



The **12<sup>th</sup>** International Conference

# Innovative Technologies for Joining Advanced Materials

**Organizers**



**TIMIȘOARA**

National R&D Institute for Welding  
and Material Testing - ISIM  
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**November  
25-26, 2021**

**Conference Papers**

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**ZOOM platform:** Meeting ID: **818 8596 1506** / Password: **919854** or  
<https://us02web.zoom.us/j/81885961506?pwd=UW0zY3dpS0F3TEtuQ2dld0hJT0NpUT09>

## CONFERENCE PAPERS

**Thursday, November 25, 2021**

**10:00 - 10:15**                      **Conference opening**

### **Welcome of participants**

- Dr. eng. Nicușor-Alin SÎRBU, General Director of ISIM Timișoara
- Assoc. Prof. dr. eng. Florin DRĂGAN, Rector of Politehnica University Timișoara
- Prof. dr. eng. Vladimir-Ioan CREȚU, President of the Timișoara Subsidiary of ASTR

**10:30 - 13:00**                      **Session 1 / Moderator: Dr. eng. Șerban PANAITESCU**

**Valorization of abrasive waterjet Garnet wastes by innovative integration in building materials**

C. Baeră, H. Szilagyi, A. Gruin, B. Bolborea, I. A. Perianu

**Electromagnetic methods for production of aluminium metal matrix composites**

M. Milgrāvis, G. Kronkalns, R. Nikoluškis, T. Beinerts, M. Kalvāns, A. Bojarevičs, I. A. Perianu

**On some possibilities for optimizing the wire electrical discharge machining (WEDM) processing of Welded Joints applied to stainless steel**

V. M. Nani, A. M. Titu, G. V. Mnerie, A. Nani, D. Mnerie

**Study on soldering alloy structure influence on whiskers germination and grow process in joints executed using Tin base soldering alloys**

C. Codrean, D. Buzdugan, B. Radu, G. Melcioiu

**Development of self-shielded flux-cored wires for arc welding of low-alloy steels**

V. V. Golovko, O. S. Kotelchuk, S. M. Naumeiko, A. A. Golyakevich

**Innovative method for overlap friction stir welding (FSW) of 1 mm thick sheets of 5754 aluminium alloy, on tilted jig**

V. Verbițchi, M. Vlascici, R. Cojocar, L. N. Boțilă, I. Duma, I. A. Perianu

**Tribological properties of different 3D printed PLA filaments**

R. Muntean, S. Ambruș, N. A. Sirbu, I. D. Uțu

**The Influence of Temperature on the Tensile Mechanical Properties of PPA**

R. M. Buzdugan, E. Vălean, B. Gălătuș, D. Foltut, I. Duma, L. Marșavina

**Innovative technologies to improve the corrosion resistance of stainless steels**

A. A. Geană, A. C. Murariu, I. A. Perianu

**Improving the fatigue behaviour of PURMAL S-70 polyurethane paint**

A. C. Murariu

**Study regarding the evaluation of prediction models for determining the concrete compressive strength using non-destructive testing (NDT) data: validation stage**

