

# Curriculum Vitae

Pedro Miguel dos Santos Vilaça da Silva

September 2013

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## 1. PERSONAL DATA

Nationality	Portuguese
Place and date of birth	Lisbon (Portugal), 8th December 1969
Gender/Marital status	Male/Married
Paternity	Vera de Paiva Vilaça (17 <sup>th</sup> January 1998) Vasco de Paiva Vilaça (21 <sup>th</sup> December 1999)

## 2. ACADEMIC DEGREES

PhD Mechanical Engineering, IST, September 2003:

- Thesis: “Fundamentals of Friction Stir Welding Process- Experimental Analysis and Analytical Modelling”: Work started at Helmholtz-Zentrum Geesthacht (originally GKSS) – Research centre (Hamburg, Germany) under the co-supervision of Professors Luísa Quintino and Jorge dos Santos.

MSc (equivalent) in Mechanical Engineering, Instituto Superior Técnico (Lisbon, Portugal), July 1997:

- Thesis for evaluation of Scientific Capacity on: “Numerical Analysis of the Structural Mismatch Effect on Crack Propagation in Welded structures”: Work started and partially developed during 1996 at Cranfield University (UK) under the co-supervision of Professors Luísa Quintino and John Norrish;
- Lesson for evaluation of Pedagogic skills on: “Electric Arc Physics in Welding”.

Diploma in Mechanical Engineering, Instituto Superior Técnico (Lisbon, Portugal), September 1994:

- Final Thesis on “Analysis and Modelling of the Profile Manufacturing Technique for Train Industry”. Funded by SOREFAME. Classification: maximum grade 20/20.

### 3. PEDAGOGIC TRAINING FOCUSING UNIVERSITY TEACHING

Training for teaching at university (organised by Technical University of Lisbon):

- “Rapid Reading Techniques”; March 2000;
- “Pedagogical exploration of audio-visual media”; November and December 1998;
- “Course on Theatre Techniques Applied to Professor”; February 1998;
- “*University didactics: planning, methodology and Evaluation*”; delivered by Instituto Ciencias De La Educación da Universidad Politecnica de Madrid; March 1997.

Training Course for University Tutoring:

- “7 Habits of Highly Efficient People”; February 2010;
- “Models and Practices of Tutoring II”; February 2010;
- “Coaching and Tutoring: New Tools for Future Challenges of University Professors”; January 2010;
- “Initiation in Tutoring Practices – Tutoring Models and Practices”; October 2009.

### 4. OTHER TECHNICAL-SCIENTIFIC TRAINING

Course and Business Plan Competition for New Technology Based Companies (VectorE). IST, Lisbon. May to December 2005.

Advanced School and Workshop on Modelling and Numerical Simulation in Continuum Mechanics. IST, Lisbon. July 2003.

Course on Aluminium Alloys for structural Applications. IST, Lisbon. January 2001.

Finite Element Method applied to Bulk Plastic Forming Mechanical Manufacturing Technologies. IST, Lisbon. January 1999.

Course on “Problèmes Non Linéaires Apliqués - Calcul des Problèmes de Contact et d'Impact”, das Écoles CEA-EDF-INRIA, Clamart, France. April 1994.

Course on Mechanical Design assisted by Computer. Lisbon, IST, January to June 1992.

## 5. TEACHING, PEDAGOGIC AND RESEARCH ACTIVITIES AT ACADEMIA

Deputy member of School of Engineering Doctor's studies council, Aalto University. Since September 2013.

Associate Professor at the Department of Engineering Design and Production of the School of Engineering of Aalto University (Espoo - Finland) from 1st March 2013. Tenure track professorship in Joining of Materials with open-end contract.

Responsible professor at the Department of Engineering Design and Production of the School of Engineering of Aalto University for the following courses:

- Kon-67.4200 – Hitsaustekniikka (Welding Technology)
- Kon-67.4203 – Hitsauksen harjoitukset (Laboratory of Welding Technology)
- Kon-67.4208 – Welding Methods and Production

Along the following academic professional career levels at Instituto Superior Técnico (IST), lectured of about 15 courses on several Mechanical, Materials, Naval and Industrial Management Engineering Degrees (Diploma, Master and Phd):

- Definitive tenure contract as Assistant Professor at Instituto Superior Técnico (IST). From 29<sup>th</sup> September 2008 to 28<sup>th</sup> February 2013;
- Assistant Professor at Center of Manufacturing and Industrial Management of Mechanical Engineering Department of Instituto Superior Técnico. Since 29 September 2003;
- Assistant at Center of Manufacturing and Industrial Management of Mechanical Engineering Department of Instituto Superior Técnico. From 1<sup>st</sup> August 1997 to 28<sup>th</sup> September 2003;
- Lecturer at Center of Manufacturing and Industrial Management of Mechanical Engineering Department of Instituto Superior Técnico. From 1<sup>st</sup> August 1995 to 31<sup>th</sup> July 1997.
- Research fellow at Mechanical Engineering Department of Instituto Superior Técnico. Initiation to research grant from CEMUL. From September 1992 to December 1994.

Member of scientific commission of dissertation for master degree (MSc) and president of master thesis jury in mechanical engineering (subject: manufacturing) at Instituto Superior Técnico (IST). From 2006/2007 to 2008/2009.

Responsible professor at Instituto Superior Técnico (IST) for the following courses:

- Joining Processes. 4<sup>th</sup> year of Integrated Master Degree (MSc) in Mechanical Engineering. 2011/2012;
- Fundamental Course in Thermal Processing of Materials. 4<sup>th</sup> year of Integrated Master Degree (MSc) in Mechanical Engineering. Since 2007/2008;
- Mechanical Manufacturing I + Mechanical Manufacturing II. 5<sup>th</sup> year of Mechanical Engineering Diploma Degree – Final degree project. From 2003/2004 to 2006/2007;
- Quality Management and Control. 5<sup>th</sup> year of Mechanical Engineering Diploma Degree. 2006/2007.

Tutor of about 30 students of Integrated Master Degree in Mechanical Engineering of Instituto Superior Técnico (IST). Since 2009/2010.

Integrated researcher member of IDMEC (Institute of Mechanical Engineering-Pole Instituto Superior Técnico) which is a research unit of LAETA (Associated Laboratory for Energy, Transports and Aeronautics). Since January 2008 to February 2013.

## 6. EVALUATION RESULTS FROM TEACHING, PEDAGOGIC AND RESEARCH ACTIVITIES AT IST

Evaluation Period: 2004-2007. Grade: “Excellent” (the maximum grade “Excellent” is attributed considering a maximum quota of 5% of the IST population)

Evaluation Period: 2008-2009: Grade: “Excellent”

## 7. LECTURING ACTIVITIES OUT OF IST CURRICULAR PLAN

Invited lecturer by Institut de Soudure (France) for the “Journée Technique – Friction Stir Welding” organised by “Le service membres industriels”. Title of lecture: “FSW Defects Types and New NDT System for the Detection of Micro Imperfections”. Villepinte (Paris Nord), France. 6 September 2012.

Invited lecturer by ISQ International at KEK (Kosovo Energy Corporation J.S.C.). Course financed by USAID on European/International Welding Specialist (E/IWS) (35 hours): Module I - Welding Processes and Equipment. Pristina, Kosovo. June 2011.

Invited lecturer by Escola Politécnica da Universidade de São Paulo (EPUSP) for 2 short courses on the PhD Programme of Materials and Metallurgic Engineering. São Paulo, Brazil. May 2011:

- Course 1 (8hours): "Conventional and Advanced Non-Destructive Testing Techniques";
- Course 2 (8hours): "Solid State Welding and Processing - Friction Stir Based Technologies".

