PERSONAL INFORMATION

Marco Ivo Frazão Pedroso

Rua de São Miguel, n39, 2640-741 Alcainça – Mafra – Portugal

+351 966 53 29 22

marco-pedroso@sapo.pt

www.marcopedroso.com ; Google Scholar ; Scopus

Skype: marcoivopedroso

Sex Male | **Date of birth** 07/10/1980 | **Nationality** Portuguese

WORK EXPERIENCE

From 01/2018 to current (end expected 02/2021)

Researcher and PhD candidate

CERIS – Técnico Lisbon – University of Lisbon – Portugal – https://tecnico.ulisboa.pt/en/

- Improve the mechanical and physical properties of aerogel-based thermal renders for application on building walls using fibres: Laboratory tests, Hygrothermal simulations and analysis, Life Cycle Inventory and Assessment (LCI, LCA, and LCIA) of the solutions, and economical, energetic, and environmental optimisation of the potential solutions - under the supervision of Prof Inês Flores-Colen, Prof José Dinis Silvestre and Prof Maria da Glória Gomes

Academia

From 01/2017 to 12/2017

Research fellow

CERIS – Técnico Lisbon – University of Lisbon – Portugal – https://ceris.pt/

- Development of an aerogel-based thermal render together with the Saint-Gobain Weber PT team, as well as its LCI and LCA - under the supervision of Prof Inês Flores-Colen, Prof José Dinis Silvestre and Prof Maria da Glória Gomes

Academia

From 01/2013 to 12/2016

Project manager

Argicol, construções Lda. Mafra - Portugal

- Execution of proposals to respond to public tenders and its monitorisation; Consultancy

Construction sector

From 04/2010 to 12/2012

Technical Director of the dBconsult acoustics laboratory

dBconsult, Engenharia acústica, Mafra - Portugal

- Implementation of the technical structure (ISO 17025); Execution of projects and *in situ* tests

Construction sector

From 04/2008 to 03/2010

Intern engineer

Argicol, construções Lda. Mafra - Portugal

- Design of civil engineering projects and of acoustic conditioning; construction monitoring

Construction sector

From 01/2001 to 03/2008

Technical designer

Argicol, construções Lda. Mafra - Portugal

- Design of buildings' speciality projects; measurement and budgets

Construction sector

EDUCATION AND TRAINING

From 01/2018 to current (end expected 02/2021)

PhD candidate in Civil Engineering

University of Lisbon – Instituto Superior Técnico, Lisbon – Portugal; https://tecnico.ulisboa.pt/en/

- Research based upon aerogel-based fibre-enhanced thermal renders for application on buildings' envelopes for added economic, energetic, and environmental efficiency

Finished 06/2016

Life Cycle Assessment of construction and building materials (40 hours)

Instituto Superior Técnico - FUNDEC, Lisbon – Portugal; https://tecnico.ulisboa.pt/en/

- Life Cycle Inventories (LCI); Life Cycle Assessment (LCA); SimaPro learning

Finished 11/2014

MSc in Construction and Rehabilitation [90 ects]

University of Lisbon – Instituto Superior Técnico, Lisbon – Portugal; https://tecnico.ulisboa.pt/en/

- Construction and rehabilitation methods; Pathologies identification and rehabilitation techniques

Finished 07/2010

Methods and instruments used to test environmental noise and building acoustics (24 hours)

Brüel & Kjaer Portugal

- Operation of sound-level meters, amplifiers, speakers, and vibration equipment's for evaluation of environmental noise and building acoustics

Finished 02/2010

Advanced Training Diploma in Acoustic Engineering [30 ects]

University of Lisbon – Instituto Superior Técnico, Lisbon – Portugal; https://tecnico.ulisboa.pt/en/

- Acoustical project and mitigation measures; Mechanical vibrations; *in situ* measurements; CadnaA learning

Finished 09/2007

Licenciatura (5-year degree) in Territorial Engineering

University of Lisbon – Instituto Superior Técnico, Lisbon – Portugal; https://tecnico.ulisboa.pt/en/

