

FOREWORD

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The market for wire rod and bar products is second in size only to that for strip and sheet and includes users in a wide range of industries. For this reason, quality requirements are widely varied in level depending on the application. Kawasaki Steel Corporation focuses on the high end of the wire rod and bar market, and accordingly, we have established a production system for meeting the strictest product quality needs, including those related to automotive applications in particular.

Although it is a personal matter, when I was a member of the Head Office Steel Business Planning Department I gave some consideration to wire rod and bar as a product line which should be curtailed. However, in my work in the Technical Control Department at Mizushima Works, I became deeply involved with wire rod and bar, and realized that interest of these products lies in the diversity of their users and methods of use. It is this diversity, in fact, which makes the fields technically interesting.

In order to establish the necessary conditions for the production of high-grade wire rod and bar steels, Kawasaki Steel has since 1984 implemented a variety of measures in processes from steelmaking and rolling through product shipment, including the following:

- Establishment of production process for a high-function steel, taking advantage of high purity blast furnace hot metal, and processed by KSC's unique production line featuring newly developed continuous forging machines annexed to the continuous caster.
- Construction of a billet mill with the aims of synchronization and linkage with the steelmaking shop, and a comprehensive quality assurance
- Modernization of the wire rod and bar mill, and the development and introduction of a heavy-duty compact mill, on-line slow-cooling equipment for wire rod material, and a heat-treatment furnace for use with bearing steels
- Construction of a full-length quality assurance system for high-grade wire rod and bar material, employing various types of quality assurance measures from steelmaking and rolling through shipping and a comprehensive quality control system

This type of manufacturing system has made it possible to develop and supply high-function products, such as close tolerance bars; various grades of steels with which heat treatment can be omitted; low-deformation resistance, high carbon steel; and high-drawability, high-tensile strength tire cord. Although a great many technical developments were carried out for the production of these high-grade steels, it can be said that two among them, continuous casting and forging and the grooveless rolling for high-grade steels, are unprecedented and especially noteworthy accomplishments. In particular, the revolutionary continuous casting and forging technology has made it possible to control center-line segregation, which is the most significant drawback of the continuous caster. Moreover, this technique does not merely reduce segregation, but permits the positive control of center-line metallurgical characteristics. It thus repre-

sents a potential major leap forward in the quality of wire rod and bar steels, including steels for ultra-durable bearings, high-drawability, high-workability wire rods, and soft-center, hard-exterior steels.

At present, Kawasaki Steel's wire rod and bar steel output cannot be called great, but we will continue to put every effort into the development and improvement of products which will satisfy our customers, taking advantage of Kawasaki Steel's expertise to enhance our product quality and expand our volume of shipments.