



# *Sustainable and Eco-friendly Cork Composites in Aerospace Engineering*

## *Educational Perspective for Cork Composites in Aerospace Applications*

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**Abstract**— Materials science is continuously being developed, and major industries take advantage of cutting-edge technologies in their applications. Since lightweight materials with superior strength are demanded by the market, composites have come to the fore as the substituent for metal alloys. Although the technical side of industrial applications is compensated by the rise of composites, sustainability and eco-friendly properties of materials, which have important places within the EU policy areas, still require efforts from institutes and companies. At this juncture, composites produced from natural materials such as cork become more of an issue due to their environmentally friendly properties. Leading companies make investments in this issue. Still, there is a lack of human resources in the field since syllabuses in engineering programs focus on technical sides rather than the environmental effects of engineering materials. This work aims to develop educational tools for gaining environmental awareness of eco-friendly composites as well as understanding the importance of cork composites in sustainability. Within this scope, an educational scheme was developed, focusing on individuals at the college level, leading to the development of curricula, course materials, and learning platforms as well as organizing internships for the students. Staff skills are enhanced in a particular and promising field with the interactions between pacemaker partners. The industrial partner contributes to the preparation of training programs on sustainability and carbon footprint of cork products since it is a leading cork producer globally. In addition, this partner provides internship positions for engineering students. Within this scope, there is an established bridge from the homeland of cork (Portugal and Spain) to Eastern Europe, where vast amounts of investments have been paid for aerospace applications. Hence, there is a chance to have a good partnership in developing sustainable cork composites for the aerospace industry. In this work, the main target group is engineering students, while research staff also benefit from this partnership. In the current educational system, engineering students are led to pure technical courses and thus, students who graduated from engineering faculties feel a lack of environmental consciousness. This point is crucial for humanity because

competition in the market leads to rapidly growing technologies, resulting in irreversible processes harmful to the environment. For this reason, technology developers, mainly engineers, should be aware of the side effects on the environment and humanity. Hence, we aim to gain awareness in the aerospace industry to use eco-friendly and sustainable cork composites. The main reason for selecting the aerospace industry as the implementation sector is that the aerospace industry is familiar with cork in aircraft, helicopters, and space shuttles. Moreover, aerospace industry is the leading sector for the development of composites since vast amounts of investments are made by the companies, resulting in significant scientific and technological developments.

**Keywords**— sustainability; cork; aerospace applications.

### ACKNOWLEDGEMENTS

This work is produced within the project “Educational Development for Sustainable and Eco-friendly Cork Composites in Aerospace Applications (ECOCORK)”, which is funded by the Erasmus+ Program of the European Union - 2020-1-TR01-KA203-092763.

### TOPIC

- 1) Sustainable Manufacturing Solutions
  - c. Manufacturing for Circular Economy