

Programme

AB2023

7th International Conference on Adhesive Bonding 2023

13-14 July, 2023

Faculty of Engineering - University of Porto
Porto, Portugal

- FUNDAMENTAL ASPECTS OF ADHESION
- **THE SCIENCE AND TECHNOLOGY OF SURFACES**
- ADVANCES IN ADHESIVE MATERIALS
- **MECHANICAL PROPERTIES OF BONDED JOINTS**
- INNOVATIVE DESIGNS AND APPLICATIONS
- **TESTING AND STANDARDIZATION**
- INDUSTRIAL ASPECTS
- **QUALITY PROCEDURES**
- ENVIRONMENTAL AND ECOLOGICAL ASPECTS

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Organisation

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* Plenary lecture

THURSDAY 13 JULY 2023

8:40 **AB 2023 Opening (Room A101, also called 'Auditorium')**

Room A101 (Auditorium)

9:00* Simulation of adhesive flow and hardening (**AB23_108**)

T Vallée (Fraunhofer IFAM, Germany), H Fricke, F Flaig, M Müller, M Kaufmann, J Wirries, M Rütters

Session 1A – Modelling

(Chair: A Akhavan-Safar and RDSG Campilho)

Room A101 (Auditorium)

Session 1B – Adhesion and surface treatments I

(Chair: CSP Borges and J Holtmannspötter)

Room B032

Session 1C – Adhesives development I

(Chair: F Koch and F Aran-Ais)

Room B035

9:40 A new finite thickness/width rate-dependent cohesive zone model (**AB23_21**)

M Planas Andrés (ISAE SUPAERO, France), E Paroissien, F Lachaud, Pierre Gérard

Alternative solution for developing adhesive surfaces on metal parts joined by adhesive technique in automotive industry (**AB23_5**)

C Baykara (Sakarya University of Applied Sciences, Turkey)

Development of a biosourced wood adhesive from a chitosan derivated polysaccharide (**AB23_1**)

J Silvestre (Université Clermont Auvergne, France), P Michaud, H de Baynast, C Delattre

10:00 Viscoelastic pull-off of a sphere with a Maugis-Dugdale model (**AB23_57**)

M Ciavarella (Politecnico di Bari, Italy), A Papangelo

Interfacial fracture behavior of cold-sprayed Cu coatings on PEEK and Cu substrates (**AB23_6**)

I Goda, T Zhang (Université de Technologie de Belfort Montbéliard, France), E Padayodi, RN Raelison

Poplar bark adhesive: a sustainable alternative for particleboard manufacturing (**AB23_114**)

RA Fernandes (ARCP – Associação Rede Competência em Polímeros, Portugal), N Ferreira, S Lopes, J Santos, I Ferreira, C Vieira, FD Magalhães, JM Martins, LH Carvalho

10:20 On the influence of modelling hypotheses on strength prediction of CFRP stepped repair (**AB23_102**)

JB Orsatelli (ISAE-SUPAERO, France), E Paroissien, F Lachaud, S Schwartz

Application of micrometer-scale digital image correlation to adhesively bonded CFRP joints (**AB23_10**)

JG Diez (Bundeswehr Research Institute for Materials, Fuels and Lubricants (WIWeB), Germany), J Holtmannspötter, E Arikan, P Höfer

Bio-based wood adhesives for interior particleboard productions (**AB23_63**)

S Oktay (Kastamonu Entegre Ağaç San. Tic. A.Ş., Turkey), B Bengü, N Kızılcan

10:40-11:00 **COFFEE BREAK (Room under the Auditorium)**

Session 2A – Joint design I

(Chair: RD Adams and D Thévenet)

Room A101 (Auditorium)

Session 2B – Adhesive application and joint fabrication

(Chair: D Castagnetti and A Bernasconi)

Room B032

Session 2C – Adhesion and surface treatments II

(Chair: R Créac'hcaec and J Holtmannspötter)

Room B035

11:00 Influence of strain-rate in single-lap joints bonding multimaterial adherends with thermal residual stresses (**AB23_47**)

VDC Pires (INEGI, Portugal), RCJ Carbas, EAS Marques, LFM da Silva

Mixture control of 2K adhesives using Electrical Capacitance Tomography (**AB23_89**)

S Voß, M Voß (Fraunhofer IFAM, Germany)

Enhanced mechanical interlocking of adhesive-bonded joints via tailored serrated patterns manufactured with laser ablation (**AB23_20**)

F Musiari (Università di Parma, Italy), F Moroni, A Lutey

11:20 Enhanced interlaminar performance and impact resistance of novel carbon fiber magnesium laminates (**AB23_22**)

X Zhou (Dalian University of Technology, China), SL Xiang, GH Qu

Use of polymer optical fibre fabrics for curing UV adhesives between non-transparent joining parts (**AB23_70**)

R Seewald (RWTH Aachen University, Germany), M Lingemann, J Kallweit, M Pätzel, A Schiebahn, T Gries, U Reisinger

The effect of different surface treatments on short-, mid- and long- term zirconia bond strengths (**AB23_105**)

D Shen, H Wang, Y Shi, Z Su, M Hannig, B Fu (Zhejiang University School of Medicine, China)

11:40 Numerical modelling and experimental validation of squeezing flows in the automobile production (**AB23_11**)

M Huf (BMW AG, Germany), H Fricke (Fraunhofer IFAM, Germany)

How adhesives flow during joining (**AB23_109**)

M Kaufmann (Fraunhofer IFAM, Germany), F Flaig, M Mueller, H Fricke, T Vallée

The effect of carbon nanotubes on the mechanical properties of polyurethane paint coating on oak wood (**AB23_156**)

K Brzozowska (Wrocław University of Science and Technology, Poland), A Chowaniec-Michalak, P Niewiadomski, Ł Sadowski