- Civil Engineering with an emphasis on urban planning

PERSONAL SKILLS

Mother tongue(s) Portuguese

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	Independent	Independent	Independent	Independent	Independent
Spanish	Basic	Basic	Basic	Basic	Basic

Communication skills

- good communication skills gained through my experience in public presentations in Seminars and Congresses

Organisational / managerial skills

- *Creativity* (needed when I had to overcome obstacles related to the development of the researched products: natural fibres sound absorbing mat and the aerogel-based fibre enhanced thermal render)
- *Integrity and sense of responsibility* (when any work or task is dependent on me, I have always fulfilled them on time, such as deadlines, still under the most rigorous quality and integrity)
- *Openness* (during the time researching it is essential to be open to other experiences and ideas, this way it is possible to build upon them)
- *Team spirit* (when in a team doing work this is essential since people have to trust each other to fulfil the needed project or tasks at hand)

Job-related skills

- Experience in executing several laboratory tests for the development of thermal renders
- Experience in implementing hygrothermal simulations and their critical analysis
- Experience in executing Life Cycle Inventories on-site and their posterior treatment; Experience in Life Cycle Assessment analysis of several construction materials
- Experience in project management
- Experience in supervision of building construction and rehabilitation; Consultancy in building acoustics (retrofitting works and *in situ* noise evaluation)

Computer skills

Independent user of the following types of software:

- Computer-assisted design (AutoCAD)
- Energy efficiency of buildings (EnergyPlus and WUFI Plus)
- Environmental acoustics (CadnaA)
- Environmental and building acoustics software (Brüel and Kjaer)
- Hygrothermal simulation (WUFI Pro)
- Life Cycle Assessment (SimaPro)
- Mathematical calculations (Matlab)
- Microsoft Office suite (Excel, Outlook, Powerpoint and Word)
- Microsoft Project
- Programming languages (Python, R)
- Statistical software (SPSS and Statistica)

Other skills

- CrossFit L1 trainer
- SUP surfer

Driving licence

- A – motorcycle
- B – automobile

ADDITIONAL INFORMATION

National patent

- A. Neves e Sousa, M. Pedroso, National Patent INPI PT108169: *Mat produced from cellulosic fibres, originated in Maritime pine needles, for thermal insulation and sound absorption, and its manufacturing process* (in Portuguese), INPI PT108169, 2017

International journals' publications

- M. Pedroso, J. de Brito, J.D. Silvestre, *Characterisation of eco-efficient acoustic insulation materials (traditional and innovative)*, Constr. Build. Mater. 140 (2017) 221–228. doi: 10.1016/j.conbuildmat.2017.02.132.
- M.G. Gomes, I. Flores-Colen, F. da Silva, M. Pedroso, *Thermal conductivity measurement of thermal insulating mortars with EPS and silica aerogel by steady-state and transient methods*, Constr. Build. Mater. 172 (2018) 696–705. doi:10.1016/j.conbuildmat.2018.03.162.
- R. Sousa, H. Sousa, L. Silva, I. Flores-Colen, M. Pedroso, *Development of a wall system made with thermally optimised masonry and super insulation mortar render*, Mason. Int. 32 (2019) 3–14.
- R. Garrido, J.D. Silvestre, I. Flores-Colen, M. de F. Júlio, M. Pedroso, *Economic assessment of the production of subcritically dried silica-based aerogels*, J. Non. Cryst. Solids. 516 (2019) 26–34. doi:10.1016/j.jnoncrysol.2019.04.016.
- M. Pedroso, J. de Brito, J. Dinis Silvestre, *Characterisation of walls with eco-efficient acoustic insulation materials (traditional and innovative)*, Constr. Build. Mater. 222 (2019) 892–902. doi:10.1016/j.conbuildmat.2019.07.259.
- M. Pedroso, I. Flores-Colen, *The influence of dimension and content of natural organic fibrous materials on the multi-performance of cement-based composites: A statistical approach*, Constr. Build. Mater. 231 (2020) 117175. doi:10.1016/j.conbuildmat.2019.117175.
- M. Pedroso, I. Flores-Colen, J.D. Silvestre, M.G. Gomes, L. Silva, L. Ilharco, *Physical, mechanical, and microstructural characterisation of an innovative thermal insulating render incorporating silica aerogel*, Energy Build. (2020) 109793. doi:10.1016/j.enbuild.2020.109793.
- M. Pedroso, I. Flores-Colen, J.D. Silvestre, M.G. Gomes, L. Silva, P. Sequeira, J. de Brito, *Characterisation of a multilayer external wall thermal insulation system. Application in a Mediterranean climate*, J. Build. Eng. (2020) 101265. doi:10.1016/j.jobe.2020.101265.
- M. Pedroso, I. Flores-Colen, J.D. Silvestre, M. da G. Gomes, *Nanomaterials' Influence on the Performance of Thermal Insulating Mortars—A Statistical Analysis*, Appl. Sci. 10 (2020) 2219. doi:10.3390/app10072219.

