Accepted Manuscript

Title: Resistance Spot Welding and the Effects of Welding Time and Current on Residual Stresses

Author: Hessamoddin Moshayedi Iradj Sattari-Far

PII: S0924-0136(14)00175-7
DOI: http://dx.doi.org/doi:10.1016/j.jmatprotec.2014.05.008
Reference: PROTEC 13995

To appear in: *Journal of Materials Processing Technology*

Received date: 21-12-2013
Revised date: 4-5-2014
Accepted date: 6-5-2014

Please cite this article as: Moshayedi, H.,Resistance Spot Welding and the Effects of Welding Time and Current on Residual Stresses, *Journal of Materials Processing Technology* (2014), http://dx.doi.org/10.1016/j.jmatprotec.2014.05.008

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Resistance Spot Welding and the Effects of Welding Time and Current on Residual Stresses

Hessamoddin Moshayedi[a], Iradj Sattari-Far[a,*]
[a] *Mechanical Engineering Department, Amirkabir University of Technology, PO Box 15875-4413, Tehran, Iran*

Highlights

- We developed an electrical-thermal-mechanical FE model to analyze RSW.
- the effects of welding current and time on nugget size and residual stresses are investigated
- With increase in welding time, pressure decreases in the central area and rises in the edge of the contact region.
- Radial residual stress is compressive in the surface of weld nugget region, and becomes tensile in the edges and outside of weld nugget.
- Welding current has more effect on residual stresses in comparison with welding time.

Accepted Manuscript

Abstract

A 2-D finite element model is developed based on fully-coupled electrical-thermal and incrementally-coupled thermal-mechanical analysis. The growth rate of the weld nugget as a function of welding time and current is studied. Comparison of the predicted results with the experimental data shows good agreement. Contact area variations and pressure distribution between the sheets' faying surface and electrode-sheet interfaces during the welding process are studied. Compressive radial residual stress on the surface of the specimen obtained in the center region of the nugget while it becomes tensile and rises

* Corresponding author. Tel.: +98 21 64543426; fax: +98 21 64543498.
E-mail addresses: h.moshayedi@aut.ac.ir (H. Moshayedi), Sattari@aut.ac.ir (I. Sattari-Far)

Download English Version:

https://daneshyari.com/en/article/10417389

Download Persian Version:

https://daneshyari.com/article/10417389

Daneshyari.com