B. Bolborea, S. Dan, C. Baeră, A. Gruin, F. Enache, I. A. Perianu

**Material optimization through thin film compositional spreads**

V. M. Bolocan, B. Gavre, D. D. Vâlsan, C. M. Crăciunescu

**13:00 - 14:00 Round Table: Architected functional materials - Prof. dr. ing. habil. Corneliu M. Craciunescu**

**14:00 - 15:00 Lunch break**

**15:00 - 17:15**

**Session 2 / Moderator: Moderator: Dr. eng. Alin-Constantin MURARIU**

**Design of shape memory micro-actuator modules with sequential actuation**

V. M. Bolocan, D. D. Vâlsan, A. Novac, G. A. Chilnicean, A. Ercuța, C. M. Crăciunescu

**Comparison of two numerical models for friction stir welding**

I. Draganov, N. Ferdinandov

**Simulation of thermal field in eutectic microwave bonding for electrical connection of photovoltaic cells**

C. D. Ghelsinger, R. C. Marin, I. Stefan, N. A. Sirbu, I. D. Savu, A. David, S. V. Savu, A. B. Olei

**Aspects regarding welding of DD13 steel by applying the FSW process and some processes derived from it**

L. N. Boțilă, R. Cojocaru, I. A. Perianu

**Aspects regarding the operating behavior of FSW welding tools**

I. A. Perianu, L. N. Boțilă, R. Cojocaru

**Innovative solutions for waste removal (used abrasive) resulted from water jet cutting process**

I. A. Perianu, R. Cojocaru, E. F. Binchiciu, G. Mnerie

**ISIM achievements regarding friction stir welding in inert gas environment**

L. N. Boțilă, R. Cojocaru

**Friction stir welding in inert gas environment (FSW-IG) of AZ31B magnesium alloy**

R. Cojocaru, L. N. Boțilă, H. F. Dașcău

**Considerations regarding friction stir welding of stainless steels**

R. Cojocaru, L. N. Boțilă, H. F. Dașcău, V. Verbițchi

**Analysis of pulsed laser spot effects on NiTi wires**

D. D. Vâlsan, V. M. Bolocan, A. Novac, G. A. Chilnicean, C. M. Crăciunescu

**Some helpful features of the TIG welding process using high frequency Pulsed Arc**

V. I. Safta, G. V. Mnerie, V. Nagy, D. Mnerie

**Ultrasonic welding of Cu alloy connectors and conductors used in the automotive industry**

E. Dobrin, N. A. Sirbu, G. V. Mnerie, I. Duma

**Damage state assessment of metal pipes of a power plant, subjected to thermal stresses**

I. Duma, A. C. Murariu, R. N. Popescu

## **Friday, November 26, 2021**

**10:00 - 13:30**

**Session 3 / Moderator: Dr. eng. Bogdan RADU**

**New results regarding the cavitation destruction behavior of heat-treated CuZn39Pb3 brass with different parameters**

C. Ghera, I. Lazar, D. Alexa, I. Bordeasu, N. A. Sirbu, D. Ostoia, M. Hluscu, C. L. Salcianu, D. C. Stroita, D. V. Bazavan

**Joining photovoltaic cell connection strips using ultra-acoustic wave - resistive hybrid heating system**

T. Tunescu, A. Filipciuc, I. Stefan, N. A. Sirbu, I. D. Savu, A. David, S. V. Savu, A. B. Olei

**New results regarding the cavitation destruction behavior of heat-treated CuSn12-C bronze with different parameters**

C. L. Salcianu, C. Ghera, S. T. Duma, D. Alexa, I. Bordeasu, N. A. Sirbu, C. E. Podoleanu, L. D. Pirvulescu, D. V. Bazavan, A. Hadar, G. Malaimare, L. M. Micu

**Establishing the optimal infill for peak tensile and compressive performance of CF reinforced polyamide test specimens manufactured through additive manufacturing**

A. A. Geană, N. A. Sirbu, M. Marin-Corciu, I. Duma

**Fracture behaviour of AZ31B and Cu 99 tensile test specimens joined by FSW and FSW-IG processes**

E. F. Binchiciu, C. Codrean, L. N. Boțilă, M. Nicolaescu, R. I. Iacobici

**Properties of hybrid aluminium-steel joints made by resistance spot welding**

Sahm alden Abd al al, M. Gáspár, Á. Meilinger

**Effect of pre-heating and post-weld local heat treatment on the microstructure and mechanical properties of low-cost  $\beta$ -titanium alloy welding joints, obtained by EBW**

S.V. Akhonin, V Yu Belous, R.V. Selin

**Testing of an innovative method for overlap friction stir welding (FSW) of 1 mm thick sheets of 5754 aluminium alloy, on tilted jig**

V. Verbičchi, I. Duma, I. A. Perianu

**Structure and mechanical properties of high strength steel 960QL weldments**

N. Ferdinandov, D. Gospodinov, M. Ilieva, R. Radev

**Influence of 3D printing parameters on mechanical properties of the PLA parts made by FDM Additive Manufacturing process**

A. C. Murariu, N. A. Sirbu, M. Cocard, I. Duma

**Considerations regarding the extension of the service life of metal wear components from urban means of rail transport**

R. Cojocaru, L. N. Boțilă, I. A. Perianu, A. A. Geană

**The influence of drying time on a glass - adhesive - steel bonding**

D.F. Mădroane, I. Duma, S.V. Galațanu

**14:00 - 17:15**                      **Session 2 / Moderator: Dr. eng. Victor VERBIȚCHI**

**Study of durable strength of steel mining and metallurgical equipment**

V. D. Makarenko, S. Yu. Maksimov, Yu. V. Makarenko, O. S. Panchenko

**Review: Advantages of repairing machine parts in order to restore their functionality**

D. Tanasković, M. Arandelović, B. Đorđević, S. Sedmak

**Damage occurrence in welded structures of the bucket-wheel boom**

M. Arsić, Ž. Flajs, A. Sedmak, E. Veg, S. Sedmak

**Modalities and requirements regarding the qualification and certification of welding personnel for thermoplastic materials**

M. Cocard

**Reserves for improving the quality of metal layers of the 450Kh30M and 500Kh22B7 types by regulation of silicon content in hard-facing consumables**

V. Peremitko, D. Nosov, A. Yevdokymov, A. Golyakevich

**Considerations regarding the quality of welds on hollow plastic balls obtained by joining two ball halves**

D. F. Teușdea, N. A. Sirbu, M. Vodă

**Experimental study on the estimation of the life of some metal constructions of major importance**

G. V. Mnerie, I Duma, R. N. Popescu

**Developing innovative constructive solutions for active tools used in U-FDM**

G. V. Mnerie, E. Binchiciu, N. A. Sirbu

**Studies regarding FCAW welding of dissimilar joints between duplex stainless steel and naval carbon Steel**

M. Puchianu, H. Dascau, G. Solomon

**Implementing a RENAR accredited system for the qualification of welding execution personnel. experience and overview of 25 years of activity in Romania**

M. Oproiu, C. Micut, H. Dascau

**New requirements regarding the qualification and certification of the inspection personnel in the welding field. Harmonization with the European Qualification Framework (EQF)**

H. Dașcău, M. Oproiu

**Critical analysis of some practices of joining stainless steel pipes used in the food industry from the perspective of hygienic welding principles**

V. NAGY, G. V. MNERIE, V. I. SAFTA, D. MNERIE

**A new approach for double porous thermoelastic bodies**

A. N. Emin



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