

Kawasaki Heavy Industries, Ltd.
Precision Machinery Business Division
Business Profile

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Precision Machinery Business Division

With over 100 years' assured hydraulic technology, Kawasaki's hydraulic components and systems continue evolving as the world's highest-brand products.

It was in 1916 (5th year of Japan's Taisho Era) that Kawasaki Heavy Industries began working on 'hydraulics.' Our hydraulics business began with starting production by introducing electro-hydraulic steering gear technology from the John Hastie in the UK. Since then, with over 100 years' abundant experience and assured technical capabilities, Kawasaki's hydraulic components and systems have continued evolving as the world's highest-brand products. We will further continue providing customers with innovative solutions which enormously dedicate to eliminating social problems like manpower shortage and to establishing remote working places and carbon-neutral environment by utilizing our world's highest cutting-edge motion control technology.

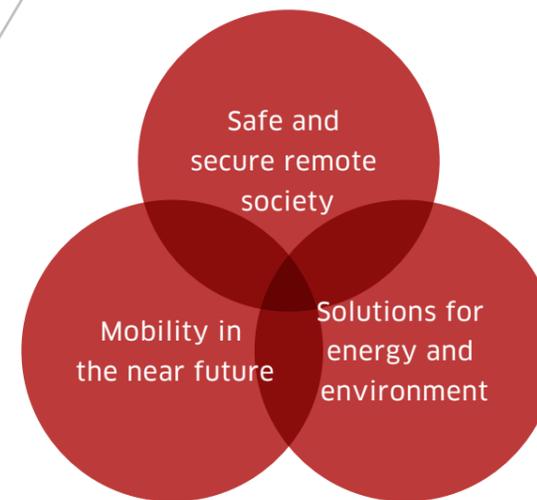
Group Vision 2030

Trustworthy Solutions for the Future

Kawasaki Heavy Industries provides innovative solutions in a timely manner to the ever-changing society, and creates a hopeful future. By acting quickly and challenging beyond various boundaries, we will further continue growing in expanding our possibilities.



3 fields that Kawasaki focuses on



Our precision machinery-related departments will provide high value-added solutions for contributing to solving social issues like those shown below.

- Electrification system for construction machinery and agricultural machinery
- Automation system for construction machinery and agricultural machinery
- High-efficiency hydraulic system
- Hydrogen-related products
- Condition monitoring & fault diagnosis
- Intelligent hydraulic machinery

We can utilize our advantage of motion control and power management as core technologies.

- 1916** We began working on production of Hele-Shaw type radial piston pumps at Marine Machinery Works of former Kawasaki Dockyard — currently Kobe Works of Kawasaki Heavy Industries.
- 1924** We completed development of electro-hydraulic steering gears.
- 1936** We started producing and selling screw pumps.
- 1968** We relocated our business to newly built Nishi-Kobe Works, and established Hydraulic Machinery Division.
- 1993** We established Kawasaki Precision Machinery (UK) Ltd. and commenced production of staffa motors in UK.
- 1994** We established Precision Machinery Business Division in Kawasaki Motors Corp., USA for securing a sales base in the United States.
- 2002** We established Kawasaki Precision Machinery Ltd. as an independent company spun off from Kawasaki Heavy Industries, Ltd. together with establishment of Kawasaki Hydraulic Service, Ltd.

- 2003** We invested in Flutek, Ltd. (South Korea)
- 2005** We established Kawasaki Precision Machinery (Suzhou) Ltd.
- 2009** We established Kawasaki Chunhui Precision Machinery (Zhejiang) Ltd.
- 2012** We established Wipro Kawasaki Precision Machinery Private, LTD. (India/joint venture)
- 2018** We remerged with Kawasaki Heavy Industries, Ltd. and became Precision Machinery Company. We established Kawasaki Precision Machinery Trading (Shanghai) Co., Ltd. (China)
- 2020** We were renamed as Precision Machinery Division of Precision Machinery & Robot Company. We had 50th anniversary of founding precision machinery business.

Hydraulic components for construction machinery and industrial vehicles

"Kawasaki" hydraulic components are highly evaluated by construction machine and industrial vehicle manufacturers the world over as a brand of high performance and high quality, realizing "performance," "durability," and "reliability" unmatched by other competitors, with our excellent design reflecting the "technology" and "experience" accumulated over the years.

Particularly in the construction machinery industry, each component including hydraulic pumps respectively boasts a high market share. They are in use in severe construction and civil engineering sites around the world.



