

NUMERICAL SIMULATION OF TRANSIENT TEMPERATURE AND VON MISES STRESSES OF THE FSW PROCESS

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ABSTRACT

The paper introduces an original 3D FEM model of Friction Stir Welding phases. The outputs are the thermal, and the stresses fields, respectively. The recently published literature validates the process model.

KEYWORDS: aluminium, FSW, thermal, material flow

REFERENCES

- [1] Iordachescu, M., Scutelnicu, E., Quintino, L., Iordachescu, D., Vilaça, P., *Friction stir processing of materials: tools design and microstructural characterization*, The Annals of Dunarea de Jos University of Galati, Fascicle XII, Welding Equipment and Technology, Year XVIII, 63-72, 2007.
- [2] Iordachescu, M., Scutelnicu, E., Iordachescu, D., *Microstructural Changes in Aluminium Alloys by Friction Stir Processing*, The Annals of Dunarea de Jos University of Galati, Fascicle XII, Welding Equipment and Technology, Year XVI, 2005.
- [3] Shinoda, T., Kawai, M., Takegami, H., *Novel Process of Surface Modification of Aluminium Casts Applied Friction Stir Phenomenon*, IIW Doc. III-1295-04.
- [4] Thomas, W. M. et. al., *Friction Stir Butt Welding*, International patent Application PCT/GB92/02203, GB Patent Application 9125978.8, US Patent 5.460.317, 6 December 1991.
- [5] Colligan, K., *Material Flow behaviour during Friction Stir Welding of Aluminium*, Welding Journal, 75(7), 229s-237s, 1999.
- [6] Mishra, R.S., Ma Z.Y. *Friction stir welding and processing*, Materials Science and Engineering R 50 (2005) 1-78, Elsevier, 2005.
- [7] Vilaça, P., Santos, J. P., Góis, A., Quintino, L., *Joining Aluminium Alloys Dissimilar in Thickness by Friction Stir Welding and Fusion Processes*, Welding in the World, Vol. 49, No. 3/4, 56-62, 2005.