

Title (en)
HOT FORMABLE, AIR HARDENABLE, WELDABLE, STEEL SHEET

Title (de)
WARMFORMBARES, LUFTHÄRTBARES, SCHWEISSBARES STAHLBLECH

Title (fr)
TOLE D'ACIER THERMOFORMABLE, DURCISSABLE A L'AIR ET SOUDABLE

Publication
EP 3114246 A1 20170111 (EN)

Application
EP 15745897 A 20150205

Priority

- US 201461935948 P 20140205
- US 2015014694 W 20150205

Abstract (en)
[origin: WO2015120205A1] A steel sheet comprising, in wt%, $0.04 \leq C \leq 0.30$, $0.5 \leq Mn \leq 4$, $0 \leq Cr \leq 4$, $2.7 \leq Mn+Cr \leq 5$, $0.003 \leq Nb \leq 0.1$, $0.015 \leq Al \leq 0.1$ and $0.05 \leq Si \leq 1.0$, has a chemistry that makes hot formed sheet after austenization insensitive to cooling rate and ensures a uniform distribution of tensile strength, in the range of 800-1400 MPa, across parts independent of the time delay between operations and final cooling/quenching. As a result, a formed part can be cooled while inside a die or in air. The addition of Nb reduces the amount of C needed to achieve a given tensile strength and improves weldability.

IPC 8 full level
C22C 38/38 (2006.01); **C21D 8/02** (2006.01); **C22C 38/12** (2006.01); **C22C 38/26** (2006.01); **C23C 2/06** (2006.01); **C23C 2/12** (2006.01)

CPC (source: EP KR RU US)
C21D 1/18 (2013.01 - KR); **C21D 8/02** (2013.01 - RU); **C21D 8/0226** (2013.01 - KR); **C21D 8/0236** (2013.01 - KR); **C21D 9/46** (2013.01 - EP KR); **C22C 38/02** (2013.01 - EP KR); **C22C 38/04** (2013.01 - EP); **C22C 38/06** (2013.01 - EP KR); **C22C 38/12** (2013.01 - EP RU); **C22C 38/22** (2013.01 - EP); **C22C 38/24** (2013.01 - EP); **C22C 38/26** (2013.01 - EP KR RU); **C22C 38/28** (2013.01 - EP); **C22C 38/32** (2013.01 - EP); **C22C 38/38** (2013.01 - EP KR RU); **C23C 2/02** (2013.01 - EP KR RU US); **C23C 2/0224** (2022.08 - EP KR RU US); **C23C 2/024** (2022.08 - EP KR RU US); **C23C 2/06** (2013.01 - EP); **C23C 2/12** (2013.01 - EP KR); **C23C 2/40** (2013.01 - EP); **C21D 1/18** (2013.01 - EP); **C21D 8/0226** (2013.01 - EP); **C21D 8/0236** (2013.01 - EP); **C21D 2211/002** (2013.01 - EP KR); **C21D 2211/008** (2013.01 - EP KR)

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)
WO 2015120205 A1 20150813; BR 112016018119 A2 20170808; BR 112016018119 B1 20201117; BR 112016018119 B8 20201215; CA 2938851 A1 20150813; CA 2938851 C 20200609; CN 105980591 A 20160928; CN 113416892 A 20210921; EP 3114246 A1 20170111; EP 3114246 A4 20180404; EP 3114246 B1 20190828; ES 2746260 T3 20200305; HU E045244 T2 20191230; JP 2017510703 A 20170413; JP 2019065396 A 20190425; JP 6830468 B2 20210217; KR 20160117543 A 20161010; KR 20180104199 A 20180919; KR 20210047366 A 20210429; MA 39245 A1 20170331; MA 39245 B2 20210430; MX 2016010006 A 20161216; PL 3114246 T3 20200331; RU 2695688 C1 20190725; UA 119344 C2 20190610

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US 2015014694 W 20150205; BR 112016018119 A 20150205; CA 2938851 A 20150205; CN 201580007549 A 20150205; CN 202110560953 A 20150205; EP 15745897 A 20150205; ES 15745897 T 20150205; HU E15745897 A 20150205; JP 2016550745 A 20150205; JP 2018208132 A 20181105; KR 20167024062 A 20150205; KR 20187026542 A 20150205; KR 20217011542 A 20150205; MA 39245 A 20150205; MX 2016010006 A 20150205; PL 15745897 T 20150205; RU 2016135709 A 20150205; UA A201609209 A 20150205