

Title (en)  
PROCESS FOR MANUFACTURING A GALVANNEALED STEEL SHEET BY DFF REGULATION

Title (de)  
VERFAHREN ZUR HERSTELLUNG EINES VERZINKTEN UND DANN WÄRMEBEHANDELTEN STAHLBLECHS DURCH DFF-REGULIERUNG

Title (fr)  
PROCÉDÉ DE FABRICATION D'UNE TÔLE D'ACIER RECUITE PAR GALVANISATION PAR RÉGULATION DFF

Publication  
**EP 2171116 B1 20110824 (EN)**

Application  
**EP 08762800 A 20080606**

Priority  

- IB 2008001462 W 20080606
- EP 07290816 A 20070629
- EP 08762800 A 20080606

Abstract (en)  
[origin: EP2009129A1] Technical abstract The invention deals with a process for manufacturing a hot-dip galvanized steel sheet having a TRIP microstructure, and comprising, by % by weight, 0.01 # C # 0.22%, 0.50 # Mn # 2.0%, 0.2 # Si # 2.0%, 0.005 # Al # 2.0%, Mo < 0.01 %, Cr # 1.0%, P < 0.02%, Ti # 0.20%, V # 0.40%, Ni # 1.0%, Nb # 0.20%, the balance of the composition being iron and unavoidable impurities resulting from the smelting, said process comprising the steps consisting in: - oxidizing said steel sheet in order to form a layer of iron oxide on the surface of the steel sheet, and to form an internal oxide of at least one type of oxide selected from the group consisting of Si oxide, Mn oxide, Al oxide, complex oxide comprising Si and Mn, complex oxide comprising Si and Al complex oxide comprising Al and Mn, and complex comprising Si, Mn and Al, - reducing said oxidized steel sheet in order to reduce the layer of iron oxide, - hot-dip galvanizing said reduced steel sheet to form a zinc-based coated steel sheet, and - subjecting said zinc-based coated steel sheet to an alloying treatment to form a galvanized steel sheet.

IPC 8 full level  
**C23C 2/02** (2006.01); **C23C 2/06** (2006.01); **C23C 2/28** (2006.01)

CPC (source: EP KR US)  
**C21D 1/52** (2013.01 - EP KR US); **C21D 9/46** (2013.01 - EP KR US); **C21D 9/561** (2013.01 - EP KR US); **C22C 1/11** (2023.01 - EP KR US); **C23C 2/0222** (2022.08 - EP KR US); **C23C 2/0224** (2022.08 - EP KR US); **C23C 2/06** (2013.01 - EP KR US); **C23C 2/261** (2022.08 - KR); **C23C 2/28** (2013.01 - EP US); **C23C 2/40** (2013.01 - EP KR US)

Cited by  
CN108165892A

Designated contracting state (EPC)  
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR

DOCDB simple family (publication)  
**EP 2009129 A1 20081231**; AR 067339 A1 20091007; AT E521726 T1 20110915; BR PI0813687 A2 20141230; BR PI0813687 A8 20151215; BR PI0813687 B1 20181030; CA 2701091 A1 20090108; CA 2701091 C 20120417; CN 101809182 A 20100818; CN 101809182 B 20150805; EP 2171116 A1 20100407; EP 2171116 B1 20110824; ES 2371985 T3 20120112; JP 2010532820 A 20101014; JP 2015078438 A 20150423; JP 5713673 B2 20150507; KR 101273308 B1 20130611; KR 20100055389 A 20100526; PL 2171116 T3 20120131; RU 2010102924 A 20110810; RU 2451107 C2 20120520; US 2010193081 A1 20100805; WO 2009004425 A1 20090108

DOCDB simple family (application)  
**EP 07290816 A 20070629**; AR P080102782 A 20080627; AT 08762800 T 20080606; BR PI0813687 A 20080606; CA 2701091 A 20080606; CN 200880025372 A 20080606; EP 08762800 A 20080606; ES 08762800 T 20080606; IB 2008001462 W 20080606; JP 2010514160 A 20080606; JP 2014227461 A 20141107; KR 20107001332 A 20080606; PL 08762800 T 20080606; RU 2010102924 A 20080606; US 66670208 A 20080606