Invited keynote on “Presentation of Portuguese NDT Society (FSEND-RELACRE) Activities” at opening ceremony of 11<sup>a</sup> COTEQ - Conference on Equipment Technology (NDT and Inspection) + 7<sup>a</sup> EXPOEQUIP. Pernambuco, Brazil. 10-13th May 2011.

Invited lecturer by IUL - Institute of Forming Technology and Lightweight Construction for a Workshop on National RTD Activities at Germany. 1 short course (2 hours) on “Friction Stir Welding: Fundamentals, Variants and Friction Stir Based Technologies”. TUD - Technische Universität Dortmund, Germany. December 2009.

Invited lecturer by ISQ International at European Joint Undertaking for ITER and the Development of Fusion Energy ("Fusion for Energy"). Training Course (24 hours): Basic Training in Welding Technology and Non Destructive Control; Module: Basic Training in Welding Technology. Barcelona, Spain. October 2009.

Lecturer by IST at Universidade de Cabo Verde (Uni-CV). Course (50 hours) on "Thermal Processing of Materials". Instituto Superior de Engenharia e Ciências do Mar (ISECMAR), S. Vicente, Cape Verde. June and July 2008.

Invited lecturer by Instituto de Emprego e Formação Profissional, I.P. – Departamento de Formação Profissional. Short course (4 hours) on "The Technological Innovation in the Welding Sector". Lisbon, Portugal. April 2008.

Lecturer at ISQ (The Portuguese National Welding and Quality Institute) for several courses on European/International Welding Specialist (E/IWS) Degree. Lecturing courses on the following themes of Module I: 1.4- Electric arc physics; 1.6 – Introduction to welding with shielding gases; 1.7 – GTAW Process; 1.12 – Other welding processes (PAW, EBW, Laser, Electroslag, Electrogas, Thermit, Friction, Ultrasonic, and Explosion); 1.14 –Cladding and surfacing; 1.16 – Joining of ceramics and composites. Since December 1995.

Invited lecturer by Universidade Nova de Lisboa. Short course (2hours): "Solid State Welding Processes – Fundamentals, Parameters, Variants, Applications". Almada, Portugal. November 2006.

Invited lecturer by European Welding Federation – IAB/IIW. Course on "Laser Materials Processing: *Weldability of Steels and Non-Ferrous Alloys*". Lisbon, Portugal. November de 2006.

Invited lecturer by post-graduation course on "Automotive Technology, Maintenance and Managing". Short courses (16 hours) on "Materials and Manufacturing Techniques". IST, Lisbon, Portugal. From 1999 to 2006.

Invited lecturer by 8<sup>th</sup> edition of National Master on Materials for the Metals Course. Short course (4 hours) on "Friction Stir Welding". IST, Lisbon, Portugal. November 2003.

## **8. PARTICIPATION AS MEMBER OF PhD JURY**

Participation as Exterior Examiner in PhD degree in Mechanical Engineering: "Studies on Effect of Friction Stir Welding Process Parameters on Weld Quality of Al/SiCp Metal Matrix Composites". Candidate:P. Periyasamy. Supervisor: Visvalingam Balasubramanian. Faculty of Mechanical Engineering - Anna University, Chennai - India. July 2012.

Participation as Co-Supervisor Examiner in PhD degree in Mechanical Engineering: "Residual stress effects and damage tolerance behaviour of integral lightweight structures manufactured by FSW and HSM". Candidate: Valentin Josef Richter-Trummer. Supervisor: Paulo Tavares de Castro. Faculdade de Engenharia da Universidade do Porto, Portugal. 12<sup>th</sup> January 2012.



Participation as Co-Supervisor Examiner in PhD degree in Leaders for Technical Industries of the MIT-Portugal Program: “Design and Advanced Manufacturing of Aircraft Structures using Friction Stir Welding”. Candidate: Sérgio Manuel Oliveira Tavares. Supervisor: Paulo Tavares de Castro. Faculdade de Engenharia da Universidade do Porto, Portugal. 10<sup>th</sup> October 2012.

Participation as Exterior Examiner in PhD degree in Mechanical Engineering: “FSW of low thickness components: Similar and Dissimilar Joints”. Candidate: Rui Manuel Ferreira Leal. Supervisor: Altino Loureiro and Dulce Rodrigues. Faculdade de Ciências e Tecnologia da Universidade de Coimbra, Portugal. 25<sup>th</sup> January 2011.

Participation as Exterior Examiner in PhD degree in Mechanical Engineering: “An Investigation and Study into Friction Stir Welding of Ferrous-Based Material”. Candidate: Wayne Morris Thomas (inventor of Friction Stir Welding). Supervisor: Elias Siores. University of Bolton, United Kingdom. 18<sup>th</sup> June 2009.

Participation as Exterior Examiner in PhD degree in Metallurgical and Materials Engineering: “Efeito do Número de Passes e do Tratamento Térmico Pós-Soldagem de Liga de Alumínio AA6063 Soldada por Atrito Linear com Mistura”. Candidate: Freddy Poestcher. Supervisor: Sérgio Duarte Brandi. Universidade de São Paulo, Brazil. 29<sup>th</sup> May 2009.

Participation as Supervisor Examiner in PhD degree in Mechanical Engineering: “Non-Destructive Testing by Eddy Currents: Development and application to FSW”. Candidate: Telmo Jorge Gomes dos Santos. Instituto Superior Técnico, Lisbon, Portugal. 30<sup>th</sup> July 2009.

Participation as Co-Supervisor Examiner in PhD degree in Mechanical Engineering: “Single Point Incremental Forming”. Candidate: Beatriz Cipriano de Jesus Silva. Supervisor: Paulo Martins. Instituto Superior Técnico, Lisbon, Portugal. 15<sup>th</sup> December 2008.

Participation as Internal Examiner in PhD degree in Mechanical Engineering: “Integrated System of Non-Destructive Characterization for Pattern Recognition”. Candidate: Nuno Miguel Carvalho Pedrosa. Supervisor: Luísa Coutinho Quintino. Instituto Superior Técnico, Lisbon, Portugal. 19<sup>th</sup> September 2006.

## **9. PARTICIPATION AS MEMBER OF MSc JURY**

22 Participations as President of Jury for MSc Degree in Mechanical Engineering at Instituto Superior Técnico, Lisbon, Portugal. 2007/2008.

18 Participations as President of Jury for MSc Degree in Mechanical Engineering at Instituto Superior Técnico, Lisbon, Portugal. 2006/2007.

10 Participations as voting member of Jury for MSc Degree in Mechanical Engineering at Instituto Superior Técnico, Lisbon, Portugal. Since 2008/2009 (Master degree according to *Bologna*).

3 Participations as voting member of Jury for MSc Degree in Mechanical Engineering at Instituto Superior Técnico, Lisbon, Portugal. From 2003/2004 to 2007/2008 (*pre-Bologna*).

5 Participations as voting member of Jury for MSc Degree in Mechanical Engineering at Universidade Nova de Lisboa. Since 2008/2009.

5 Participations as voting member of Jury for MSc Degree in Materials Engineering at Instituto Superior Técnico, Lisbon, Portugal. Since 2006/2007.

1 Participation as voting member of Jury for MSc Degree in Aerospace Engineering at Instituto Superior Técnico, Lisbon, Portugal. 2008/2009.

## **10. ACTIVITIES AS SUPERVISOR AND CO-SUPERVISOR OF PHD THESIS**

### **10.1. PhD Thesis Finished**

Supervisor of PhD degree in Mechanical Engineering: “Non-destructive testing by Eddy currents: Development and application to FSW”. Student: Telmo Jorge Gomes dos Santos. Start 2006 - Finish 2009.