Take a look at our website for detailed product introductions.

Hydraulic components for excavators

Highest brand globally reputed
Kawasaki's Hydraulic Systems



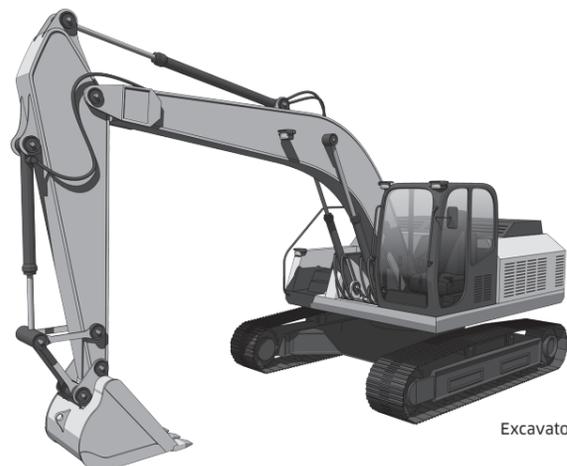
Swash plate type axial piston pumps
K3V/K5V/K7V series



Motors for Swing and Reduction gear
M5X-RG series



Multiple control valves
KMX series



Excavators

Hydraulic components for construction machinery and Industrial vehicles



Hydraulic pilot valves
PV48K/PV48M series



Hydraulic pilot valves
PVD8P series



Swash plate type axial piston pumps
K3VL/K3VLS series

Application vehicle examples



Compact track loaders



Mini excavators

The world's largest market share enables to be chosen as the standard components in the construction machinery industry.

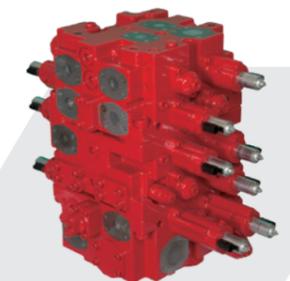
Kawasaki's technology leading the next generation hydraulic technology



Electric remote control valves
ERU2



Electric remote control valves
ERUP2/L



Multiple control valves
KMX36NAE

Application vehicle examples



Wheel loaders



Tractors



Cranes



Rough Terrain Cranes

Technology development for electrification and automation of construction machinery

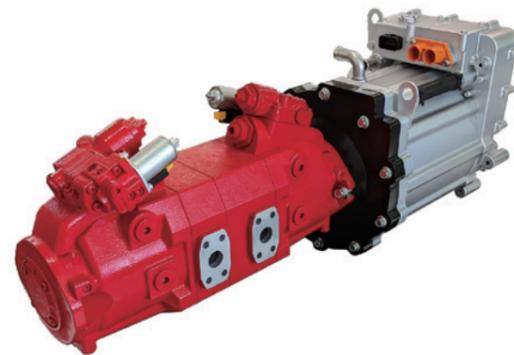
In response to social issues such as carbon neutrality, future decline in the working population, and decline in the number of skilled operators, needs for electrification, automation, and autonomy are increasing in the field of construction machinery. Our company contribute to solving these social issues by developing and supplying the latest hydraulic components and systems compatible with electrification and automation, utilizing our advantage of motion control technology.

K-Axle™ Coping with electrification

K-Axle™ is electric motor pump unit for construction machinery consisting of the following three items.

- ① Variable displacement hydraulic pump applying technology obtained in the development of our high-speed hydraulic motor M7V series.
- ② High-speed electric motor with a built-in inverter
- ③ Specified controller for controlling them

