

## Contributing to the Environment through Our Products

### Main Efforts of the KHI Group

#### Product Assessment

For newly developed and designed products, as well as for particularly important products, KHI assesses products according to such criteria as resource and energy savings and recycling potential, with the goal of reducing the environmental impact of our products during their life cycles. Because specific evaluation techniques vary depending on the type of product, each business segment draws up product assessment rules appropriate to the characteristics of the respective product. The main evaluation items of product assessment are shown below.

- (1) Product weight reduction
- (2) Product energy saving
- (3) Longer product life
- (4) Product safety and environmental conservation effectiveness
- (5) Measures for product disposal and recycling
- (6) Environmental impacts when problems or other extraordinary circumstances occur
- (7) Provision of information for use and maintenance
- (8) Compliance with regulations

#### Responding to the ELV Directive\*<sup>1</sup>, the RoHS Directive\*<sup>2</sup>, and the REACH Regulation\*<sup>3</sup>

Since 2000, laws and regulations related to chemical substances have been strengthened in the European Union (EU) by the establishment of such controls as the ELV Directive, the RoHS Directive, and the REACH Regulation. The ELV Directive focuses on automobiles, and while motorcycles are not subject to the content of this directive, the Motorcycle & Engine Company has embraced the voluntary actions espoused by the Japan Automobile Manufacturers Association (JAMA). The Precision Machinery Company also applies this directive to some of our products. The RoHS Directive covers electric and electronic products, and some of the products made by the Precision Machinery Company and the Robot Division comply with this directive.

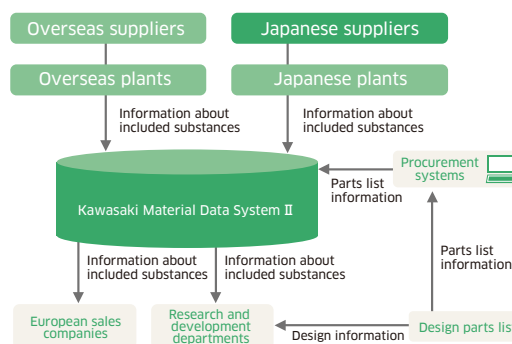
The REACH Regulation went into effect in June 2007 and applies to all chemical substances manufactured in and imported by the EU. Enterprises that manufacture or import one ton or more of chemical substances a year are required to register the chemical substances. As KHI products are

mainly molded articles, only a limited number need to be registered. Registration and notification are, however, compulsory for all substances that are deliberately emitted and all substances that are carcinogenic or otherwise of high concern. In addition to registration and notification, regulations exist for the evaluation, authorization, restriction and communication of information regarding chemical substances, necessitating a system to identify information about the chemical substances in products throughout our entire supply chain.

Laws and regulations related to chemical substances have been strengthened not only in the EU but in many countries around the world. As requirements vary by country, for instance regarding substances and products covered, we believe that our response must be based on a firm understanding of the law.

KHI practices CSR procurement (see "Kawasaki Report 2013 (Full Report)" page 46) and responds to requests from customers to gather chemical substance information. In addition, the Motorcycle & Engine Company has created the Kawasaki Material Data System II\*<sup>4</sup> to collect data about chemical substances and respond to REACH and other chemical substance regulations.

#### Response to REACH by the Motorcycle & Engine Company



\*1 ELV Directive: End of Life Vehicles Directive

\*2 RoHS Directive: Directive on Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment

\*3 REACH Regulation: Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals

\*4 Kawasaki Material Data System II: Currently we are preparing for the shift to International Material Data System (IMDS)

## Topic 1 Approach by the Motorcycle & Engine Company

### Cleaner Exhaust Gas

In fiscal 2013, we continued to tackle technologies that make exhaust from motorcycles cleaner, from a world standard perspective, and launched sales of the class-leading sports model Ninja 300. In the air intake system, the electronic fuel injection system equipped with dual throttle valves\*<sup>1</sup> and a fine-atomizing injector\*<sup>2</sup> achieves fine control of fuel supply in response to all driving conditions and attains high combustion efficiency, combining superior engine performance with cleaner exhaust emissions.



Ninja 300

\*1 Dual throttle valve: a device that achieves optimal control of air intake volume through coordination between an electronically operated throttle and a manually operated throttle.

\*2 Fine-atomizing injector: a device that achieves efficient combustion through fine atomization of fuel to a particle size of 60µm.

**Promoting the 3Rs**

Since October 2004, we have operated an independent motorcycle recycling system in cooperation with three other motorcycle manufacturers and 12 importers in Japan. In fiscal 2013, we achieved a recycling rate of 93.6%. Since October 2011, the user burden of recycling costs has become completely free of charge.