Co-Supervisor of PhD degree in Mechanical Engineering: “Production of functionally graded materials and surfacing by application of solid state techniques”. Student: João Pedro Machado da Gandra. Start 2011 - Finish 2013.

Co-Supervisor of PhD degree in Mechanical Engineering: “Residual stress effects and damage tolerance behaviour of integral lightweight structures manufactured by FSW and HSM”. Student: Valentin Josef Richter-Trummer. Start 2008- Finish 2012.

Co-Supervisor of PhD degree in Leaders for Technical Industries of the MIT-Portugal Program: “Design and advanced manufacturing of aircraft structures using FSW”. Student: Sérgio Manuel Oliveira Tavares. Start 2007 – Finish 2011.

Co-Supervisor of PhD degree in Mechanical Engineering: “Single point incremental forming”. Student: Beatriz Cipriano de Jesus Silva. Start 2007 – Finish 2008.

### **10.2. PhD Thesis Under Development**

Supervisor of PhD programme within Industry (company: DELPHI) in Mechanical Engineering: “Analysis and development of ultrasonic welding of metallic stranded cables”. Student: Alexandre Filipe Cavalheiro Pinto Pedro Fernandes. Start 2010.

Co-Supervisor of PhD degree in Leaders for Technical Industries of the MIT-Portugal Program: “Smart Seat Design”. Student: Filipe Miguel Ferreira Nascimento. Start 2010.

Co-Supervisor of PhD degree in Mechanical Engineering: “Development and Mechanical Characterization of a new Manufacturing Technique: Friction Stir Channelling”. Student: Catarina Vidal. Start 2010.

## **11. ACTIVITIES AS SUPERVISOR AND CO-SUPERVISOR OF MSc THESIS**

### **11.1. MSc Thesis Finished**

Supervisor of 10 thesis of MSc degree (according to *Bologna*) in Mechanical Engineering. Since 2006/2007.

Supervisor of 5 thesis of MSc degree (according to *Bologna*) in Materials Engineering. Since 2006/2007.

Supervisor of 1 thesis of MSc degree (according to *Bologna*) in Aerospace Engineering. 2008/2009.

Supervisor of 1 thesis of MSc degree (pre-*Bologna*) in Mechanical Engineering. 2005/2006.

Co-Supervisor of 4 thesis of MSc degree (according to *Bologna*) in Mechanical Engineering. Since 2006/2007.

Co-Supervisor of 2 thesis of MSc degree (pre-*Bologna*) in Mechanical Engineering. From 2002/2003 to 2005/2006.

### **11.2. MSc Thesis Under Development**

Supervisor of 6 thesis of MSc degree (according to *Bologna*) in Mechanical Engineering.

Supervisor of 2 thesis of MSc degree (according to *Bologna*) in Materials Engineering.

## **12. ACTIVITIES AS SUPERVISOR OF PROJECTS FOR DIPLOMA DEGREE**

Supervisor of 19 thesis for Mechanical Engineering Diploma Degree – Final degree project (pre-*Bologna*). From 1995/1996 to 2005/2006.

Supervisor of 2 projects for integration of students in research activities of LAETA in the field of mechanical engineering funded by Fundação para a Ciência e a Tecnologia (FCT):

- “Development of laboratorial conditions for Conventional and Advanced NDT techniques”. From October 2009 to September 2010.
- “Development of laboratorial conditions for Solid state and fusion welding”. From October 2009 to September 2010.

### **13. ORGANIZATION OF TECHNICAL-SCIENTIFIC EVENTS**

Member of Scientific Commission of “11th European Conference on Non-Destructive Testing” (11th ECNDT) Prague, Czech Republic. Hosted by EFNDT. 6-10<sup>th</sup> October 2014.

Member of Scientific Commission and Chairman of “12th International Conference on Application of Contemporary Non-destructive Testing in Engineering”. Portoroz, Slovenia. 4-6<sup>th</sup> September 2013.

Member of Organization Commission and Chairman of “2<sup>nd</sup> Portuguese National Conference on NDT”, Theme (2011): “Application of NDT in Key-Sectors of Industry: Energy and Transports”. Including “Exhibition of NDT Technology”. FEUP, Porto, Portugal. 16<sup>th</sup> December 2011.

Member of Organization Commission and Chairman of “1<sup>st</sup> Portuguese National Conference on NDT”, Theme (2009): “Application of NDT in Industry: Emergent NDT Techniques”. Including “Exhibition of NDT Technology”. ISQ, Lisbon, Portugal. 4<sup>th</sup> December 2009.

Chairman of session 7-E (Innovative and Emerging Production Technologies) at the 3<sup>rd</sup> International Conference on Integrity, Reliability & Failure - IRF'2009, FEUP, Porto, Portugal. 20-24<sup>th</sup> July 2009.

Member of Organization Commission of “Presentation of Electric Vehicle Mitsubishi i MiEV”. Mitsubishi Motors Portugal, Lisbon, Portugal. 23<sup>th</sup> April 2009.

Member of Organization Commission and Chairman of “1<sup>st</sup> Days of Innovation in Manufacturing Technologies”, Theme (2009): “Developments in Welding and Cutting Technologies”. IST, Lisbon, Portugal. 28 e 29<sup>th</sup> October 2008.

Chairman of “Workshop on Non-Destructive Testing – Innovation and Quality”. RELACRE, Lisbon, Portugal. 3<sup>rd</sup> April 2008.

Member of Organization Commission of “Presentation of IDMEC RTD Activities” at 75<sup>th</sup> Anniversary of Technical University of Lisbon. Repeated at Celebrations of 95<sup>th</sup> Anniversary of IST. Lisbon, Portugal. 2006.

Member of Organization Commission and Chairman at “Seminar for Innovation and *Networking* in Moulds Industry”. Project MarketMolde of CEFAMOL (Associação Nacional da Indústria dos Moldes). Lisbon, Portugal. 6<sup>th</sup> November 2003.

### **14. INSTITUCIONAL MANAGEMENT POSITIONS**

#### **14.1. Management Positions at IST**

Member of the Plenary of the Pedagogical Council of Instituto Superior Técnico, representing teaching staff. Re-elected successively for the biennium's 2001+2002 and 2003+2004.

## **14.2. Management and Formal Representing Positions Out of Academia**

Delegate of the Finnish delegation in International Institute of Welding (IIW), C-III: Resistance welding, solid state welding and allied joining processes. Start in August 2013.

President of Portuguese Society for Non-Destructive Testing (FSEND-RELACRE). Full Member of EFNDT and ICNDT. Re-elected successively for the triennium's 2009 to 2011 and 2012 to 2014 (interrupted in February 2013).

Delegate of NDT Portuguese Society (voting delegate) at the following events/meetings:

- General Assembly of EFNDT (Vienna, Austria, January 2009)
- Advisory Group + Board of Directors of EFNDT (Brussels, Belgium, March 2010)
- General Assembly of EFNDT at 10<sup>th</sup> ECNDT. Including the management of Portuguese National NDT Society Stand: FSEND-RELACRE (Moscow, Russia, June 2010)
- Opening Ceremony at 11<sup>a</sup> COTEQ (Pernambuco, Brazil, May 2011)
- 6<sup>o</sup> CLME (Maputo, Mozambique, August 2011)
- Board of Directors of EFNDT at MATEST 2011 (Split, Croatia, November 2011)
- General Assembly of EFNDT (Berlin, Germany, January 2012)
- General Assembly of ICNDT at 18<sup>th</sup> WCNDT. Including the management of Portuguese National NDT Society Stand: FSEND-RELACRE (Durban, South Africa, April 2012)

Member of Advisory Group (AG) of Board of Directors (BoD) of EFNDT (European Federation for Non-Destructive Testing). From 2009 to 2012.