12:00	<p>Failure of architected interfaces (AB23_30)</p> <p><u>MK Budzik</u> (Aarhus University, Denmark), MA Dias, M Hedvard, A Athanasiadis</p>	<p>Consideration of air pockets and non-newtonian fluids for adhesive squeeze flows (AB23_110)</p> <p><u>M Müller</u> (Technische Universität Braunschweig, Germany), F Flaig, M Kaufmann, T Vallée, H Fricke</p>	<p>High pressure cold spraying of a systematic series of powders on carbon fiber reinforced thermoplastic composites (AB23_53)</p> <p><u>T Zhang</u> (University of Technology of Belfort Montbéliard, France), E Padayodi, JC Sagot, RN Raelison</p>
12:20	<p>Experimental identification of cohesive laws for structural adhesive joints in mixed-mode I+III (AB23_84)</p> <p><u>S Marzi</u> (TH Mittelhessen, Germany)</p>	<p>Optimized adhesive application (AB23_111)</p> <p><u>M Kaufmann</u> (Fraunhofer IFAM, Germany), F Flaig, M Mueller, H Fricke, T Vallée</p>	<p>Interlaminar bond strength and flexural properties of hybrid woven carbon-flax thermoplastic composites (AB23_54)</p> <p><u>M Bahrami</u> (Universidad Carlos III de Madrid, Spain), JC del Real, M Mehdikhani3, Y Swolfs, J Butenegro, MA Martínez, J Abenojar</p>
12:40	<p>The fracture behavior of hybrid CFRP laminates reinforced by thin-ply (AB23_50)</p> <p><u>F Ramezani</u> (INEGI, Portugal), RJC Carbas, EAS Marques, AM Ferreira, LFM da Silva</p>	<p>Optimization strategies to determine ideal application patterns (AB23_112)</p> <p><u>F Flaig</u> (Technische Universität Braunschweig, Germany), M Müller, M Kaufmann, T Vallée, H Fricke</p>	<p>Influence of high-performance thermoplastic composite manufacturing process on structural adhesive bonding strength (AB23_64)</p> <p><u>O Pelz</u> (Universität der Bundeswehr Hamburg, Germany), E Arikan, S Abdul, M Fette, J Wulfsberg, J Holtmannspötter</p>
13:00-14:00	<p>LUNCH BREAK (Room under the Auditorium)</p> <p>Room A101 (Auditorium)</p>		
14:00*	<p>Adhesion mechanisms of polymers and the role of surface of chemistry and macroscopic wetting (AB23_26)</p> <p><u>J Holtmannspötter</u> (WIWeb, Germany), E Arikan, F Zimmer</p>		
	<p>Session 3A – Adhesive properties I (Chair: E Dragoni and EAS Marques)</p> <p>Room A101 (Auditorium)</p>	<p>Session 3B – Joint design II (Chair: C Sato and G Stamoulis)</p> <p>Room B032</p>	<p>Session 3C – Adhesion and surface treatments III (Chair: T Vallée and RJC Carbas)</p> <p>Room B035</p>
14:40	<p>A torsion specimen for fatigue testing of pressure-assisted bonded interfaces (AB23_56)</p> <p><u>D Castagnetti</u> (University of Modena and Reggio Emilia, Reggio Emilia, Italy), E Dragoni</p>	<p>Micromechanics of architected interfaces (AB23_32)</p> <p><u>MA Dias</u> (The University of Edinburgh, UK), AEF Athanasiadis, DN Fernando, MK Budzik</p>	<p>Laser-induced topological surface structures investigated by 3D elemental analysis by STEM-EDX tomography (AB23_170)</p> <p><u>S Horiuchi</u> (National Institute of Advanced Industrial Science and Technology, Japan), K Yase, T Hanada, M Arai, N Terasaki</p>
15:00	<p>Cure-shrinkage modeling of two-part adhesives using finite element method (AB23_182)</p> <p><u>M Schiel</u> (Henkel AG & Co., Germany), A Goyal</p>	<p>A coupled adhesion-friction model and its application to 3D gecko spatula peeling (AB23_175)</p> <p>S Gouravaraju, RA Sauer, <u>SS Gautam</u> (IIT Guwahati, India)</p>	<p>Experimental and analytical investigation of chemical bonding between laser-treated titanium alloy amorphous surface and epoxy adhesive (AB23_78)</p> <p><u>S Li</u> (Tongji University, China), J Lin, J Min</p>
15:20	<p>Development of the extended rotational rheometer for the determination of stress- relevant adhesive properties (AB23_72)</p> <p><u>J Wirries</u> (Fraunhofer IFAM, Germany), T Vallée, M Rütters</p>	<p>Mechanical behavior of peeling for local load on polyimide sheet adhesively bonded to curved surface (AB23_62)</p> <p><u>A Maesaka</u> (Sony Semiconductor Solutions Corporation, Japan), Y Kakei, T Osaka, M Kuribayashi, Y Kudo, C Sato</p>	<p>Durability of the effectiveness of atmospheric plasma treatment applied to a thermoplastic Styrene-Butadiene-Styrene (SBS) rubber (AB23_85)</p> <p><u>C Ruzafa-Silvestre</u> (INESCOP, Spain), VM Serrano-Martínez, F Arán-Ais, E Orgilés-Calpena</p>
15:40	<p>High throughput preparation and testing of butt shear joint (BSJ) adhesive bonds (AB23_77)</p> <p><u>C Kang</u> (Tokyo Institute of Technology, Japan), JJM Machado, Y Sekiguchi, M Ji, C Sato, M Naito</p>	<p>Mechanical behaviour of bonded glass-to-glass SLJs with transparent epoxy adhesive at elevated temperature for load-bearing elements (AB23_74)</p> <p><u>Y Boutar</u> (Czech Technical University in Prague, Czech Republic), M Eliášová, M Zikmundová</p>	<p>Experimental study on improving interfacial bonding performance between steel and CFRP by laser surface treatment (AB23_160)</p> <p><u>H Teng</u> (Tongji University, China), HL Wan, FZ Sun, JP Lin, JY Min</p>
16:00-16:20	<p>COFFEE BREAK (Room under the Auditorium)</p>		

Session 4A – Adhesion and surface treatments IV

(Chair: A Akhavan-Safar and EAS Marques)

Session 4B – Adhesive properties II

(Chair: T Vallée and A Pironi)

Session 4C – Repair and recycling

(Chair: A Chiminelli and JG Broughton)

