Title (en)

Wear-resistant, heat-resistant material and use of same

Title (de)

Verschleissbeständiger, warmfester Werkstoff, sowie dessen Verwendung

Title (fr)

Substance active résistant à l'usure et à la chaleur, ainsi que son utilisation

Publication

EP 2354264 A1 20110810 (DE)

Application

EP 10015691 A 20101215

Priority

DE 102010004722 A 20100115

Abstract (en)

The wear-stable, heat-resistant material comprises a hard-phase-rich cast iron-based alloy with a chemical composition. The hard phases are formed as compact hard phases and are dispersively and homogeneously distributed in the alloy in a volume content of 10-50%, where 50% of the hard phases are primary carbide of type MC and 50% of the primary hard phases have a size of 7 mu m at its narrowest point. The alloy parameter is selected, so that a micro-hot hardness adjusts to a testing temperature of 550 HV0.05 to 550[deg] C, 530 HV0.05 to 580[deg] C, 400 HV0.05 to 600[deg] C and 370 HV0.05 to 640[deg] C. The wear-stable, heat-resistant material comprises a hard-phase-rich cast iron-based alloy with a chemical composition. The hard phases are formed as compact hard phases and are dispersively and homogeneously distributed in the alloy in a volume content of 10-50%, where 50% of the hard phases are primary carbide of type MC and 50% of the primary hard phases have a size of 7 mu m at its narrowest point. The alloy parameter is selected, so that a micro-hot hardness adjusts to a testing temperature of 550 HV0.05 to 550[deg] C, 530 HV0.05 to 580[deg] C, 400 HV0.05 to 600[deg] C and 370 HV0.05 to 640[deg] C after a heat treatment. The heat treatment comprises hardening at temperature of 900-1220[deg] C and tempering in secondary hardness range of 480-650[deg] C. The compact hard phases are contained in volume content of 15-50% in the material, where 80% of the compact hard phases are present with the type of MC and 90% of primary hard phases of the type MC at its narrowest point have an extension of 15 mu m. The compact hard phases have a spherical shape. The material has a surface hardness of 48 HRC adjustable by flame hardening at a testing temperature of 640[deg] C. The material has a bending strength of 900 N/mm 2>and a fracture toughness of 33 MPam (0.5). An independent claim is included for a method for producing a wear-stable, heat-resistant material.

Abstract (de)

Die Erfindung betrifft einen verschleißbeständigen, warmfesten Werkstoff, insbesondere für ein Presswerkzeug zur Brikettierung, Kompaktierung und/oder Zerkleinerung, vorzugsweise in einer Walzenpresse. Hierbei umfasst der Werkstoff eine hartphasenreiche Guß-Legierung auf Eisenbasis mit der chemischen Zusammensetzung: C: 2,3 - 3,7 Gew.-%, Cr: 3,0 - 8,0 Gew.-%, Mo: 4,0 - 8,0 Gew.-%, V: 5,0 - 11,0 Gew.-%, W: 0,5 - 5,0 Gew.-%, Nb: 0,3 - 1,0 Gew.-%, Co: 0,5 - 8,0 Gew.-%, Ti: 0,2 - 1,5 Gew.-%, Al: 0,01 - 1,0 Gew.-%, Rest Fe, sowie unvermeidbare Verunreinigungen. Die Hartphasen des Werkstoffes sind als kompakte Hartphasen ausgebildet und in Volumengehalten von 10% bis 50 % in der Legierung dispers und homogen verteilt. Wenigstens 50% der Hartphasen sind primäre Karbide vom Typ MC, wobei die Karbide im wesentlichen aus Vanadium und Molybdäncarbiden bestehen, und wenigstens 50 % dieser primären Hartphasen weisen an ihrer schmalsten Stelle eine Größe von mindestens 7 µm auf.

IPC 8 full level

C22C 37/00 (2006.01); **C21D 6/00** (2006.01); **C21D 9/00** (2006.01)

CPC (source: EP)

C21D 1/18 (2013.01); **C21D 1/25** (2013.01); **C21D 6/002** (2013.01); **C22C 37/00** (2013.01)

Citation (search report)

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Designated contracting state (EPC)

AL 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 RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

EP 2354264 A1 20110810; **EP 2354264 B1 20120523**; DE 102010004722 A1 20110721; DE 102010004722 B4 20130508; SI 2354264 T1 20120831

DOCDB simple family (application)

EP 10015691 A 20101215; DE 102010004722 A 20100115; SI 201030048 T 20101215