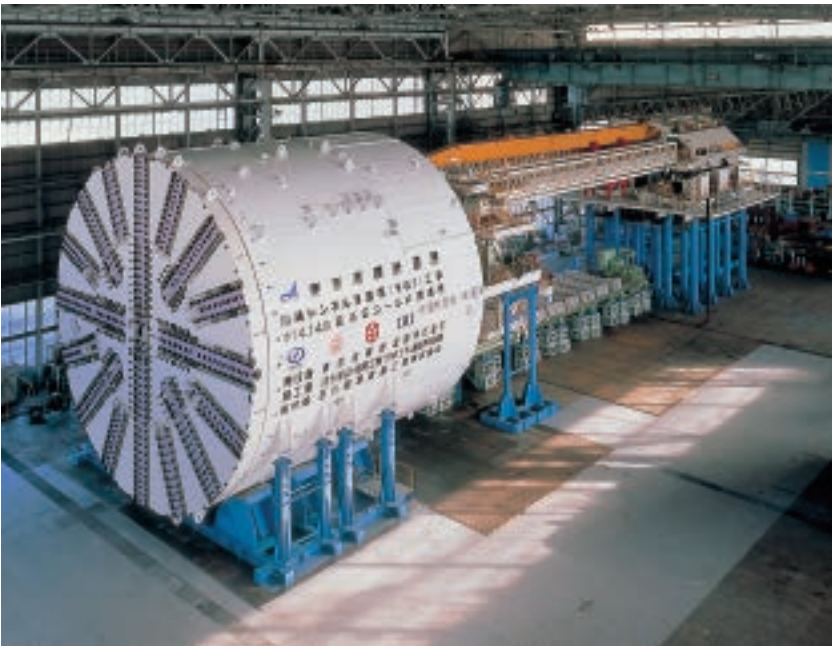
Echigo TOKImeki Resort SETSUGEKKA diesel multiple units for Echigo TOKImeki Railway



NR303 rotary snowplow

## Shield tunneling machines & Concrete construction materials

IHI developed the world's largest shield and rotating shield tunneling machines, which have greatly improved construction efficiency. IHI is the world's leading supplier of automatic segment assembling systems while also providing various types of segments.



Large-diameter shield tunneling machine

### Main Products

- Shield tunneling machines
- Segment
- Automatic segment assembling systems



Special section (double-o tube) shield tunneling machine



IKK Composite Segment

## Urban development

We optimize the potential of our real estate holdings by redeveloping company offices and housing nationwide. We engage in leasing and sales, particularly in metropolitan Tokyo. A good example of this approach is in Toyosu, known for former shipbuilding yards, where we are undertaking a massive urban redevelopment project. We also prioritize using idle land, as part of which we operate Japan's biggest mega solar generating business, in Kagoshima, thereby contributing to environmental and social sustainability.



Rental office buildings "TOYOSU FORESIA™", "TOYOSU FRONT™"

### Main Products

- Real estate leasing and sales



Joint housing business with major developer



Kagoshima Megasolar

## Security

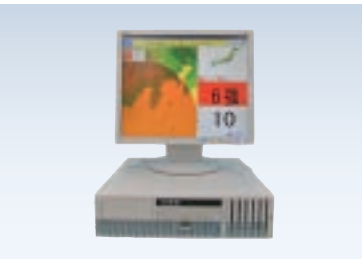
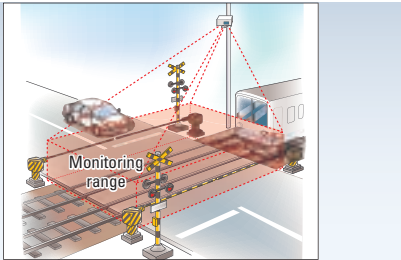
IHI provides various products based on mechatronics and sensor technologies. IHI's 3D Laser Radar is installed as an obstacle detection system at railway level crossings and Driving Safety System Sensor for road infrastructure.