Room A101 (Auditorium)**Room B032****Room B035**

16:20	In-situ destructive testing of additively manufactured parts on extrusion level (AB23_113) <u>R Welker</u> (WIWeB, Germany), E Arikan, F Zimmer, J Holtmannspoetter	Modeling adhesive behavior under reversed cyclic loading (AB23_9) Y Chen, <u>LV Smith</u> (Washington State University, USA)	A model for the prediction of scarfing parameters for bonded repairs of CFRP layers with automated vacuum suction blasting (AB23_4) <u>L Brieskorn</u> (Fraunhofer IFAM, Germany), W Hintze, S D Rajanna
16:40	Effect of laser pretreatment for long-term stabilization of adhesion and evaluation of interfacial strength using mechanoluminescence (AB23_116) <u>N Terasaki</u> (National Institute of Advanced Industrial Science and Technology, Japan), Y Fujio, Y Sakata, K Houjo, K Shimamoto, H Akiyama, K Yase, K Kawasaki, S Horiuchi	Mechanical characterization of a novel silane based polyurethane hybrid flexible adhesive (AB23_28) <u>VC Rodrigues</u> (INEGI, Portugal), EAS Marques, RJC Carbas, M Youngberg, A Dussaud, LFM da Silva	Using low melting alloys to separate adhesively bonded joints for repair and recycling (AB23_65) <u>PL Geiß</u> (University of Kaiserslautern, Germany)
17:00	Understanding the transfer between pulsed lasers for surface preparation (AB23_106) <u>S Kirchner</u> (IRT Saint Exupéry, France), J Lecomte, L Ferres, T Balutch, C Debras, M Péron, N Cuvillier	Physico-chemical characterization of protein sunflower meals and their chemical modification for wood board panel adhesion (AB23_98) <u>C Casenave</u> (LCPO UMR 5629, France), S Grelier, H Cramail, C Mangeon Pastori	Reversible bonding of adhesives for non-destructive testing of composites (AB23_90) M Eppmann, <u>M Voß</u> (Fraunhofer IFAM, Fermany)
17:20	Comparison of the mode I fracture toughness of 3d printed metal-composite co-bonded joints with and without surface treatment (AB23_12) <u>M Gulino</u> (University of Parma, Italy), F Moroni, A Pironi, P Jerrard	Analyzing the fracture properties of structural adhesives considering material non-linearity (AB23_2) <u>G Stamoulis</u> (Université de Bretagne Occidentale, France), N Carrere	Use of intumescent flame-retardant systems in epoxy adhesives for debonding purpose (AB23_60) <u>Q Kachouri</u> (Luxembourg Institute of Science and Technology, Luxembourg), J Bardon, D Ruch and A Laachachi
17:40	Surface treatment of thin stainless steel foils for adhesive bonding (AB23_129) <u>CJA Beier</u> (RWTH Aachen University, Germany), K Prinz zu Löwenstein, MK Heym, V Ginster, A Schiebahn, U Reisgen	Enhanced peel-off and shear strength of thermoplastic adhesive tapes modified with sacrificial defects (AB23_7) <u>A Wagih</u> (King Abdullah University of Science and Technology, Kingdom of Saudi Arabia), G Lubineau	Evaluation of in-situ surface preparation methods for composite patch repair of corroded steel pipes (AB23_120) <u>JG Broughton</u> (Oxford Brookes University, UK), R Offer, D Johnson, P Hill
18:00	Development of bonding technology for aluminium alloys with various mechanical, chemical and laser beam surface treatment processes (AB23_152) <u>F Tajti</u> (John Von Neumann University, Hungary), B Körömi, M Berczeli	Development of a unified specimen for adhesive characterisation: Numerical study on the mode I (mDCB) and II (ELS) fracture components (AB23_45) <u>DS Correia</u> (INEGI, Portugal), ID Costa, EAS Marques, RJC Carbas, A Akhavan-Safar, LFM da Silva	Analysis of the influence of basalt powders on the mechanical properties of epoxy coatings (AB23_154) <u>A Chowaniec-Michalak</u> (Wroclaw University of Science and Technology, Poland), S Czarnecki, Ł Sadowski

19:00 Poster session and RECEPTION (Room under the Auditorium)**Adhesion and surface treatments**

Poster 1	The influence of sandblasting on the strength of aluminium alloy–glass adhesive joints (AB23_34)	<u>J Ogrodniczek</u> (University of Life Sciences in Lublin, Poland), A Rudawska
Poster 2	Synergetic effect of metal-ceramic composite coatings and metal-polymer composite bond coating on LPCS metallization of CFRP composite structures (AB23_55)	<u>T Zhang</u> (University of Technology of Belfort Montbéliard, France), E Padayodi, JC Sagot, RN Raelison
Poster 3	Plasma treatment effects on the wettability and adhesion of commercial rubber (AB23_61)	<u>J Abenojar</u> (Univ Carlos III de Madrid, Spain), MA Martinez, J Butenegro, M Bahrami, D Garcia-Pozuelo
Poster 4	Adhesion of chosen single and multi-layer hard coatings to replaceable cutting inserts made of sintered carbides after laser heating (AB23_101)	<u>MJ Kupczyk</u> (Poznan University of Technology, Poland)
Poster 5	An attempt to verify the theoretical models describing scratch adhesion test (AB23_161)	<u>MJ Kupczyk</u> (Poznan University of Technology, Poland)
Poster 6	The effectiveness of impregnation of building materials of cellulose origin and its impact on mechanical properties (AB23_155)	P Niewiadomski, A Karolak, M Olesiak, <u>A Chowaniec-Michalak</u> (Wroclaw University of Science and Technology, Poland)

