

Title (en)

Tool steel for high-performance thermoforming tools and production process for same

Title (de)

Werkzeugstahl für höher beanspruchte Warmumformungswerkzeuge sowie dessen Herstellungsprozess

Title (fr)

Acier à outil pour outils de formage à chaud plus sollicités et son procédé de fabrication

Publication

EP 2535430 B1 20181212 (DE)

Application

EP 11008259 A 20111007

Priority

- EP 11004855 A 20110615
- EP 11006269 A 20110625
- EP 11008259 A 20111007

Abstract (en)

[origin: EP2535430A2] Tool steel comprises (in mass%): carbon (0.28-0.40), silicon (0.03-0.5), manganese (0.03-0.7), chromium (2-3.5), nickel (0.3-1), molybdenum (0.6-1.6), vanadium (0.15-0.35), tungsten (0.001-1), niobium (0.01-0.1), and iron and common impurities (remaining amount), where the steel has a fine grained tough structure. Independent claims are also included for: (1) producing the tool steel, comprising carrying out the crude steel production in an electric arc furnace or Linz and Donawitz converter (LD converter) with subsequent secondary metallurgical treatment of the melt in the ladle furnace and/or degassing systems, where silicon-, aluminum-, carbon- and/or diffusion deoxidation is included as deoxidation process; and (2) producing blanks for hot working tools from produced forging, comprising tempering the blanks after a mechanical processing, where the austenitized workpieces are tempered at 850-950[deg] C in a medium of oil, polymer or water, and machined workpieces are cured in a lead- or salt bath, or alternatively in a hot bath simulation in vacuum.

IPC 8 full level

C21D 1/18 (2006.01); **C21C 5/00** (2006.01); **C21D 7/13** (2006.01); **C22C 38/44** (2006.01); **C22C 38/46** (2006.01); **C22C 38/48** (2006.01)

CPC (source: EP)

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Cited by

CN106811585A; CN103436767A; CN103642976A; CN112501382A; CN109957639A; WO2023078299A1

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DOCDB simple family (publication)

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