

# COMPANY AND PRODUCTS

## Technological Innovation for the Benefit of the Global Community

TAKUMA's long history of achievement and innovation began over seventy years ago when it manufactured boilers for the naval shipping industry. TAKUMA has since applied its technological expertise to promote and diversify the company's business activities. Of particular note is TAKUMA's boiler technology, which has evolved to become the cornerstone of power generation systems used in energy from waste (EfW) plants. TAKUMA has won notable acclaim from various organizations for its untiring efforts as a pioneer in the environmental technology sector.

The future growth of any company in the 21<sup>st</sup> century is dependent upon its ability to care for the environment. As a company that considers the environment to be its business, TAKUMA is committed to upholding the company policy to value technology, humanity, and the Earth, while concentrating its efforts on the provision of superior industrial and general-purpose equipment and machinery as well as waste and water treatment facilities.

Activities associated with the industrial equipment and machinery business are focused on the development and design of energy systems such as power generation plants, industrial waste treatment plants, co-generation systems, and impregnation equipment.

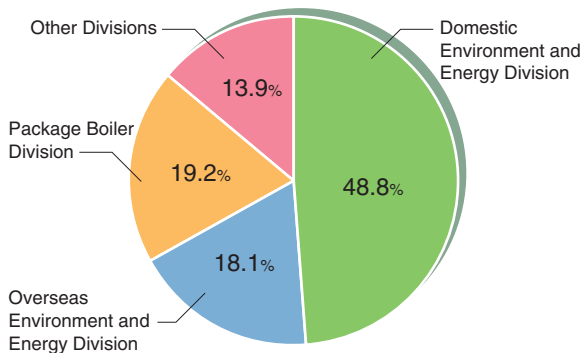
The general-purpose equipment and machinery line-up consists of such compact, energy-efficient, and environmentally friendly products as the Vacotin vacuum hot water heater, EQOS steam boiler, and thermal oil heater.

TAKUMA's EfW plants, bulky waste processing facilities, and recycling plants not only set new standards in environmental protection but also achieve efficient treatment of waste and produce heat that can be utilized in both commercial and industrial applications.

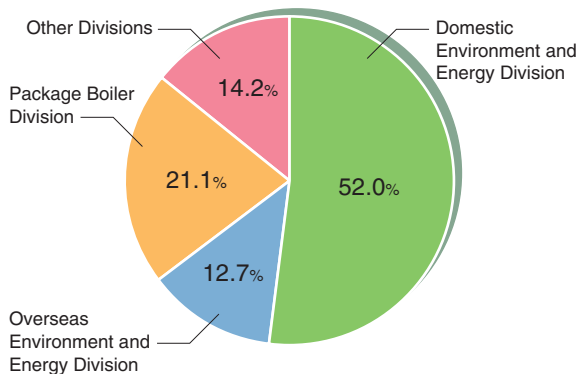
TAKUMA also has a prominent presence in the water treatment field with its sewage treatment, wastewater treatment, sewage treatment, and water purification plants. Furthermore, the company has successfully developed new technologies, such as gasification power generation, which recover previously unutilized energy sources from sewage sludge.

### Sales Breakdown by Division (On Consolidated Basis)

●Year Ended March 31, 2009



●Year Ended March 31, 2008



# COMPANY AND PRODUCTS

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## WASTE TREATMENT PLANTS

One major challenge posed by today's consumption-based society is the excessive generation of waste. TAKUMA's EfW plants are an efficient and environmentally friendly solution that can be utilized to effectively divert waste from being sent to landfill facilities. TAKUMA also develops, designs, and builds recycling facilities that convert waste into useful materials.

In 1963 TAKUMA introduced the first municipal waste incineration plant to Japan designed for fully mechanical and continuous operation, thus providing an effective solution to the problems associated with the management of the enormous volumes of waste generated daily. TAKUMA has since gone on to develop a diverse portfolio of waste treatment technologies such as bulky waste shredders and crushers, incinerator ash melting plants, recycling plants, and district heating systems that utilize excess heat.



