

Title (en)
Process for manufacturing a galvanized steel sheet by DFF regulation

Title (de)
Verfahren zur Herstellung eines galvanisierten oder Galvanneal-Stahlblechs durch DFF-Regulierung

Title (fr)
Processus de fabrication d'une plaque d'acier galvanisée par régulation DFF

Publication
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Application
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Priority
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Abstract (en)
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.

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Citation (search report)
• [X] BE 1014997 A3 20040803 - CT RECH METALLURGIQUES ASBL [BE]
• [A] EP 1612288 A1 20060104 - NIPPON STEEL CORP [JP], et al
• [A] US 3925579 A 19751209 - FLINCHUM CHARLES, et al
• [A] WO 2007064172 A1 20070607 - POSCO [KR], et al
• [A] US 2003047255 A1 20030313 - DELAUNAY DIDIER [FR], et al
• [A] EP 0448351 A1 19910925 - KAWASAKI STEEL CO [JP]
• [A] US 3936543 A 19760203 - BYRD FRED, et al
• [A] WO 2006061151 A1 20060615 - THYSSENKRUPP STEEL AG [DE], et al

Cited by
EP3045559A4; EP2942419A4; RU2648722C2; EP2659016A4; EP3080312A4; EP4215628A1; US10100385B2; US9873934B2; EP2840161A4; EP2921569A4; US10400315B2; US10570472B2; WO2015001367A1; WO2015001414A1; EP2659016A2

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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