

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
3 February 2005 (03.02.2005)

PCT

(10) International Publication Number
WO 2005/010233 A3

(51) International Patent Classification⁷: **C25D 5/44**,
C23C 18/18, 18/31

(21) International Application Number:
PCT/US2004/011417

(22) International Filing Date: 14 April 2004 (14.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/606,460 26 June 2003 (26.06.2003) US

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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,
GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
24 February 2005

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: AQUEOUS ACIDIC IMMERSION PLATING SOLUTIONS AND METHODS FOR PLATING ON ALUMINUM AND ALUMINUM ALLOYS

(57) Abstract: The present invention provides a non-cyanide aqueous acidic immersion plating solution having a pH of from about 3.5 to about 6.5 and comprising zinc ions, nickel ions and/or cobalt iron ions, and fluoride ions. In one embodiment the immersion plating solutions of the invention also contain at least one inhibitor containing one or more nitrogen atoms, sulfur atoms, or both nitrogen and sulfur atoms. The present invention also relates to methods for depositing zinc alloy protective coatings on aluminum and aluminum alloy substrates comprising immersing the aluminum or aluminum alloy substrate in the non-cyanide acidic immersion plating solutions of the invention. Optionally, the zinc alloy coated aluminum or aluminum alloy substrate is plated using an electroless or electrolytic metal plating solution.



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