Lakeside Energy from Waste Plant (U.K.)



Beijing Gaoantun Waste-to-Energy Plant (CHINA)



Amagasaki Clean Center (Amagasaki, JAPAN)

## WATER TREATMENT PLANTS

Water treatment is relevant not only to the prevention of pollution in oceans, rivers, and lakes, but also to the preservation of the Earth's limited fresh water supply. TAKUMA water treatment technologies have been developed, designed, and manufactured to deliver the most efficient and environmentally friendly water treatment systems available.

TAKUMA offers an extensive range of water treatment plants such as wastewater treatment, sewage treatment, and sewage sludge incineration facilities. Other products include reclaimed wastewater utilization systems, incinerator ash recycling systems, and water purification systems for use in boilers and high-tech industry applications.



Continuous up-flow sand filter



Circulating Fluidized-Bed Incinerator for Sewage Sludge

# COMPANY AND PRODUCTS

## INDUSTRIAL EQUIPMENT AND MACHINERY

TAKUMA has developed and refined its expertise in combustion and thermal technologies through many years of designing and manufacturing boilers, and is continually in search of new ideas that can be utilized to create new innovative plants and equipment.

TAKUMA is a leading manufacturer of steam and hot water boilers that are used throughout the world in a wide variety of industrial applications. In particular, TAKUMA boiler power plants are not only efficient and economical, but are also able to accommodate a diverse array of fuel sources, including waste heat. Industrial waste treatment plants from TAKUMA are designed to incorporate comprehensive treatment systems that utilize thermal energy to safely recycle and transform industrial waste into non-hazardous materials. Additionally, cost-effective gas turbine co-generation technology from TAKUMA has received attention as a promising new energy supply system.



Biomass Boiler



Industrial Waste Treatment Plant with Power Generator



Biomass Boiler for Power Generation



Gas Turbine Co-Generation Package

## GENERAL-PURPOSE EQUIPMENT AND MACHINERY

TAKUMA promotes research and development of new thermal technologies based on innovative designs that are user friendly and manufactured in accordance with the highest quality control standards.

Extensive research of vacuum technology crystallized in the Vacotin heater, which has proven to be a safe, economical and durable product. TAKUMA's hybrid hot water supply system, which has been integrated with a CO<sub>2</sub> heat pump, has achieved lower running costs.

Other leading products in this field include the EQOS steam boiler, a water tube boiler built for both industrial and general applications, as well as the Thermoheater, which is capable of achieving high temperatures even under normal pressure due to its high heat-transfer capacity.

The quiet, energy efficient Smoke Tube RE boiler emits low levels of nitrogen oxide and is able to effectively accommodate load fluctuations. The NPO-C package water tube boiler is energy efficient and environmentally friendly.



Vacotin heater



EQOS steam boiler



Thermoheater



RE-F II smoke tube boiler

# COMPANY AND PRODUCTS

## OPERATION AND MAINTENANCE SERVICES

The safe and effective operation and maintenance of large-scale waste and sewage treatment plants demands high levels of professional expertise due to the sophisticated components and equipment inherent of such facilities.

In order to ensure facilities supplied to its clients are maintained at highly efficient operational levels, TAKUMA offers comprehensive solutions that include support by professionally trained operation and maintenance technicians. These technicians are highly knowledgeable of the minute details associated with the facilities they take responsibility for, which allows them to successfully operate and maintain the facilities at optimal conditions, thus ensuring highly efficient operation and prolonged plant service life.



Control room for waste incineration plant

## RESEARCH AND DEVELOPMENT

The global marketplace is ever changing, with social trends and technological innovation, in particular, evolving at increasingly rapid paces. It is therefore essential for businesses not only to understand, but to also have the ability to respond quickly and effectively to such changing market conditions. Research and development activities focused on core technology research, product development, and production are a key component to meeting these challenges.

