

Title (en)
STEEL MATERIAL

Title (de)
STAHLMATERIAL

Title (fr)
MATÉRIAU D'ACIER

Publication
EP 3770291 A4 20211222 (EN)

Application
EP 19772012 A 20190320

Priority
• JP 2019011847 W 20190320
• JP 2018056867 A 20180323

Abstract (en)
[origin: EP3770291A1] Steel according to one embodiment of the present invention has predetermined chemical components, wherein in a region where a distance r from the center of a cross-section perpendicular to the length direction satisfies $0.7R \leq r \leq 0.9R$, structures include ferrite and bainite, the average fraction of the ferrite is in the range of 40 to 70% in terms of area ratio, the total average fraction of the structures other than the ferrite and the bainite is 0% or more and 3% or less on average, and the balance includes bainite; and the standard deviation of a ferrite fraction in the region is 4% or less.

IPC 8 full level
C22C 38/00 (2006.01); **B22D 11/00** (2006.01); **B22D 11/20** (2006.01); **B22D 11/22** (2006.01); **C21D 1/06** (2006.01); **C21D 8/06** (2006.01); **C21D 9/32** (2006.01); **C22C 38/60** (2006.01)

CPC (source: EP KR US)
C21D 1/06 (2013.01 - EP); **C21D 1/18** (2013.01 - EP); **C21D 1/26** (2013.01 - EP); **C21D 1/76** (2013.01 - EP); **C21D 6/004** (2013.01 - US); **C21D 6/005** (2013.01 - US); **C21D 6/007** (2013.01 - US); **C21D 6/008** (2013.01 - US); **C21D 9/0075** (2013.01 - EP); **C21D 9/32** (2013.01 - EP US); **C22C 38/001** (2013.01 - EP US); **C22C 38/002** (2013.01 - EP US); **C22C 38/005** (2013.01 - EP US); **C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C22C 38/06** (2013.01 - US); **C22C 38/20** (2013.01 - EP US); **C22C 38/22** (2013.01 - EP); **C22C 38/24** (2013.01 - EP US); **C22C 38/26** (2013.01 - EP); **C22C 38/28** (2013.01 - EP US); **C22C 38/30** (2013.01 - EP US); **C22C 38/32** (2013.01 - EP US); **C22C 38/42** (2013.01 - KR); **C22C 38/44** (2013.01 - KR US); **C22C 38/46** (2013.01 - KR); **C22C 38/48** (2013.01 - EP KR US); **C22C 38/50** (2013.01 - KR); **C22C 38/60** (2013.01 - EP KR); **C23C 8/02** (2013.01 - EP); **C23C 8/22** (2013.01 - EP); **C23C 8/32** (2013.01 - EP); **C23C 8/80** (2013.01 - EP); **C21D 1/58** (2013.01 - EP); **C21D 8/065** (2013.01 - EP); **C21D 2211/002** (2013.01 - EP US); **C21D 2211/005** (2013.01 - EP US); **C21D 2261/00** (2013.01 - EP)

Citation (search report)
• [XII] US 2016060744 A1 20160303 - KUBOTA MANABU [JP], et al
• [A] JP 4528363 B1 20100818
• [A] JP 4050829 B2 20080220
• See references of WO 2019182054A1

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

DOCDB simple family (publication)
EP 3770291 A1 20210127; **EP 3770291 A4 20211222**; **EP 3770291 B1 20240117**; CN 111868281 A 20201030; CN 111868281 B 20220510; JP 6919762 B2 20210818; JP WO2019182054 A1 20201217; KR 102463278 B1 20221107; KR 20200118854 A 20201016; US 2020407815 A1 20201231; WO 2019182054 A1 20190926

DOCDB simple family (application)
EP 19772012 A 20190320; CN 201980019373 A 20190320; JP 2019011847 W 20190320; JP 2020507893 A 20190320; KR 20207026131 A 20190320; US 201916976379 A 20190320