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Optimized Decarburization Process for Stainless Steel with Combination of Refining in Converter and RH Degasser

Masanori Nishikoori, Chikashi Tada, Hiroshi Nishikawa

Synopsis :

A new combined decarburization process for the production of stainless steel has been established at No.1 steelmaking Shop in Chiba Works of Kawasaki Steel Corp. The process utilizes K-BOP (top and bottom blowing converter) for decarburizing the stainless steel melt with an oxygen/inert gas mixture and KTB method during RH degassing (oxygen top blowing onto the molten steel in vacuum vessel) for efficient vacuum decarburization. By this process, it has become possible to produce high chromium stainless steel with ultra-low carbon and low nitrogen more easily and with higher productivity than the conventional K-BOP and VOD process. The carbon and nitrogen contents of the steel product obtained by the new process are low enough and equivalent to those by the K-BOP and VOD process. Another advantage of the KTB method is higher oxygen-utilizing efficiency for decarburization during RH degassing by the optimized operation of oxygen blowing for the production of a certain steel grade such as SUS 304 whose upper limit of nitrogen content is relatively high.

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The body can be viewed from the next page.

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introduction of this K-BOP-KTB process, together with measures for the effective use of the KTB.

3 Necessity of Vacuum Oxygen-Blowing Decarburization Process in Production

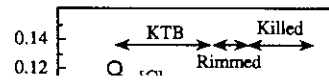
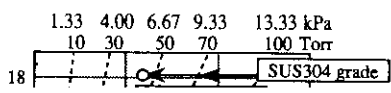
Works

The flow of the stainless steel production process at Chiba Works No. 1 Steelmaking Shop is shown in Fig. 1. The Cr source in the steel

An essential task in refining stainless steel is to promote decarburization while suppress Cr loss to oxidation. It is generally known that reducing the partial

40
kg/t
(SUH409 grade)

1.0
0.8
mm
(SUS430 grade) KTB K-BOP



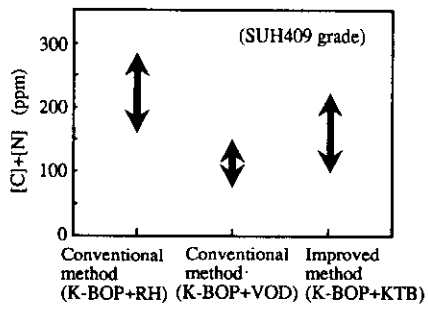


Fig. 10 Comparison of final [C] + [N] level between experimental and conventional method (SUH 409 grade)

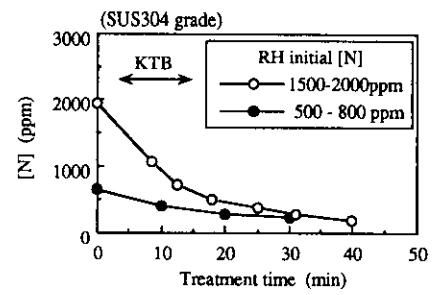


Fig. 11 Change in nitrogen content during RH treatment (SUS 304 grade)

gen is consumed by decarburization. The oxidations of



(SUS304 grade)

base

(3) SUS 304 and other steel grades with relatively high
ranges of refining target [N] are processed by N.