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Development of Centrifugal Cast Roll with High Wear Resistance for Finishing Stands of Hot Strip Mill

Kenji Ichino, Yoshihiro Kataoka, Tomoya Koseki

Synopsis :

A high C - high V type alloyed steel roll has been developed, which significantly increases wear resistance while maintaining the same productivity as the conventional roll. This paper describes the manufacturing concept of the developed roll and its characteristics: (1) The difference in specific gravity between primary crystals and residual molten steel segregates vanadium-carbides in the inner layer of a roll shell during centrifugal casting. (2) The addition of an appropriate amount of Nb makes the compound carbides of (V, Nb) C, which have a specific gravity similar to that of residual molten steel. (3) The uniform distribution of MC type granular carbides has been achieved in the roll made of 2 mass% C - high V - Nb bearing-type alloyed steel. (4) The increment of tough carbides with the increase in C, Cr and Mo content is effective in suppressing increases in rolling load and in improving the wear resistance of the roll. (5) The developed rolls have wear resistance that is more than 4 times as high as conventional rolls and have been successfully used at the finishing stands of hot strip mills.

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Development of Centrifugal Cast Roll











Tomova Koseki

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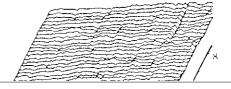
als used for investigating the effect of alloy element on the wear resistance of rolls. These materials were made by the atmospheric melting process and subjected to the cates that in the case of the centrifugal cast roll, the carbides of VC with a small specific gravity segregate in the inner surface side of the equiaxed grain region owing to the centrifugal force, as shown in **Fig. 1**. This phenomenon can be explained in terms of the difference in specific gravity between the primary crystal and the residual molten steel. To prevent this carbide segrega-

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