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Development in the Quality and Designability of Stainless Steel Sheets

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Synopsis :
This paper summarizes developments in the quality, designability, and multi-functionability of stainless steel sheets. The corrosion resistance of stainless steel has been improved by controlling alloying elem ents in two ways. The first is to reduce carbon to an extra-low concentration, and the second is to increase the content of alloying elements. Also described are improvements in the oxidation resistance and quench-hardenability of stainless steel fo r disk brake use. For desingability, two coloring methods of stainless steel have b

# of Stainless Steel Sheets*

Synopsis:

Table 1 Pitting potentials ($V'_{C,10}$) and major applications of new ferritic stainless steels with low carbon and nitrogen contents

[redacted]	[redacted]	[redacted] (mv SCE)	Major Applications

steels. An extra-low-C ferritic stainless steel containing 26%Cr and 4%Mo has corrosion resistance superior to that of austenitic stainless steel.[6,9,10] Recently, highly alloyed ferritic stainless steels were adopted for con-

environments, promoting the development of stainless steels.

3 Oxidation Resistance

oxidation resistance of ferritic stainless steel developed with that of the conventional stainless steels. In

as R409SR;[16] it is clear that the upper limit of service temperatures is raised as the Si content is increased. However, to maintain good press formability, the prefer-

medium carbon martensitic stainless steels such as SUS429J1 and SUS420J1, the effect of temperature on hardness is extremely great, so it is difficult to obtain

As good oxidation resistance is obtained by forming protective oxide films on the steel surface, in very thin steels such as foil, the amount of alloying elements

hardness of SUS410 is too low. In R410DB, on the other hand, the hardness of the quenched material is independent of quenching temperature. With this steel,