Responsible for Working Group 4 (WG4): NDT Laboratory Accreditation da EFNDT (European Federation for Non-Destructive Testing). From 2010 to 2012.

## **15. EVALUATION OF NATIONAL AND INTERNATIONAL PROJECT PROPOSALS**

External evaluator of cooperative RTD project proposals for calls from QREN programme (Portuguese National Strategic Reference Framework, framing for the application of the Community's policy for economic and social cohesion in Portugal for the 2007-2013 period) for ADI (Portuguese National Innovation Agency of Ministry of Economy). Since 2012.

## **16. MANAGEMENT OF RTD PROJECTS**

### **16.1. Service Delivery and RTD Projects with Industrial Partners**

Responsible for project “KABUStir – Integration of FSW on Advanced Structural Components for Buses and Coaches”. Industrial partner: KABUS OY. Start: September2013. Duration: 6 months. 2013.

Responsible for project “SIEMENStir – Phase 2: Butt Joint by Friction Stir Welding and Rewinding of 6 Aluminium Coils for Electrical Power Transformers”. Industrial partner: SIEMENS S.A. Transformer Factory (Energy Sector). Duration: 6 weeks. 2012.

Responsible for project “CRAVUS\_Crimp – Development of statistical analysis of crimping technological conditions”. Industrial partner: DELPHI P – Manufacturing Excellence Center. Duration: 6 months. 2012.

Responsible for project “Development of Weldability of Galvanised Steel Components of Ford Automotive”. Industrial partner: Gonvarri Portugal S.A. and EPEDAL Indústria de Componentes Metálicos, S.A. Duration: 1 month. 2012.

Responsible for IDMEC-IST FSW tasks on activity in frame of TP104 Metallic Fuselage of AIRBUS “FSWELL – Dedicated NDT system to detect LOP root defects in FSW of AlMgSc alloys”. Industrial partner: AIRBUS. Duration: 12 months. 2012.

Responsible for IDMEC-IST FSWelding and FSChannelling tasks on project QREN contract N° 21526 (20NITL3956) “LighTRAIN – Innovative Welded Al-alloy Passenger Railway Cars”. Industrial partner: ALSTOM. Duration: 36 months. 2011.

Responsible for project “SIEMENStir – Phase 1: Butt Joint by Friction Stir Welding and Rewinding of 6 Aluminium Coils for Electrical Power Transformers”. Industrial partner: SIEMENS S.A. Transformer Factory (Energy Sector). Duration: 6 weeks. 2011.

Responsible for project “CRAVUS\_CuThin – Development of Ultrasonic Welding of Stranded Cu Cables with Thin Section”. Industrial partner: DELPHI P – Manufacturing Excellence Center. Duration: 6 months. 2011.

Responsible for IDMEC-IST NDT tasks on project QREN N° 11518 “AEROINSPECT”. Industrial partner (project leader): AEROHELICE. Duration: 36 months. 2010-2012.

Responsible for project “SoldOz – Phase 2: Weldability Analysis of Old Structural Components (4 samples)”. Industrial partner: Oz – Diagnóstico, Levantamento e Controlo de Qualidade em Estruturas e Fundações, Lda. Duration: 4 weeks. 2010.

Responsible for IDMEC-IST FSW tasks on project QREN “INNOVA – *Optimization of a Space-Frame Structure by Application of New Manufacturing Technologies*”. Industrial partner (project leader): MCG, Lda. Duration: 36 months. 2009-2011.

Responsible for project “ValeSTIR – Production of Similar and Dissimilar Friction Stir Welded Plates AA6082 (5mm) and AA7075 (10mm)”. Industrial partner: AIMME (Spain). Duration: 3 months. 2008.

Responsible for project “CRAVUS\_Piezo – Analysis of Operating Conditions and Calibration of Piezoelectric Used in Ultrasonic Welding of Cable Systems for Automotive Industry”. Industrial partner: DELPHI P – Manufacturing Excellence Center. Duration: 4 weeks. 2008.

Responsible for project “CRAVUS\_CuWire – Analysis of chemical composition, metallurgical and mechanical properties of Cu Wires in Typical Cable Systems for Automotive Industry”. Industrial partner: DELPHI P – Manufacturing Excellence Center. Duration: 8 weeks. 2008.

Responsible for project “SoldOz – Phase 1: Weldability Analysis of Old Structural Components (2 samples)”. Industrial partner: Oz – Diagnóstico, Levantamento e Controlo de Qualidade em Estruturas e Fundações, Lda. Duration: 4 weeks. 2008.

Responsible for project “MONDAG – Development of Projection Resistance Welding Applied to the Production of Chassis for Microwave Ovens: New Adaptive Tooling”. Industrial partner: Gonvarri Portugal S.A. and Teka Portugal, S.A. Duration: 6 months. 2007.

Co-responsible (w/ Prof. Mihail Fontul) for project “CARVIBRA – Measurement and analysis of noise in the model Colt, in gasoline and diesel versions”. Industrial partner: Mitsubishi Motors de Portugal, S.A. Duration: 3 months. 2007.

Responsible for project “NORMISO – Support for Application of ISO 3834 via Establishment of Quality Requirements for Fusion Welded Joints in Automated Handling Equipment”. Industrial partner: MANO - Equipment Handling and Automation, S.A. Duration: 6 months. 2006.

Responsible for project “CRAVUS\_StatisticalTool – Development of Advanced Statistical Analysis Computational Tool for Crimping and Ultrasonic Welding of Cable Systems for Automotive Industry”. Industrial partner: DELPHI P – Manufacturing Excellence Center. Duration: 12 months. 2006.

Co-responsible (w/ Prof. Luis Alves) for project “DESFOCA – Applicability Analysis of New Manufacturing Solutions for Aerospace Products”. Industrial partner: OMNIDEA. Duration: 6 months. 2006.

Responsible for IDMEC-IST NDT and FSW tasks on project IDEIA contract Nº 70/2007/3.1B/00290/065. “INSOLD – NDT Inspection System for Detection of Imperfections in FSW Joints”. Industrial partner: ISQ. Duration: 24 months. 2006.

Responsible for project “PSYS – Concept Development and design of Multimaterial Panel System for Application in Civil Construction”. Industrial partner: EDIMETAL Soluções Industriais de Metalomecânica e Carpintarias, S.A. Duration: 12 months. 2005.

Responsible for project “FIREND – Development and Construction of a Projectile with Mechanical Detonation System for Fighting Forest Fire”. Industrial partner: Academia Militar (CINAMIL). Duration: 36 months. 2005.

Responsible for IDMEC-IST FSW tasks on project POE Measure 3.1 Action B3. “X-HIBSIS – Implementation of FSW in Portuguese Industry”. Industrial partner (project leader): ISQ. Duration: 36 months. 2003.

Responsible for project “MATRIX – Definition of Parameters for Repairing Dies and Punches with GTAW”. Industrial partner: Lusolanda Lda. Duration: 4 weeks. 1997.

## **16.2. Coordination and Participation in Scientific Research Projects**

Member of Advisory Group on Friction Stir Welding of Steel of project: HILDA – “High Integrity Low Distortion Assembly”. A European Research Project Funded by the European Union in Call FP7-SST-2012-RTD-1, Grant Agreement Number 314534. Funding 2.1 million€. Consortium coordinated by the University of Strathclyde (UK). Start September 2012. Duration 36 months. Since July 2013.

