KAWASAKI STEEL TECHNICAL REPORT No. 44 June 2001

Progress in Technological Developments During the Past 50 Years at Kawasaki Steel and Future Prospects*

Synopsis:

Research Laboratories were completed at a location adjoining the company's Chiba Works, making it possible to strengthen technical development further. Kawasaki Steel then proceeded to develop numerous processes which introduced new concepts in advance of the world's other steel makers, and new products which applied new metallurgical principles.

This paper will first describe the brief history of the establishment of Kawasaki Steel, and present an outline of the construction and expansion of the company's two

and the processes which led to the establishment of mass

ture. The subsequent construction of a 4-high cold rolling mill, together with efforts to increase production of the well regarded high grade finished sheets and improve dimensional accuracy, were rewarded with excellent results.

In 1938, Kawasaki Dockyards Co. constructed Nishinomiya Works, which was a special steel bar plant located in Hyogo Pref., and Kuji Works, which produced iron pellets, in Iwate Pref. In the same year, Kawasaki Dockyards Co. changed its name to Kawasaki Heavy

tion of Chita Works, which manufactured special steels,

announced a plan to double the national income of Japan. Because it would have been nearly impossible to

million ton and a combined bloom and beam blank CCM with an annual capacity of 960 000 t. The

which accompanied this high growth policy by expanding Chiba Works alone, Kawasaki Steel began construction of Mizushima Works in July 1961. The fundamental

uous casting (CC) process was a major technical revolution on the same order of impact as the adoption of the large scale BF and the introduction of the LD converter

3.2 Development of High Efficiency Technologies

In the ironmaking division, Chiba Works No. 6 BF

continuous casting operations by developing sequential casting of different grades and automatic slab width changing during casting and applying these technologies

ing new continuous annealing technologies through the construction and operation of this line, the KM-CAL also provided the motive force for subsequent technical innovations. A large capacity, high temperature annealing KM-CAL, which makes practical use of new metal

technology for rolling large section H-shapes from continuously cast slabs in one heat was developed. These technologies made it possible to manufacture virtually all sizes of H-shapes from continuously cast material. In 1981, caliber less rolling for square bars and round bars

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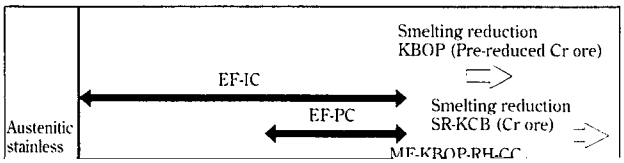
ial in inner and outer panels for automobiles—the com-

pany developed extra-deep drawing high strength cold

Other efforts include conversion from liquid fuels to gas

fuels, the adoption of low NO_X burners, and the devel-

which a large quantity of KPP (Kawasaki plastic coated [redacted] achieving higher equipment efficiency in all [redacted]



such as sheet bar welder, high speed shear, etc. The new process enables lubricated ferrite rolling and heavy reduction rolling, and has made it possible to produce a series of new high performance products which had been impossible to roll by conventional mills. Examples

which uses bainitic transformation and precipitation hardening in ultra low C steel to control strength. Application of TPCP made it possible to achieve as-hot rolled high strength in heavy gauge plates, heavy section

1986, Kawasaki Steel succeeded for the first time in the world in realizing industrial production of austenitic stainless steel pipe, including Mo added SUS316, and dual phase stainless steel pipe. By establishing a mass

