

Title (en)
COMPLEX-PHASE STEEL HAVING HIGH HOLE EXPANSIBILITY AND MANUFACTURING METHOD THEREFOR

Title (de)
KOMPLEXER PHASENSTAHL MIT HOHER LOCHAUSDEHNBARKEIT UND VERFAHREN ZUR HERSTELLUNG DAVON

Title (fr)
ACIER À PHASE COMPLEXE AYANT UNE FACULTÉ D'EXPANSION DE TROUS ÉLEVÉE ET PROCÉDÉ DE FABRICATION POUR CELUI-CI

Publication
EP 4036267 A1 20220803 (EN)

Application
EP 20869076 A 20200925

Priority

- CN 201910920750 A 20190927
- CN 2020117724 W 20200925

Abstract (en)
Disclosed in the present invention is complex-phase steel having high hole expansibility. The complex-phase steel has a microstructure of ferrite and bainite. The complex-phase steel having high hole expansibility comprises the following chemical elements in percentage by mass: C: 0.06-0.09%, Si: 0.05-0.5%, Al: 0.02-0.1%, Mn: 1.5-1.8%, Cr: 0.3-0.6%, Nb≤0.03%, Ti: 0.05-0.12%, and the balance of Fe and inevitable impurities. In addition, also disclosed in the present invention is a manufacturing method for the foregoing complex-phase steel having high hole expansibility. The method comprises the following steps: (1) smelting and casting; (2) heating; (3) hot-rolling; (4) phosphorous removal; (5) laminar cooling: a relaxation time period is controlled to be 0-8s, and a laminar cooling rate is 40-70°C/s; (6) coiling; (7) leveling; and (8) pickling. The complex-phase steel having high hole expansibility can simultaneously satisfy the requirements for hole expansibility and good plasticity.

IPC 8 full level
C22C 38/38 (2006.01); **C21D 8/02** (2006.01); **C21D 9/46** (2006.01); **C22C 38/00** (2006.01)

CPC (source: CN EP KR US)
B21C 47/02 (2013.01 - KR US); **C21D 1/02** (2013.01 - EP); **C21D 6/002** (2013.01 - EP); **C21D 6/005** (2013.01 - EP); **C21D 6/02** (2013.01 - EP); **C21D 8/0205** (2013.01 - CN EP); **C21D 8/021** (2013.01 - EP); **C21D 8/0226** (2013.01 - CN EP KR US); **C21D 8/0242** (2013.01 - CN EP US); **C21D 8/0263** (2013.01 - EP); **C21D 8/0278** (2013.01 - EP); **C21D 9/46** (2013.01 - EP); **C21D 11/005** (2013.01 - CN); **C22C 38/02** (2013.01 - CN EP US); **C22C 38/04** (2013.01 - US); **C22C 38/06** (2013.01 - CN EP US); **C22C 38/26** (2013.01 - CN EP KR US); **C22C 38/28** (2013.01 - CN EP KR US); **C22C 38/38** (2013.01 - CN EP KR); **C23G 1/08** (2013.01 - EP); **C23G 3/02** (2013.01 - CN); **C21D 2211/002** (2013.01 - CN EP KR US); **C21D 2211/004** (2013.01 - EP); **C21D 2211/005** (2013.01 - CN EP KR US); **C23G 3/027** (2013.01 - EP)

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)
BA ME

DOCDB simple family (publication)
EP 4036267 A1 20220803; **EP 4036267 A4 20230607**; CN 112575267 A 20210330; JP 2022550329 A 20221201; JP 7375179 B2 20231107; KR 20220073762 A 20220603; US 2022341010 A1 20221027; WO 2021057899 A1 20210401

DOCDB simple family (application)
EP 20869076 A 20200925; CN 201910920750 A 20190927; CN 2020117724 W 20200925; JP 2022519055 A 20200925; KR 20227012051 A 20200925; US 202017762627 A 20200925