Title (en)

Low-carbon free cutting steel

Title (de)

Niedrig gekohlter Automatenstahl.

Title (fr)

Acier de décolletage faible teneur en carbonne.

Publication

EP 1507016 A1 20050216 (EN)

Application

EP 04254607 A 20040730

Priority

JP 2003285463 A 20030801

Abstract (en)

The invention provides a low-carbon free cutting steel containing no lead and is at least comparable in machinability to the conventional leaded free cutting steels and composite free cutting steels and furthermore has excellent finished surface characteristics. The steel is a low-carbon free cutting steel which comprises, on the percent by mass basis, C: 0.05 to under 0.20%, Mn: 0.4 - 2.0%, S: 0.21 - 1.0%, Ti: 0.002 - 0.10%, P: 0.001 - 0.30%, Al: not higher than 0.2%, O: 0.001 - 0.03% and N: 0.0005 - 0.02%, with the balance being Fe and impurities, and which satisfies the relations (a) and (b) given below concerning the inclusions contained in the steel: <DF NUM="(a),">(A + B)/C >/= 0.8 </DF> <DF NUM="(b),">NA >/= 5 </DF> wherein, A: the total area occupied by substantial MnS with Ti carbide and/or Ti carbonitride included therein among the inclusions not smaller than 1 mu m in circle-equivalent diameter per mm<2> of a cross section parallel to the direction of rolling; B: the total area occupied by substantial MnS with neither Ti carbide nor Ti carbonitride included therein among the inclusions not smaller than 1 mu m in circle-equivalent diameter per mm<2> of a cross section parallel to the direction of rolling; C: the total area occupied by all the inclusions not smaller than 1 mu m in circle-equivalent diameter per mm<2> of a cross section parallel to the direction of rolling; NA: the number of substantial MnS inclusions with Ti carbide and/or Ti carbonitride included therein among the inclusions not smaller than 1 mu m in circle-equivalent diameter per mm<2> of a cross section parallel to the direction of rolling.

IPC 1-7

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