To-date, over 2,000 3DLR units have been supplied worldwide and IHI continues exploring future sensor business fields.

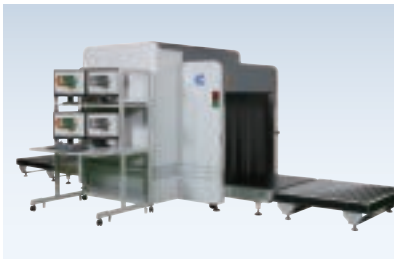
IHI also supplies large X-ray visual inspection systems for cargo containers, for which IHI is the domestic market leader. We have ample track record for airports and seaports custom check including small and mid-sized X-ray inspection system.



3D laser radar



Earthquake early warning receiving equipment  
QCAST® S704-FCP1



X-ray inspection systems



Oil leak detectors

Left: Monitor amplifier  
Right: Oil sensor



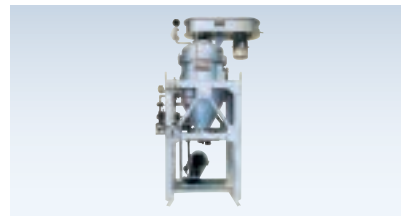
# Industrial Systems & General-Purpose Machinery Business Area

## Rotating machinery

IHI provides an array of compact and packaged machinery for plant utilities. Our offerings include separators, filters, dewatering equipment, and air compressors. We draw on many years of expertise from custom-manufacturing compressors, and our liquefied natural gas BOG plant compressors dominate the market. Our organic rankine cycle power generator can produce electricity from water with temperatures ranging from 70°C to 95°C, helping customers to conserve and create energy.



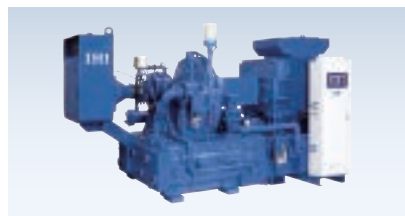
Screw Decanter Centrifuge



IHI-Leaf Filter



IHI-FUNDABAC Filter



Centrifugal air compressor



Process reciprocating compressor



Organic rankine cycle power generator

### Main Products

- Separators
- Filters
- Compressors
- Organic rankine cycle power generator
- Gear

## Turbochargers

IHI supplies a wide range of turbochargers from large ones for land and marine power generators to small ones for automobile engines, and has already produced more than 50 million turbochargers for vehicles. We have development, production, and sales bases also in the U.S., Europe, Thailand, China, and Korea and are growing our business worldwide.



Turbochargers for vehicles



Turbochargers for marine vessels

### Main Products

- Turbochargers

## Grid scale energy storage system

IHI provides turnkey solutions for grid scale energy storage system, centered on its ESWare suite of advanced control systems.

- (1) Analysis: Evaluating project profitability before project deployment and optimizing system configuration
- (2) Control: Managing systems in real time in line with customer requests and optimization directives
- (3) Optimization: Formulating operational strategies to optimize profitability based on past operational results and weather, load, and other forecasts



Grid scale energy storage system

### Applications

- Peak shifting and shaving
- Renewable integration
- Frequency regulation
- Backup power sources



ESWare™ -ES/analyzer

## Heat treatment and surface engineering

Heat treatment processes and equipment are used in many industries. IHI supplies an array of equipment to meet user needs. Our heat treatment equipment offerings include vacuum heat treatment furnaces, high pressure dewax sintering furnaces, hot presses, high purification furnaces, vacuum carburizing furnaces, and vacuum vapor degreaser. In addition to supplying equipment, IHI itself maintains a heat treatment processing business.

We also supply PVD/PACVD/CVD coating equipment using plasma technologies and are engaged in state-of-the-art thin film coating and surface-treatment business, where we provide coatings for cutting tools, dies, automobile parts, industrial machinery parts, decorative parts and medical equipment, and MSCoating®, an innovative technology that uses an electrode discharge process.



