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Development of Ni-Fe alloy Plating for Prol onging Mold Life of Continuous Steel Casting

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Synopsis :
Through Kawasaki Steel Corporation's platin g experience consecutively with Cr, Ni and MC (Multi-Coating) on the inner surface of the continuous casting mold, a Ni-Fe (4-10%) alloy has been newly de veloped for a single layer pl ating. Auxiliary anodes are adopted for the assembled mold plating prac tice to obtain plating layer uniform in thickness along the horizontal section. Tape red plating technique is also developed to realize thin plating at the upper part of the mold in consideration of high thermal conductivity, and thick plating at the lower part from the viewpoint of good wear resistance. Ni-Fe plating has a higher heat conductivity than Ni plating and MC, and shows an excellent wear resistance at higher temperatures such as 400 ¥. Commercial application of the tapered single layer Ni-F e plating proved a longer mold life, with mold cost per ton of strand reduce d by 25% for bloom and 43% for slab.

The body can be viewed from the next page.

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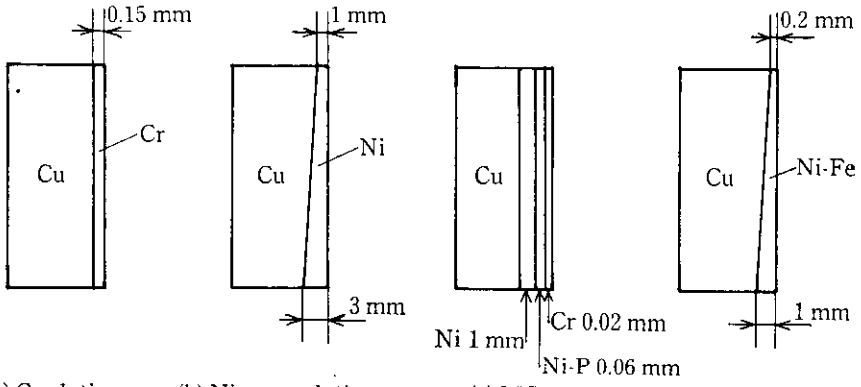


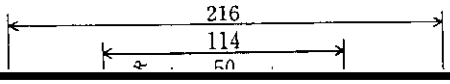
(a) Cr plating (b) Ni taper plating (c) MC (d) Ni-Fe plating

On the other hand, MC is composed of multilayer deposits of Ni, Ni-P and Cr. Ni-P layer, which comes

80	○	Without stress-reducing reagent	TS	El.	Type of plating	Reagent addition


Main anode
Auxiliary anode
With subsidiary anode

Heat treatment	Ni	Ni-4.7%Fe	Ni-7.9%Fe*



heat treatment. Breaking was found on base material of copper for both platings, and therefore adhesion of plating layers is considered to be sufficient.

cooled thereafter. Wear of these pieces was then measured by Tabor Wear Test, and **Fig. 9** represents the results. Thickness of plating material divided by value of this wear gives the wear resistance which is

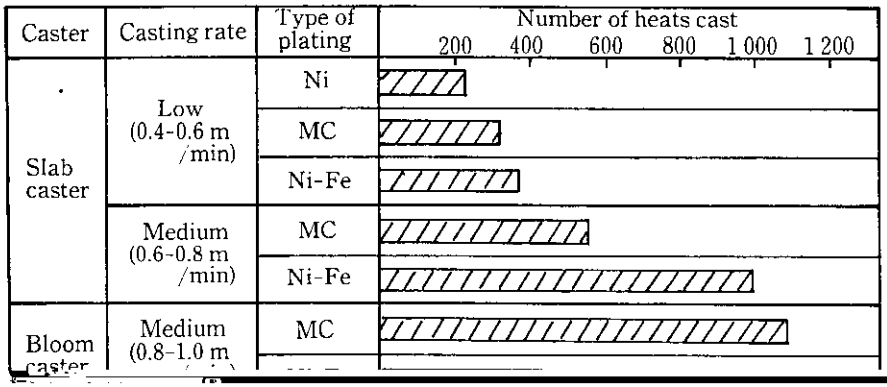


Fig. 10 Comparison of mold life between different types of mold plating

4 Service Life and Life Cycle Cost of Mold Copper Plate

Fig. 10 represents compared service life by plating material of Ni-Fe plating, etc. now used in the process