THE ANNALS OF "DUNAREA DE JOS "UNIVERSITY OF GALATI
FASCICLE XII WELDING EQUIPMENT AND TECHNOLOGY ISSN 1221 - 4639

2004

# Heat Transfer on Dissimilar Metals Welding

Elena Scutelnicu, Mihaela Iordachescu
"Dunarea de Jos" University of Galati

## ABSTRACT

*Goldak et al., first introduced the three-dimensional double ellipsoidal heat source to predict the temperature field of semi-infinite body. For thin plates the source influence in the thickness direction could be negligible and the source becomes a Gaussian surface-distributed heat source or elliptical disk heat source.*

*Assuming such heat source, several theoretical investigations on the heat transfer in dissimilar metals welded joints are presented in this paper. An actual theoretical method using finite element analysis is availed for the thermal processes simulation on the spot welding by fusion. Using thin sheets, the thermal transfer in the thickness direction is negligible and heat flow is considered two-dimensional.*

## References

[1] **Fetecău, C., Stan, F.** - *Technological Particularities of the Turning Process for Thermo Reactive Materials*, Analele Universității Dunarea de Jos din Galati, Fascicula V, Anul XXII (XXVII), ISSN 1221-4566, 2004, pag. 73-78.
[2] **Goldak, J., Chakravarti, A., Bibby, M.** - *A Double Ellipsoid Finite Element Model for Welding Heat Sources*, IIW Doc. 212-603-85, 1985.
[3] **Nguyen, N., T., Ohta, A., Matsuoka, K., Suzuki, N., Maeda, Y.** - *Analytical Solutions for Transient Temperature of Semi-Infinite Body Subjected to 3-D Moving Heat Sources*, Welding Journal, Aug., 1999, pag. 265s-273s.
[4] **Scutelnicu, E., Mihailescu, A.** - *Dependenta dintre Proprietatile Termofizice si Transferul Termic in Imbinarile Sudate,* Conferinta Internationala Tehnologii Moderne, Calitate, Restructurare, ISBN 9975-9638-0-3, Chisinau, Republica Moldova, 2001, pag. 408-412.
[5] **Scutelnicu, E.** – *Theoretical and Experimental Researches on the Thermal Processes in Dissimilar Metals Welding*, PhD thesis, Dunarea de Jos University of Galati, Romania, 7th February, 2003.
[6] **Scutelnicu, E., Constantin, E., Iordachescu, D.** - *Modelarea Proceselor Termomecanice de Asamblare*, ISBN-973-627-078-5, Editura Fundatiei Universitare Dunarea de Jos din Galati, 2003, Romania.
[7] **Xin, R., C., Tao, W., Q.** - *Analytical solution for transient heat conduction in two semi-infinite bodies in contact*, Journal of Heat Transfer 116(2), 1994, pag. 224-229.
[8] ******* *COSMOS/M2.5*, User'Manual, 1999.