Table of contents

Preface

Proceedings

Furnace Brazing

Current-Assisted Vacuum Brazing to Control Brittle Phases in Ni-Based Brazing Alloys	. 1
K. Bobzin, H. Heinemann, M. Erck, B. Korte	
Modification of Ni-based brazing alloys with Ni particles for targeted adjustment of the melting range	11
T. Lorenz, S. Hausner, G. Wagner	
Advanced Brazing Filler Alloys	
A Multi-Principal Element Alloy Filler for Brazing FCC Solid Solution Substrates B. Schneidermann, W. Miglietti, Z. Yu	17
Optimization of a novel Fe-based Brazing Foil for Joining Stainless Steel K. Bobzin, H. Heinemann, M. Erck, O. Stryzhyboroda, Y. B. Aydin	27
Brazing of C/C composites using a developed Au-Ni-W filler	37
Challenges and prospects for high-entropy brazing alloys	45
Properties of Brazed Joints	
Influence of erosion and grain boundary diffusion in thin-walled steel joints brazed with nickel-based filler material on microstructure and joint strength	58
Influences of the furnace curves on the microstructure and corrosion behavior of brazed tungsten carbide/steel joints	65
H. Kanangarajah, J. L. Otto, H. Srivastav, F. Walther	
Dezincification and Microstructure of Brass Brazed with Silver Filler Metal	71

Comparative Analysis of Laser-Based Cladding Techniques for Brazing Filler Application and the Resulting Joint Microstructures	76
I. Bobrov, J. Xu, M. Pieper, M. Streinz, D. Scheller, A. Pfuch, F. Gemse	
3D Microstructures of Brazed Austenitic Steel Joints with NiCrSiB Filler	90
Furnace Brazing II	
Observation and evaluation of interfacial reactions during brazing with Ag based brazing filler metals using EPMA	96
R. Kamata, Y. Miyazawa	
Microstructural analysis of vacuum brazed NiTi - NiTi joints using various filler metals	105
W. Tillmann, L. Wojarski, A. Nebel, M. Koymatli	
Synchrotron X-ray Study of Vacuum Brazed 316L Stainless Steel Joints	114
Formation of the seam structure by brazing telescopic joints of SS to Ni alloy	120
Joining of light weight metals	
Challenges in flux-free laser beam brazing of aluminum	130
Fluxless Soldering of Aluminium-Aluminium and Aluminium-Copper at temperatures lower than 300 °C using ultrasonics and active gas atmospheres	137
Effect of cobalt-modified BNi-2 filler on the vacuum brazing of nickel based superalloys and titanium alloys T. Göynuk, I. Karakaya, Z. Esen	143
Flux-free melt tinning of aluminum alloys as solder cladding for the realization of similar and dissimilar solder joints in aluminum assemblies	148
Functional surface and additive manufacturing in brazing technology	
Modified spreading process of a brazing filler by Direct Laser Interference Patterning (DLIP) surface texturing	154

Additive brazed coatings for new part production and repair	159
I. Rass, T. Kolberg	
Diffusion Braze Repair of Gas Turbine Engine Components, Past, Present and Future - Part 1	168
W. Miglietti	
Characterization of plasma sprayed Ni-based brazing filler on steel	178
J. Xu, I. Bobrov, A. Würzl, A. Pfuch, T. Seemann, M. Schweder, T. Lampke	
Diffusion bonding and brazing of additively manufactured 316L and IN718 components to wrought or additively manufactured substrates	181
Mechanical testing of steel brazed joints: measured strength values versus designs of tested specimens	194
Nano effects on brazing	
In-situ characterization of deoxidation of austenitic stainless steels during vacuum heating – Using state of the art synchrotron based X-ray photoemission and low-energy electron microscopy	204
A. Knutsson, P. Sjödin, L. Zhu, A. A. Zakharov, A. Al-Sakeeri, I. Lazar, A. Mikkelsen, F. Lenrick	
Exploring the nanoscale mechanisms of Ni-P system to examine the suitability as joining material for high temperature applications	212
Process reliable brazing of mixed joints stainless steel - copper	222
Investigation of modified nickel nanopastes for a pressureless joining process B. Sattler, S. Hausner, G. Wagner	232
Industrial applications of brazing	
Development of an on novel additively manufactured ceramic hydrogen burner components for innovative energy efficiency strategies	242
HP. Martin, K. Schönfeld, S. Dahms, J. Michel, D. Bernhardt, M. Beckmann	
Experimental Study of Wettability of Ag and Cu based Filler Metals for Brazing in HVAC&R Applications	252
H. Zhao, X. Li, S. Elbel	

Strength Evaluation of Brass/Stainless Steel Brazed joints	259
Exploring Advances in Vacuum Brazing for Aerospace, Automotive, Medical, and HVAC&R Applications	264
A. Adamek	
Effect of the particle size distribution of Ni-based brazing powders without binder on adhesion condition to the substrate by laser cladding	266
Innovative process for sealing cast turbine blade openings using high-temperature brazing with infiltatipon technology	275
Joining of ceramics and metals	
Ni-Nb-Ta: Active metal brazing above 1100 °C	276
A. Rost, F. König, LY. Schmitt, J. Schilm, U. Klotz	
Brazing silicon carbide using a Si-Re alloy at very high temperature for energy applications	277
V. Chaumat, G. Roux	
Combining experimental techniques and thermodynamic calculations to understand the physico-chemical phenomena involved in brazing alumina, zirconia, and titanium with gold	283
AL. Cenac Lahon Debat, C. Le Fessant, J. Chevalier, L. Gremillard, P. Steyer, O. Dezellus	
FeSiTi as brazing solution for high strength and high temperature applications of SiC-ceramics	291
HP. Martin, C. Steinborn, A. Triebert	
Brazing at reduced temperatures	
Status of industrial Al vacuum brazing and current challenges	299
M. Düring, H. C. Schmale, M. Türpe	
Development of AgSn Transient Liquid Phase Diffusion Bonding Sheet	305
T. Kishimoto, J. Takeuchi	
In-situ synchrotron investigations of laser soldering applications with tailored energy deposition	309
J. Brüggenjürgen, C. Spurk, M. Hummel, A. Olowinsky, F. Beckmann, J. Moosmann	

Reactive brazing composites with sintered framework structures for the production of high temperature resistant brazed joints at soldering conditions	318
U. Holländer, K. Möhwald, H.J. Maier	
Poster Session	
Brazing of heat-treated TiAl using Ag-Cu-Ti filler or Ti-Zr based filler T. Yamazaki, T. Murao	327
How to best obtain and prepare data for machine learning	335
Examining Phosphorus Effects on Base Materials: A Microstructural Perspective Z. I. Yondu, X. Stergiopoulou, F. Lenrick	336
Dephosphorization of copper phosphide to copper	340
Thermal property of Ni-based brazing filler metals with high corrosion resistance for heat exchanger	344
S. Kubota, Y. Miyazawa	
Joining Molybdenum to AISI 316 austenitic stainless steel	353
Diffusion bonding by hot isostatic pressing without encapsulation	359
Al ₂ O ₃ - Substrate Preparation and Metallization for the TLP – Soldering of Alumina-Copper Joints	360
List of authors	361