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] î0 5r c ‰ ¥ ö7Á&"5ð È † 1961 º _ RG b _ ¡ [#Õ#Ø6ä K Z è ¶>* M2 K Z *5r † ì •/¡ †3ã l K>* 1981 º _ c a#ú q 6 _9×&" ° & Ø *5r † b-ç ‰ ¥ ö RGH>& È L 0.23 mm>*0.20 mm>' † _ ì K S X 8 ["@#.$× m 2 _ | •5r † * ö †"z 8>*5ð È/²8 l b É Û ¬ Ð!V!· U 2>&RGHPJ >' > | g ¤(ý A g B 2>& RGHPD>' b&" D š •/¡ †6ä$Î K>* * 5r † š } þ ¦ q \ K Z9× 80Û o † " Z 8 • q3Æ [c>* RGH _ G#Ý K S – å Ä Å ± î b 5 , _ | ~>* l } _&" ° & Ø † ¥ V l O • G \ _ B Œ K>* a#ú q9×(í b&" D š í *5r † , 0 >& New RGH PD >' b i†²$· €¦9³â` † " _&$ • † Î K0ˆa• ¤ ½@Æ˜ ‹‡@È£0 † +1 K S

Synopsis :

Since Kawasaki Steel had begun to manufacture a grain oriented electrical steel sheet "RG" in 1961, it was always seeking after a low iron loss technology to have successfully made the commercialization of "thin gage RGH" (0.23 mm, 0.20 mm in thickness) having high magnetic flux density and low iron loss, in 1981. Then, Kawasaki Steel has developed "RGHPJ" by using plasma jet and "RGHPD" of fine grooving to reduce iron loss, both of which materials obtain a high evaluation as core materials for low iron loss transformers. Recently a heat -resistant domain- controlled new product "New RGH PD" exibiting low iron loss has been commercialized by using a highly grain oriented electrical steel through the improve ment of inhibitors RGH.

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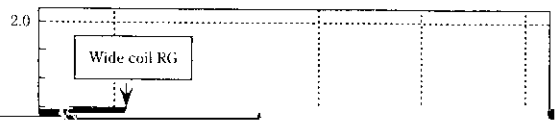
川崎製鉄の方向性電磁鋼板の歴史と最近の進歩*

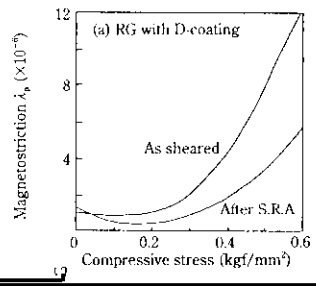
川崎製鉄技報
29 (1997) 3, 129–135

History and Recent Development of Grain Oriented Electrical Steel at Kawasaki Steel

要旨



	Si	Mn	Se	Sb
(a)	2.93	0.05	0.031	—
(b)	2.91	0.05	0.020	0.033
(c)	2.95	0.05	0.022	0.061


(a) RG with D-coating
As sheared
After S.R.A
Magnetostriction λ_p ($\times 10^{-6}$)
Compressive stress (kgf/mm^2)
12
8
4
0
0.2
0.4
0.6

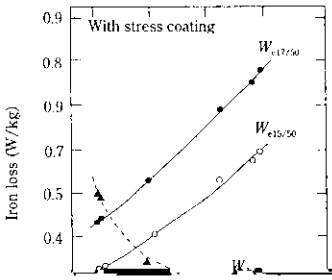

With stress coating
Iron loss (W/kg)
0.9
0.8
0.9
0.7
0.5
0.4

Table 3 Specification and typical magnetic properties of thin gauge RGH in 1983

Grade	Thickness	Specification		Typical magnetic properties		
		$W_{15/60}$(W/lb)	$W_{17/50}$(W/kg)	$W_{15/60}$(W/lb)	$W_{17/50}$(W/kg)	B_8(T)
8 mil MOH	0.20 mm	≦ 0.38	≦ 0.98	0.36	0.88	1.89
9 mil MOH	0.23 mm	≦ 0.40	≦ 1.00	0.38	0.92	1.89

Table 4 Specification and typical magnetic properties of RCMP Land RCHP1 in 1999

Table 5 Typical magnetic properties of New RGH

今後の技術開発の展望としては，前述したように方向性電磁鋼板