

Title (en)

High temperature Al-Cu-Mg-Ag alloy and method for producing a semi-finished product or product from such an aluminium alloy

Title (de)

Warmfeste Al-Cu-Mg-Ag-Legierung sowie Verfahren zur Herstellung eines Halbzeuges oder Produktes aus einer solchen Aluminiumlegierung

Title (fr)

Alliage d'Al-Cu-Mg-Ag résistant à la chaleur et procédé de fabrication d'un demi-produit ou d'un produit à partir d'un tel alliage d'aluminium

Publication

EP 2559779 A1 20130220 (DE)

Application

EP 11177747 A 20110817

Priority

EP 11177747 A 20110817

Abstract (en)

Heat resistant aluminum-copper-magnesium-silver alloy for producing semi-finished products or products suitable for applying at higher temperatures, and exhibiting high static and dynamic strength properties and an improved creep resistance, comprises (in wt.%) silicon (0.3-0.7), iron (not > 0.15), copper (3.5-4.7), manganese (0.05-0.5), magnesium (0.3-0.9), titanium (0.02-0.15), zirconium (0.03-0.25), silver (0.1-0.7), scandium (0.03-0.5), vanadium (0.03-0.2), other component (not > 0.05), and aluminum (remaining), where the total amount of other component is not > 0.15 wt.%. An independent claim is also included for producing the semi-finished product or a product of the aluminum alloy, comprising (a) casting a bar made of the alloy with a sufficient resolution of the elements comprising zirconium, scandium and vanadium, (b) homogenizing the cast bar at a temperature that is as close as possible below the melting temperature of the alloy for a time sufficient to obtain a uniform distribution of the alloy elements in the cast structure, preferably at 485-510[deg] C for 10-25 hours, (c) hot working the homogenized bar by extruding, forging including indirect extrusion and/or rolling at 280-470[deg] C, (d) solution annealing the extruded, forged and/or rolled semi-finished product at temperatures that are sufficiently high for curing the alloy elements uniformly distributed in the structure to be brought into solution, preferably at 480-510[deg] C for 30 minutes to 8 hours, (e) quenching the solution heat treated semi-finished product in water at a temperature between room temperature and 100[deg] C, or water-glycol mixtures at temperatures = 50[deg] C, where the water-glycol mixtures has 60% glycol, (f) compressing or stretching the semi-finished product by an amount that leads to a reduction of the internal stresses, which are formed during the quenching in cold quenching medium, preferably by 1-5%, and (g) thermosetting the quenched-, optionally cold compressed- or stretched semi-finished at temperatures that are adapted in the steps (a), (b) or (c) preferably 80-210[deg] C for 5-35 hours, preferably 10-25 hours.

Abstract (de)

Beschrieben ist eine warmfeste Al-Cu-Mg-Ag-Legierung zur Herstellung von Halbzeugen oder Produkten, geeignet für die Anwendung bei höheren Temperaturen, mit hohen statischen und dynamischen Festigkeitseigenschaften in Verbindung mit einer verbesserten Kriechbeständigkeit enthaltend: - 0,3 - 0,7 %Gew. - % Silizium (Si) - max. 0,15 Gew. - % Eisen (Fe) - 3,5 - 4,7 Gew. - % Kupfer (Cu) - 0,05 - 0,5 Gew. - % Mangan (Mn) - 0,3 - 0,9 Gew. - % Magnesium (Mg) - 0,02 - 0,15 Gew. - % Titan (Ti) - 0,03 - 0,25 Gew. - % Zirkon (Zr) - 0,1 - 0,7 Gew. - % Silber (Ag) - 0,03 - 0,5 Gew. - % Scandium (Sc) - 0,03 - 0,2 Gew. - % Vanadium (V) - max. 0,05 Gew. - % andere, einzeln - max. 0,15 Gew. - % andere, insgesamt - Rest Aluminium. Beschrieben ist ferner ein Verfahren zur Herstellung eines Halbzeuges oder Produktes aus der vorgenannten Aluminiumlegierung.

IPC 8 full level

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CPC (source: EP US)

B22D 7/005 (2013.01 - EP US); **B22D 27/00** (2013.01 - EP US); **C21D 1/60** (2013.01 - EP US); **C22C 21/00** (2013.01 - EP US); **C22C 21/14** (2013.01 - EP US); **C22C 21/16** (2013.01 - EP US); **C22F 1/057** (2013.01 - EP US)

Citation (applicant)

- EP 1518000 B1 20050831 - FUCHS FA OTTO [DE]
- "International Alloy Designations and Chemical Composition Limits for Wrought Aluminium and Wrought Aluminium Alloys", April 2006, THE ALUMINUM ASSOCIATION INC.

Citation (search report)

- [X] EP 1518000 A1 20050330 - FUCHS FA OTTO [DE]
- [X] US 2008029187 A1 20080207 - LIN JEN C [US], et al
- [X] US 2005084408 A1 20050421 - CHO ALEX [US], et al

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CN115927935A; EP2719784A4; CN117127071A

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DOCDB simple family (application)

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