

Progress of Stainless Steel Production by Top and Bottom Blown Converter

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(K-BOP)

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Synopsis :

Taking the chance of stainless steelmaking integration at Chiba Works in April 1981, an 85 t new UHP melting furnace (MF) was erected and existing LD converters were converted into top and bottom blown converters at Chiba No.1 steelmaking shop for rationalization of the stainless steelmaking process. Saving energy by replacing electric

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要旨

ステンレス鋼の精錬部門を合理化するために、昭和56年に千葉製鉄所第1製鋼工場の既存上吹き転炉を上底吹き転炉(K-BOP)に改造するとともに溶解炉を新設し、千葉製

Synopsis:

Taking the chance of stainless steelmaking integration at Chiba Works in April 1981, an 85 t new UHP melting furnace (MF) was erected and existing LD converters were converted into top and bottom blown converters at Chiba

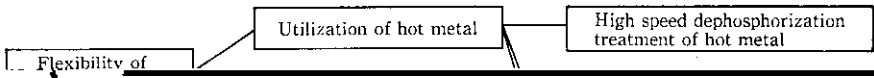


Table 2. Changes in chemical compositions and temperature

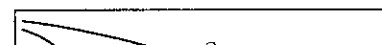
during hot metal treatment

	Chemical composition (%)					Temp. (°C)
	C	Si	Mn	P	S	
Tapping from BF	4.50	0.25	0.30	0.140	0.035	1 480
Before treatment	4.50	0.10	0.25	0.140	0.035	1 380
After treatment	4.25	Tr	0.22	0.020	0.020	1 280

あり、加えて以下の利点を有する多機能な精錬炉である。

- (1) 上吹きランスを備えているため、加炭吹錬、炉内2次燃焼などの熱補償に有利かつ生産性が高い。
- (2) プロパン、その他の冷却ガスが使用できるので羽口保護に有利である。
- (3) 生石灰粉インジェクションが可能のため、還元期の脱硫に有利である。

で、設備の稼働率は極めて高く、またステンレス鋼増産への対応も容易である。



(Input)		(Output)	
Shortage (5.7%)	Oxidation (60.0%)	Vessel, (14.2%) Lance, etc.	Molten steel (63.2%)
Hot metal (34.3%)		Waste gas (9.2%)	
		Slag (13.4%)	

Fig. 5 Heat balance of hot metal process

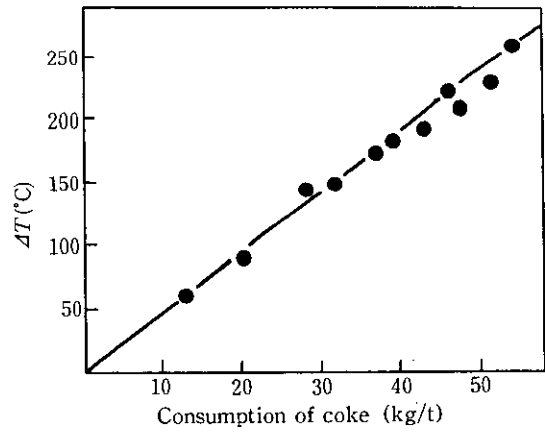


Fig. 7 Relationship between consumption of coke and increase of temperature of molten steel

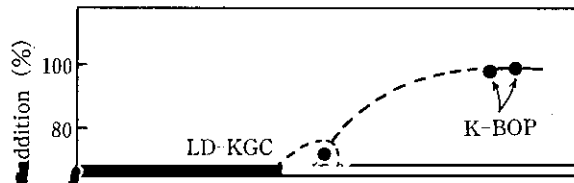


Table 3 Heat efficiency of coke

Chemical reactions	Chemical content	
$C \rightarrow CO$	83%	2 034 kcal/kg·coke
$CO \rightarrow CO_2$	7.2%*	341 kcal/kg·coke
Sensible heat of CO	—	-785 kcal/kg·coke
Sensible heat of H ₂	—	—