Vacuum thermal treatment furnace



Vacuum carburizing furnace



Vacuum degreaser



CVD coating equipment (Ionbond Bernex™ CVD)

### Main Products

- Advanced material manufacturing equipment
- Vacuum thermal treatment equipment
- Thin film and surface treatment equipment
- MSCoating®
- Heat treatment and coating services



PVD / PACVD coating equipment



Job Coating Service

## Agricultural machinery, Small power systems, Life associated equipment, and Packaged boilers

IHI supports agriculture with machinery for cultivating, fertilizing, seeding, harvesting, and other tasks. Our lawn maintenance machines, grass cutters, and campus greening equipment help maintain landscapes and lawns at an array of sports facilities. They include golf courses, soccer, baseball, and athletic fields, and racecourses. Our equipment is also utilized heavily at schools, parks, riverbanks, and homes.

Our products serve in hospitals, clinics, nursing homes, hotels, restaurants, airports, train stations, and factories. We manufacture ozone deodorizers and disinfectors, accommodating rising demand for deodorization, sanitization, dust removal, and cleaning applications. In addition, we are accommodating diverse customer needs by supplying compact packaged boilers that deliver heat and steam to factories and other facilities.



Lawn maintenance machines



Ozone air cleaner "eZ-2000D"



Small diesel engine (N4L DI-TA)



Round baler



Endoscope sterilizer



Small packaged once through boiler

### Main Products

- Agricultural machines
- Lawn maintenance machines
- Ozone deodorizers / ozone disinfectors
- High-temperature heating system
- Diesel engines
- Packaged boilers



## Transport machinery

IHI has remained a technology leader in this field for a century. We accommodate needs ranging from under one metric ton to thousands of metric tons. Our offerings include bulk handling systems, such as port unloaders. Through standardization, we have increased economy with jib and overhead travelling cranes for various industries. We leverage advanced technologies in manufacturing through maintenance and modifications. We are a top supplier of jib climbing cranes for skyscraper and dam construction.



Continuous ship unloader



Jib crane



Jib climbing cranes

### Main Products

- Unloaders
- Coal unloading and transportation facilities
- Overhead traveling crane
- Jib cranes
- Jib climbing cranes
- Hoists

## Parking

Since installing Japan's first tower parking system in 1962, IHI has drawn on its experience, reliability, and proprietary technology to perfect these products. We look to introducing parking systems with smaller environmental footprints as well as other new types of parking system. We will continue to provide optimal parking solutions in the years ahead.



Tower parking (pallet type)



Tower parking (pallet-less type)



Super square parking



Multi-storey parking

### Main Products

- Parking systems

## Iron, Steel and Coke-making equipment

PWIIH offers state-of-the-art technologies for the primary stage of integrated steelmaking (mainly blast furnaces and coke oven plants), ranging from engineering to a full spectrum of EPC (Engineering, Procurement and Construction). Since 1941, IHI has built and relined over 90 blast furnace plants in and outside of Japan. Backed by a wide range of experience of Paul Wurth Group (Luxembourg), a number of our coke oven plants have been adopted by Japanese customers.



Blast furnace (© NIPPON STEEL & SUMITOMO METAL CORPORATION)

### Main Products

- Industrial furnaces

## Pulp & Paper machinery

IHI is Japan's premier maker of pulp and paper manufacturing machinery, supplying papermakers with the largest and fastest paper-making and paper-coating machines. We have an unmatched record overseas as well as in Japan.



Paper machine

### Main Products

- Pulp & paper machinery

## Logistics systems

IHI pioneered and is a leading company in numerous areas of logistics such as automated storage and retrieval system (ASRS), transportation system, and sorting systems. Our ASRS can be used at temperatures as low as -60°C, or store hazardous materials. We also provide storage, transportation equipment for clean rooms, and the world's first artificial intelligence-loaded depalletizing robotics system for logistics, food, chemicals, and diverse other industries. We draw on our expertise to provide comprehensive logistics solutions.