For new-model motorcycles, we emphasize environmentally conscious designs highlighting reduced materials and more recycling, right from the development phase. We conduct preliminary evaluations of efforts related to the 3Rs—reduce, reuse and recycle—before commencing design, prototyping and mass production phases. In particular, we seek to increase recyclability through greater use of materials that are easy to recycle and we have achieved a potential recycling rate exceeding 90% on every model, with most models exceeding 95%. This potential recycling rate was calculated based on the Guidelines for Definition and Calculation Method on the Recyclability Rate for New Vehicles (1998 Japan Automobile Manufacturers Association).

**Reducing and Eliminating Environmental Substances of Concern**

For new-model motorcycles sold in Japan, we already meet the voluntary targets of reduced environmental substances of concern (lead, mercury, hexavalent chromium and cadmium) set by the Japan Automobile

Manufacturers Association, and we have also achieved voluntary targets for older models still being sold.

For general-purpose engines and JET SKI watercraft, there are no Japanese regulations such as the JAMA voluntary reduction targets, but we are making elimination and reduction efforts that follow those applied to motorcycles, and we had achieved voluntary reduction targets for lead, mercury and cadmium by fiscal 2008. Hexavalent chromium had been contained to a very small amount, but we completed its elimination in fiscal 2009.

Source: Japan Automobile Manufacturers Association, Reduction Targets for Environmental Substances of Concern for New Vehicles

Substance	Reduction target
Lead*1	Use 60 g or less in and after January 2006 (for 210-kg weight vehicle)
Mercury	Use prohibited in and after October 2004 (Exception for the use of minute quantities in parts that are necessary for traffic safety*2)
Hexavalent chromium	Use prohibited in and after January 2008
Cadmium	Use prohibited in and after January 2007

\*1 Used batteries are already recycled and excluded from the target values  
 \*2 Combination lamps, discharge headlamps, etc.

## Topic 2 High-Efficiency Gas Turbine L30A Wins an Award in the Japan Industrial Technology Grand Prix

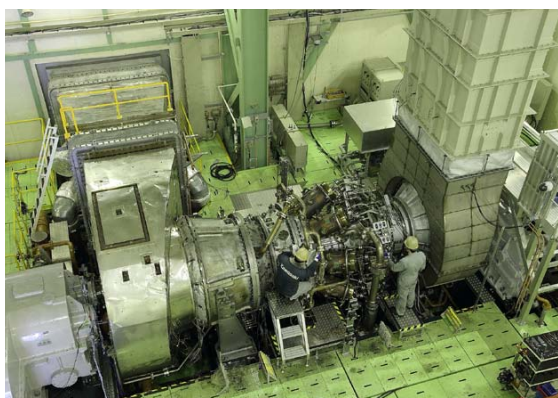
The L30A, a gas turbine in the 30 MW class developed by KHI, was recently awarded the special award by the Japan Industrial Technology Examination Committee in the 42nd Japan Industrial Technology Grand Prix, organized by the Nikkan Kogyo Shimbun. The Japan Industrial Technology Grand Prix focuses each year on technology development that has contributed to the growth of Japan's industrial society, recognizing the enterprises and groups that undertake development or practical applications.

The L30A has the world's highest level of efficiency in its class, a world-leading level of environmental performance and excellent maintenance characteristics. We believe that the prize award represents strong recognition of the technological capabilities that supported our in-house development of the L30A.

The L30A achieves a power generating efficiency of more than 40%, the world's highest level in its class. It also boasts outstanding environmental performance, with the world's lowest NOx emissions levels of 15 ppm or below (O<sub>2</sub> = 15%). The first model began pilot operation in October 2012 and accumulated over 4,600 operating hours by the end of March. After that, it has continued problem-free operation, clocking up a cumulative operating time of 700 hours a month on average. This facility has a cogeneration system using the L30A that can supply 30 MW of electric power and 46 tons of steam and is expected to deliver an annual energy-saving of 29% (equivalent to 24,000 kl

of crude oil), and an annual CO<sub>2</sub> reduction of 51% (117,000 t).

In recent years, cogeneration systems that use highly efficient and environment-friendly gas turbines and combined cycle plants have attracted attention as solutions to environmental and energy issues. Against this background, the L30A represents the optimal response to society's needs in this area. Receiving the prize award, we are committed to boosting our efforts to contribute to comfortable lifestyles for people around the world and the future of the global environment with distributing the L30A into a wide market in Japan and overseas.



L30A gas turbine of 30 MW class