

## Title (en)

Process for manufacturing of articles from carburized or carbonitrided steel and steel for the manufacturing of said articles

## Title (de)

Herstellungsverfahren für Bauteile aus zementierter oder carbonitrierter Stahl und Stahl für die Herstellung dieser Bauteile

## Title (fr)

Procédé de fabrication d'une pièce en acier cimentée ou carbonitrurée et acier pour la fabrication de cette pièce

## Publication

**EP 0890653 A1 19990113 (FR)**

## Application

**EP 98400447 A 19980225**

## Priority

FR 9708770 A 19970710

## Abstract (en)

A novel carburising or carbonitriding steel has the composition (by wt.) 0.2-0.26% C, 0.05-0.5% Si, 1 to less than 1.6% Mn, 0.4-1.5% Cr, 0.08 to less than 0.27% Mo, 0 to less than 0.6% Ni, 0.003-0.06% Al, 0-0.3% Cu, 0-0.1% S, less than 0.03% P, optionally up to 0.02% Te, up to 0.04% Se, up to 0.07% Pb and up to 0.005% Ca, balance Fe and impurities. Also claimed is a process for manufacturing a mechanical steel part by subjecting a rough steel part to surface carburising or carbonitriding, the steel having (a) the composition (by wt.) 0.15-0.35% C, 0-0.6% Si, 0 to less than 5% Mn + Cr + Ni + Mo, 0-0.1% Al, 0 to less than 0.5% Cu, 0-0.15% S, less than 0.03% P, optionally up to 0.02% Te, up to 0.04% Se, up to 0.07% Pb and up to 0.005% Ca, balance Fe and impurities; (b) a Jominy curve in which J3 = 45-50 HRC, J11 = 39-47 HRC and J25 = 31-40 HRC; and (c) average values J3m, J11m, J15m and J25m of five Jominy tests such that  $\text{MOD}(\text{J11m} - \text{J3m} \times 13 \text{ divided by } 22 - \text{J25m} \times 8 \text{ divided by } 22) = \leq 2.5 \text{ HRC}$  and  $\text{J3m} - \text{J15m} = \leq 9 \text{ HRC}$ .

## Abstract (fr)

Procédé de fabrication d'une pièce de mécanique en acier selon lequel on fabrique une ébauche de pièce en acier et on effectue un traitement de cémentation ou de carbonitruration à haute température d'au moins une partie de la surface de l'ébauche de la pièce, la composition chimique de l'acier dont est constitué la pièce comprenant, en poids : 0,15 %  $\leq$  C  $\leq$  0,35 % ; 0 %  $\leq$  Si  $\leq$  0,6 % ; 0 %  $\leq$  Mn + Cr + Ni + Mo  $<$  5 % ; 0 %  $\leq$  Al  $\leq$  0,1 % ; 0 %  $\leq$  Cu  $\leq$  0,5 % ; 0 %  $\leq$  Ti  $\leq$  0,05 % ; 0,004 %  $\leq$  N  $\leq$  0,02 % ; 0 %  $\leq$  S  $\leq$  0,15 % ; P  $\leq$  0,03 % ; éventuellement, jusqu'à 0,02 % de tellure, jusqu'à 0,04 % de sélénium, jusqu'à 0,07 % de plomb, jusqu'à 0,005 % de calcium, le reste étant du fer et des impuretés résultant de l'élaboration ; la composition chimique étant ajustée pour que la courbe JOMINY de l'acier soit telle que : 45 HRC  $\leq$  J3  $\leq$  50 HRC ; 39 HRC  $\leq$  J11  $\leq$  47 HRC ; 31 HRC  $\leq$  J25  $\leq$  40 HRC ; les valeurs moyennes J3m, J11m et J25m de cinq essais JOMINY étant telles que :  $|\text{J11m} - \text{J3m} \times 14 / 22 - \text{J25m} \times 8 / 22| \leq 2,5 \text{ HRC}$  et  $\text{J3m} - \text{J15m} \leq 9 \text{ HRC}$ . Acier de cémentation ou de carbonitruration pour fabriquer cette pièce.

## IPC 1-7

**C22C 38/00**

## IPC 8 full level

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- [Y] PATENT ABSTRACTS OF JAPAN vol. 97, no. 006 30 June 1997 (1997-06-30)
- [Y] PATENT ABSTRACTS OF JAPAN vol. 95, no. 007 31 August 1995 (1995-08-31)
- [Y] PATENT ABSTRACTS OF JAPAN vol. 12, no. 082 (C - 481) 15 March 1988 (1988-03-15)
- [Y] PATENT ABSTRACTS OF JAPAN vol. 12, no. 082 (C - 481) 15 March 1988 (1988-03-15)
- [Y] PATENT ABSTRACTS OF JAPAN vol. 10, no. 269 (C - 372) 12 September 1986 (1986-09-12)

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