Magazine publications

- M. Pedroso, J. de Brito, J.D. Silvestre, *Characterisation of eco-efficient acoustic insulation materials(traditional and innovative)* (in Portuguese), Rev. Int. TechITT. 15 (2017) 4–16.
- I. Flores‐Colen, A. Soares, M. Pedroso, *Mortar innovation for façades rehabilitation* (in Portuguese), Construção Mag. (2019) 14‐17.
- M. Pedroso, J. Brito, J.D. Silvestre, *Evaluation of the behaviour of walls with eco-efficient sound-absorbing materials (traditional and innovative)* (in Portuguese), Rev. Eng. Civ. (2019) 44–56.

Conferences, Seminars and Presentations

- M. Pedroso, A. Neves e Sousa, *Use of natural fibrous materials for wall and ceiling coatings* (in Portuguese), in: CONPAT 2015, IST, Lisboa - Portugal, 2015: pp. 1–8.
- M. Pedroso, I. Flores-Colen, J.D. Silvestre, L. Silva, P. Sequeira, G. Sousa, *Development of super-insulating thermal renders: preliminary studies* (in Portuguese), ICEUBI2017 - Int. Congr. Eng. A Vis. Futur. (2017). Document * With an oral presentation
- M. Pedroso, I. Flores-Colen, L. Silva, R. Sousa, H. Sousa, *Improved thermal performance of exterior wall system: PEP* (in Portuguese), in: Construção 2018 - Reabil. e Construir Forma Sustentável, Porto - Portugal, 2018.
- R. Sousa, H. Sousa, L. Silva, I. Flores-Colen, M. Pedroso, *Development of energy efficient masonry system*, in: G. Milani, A. Taliercio, S. Garrity (Eds.), 10th Int. Mason. Conf., Milan - Italy, 2018.
- M. Pedroso, I. Flores-Colen, L. Silva, P. Sequeira, J.D. Silvestre, M.G. Gomes, *Super insulating thermal mortars: Experimental analysis of their application in coating systems* (in Portuguese), in: III Simpósio Argamassas e Soluções Térmicas Revestimentos, Coimbra - Portugal, 2018. * With an oral presentation
- M. Pedroso, I. Flores-Colen, L. Silva, P. Sequeira, J.D. Silvestre, M.G. Gomes, *Mechanical resistance characteristics of super insulating thermal mortars: state of the art* (in Portuguese), in: 3o Congr. Luso-Brasileiro - Mater. Construção Sustentáveis - CLB-MCS 2018, Coimbra - Portugal, 2018.
- M. Pedroso, I. Flores-Colen, J.D. Silvestre, M.G. Gomes, *Study on the thermal conductivity performance of cement-based composites incorporating natural organic fibres*, in: R. Ball, B. Dams, V. Ferrandiz-Mas, X. Ke, K. Paine, M. Tyrer, P. Walker (Eds.), 39th Cem. Concr. Sci. Conf. 2019, University of Bath, Bath, United Kingdom, 2019: pp. 112–115. * With an oral presentation
- I. Flores-Colen, M. Júlio, M. Pedroso, A. Soares, *Research on aerogel-based renders*, in: 11th Int. Conf. Sustain. Energy Build., Budapest, Hungary, 2019.
- Flores-Colen, I., Pedroso, M., Soares, A., Gomes, M., Ramos, N., Maia, J., Sousa, R., Sousa, H., Silva, L., 2020. In-Situ Tests on Silica Aerogel-Based Rendering Walls, in: Serrat, C., Casas, J.R., Gibert, V. (Eds.), XV International Conference on Durability of Building Materials and Components. eBook of Proceedings. CIMNE, Barcelona, pp. 1–6. https://doi.org/10.23967/dbmc.2020.190

