

# Mitsubishi Heavy Industries Mechatronics Systems, Ltd. Supports Society



**Mitsubishi Heavy Industries  
Mechatronics Systems, Ltd.**

Mitsubishi Heavy Industries Mechatronics Systems, Ltd. (MHI-MS) was founded in October 2009 through the consolidation of five Mitsubishi Heavy Industries, Ltd. (MHI) group companies in the Kobe region, and it has been expanding its operations with a diverse product line-up in the Machinery, Equipment & Infrastructure domain. Furthermore, in an effort to seek new development and further growth, MHI-MS separated some businesses to merge with another company last year.

## 1. Business transition

At the time of its launch in October 2009, MHI-MS mainly offered shield tunnel boring machinery and waste gas and water treatment products. It expanded its business in April 2012 by adding products that were originally handled by the former Machinery and Steel Structure Division at MHI Kobe Shipyard and Machinery Works, including testing equipment, hydraulic penstocks, sports and cultural facilities, and biomass products. Prior to this, MHI-MS had handled after-sales services for these products.

In April 2014, MHI-MS absorbed Mitsubishi Heavy Industries Parking Co., Ltd., which developed multistory parking structures. It also integrated and reorganized the steel structure business of Mitsubishi Heavy Industries Bridge & Steel Structures Engineering Co., Ltd., the products of which include stacks, gas holders, disaster prevention infrastructure, seismic isolators, and vibration control systems. In 2015, it took over MHI's hydraulic machinery and accelerator businesses in October and integrated the ITS product business in November.

To achieve further growth, the waste gas treatment business (i.e., anti-air pollution equipment and solvent recovery systems) was transferred to Mitsubishi Hitachi Power Systems Environmental Solutions, Ltd. (MHPS-ES) in October 2015. Another business transfer to MHPS-ES is scheduled for April 2016, involving the water treatment and biomass utilization businesses.

## 2. Product line-up

The products of MHI-MS consist of those from six businesses, i.e., Intelligent Transport Systems (ITS), hydraulics & machinery, machinery system, parking system, steel structure plants, and water treatment, as shown in [Figure 1/ Table 1](#). This article introduces products from each division.

**Table 1 MHI-MS key products**

Division	Key product
ITS	Toll collection system, electric toll collection system (ETC), ETC on-board unit (OBU), road pricing/parking system and OBU, highway traffic management system, smart community
Hydraulic machinery	Deck machinery (deck crane, anchor windlass, mooring winch), hydraulic components (pump, motor, traveling unit, hydraulic unit), testing system (seismic isolator testing system, car crash simulator, etc.), air heater (rotary regeneration air pre-heater)
Machinery system	Testing equipment (low-noise wind tunnel, driving simulator, flow noise simulator, etc.), general machinery (movable launcher for rocket, vehicle carrier chassis for x-ray inspection, etc.), cultural/sports facilities (stage machinery, movable seats, etc.), penstock, particle accelerator, tunnel boring machine
Parking system	Integrated parking system (horizontal circulate type/pallet-less type), lift park (elevator type), prest park (horizontal circulate type/pallet type), cell park (free circulation type), etc.
Steel structure plants	Stack, gas holder, disaster prevention infrastructure system (water gate, etc.), roadway infrastructure maintenance machinery, storage system (beer tank, etc.)
Water treatment systems	Industrial water treatment system, industrial waste water treatment system, water reclamation system, biomass utilization system (saccharification)



**Figure 1 Diverse product line-up for supporting society**

(1) ITS (**Figure 2**)

Roadway infrastructure continues to expand and the number of vehicles is increasing worldwide, with traffic congestion and accidents occurring due to a variety of causes such as road conditions, geological profile and human factors. MHI-MS ensures a more pleasant and smooth roadway and traffic environment by combining optimal ITS solutions such as toll collection, ETC and traffic control systems.

(2) Hydraulics & machinery (**Figure 3**)

MHI-MS offers diverse products in the field of hydraulics and controllers. Our deck machinery such as deck cranes used at docks around the world plays a significant role in more efficient cargo handling with its faster and proven performance. We also contribute to protecting people's lives and creating a safer society with testing systems such as our car crash simulator and vibration experiment facility that ensure the safety of buildings and industrial products such as vehicles. Our compact yet high-performance hydraulic devices are the key driver for not only testing equipment and marine machinery, but also for a wide range of products that require power, control and energy efficiency. In addition, MHI-MS manufactures air heaters that enable higher combustion efficiency in boilers through waste gas heat recovery, thus supporting the reliable supply of electricity.



**Figure 2 Non-stop auto toll collection system**  
Wireless communication system between vehicle and toll correction equipment using active Dedicated Short Range Communications (DSRC) in 5.8 GHz band



**Figure 3 Deck crane with synchronized control for long rail**  
Three cranes operated simultaneously with synchronized control function to handle long rails

(3) Machinery system (**Figure 4**)

A variety of testing systems that meet customer needs, such as our wind tunnel for use by automotive manufacturers for automobile development, accelerators used in particle physics research, and a rocket launch pad and combustion testing device are offered. MHI-MS products also play an important role in developing our society's infrastructure as exemplified by steel

penstocks for hydraulic power stations, tunnel boring machines for underground structure development, and stage systems and movable seats for multi-purpose use in theaters and stadiums.

(4) Parking system (**Figure 5**)

Under the key design concept of friendliness to people, vehicles and the environment, MHI-MS has developed wide-ranging mechanical parking systems that support the harmonious coexistence of automobiles and urban infrastructure. From product development and design, to production, installation and after-sales services, we assist customers with comprehensive solutions that provide efficient space utilization, advanced safety, and user ease and comfort in order to swiftly and accurately meet evolving and diverse market needs.



**Figure 4 Full-scale aero-acoustic wind tunnel**

Urban and highway driving condition simulator for high-precision aerodynamic/noise assessment



**Figure 5 Integrated parking system (IPS: plane reciprocating/large conveyor type)**

Fastest continuous loading/unloading system with barrier-free option, used extensively at large facilities such as redevelopment projects, commercial and office buildings, and hospitals

(5) Steel Structure plant (**Figure 6**)

Ranging from design and construction to after-sales services, MHI-MS offers comprehensive solutions with a variety of key products in developing industrial infrastructure. Products include a stack that diffuses flue gas from power generation and other plants, a gas holder that safely stores gas generated at steel plants, seismic and vibration damping systems that protect people lives and the facilities of our clients from storms and earthquakes, disaster-prevention infrastructure systems including flood and tsunami gates, and a special-purpose vehicle for roadway maintenance.

(6) Water Treatment system (**Figure 7**)

In order to reduce environmental load, MHI-MS provides various industrial water treatment and wastewater reclamation systems for power generation and other plants. In particular, our energy-efficient and resource-saving water treatment and wastewater recycling systems ensure the diverse needs of our clients are met. In terms of carbon dioxide reduction and food issues, MHI-MS is currently pursuing the development of a biomass utilization (saccharification) system based on our unique technology.



**Figure 6 Gas holder and stack**  
Gas holder (50m dia x 100m h) and stack (200m h), designed as wind storm and large-scale earthquake resilient



**Figure 7 High-speed coagulation and segmentation system**

Approx. five times higher treatment capacity than conventional system

### 3. Future development

As noted, MHI-MS has grown by reorganizing and integrating wide-ranging MHI businesses in the Machinery, Equipment & Infrastructure domain, with most businesses each valued at approximately 10 billion yen annually. We continue to strengthen the competitiveness of these businesses individually while aiming for further growth by seeking company-wide synergy effects and adding value to our products.