Title (en)

Hot working steel

Title (de)

Warmarbeitsstahl

Title (fr)

Acier pour travail à chaud

Publication

EP 1887096 A1 20080213 (DE)

Application

EP 06118672 A 20060809

Priority

EP 06118672 A 20060809

Abstract (en)

Procedure for adjusting the thermal conductivity of a steel, preferably a hot-work steel comprises metallurgically producing an internal structure of the steel, whose: carbide components exhibit a defined electron and phonon density, and/or crystal structure exhibits a mean free-path length for the phonon and electron flux that is defined by selectively produced lattice defects. Independent claims are included for: (1) a tool steel, preferably hot-work steel comprising carbon (0.26-0.55 wt.%), chromium (less than 2 wt.%), molybdenum (0-10 wt.%) and tungsten (0-15 wt.%), where the total content of tungsten and molybdenum is 1.8-15 wt.%, carbide-forming elements (0-3 wt.%) comprising titanium, zirconium, hafnium, niobium and/or tantalum, vanadium (0-4 wt.%), cobalt (0-6 wt.%), silicon (0-1.6 wt.%), manganese (0-2 wt.%), nickel (0-2.99 wt.%) and sulfur (0-1 wt.%), and the remaining of iron and unavoidable impurities; and (2) a steel object partially comprising a tool steel, preferably a hot-work steel.

Abstract (de)

Die vorliegende Erfindung betrifft einen Warmarbeitsstahl mit folgender Zusammensetzung: 0,26 bis 0,55 Gew.-% C; < 2 Gew.-% Cr; 0 bis 10 Gew.-% Mo; 0 bis 15 Gew.-% W; wobei der Gehalt von W und Mo in der Summe 1,8 bis 15 Gew.-% beträgt; Rest: Eisen, Legierungsbegleitelemente und übliche Verunreinigungen. Der Warmarbeitsstahl weist im Vergleich zu bekannten Werkzeugstählen eine wesentlich höhere Wärmeleitfähigkeit auf.

IPC 8 full level

C22C 38/22 (2006.01)

CPC (source: EP KR US)

C21D 8/005 (2013.01 - KR); **C22C 33/006** (2013.01 - KR); **C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C22C 38/12** (2013.01 - EP US); **C22C 38/14** (2013.01 - KR); **C22C 38/22** (2013.01 - EP US); **C22C 38/24** (2013.01 - EP US); **C22C 38/30** (2013.01 - EP US); **C22C 38/34** (2013.01 - EP US); **C22C 38/38** (2013.01 - EP US); **C22C 38/44** (2013.01 - EP US); **C22C 38/46** (2013.01 - EP US); **C22C 38/52** (2013.01 - EP US); **C22C 38/58** (2013.01 - EP US)

Citation (search report)

- [X] EP 1275745 A1 20030115 - MITSUBISHI HEAVY IND LTD [JP]
- [AD] DE 4321433 C1 19941208 - THYSSEN STAHL AG [DE]
- [A] EP 0733719 A1 19960925 - BOEHLER EDELSTAHL [AT]
- [X] PATENT ABSTRACTS OF JAPAN vol. 016, no. 428 (M - 1307) 8 September 1992 (1992-09-08)
- [X] PATENT ABSTRACTS OF JAPAN vol. 1999, no. 13 30 November 1999 (1999-11-30)
- [A] PATENT ABSTRACTS OF JAPAN vol. 1997, no. 02 28 February 1997 (1997-02-28)
- [A] PATENT ABSTRACTS OF JAPAN vol. 1995, no. 10 30 November 1995 (1995-11-30)

Cited by

EP2476772A1; EP3330401A1; WO2012095532A1; EP2492366A1; EP4219783A1; DE102015113058A1; CN114807774A; EP2578909A4; EP2236639A1; WO2014009571A1; US9617952B2; EP2535430A2; US8663550B2; WO2010112319A1; WO2020161359A1; EP2052095A1; EP2663664A1

Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

Designated extension state (EPC)

AL BA HR MK YU

DOCDB simple family (publication)

EP 1887096 A1 20080213; AU 2007283164 A1 20080214; AU 2007283164 B2 20120216; BR PI0716490 A2 20150310; CA 2659849 A1 20080214; CA 2659849 C 20171121; CA 2981388 A1 20080214; CA 2981388 C 20200211; CN 101512034 A 20090819; CN 102888563 A 20130123; CN 102888563 B 20160330; EP 2052095 A1 20090429; EP 3228724 A1 20171011; EP 3228724 B1 20220810; ES 2929658 T3 20221130; JP 2010500471 A 20100107; JP 2014111835 A 20140619; JP 2015221941 A 20151210; JP 2016128609 A 20160714; JP 2016156088 A 20160901; JP 5518475 B2 20140611; KR 101659704 B1 20160926; KR 20090038030 A 20090417; KR 20150080642 A 20150709; KR 20160047582 A 20160502; MX 2009001483 A 20090515; PL 3228724 T3 20221219; PT 3228724 T 20221110; RU 2009108335 A 20100920; RU 2469120 C2 20121210; US 2010189592 A1 20100729; US 2014023551 A1 20140123; US 2017268084 A1 20170921; US 8557056 B2 20131015; US 9689061 B2 20170627; WO 2008017341 A1 20080214; ZA 200900495 B 20091125

DOCDB simple family (application)

EP 06118672 A 20060809; AU 2007283164 A 20070608; BR PI0716490 A 20070608; CA 2659849 A 20070608; CA 2981388 A 20070608; CN 200780032677 A 20070608; CN 201210317360 A 20070608; EP 07764595 A 20070608; EP 17151574 A 20070608; EP 2007005091 W 20070608; ES 17151574 T 20070608; JP 2009523159 A 20070608; JP 2013268301 A 20131226; JP 2015124483 A 20150622; JP 2016002101 A 20160107; JP 2016002102 A 20160107; KR 20097004460 A 20090303; KR 20157016617 A 20070608; KR 20167009181 A 20070608; MX 2009001483 A 20070608; PL 17151574 T 20070608; PT 17151574 T 20070608; RU 2009108335 A 20070608; US 201314037538 A 20130926; US 201715614142 A 20170605; US 37686607 A 20070608; ZA 200900495 A 20090122