Title (en)

HIGH-STRENGTH STEEL AND HIGH-STRENGTH BOLT WITH EXCELLENT RESISTANCE TO DELAYED FRACTURE, AND MANUFACTURING METHOD THEREFOR

Title (de)

HOCHFESTER STAHL UND HOCHFESTER BOLZEN MIT HERVORRAGENDER BESTÄNDIGKEIT GEGEN VERZÖGERTEN BRUCH SOWIE HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)

ACIER À HAUTE RÉSISTANCE ET BOULON À HAUTE RÉSISTANCE DOTÉS D'UNE EXCELLENTE RÉSISTANCE À LA RUPTURE DIFFÉRÉE ET LEUR PROCÉDÉ DE FABRICATION

Publication

EP 2546379 B1 20150429 (EN)

Application

EP 11753527 A 20110311

Priority

- JP 2010054649 A 20100311
- JP 2011056481 W 20110311

Abstract (en)

[origin: US2012247618A1] A high strength steel material which is excellent in delayed fracture resistance containing, by mass %, C: 0.10 to 0.55%, Si: 0.01 to 3%, and Mn: 0.1 to 2%, further containing one or both of V: 1.5% or less and Mo: 3.0% or less, the contents of V and Mo satisfying V +1/2Mo>0.4%, further containing one or more of Cr: 0.05 to 1.5%, Nb: 0.001 to 0.05%, Cu: 0.01 to 4%, Ni: 0.01 to 4%, and B: 0.0001 to 0.005%, and having a balance of Fe and unavoidable impurities, the structure being a mainly tempered martensite structure, the surface of the steel material being formed with (a) a nitrided layer having a thickness from the surface of the steel material of 200 μm or more and a nitrogen concentration of 12.0 mass % or less and higher than the nitrogen concentration of the steel material by 0.02 mass % or more and (b) a low carbon region having a depth from the surface of the steel material of 100 μm or more to 1000 μm or less and having a carbon concentration of 0.05 mass % or more and 0.9 time or less the carbon concentration of the steel material.

IPC 8 full level

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CPC (source: EP KR US)

C21D 8/065 (2013.01 - EP KR US); **C21D 9/0093** (2013.01 - EP KR US); **C21D 9/52** (2013.01 - EP US); **C21D 9/525** (2013.01 - EP US); **C22C 38/002** (2013.01 - EP KR US); **C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C22C 38/20** (2013.01 - EP US); **C22C 38/22** (2013.01 - EP US); **C22C 38/24** (2013.01 - EP US); **C22C 38/26** (2013.01 - EP US); **C22C 38/28** (2013.01 - EP US); **C22C 38/32** (2013.01 - EP US); **C22C 38/34** (2013.01 - EP KR US); **C22C 38/38** (2013.01 - EP US); **C22C 38/40** (2013.01 - EP KR US); **C22C 38/44** (2013.01 - EP KR US); **C22C 38/46** (2013.01 - EP KR US); **C22C 38/48** (2013.01 - EP KR US); **C22C 38/50** (2013.01 - EP KR US); **C22C 38/54** (2013.01 - EP KR US); **C22C 38/58** (2013.01 - EP KR US); **C23C 8/26** (2013.01 - EP US); C21D 2211/008 (2013.01 - EP US); C21D 2221/10 (2013.01 - EP US)

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