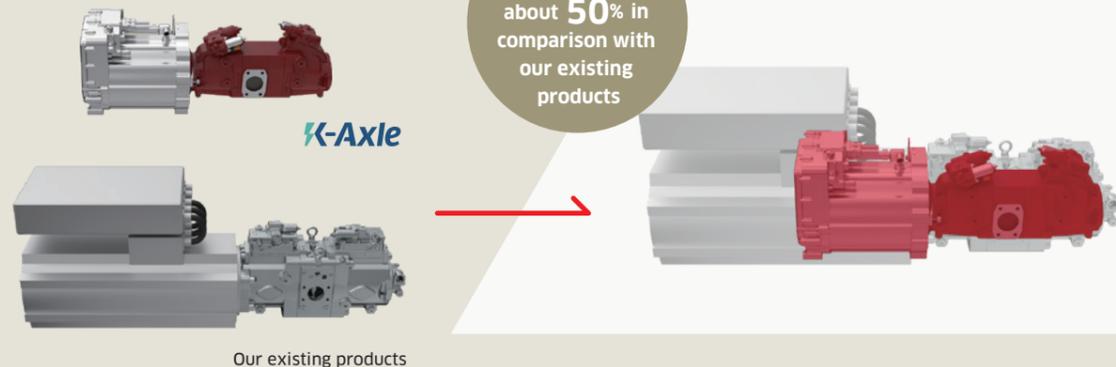
K-Axle



Features

- Electro-hydraulic system downsized by about 50% in volumetric comparison with existing ones
- Highly efficient operation enabled by excellent control performance
- Improved internal layout and maintainability of construction machinery and industrial vehicles
- Contribution to extending operation time and reducing cost

Downsizing



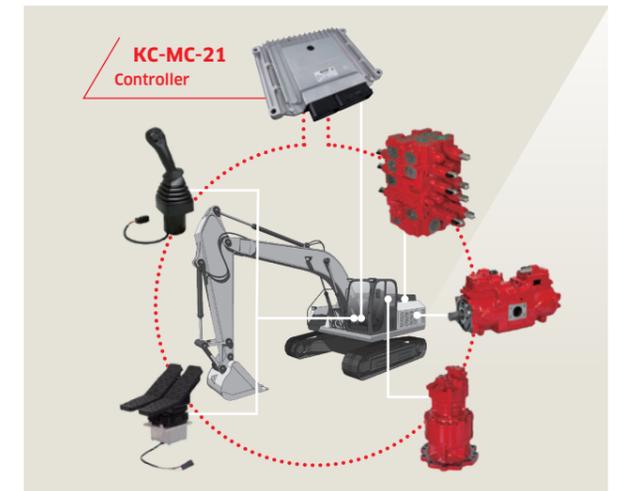
Full electronic control system for excavators

Autonomous response

The full electronic control system for excavators realizes reduced fuel consumption rate and reduced pressure loss as well as improved maneuverability by optimal operation of hydraulic components like pumps and multi-control valves, utilizing electronic control technology.

Machine control

Combining hydraulic control technology and machine control technology enables high-precision control, assists excavator operation requiring high skill, and realizes further advanced productivity and high security at construction sites.



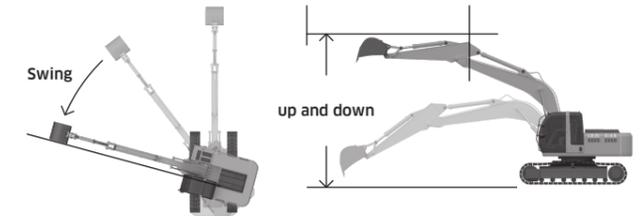
■ Leveling assistance



■ Payload



■ Automatic stop control



Excavator automation and autonomous system

Autonomous response

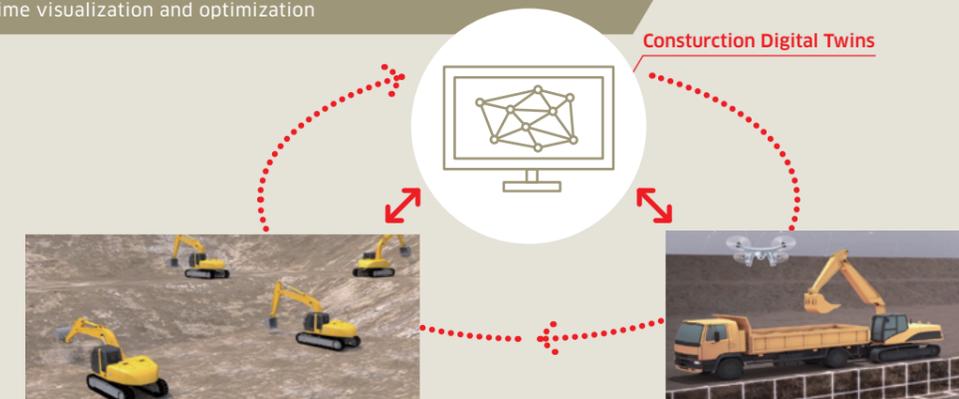
There is increasing market demand for the automation and autonomy of construction machinery as one of the solutions to current social issues such as labor shortages and a decline in the number of skilled operators.

