

Table of Contents

Preface

Chapter 1: Welding Technologies and Properties of Welded Connections

Experimental Studies of Corrosion Resistance of Welded Seams of Steel Structures with a High Sulfur Content in Surface Layers Using Modern Methods of Modeling	
S.Y. Maksimov, V.D. Makarenko, S.M. Tkachenko, O.S. Panchenko and Y.V. Makarenko	3
Repair of Injection Moulds by Welding for Pre-Hardened 1.2714 Hh Steel	
C.E. Popescu, A. But and I. Duma	12
Welding of Toroidal Cores Made out of Amorphous Alloy Using Capacitor Discharge Spud Welding Technology (CD Welding)	
A. Suciu, A.C. Cazan, R. Dzitac, L.G. Matei and G. Mnerie	20
Microstructural Investigation and Mechanical Properties of Resistance Spot Welding Joints of Mild Steel Sheets	
I. Hulkă, B. Radu, V. Ungureanu and N.A. Sîrbu	26
Physical Heat Cycle Measurement of Resistance Spot Welding	
S. Alden Abd Al Al, Á. Meilinger and M. Gáspár	33
Changing Welding to Digital and Green - Actions and Communication	
A.M. Savu, A.I. Biholar, Á.A. Avram, M.C. Florescu and I.D. Savu	44
The Influence of Pigments on Ultrasonic Welding Behaviour of 3D Printed Components Using the Low Force Stereolithography Technology	
G. Mnerie, E. Dobrin, E. Binchiciu and L.I. Buzatu	52
Welding Corrective Maintenance Solutions for Molds	
A. But, C.E. Popescu and I. Duma	62
Residual Fatigue Life Estimation of Damaged Welded Structures	
I. Vasovic Maksimović, M. Maksimović, M. Djuric, M. Ristic and J. Vidakovic	68
Ultrasonic Welding Parameter Optimization for Electric Component Welding	
T.A. Kovács, L. Tóth, I.A. Perianu and M. Schramkó	77
Implementation of Manual Metal Arc Welding with Pulsed Current on TIG Modern Inverter Welding Equipment	
A. Magda, M. Burca and I.A. Perianu	83
Study on some Correlations between Hardness with Process Parameters Applying on Welded Joints Made through TIG Welding Process Using High Frequency Pulsed Arc	
B. Remus, S. Voicu-Ioan, M. Dumitru and G. Mnerie	89
Concept of Expert Software for Welding of Nodes from Inland Vessels	
A.A. Midan, S.V. Savu, A.I. Biholar, A.D. Savu and N.A. Sîrbu	95
Resistance of the Steel Lap Joints Connected by Spot Welding and Braze	
I. Both, V. Ungureanu, M. Burca, A. Popescu, A. Cristian and A. Biholar	102
The Role of Welding in Fracture Mechanics Development	
A. Sedmak, H. Dascau and S. Sedmak	114
Effects of Cold Gas Tungsten Arc Welding on Dissimilar DHP-CW024A Copper/304 SS Thin Lap Joint	
V. Denora, N. Contuzzi, M. Rashkovets, P. Posa, A. Angelastro and G. Casalino	120

Chapter 2: Friction Stir Welding Technologies

Submerged Friction Stir Welding Compared to Friction Stir Welding of EN AW 6082 Aluminum Alloy	
L. Botila, I.A. Perianu, M. Marin-Corciu, E. Dobrin, I. Duma and R.N. Popescu	135
Experimental Research on FSW and SFSW Welding of EN AW 7075 Aluminum Alloy	
L. Botila, I.A. Perianu, M. Marin-Corciu, E. Binchiciu, I. Duma and R.N. Popescu	143

Identification of the Local Mechanical Behavior of FSW Welds Using the Inverse Method	
N.S. Miloiu, Y. Demmouche, M. Dhondt, C. Bădulescu, D.M. Iordache, E.L. Nitu and I.A. Perianu	151
Aspects Regarding FSW and SFSW Welding of Copper Cu99	
L. Botila, I.A. Perianu, M. Marin-Corciu, E. Binchiciu, I. Duma and R.N. Popescu	162
Failure Analysis of AA 7075 Joints Processed by FSW and SFSW	
E. Binchiciu, L. Botila, G. Mnerie, E. Dobrin, I. Duma and M. Nicolaeiscu	170
Influence of the Cylindrical Profile of the Welding Tool Pin on the Dimensions of FSW and SFSW Welded Joints in EN AW 1200 Aluminium Alloy	
E. Dobrin, L. Botila and G. Mnerie	178
Failure Analysis of Al 6082 Joints Processed by FSW and SFSW	
I. Duma, R.N. Popescu, I.A. Perianu, L. Botila, E. Binchiciu, M. Marin-Corciu and E. Dobrin	186
Comparative Analysis of FSW and SFSW Welded Joints of EN AW 1200 Aluminum Alloy	
L. Botila, I.A. Perianu, M. Marin-Corciu, I. Duma, R.N. Popescu and V. Constantin	193
Aspects of the Influence of the Taper Profile of the Welding Tool pin on the Dimensions of FSW and SFSW Welded Joints in EN AW 1200 Aluminum Alloy	
E. Dobrin, L. Botila, G. Mnerie, I.A. Perianu, E. Binchiciu and R.N. Popescu	204