MSc and PhD Thesis

- M. Pedroso, MSc Thesis in Construction and Rehabilitation: *Use of natural fibrous materials for the production of acoustic absorbing panels* (in Portuguese), 2014, Supervised by Prof Albano Neves e Sousa from Técnico Lisboa, IST, Lisboa - Portugal - This Thesis conducted to the National Patent INPI PT108169
- M. Pedroso, PhD Thesis in Civil Engineering: *Eco-efficient and multifunctional thermal renders based on silica aerogel and natural fibres*, under current development, Supervised by Prof Inês Flores-Colen, Prof José Dinis Silvestre and Prof Maria da Glória Gomes, all from Técnico Lisboa, IST, Lisboa - Portugal - expected to be delivered February 2021.

Invited position

- Visiting Postgraduate Scholar - Department of Architecture and Civil Engineering at the University of Bath – United Kingdom – September 2019; Under the supervision of Dr Richard J. Ball. Exchange of research results and some tests carried out together for a forthcoming paper to be submitted to an international Journal.

Scholarships

- Scholarship as Research fellow (one year: 01/2017 to 12/2017) – Research associated with the development of a new aerogel-based thermal render for application on exterior walls – PEP project (POCI-01-0247-FEDER-017417). During this period there was the development of an aerogel-based thermal render formulation in conjunction with the Saint-Gobain Weber PT team, execution of laboratory tests and execution of its Life Cycle Inventory – Supervised by Prof Inês Flores-Colen, Prof José Dinis Silvestre and Prof Maria da Glória Gomes.
- PhD funding (three years: 01/2018 to 02/2021) by the Portuguese National Foundation for Science and Technology (FCT) – development of aerogel-based fibre enhanced thermal renders including formulation development, hygrothermal simulation (WUFI Pro), Life Cycle Assessment (SimaPro) and economic, energetic and environmental optimisation studies - SFRH/BD/132239/2017.

Research projects

- Efficient Plus Wall (in Portuguese – Parede Eficiente Plus) research project (POCI-01-0247-FEDER-017417) from 01/2017 to 05/2019. This project was executed between Saint-Gobain Weber Portugal, the Faculty of Engineering from the University of Oporto and the CERIS research group of Técnico

Lisbon. My participation was related with the development of aerogel-based thermal render formulations, their laboratory and *in situ* tests, execution of the Life Cycle Inventory (LCI) to then execute its Life Cycle Assessment (LCA). Supervision: Prof Inês Flores-Colen, Prof José Dinis Silvestre and Prof Maria da Glória Gomes. Website

Memberships

- Civil Engineering Effective Member #59979 of the Portuguese Association of Professional Engineers

Invited reviewer

- Journal of Building Engineering

Other courses and Seminars

- Ethics and professional deontology (10 hours) (2008) – Portuguese Association of Professional Engineers
- Implementation of quality management systems in laboratories - EN 17025 (24 hours) (2011) – SGS Portugal
- Scientific writing and oral communication (16 hours) (2014) – Técnico Lisbon