High-speed picking and storage system "Shuttle and Server™"



IHI Automated Storage / Retrieval System "Rack-pack"



Roll to roll handling system for flexible device

### Main Products

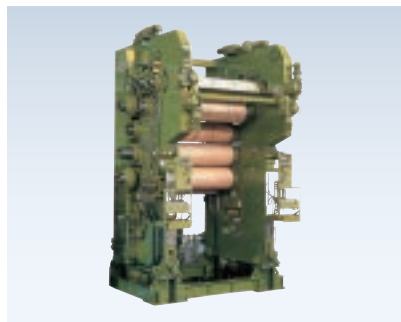
- Automated material handling systems in clean room
- Storage systems
- Transportation systems
- Sorting / picking systems

## Rubber & Film molding equipment

Our Calender lines are used for manufacturing plastic films and rubber sheets mainly for tires. IHI continues to build on its strong record in these fields worldwide, and continues to improve productivity through introducing our unique thickness control technology and automation technologies.



Calender for plastics



7-Roll calender  
(the world's biggest calender for rigid film production)



Creel autoloading system

### Main Products

- Rubber and film molding equipment (calender)

## FA systems for the automobile industry

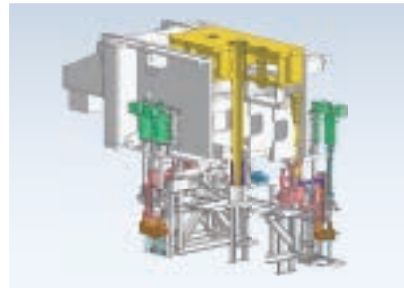
High-speed tandem press lines are essential to form automobile bodies and chassis. Our factory automation (FA) systems, including our high-speed transfer feeders, hybrid regenerative cushion systems, destack feeders, panel racking systems, automatic die change systems, total line controls and other FA systems, ensure the world's fastest productivity with less energy consumption considering the environment.



High-speed transfer feeder (V-feeder)



High-speed tandem press line with V-feeder



Hybrid regenerative cushion system

### Main Products

- High-speed transfer feeder (V-feeder)
- Hybrid regenerative cushion system



# Aero Engine, Space & Defense Business Area

## Aircraft engines

IHI is Japan's leading maker of jet engines, with a market share of between 60% and 70%. We are the primary contractor and manufacturer for aircraft engines used by the Ministry of Defense. We collaborate in international projects to develop and supply large and small engines for all types of civilian aircraft. We have leveraged our experience and manufacturing technologies to provide maintenance for all types of engines. We are considered Asia's core maintenance center. To meet the growing demand for eco-friendly engines and fulfill our corporate responsibility, we are developing next-generation engines that draw on our advanced technologies.

### Main Products

- Turbofan engines
- Turboshift engines
- Turbojet engines
- Turboprop engines
- Jet engine maintenance
- Jet engine test cells
- Jet engine parts