Poster 7	Surfactant contamination on the surface of aluminum substrates and its effect on the adhesive and adhesive joint (AB23_38)	CSP Borges (INEGI, Portugal), R Brandão, A Akhavan-Safar, EAS Marques, RJC Carbas, C Ueffing, P Weissgraeber, LFM da Silva
Poster 8	Improvement of automotive joining technologies by surface treatment processes (AB23_166)	M Berczeli (John von Neumann University, Hungary), F Tajti, Z Weltsch
Poster 9	Eco-friendly surface treatment and properties of AA 6061 surface for adhesive bonding (AB23_167)	DG Kang (Sungkyunkwan University, South Korea), J-H Kim, S-B Jung
Poster 10	Adhesion of biobased composite patches (AB23_176)	MA Tazi (CESI LINEACT, France), M Jebli, S Teixeira de Freitas, P Casari, S de Barros
Poster 11	Resin coating concept with less environmental impact (AB23_178)	Ł Kampa (Wroclaw University of Science and Technology, Poland), Ł Sadowski
Poster 12	Investigation on transparency, self-cleaning, tribology, and UV-resistivity properties of epoxy based paints filled with nano and micro-sized oxides (AB23_191)	R Taherian (Shahrood University of Technology, Iran), Y Najafi
Poster 13	Influence of aluminium 2024-T3 surface treatment on improving bonding in Al/CFRP laminates (AB23_196)	M Drożdździel-Jurkiewicz (Lublin University of Technology, Poland), J Bieniaś
Poster 14	Feasibility of the manufacturing process of cork stoppers for spirituous wines using vegetable fibres and textiles (AB23_197)	I Martin-Alconchel (University of Cádiz, Spain), M Suffo
Adhesives development		
Poster 15	Analysis of acoustic absorption coefficients and characterisation of epoxy adhesive compositions based on the reaction product of bisphenol A with epichlorohydrin modified with fillers (AB23_158)	I Miturska-Barańska (Lublin University of Technology, Poland.), A Rudawska, L Sobotova, E Olewnik-Kruszkowska, M Müller, M Hromasová
Poster 16	Silicone pressure-sensitive adhesives modified with halloysite of increased thermal resistance (AB23_180)	K Mozelewska (West Pomeranian University of Technology in Szczecin, Poland), AK Antosik, P Miądlicki, M Musik
Poster 17	Hybrid, genetically encoded biomimetic adhesive designed by combining the properties of spider flagelliform silk and mussel bioadhesives: Experimental study on a new generation of bioadhesive (AB23_189)	H Iranpour (Danesh Pajouh Kar Company, Iran), A Alipour, MA Shokrgozar, H Shahsavarani
Poster 18	Enhanced thermal conductivity of epoxy composites by introducing different nanoparticles (AB23_192)	MR Haji, R Taherian (Shahrood University of Technology, Iran), MJ Molaei
Poster 19	The effect of fly ash carbon on the mechanical and thermal conductivity properties in thermally conductive adhesives (AB23_193)	MR Haji, R Taherian (Shahrood University of Technology, Iran), MJ Molaei
Adhesive properties		
Poster 20	Mechanical properties of unmodified and montmorillonite-modified epoxy compounds - Part II tensile test (AB23_33)	A Rudawska (Lublin University of Technology, Poland)
Poster 21	Comparative analysis of compressive strength and structure of epoxy adhesive compounds containing fillers with good thermal conductivity (AB23_35)	J Ogrodniczek (University of Life Sciences in Lublin, Poland), A Rudawska, M Müller
Poster 22	Effects of strain rate and temperature on mixed mode fracture behaviour of polyurethane adhesives (AB23_43)	M Ribas (University of Porto, Portugal), A Akhavan-Safar, EAS Marques, RJC Carbas, S Wenig, LFM da Silva
Poster 23	Numerical model to predict residual stresses induced by curing adhesives based on the extended rotational rheometer (AB23_73)	J Wirries (Fraunhofer IFAM, Germany), T Vallée, M Rütters
Poster 24	Crack length estimation in adhesive bonded joints under mode II quasi-static loading using optical backscatter reflectometry (AB23_135)	M Mehrabi (Politecnico di Milano, Italy), LM Martulli, A Bernasconi, M Carboni
Poster 25	Experimental validation of the characterisation of highly flexible adhesive by DCB test tube (AB23_144)	FJ Simón (Universidad Miguel Hernández, Spain), O Cuadrado, EAS Marques, M Sánchez, LFM da Silva
Poster 26	Self-healing cementitious composite with resin-filled macrotubes modified with granite powder (AB23_150)	M Woźniak, K Krzywiński (Wroclaw University of Science and Technology, Poland), Ł Sadowski
Poster 27	Mode I fatigue-fracture behaviour of adhesives subjected to single and periodic overloads (AB23_138)	FC Sousa (INEGI, Portugal), A Akhavan-Safar, LFM da Silva
Poster 28	SPECSIL – silicone pressure-sensitive adhesives with increased thermal-mechanical properties (AB23_179)	AK Antosik (West Pomeranian University of Technology, Poland), E Kucharska, K Mozelewska

