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Book of Abstracts

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Welcome Address

The abstracts collected in this book represent the proceedings of the conference ICCS25 (25th International Conference on Composite Structures) , 19-22 July 2022. This book aims to help you to follow this Event in a timely and organized manner. Papers are selected by the organizing committee to be presented in virtual/physical format. Such arrangement is due to the effects of the coronavirus COVID-19 pandemic. The event, held at FEUP-Faculty of Engineering, University of Porto (Portugal), follows the success of the first 24 editions of ICCS. As the previous ones, this event represents an opportunity for the composites community to discuss the latest advances in the various topics in composite materials and structures.

Conference chairs

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open-cell aluminum foam with cork. These hybrid structures were prepared by infiltrating a mixture containing polymer-coated cork powders into the open-cell foam. The samples are geometrically analyzed using X-ray microcomputed tomography to extract morphological and topological properties of the voids and the solid phase. The mechanical, thermal, acoustic, and fire retardancy properties of these aluminum foam-cork hybrid structures are evaluated and compared with their individual components (open-cell aluminum alloy foam and agglomerated cork).

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Mechanical properties of the aluminum foam-filled tubes

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The research focuses on lightweight structures filled with cellular (porous) metals. Initially, their design and fabrication procedures are described. Aluminum alloy tubes of different shapes were filled (in-situ and ex-situ) with different aluminum alloy foams (e.g., open and closed-cell foams). They were subjected to mechanical loading in an extensive experimental testing program. Different types of loading (e.g., compression, bending) and velocity (e.g., quasi-static, dynamic) were considered. The deformation response, including the collapse mechanism of the foam-filled structures, has been analyzed in detail. The mechanical properties, energy absorption capacity, and strain rate sensitivity were also evaluated. It was found that the lightweight aluminum foam-filled tubes offer a stable crush performance and that their mechanical properties and deformation mechanism can be tuned for specific applications.
