Title (en)

Al-Cu-Mg alloy aircraft structural element

Title (de)

Strukturelement eines Flugzeugs aus Al-Cu-Mg Legierung

Title (fr)

Element de structure d'avion en alliage Al-Cu-Mg

Publication

EP 1114877 A1 20010711 (FR)

Application

EP 00420263 A 20001220

Priority

FR 9916610 A 19991228

Abstract (en)

An aircraft structure component has a rolled, extruded, or forged product, as a starting material, made of an alloy containing (wt.%): copper (4.6-5.3), magnesium (0.10-0.50), manganese (0.15-0.45), silicon (less than 0.10), iron (less than 0.15), zinc (less than 0.20), chromium (less than 0.10), other elements (less than 0.05 each, less than 0.15 total), and aluminum (balance). An aircraft structure component, particularly a lower wing component of an aircraft, consists of a rolled, extruded, or forged product, as a starting material, which is made of an alloy containing (wt.%): copper (4.6-5.3), magnesium (0.10-0.50), manganese (0.15-0.45), silicon (less than 0.10), iron (less than 0.15), zinc (less than 0.20), chromium (less than 0.10), other elements (less than 0.05 each, less than 0.15 total), and aluminum (balance) treated by solution heat treating, quenching, controlled tension to more than 1.5 % permanent deformation, and aging. An Independent claim is also included for a process of manufacturing the aircraft structure component, including casting a plate or billet with the alloy composition, homogenizing the plate or billet, hot transforming the plate by rolling or the billet by extrusion or forging to obtain a product thicker than 10 mm, quenching the hot transformed product; and solution heat treating, controlled tensioning, aging, and machining the product.

Abstract (fr)

L'invention a pour objet un élément de structure, notamment un élément d'intrados d'aile d'avion, réalisé à partir d'un produit laminé, filé ou forgé, en alliage de composition (% en poids) : Cu : 4,6-5,3Mg : 0,10-0,50Mn : 0,15-0,45Si < 0,10Fe < 0,15 Zn < 0,20Cr < 0,10autres éléments < 0,05 chacun et < 0,15 au total, reste A1 traité par mise en solution, trempe, traction contrôlée à plus de 1,5% de déformation permanente et revenu.

IPC 1-7

C22C 21/16; C22F 1/057

IPC 8 full level

C22C 21/16 (2006.01); **C22F 1/057** (2006.01)

CPC (source: EP US)

C22C 21/16 (2013.01 - EP US); **C22F 1/057** (2013.01 - EP US); Y10S 428/923 (2013.01 - EP US); Y10T 428/12 (2015.01 - EP US); Y10T 428/12229 (2015.01 - EP US); Y10T 428/12764 (2015.01 - EP US)

Citation (search report)

- [DA] FR 1379764 A 19641127 - PECHINEY PROD CHIMIQUES SA
- [DA] US 5376192 A 19941227 - CASSADA III WILLIAM A [US]
- [A] US 4610733 A 19860909 - SANDERS JR ROBERT E [US], et al
- [A] FR 2472618 A1 19810703 - SHOWA ALUMINIUM IND [JP]

Cited by

FR3040711A1; FR3011252A1; CN102108476A; CN110205446A; CN110724866A; CN106513638A; FR2848480A1; WO2008003504A2; GB2419891A; GB2419891B; ES2293814A1; WO2015044538A1; WO2017037391A1; WO2004056501A3; US8043445B2; US7763128B2; US7837808B2; US7666267B2; US7494552B2; WO2004111282A1; US10472707B2; DE112004000603B4; US7604704B2; US7323068B2; US7815758B2

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