- Seminar "Sustainable mobility" – Aveiro University (12/2004) – Aveiro, Portugal
- Workshop "Wastewater treatment" – Takone (03/2009) – Parede, Portugal
- Seminar "4th Encounter of Acoustic Engineering – Acoustic Engineering and its social connections" – Portuguese Association of Professional Engineers (03/2010) – Lisbon, Portugal
- Seminar "Acoustical Labs and the ISO 17025:2005" – Brüel and Kjaer Portugal (01/2011) – Coimbra, Portugal
- Seminar "Acoustical modelling" – Portuguese Acoustical Society (01/2011) – Coimbra, Portugal
- Technical session "The new standards NP ISO 1996-1 and NP ISO 1996-2" – Portuguese Acoustical Society and RELACRE (03/2011), LNEC – Lisbon, Portugal

Research reports

- "1st Report of project activities: Parede Eficiente Plus" (in Portuguese), Report related to the period from 07/03/2016 until 31/12/2016, P2020, Saint-Gobain Weber Portugal.
- "State of the art of thermal renders and their sustainability. Preliminary studies" (in Portuguese), integrated in the Project Parede Eficiente Plus, Report ICIST, DTC 06/17, CERIS - IST - UL, Lisbon, Portugal.
- "Experimental study of thermal render's formulations" (in Portuguese), integrated in the PEP Project, Report FUNDEC, PS 02/17, FUNDEC - IST - UL, Lisbon Portugal.
- "2nd Report of project activities: Parede Eficiente Plus" (in Portuguese), Report related to the period from 01/01/2017 until 31/12/2017, P2020, Saint-Gobain Weber Portugal.
- "Development of super-insulating thermal mortar's formulations: Study, development, test and application" (in Portuguese), integrated in Project Parede Eficiente Plus, Report ICIST, DTC 05/18, CERIS - IST - UL, Lisbon, Portugal.
- "3rd Report of project activities: Parede Eficiente Plus, project 017417" (in Portuguese), Report related to the period from 07/03/2016 until 31/08/2018, P2020, Saint-Gobain Weber Portugal.
- M. Pedroso, J. D. Silvestre, I. Flores-Colen, "Life Cycle Assessment (LCA) report of the lightweight concrete thermal block developed by Saint-Gobain Weber, IC and Previcon for the PEP project" (in Portuguese), CERIS DTC 14/2018, CERIS - IST - UL, Lisbon, Portugal.
- "Thermal render's microstructural study" (in Portuguese), integrated in the PEP Project, Report FUNDEC, PS 02/19, FUNDEC - IST - UL, Lisbon Portugal.
- "In situ application and test of the developed thermal render and LCA of the lightweight block, render and PEP system" (in Portuguese), integrated in PEP Project, Report ICIST, DTC 05/19, CERIS - IST - UL, Lisbon, Portugal.
- "Project PEP final report" (in Portuguese), Report related to the complete project, P2020, Saint-Gobain Weber Portugal.
- M. Pedroso, J. D. Silvestre, I. Flores-Colen, "Life Cycle Assessment (LCA) report of the super-insulating thermal render SIM developed under the PEP project" (in Portuguese), CERIS DTC 43/2019, CERIS - IST - UL, Lisbon, Portugal
- M. Pedroso, J. D. Silvestre, I. Flores-Colen, "Life Cycle Assessment (LCA) report of a multilayer coating system for facades' thermal insulation" developed by Saint-Gobain Weber (in Portuguese), FUNDEC PS 20/2020, FUNDEC - IST - UL, Lisbon, Portugal

Other projects

- Project Manager: Transformation of an office building into an infirmary (2011) for the Portuguese Ministry of Defence (22,000.00 €)
- Project Manager: Roof retrofit of a service station (2012) for the Portuguese Ministry of Defence (10,140.00 €)
- Project Manager: Facades rehabilitation of the historic building "Edificio Dona Maria" (2013) for the Portuguese Ministry of Defence (52,490.00 €)
- Project Manager: Facades and roof retrofitting of seven buildings (2013) for the Portuguese Ministry

of Defence (148,752.21 €)

- Technical Director of the construction of an Industrial warehouse (2015) (125,000.00 €)