

Title (en)

6XXX SERIES ALUMINIUM ALLOY SHEETS, PLATES OR BLANKS WITH IMPROVED FORMABILITY

Title (de)

BLECHE, PLATTEN ODER ZUSCHNITTE AUS EINER ALUMINIUMLEGIERUNG DER SERIE 6XXX MIT VERBESSERTER FORMBARKEIT

Title (fr)

TÔLES, PLAQUES OU ÉBAUCHES EN ALLIAGE D'ALUMINIUM DE LA SÉRIE 6XXX À FORMABILITÉ AMÉLIORÉE

Publication

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Application

EP 21211696 A 20211201

Priority

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Abstract (en)

The invention concerns a process for producing a sheet or a plate or a blank, comprising the following successive steps: (a) casting a 6xxx alloy comprising, in wt.-%: Si: 1.25 - 1.45 ; Fe: ≤ 0.30 ; Cu: ≤ 0.15 ; Mn: 0.01 - 0.15 ; Mg: 0.25 - 0.40 ; Cr: 0.03 ; Ni: ≤ 0.04 ; Zn: ≤ 0.15 ; Ti: 0.01 - 0.10 ; other elements: < 0.05 each and < 0.15 in total ; rest aluminium; (b) heat treating; (c) hot rolling; (d) cold rolling; (e) optionally inter-annealing between hot rolling and cold rolling and/or during cold rolling and/or after cold rolling; (f) solution heat treating; (g) quenching; (h) optionally pre-aging; (i) shearing without any milling step.

IPC 8 full level

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CPC (source: EP)

C22C 21/02 (2013.01); **C22C 21/08** (2013.01); **C22F 1/043** (2013.01); **C22F 1/05** (2013.01)

Citation (applicant)

- JP 3872753 B2 20070124
- JP 4495623 B2 20100707
- SERGEY F. GOLOVASHCHENKO ET AL.: "Trimming and sheared edge stretchability of automotive 6xxx aluminum\"", JOURNAL OF MATERIALS PROCESSING TECH., vol. 264, 2019, pages 64 - 75, XP085512049, DOI: 10.1016/j.jmatprotec.2018.09.001
- NICHOLAS ROBERT KALWEIT: "thesis", 2017, UNIVERSITY OF MICHIGAN-DEARBORN, article "Edge Stretch Performance of 6DR1 Aluminum in Typical Automotive Blanking Conditions"
- X.H. HU ET AL.: "Predicting tensile stretchability of trimmed AA6111-T4 sheets", COMPUTATIONAL MATERIALS SCIENCE, vol. 85, 2014, pages 409 - 419, XP028662080, DOI: 10.1016/j.commatsci.2014.01.015
- QUOCHUNG B. LE ET AL.: "Analysis of sheared edge formability of aluminum\"", JOURNAL OF MATERIALS PROCESSING TECHNOLOGY, vol. 214, 2014, pages 876 - 891, XP028669851, DOI: 10.1016/j.jmatprotec.2013.11.021
- NAN WANG ET AL.: "Mechanism of fractureof aluminum blanks subjected to stretching along the sheared edge", JOURNAL OF MATERIALS PROCESSING TECHNOLOGY, vol. 233, 2016, pages 142 - 160, XP029466576, DOI: 10.1016/j.jmatprotec.2016.02.022

Citation (search report)

- [X] WO 2018206696 A1 20181115 - ALERIS ALUMINUM DUFFEL BVBA [BE]
- [X] WO 2019025227 A1 20190207 - ALERIS ALUMINUM DUFFEL BVBA [BE]
- [X] US 2020340091 A1 20201029 - BOISSONNET LAURENT [FR], et al
- [X] WO 2014135367 A1 20140912 - ALERIS ALUMINUM DUFFEL BVBA [BE]
- [X] US 2015152535 A2 20150604 - KEHL WERNER [DE], et al
- [A] US 2019226071 A1 20190725 - PHILIPPE SABINE [FR], et al
- [A] JP 2003226927 A 20030815 - TOYOTA MOTOR CORP, et al

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