Title (en)

METHOD FOR PRODUCING A FORMED STEEL PART HAVING A PREDOMINANTLY FERRITIC-BAINITIC STRUCTURE

Title (de)

VERFAHREN ZUM HERSTELLEN EINES STAHLFORMTEILS MIT EINEM ÜBERWIEGEND FERRITISCH-BAINITISCHEN GEFÜGE

Title (fr)

PROCÉDÉ DE PRODUCTION D'UNE PIÈCE MOULÉE EN ACIER À STRUCTURE À PRÉDOMINANCE FERRITIQUE-BAINITIQUE

Publication

**EP 2297367 B1 20170607 (DE)**

Application

**EP 09741994 A 20090424**

Priority

- EP 2009054961 W 20090424
- DE 102008022399 A 20080506

Abstract (en)

[origin: WO2009135776A1] In order to produce formed steel parts in a simple process, said parts having high strength and good residual elongation at break, according to the invention a primary steel material is provided which (in % by weight) comprises C: 0.02 - 0.6%, Mn: 0.5 - 2.0%, Al: 0.01 - 0.06%, Si: max. 0.4%, Cr: max. 1.2%, P: max. 0.035%, S: max. 0.035%, and optionally one or more of the elements of the "Ti, Cu, B, Mo, Ni, N" group, with the proviso that Ti: max. 0.05%, Cu: max. 0.01%, B: 0.0008 - 0.005%, Mo: max. 0.3%, Ni: max. 0.4%, N: max. 0.01%, and the remainder as iron and inevitable contamination. The primary material is heated through at a heating temperature (TA) ranging between the AcI and Ac3 temperature such that at best incomplete austenitization of the primary material takes place, is placed into a press-form tool and formed therein into the formed steel part. The formed steel part is then heated to a bainite forming temperature (TB), which is above the martensite starting temperature (Ms), however below the perlite transformation temperature of the steel from which the primary material is produced in each case. After cooling, it is maintained for an austempering period (tB) at the bainite forming temperature (TB) in a substantially isothermic manner until the formed steel part has produced a structure comprising predominantly ferrite and bainite, the martensite content thereof being < 5%, wherein residual austenite contents of = 10% may be present. After the end of the austempering period (tB), the formed steel part is brought to room temperature. ..

IPC 8 full level

**C21D 9/48** (2006.01); **C21D 1/18** (2006.01); **C21D 1/20** (2006.01); **C21D 8/02** (2006.01); **C22C 38/04** (2006.01); **C22C 38/32** (2006.01)

CPC (source: EP US)

**C21D 1/18** (2013.01 - EP US); **C21D 1/185** (2013.01 - EP US); **C21D 1/20** (2013.01 - EP US); **C21D 8/02** (2013.01 - EP US); **C21D 9/48** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C22C 38/32** (2013.01 - EP US); C21D 2211/002 (2013.01 - EP US); C21D 2211/005 (2013.01 - EP US)

Designated contracting state (EPC)

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 SE SI SK TR

DOCDB simple family (publication)

**WO 2009135776 A1 20091112**; CA 2725210 A1 20091112; CA 2725210 C 20160531; DE 102008022399 A1 20091119; EP 2297367 A1 20110323; EP 2297367 B1 20170607; EP 2297367 B9 20170913; US 2011132502 A1 20110609; US 8888934 B2 20141118

DOCDB simple family (application)

**EP 2009054961 W 20090424**; CA 2725210 A 20090424; DE 102008022399 A 20080506; EP 09741994 A 20090424; US 99121609 A 20090424