

Recent Developments in the Kawasaki Steel Technical Research Division—Looking toward New Fields of Technology

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The twenty years since Kawasaki Steel consolidated its research organization in Chiba have seen the development of a number of innovative steelmaking processes, several of which were presented in the previous special issue of *Kawasaki Steel Technical Report* entitled "Advanced Technology of Iron and Steel" (No. 22). Although both next-generation steelmaking processes and functional or "fine" steels continue to be the subject of intensive development programs, Kawasaki Steel is also placing heavy emphasis on certain new and very different fields of research.

Supported by the company's core steel business, the High Technology Research Laboratories were established in March 1985, planting the seeds of new business operations in the company's main target areas. In two of these areas, new materials and new chemical products, Kawasaki's steelmaking expertise provides fundamental technology: For example, techniques related to the physical chemistry of the steelmaking, including smelting, solidification, sintering, microstructure control, powdering, surface coating, and high-level purification, have application in the manufacture of new materials, while techniques which the company already uses commercially in processing steelmaking by-products such as tar, pitch, and gas can be applied to the production of fine chemicals. In the third area, LSIs, the company's operations provided no basic technologies, but long experience with networking techniques and a high level of practical electronic technology gave us a toehold in the hardware side of the electronics business, making it possible to develop electronic devices as a strategic first step into this field.

Even though these areas of business are new for Kawasaki Steel, it must be remembered that they are in fact characterized by intense competition among established companies, and success will require tremendous effort. Apart from the obvious problem of catching up with some of the world's leading firms, we must develop areas in which we have originality or superiority in product concept, processes, or materials (or any combination of these factors). Nevertheless, our day-to-day priorities, are likely to include the major currents of these times and emphasize customer and market needs. In other words, a necessary condition for entry into our chosen areas of new business will be a close relationship between our customers and the New Business and Chemical Divisions.

Only four or five years have passed since we started our research in what was for us new technology at the time, but in some cases we have already seen commercial results. Getting these and other projects off the ground requires not only a high level of technology, but also keen foresight. A capacity for understanding our objectives and their background and moving rapidly to solve technical problems is also essential, as is a willingness to learn from failure and return to basics when necessary in order to find substantial problems.

The reports included in this special issue represent work at various stages of progress, but in all cases the projects described are of particular importance to the technical development of the

field in question.

In closing, it should be added that the common feeling of all of our R&D staff is that tough problems are always welcome, as they bring out our best. We therefore look forward to receiving new and even more difficult challenges from those we serve.