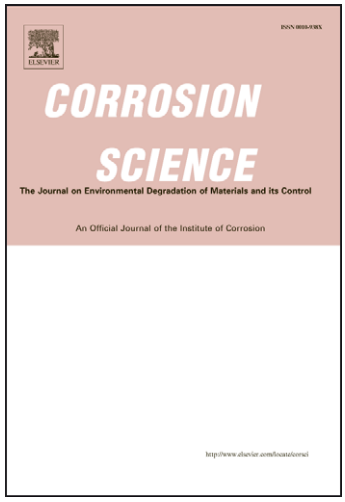

Characterisation and understanding of the corrosion behaviour of the nugget in a 2050 aluminium alloy Friction Stir Welding joint

Vincent Proton, Joël Alexis, Eric Andrieu, Jérôme Delfosse, Marie-Christine Lafont, Christine Blanc

PII: S0010-938X(13)00119-4
DOI: http://dx.doi.org/10.1016/j.corsci.2013.04.001
Reference: CS 5300

To appear in: *Corrosion Science*

Received Date: 18 November 2012
Accepted Date: 1 April 2013

Please cite this article as: V. Proton, J. Alexis, E. Andrieu, J. Delfosse, M-C. Lafont, C. Blanc, Characterisation and understanding of the corrosion behaviour of the nugget in a 2050 aluminium alloy Friction Stir Welding joint, *Corrosion Science* (2013), doi: http://dx.doi.org/10.1016/j.corsci.2013.04.001

Characterisation and understanding of the corrosion behaviour of the nugget in a 2050 aluminium alloy Friction Stir Welding joint

Vincent Proton[a], Joël Alexis[b], Eric Andrieu[a], Jérôme Delfosse[c], Marie-Christine Lafont[a], Christine Blanc[a,*]

[a]Université de Toulouse, CIRIMAT, UPS/CNRS/INPT, 4 allée Emile Monso, BP 44362, 31030 Toulouse Cedex 04, France

[b]Université de Toulouse, LGP, ENIT/INPT, 47 av. d'Azereix, BP 1629, 65016 Tarbes Cedex, France

[c]EADS Innovation Works-IW/MS/MM, 12 rue Pasteur, BP 76, 92152 Suresnes Cedex, France

[*]Corresponding author at: Université de Toulouse, CIRIMAT, UPS/CNRS/INPT, 4 allée Emile Monso, BP 44362, 31030 Toulouse Cedex 4, France

E-mail address: christine.blanc@ensiacet.fr; fax: 33 (0)5 34 32 34 98; phone: 33 (0)5 34 32 34 07

Abstract

The corrosion behaviour of the nugget of a Friction Stir Welding joint employing a 2050 Al-Cu-Li alloy was investigated. The results showed that the nugget was susceptible to both intergranular and intragranular corrosion. Such corrosion behaviour was related to microstructural heterogeneities observed on a microscopic scale. Furthermore, heterogeneities in the corrosion behaviour of the nugget observed on a macroscopic scale were evidenced by a different corrosion behaviour from the top to the bottom of the nugget and by a localisation of the corrosion damage related to the "Onion ring structure". Critical microstructural parameters were identified to explain the results.

Keywords:

A. Aluminium

A. Alloy

B. Polarisation

B. TEM

C. Intergranular corrosion

C. Welding