KAWASAKI STEEL GIHO
Vol.30 (1998) No.3

Development of Heavy Section Steel Plates with Improved Internal Properties through Forging and Plate Rolling Process Using Continuous Casting Slabs

(Kiyomi Araki) (Takeshi Kohriyama) (Motoshi Nakamura)

:

-

400 MPa 240 mm

1.3

Synopsis :

Heavy steel plates with thickness of over 150 mm have usually been manufactured by using materials obtained through ingot casting process, in consideration of the internal properties. The possibility of applying a forging process before plate rolling was investigated to secure both homogeneous and sound internal properties by using continuous casting slabs, instead of ingot casting slabs. When a certain annihilation of center porosities is considered, a forging method with reduction in widthwise direction before reduction in thicknesswise direction of slabs was found to be very effective. As a result of the application of this process for TS: 400 MPa class steel, it is concluded that excellent internal properties can be obtained in the manufacture of heavy steel plates with thickness of up to 240 mm (reduction ratio: 1.3).

連続鋳造スラブ鍛造による
内質特性の優れた厚肉鋼板の製造技術*

川崎製鉄技報
30 (1998) 3, 181-185

Development of Heavy Section Steel Plates with Improved Internal Properties through Forging and Plate Rolling Process Using Continuous Casting Slabs

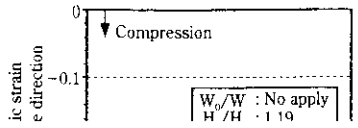


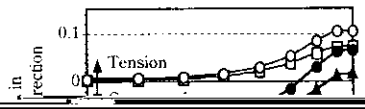
要旨

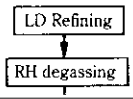
連続鋳造スラブを用いた厚肉鋼板の製造において、厚板圧延前にセンターポロシティの圧着に有利な鍛造プロセスを適用する方法を

Table 1 Condition of elastic-plastic stress calculation

Dimension of slab (mm)	310 × 2 240 × 3 000
Heating temperature (°C)	1 250




0.1
0
Tension
in
rection


LD Refining
RH degassing

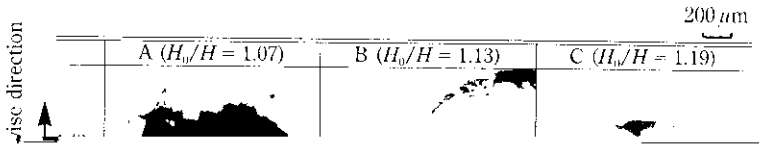


Photo 1 Micrographs of center porosities

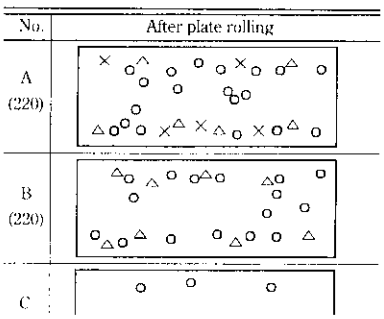
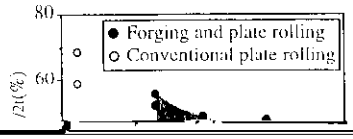


Table 7 Results of tensile test

No.	Location	Direction	YP (MPa)	TS (MPa)	El (%)	RA (%)
A			219	432	20	28
			217	426	19	27
			217	425	19	22
B			218	432	25	36
			216	430	20	29
			217	428	24	35
C	1/2 t	Z	218	435	25	37



スでの $RA(Z)_{1/2t}$ は，製品厚 150 mm 以上で急に低下する傾向があるが，本製造プロセス適用鋼板では高位であることが分かる．