

## Title (en)

High ductility steel, manufacturing process and utilization

## Title (de)

Stahl mit hoher Dehnbarkeit, Verfahren zur Herstellung und Verwendung

## Title (fr)

Acier à haute ductilité, procédé de fabrication et utilisation

## Publication

**EP 0725156 B1 20010718 (FR)**

## Application

**EP 96400061 A 19960111**

## Priority

FR 9501079 A 19950131

## Abstract (en)

[origin: EP0725156A1] A steel alloy contains by wt. 0.15-0.35, pref. 0.20-0.24% C, 0-3, pref. 0-2.5% Si, 0-3, pref. 0.01-0.5% Al, 0.1-4.5, pref. 1.2-1.7% Mn, 0-9, pref. 1.5-2.5% Ni, 0-6, pref. 0.5-1.5% Cr, 0-0.5% V, 0-0.5% Nb, 0-0.5% Zr and less than 0.3, pref. 0.003-0.02% N. It also contains Mo and W so that Mo+W/2 is between 0 and 3, pref. 0.1 and 0.5%. The Si and Al contents add up to 1-3, pref. 1.5-2.5%. The alloy may contain 0.0005-0.005% B and 0.005-0.1% Ti. The following equation also applies:  $4.6(\%C) + 1.05(\%Mn) + 0.54(\%Ni) + 0.66(\%Mo + \%W/2) + 0.5(\%Cr) + K \geq 3.8$ , where K is 0.5 if the alloy contains B and 0 if it does not. The alloy may contain at least one of elements Ca, Se, Te, Bi and Pb in amount less than 0.2%. The remainder is Fe plus incidental impurities. Also claimed is the prodn. of the alloy, where after casting the alloy is shaped at below 1300 degrees C to final form, e.g. a sheet thicker than 8 mm. and heated to above complete austenisation temp., then cooled at more than 0.3 degrees C/s to a temp. A between M+150 degrees C and M-50 degrees C, where M is the temp. at which martensitic transformation begins. The alloy is held at temp. A for 5-90 min., then cooled to ambient at more than 0.02 degrees C/s.

## IPC 1-7

**C22C 38/44**; **C22C 38/54**

## IPC 8 full level

**C22C 38/00** (2006.01); **C22C 38/44** (2006.01); **C22C 38/54** (2006.01); **C22C 38/58** (2006.01)

## CPC (source: EP US)

**C22C 38/44** (2013.01 - EP US); **C22C 38/54** (2013.01 - EP US)

## Citation (examination)

EP 0709481 A1 19960501 - CREUSOT LOIRE [FR]

## Cited by

WO2006114453A1; FR2838137A1; EP1832667A1; DE102008035714A1; DE102008035714B4; DE102008035714B9; FR2847273A1; AU2003294049B2; KR101051934B1; FR2847274A1; CN100352966C; AU2003294048B2; KR101010595B1; FR2838138A1; AU2003258841B2; DE19942641A1; EP2789705A4; US9255313B2; US11279994B2; EP1905857A2; US7754031B2; WO2004048631A1; WO03083154A1; WO2004048630A1; WO2007101921A1; US10612106B2; US11414722B2; US9856548B2; US10370746B2; WO03083153A1

## Designated contracting state (EPC)

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**EP 0725156 A1 19960807**; **EP 0725156 B1 20010718**; DE 69613868 D1 20010823; DE 69613868 T2 20011129; FR 2729974 A1 19960802; FR 2729974 B1 19970228; JP H08239738 A 19960917; US 5695576 A 19971209

## DOCDB simple family (application)

**EP 96400061 A 19960111**; DE 69613868 T 19960111; FR 9501079 A 19950131; JP 3740296 A 19960131; US 59073796 A 19960124