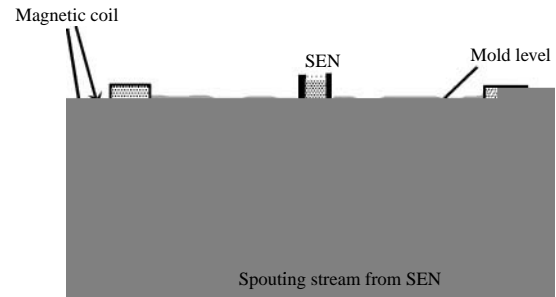


Molten Steel Flow Control System in Mold by Electromagnetic Force[†]

0- Hmsqnc t bshnm

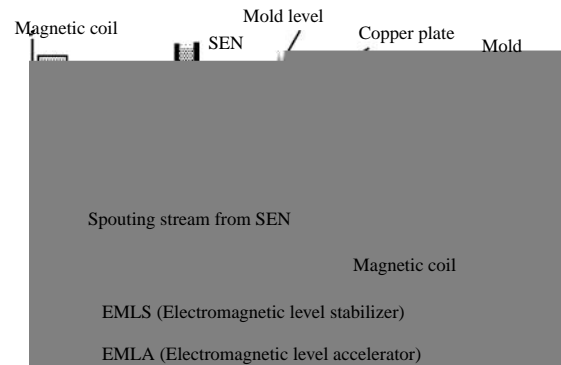
In continuous casting of steel, the following are essential goals:

- (1) Stable high efficiency casting (breakout-less continuous casting)
- (2) Casting of very clean steel with minimal inclusions
- (3) Improved yield by eliminating the need for CC slab conditioning
- (4) Energy saving by direct rolling



- Upper magnetic field → Improvement of surface quality
 - Stabilization of mold level fluctuation
 - Prevention of mold powder entrapment
- Lower magnetic field → Improvement of internal quality
 - Reduction of penetration of inclusion into the strand
 - Reduction of bubble of inclusion entrapped in slab

Fig. 1 Molten steel flow control by static magnetic field



Developed flow control technology by traveling magnetic field
→ Realized optimum flow control as cast conditions change

Minimization of non metallic inclusions entrapped in slab by optimum meniscus flow control by EMLS/EMLA with automation.

Fig. 2 Molten steel flow control by traveling magnetic field

ling the flow rate at the molten steel meniscus

- (3) Prevention of inclusion entrapment by controlling the downward flow of molten steel

2- Rt odqhnqhsx ne IED Sdbgmknfhdr

JFE-type molten steel flow control systems are superior in the following points:

- (1) Optimization of the molten steel flow pattern in the mold is possible.
- (2) Automatic computer control of the applied magnetic flux density is possible.

FC-Mold: Unique automatic control of applied mag-

netic flux density

EMLS/EMLA: Automatic control of direction and intensity of traveling magnetic field

As a result, it is possible to realize stable, highly efficient continuous casting operation in the production of high quality, as-cast (conditioning-free) slabs.

3- Dw` l old ne @ookhb`shnm ne Bn l o t s d q sn @bst`k Bnmshmt n tr B`rshmf L`bghmd

JFE Group's molten steel flow control system enables automatic computer assisted operation from the start

[†] Originally published in *JFE GIHO* No. 3 (Mar. 2004), p. 68