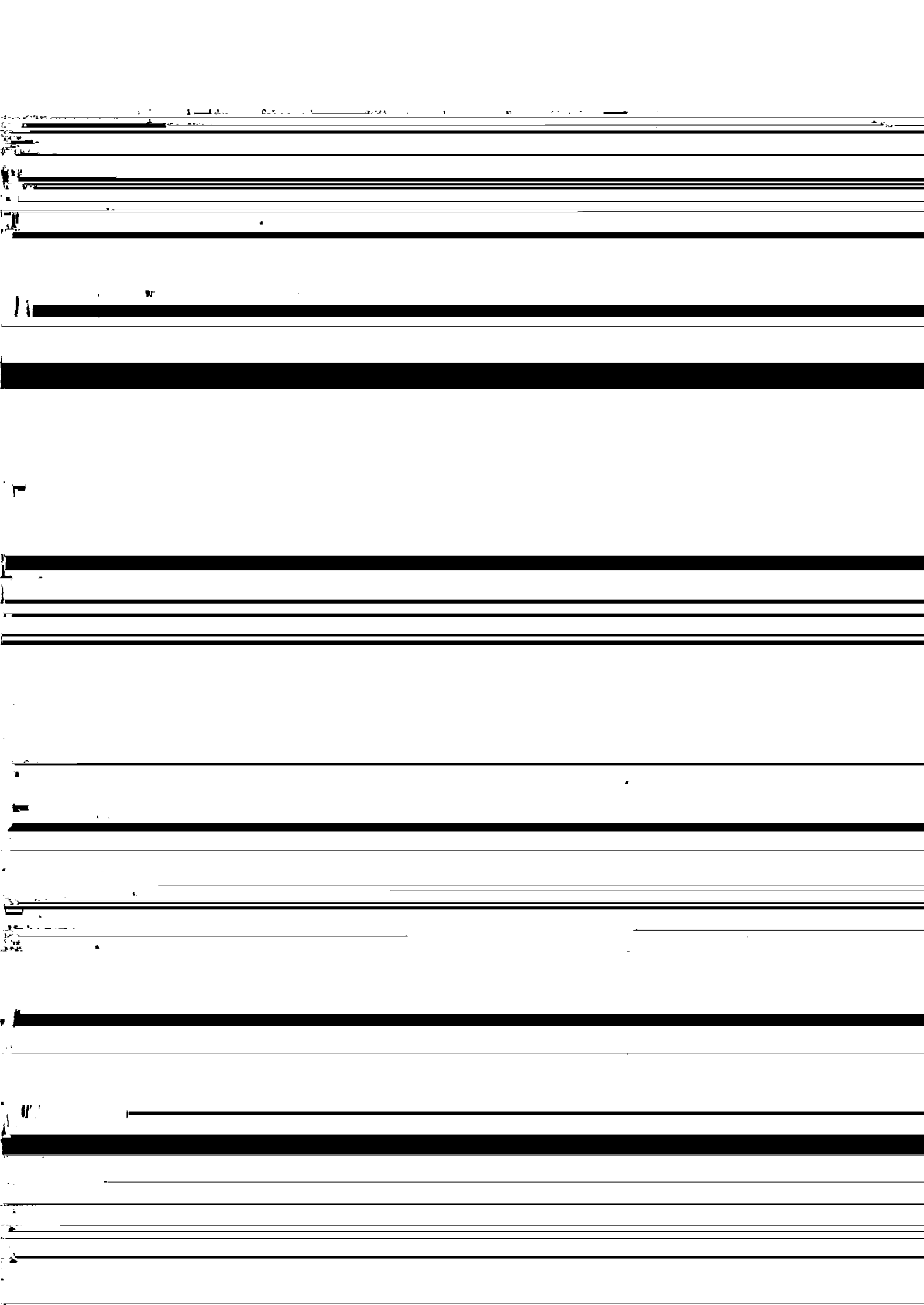
perature and is therefore suitable for such applications,

ment were developed and commercialized. From environmental point of view, Cr-free precoated steel sheets with good electrical conductivity were developed for

constructed a tinplate line outside of Japan in 1973, and started up its 9th overseas tinplate line in 1996 for a client in China.

uct has been adopted in pressed parts for copying

nologies, Kawasaki Steel has commercialized various



ties Industry Law, Kawasaki Steel will enter the wholesale power supply business. The Kawatetsu Clean Power

present, this material is being produced by Kawatetsu Mining Co., Ltd., a member of the Kawasaki Steel

system, and then builds the required properties into the rolling process.

Japan has begun two national projects aimed at the development of innovative steel materials. These are the "Ultra-Steel" and the "Ferritic Super-Metal." The goal of both projects is to obtain strength and toughness by ultra-refinement of the crystal structure, while absolutely minimizing the use of alloying elements. The results of

will therefore strongly promote research and develop-

the center.

6 Conclusion

Because steel is overwhelmingly superior to other materials in numerous respects, including quantity,