Responsible for IDMEC-IST in FCT project: PTDC/EME-TME/118678/2010. “MicroBac – Defects Detection in Microfabrication With Bacterial Cells”. Principal contractor: FCTUNL. Duration: 36 months. 2012-2015.

Researcher of IDMEC-IST in FCT project: PTDC/EME-TME/103543/2008. “FRISURF – Technology developments of Friction stir processing to produce functionally graded materials and improve surfaces for advanced engineering applications”. Principal contractor: IDMEC-IST. Duration: 36 months. 2010-2013.

Co-responsible of project supporting a PhD thesis on MIT-Portugal program: “New Design Concepts for Aeronautical Products Welded by Friction Stir”. Principal contractor: FEUP. Duration: 36 months. 2007.

Responsible for IDMEC-IST in FCT project: PTDC/EME-TME/69999/2006. “FTD – Friction Stir Welding Tool Design”. Principal contractor: FCTUC. Duration: 36 months. 2007-2010.

Researcher of IDMEC-IST in CRAFT-COOP-CT-2006, contract N<sup>o</sup> 032657. “SIM-TWB – Accurate Simulation of Tailor-Welded-Blanks to Reduce Process Design Time for the Sheet Pressing Industry”. Principal contractor: EWF. Duration: 24 months. 2006-2008.

Responsible for IST in FCT project: POCI/EME/57623/2004. “FORTAB – Formabilidade de Chapas de Alumínio Soldadas por Fricção Linear”. Principal contractor: FCTUC. Duration: 36 months. 2005-2008.

Researcher of IDMEC-IST in FCT project: POCI/EME/60990/2004. “NDTStir – Sistema de Caracterização Não Destrutiva e Modelação Numérica dos Defeitos de Soldadura por Fricção Linear Sujeitos à Fadiga para Ligas de Alumínio”. Principal contractor: IDMEC-IST. Duration: 36 months. 2005-2008.

Researcher of IST in programme GROWTH, project CRAFT, contract N<sup>o</sup> G1-ST-CT-2002-50279. “DIPLOMAT – Development of an Interactive Process Technology Database and Design Guidelines for Friction Stir Welding of Lightweight Materials”. Principal contractor: Mondego Shipyard. Duration: 24 months. 2003-2005.

Researcher of IDMEC-IST in FCT project: POCTI-CTM/41152/01. “iSTIR – Modelling of Friction Stir Welding of Aluminium Alloys”. Principal contractor: IDMEC-IST. Duration: 36 months. 2002-2005.

Responsible for IST for the tasks of laser welding and cutting of tailor blanks in “PROTAP – Development of Manufacturing Technologies for Automotive Industry”. Principal contractor: CEIIA. Duration: 36 months. 2000-2002.

Researcher of IST in service at GKSS, Germany (actual Helmholtz-Zentrum Geesthacht). “*Measurement of residual stresses in structures welded by key-hole welding technologies using X-ray diffractometry method*”. From 7<sup>th</sup> September to 2<sup>nd</sup> October 1998.



Researcher of IST in service at ISQ (Portugal) in project: ECSC Project MC/935. “*Development of Artic Grade Structural Steels*”. From January 1995 to July 1995.

## 17. PROJECT REPORTS

Author and co-author of about 50 technical-scientific reports supporting Research and Technological Development projects.

## 18. REVIEW OF TECHNICAL-SCIENTIFIC PUBLICATIONS

Reviewer of the following International Technical-Scientific Journals, since 2006:

- Journal of Materials & Design
- Journal of Engineering, Science and Technology
- Journal of Materials Chemistry and Physics;
- Journal of Engineering Manufacture;
- International Journal of Structural integrity;
- Journal of Materials Processing Technology
- Journal of Materials Science & Engineering A
- Journal Materials Science Forum
- Advances in Materials Science and Engineering

## 19. TECHNICAL-SCIENTIFIC PUBLICATIONS

### 19.1. IST Internal Compendiums for Students

Pedro Vilaça, “Complementos de Tecnologia Mecânica (Complements of Mechanical Technology)”. Edition: Secção de Folhas da Associação de Estudantes do IST, Part 1 (code: CTM.P1) + Part 2 (code: CTM.P2), 2008.

Pedro Vilaça, “Apontamentos Sobre Controlo Estatístico da Qualidade (Compendium on Quality Statistical Control)”. Edition: Secção de Folhas da Associação de Estudantes do IST. Re-edited November 2005.

Pedro Vilaça, “Física do Arco Eléctrico na Soldadura (Electric Arc Physics in Welding)”. Edition: Secção de Folhas da Associação de Estudantes do IST. March 1998.

Pedro Vilaça, “Apontamentos Sobre Tecnologia dos Adesivos (Compendium on Adhesive Technology)”. Edition: Secção de Folhas da Associação de Estudantes do IST. Re-edited May 1999.

Pedro Vilaça, “Manual de Órgãos de Máquinas (Handbook for Machinery Components)”. Handbook for 150 hours of training (module C10, Integrated in “Technological Area”). Edition: IEFP and ISQ. Re-edited September 1999.

### **19.2. Posters in Conferences, Seminars and Workshops**

[PC-6] Catarina Vidal, Virgínia Infante, Pedro Vilaça, “Thermal Fatigue Behaviour of Friction Stir Channelling Solid Plates of AA5083 H111 Aluminium Alloy”, International Conference on Fatigue Damage of Structural Materials IX, Hyannis, MA, USA, 16-21 September, 2012.

[PC-5] Brian Hohmann, Sergio Tavares, Telmo dos Santos, P. M. S. T. de Castro, P. Vilaça, T. Eagar, “*Non-destructive Testing for Friction Stir Welds in Aeronautics*”. Poster presentation at the 1<sup>st</sup> MIT-Portugal Annual Conference: Engineering for better jobs. 7<sup>th</sup> July 2009.

[PC-4] C. Vidal, V. Infante, P. Vilaça, “*Establishment of Features for Improvement of Fatigue Behaviour of Aeronautic Material Welded by Friction Stir*”. Ref.: A 360 (poster presentation). Fifth International Materials Symposium (MATERIAIS 2009), Lisbon, Portugal. 5-8<sup>th</sup> April 2009.

[PC-3] R. M. Leal, B. M. Chaparro, D. M. Rodrigues, A. Loureiro, P. Vilaça, “*Mechanical Behaviour of FSW aluminium tailored blanks*”, Poster Session 19, Materials for Transport and Mechanical Engineering Applications, IV International Materials Symposium, Porto, Portugal. 1-4<sup>th</sup> April 2007.

[PC-2] Pedro Vilaça, Eduardo Dias, Luísa Quintino, Luís Quinto, Francisco Lima ; “*Concept and Design Development of a Mechanical Fire Fighting Projectile*”; 5<sup>th</sup> International Conference on Mechanics and Materials in Design Porto Portugal. 24-26<sup>th</sup> July 2006.

[PC-1] Pedro Vilaça, Luísa Quintino, “*Task 2 – Numerical and Analytical Modelling*”, 2 Posters at Final Seminar of project: HIBSYS. Mondego Shipyard. October 2005.

### **19.3. Communications and Papers in Proceedings of Conferences**

[CI-100] Alexandre Fernandes, João Valente, Filipe Anunciação, Pedro Vilaça, “Advances in ultrasonic welding of thin section cumg cable splices”. IIW 2013 - 66th Annual Assembly, Commission III, DocIII-B-07-13. Dusseldorf, Germany. 11-17 September, 2013.

