Title (en)

Steel alloy for machine components

Title (de)

Stahllegierung für Maschinenkomponenten

Title (fr)

Alliage d'acier pour composants de machines

Publication

EP 2196553 A1 20100616 (DE)

Application

EP 09450220 A 20091123

Priority

AT 19042008 A 20081205

Abstract (en)

The machine component or component consists of thermally hardened steel alloy having carbon (0.48-0.55 wt.%), silicon (0.18-0.25 wt.%), manganese (0.35-0.45 wt.%), chromium (4.40-4.70 wt.%), molybdenum (2.90-3.10 wt.%), vanadium (0.72-0.77 wt.%), iron and accompanying elements necessitated by steel production and impurities as remainder. The accompanying elements or impurity elements consist of phosphorus (0.005 wt.%), sulfur (0.001 wt.%), nickel (0.1 wt.%), copper (0.1 wt.%), cobalt (0.1 wt.%), titanium (0.005 wt.%), aluminum (0.01 wt.%), nitrogen (0.003 wt.%) and oxygen (0.002 wt.%). The machine component or component consists of thermally hardened steel alloy having carbon (0.48-0.55 wt.%), silicon (0.18-0.25 wt.%), manganese (0.35-0.45 wt.%), chromium (4.40-4.70 wt.%), molybdenum (2.90-3.10 wt.%), vanadium (0.72-0.77 wt.%), iron and accompanying elements necessitated by steel production and impurities as remainder. The accompanying elements or impurity elements consist of phosphorus (0.005 wt.%), sulfur (0.001 wt.%), nickel (0.1 wt.%), copper (0.1 wt.%), cobalt (0.1 wt.%), titanium (0.005 wt.%), aluminum (0.01 wt.%), nitrogen (0.003 wt.%), oxygen (0.002 wt.%), calcium (0.001 wt.%), magnesium (0.001 wt.%) and tin (0.005 wt.%). The component has a purity degree of steel alloy. The elasticity module of the material is 205000 MPa. The machine component has a tensile strength of greater than 2000 MPa for changing mechanical loads to a temperature of greater than 160[deg] C, and a hardness of greater than 55 [HRC] produced by thermal tempering.

Abstract (de)

Die Erfindung bezieht sich auf Maschinenkomponenten oder Bauteile mit einer Festigkeit von größer 2000 [MPa] für wechselnde, mechanische Belastungen bis zu einer Temperatur von 160°C, gebildet aus einer thermisch vergüteten Stahllegierung. Um verbesserte Langzeiteigenschaften, insbesondere Ermüdungssicherheit bei hohen Beanspruchungen auf einen höheren E-Modul des Werkstoffes zu erreichen, ist gemäß der Erfindung vorgesehen, dass die Stahllegierung eine chemische Zusammensetzung in Gew.-% von Kohlenstoff (C) 0.48 bis 0.55 Silicium (Si) 0.18 bis 0.25 Mangan (Ma) 0.35 bis 0.45 Chrom (Cr) 4.40 bis 4.70 Molybdän (Mo) 2.90 bis 3.10 Vanadin (V) 0.72 bis 0.77 Eisen (Fe) und erschmelzungsbedingte Begleitelemente und Verunreinigungen als Rest besitzt.

IPC 8 full level

C22C 38/00 (2006.01); **C22C 38/22** (2006.01); **C22C 38/24** (2006.01)

CPC (source: EP US)

C22C 38/22 (2013.01 - EP US); **C22C 38/24** (2013.01 - EP US)

Citation (applicant)

- EP 1300482 A1 20030409 - BOEHLER EDELSTAHL [AT]
- JP 2004169177 A 20040617 - DAIDO STEEL CO LTD
- JP H10121201 A 19980512 - KOBE STEEL LTD
- JP 2002121648 A 20020426 - SANYO SPECIAL STEEL CO LTD

Citation (search report)

- [A] EP 1300482 A1 20030409 - BOEHLER EDELSTAHL [AT]
- [A] JP H10121201 A 19980512 - KOBE STEEL LTD
- [A] JP 2004169177 A 20040617 - DAIDO STEEL CO LTD
- [A] JP 2002121648 A 20020426 - SANYO SPECIAL STEEL CO LTD

Cited by

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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 SM TR

Designated extension state (EPC)

AL BA RS

DOCDB simple family (publication)

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DOCDB simple family (application)

EP 09450220 A 20091123; AT 19042008 A 20081205; AU 2009240807 A 20091124; BR PI0905064 A 20091203; CA 2686594 A 20091127; ES 09450220 T 20091123; PL 09450220 T 20091123; SI 200931096 T 20091123; US 62508409 A 20091124; ZA 200908581 A 20091203