We are developing an "excavator automation/autonomous system" that utilizes our motion control technology, aiming for social implementation near future.

Through this, we will improve productivity and reduce labor requirements at construction sites, contributing to the digitalization of the construction industry and the resolution of social challenges.

Complete digitalization of excavator construction

Real-time visualization and optimization



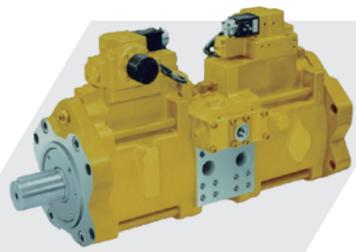
Components and systems for industrial machinery

Our components and systems for industrial machinery meet the diverse needs of our customers with reliable hydraulic technology and advanced control technology that we have cultivated over many years.



Take a look at our website for detailed product introductions.

Components for industrial machinery



Swash plate type axial piston pumps
K3VG/K3VL series



Swash plate type axial piston pumps
K7VG series



Bent axis type axial piston pumps
LX(V)/LZ(V) series



Screw pumps



Motors
M3X/M3B series



Staffa motors



Hydraulic valves
SLV series



Hydraulic valves
Kawasaki valves



SUN cartridge valves

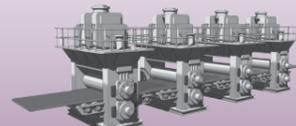
Application examples



Civil engineering machines

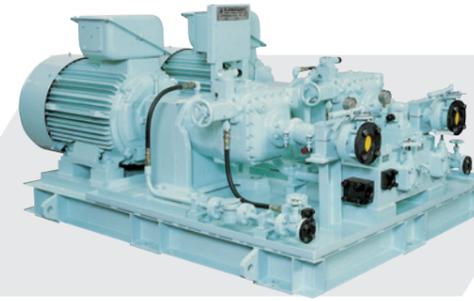


Press machines

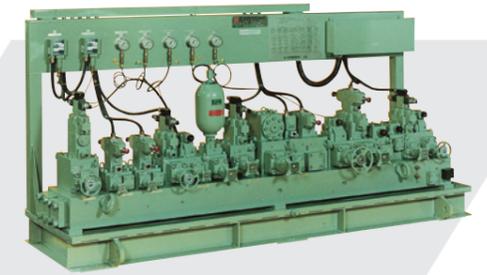


Steel manufacturing machines

Hydraulic systems for Industrial machinery



Pump unit



Valve stands

Precision gear pumps