[CI-99] Pedro Vilaça, Joel Mendes, Eugénio Santis, João Prior, Luísa Quintino, “Application of FSW to join aluminium foil windings for electrical transformers”. IIW 2013 - 66th Annual Assembly, Commission III, DocIII-B-06-13. Dusseldorf, Germany. 11-17 September, 2013.

[CI-98] Pedro Vilaça, Hannu Hänninen, Tapio Saukkonen, Rosa M. Miranda, “Influence of secondary flash formation on friction surfacing of high-strength steel substrate with AISI 316 consumable”. IIW 2013 - 66th Annual Assembly, Commission III, DocIII-B-05-13. Dusseldorf, Germany. 11-17 September, 2013.

- [CI-97] Pedro Vilaça, Telmo G. Santos, Luis Rosado, Rosa M. Miranda, Innovative Concept and Application of EC Probe For Inspection of Friction Stir Welds. Conference Proceedings of The 12th International Conference of the Slovenian Society for Non-Destructive Testing. ISBN 978-961-93537-0-7. Pp. 347-356. Portorož, Slovenia, September 4-6, 2013.
- [CI-96] J. Gandra, D. Pereira, R. M. Miranda, P. Vilaça, "Influence of process parameters in the friction surfacing of AA 6082-T6 over AA 2024-T3". 46th CIRP Conference on Manufacturing Systems. Setúbal, Paper ID 121. Portugal. 29-30 May 2013.
- [CI-95] Catarina Vidal, Virgínia Infante, Paulo Peças, Pedro Vilaça, "Application of Taguchi Method in the Optimization of Friction Stir Welding Parameters of an Aeronautic Aluminium Alloy " 2<sup>nd</sup> Annual International Conference on Materials Processing and Characterization ICMPC-2013. Paper ID 121. Griet, India. 16-17 March, 2013.
- [CI-94] Francisco Matos, Telmo Santos, Rosa Miranda, Pedro Vilaça, Luísa Quintino, Nuno Pedrosa, "Desenvolvimento e Aplicação de Ensaio Não Destrutivos para a Indústria Aeronáutica". VI Encontro Nacional do Colégio de Engenharia Mecânica – Sessão Técnica B1. Coimbra, Portugal. 1-3 de Março de 2012.
- [CI-93] Francisco Matos, José P. Sousa, Nuno Pedrosa, Telmo G. Santos, Pedro Vilaça, Luísa Quintino, "Developments in NDT inspection of wheels and propeller blades of airplanes". IIW-Regional Congress. Johannesburg, South Africa. 16-7<sup>th</sup> and 8<sup>th</sup> November, 2012.
- [CI-92] Pedro Vilaça\*, João Gandra, Rosa M. Miranda, Catarina Vidal, Virgínia Infante, Luísa Coutinho "Fundamentals and Innovations of Linear Friction Based Manufacturing Technologies: FS, FSW and FSC". IIW-Regional Congress. Johannesburg, South Africa. 16-7<sup>th</sup> and 8<sup>th</sup> November, 2012.
- [CI-91] Catarina Vidal, Virgínia Infante, Pedro Vilaça, "Multiaxial Fatigue Assessment of Friction Stir Channels", International Conference on Fatigue Damage of Structural Materials IX, Hyannis, MA, USA, 16-21 September, 2012.
- [CI-90] J. Gandra, M. Passanha, P. Vilaça, R. M. Miranda, "Energy efficiency in the Friction surfacing of carbon steels", 2nd Research Welding School. Wels – Áustria. 11th – 13th September, 2012.
- [CI-89] Miguel Ferraz, Pedro Vilaça, Catarina Vidal, Virginia Infante, Luísa Quintino, "Preliminary Study on Procedures and Channels Characteristics Using Friction Stir Channeling" IIW 2012 - 65th Annual Assembly, Commission III, DocIII-1647-12; 8-13 July, Denver, USA 2012.
- [CI-88] João Gandra, Rosa M. Miranda, Pedro Vilaça, Alexandre Velhinho, "Production of Functionally Graded Surface Composites by Friction Surfacing". International Conference on Mechanics of Nano, Micro and Macro Composite Structures. Politecnico di Torino, Department of Aeronautics and Space Engineering, Italy. Ref. doc. 391. 18 to 20 June 2012.
- [CI-87] Pedro Marques, Catarina Vidal, Virgínia Infante, Pedro Vilaça, "Mechanical Behaviour of Friction Stir Channelling Solid Blocks of AA 7178-T6 Aluminium Alloy", XIII Portuguese Conference on Fracture, Coimbra, Portugal, 2-3 February, 2012.

- [CI-86] A. Velhinho, R. Bicho, J.P. Borges, S.C. Ferreira, J. Gandra, G. Rodrigues, J.P. Mota, R.M. Miranda, L.A. Rocha and P. Vilaça, "*Functionally graded composites: from structural to biological applications*", 6th Africa Materials Research Society. December 2011.
- [CI-85] João Gonzalez, Luís Rosado, Telmo G. Santos, Pedro Vilaça, "*Simulação Numérica e Validação Experimental da Optimização da Sonda de Correntes Induzidas: Ionic*", 2ª Conferência Nacional em Ensaios Não Destrutivos, Fórum Sectorial de END – RELACRE, FEUP, Portugal. 16<sup>th</sup> December 2011.
- [CI-84] José P. Sousa, Francisco Demyony, Nuno Pedrosa, Telmo G. Santos, Pedro Vilaça, Luísa Quintino. "*Development of Automatic Systems for NDT Inspection of Wheels and Propeller Blades of Airplanes*". International Conference MATEST 2011. Split Croatia. 2-5 November 2011.
- [CI-83] Catarina Vidal, Virgínia Infante, Pedro Vilaça, "*Mechanical Characterization of Friction Stir Channels under Internal Pressure and In-Plane Bending*", 10th International Conference on Fracture and Damage Mechanics, Dubrovnik, Croatia, 19-21 September, 2011.
- [CI-82] T. G. Santos, R. M. Miranda, P. Vilaça, "*Evaluation of Structural Evolution in Friction Stir Processing with Eddy Currents*"; IIW 2011 - 64th Annual Assembly, Commission III, docIII-1599-11; 18-20 July, Chennai, India 2011.
- [CI-81] J. Gandra, R. M. Miranda, P. Vilaça, "*Monitoring of temperature and mechanical parameters in friction surfacing*"; IIW 2011 - 64th Annual Assembly, Commission III, docIII-1592-11; 18-20 July, Chennai, India 2011.
- [CI-80] C. Vidal, V. Infante, P. Vilaça, "*Assessment of Performance Parameters for Friction Stir Channelling*"; IIW 2011 - 64th Annual Assembly and International Conference, Presented both at Commission III as docIII-1593-11 and International Conference, Session I: Friction Stir Processes as IC99; 18-22 July, Chennai, India 2011.
- [CI-79] L.Quintino, P. Vilaça, R. Miranda, "*Friction Stir Welding and Processing at Technical University of Lisbon*". I IIW European-South American School of Welding and Correlated Processes – Study-group "Welding Research Strategy and Collaboration". Ouro Preto, Brazil. 18-20 May 2011.
- [CI-78] J. Gandra, R. M. Miranda, P. Vilaça, "*Surface Improvement by Overlapping in Multiple-Pass Friction Stir Processing*". VI International Materials Symposium (MATERIAIS 2011). Book of Abstract, pp.165. Guimarães, Portugal, 18-20 April 2011.
- [CI-77] Catarina Vidal, Virgínia Infante, Pedro Vilaça, "*Metallographic Characterization of Friction Stir Channels*", VI International Materials Symposium (MATERIAIS 2011). Book of Abstract. Guimarães, Portugal, 18-20 April 2011.
- [CI-76] T. G. Santos, J. Faria, P. Vilaça, R. M. Miranda, "*Application of eddy currents in processed materials structural evaluation*". VI International Materials Symposium (MATERIAIS 2011). Book of Abstract, pp.157. Guimarães, Portugal, 18-20 April 2011.
- [CI-75] Telmo G. Santos, Luís Rosado, Pedro Vilaça, Moisés Piedade, Pedro Ramos, "*Investigação e Desenvolvimento de Sistemas Inovadores de END: Actuais Capacidades Instaladas em Portugal*". Proceedings of CLME2011 – 6º Congresso Luso-Moçambicano de

Engenharia, Edições INEGI, ISBN: 978-972-8826-23-9, pp. 1113-1114. Doc. Ref.: 355003R. Maputo, Moçambique. 29 Agosto – 2 Setembro, 2011.

