KAWASAKI STEEL GIHO
Vol.18 (1986) No.1

Production of High Carbon Steel by Using Preliminarily Treated Hot Metal in Top and Bottom Blown Converter

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:

1 90 (K-BOP)

(1) (2)

(3) Mn

(4)

Synopsis :

Approximately 90% of high carbon steel is produced by a process newly developed at No.1 Steelmaking Shop of Chiba Works. This new process, which uses dephosphorized hot metal and top-and bottom-blown converter (K-BOP), can achieve the maximum benefits of compound metallurgical techniques. Its features are following. (1) Heat compensation by coke charging through application of desulfurization in gas phase to prevent sulfur pick-up. (2) Reduction of manganese ore by carbon in low oxygen potential (3) Desulfurization, deoxidization and chemical adjustment by reduction refining Significant benefits, such as decrease in flux and alloy consumption, lowering of tapping temperatures, and improvement on quality including cleanliness are achieved by this newly-developed process.

上底吹き転炉における予備処理溶銑を用いた高炭素鋼の製造*

川崎製鉄技報
18 (1986) 1, 14-19

Production of High Carbon Steel by Using Pre[illegible]

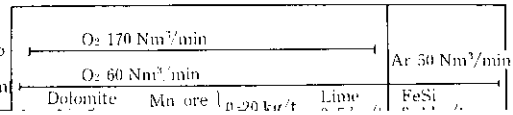
Treated Hot Metal in Top and Bottom Blown Converter

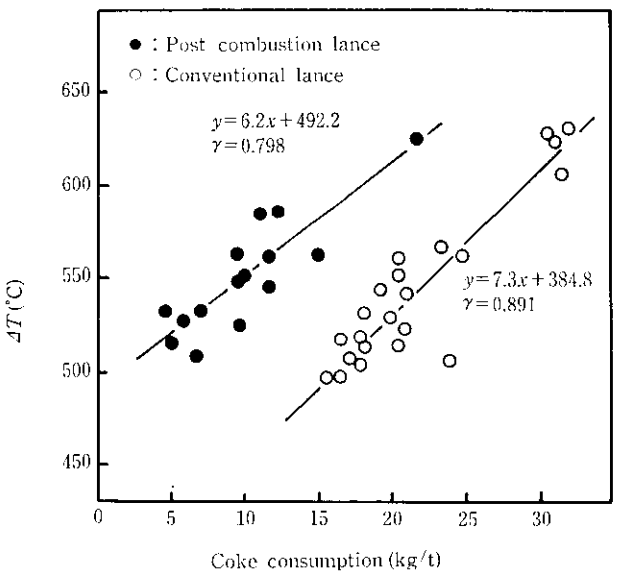
要旨

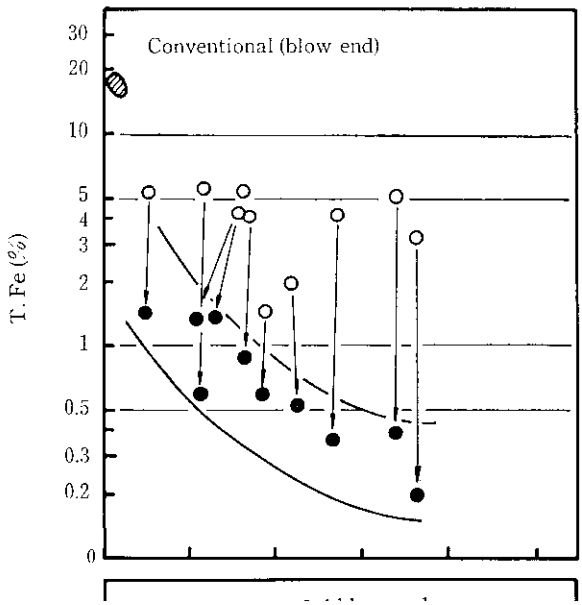
千葉製鉄所第1製鋼工場では高炭素鋼の約 90% を予備処理溶銑

2.1　溶銑予備処理

本プロセスの特徴の一つは溶銑段階でPを除去し，転炉での脱P




● : Post combustion lance
○ : Conventional lance
y=6.2x+492.2
γ=0.798
y=7.3x+384.8
γ=0.891
ΔT (°C)
650
600
550
500
450
0
5
10
15
20
25
30
Coke consumption (kg/t)


Conventional (blow end)
T. Fe (%)
30
20
10
5
4
3
2
1
0.5
0.3
0.2
0

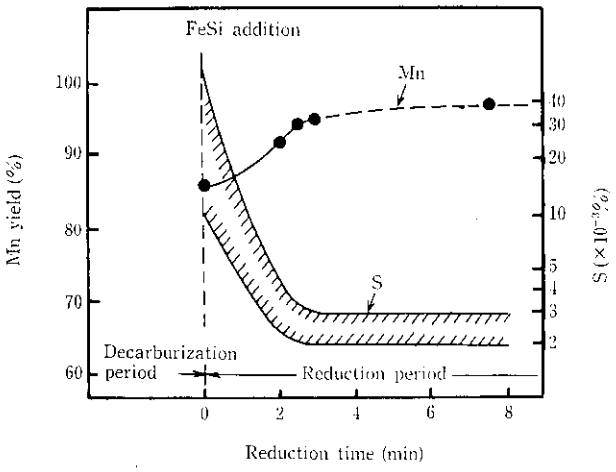
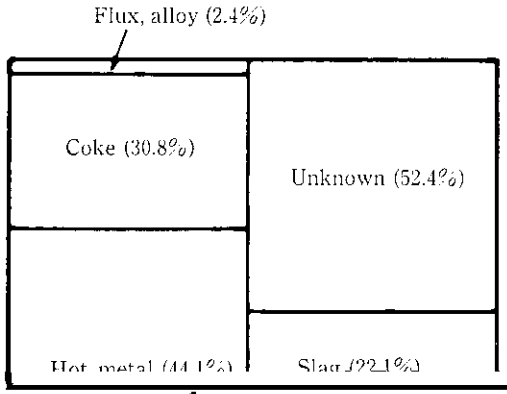
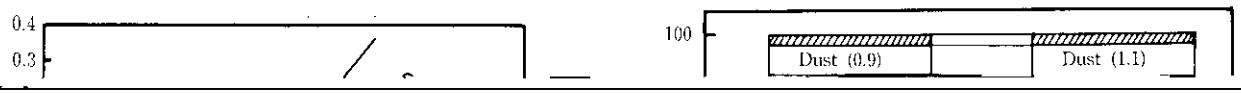


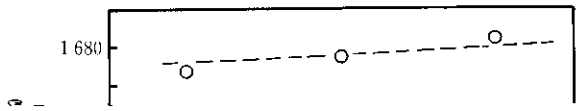
Fig. 7　Change of Mn yield and S content during reduction period

K-BOP 特有のものである。

この気化脱硫により還元期の脱硫負荷は著しく軽減され，極めて少量の造滓材と短時間の還元処理により，溶鋼S 0.005% 以下に低下する。還元期脱硫反応の状況を **Fig. 10** に示す。ここで重要な




0.4
0.3
100
Dust (0.9)
Dust (1.1)



品質面においても転炉内でSiにより脱酸され，50 ppm 程度まで酸素が低下する。従って出鋼後の Al 歩留りは非常に高く脱酸生成物も少ない。さらに，Sも低レベルであることも寄与し，極めて清