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Development of New Type Indefinite Chilled Double Poured Cast Iron (ICDP) Work Roll with Higher Wear Resistance

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Abstract. In the recent hot strip rolling Mills, High Speed Tool Steel Roll with high alloyed outer-shell which contains much alloy elements to form the carbides, is getting popular in their usage.
Now in the finishing stands of Japanese hot strip mills, the roll materials of the earlier finishing stands (F1 to F3) and a part of later finishing stands (F4 to F5) have been changed to the high speed steel from the conventional materials of high Cr (earlier finishing stands) and ICDP (later finishing stands).
On the other side, High Speed Steel Roll in the finishing last stand of hot strip mill (F7) is very limited in their usage because of their low threading efficiency and low resistance to the mill incidents.
Therefore the conventional ICDP roll is still applied in the finishing last stand (F7). However, the demand to improve the wear resistance of the ICDP Roll is getting stronger because of the big difference of the limit in rolling volume between high speed steel rolls stands and conventional material rolls stands.
For this technical subject, we researched to find the way to contain the MC Type Carbide of the high speed steel roll into the conventional ICDP Roll and we succeeded to develop the new type ICDP Roll which makes it possible to add the excellent wear resistance to the conventional ICDP roll with high resistance to the mill incidents through the research to find the suitable volume of Chromium(Cr), Molybdenum(Mo) and the forming elements of MC Type Carbide like Vanadium(V).
This newly developed ICDP Cast Iron Work Roll offers not only the excellent wear resistance but also the big improvement of the uniformity of the micro structure, and it is proved to be the most suitable roll material for the finishing last stand (F7) of the hot strip mill through the actual application in Japanese mills.

***Key words**: centrifugal casting, roll, ICDP, wear resistance*