[CI-74] Luís S. Rosado, Telmo G. Santos, Moisés Piedade, Pedro M. Ramos, Pedro Vilça, “*Desenvolvimento de Sistemas Electrónicos para END por Correntes Induzidas*”. Proceedings of CLME2011 – 6º Congresso Luso-Moçambicano de Engenharia, Edições INEGI, ISBN: 978-972-8826-23-9, pp. 1115-1116. Doc. Ref.: 355007R. Maputo, Moçambique. 29 Agosto – 2 Setembro, 2011.

[CI-73] Nuno Pedrosa, Carlos Ôlo, Francisco Matos, Pedro Barros, Luísa Quintino, Telmo G. Santos, José P. Dias, Pedro Vilça, “*Técnicas Avançadas de Ensaaios Não Destrutivos Aplicadas a Componentes para a Indústria Aeronáutica*”. Proceedings of CLME2011 – 6º Congresso Luso-Moçambicano de Engenharia, Edições INEGI, ISBN: 978-972-8826-23-9, pp. 1125-1126. Doc. Ref.: 355008R. Maputo, Moçambique. 29 Agosto – 2 Setembro, 2011.

[CI-72] Pedro Vilça, Luis Vieira Gomes, Cláudia Almeida, “*Actividades Técnico-Científicas do FSEND-RELACRE Nacionais, Internacionais e no Apoio ao OCP em END*”. Proceedings of CLME2011 – 6º Congresso Luso-Moçambicano de Engenharia. Edições INEGI, ISBN: 978-972-8826-23-9, pp. 1127-1128. Doc. Ref.: 355014R. Maputo, Moçambique. 29 Agosto – 2 Setembro, 2011.

[CI-71] Filipe Nascimento, Francisco Pires, Marta Carvalho, Pedro Vilça, “*Implementing new safety systems in the seat design*”. International MasterClass 2011 in Biomechanics for Design for Injury Prevention. 11 – 14th Loughborough University, UK. July 2011.

[CI-70] J. Gandra, R. M. Miranda, P. Vilça, A. Velhinho, J. Pamies Teixeira, “*Producing FGMs by FSP – a preliminary study*”, 11th International Symposium on Multiscale, Multifunctional and Functionally Graded Materials. Guimarães, Portugal, September 2010.

[CI-69] Telmo G. Santos, Pedro Vilça, L. Quintino, J. dos Santos, R. M. Miranda, “*Advanced eddy current probes: developments and applications to FSpW and composite materials*”. Doc. Com. III-1575-10. Proceedings of 63rd Annual Assembly & International Conference of the International Institute of Welding (IIW2010), Istanbul, Turkey, 11 – 17 July, 2010.

[CI-68] T. G. Santos, Pedro Vilça, Luís Rosado, Moisés Piedade, Pedro Ramos, “*Developments in NDT of Friction Stir Welding Using Eddy Currents*”. Proceedings of 10th ECNDT – European Conference on NDT, Part 1, 2nd edition, Publishing house Spektr, ISBN: 978-5-904270-26-1, pp. 88-89. Moscow, 7 – 11 June, 2010.

[CI-67] Vidal, C., Infante, V., Vilça, P., “*Assessment of Improvement Techniques Effect on Fatigue Behaviour of Friction Stir Welded Aerospace Aluminium Alloys*”, 10<sup>th</sup> International Fatigue Congress, Prague, Czech Republic, 6-11 June, 2010.

[CI-66] Catarina Vidal, Virgínia Infante, Paulo Peças, Pedro Vilça, “*Application of Taguchi Method in the Optimization of Friction Stir Welding Parameters of an Aeronautic Aluminium Alloy*”, Iberian Conference on Fracture and Structural Integrity, <http://www.gef.es/Congresos/27/pdf/117.pdf>. 2010.

[CI-65] L. Rosado, M. Piedade, Pedro M. Ramos, Telmo G. Santos, Pedro Vilça, “*A Reconfigurable Digital Signal Processing System for Eddy Currents Non-Destructive Testing*”. I2MTC 1010, Texas, USA, 3-6 May, 2010.

- [CI-64] R.A.S. Castro, V. Richter-Trummer, S.M.O. Tavares, P.M.G.P. Moreira, P. Vilça, P.M.S.T. de Castro, “*Friction stir welding on T-joints: residual stress evaluation*”, 8<sup>o</sup> Congresso Nacional de Mecânica Experimental. Guimarães, 21-23 de Abril, 2010
- [CI-63] Vidal, C., Infante, V., Peças, P., Vilça, P., *Application of Taguchi Method in the Optimization of Friction Stir Welding Parameters of an Aeronautic Aluminium Alloy*, Iberian Conference on Fracture and Structural Integrity, Porto, Portugal, 17-19 March, 2010.
- [CI-62] Telmo G. Santos, Luís S. Rosado, Pedro Vilça, Moisés Piedade, Pedro M. Ramos, *Novas Sondas de Correntes Induzidas: Desenvolvimento, Produção, Controlo e Aplicação* (in Portuguese), 1<sup>a</sup> Conferência Nacional em Ensaios Não Destrutivos, Fórum Sectorial de END – RELACRE, Oeiras, Portugal. 4<sup>th</sup> December 2009.
- [CI-61] Flávio Gil Alves Paiva, Freddy Poetscher, Pedro Vilça, Sergio Duarte Brandi, “*Caracterização de Junta Soldada por Atrito Linear com Mistura (FSW) da Liga Al-Si-Mg AA6063-T6*”. XXXV CONSOLDA - Congresso Nacional de Soldagem, ABS-Associação Brasileira de Soldagem. Piracicaba - SP, 26-29 de Outubro de 2009.
- [CI-60] Freddy Poetscher, Flávio Gil Alves Paiva, Pedro Vilça, Sérgio Duarte Brandi, “*Efeito de Tratamentos Térmicos Pós-soldagem na Microestrutura e Propriedades Mecânicas de Junta Soldada por Atrito Linear com Mistura de Liga de Alumínio AA6063-T6*”. XXXV CONSOLDA - Congresso Nacional de Soldagem, ABS-Associação Brasileira de Soldagem. Piracicaba - SP, 26-29 de Outubro de 2009.
- [CI-59] L. Rosado, T. Santos, M. Piedade, Pedro M. Ramos, P. Vilça, “*New Non-Destructive Test Technique on Metal Inspection*” XIX IMEKO World Congress – Fundamental and Applied Metrology, Lisbon, Portugal. 6-11 September 2009.
- [CI-58] Telmo Santos, Pedro Vilça, Jorge dos Santos, Luísa Quintino, “*Innovative Eddy Current Probe for Micro Defects*”, Kingston, Rhode Island, USA, 26-31 July 2009.
- [CI-57] M.B.Silva, M. Skjoedt, P. Vilça, N. Bay, and P.A.F. Martins, “*Friction Stir Welding of Aluminium Tailored Blanks Processed by Single Point Incremental Forming*”. IRF'2009 - 3rd International Conference on Integrity, Reliability & Failure (Challenges and Opportunities); Doc. Ref: S2401\_A0561; Chapter XXI: Innovative and Emerging Production Technologies, ISBN 978-972-8826-22-2, pp. 599-600, Porto 20-24 July 2009.
- [CI-56] Mihaela Iordachescu, Danut Iordachescu, José Luis Ocana, P. Vilça, R. M. Miranda, Juan Poro and Catarina Vidal, “*Friction Stir Welding & Laser shock Processing Effectiveness on Modifying Aluminium Alloys Properties*”. IRF'2009 - 3rd International Conference on Integrity, Reliability & Failure (Challenges and Opportunities); Doc. Ref: S2402\_A0394; Chapter XXI: Innovative and Emerging Production Technologies, ISBN 978-972-8826-22-2, pp. 601-602, Porto 20-24 July 2009.
- [CI-55] M. Iordachescu, D. Iordachescu, J. L. Ocana, P. Vilça, E. Scutelnicu, “*Contribution to the Classification of the Characteristic Flaws in Friction Stir Welding Aluminium Butt Joints*”. Proceedings of the IIW International Conference on Advances in Welding and Allied Technologies, ISBN 978-981-08-3259-9; Chapter: Friction Stir Welding, IIW Document: FSW-5, pp. 259-264; Singapore, 16-17 July 2009.
- [CI-54] Telmo Santos, Pedro Vilça, Jorge dos Santos, Luísa Quintino, “*A New NDT System for Micro Imperfections Detection: Application to FSW and FSpW*”. Proceedings of the IIW