Chapter 3: Brazing Processes

Sustainability of Microwelding through Direct and Indirect Heating	
C.D. Ghelsingher, A.I. Biholar, R.C. Marin, A.A. Midan, A.D. Savu and S.V. Savu	215
Microstructural Aspects on Brazing Stainless Steels for High Temperature Applications	
B. Radu, C. Opri, C. Codrean, I.M. Anghel and I. Duma	221

Chapter 4: Additive Manufacturing Technologies

Influence of Density of 3D Printing Using the FDM Method on Productivity and Mechanical Properties of ABS	
V. Petrović, A. Čabrilo, V. Blanuša, P. Balaban, B. Savić and G. Mnerie	233
Fiberglass Reinforcement of Additively Manufactured Polymeric Specimens via FDM Process	
N. Trihenea, V. Constantin and D.A. Predu	240
Comparative Analysis of Mechanical Characteristics: Ultrasonically Compacted vs. Conventionally Additive Manufactured Polymeric Samples	
E. Binchiciu, M. Marin-Corciu, G. Mnerie and V. Constantin	246
Review of Potential Capabilities of 3D Printed Parts Reinforced with a Non- Newtonian Fluid for Enhancing Impact Resistance	
M. Marin-Corciu, N.A. Sîrbu, S.V. Galatanu, N. Trihenea and A.I. Biholar	254
Stress and Strain Analysis for a Topological Optimized Beam	
G. Murariu, I.A. Perianu and S.V. Galatanu	260
Further Analysis into Best Infill Structure Used in Additive Manufacturing for Mechanical Applications	
M. Marin-Corciu, N.A. Sîrbu, S.V. Galatanu, N. Trihenea and A.I. Biholar	268
An Analysis of the Advancements in Laser-Powered Direct Energy Deposition for Parts Repair	
N. Trihenea, V. Constantin and D.A. Predu	280

Chapter 5: Applied Materials and Processing Technologies

Mechanical Tests of EN AW 5754 Aluminium Alloy Clinch Joints	
A. Shukurea, P.Z. Kovács and J. Lukács	289
Advancements in Abrasive Waterjet Cutting Technologies: A Comprehensive Overview and Future Prospects in the Manufacturing Industry	
I.A. Perianu, A.C. Murariu, L. Botila, M. Marin-Corciu, I. Duma and C. Baeră	300

Bibliographic Study Regarding Renewable Energy: Infrared Reflective Layer Made of Al₂O₃ Using HVOF Process	
V. Constantin, A.C. Murariu, I.A. Perianu and I. Duma	310
Study of Penetration Depth According to Working Parameters in Steel Engraving Using Optical Laser	
F. Corb, T. Buidos, C. Stănel, I. Stănel and G. Mnerie	317

Chapter 6: Cavitation Resistance of Structural Materials

Research on the Cavitation Resistance Testing of Friction Stir Welded Joint of En Aw 1200 Aluminium Alloy	
C. Besalic, A.N. Luca, G. Mnerie, L. Botila, C. Ghera and R. Bădărău	329
Research on the Cavitation Resistance Testing of Friction Stir Welded Joint of Cu99 Cooper	
C. Besalic, A.N. Luca, G. Mnerie, L. Botila, C. Ghera and R. Bădărău	335
Considerations on the Behaviour and Resistance of Aluminium Alloys to Cavitation Erosion	
I. Bordeasu, A.N. Luca, C. Ghera, C.L. Salcianu, D. Ostoia and L.M. Micu	342

Chapter 7: Repairing and Improving Service Life of Machines, Tools and Equipment

Hardness Distribution of Heat-Affected Zones Made by Hardfacing on S690QL and S960QL Steel Plates	
G. Terdik and Á. Meilinger	359
Effect of Surface Coatings on the Service Life of Unimax Casting Tool Steel	
L. Tóth, E.R. Fábián, Z. Nyikes, I.A. Perianu and T.A. Kovács	369
Investigation the Effects of Fire on an Industrial Metallic Structure	
A.C. Murariu, I. Duma and I.A. Perianu	377
Analysing Recurring Failures: Case Study of a Pressurized Gas Supply Pipeline	
A.C. Murariu, I. Duma and R.N. Popescu	385
The Influence of Thread Length and Tightening Torque of the M8/M12 Bolts on the Vibration Fixture Response	
C. Öhl, M. Rus, D. Mădroane, I. Duma, S.V. Galatanu and E. Linul	393
Constructive and Technological Solutions to Improve the Life of a Hydro Turbine's Runner Blade	
T. unescu, I. řtefan, R. Socol, N.A. řirbu and I.D. Savu	399

Chapter 8: Materials for Construction

Study Regarding the Possibility of Using Ultrasonic Pulse Velocity (UPV) on Earthen Construction Evaluation	
B. Bolborea, S. Dan, C. Baeră, A. Gruin, A. Ion, A.C. Vasile, I.A. Perianu and A.M. Barbu	407
Research Possibilities for Efficient Capitalization in Construction Eco-Products, of Mineral Additions Generated by the Local Romanian Industries as Wastes or By-Products	
C. Baeră, B. Bolborea, A. Gruin, A.C. Vasile, M.L. Negrut, A.M. Barbu and I.A. Perianu	421