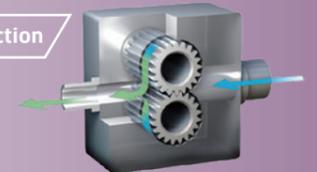
for chemical fiber



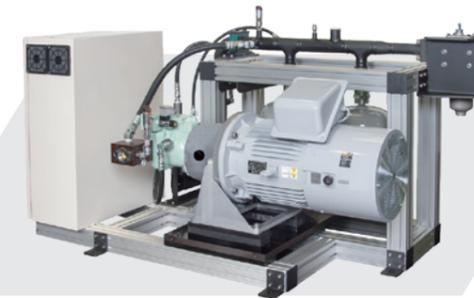
for film production



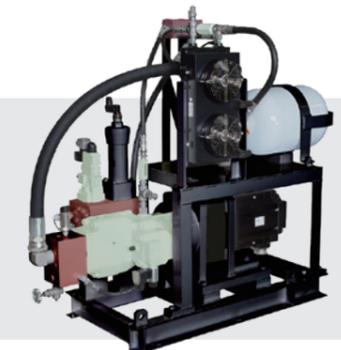
Construction



Products coping with carbon neutrality



ECO SERVO Light



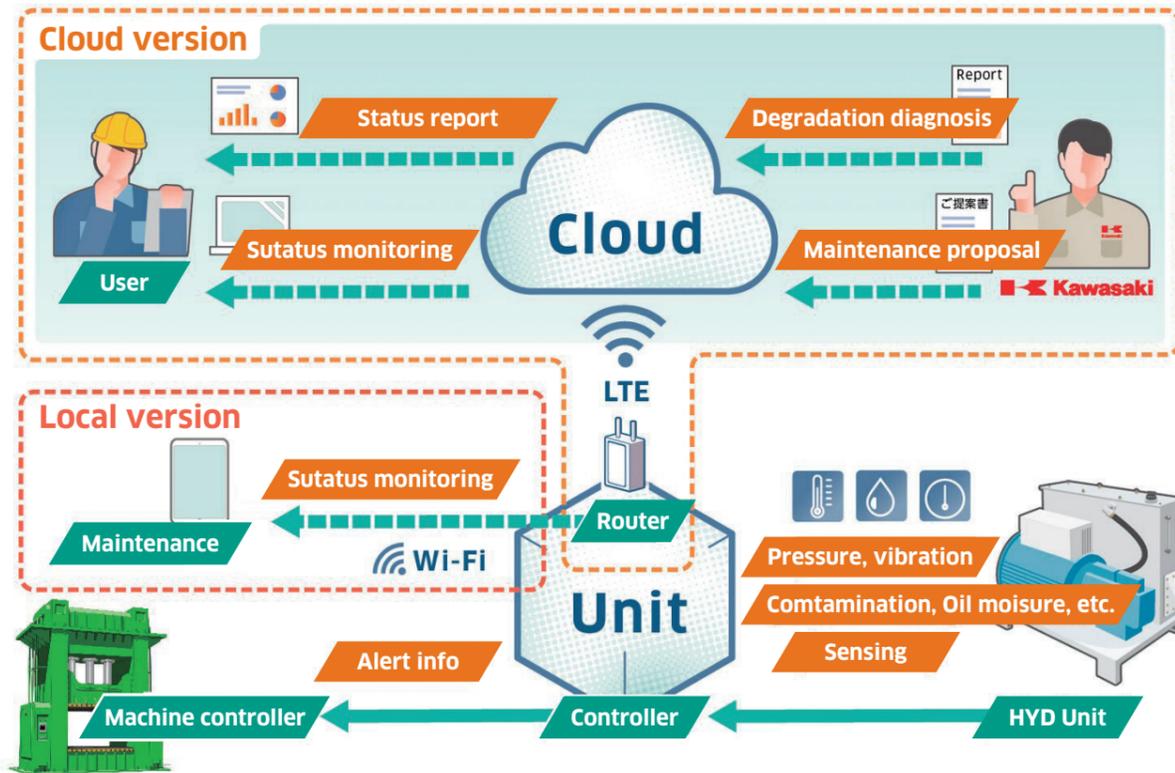
ECO SERVO Avant



Energy-saving inverter system KISS

Hydraulic condition monitoring system

The hydraulic condition monitoring system for general industrial machinery visualizes the operating condition of hydraulic systems, reduces maintenance and inspection work by customers, and enables to contribute to reducing equipment downtime by having diagnoses of hydraulic pump failures and hydraulic fluid deterioration having a large influence on equipment in the event of a problem.



Products for special applications

By wholly combining reliable precision and advanced control technology, we are developing products in various fields.



Maritime surveillance camera stabilization systems



Liquid fuel control systems for gas turbines



Ventilation fans for high-speed rail

Marine Machinery

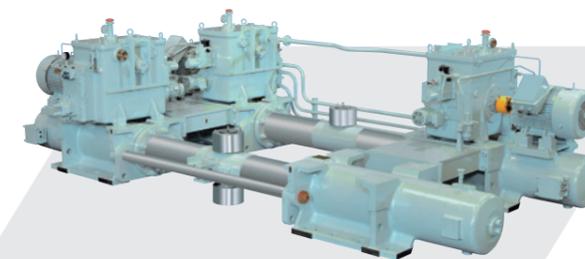
Kawasaki's hydraulic expertise began with the development of hydraulic systems for steering gears.

We can assure you that we respond to a wide variety of needs that may arise in line with more sophisticated, automated and higher speed ships.

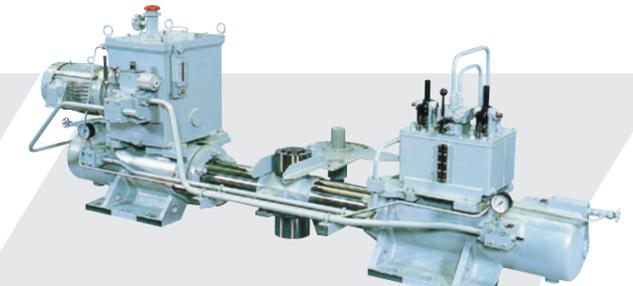


Take a look at our website for detailed product introductions.