International Conference on Advances in Welding and Allied Technologies, ISBN 978-981-08-3259-9; Chapter: Inspection, Testing & Characterization, IIW Document: ITC-2, pp. 361-366; Singapore, 16-17 July 2009.

[CI-53] Catarina Vidal, Virgínia Infante, Pedro Vilça, “*Fatigue Behaviour in Friction Stir Welded Joints of AA2024 Treated by Improvement Techniques*”. Proceedings of the IIW International Conference on Advances in Welding and Allied Technologies, ISBN 978-981-08-3259-9; Chapter: Friction Stir Welding, IIW Document: FSW-2, pp. 241-246; Singapore, 16-17 July 2009.

[CI-52] Alexandre Fernandes, Filipe Anunciação, Luísa Quintino, Pedro Vilça, “*Metallurgical Aspects and Fundaments of Ultrasonic Weld of Multistranded Copper Cables*”, 62<sup>nd</sup> Annual Assembly of International Institute of Welding - IIW 2009; Commission IX: Behaviour of Metals Subjected to Welding, Sub-Commission IX-NF: Non Ferrous Metals. IIW Document: IX-2297-09 (IX-NF-24-09), Singapore, July 2009.

[CI-51] R. M. Leal, A. Loureiro, D.M. Rodrigues, P. Vilça, “*Friction Stir Welding of Copper Thin Sheets: Effect of tool geometry and process parameters*”, 62<sup>nd</sup> Annual Assembly of International Institute of Welding - IIW 2009; Commission III/Sub-Commission III-B “Friction Based Processes”. IIW Document: III-1522-09, Singapore, July 2009.

[CI-50] P. M. S. T. de Castro, Research team: S. M. O. Tavares, P. Vilça, J. dos Santos, “*New design concepts for aeronautical applications by friction stir welding*”, in: A. M. Cunha, O. S. Carneiro, eds., ‘Proceedings of the first MIT-Portugal Annual Conference’, pp.54-55, ISBN: 978-972-8692-41-4.

[http://www.mitportugal.org/index.php?option=com\\_docman&task=doc\\_download&gid=363&Itemid=383](http://www.mitportugal.org/index.php?option=com_docman&task=doc_download&gid=363&Itemid=383). 7th July 2009

[CI-49] Iordachescu, M., Ruiz-Hervias, J., Iordachescu, D., Vilça, P., Planas, J., “*Friction Stir Processing of AA6061-T4 - Cold rolled vs. as cast*”, 8th International Conference on Trends in Welding Research; Pine Mountain, GA; 1 June 2008 through 6 June 2008; Code 79048. ASM Proceedings of the International Conference: Trends in Welding Research (ISBN: 978-161503002-6), Pages 90-95. DOI: 10.1361/cp2008twr090. 2009.

[CI-48] Pedro Vilça, “*Non Destructive Testing Technique Advances for FSW and Friction Stir Activities at IST*”, International Seminar on Advanced Manufacturing Technologies, Centro Láser da Universidad Politécnica de Madrid, Madrid, 9<sup>th</sup> June 2009.

[CI-47] R. M. Leal, A. Loureiro, D.M. Rodrigues, P. Vilça, “*Effect of shoulder geometry on friction stir welding of copper thin sheets*”, Fifteenth International Conference On the Joining of Materials / The 6th International Conference on Education in Welding ICEW-6, Article 3, Session 4. Helsingor – Denmark, 3 – 6 May 2009.

[CI-46] R. M. Leal, C. Leitão, A. Loureiro, D. M. Rodrigues, P. Vilça, “*Microstructure and hardness of friction stir welds in pure copper*”, Proceedings of The V International Materials Symposium MATERIAIS 2009, paper A434. Lisboa, April 2009.

[CI-45] Tavares, S.M.O., Richter-Trummer, V., Azevedo, P.C.M., Figueiredo, M.A.V., De Castro, P.M.S.T., Emílio, B., Vilça, P., “*Friction stir welding of T-joints in dissimilar aluminium alloys*”. 2008 ASME International Mechanical Engineering Congress and Exposition, IMECE 2008; Boston, MA; 31 October 2008 through 6 November 2008; Code 76723. Proceedings of

ASME International Mechanical Engineering Congress and Exposition (ISBN: 978-079184865-4), Volume 4, Pages 265-273. 2009.

[CI-44] M. Iordachescu, D. Iordachescu, J. L. Ocana, P. Vilaça, E. Scutelnicu, “FSW - Characteristic Flaws in Aluminium Alloys Joints”. BRAMAT 2009 International Conference on Materials Science & Engineering. Brasov, Romania. 26 – 28 February 2009.

[CI-43] C. Leitão, R. M. Leal, D. M. Rodrigues, A. Loureiro, P. Vilaça, “Soldadura por fricção linear – Contribuição para a produção de transportes ligeiros”. Tema: Energia e Transportes, Comunicação 21. Actas do 5º Encontro Nacional do Colégio de Engenharia Mecânica da Ordem dos Engenheiros, Guimarães, 12-14 Fevereiro de 2009.

[CI-42] S.M.O. Tavares, V. Richter-Trummer, P.C.M. Azevedo, M.A.V. Figueiredo, P.M.S.T. de Castro, B. Emílio, P. Vilaça, “Friction stir welding of T-joints in dissimilar aluminium alloys”, International Mechanical Engineering Congress & Exposition: 2008 ASME; Track 4 Design and Manufacturing; Topic: 4-5 Joining Technologies for Advanced Materials and Structures; Paper reference n.: IMECE2008-67522; Boston, Massachusetts, USA. November 2-6, 2008.

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## 20. PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

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## **21. PARTICIPATION IN STANDARDIZATION COMMITTEES**

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