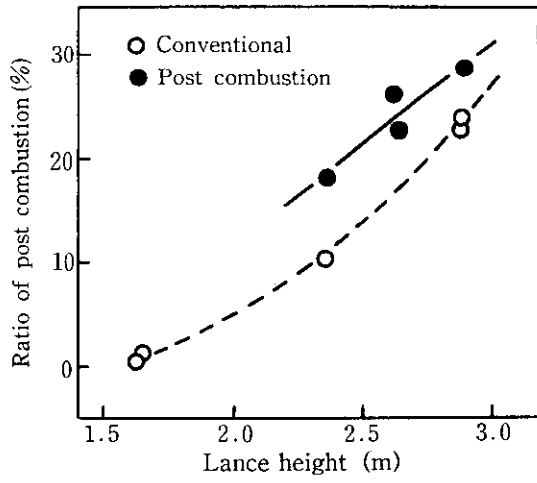


Fig. 8 Relation between lance height and ratio of post combustion

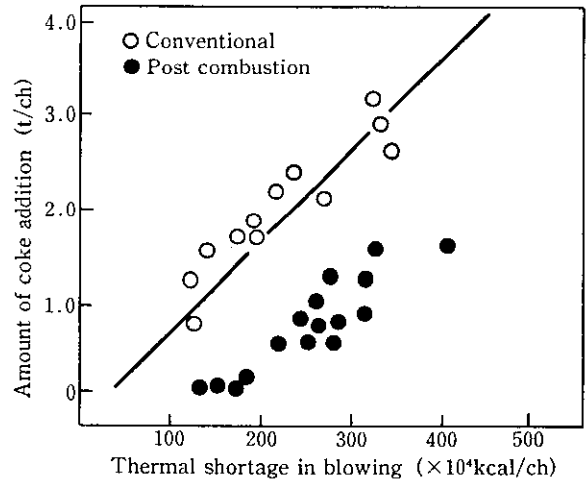
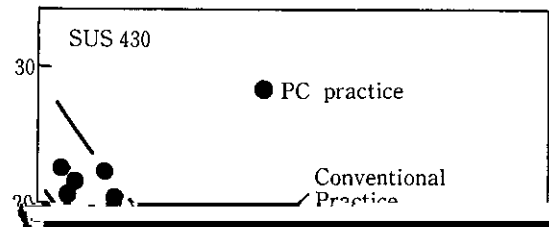
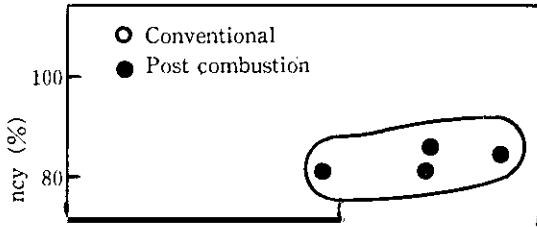


Fig. 10 Relation between thermal shortage in blowing and amount of coke addition

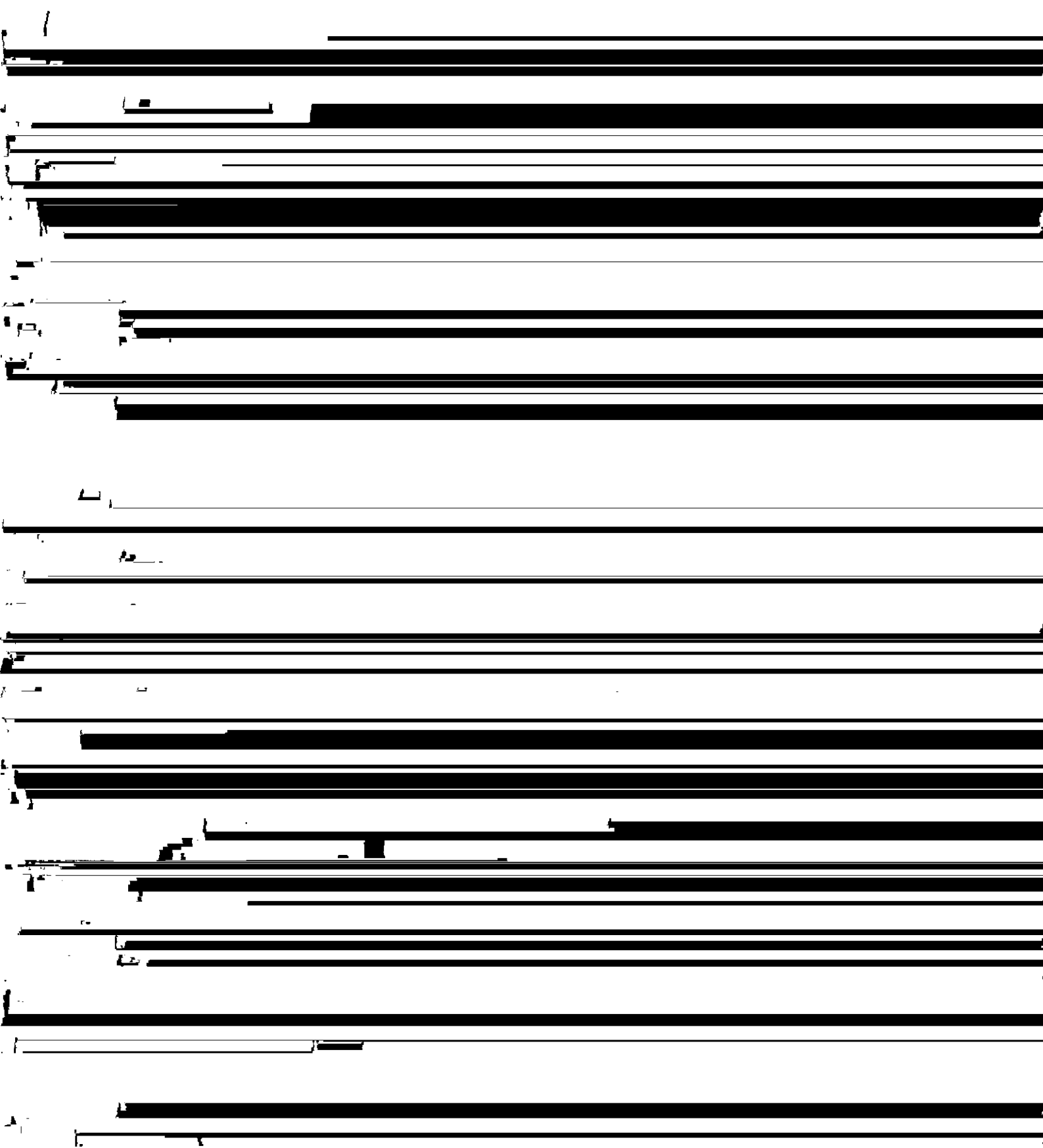


この場合、 P_{Fe} の測定値が、 P_{Fe} の値は増加している。そのことより、 P_{Fe} は P_{Fe} の値の増加の傾向

のフェーズではスラグ公称値からスラグ相の P_{Fe} を推定し、 P_{Fe} によるものと推定できる。

Optimum period for
Mn ore addition

SUS 304



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