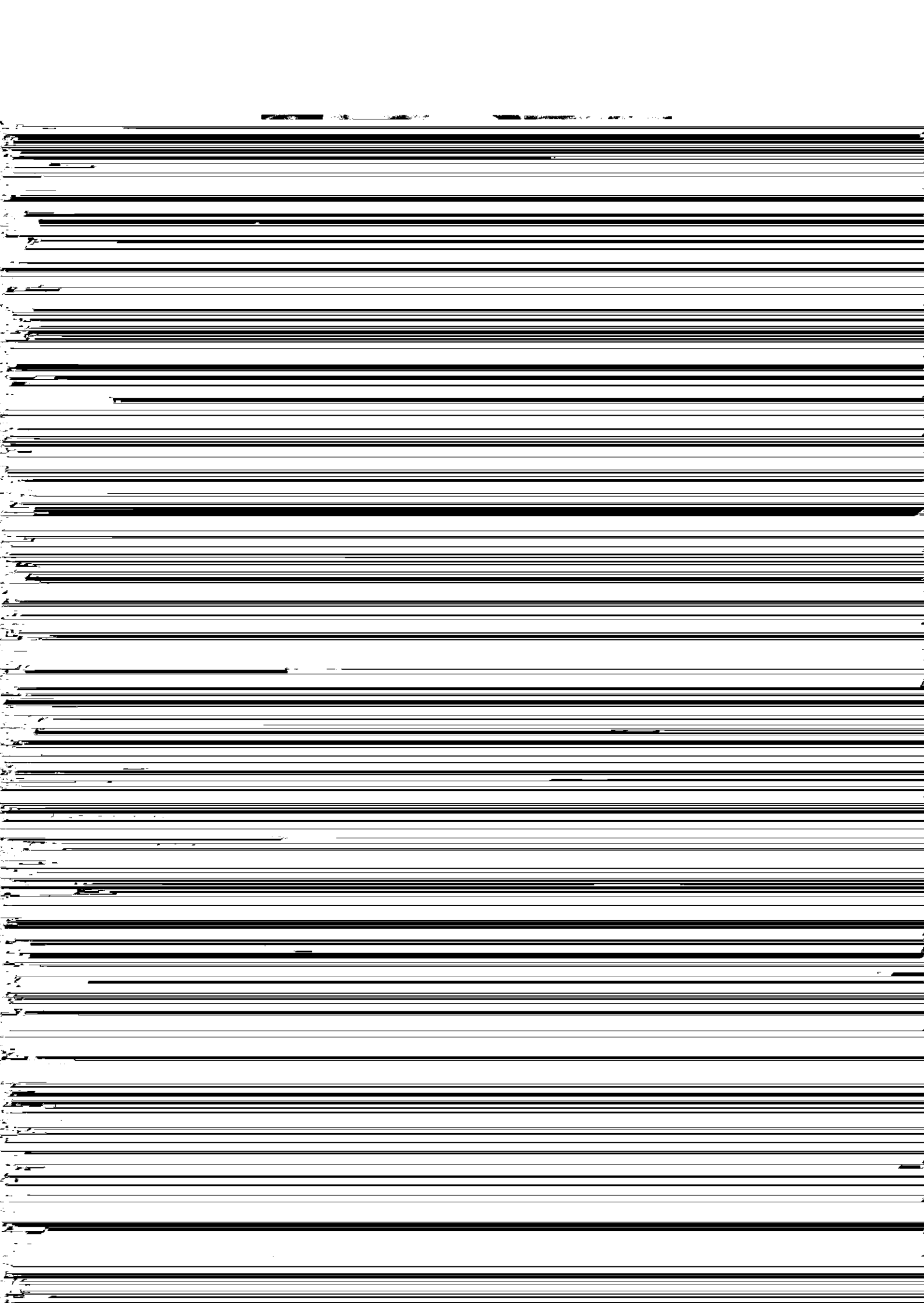
Anodic

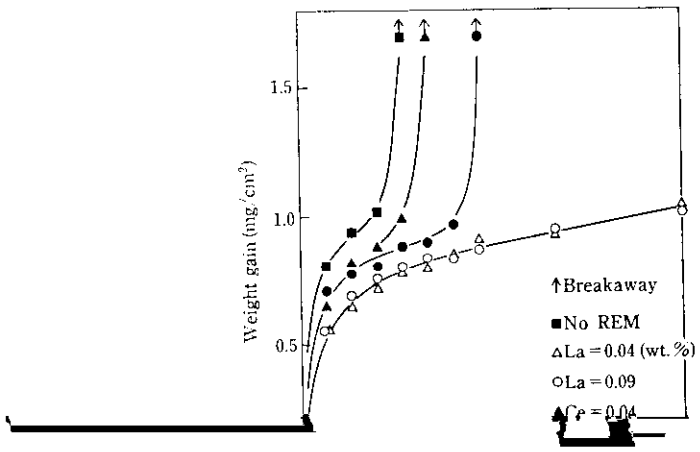
tion is needed for black.

Table 2 Specifications of substrate

Types of steel	SUS 304, SUS 430

6 Development of Multifunctional Steels





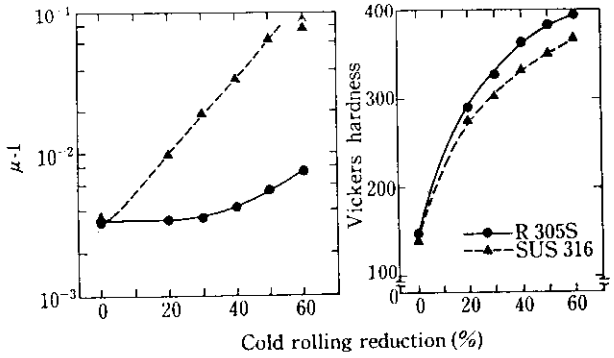


Fig. 11 Changes in permeability and Vickers hard-

Fig. 10 Effects of REM contents on the oxidation resistance of Fe-20Cr-5Al foil 50 μm thick at 1150°C in air

cantly. The optimum composition for nonmagnetic steel tubes was therefore studied.

(2) For the improvement of oxidation resistance, a ferritic stainless steel was developed by increasing the content of Si.
(3) To improve quench-hardenability, a martensitic stainless steel was developed by controlling C, N

shita: "Stainless Steel '77", Sponsored by Climax Molybdenum Co., London, (1977)
4) Y. Ono and H. Kaito: *Kawasaki Steel Giho*, **17**(1985)3, 193
5) K. Yoshioka, S. Suzuki, N. Kinoshita, T. Hirano, Y. Hirose, and M. Kurosawa: *Kawasaki Steel Giho*, **17**(1985)3, 240

after only quenching and does not require temper annealig.

to-Hagané, **70**(1984)13, S1348
7) K. Masamura and I. Matsushima: Proceedings of Fusho-