PW1100G-JM turbofan engine



GEnx turbofan engine



GE90 turbofan engine



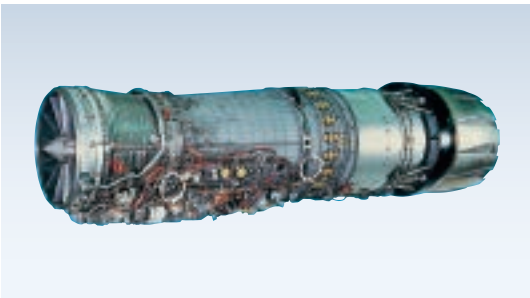
V2500 turbofan engine



CF34 turbofan engine



Aero Engine Maintenance



F110 turbofan engine



F7-10 turbofan engine



F3 turbofan engine



T700 turboshaft engine

## Rocket systems & Space exploration

IHI has participated in Japan's space development effort from the outset. We have applied our cryogenic-pump and turbomachinery and other technologies to develop and manufacture the turbopumps and gas-jet systems crucial to successful rocket launches. Our involvement in Japan's space program expanded significantly in 2000, when we acquired Nissan Motor's Aerospace Division, a pioneer in solid-fuel rocket development in Japan. We play an important role in developing and constructing the Exposed Facilities of the KIBO Japanese Experiment Module, which is a part of the International Space Station program. We support experiments in space by supplying experimental systems needed for cooperative international projects.

### Main Products

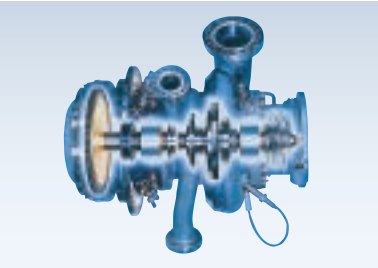
- Rocket
- Rocket propulsion systems
- Rocket control systems
- Satellite propulsion systems
- Satellite control systems
- Equipment for utilization of space environment
- Space station-related equipment
- Ground test facilities
- Ground support facilities



H-IIA Launch Vehicle (© JAXA)



Epsilon-2 Launch Vehicle (© JAXA)



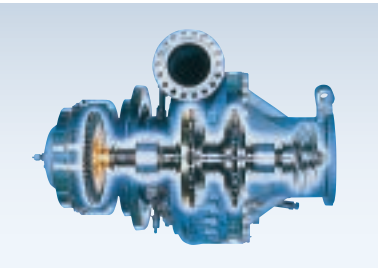
Liquid oxygen turbopump for the H-IIA rocket LE-7A engine



HTV propulsion system and exposed palette (HTV: H-II Transfer Vehicle) (© JAXA/NASA)



JEM Small Satellite Orbital Deployer (J-SSOD) (© JAXA/NASA)



Liquid hydrogen turbopump for the H-IIA rocket LE-7A engine



22N thruster



500N apogee engine

Liquid propellant apogee engine, etc.



## Our Offices Around the World

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### EUROPE, MIDDLE EAST, AFRICA

LONDON:	<b>IHI Europe Ltd.</b> 2nd Floor, America House, 2 America Square, London EC3N 2LU, U.K. TEL: +44(20)7481-8180 FAX: +44(20)7481-4955
PARIS:	17, Rue d'Orleans, 92200 Neuilly sur Seine, FRANCE TEL: +33(1)4643-1493 FAX: +33(1)4637-7869
ALGERIA:	Boulevard Millenium, Hai Khemisti, Les Iris-Plaza, Tour A 7ème étage, Oran, Algérie TEL: +213(41)730576
MOSCOW:	Office E02-312, 2nd floor, 8, 4th Dobryninskiy Pereulok, Moscow 119049 RUSSIA TEL: +7(495)989-6001 FAX: +7(495)989-6005
ISTANBUL:	Esentepe Mahallesi Harman Sokak, Harmanci Giz Plaza No:5 Kat:18 D:35 34394 Levent-Sisli Istanbul TURKEY TEL: +90(850)252-2122 FAX: +90(212)282-8370
DUBAI:	Burj Daman Building, Level6, Office C609 DIFC, P.O.Box 506940, Dubai, UAE TEL: +971-4-458-3864 FAX: +971-4-458-4096