Joint design

Poster 29	Influence of bent adherends in single-lap joint performance (AB23_25)	VDC Pires, RJC Carbas (INEGI, Portugal), EAS Marques, LFM da Silva
Poster 30	Experimental testing and numerical simulation of joints bonded with a novel silane based polyurethane hybrid flexible adhesive (AB23_29)	VC Rodrigues (INEGI, Portugal), EAS Marques, RJC Carbas, M Youngberg, A Dussaud, LFM da Silva
Poster 31	Design of failure loads and crack growth by width varying interfaces (AB23_31)	MK Budzik (Aarhus University, Denmark), MA Dias, U Hoffman
Poster 32	Optimization of dissimilar single-lap joints bonding multimaterial adherends in quasi-static conditions with thermal residual stresses (AB23_48)	VDC Pires (INEGI, Portugal), RJC Carbas, EAS Marques, LFM da Silva
Poster 33	Study of composite joints with toughened adherend reinforced by thin ply (AB23_51)	F Ramezani (INEGI, Portugal), RJC Carbas, EAS Marques, LFM da Silva
Poster 34	Enhancing the mechanical properties of pine wood through a densification process for eco-friendly adhesively bonded joints (AB23_59)	Sh Jalali (INEGI, Portugal), LMRM Corte-Real, CSP Borges, EAS Marques, RJC Carbas, LFM da Silva
Poster 35	Glued-in hardwood rods using bio-sourced adhesives under RT conditions (AB23_67)	J Kolbe, S Koesling, T Vallée (Fraunhofer IFAM, Germany), N Monard, J Haupt, L Schröder
Poster 36	Glued-in hardwood rods using bio-sourced adhesives under severe environmental conditions (AB23_68)	J Kolbe, S Koesling, T Vallée (Fraunhofer IFAM, Germany), N Monard, J Haupt, L Schröder
Poster 37	Mechanical characterization of the behaviour of additively manufactured thermoplastics for use in multimaterial bonded structures (AB23_91)	LPF Garrido (University of Porto, Portugal), MM Kasaee, EAS Marques, RJC Carbas, LFM da Silva
Poster 38	Analytical modelling of single-lap joints, L-joints, and T-joints with bio-based materials for the automotive industry (AB23_94)	AMS Couto (University of Porto, Portugal), CSP Borges, P Tsokanas, S Jalali, EAS Marques, RJC Carbas, LFM da Silva
Poster 39	Experimental study on the effect of bonding area dimensions on the mechanical behaviour of composite single lap joint with epoxy and polyurethane adhesives (AB23_104)	M Abbasi (Politecnico di Torino, Italy), R Ciardiello, L Goglio
Poster 40	Load-carrying capacity prediction of rods glued-in parallel to the grain in cross-laminated timber (AB23_69)	T Vallée (Fraunhofer IFAM, Germany), Th Tannert
Poster 41	A new perspective for the mode decoupling of interlaminar fracture tests on bimaterial specimens (AB23_149)	P Tsokanas (INEGI, Portugal), F Mujika, A Arrese, LFM da Silva
Poster 42	Design and testing of multi-material additively bonded impact absorption bonded structures (AB23_92)	LPF Garrido (University of Porto, Portugal), MM Kasaee, EAS Marques, RJC Carbas, LFM da Silva
Poster 43	The performance of hybrid laminate joints under different strain rates (AB23_24)	RCJ Carbas (INEGI, Portugal), F Ramezani, EAS Marques, LFM da Silva
Poster 44	Design and analysis of graded FRP laminates plates varying fiber volume fraction through the thickness (AB23_52)	H Malekinejadbahabadi (INEGI, Portugal), F Ramezani, RCJ Carbas, EAS Marques, LFM da Silva

Non-destructive testing

Poster 45	Electromechanical impedance damage metrics for void detection in adhesive joints (AB23_14)	AFG Tenreiro (INEGI, Portugal), AM Lopes, LFM da Silva
Poster 46	Load and damage detection of adhesively bonded pipe-socket joints by integrating polymer optical fibers (AB23_130)	J Weiland, CJA Beier (RWTH Aachen University, Germany), M Lubber, A Schiebahn, R Engelbrecht, U Reisgen
Poster 47	Application of acoustic emission technique to investigation of delamination process in the CFRP laminates exhibiting elastic couplings (AB23_188)	J Rzeczkowski (Lublin University of Technology, Poland), S Samborski
Poster 48	Examples of internal damage identification in laminate FRP composites with acoustic emission (AB23_194)	I Korzec (Lublin University of Technology, Poland), S Samborski

Durability

Poster 49	Modification of the epoxides with the metallic fillers – the mechanical properties after ageing in aqueous environments (AB23_23)	A Rudawska, J Szabelski (Lublin University of Technology, Poland)
Poster 50	S-N behavior of adhesive joints: A review (AB23_40)	FC Sousa, P Zamani, A Akhavan-Safar (INEGI, Portugal), LFM da Silva
Poster 51	Investigation of the mechanical behaviour of bonded joints in a cryogenic environment (AB23_71)	R Seewald (RWTH Aachen University, Germany), M Bayer, A Schiebahn, U Reisgen

Poster 52	Development of a cyclic creep testing station tailored to pressure-sensitive adhesives (AB23_162)	EMD Fernandes (INEGI, Portugal), BD Simões , EAS Marques , RJC Carbas , S Maul , P Stihler , P Weißgraeber , LFM da Silva
Poster 53	An analytical approach to model the creep behaviour of pressure-sensitive adhesives of pressure-sensitive adhesives (AB23_163)	EMD Fernandes (INEGI, Portugal), BD Simões , EAS Marques , RJC Carbas , S Maul , P Stihler , P Weißgraeber , LFM da Silva
Poster 54	Experimental determination of the mechanical and fracture properties of different acrylic PSAs (AB23_157)	BD Simões (INEGI, Portugal), EAS Marques , RJC Carbas , S Maul , P Stihler , P Weißgraeber , LFM da Silva
Poster 55	A design and validation process for structural bonded joints exposed to harsh service conditions (AB23_87)	EAS Marques (University of Porto, Portugal), CSP Borges , PDP Nunes , BD Simões , A Akhavan-Safar , RJC Carbas , LFM da Silva
Poster 56	Effect of seasoning conditions on the mechanical properties of modified adhesive compositions based on bisphenol A epoxy resin (AB23_147)	E Doluk (Lublin University of Technology, Poland), I Miturska-Barańska
Poster 57	Effect of thermal shock on the shear strength of carbon composite adhesive joints (AB23_177)	M Klonica (Lublin University of Technology, Poland)
Poster 58	Tensile shear strength of open-faced and closed specimens immersed in water (AB23_181)	K Shimamoto (National Institute of Advanced Industrial Science and Technology (AIST), Japan), H Akiyama , K Houjou , C Sato
Poster 59	Experimental study of the impact of notches made in the front edge of adherends on the properties of static and fatigue strength of adhesive joints (AB23_184)	A Kubit (Rzeszow University of Technology, Poland), W Zielecki , P Szawara , P Myśliwiec
Hybrid joints		
Poster 60	Failure behavior of novel hybrid bonded-hole hemmed joints in lightweight materials (AB23_16)	A Haran-Nogueira , MM Kasaie (INEGI, Portugal), A Akhavan-Safar , RJC Carbas , EAS Marques , LFM da Silva
Poster 61	Load transfer mechanism in bonded bolted hybrid joints for steel structures (AB23_169)	K Yokozeki (Nippon Steel Corporation, Japan), T Vallée , M Albiez , J Boretzki , H Fricke
Repair and recycling		
Poster 62	Reversible and recyclable vitrimer adhesives (AB23_127)	M Surós , D Santiago (Eurecat, Technology Centre of Catalonia, Spain), P Verdugo , M Pedrola , D Guzmán , À Serra , S De la Flor
Applications		
Poster 63	Using toughened epoxy adhesives for the reinforcement of bus structures with recycled CFRP (AB23_100)	MA Martinez (Univ Carlos III de Madrid, Spain), D Lavayen , JA Butenegro , MJ Lopez-Boada , J Abenojar , M Bharami
Poster 64	Mechanoluminescent mapping of local fracture toughness on aircraft CFRP-epoxy adhesive sheet assembly in DCB and ENF test (AB23_117)	N Terasaki (National Institute of Advanced Industrial Science and Technology, Japan), K Takagi
Poster 65	Benchmarking mechanical assessment of adhesive bonding and hybrid structural joining techniques implemented in maritime industries (AB23_123)	AQ Barbosa (INEGI, Portugal), P Tsokanas , F Delzendehrooy , R Pereira , RJC Carbas , EAS Marques , LFM da Silva
Poster 66	European adhesive bonder - Boosting knowledge of adhesive bonding personnel (AB23_17)	AQ Barbosa (INEGI, Portugal), E Meiß , A Almeida , T Avelino , F Mañas , M Uran , M Tonnhofer , EAS Marques , RJC Carbas , LFM da Silva
Poster 67	Static interface strength measurement in thin films: Mode I fracture delamination using double cantilever beam (AB23_174)	P Morais (University of Porto, Portugal), A Akhavan-Safar , RJC Carbas , EAS Marques , B Karunamurthy , LFM da Silva
Poster 68	Analysis of the mechanical performance and durability of adhesively bonded joints used in the milling tool industry (AB23_46)	RJF de Sousa (INEGI, Portugal), PN Gomes , DS Correia , EAS Marques , RJC Carbas , PJC das Neves , WP Afonso , LFM da Silva
Poster 69	Research on the impact of the polymer sealant interlayer on the properties of a FSW joint between a lid and a container made of aluminum alloy EN AW-2024-T3 (AB23_185)	A Kubit (Rzeszow University of Technology, Poland), W Zielecki , P Szawara , P Myśliwiec
Poster 70	Adhesive bonding of the ceramic claddings in the facades of residential buildings (AB23_187)	S Czarniecki (Wroclaw University of Science and Technology, Poland), J Hola , L Sadowski
Poster 71	Polypropylene joining in automotive applications (AB23_195)	J Hrachova (SABIC Technology Center, Netherlands), H Leenders