Electro-hydraulic steering gears



Large-size steering gears



Small-size steering gears

Deck machinery



Windlasses



Mooring winches



Cargo winches

Other marine machinery



Electric deck machinery



Electric deck machinery



Ro/Ro systems

Applied vessel examples



Offshore vessels



Ferry boats



Cargo vessels



Tankers

Hydrogen-related products

In 2001, we began developing hydrogen gas valves for fuel cell vehicles. Since then, we have continued developing products aimed at expanding the use of hydrogen, utilizing the hydraulic control technologies and know-hows we have cultivated over the years, with the goal of achieving carbon neutrality.

Hydrogen supply systems

We are currently developing hydrogen supply systems using our own hydrogen gas valves. We aim to apply our systems to non-automotive fields such as construction machinery.

Precedent application examples



Forklifts

Wheel loaders

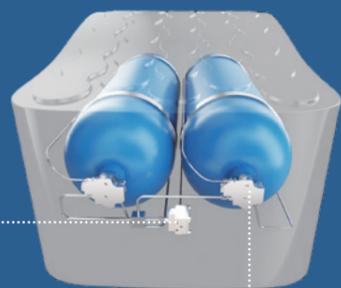
Excavators



Rolling stock



Pleasure boats



Hydrogen gas valves

In addition to commercializing valves for passenger cars, we are also developing high-flow valves for commercial vehicles.



Pressure reducing valves

Tank valves

Hydrogen compressor for hydrogen stations

We are commercializing hydraulic hydrogen compressors by utilizing the technology and experience we have cultivated over many years in industrial hydraulic systems. Currently we are also developing large-capacity compressors for commercial vehicles.



After-sales service

We respond to the diverse needs of our customers, and provide detailed support meeting their needs.



Parts sales

Number of shipments: approx. **45,000** / year;
Number of items in stock: approx. **2,000** items

- We are expanding our supply network globally
- We are expanding our more flexible and more prompt supply system.



Repair work available

Number of repairs: approximately **1,300** / year

- Thorough history management using a specialized database
- We are contributing to realization of a recycling-oriented society while maintaining quality equivalent to that of new products.



Visit to customers available

Number of visit to customers: approximately **1,000** / year
4 after-sales service locations **10** after-sales service agencies

- Responding to equipment inspections and to troubles of industrial machinery, marine machinery, etc.
- We dispatch engineers quickly and globally. Free on-site inspections are also available.



Training and education of hydraulic basics

Basic knowledge such as mechanism of hydraulics and working principles of hydraulic components can be acquired.



Maintenance training seminars

Optimal maintenance method for hydraulic systems delivered to customers can be acquired.

// Training and education of hydraulic basics and maintenance seminars can be held both face-to-face and online. //

Domestic bases & Overseas bases

Precision Machinery Business Division, Precision Machinery & Robot Company, Kawasaki Heavy Industries, Ltd.



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2 Tokyo Head Office
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3 Kobe Head Office
Kobe Crystal Tower, 1-3, Higashikawasaki-cho 1-chome, Chuo-ku, Kobe, Hyogo 650-8680, Japan
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4 Fukuoka Office
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5 Tokyo After-sales Service Center
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6 Imabari After-sales Service Center
Kawasaki Trading Co., Ltd., 6th Floor, Maemi Bldg., 5-3, Kitahorai-cho 1-chome, Imabari, Ehime 794-0028, Japan
TEL. +81-898-22-2531 FAX. +81-898-22-2183

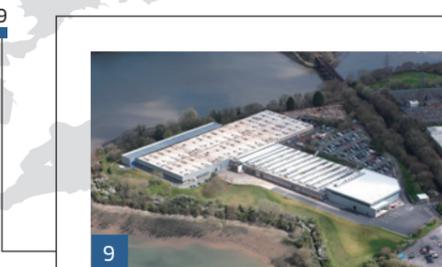
7 Fukuoka After-sales Service Center
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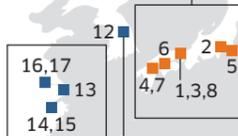


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10



12 Flutek, Ltd.
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14 KHI Consulting & Service (Shanghai) Company, Ltd.
No.200, YaSha Road, Shangyu Economic Development Zone, Shangyu, Zhejiang, 312300 China
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10 Wipro Kawasaki Precision Machinery Private Ltd.
No.15, Sy. No.37, Kumbalgotu Industrial Area, Kumbalgotu Village, Kengeri Hobli, Bangalore, -560 074, India
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https://global.kawasaki.com/en/industrial_equipment/hydraulic/index.html



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