### ASIA, PACIFIC

NEW DELHI:	302A, Salcon Ras Vilas, District Centre Saket, New Delhi-110017, INDIA TEL: +91(11)4105-2694 /+91(11)4166-3504 FAX: +91(11)4166-3503
YANGON:	<b>IHI ASIA PACIFIC PTE. LTD. Yangon Branch</b> Unit 309, 3rd Floor, Prime Hill Business Square, No.60, Shwe Dagon Pagoda Road, Dagon Township, Yangon, MYANMAR TEL/FAX: +95(1)395526
BANGKOK:	<b>IHI ASIA PACIFIC (Thailand) CO.,LTD.</b> 11th Floor,Ramaland Bldg., 952 Rama IV Road, Suriyawongse, Bangrak, Bangkok 10500, THAILAND TEL: +66(2)236-3490 /+66(2)236-9099 FAX: +66(2)236-7340
KUALA LUMPUR:	Letter Box No.52, 19th Floor, UBN Tower, No.10, Jalan P. Ramlee, 50250 Kuala Lumpur, MALAYSIA TEL: +60(3)2072-1255 FAX: +60(3)2072-1418
SINGAPORE:	<b>IHI ASIA PACIFIC PTE. LTD.</b> 77 Robinson Road, #14-03 Robinson 77, SINGAPORE, 068896 TEL: +65(6515)6609 FAX: +65(6438)8006
HANOI:	Unit 515, Sun Red River, 23 Phan Chu Trinh Street, Hoan Kiem District, Hanoi, VIETNAM TEL: +84(24)3934-5305 FAX: +84(24)3934-5303
JAKARTA:	Mid Plaza II, 17th Floor, Jl. Jendral Sudirman Kav.10-11 Jakarta 10220 INDONESIA TEL: +62(21)570-7701 FAX: +62(21)570-7705
SHANGHAI:	<b>IHI (Shanghai) Management Co., Ltd.</b> Room 021 24th Floor, Hang Seng Bank Tower,1000, Lujiazui Ring Road, Pudong New Area, Shanghai, 200120 CHINA TEL: +86(21)6841-1717 FAX: +86(21)6841-1919
BEIJING:	<b>IHI (Shanghai) Management Co., Ltd. Beijing Branch</b> Room 8008, Chang Fu Gong Office Building No.26, Jian Guo Men Wai Avenue Beijing, 100022 CHINA TEL: +86(10)6527-2700 FAX: +86(10)6527-3100
TAIPEI:	<b>IHI Taiwan Corporation</b> Room 1202, Chia Hsin Building., No.96 Section2, Zhongshan N. Road, Taipei, 10449 TAIWAN TEL: +886(2)2542-5520 FAX: +886(2)2542-4362
HONG KONG:	<b>IHI (HK) Ltd.</b> Room 2203, 22/F, Causeway Bay Plaza 2, 463-483 Lockhart Road Causeway Bay, Hong Kong TEL: +852(2522)4093 FAX: +852(2845)2497
SEOUL:	23F, Seoul Finance Center B/D, 136, Sejong-Daero, Jung-Gu, Seoul 04520, KOREA TEL: +82(2)753-8605 FAX: +82(2)755-4772
SYDNEY:	<b>IHI ENGINEERING AUSTRALIA PTY. LTD.</b> Suite 2201,Level 22,111 Pacific Highway,North Sydney NSW 2060 Australia TEL: +61(2)9923-9300 FAX: +61(2)9923-9333

### AMERICAS

NEW YORK:	<b>IHI INC.</b> 150 East 52nd Street, 24th Floor, New York, NY 10022, U.S.A. TEL: +1(212)599-8100 FAX: +1(212)599-8111
SÃO PAULO:	<b>IHI do Brasil Representações Ltda.</b> Av. Paulista 726, 9 Andar CJ 901-Bela Vista-São Paulo-SP CEP: 01310-910, Brasil TEL: +55(11)3251-2593 FAX: +55(11)3254-7481

## IHI Corporation

### Head Office

Toyosu IHI Bldg., 1-1, Toyosu 3-chome, Koto-ku, Tokyo 135-8710 Japan  
TEL: +81-3-6204-7800 FAX: +81-3-6204-8800  
URL : [www.ihl.co.jp/en/index.html](http://www.ihl.co.jp/en/index.html)

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