Room A101 (Auditorium)8:40* Structural monitoring of adhesive joints using machine learning (**AB23_13**)

AFG Tenreiro (INEGI, Portugal), G Ramalho, AM Lopes, LFM da Silva

Session 5A – Durability I

(Chair: L Goglio and A Bernasconi)

Session 5B – Adhesives development II

(Chair: F Koch and LH Carvalho)

Session 5C – Joint design III

(Chair: RDSG Campilho and N Terasaki)

Room A101 (Auditorium)**Room B032****Room B035**9:20 Influence of high frequency on the fatigue life of metallic single lap joints (**AB23_18**)

F Moroni, F Musiari, A Pirondi (Università di Parma, Italy)

Reactive polyurethane hot-melt adhesives with high biogenic carbon content (**AB23_86**)

MA Moyano (INESCOP, Spain), MP Carbonell Blasco, F Arán Aís, E Orgilés Calpena

Modeling the adhesion between two substrates using homemade interface interaction: application to thermoplastic/metal induction welding (**AB23_80**)

T Fkyerat (ENSTA Bretagne, France), U Cachot, F Le Poulain, R Créac'hcadec

9:40 An efficient approach to predicting the fatigue life of adhesive joints with varying modes of loading and joint configurations for automotive applications (**AB23_36**)

AH Ibrahim (University of Waterloo, Canada), B Watson, H Jahed, S Rezaee, C Royer, DS Cronin

Design of bio-based adhesives for fuel cell applications (**AB23_107**)

E Stammen (TU Braunschweig, Germany), K Dilger, F Bergenthum, S Brokamp

Dynamic behaviour of structural joints: experimental and numerical analysis (**AB23_115**)

P Millan (IDMEC, Portugal), A Tenreiro, J Amorim, R Beygi, M Kasaei, LFM da Silva

10:00 Fatigue crack growth in adhesive joints: The role of test strategy, loading mode, and temperature (**AB23_41**)

A Akhavan-Safar (INEGI, Portugal), EAS Marques, RJC Carbas, LFM da Silva

New concept of assembling based on interfacial Michael reactions to build up original thermoset adhesives (**AB23_99**)

M Brogly (University de Haute Alsace, France), J-F Stumbe, F Cavodeau, R Perrin, C Robach, J Breuils, A Rannée

Ultra tough architected joints through single step bonding process with tunable properties (**AB23_76**)

C van Innis (UCLouvain, Belgium), MK Budzik, T Pardoen

10:20 A digital twin of the laser-shock based disassembly process for metal-composite adhesively bonded specimens (**AB23_190**)

P Kormpos, K Tserpes (University of Patras, Greece)

Effect of lignin methylation on the performance of lignin-phenol-formaldehyde resins through ABES (**AB23_146**)

S Gonçalves (University of Porto, Portugal), NT Paiva, J Martins, FD Magalhães, LH Carvalho

Synergistic influence of reduced-GO on the interfacial and high velocity impact characteristics of NiTi interleaved fibre intermetallic laminates (**AB23_19**)

D Rajamani (Vel Tech Rangarajan Dr Sagunthala R&D Institute of Science and Technology, Chennai, India), E Balasubramanian

10:40-11:00 **COFFEE BREAK (Room under the Auditorium)****Session 6A – Adhesive properties III**

(Chair: M Brogly and S Marzi)

Session 6B – Joint design IV

(Chair: E Stammen and M Budzik)

Session 6C – Durability II

(Chair: D Castagnetti and L Goglio)

Room A101 (Auditorium)**Room B032****Room B035**11:00 Relationship between cure kinetics of formaldehyde-based wood adhesives by means of dynamic rheology and DSC (**AB23_96**)

L Nasserri (University of Natural Resources and Life Sciences, Austria), C Rosenfeld, P Solt-Rindler, A Kandelbauer, J Konnerth, HWG van Herwijnen

Parametric cohesive zone analysis of bi-adhesive single-step joints (**AB23_121**)

