

Title (en)

Ultra high strength products forged from 6xxx aluminium alloys having excellent corrosion resistance

Title (de)

Aus 6xxx-Aluminiumlegierungen geschmiedete, ultrahochfeste Produkte mit ausgezeichneter Korrosionsbeständigkeit

Title (fr)

Produits à très haute résistance forgés à partir d'alliages d'aluminium 6xxx ayant une excellente résistance à la corrosion

Publication

EP 3018226 A1 20160511 (EN)

Application

EP 14003717 A 20141105

Priority

EP 14003717 A 20141105

Abstract (en)

An aluminium alloy forged product obtained by following steps: a) casting a billet from a 6xxx aluminium alloy comprising: Si: 0.7-1.3 wt. %; Fe : # 0.5 wt. %; Cu: 0.1-1.5 wt. %; Mn: 0.4-1.0 wt. %; Mg: 0.6-1.2 wt. %; Cr: 0.05-0.25 wt.%; Zr: 0.05-0.2 wt. %; Zn: # 0.2 wt.%; Ti: # 0.2 wt. % , the rest being aluminium and inevitable impurities; b) homogenising the cast billet, at a temperature T_H , which is 5°C to 80°C lower than solidus temperature T_S, in the range of typically 500-560°C, for a duration between 2 and 10 hours; c) quenching said billet down to room temperature by using water quench system; d) heating the homogenised billet to a temperature between (T_S - 5°C) and (T_S - 125°C); e) extruding said billet through a die to produce a solid section with an exit temperature (typically 530°C) lower than T_S (typically 550°C), and with an extruding ratio of at least 8; f) quenching the extruded product down to room temperature by using water quench system; g) stretching the extruded product to obtain a plastic deformation typically between 0.5% and 10%; h) heating cut-to-length extruded rod to forging temperature, typically between 400 and 520°C; i) forging in heated mould between 150 and 350°C; j) separate solutionising at a temperature between 530 and 560°C for durations between 2 min. and 1 hour; k) water quenching the forged and solutionised material down to room temperature; l) room temperature ageing for a duration between 6 hours and 30 days; m) ageing to T6 temper by a one-or multiple-step heat treatment at temperatures ranging from 150 to 200°C for holding times ranging from 2 to 20 hours.

IPC 8 full level

C22C 21/02 (2006.01); **C22C 21/08** (2006.01); **C22F 1/05** (2006.01)

CPC (source: EP US)

B21C 23/001 (2013.01 - US); **B21J 1/06** (2013.01 - US); **C22C 21/02** (2013.01 - EP US); **C22C 21/08** (2013.01 - EP US); **C22F 1/002** (2013.01 - EP US); **C22F 1/05** (2013.01 - EP US)

Citation (applicant)

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- JP 2012097321 A 20120524 - FURUKAWA SKY ALUMINUM CORP
- "International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys", THE ALUMINUM ASSOCIATION, INC.

Citation (search report)

- [X] EP 2003219 A2 20081217 - KOBE STEEL LTD [JP]
- [X] US 2010089503 A1 20100415 - INAGAKI YOSHIYA [JP], et al
- [X] JP 2004292937 A 20041021 - KOBE STEEL LTD
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Designated extension state (EPC)

BA ME

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