

Title (en)

Method and tool for thermal treatment of aluminium sheet material and aluminium sheet material thermally treated using such a method

Title (de)

Verfahren und Werkzeug zur Wärmebehandlung von Aluminiumblechwerkstoff sowie nach einem derartigen Verfahren wärmebehandelter Aluminiumblechwerkstoff

Title (fr)

Procédé et outil de traitement thermique d'une matière première en tôle d'aluminium ainsi que la matière première en tôle d'aluminium traitée par ce type de procédé

Publication

EP 2554288 A1 20130206 (DE)

Application

EP 12178269 A 20120727

Priority

DE 102011080528 A 20110805

Abstract (en)

Heat treating of aluminum sheet material (8), comprises: providing aluminum sheet material; heating the aluminum sheet material at a temperature that is \geq heating temperature; maintaining the temperature during a heating period; quenching a deterrent portion (10) of the sheet material at a temperature = a quenching temperature; and cooling a cooling portion (11) of the sheet material at a temperature = a cooling temperature, where cooling takes place within a cooling period, which is greater than the quenching period, and shielding of the cooling portion by a tool occurs during quenching. Heat treating of aluminum sheet material (8), comprises (a) providing aluminum sheet material, (b) heating the aluminum sheet material at a temperature that is \geq heating temperature, (c) maintaining the temperature during heating period, (d) quenching at least one deterrent portion (10) of the aluminum sheet material at a temperature that is = a quenching temperature, where the quenching is carried out within a quenching period, and (e) cooling at least one cooling portion (11) of the aluminum sheet material at a temperature that is = a cooling temperature, preferably ambient temperature, where cooling is carried out within a cooling period, which is greater than the quenching period, and shielding of the cooling portion using a tool takes place during quenching. Independent claims are also included for: (1) the aluminum sheet material having tailored material properties, manufactured by the above mentioned method, where the cooling portion opposite to the deterrent portion exhibits a mechanical material property deviating by a differential amount, preferably a reduced yield strength and/or a reduced tensile strength, and where the differential amount is stable at least during a time interval for further processing, preferably forming; and (2) the tool for carrying out the above mentioned method, comprising two tool halves connectable with each other, where at least one of the tool halves includes an opening (6) for accessibility to the deterrent portion of the aluminum sheet material.

Abstract (de)

Ein Verfahren zur Wärmebehandlung von Aluminiumblechwerkstoff umfasst die Verfahrensschritte Bereitstellen von Aluminiumblechwerkstoff (8), Erwärmen des Aluminiumblechwerkstoffs (8) auf eine Temperatur (T) größer oder gleich einer Erwärmungstemperatur (T_{er}), Halten der Temperatur (T) während einer Erwärmungsdauer (t_{er}), Abschrecken mindestens eines Abschreckungsbereichs (10) des Aluminiumblechwerkstoffs (8) auf eine Temperatur (T) kleiner oder gleich einer Abschrecktemperatur (T_{schr}), wobei das Abschrecken innerhalb einer Abschreckdauer (t_{schr}) erfolgt, Abkühlen mindestens eines Abkühlungsbereichs (11) des Aluminiumblechwerkstoffs (8) auf eine Temperatur (T) kleiner oder gleich einer Abkühltemperatur (T_k), insbesondere Umgebungstemperatur (T_u), wobei das Abkühlen innerhalb einer Abkühldauer (t_k) erfolgt, die größer ist als die Abschreckdauer (t_{schr}).

IPC 8 full level

B21D 37/16 (2006.01); **C22F 1/04** (2006.01)

CPC (source: EP)

B21D 37/16 (2013.01); **C22F 1/002** (2013.01); **C22F 1/04** (2013.01); **C22F 1/05** (2013.01); **C22F 1/053** (2013.01); **C21D 1/673** (2013.01); **C21D 2221/00** (2013.01)

Citation (applicant)

- DE 19620196 A1 19971127 - AUDI AG [DE]
- DE 102010033864 A1 20110407 - GM GLOBAL TECH OPERATIONS INC [US]

Citation (search report)

- [X] DE 10329981 A1 20050217 - BROSE FAHRZEUGTEILE [DE]
- [X] JP 2010018850 A 20100128 - AISIN KEIKINZOKU CO LTD
- [X] JP 2009161851 A 20090723 - FURUKAWA SKY ALUMINUM CORP
- [A] BECKMANN MARION ET AL: "Methods of local short-term heat treatment of 6000 series aluminum alloys", METALL, HUETHIG, HEIDELBERG, DE, vol. 56, no. 7-8, 1 January 2002 (2002-01-01), pages 462 - 467, XP009111952, ISSN: 0026-0746

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EP3187599A1; CN106885474A; WO2018011069A1; US10369606B2; WO2018024408A1

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 2554288 A1 20130206; EP 2554288 B1 20150923; DE 102011080528 B3 20130207

DOCDB simple family (application)

EP 12178269 A 20120727; DE 102011080528 A 20110805