

Title (en)  
HYDROXYSULFATE SURFACE TREATMENT

Title (de)  
HYDROXYSULFAT-OBERFLÄCHENBEHANDLUNG

Title (fr)  
TRAITEMENT DE SURFACE PAR HYDROXYSULFATE

Publication  
**EP 1699947 A1 20060913 (FR)**

Application  
**EP 04816380 A 20041214**

Priority  
• FR 2004003208 W 20041214  
• FR 0315381 A 20031224

Abstract (en)  
[origin: FR2864552A1] Aqueous treatment solution contains sulphate ions (SO<sub>4</sub><sup>2-</sup>) at a concentration of greater than or equal to 0.02 mol/l, for the treating the surface of a steel sheet with a zinc or zinc alloy based coating on at least one of its surfaces. The treatment is aimed at reducing the formation of powder or metal particles generated by the degradation of the coating during the shaping of the sheet. Independent claims are also included for: (a) lubrication of a coated steel sheet using the aqueous treatment solution; (b) utilisation of the aqueous treatment solution for treating coated steel sheet to improve temporary protection against corrosion.

IPC 8 full level  
**C23C 22/68** (2006.01); **B21D 22/20** (2006.01); **C23C 2/26** (2006.01); **C23C 22/53** (2006.01); **C25D 9/06** (2006.01); **C25D 11/34** (2006.01)

CPC (source: EP KR US)  
**B21D 22/20** (2013.01 - KR); **C23C 2/06** (2013.01 - KR); **C23C 2/26** (2013.01 - EP KR US); **C23C 22/53** (2013.01 - EP KR US); **C23C 22/68** (2013.01 - EP KR US); **C25D 9/06** (2013.01 - EP KR US); **C25D 11/34** (2013.01 - KR)

Citation (examination)  
• WO 2005021823 A1 20050310 - JFE STEEL CORP [JP], et al & EP 1666624 A1 20060607 - JFE STEEL CORP [JP]  
• See also references of WO 2005071140A1

Cited by  
US10287665B2

Designated contracting state (EPC)  
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR

DOCDB simple family (publication)  
**FR 2864552 A1 20050701**; **FR 2864552 B1 20060721**; BR PI0418188 A 20070427; BR PI0418188 B1 20150818; CA 2551492 A1 20050804; CN 1914354 A 20070214; EP 1699947 A1 20060913; EP 2450470 A1 20120509; JP 2007517135 A 20070628; KR 101022683 B1 20110317; KR 20060129306 A 20061215; MX PA06007253 A 20060818; RU 2006126698 A 20080127; RU 2371516 C2 20091027; UA 89368 C2 20100125; US 2008308192 A1 20081218; WO 2005071140 A1 20050804; ZA 200605133 B 20070926

DOCDB simple family (application)  
**FR 0315381 A 20031224**; BR PI0418188 A 20041214; CA 2551492 A 20041214; CN 200480040618 A 20041214; EP 04816380 A 20041214; EP 12000368 A 20041214; FR 2004003208 W 20041214; JP 2006546227 A 20041214; KR 20067014952 A 20041214; MX PA06007253 A 20041214; RU 2006126698 A 20041214; UA A200608324 A 20041214; US 58376504 A 20041214; ZA 200605133 A 20060622