

R&D that Supports New Challenges

Research and development at Kobe Steel is carried out at the Kobe Corporate Research Laboratories, which consist of four laboratories engaged in research in basic and advanced fields. The laboratories work closely with development departments in the business segments to clearly meet customers' needs. They contribute toward strengthening the business segments' competitiveness and to creating innovative products.

Kobe Corporate Research Laboratories

■ Material Research Laboratory

The Materials Research Laboratory (MRL) engages in research based upon the four technologies — refining and solidification, material control, processing technology, and surface control. In the material business sector, the staff of the MRL are working to increase the performance of materials and surfaces, and to optimize manufacturing processes. In the machinery sector, the MRL uses materials technology to develop differentiated products. Examples include controlling the nanostructure of metals to increase the strength of main cable wires and improvement of steel's resistance to the environment.



■ Mechanical Engineering Research Laboratory

The Mechanical Engineering Research Laboratory (MERL) carries out research and development in machinery, materials, environment, energy, and steel structures, by using advanced simulation technology and experimental and measurement technology in the fields of structures, strength, vibration, acoustics, fluid flow and electrical heating, combustion, and chemistry. The aluminum noise control material "Danshave" used in the 500 and 700 series Nozomi Shinkansen bullet trains is one example.



■ Production System Research Laboratory

The Production System Research Laboratory (PRL) is engaged in strengthening of production technology and innovation using advanced electronics. PRL is also engaged in development of communication networks and information systems required for the advanced information society. In addition PRL is developing and commercializing wireless communications systems to allow high-speed and low-cost Internet use.



■ Electronics Research Laboratory

The core technologies of the Electronics Research Laboratory (ERL) include thin-film materials and film-forming technology, microprocessing and measurement evaluation technology, superconducting materials and superconducting magnet technology. ERL is engaged in the creation and development of new products and technologies targeting liquid crystal television, DVD and other digital products, bio-, environmental and other high growth fields. ERL is also promoting the application of the developed technologies in the production workplace.



■ Coal & Energy Project Section

Coal liquefaction; upgraded brown coal; hyper-coal (ash-free coal); waste lubrication oil using low-rank oil; heavy oil hydro-cracking

Principal Technologies Developed by the Business Sector

[Iron & Steel]

- Iron & steel production technology
 - Next-generation ironmaking
 - Ultra clean steel refining
 - High-precision rolling
 - Material control
 - Surface treatment, others
- Product technology (construction, shipbuilding, bridge construction, automobiles, household appliances, aviation, others)

[Welding]

- Design of welding consumables
- Mechanical/chemical performance evaluation of welding
- Physical analysis of arc phenomenon
- Development/application of welding technology
- Design/development of welding robots
- Development of welding systems
- Development of offline teaching systems
- Design/development of welding power sources

[Aluminum & Copper]

- Aluminum sheet production technology (wide-width high-speed rolling, automatic controlled rolling)
- Aluminum extruded section production technology (high dimensional accuracy extrusion, thin-wall extrusion)
- Aluminum cast and forged product technology (large-size thin-wall sand casting, hydraulic & mechanical forging)
- Copper sheet and strip production technology (low-distortion low-residual stress sheet, advanced plating)
- Alloy design, material control, surface treatment, sheet forming extrusion processing, welding & joining, FEM simulation for lightweighting design
- Product technology (electric & electronic devices, appliances, automobiles, aluminum cans, aviation, others)

[Machinery & Engineering]

- New ironmaking process
- Compressors (screw, turbo, reciprocating)
- Industrial machinery technology (tire forming, plastic mixing, metalworking, high pressure, deposition, beam)
- Energy equipment technology (high pressure vessels, aluminum heat exchanger, LNG vaporizers, nuclear spent fuel casks)
- Plant engineering (nuclear waste treatment, chemical weapons destruction, advanced transit systems, bridges, cable technology)

[R & D-related subsidiaries]

- Kobelco Research Institute, Inc.
- Shinko Research Co., Ltd.

R & D