

Title (en)
ULTRA HIGH STRENGTH 6XXX FORGED ALUMINIUM ALLOYS

Title (de)
ULTRAHOCHFESTE GESCHMIEDETE 6XXX-ALUMINIUMLEGIERUNGEN

Title (fr)
PRODUITS À TRÈS HAUTE RÉSISTANCE FORGÉS À PARTIR D'ALLIAGES D'ALUMINIUM 6XXX AYANT UNE EXCELLENTE RÉSISTANCE À LA CORROSION

Publication
EP 3215648 A1 20170913 (EN)

Application
EP 15790515 A 20151102

Priority
• EP 14003717 A 20141105
• EP 2015075401 W 20151102

Abstract (en)
[origin: EP3018226A1] 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 (search report)
See references of WO 2016071257A1

Cited by
CN115283593A; CN108188192A

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 3018226 A1 20160511; CA 2965738 A1 20160512; CA 2965738 C 20230912; EP 3215648 A1 20170913; EP 3215648 B1 20190123; HU E043253 T2 20190828; MX 2017005153 A 20180123; PL 3215648 T3 20190731; SI 3215648 T1 20190731; US 2017314113 A1 20171102; WO 2016071257 A1 20160512

DOCDB simple family (application)
EP 14003717 A 20141105; CA 2965738 A 20151102; EP 15790515 A 20151102; EP 2015075401 W 20151102; HU E15790515 A 20151102; MX 2017005153 A 20151102; PL 15790515 T 20151102; SI 201530705 T 20151102; US 201515522808 A 20151102