

Technological Alliance between Kobe Steel and its Group Companies

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Throughout its history of over a hundred years, Kobe Steel has been a manufacturer of a wide variety of products including materials, such as steel & aluminum, and machinery, such as industrial machines & construction machines. During its extensive history, Kobe Steel has organized an alliance of Kobe Steel Group companies, each of which has established its position in many advanced products in both the material and machinery business fields. Such advanced products include new iron making plants, environmental equipment & facilities, electronic materials, and wholesale power.

Nowadays, the value of companies is evaluated by the total business value of the group of companies as a whole, rather than by the value of an individual company. Thus, it is a business requirement to maximize the total commercial value of the group of companies as a whole, by integrating individual capabilities, while cultivating their individuality. Currently, more than fifty out of one hundred sixty Kobe Steel Group companies are actively pursuing manufacturing business of their own, by exploiting their technical expertise and market development capabilities. Their fundamental technologies are, in many aspects, common or complementary with Kobe Steel's technologies, and we have been strengthening the technological alliance.

For manufacturers, technologies are the fundamental basis of business, and it is essential to strengthen their basic, underlying technologies. At the same time, it is indispensable for manufacturers to pursue unique products having advantageous features. Kobe Steel Group now pursues uniqueness under a slogan "ONLY ONE", meaning products that are only one of a kind in the world. In addition, it is becoming more and more important to develop production technologies which assure stable manufacturing of high quality products.

Kobe Steel Group, in its strategy, puts the highest priority on strengthening its manufacturing technologies for producing value-added and cost-competitive products with stability, by merging and integrating the fundamental technologies of Kobe Steel and Kobe Steel Group together.

In the field of materials, Kobe Steel and Kobe Steel Group companies are closely allied in the development, improvement and commercialization of a wide range of products. Such products include: steel products, e.g., valve-springs & vessel crankshafts,

both of which we have high world wide market shares, high strength sheets & wires with excellent formabilities for automotive applications; nonferrous metal products, e.g., aluminum sheets and extruded products for transportation machinery, and titanium products for aircraft engines; and, furthermore, electronics materials, e.g., copper alloy sheets for semiconductor leadframes.

In the field of machinery and engineering, Kobe Steel and Kobe Steel Group companies are pursuing global business by developing products and their production systems. Those products include industrial machinery, including gas compressors, and construction machinery, including hydraulic excavators. The technologies, developed within the Kobe Steel and Kobe Steel Group, have led further to new iron source business and environment business. The new iron source business involves a direct iron reduction process, which is gaining attention from around the world, as the demand for reduced iron increases against a background of global iron source depletion.

This special edition about the group companies introduces new products and technologies, developed through close technical collaborations between Kobe Steel and each Kobe Steel Group companies.

In the field of construction machinery, KOBELCO CONSTRUCTION MACHINERY CO., LTD. mainly builds hydraulic excavators and KOBELCO CRANES CO., LTD. mainly builds large cranes. Both the companies pursue multifunctional products with energy saving features, low noise and ease of operations. Various in-house basic technologies, developed by our Corporate Research Laboratories, such as acoustic technology, control technology, structure and vibration analyses, and weight reduction technology, were employed not only in designs of their products, but also in the production technologies at those group companies.

Sputtering target materials for thin-film wiring of LCDs, commercialized by KOBELCO RESEARCH INSTITUTE, INC., are other examples of the collaborative results. The sputtering target materials, developed by Kobe Steel's material design technology, are widely used in the majority of LCD panels, with their superior performance, widely accepted by the LCD industry. Another example is wafer reclamation technology, commercialized by KOBE PRECISION INC.(KPI) There, collaborative research has been carried out between KPI and Kobe Steel to improve

process technologies and product qualities in the reclamation of used wafers, including prevention of copper contamination.

Solid waste and water treatment technologies of KOBELCO ECO-SOLUTIONS CO., LTD. are other examples in the field of environmental business. The company leads the business field of gasification melting & ash-melting, including plasma ash-melting, and tackles issues of persistent solid wastes such as PCBs. The company is also highly appraised in the developments of high-level water treatment technologies, including highly efficient nitrification technology, and of sludge reduction plants in water treatment systems. The technologies, developed by the Machinery & Engineering division and Corporate Research Laboratories of Kobe Steel, are widely applied to those new technologies of the company.

There are many other "ONLY ONE" products, developed through the alliances between Kobe Steel and Kobe Steel Group companies. Those include "Lubricant Pretreated Aluminum Sheet for Printed Wiring Board Drilling" by SUN ALUMINUM IND. LTD.; "Cryogen-free Superconducting Magnet" by

JAPAN SUPERCONDUCTOR TECHNOLOGY; "High Strength Oil-tempered Steel Wire for Valve Springs" by SHINKO WIRE CO., LTD. and "Sound Absorbing Panel for Surface Traffic Noise Reduction" by SHINKO KENZAI, LTD.

As described above, Kobe Steel and Kobe Steel Group companies own a wide variety of unique and advanced technologies. It is my pleasure if this special edition about Kobe Steel Group companies can be of some help to understand the outline our technologies.

Higher level technologies will continue to be required, as business competition intensifies at a global level with diversifying user needs. Kobe Steel and its group companies are committed to strive for development of unique and advanced products and technologies (ONLY ONE) together, through integrating the powers of Kobe Steel Group companies, and to satisfy society 's future needs. We, as an alliance, will continue to ensure competitive costs and qualities of our products by improving our production technologies to make them even more efficient and stable.