

Title (en)
Preventing pencil pipe defects in steel

Title (de)
Verhinderung von Gussblasen in Stahl

Title (fr)
Prévention de soufflures dans l'acier

Publication
EP 0982088 A1 20000301 (EN)

Application
EP 99304054 A 19990525

Priority
US 12661798 A 19980731

Abstract (en)
A method of eliminating pencil pipe defects in steel includes the step of flowing molten steel through a passageway (P) that may be formed by: an upper tundish nozzle (14) disposed beneath a tundish (12); nozzle plates (16) for controlling flow of the molten steel; and an entry nozzle (18) disposed between the nozzle plates and a mold. Nitrogen-containing gas is directed under predetermined gas flow conditions along substantially an entire length of the passageway. The gas may be directed to portions of the passageway formed by the upper tundish nozzle and the nozzle plates and into the passageway. The molten steel may be exposed to the gas directed under the predetermined gas flow conditions to a portion of the passageway formed by the entry nozzle. Instead of or in addition to exposure to the nitrogen-containing gas, the molten steel may be exposed to a reactive surface (94) formed of a CaO-ZrO₂ composition, the reactive surface forming a portion of the entry nozzle. The nitrogen-containing gas may also be directed through a porous refractory sleeve of the entry nozzle and into the passageway. The gas flow conditions are effective to eliminate pencil pipe defects in the steel. <IMAGE>

IPC 1-7
B22D 11/10; **B22D 41/58**; **B22D 41/42**

IPC 8 full level
B22D 11/10 (2006.01); **B22D 11/11** (2006.01); **B22D 41/00** (2006.01); **B22D 41/42** (2006.01); **B22D 41/58** (2006.01)

CPC (source: EP KR)
B22D 11/10 (2013.01 - KR); **B22D 11/11** (2013.01 - EP); **B22D 41/00** (2013.01 - KR); **B22D 41/42** (2013.01 - EP); **B22D 41/58** (2013.01 - EP)

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Designated contracting state (EPC)
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DOCDB simple family (publication)
EP 0982088 A1 20000301; AU 2251699 A 20000224; CA 2268673 A1 20000131; JP 2000079453 A 20000321; KR 20000011248 A 20000225

DOCDB simple family (application)
EP 99304054 A 19990525; AU 2251699 A 19990330; CA 2268673 A 19990408; JP 17051699 A 19990617; KR 19990014876 A 19990426