

Title (en)

Phase transformation controlled and nitride precipitation hardened heat treated steel

Title (de)

Umwandlungskontrollierter Nitrid-ausscheidungshärtender Vergütungsstahl

Title (fr)

Acier de traitement à durcissement par precipitation des nitrides et à transformation contrôlée

Publication

EP 1215299 A3 20031210 (DE)

Application

EP 01128805 A 20011204

Priority

DE 10063117 A 20001218

Abstract (en)

[origin: EP1215299A2] Heat-treatable steel contains (in wt.%): 15-18 Cr, maximum 0.5 Mn, 4-10 Ni, maximum 15 Co, maximum 4 W, maximum 4 Mo, 0.5-1 V, 0.001-0.1 of one of Nb, Ta, Hf, and Zr, 0.001-0.05 Ti, maximum 0.5 Si, maximum 0.05 C, 0.13-0.25 N, maximum 4 Cu and a balance of Fe. The weight ratio of V to N is 3.5-4.2. An Independent claim is also included for a process for heat treating a heat-treatable steel comprises solution annealing at 1,050-1,250 degrees C for 0.2-10 hours, cooling in air to room temperature, intermediate annealing at 640-780 degrees C for 0.2-10 hours and tempering at 570-630 degrees C for 0.2- hours. Preferably the steel contains (in wt.%) 1-10 Co, 0.5-1.5 Cu, 15.5-16.5 Cr, maximum 0.02 C, 0.5-0.7 V, 0.16-0.20 N, 0.01-0.07 Nb, 1.5-3 Mo, 0.02-0.4 Mn and 0.02-0.25 Si.

IPC 1-7

C22C 38/46; **C22C 38/52**; **C21D 6/02**; **C21D 6/00**

IPC 8 full level

C21D 1/78 (2006.01); **C21D 6/00** (2006.01); **C21D 6/02** (2006.01); **C22C 38/00** (2006.01); **C22C 38/42** (2006.01); **C22C 38/44** (2006.01); **C22C 38/46** (2006.01); **C22C 38/48** (2006.01); **C22C 38/52** (2006.01)

CPC (source: EP US)

C21D 1/78 (2013.01 - EP US); **C21D 6/004** (2013.01 - EP US); **C22C 38/001** (2013.01 - EP US); **C22C 38/42** (2013.01 - EP US); **C22C 38/44** (2013.01 - EP US); **C22C 38/46** (2013.01 - EP US); **C22C 38/48** (2013.01 - EP US); **C22C 38/52** (2013.01 - EP US)

Citation (search report)

- [A] US 6030469 A 20000229 - ERNST PETER [CH], et al
- [A] EP 0780483 A1 19970625 - NIPPON STEEL CORP [JP]
- [A] US 5415706 A 19950516 - SCARLIN BRENDON [CH], et al
- [A] DE 19614407 A1 19971016 - ABB RESEARCH LTD [CH]
- [A] RU 2071989 C1 19970120 - MO I STALI I SPLAVOV [RU]

Designated contracting state (EPC)

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR

DOCDB simple family (publication)

EP 1215299 A2 20020619; **EP 1215299 A3 20031210**; **EP 1215299 B1 20050309**; CN 1252305 C 20060419; CN 1368560 A 20020911; DE 10063117 A1 20030618; DE 50105523 D1 20050414; US 2002139449 A1 20021003; US 6592685 B2 20030715

DOCDB simple family (application)

EP 01128805 A 20011204; CN 01143710 A 20011218; DE 10063117 A 20001218; DE 50105523 T 20011204; US 211701 A 20011205