DFT Carvalho, RDSG Campilho (ISEP, Portugal), AS Vargas, RDF Moreira, K Madani

Experimental and analytical analysis of the creep behavior of an acrylic pressure-sensitive adhesive - An exploratory research (**AB23_103**)

BD Simões (INEGI, Portugal), EMD Fernandes, EAS Marques, RJC Carbas, S Maul, P Stihler, P Weißgraeber, LFM da Silva

11:20 Monitoring and simulation of curing of 2K methacrylate resins for adhesives: Kinetics and physical properties (**AB23_97**)

D Lellinger, D Tenzer, H Oehler, M Ciesielski, I Aliq (Fraunhofer LBF, Germany)

Are probabilistic methods a way to get rid of fudge factors? (**AB23_66**)

T Vallée (Fraunhofer IFAM, Germany), M Kaufmann, RD Adams, M Albiez, JR Correia, Th Tannert

Effect of elevated temperature on the lap glued joint behaviour of load-bearing spruce elements (**AB23_134**)

J Vaněrek (Brno University of Technology, Czech Republic), M Šmak, R Bálková, Z Vejvustek

11:40 Mixed-mode I+II fracture tests on adhesive joints at constant mode-mixity (**AB23_83**)

N Ladwig (TH Mittelhessen, Germany), S Marzi

Impact loading analysis of double-lap composite bonded joints (**AB23_122**)

LAR Gomes, RDSG Campilho (ISEP, Portugal), JPA Valente, MJR Queirós, K Madani

Influence of environmental conditions on the fatigue performance of single lap bonded joints (**AB23_137**)

FC Sousa (INEGI, Portugal), A Akhavan-Safar, RJC Carbas, EAS Marques, AQ Barbosa, LFM da Silva

12:00	<p>Vitrimeric adhesives: the next generation of high-performance and recyclable bonding solutions (AB23_171)</p> <p>A Roig, D Santiago, L Molina, À Serra, <u>S De la Flor</u> (Universitat Rovira i Virgili, Spain)</p>	<p>Characterization and modelling of crash behaviour of structural adhesives (AB23_81)</p> <p><u>F Damême</u> (University Polytechnique Hauts-De-France, France), C Grolleron, B Bourel, D Morin, F Lauro</p>	<p>Mixed mode fatigue crack growth in polyurethane adhesives (AB23_42)</p> <p><u>M Ribas</u> (University of Porto, Portugal), A Akhavan-Safar, EAS Marques, RJC Carbas, S Wenig, LFM da Silva</p>
12:20	<p>Thermo-accelerated curing of transparent glass-glass bondings through in-situ heat generation in the adhesive joint (AB23_131)</p> <p><u>C Kothe</u> (Technische Universität Dresden, Germany), N Ratsch, C Lammel, F Nicklisch, S Böhm, B Weller</p>	<p>Experimental and numerical study of eco-friendly adhesive L-joints for the automotive industry (AB23_93)</p> <p><u>AMS Couto</u> (University of Porto, Portugal), CSP Borges, P Tsokanas, S Jalali, EAS Marques, RJC Carbas, LFM da Silva</p>	<p>Damage imaging of adhesively bonded plates using dense ultrasonic wavefield data (AB23_143)</p> <p><u>M Barzegar</u> (Instituto de Telecomunicações, Portugal), Y Lugovtsova, J Bulling, D Pasadas, A Ribeiro, H Ramos</p>
12:40	<p>Development of a unified specimen for adhesive characterisation: Experimental study on the mode I (mDCB) and II (ELS) fracture components (AB23_44)</p> <p><u>DS Correia</u> (INEGI, Portugal), ID Costa, EAS Marques, RJC Carbas, A Akhavan-Safar, LFM da Silva</p>	<p>Development of bonding technology for hybrid-composite elements of armored vehicles with high energy density surface treatments for high resilience (AB23_165)</p> <p><u>Z Weltsch</u> (Széchenyi István University, Hungary)</p>	<p>PBT-GF30/silicone and aluminum/silicone resistance against water uptake and influence on the failure of the joint (AB23_39)</p> <p><u>CSP Borges</u> (INEGI, Portugal), A Akhavan-Safar, EAS Marques, RJC Carbas, C Ueffing, P Weissgraeber, LFM da Silva</p>
13:00-14:00 LUNCH BREAK (Room under the Auditorium)			
Room A101 (Auditorium)			
14:00*	<p>So how do you predict the strength of adhesive joints? (AB23_95)</p> <p><u>RD Adams</u> (University of Britol, UK)</p>		
Session 7A – Adhesives development III	Session 7B – Applications I	Session 7C – Hybrid joints	
(Chair: M Brogly and F Aran-Ais)	(Chair: H Fricke and F Moroni)	(Chair: MM Kasaei and A Pironi)	
Room A101 (Auditorium)	Room B032	Room B035	
14:40	<p>Energy savings in the body shop process enabled with the next generation BETAMATE structural adhesives (AB23_3)</p> <p><u>F Koch</u> (DuPont, Switzerland)</p>	<p>Fatigue fracture characterization of semiconductor chip-package interfaces (AB23_173)</p> <p><u>P Morais</u> (University of Porto, Portugal), A Akhavan-Safar, RJC Carbas, EAS Marques, B Karunamurthy, LFM da Silva</p>	<p>A new hybrid bonded-hole hemming process for joining dissimilar materials (AB23_15)</p> <p>A Haran-Nogueira, <u>MM Kasaei</u> (INEGI, Portugal), A Akhavan-Safar, RJC Carbas, EAS Marques, LFM da Silva</p>
15:00	<p>Characterization of bio-based polyurethane adhesives in zero-thickness bonds (AB23_58)</p> <p><u>Sh Jalali</u> (INEGI, Portugal), CSP Borges, EAS Marques, RJC Carbas, LFM da Silva</p>	<p>Characterization and evaluation of stress resistance in the structural bonding of electric cooktops (AB23_27)</p> <p>P Gómez, C Pina, <u>R Acero</u> (University of Zaragoza, Spain)</p>	<p>Hybrid joining improves the mechanical performance of adhesive and self-piercing rivet joints at coupon and component levels (AB23_37)</p> <p><u>AH Ibrahim</u> (University of Waterloo, Canada), DS Cronin</p>
15:20	<p>Adhesive performances of enzymatic degradable on-demand polyurethane laminated films for flexible packaging (AB23_119)</p> <p><u>C Dessi</u> (Université Clermont Auvergne, France), H Askanian, A Romano, D Brazinskiene, V Verney</p>	<p>Damage modelling of structural adhesive under cyclic solicitations: Automotive application (AB23_79)</p> <p><u>S Pinaroli</u> (Arts et Metiers Institute of Technology, France), L Morin, K Derrien, V Favier, A Reullier</p>	<p>Effects of adhesives and geometries on strength of bonded bolted hybrid joints for steel structures (AB23_168)</p> <p><u>K Yokozeki</u> (Nippon Steel Corporation, Japan), T Vallée, T Evers, H Fricke</p>
15:40	<p>Analysis of the mechanical performance of high-strength cementitious overlays modified with nanoparticles (AB23_142)</p> <p><u>J Szymanowski</u> (Wroclaw University of Science and Technology, Poland)</p>	<p>Adhesion analysis of impregnation systems in superconducting magnets (AB23_128)</p> <p><u>B Verma</u> (CERN, Switzerland), R Piccin, D Tommasini, IA Santillana</p>	<p>Numerical investigation on the static and fatigue behaviour of hybrid spot welded-adhesively bonded joints (AB23_145)</p> <p><u>S Safaei</u> (Politecnico di Milano, Italy), L Martulli, M Carboni, A Bernasconi</p>
16:00-16:20 COFFEE BREAK (Room under the Auditorium)			