The continual aims of research and development activities at TAKUMA are to create unique and superior technologies for use in each of the company's business segments and to undertake any experiments, feasibility tests, and demonstration projects required to verify the technical and commercial viability of these new technologies.

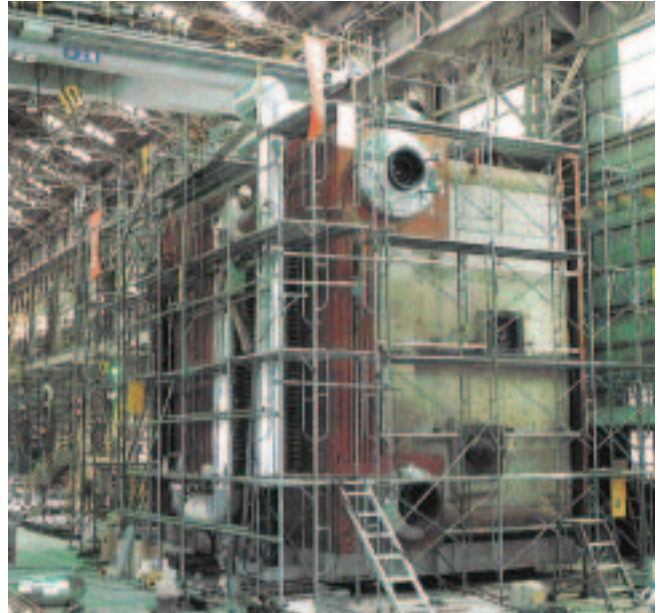
Research and development activities at TAKUMA began with the invention of the TAKUMA Boiler and have since expanded to include practical applications of new technologies in the energy, consumer, and environmental technology sectors. TAKUMA has always been and will continue to remain committed to maintaining its focus on technology, humanity and the Earth.



Demonstration plant showcasing a system for recovering energy from distilled spirit lees (see page 15)

## HARIMA FACTORY

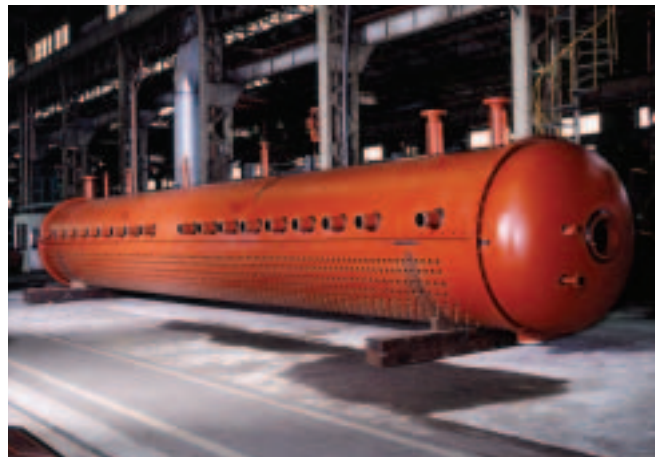
The Harima Factory opened in 1942 as TAKUMA's main production base, and has manufacturing facilities for large machinery like boilers, continuous up-flow sand filters, and incinerator stokers, as well as a plant dedicated to producing small heat exchangers. It also has packaging and maintenance facilities for co-generation gas turbines, as well as laboratories for a variety of research and development. Our products enjoy a reputation for quality and reliability among customers not only in Japan, but also in Korea, China, Russia, Southeast Asia, Europe, and Africa, along with many other countries and regions. In addition to our wealth of experience and advanced processing technologies, we have in recent years set up procurement bases internationally, allowing us to supply the needs of a wide range of customers.



The Scene of Assembling Package Boiler



Harima Factory



Drum of Water Tube Boiler



A waste-heat boiler being loaded at Harima Factory's wharf