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3?!T-RH +: ž « b) œ O _ | •9× 2A6+4 #Ý(ò ¦ b0 4
Producing High Quality Forging Ingots by LD-RH Process

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\&k È å0 5r d _ > 8 Z c>* Y(ç"@ –(ò b a ^ 83?!T P5ð †(-6 µ+ b9× 8 100t-LRF _ j)% M •>*3?!T-LRF É ß - « _ | ~>*9× 2A b6+5ð †0 4 K Z A S M ‰>* q , b0 5ð • /¡>* M ^ ƒ U3?!T _ > E •>0 G ¿6 2 _ | • *!å5ð0 4 •/¡>* RH +: ž « b#” v5 Q ± _ | •>& O>>*&H>' b * ö •/¡ I } _>* ë Ò b a ^ 8 ± º p'55ð " b0 4 •/¡'¼ b) œ O _ | ~>* 3?!T-RH +: ž « É ß - « [v>* q ± "5 320t r [b9× 2A5ð " b0 4 † •+ \ K S

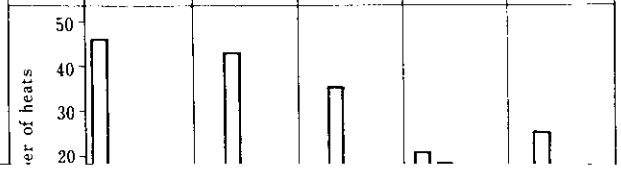
Synopsis :
High quality steel forgings have so far b een produced at Mizushima Works from hot metal low in impurity contents via LD-LRF process excellent in refining function. Modification of the process is successfully attempted here to further upgrading and sealing up the forgings. The modification consists of converting LRF to RH, and involves better dephosphorization by double tapping blowing in LD, improved removal or oxygen and hydrogen by intensifying melt circulati on in RH, and decreased solute segregation by teeming thus refined melt in to hollow ingots of up to 320t.

用途に応じて菊型鍛造用鋼塊，または中空鋼塊に無酸化下注造塊法で鋳造する。

上述の製造プロセスの特徴を要約すれば次のとおりである。

(1) 精錬用主原料は，高炉溶銑のみであるため，スクラップを使用する電気炉鋼に比較して Cu, Co, As, Sb, Sn 等の不純物元素が少ない。

Element	Cu	As	Sn	Sb	Co
Standard	≤0.02	≤0.004	≤0.002	≤0.0005	≤0.005



100 [redacted] 出鋼温度(1,200℃)と 1 次吹錬終了から 2 次吹錬装入までの温


Double tapping
Single tapping
12
10

5 極低硫鋼の製造技術

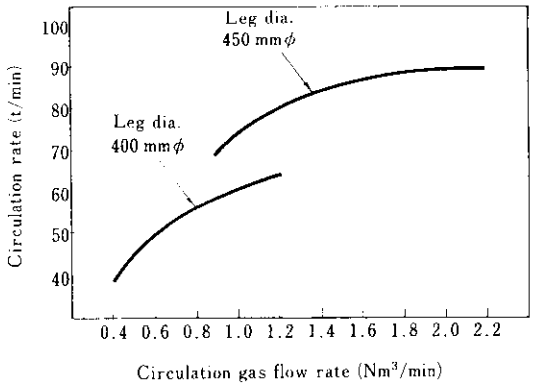
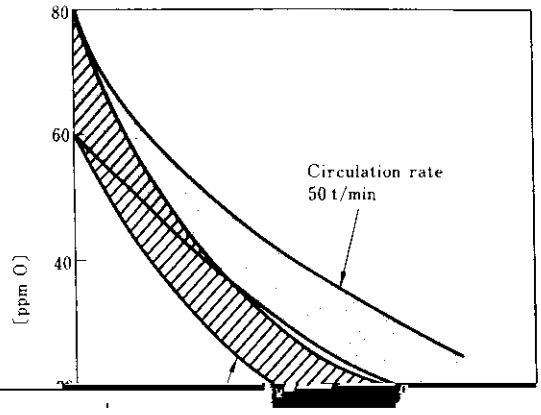


Fig. 15 Influence of gas flow rate and leg diameter on circulation rate of molten steel



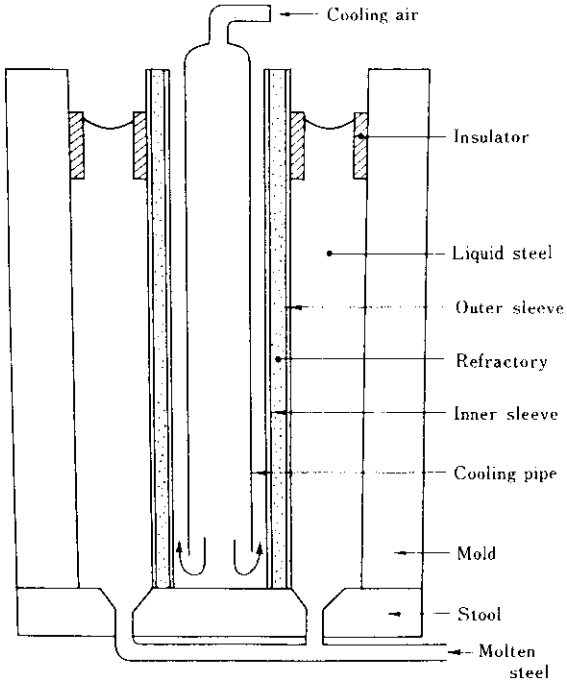


Fig. 18 Schema of hollow ingot casting assembly

Table 2 Comparison of solidification time between conventional ingot and hollow ingot

Ingot weight (t)	Solidification time (h)	

鋼塊が通常菊型鋼塊にくらべ有利である。さらに，内面側にも
健全な初期凝固層が形成されることは，円筒状製品の内面の健

	Top	Middle	Bottom
[H]$_{ppm}$ (%)			

11) 飯田義治・山本進美・「大型鍛造用中空鋼塊の開発」，鉄と鋼，65 (1979) 4，S203