Session 8A – Applications II	Session 8B – Durability III	Session 8C – Joint design V	
(Chair: B Verma and LFM da Silva)	(Chair: A Akhavan-Safar and Ł Sadowski)	(Chair: RD Adams and X Han)	
Room A101 (Auditorium)	Room B032	Room B035	
16:20	Synthesis of a functionalized glycol chitosan-EDTA with potential of extrafibrillar demineralization and its use for self-etch dentin bonding (AB23_133) <u>M Li</u> (Zhejiang University School of Medicine, China), B Fu	Assessment of the fracture properties of adhesively bonded joints submitted to fatigue loads under various mixed-mode ratios using the Arcan fixture (AB23_159) C Bernolin, G <u>Stamoulis</u> (Univ. Bretagne Occidentale, France), P Bidaud, W Albouy, N Dagorn, D Thévenet	Metal-composite joints with debonding on demand functionality for automotive applications (AB23_136) G Ibarz, M Canales, M Lizaranzu, S Roche, C Valero, <u>A Chiminelli</u> (ITAINNOVA, Spain), J Aucher, M Fache
16:40	Metal-composite hybrid joint adhesion and testing optimization or electric vehicle applications (AB23_118) <u>BM Lekube</u> (Leartiker S.Coop, Spain), JH Badiola, P Larreategi, F Ares, A Chiminelli, C Valero, T Ozgur	The role of substrate pre-treatment on the environmental fatigue resistance of hybrid electrical steel laminates (AB23_49) <u>M Ninou</u> (JKU-IPMT, Austria), R Pugstaller, GM Wallner, B Strauß	On the effect of manufacture parameters on the mechanical property of copper plate/magnetic column bonded structure using a parameter identification approach (AB23_139) <u>L Ren</u> (Dalian University of Technology, China), X Han, H Peng
17:00	Numerical modelling of peel and shear test of pressure sensitive adhesive joints in building tapes (AB23_124) <u>K Ostapska</u> (SINTEF Community, Norway), M Sletnes, P Rütther	Fatigue crack strengthening in steel structures by adhesively bonded steel patches (AB23_82) <u>F Ilg</u> (Hochschule München University of Applied Sciences, Germany), E Stammen, B Abeln, C Schuler, K Dilger, M Feldmann	Mechanical behaviour of composite single lap joints with polyurethane adhesive: experiments, FEM modelling, and backface strain measurement by DIC (AB23_140) <u>M Abbasi</u> (Politecnico di Torino, Italy), R Ciardiello, L Goglio
17:20	An adhesive-assisted biomimetic mineralization to prevent the formation of enamel white spot lesions (AB23_125) <u>L Zhang</u> (Zhejiang University School of Medicine, China), B Fu	Shear bond stiffness evaluation of adhesive lap joints based on the guided wave transmission/reflection spectral interference (AB23_172) <u>N Mori</u> (Osaka University, Japan), J Toyota, D Wakabayashi, T Hayashi	Effect of temperature on fracture mechanism of SGA adhesive scarf joints (AB23_186) <u>K Kamiyama</u> (Mitsubishi Electric Corporation, Japan), M Mikuni, T Matsumoto, S Matsuda, H Kishi
17:40	Evaluating the effect of neutral 10-MDP-Na salt on the dentin bond strength and remineralization potential of the etch-&-rinse adhesive (AB23_126) <u>Y Xu</u> (Zhejiang University School of Medicine, China), M Li, B Fu	Heat flow through epoxy resin adhesive modified with titanium dioxide (IV) (AB23_151) <u>K Krzywiński</u> (Wroclaw University of Science and Technology, Poland), Ł Sadowski	On the mechanical behavior of L- and T-shaped wooden bio-adhesive joints (AB23_148) <u>P Tsokanas</u> (INEGI, Portugal), S Jalali, CSP Borges, RJC Carbas, EAS Marques, LFM da Silva
18:00	Investigation and optimization of process parameters and tools for underwater bonding of mounting systems (AB23_183) <u>L Fröck</u> (Fraunhofer IGP, Germany), L Lemmrich, L Vaccari	Soft projectile impact tests for adhesion assessment under dynamic loading (AB23_153) C Caisso, N Dagorn, W Albouy, M Arrigoni, <u>D Thévenet</u> (ENSTA Bretagne, France)	A path for increasing the sustainability of structural design supported by adhesive bonding (AB23_88) <u>EAS Marques</u> (University of Porto, Portugal), LP Garrido, CSP Borges, S Jalali, RJC Carbas, LFM da Silva
20:00	AB2023 BANQUET (Cruise in Douro River)		