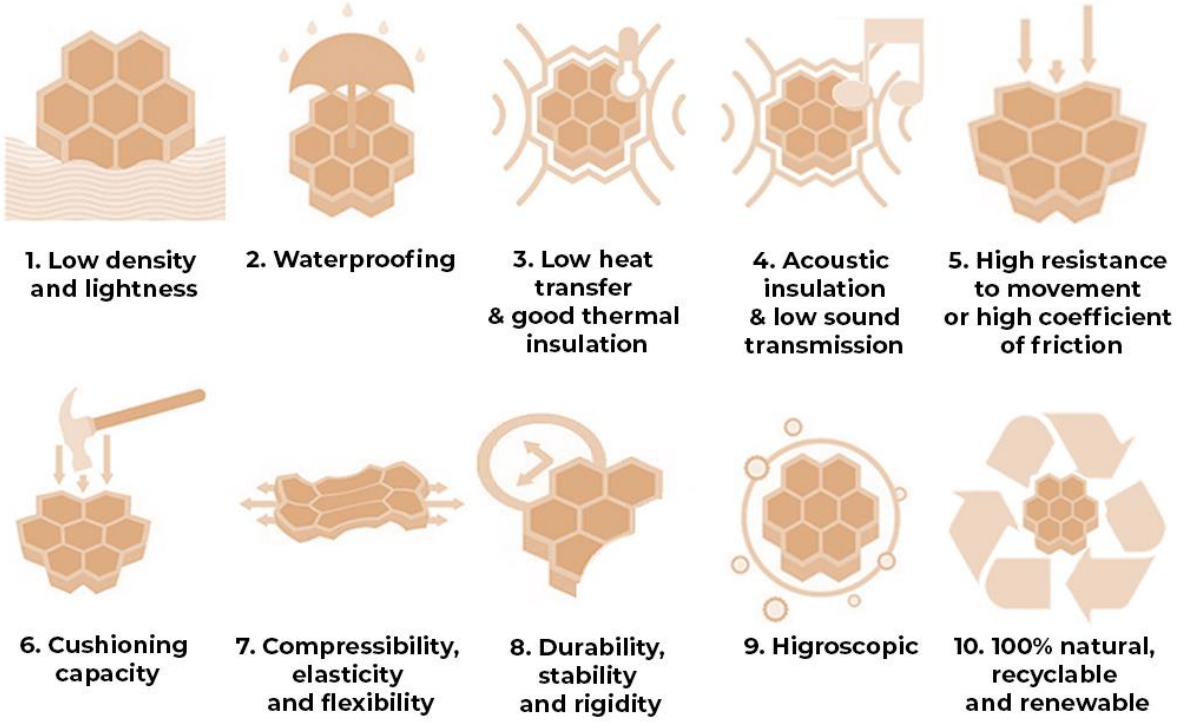
Sustainable and Eco-friendly Cork Composites in Aerospace Engineering

Cork Composites

Cork is a natural cellular material that is widely used in various engineering applications.

The **most important properties** of cork are;



Cork Composites

- Although the technical side of industrial applications is compensated by the rise of composite materials, **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.

- Because of its excellent properties, cork based materials are good alternatives for synthetics materials in engineering.

Cork Composites

- Leading authorities make great investments in sustainable and eco-friendly solutions.
- 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.
- To compensate this important gap, **ecoCORK** project is running.

What is ecoCORK ?

- **ecoCORK** is a Strategic Partnership Project in Higher Education supported by Erasmus+ Program.

- There are six partners in the consortium.

What is ecoCORK ?

- In the current educational system, engineering students are led to pure technical courses and thus, students who graduated from engineering faculties feel the lack of environmental consciousness.

- This point is crucial for humanity because competition in the market leads to rapidly growing technology, 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 for the usage of eco-friendly and sustainable cork.

What is ecoCORK ?

- The main reason for selecting the aerospace industry as the implementation sector is that the aerospace industry is familiar with cork as using it 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.

- As is well known, scientific developments and trends mostly emerge in the aerospace industry and then these spread to the other sectors.

What is ecoCORK ?

Within the scope of ecoCORK, there are five modules:

- **Module-1:** Introduction to cork science, cork cultivation, cork harvesting, cork processing
- **Module-2:** Sustainability of cork, carbon footprint of cork, potential products of cork
- **Module-3:** Sectors for cork products, cork properties, future trends for cork
- **Module-4:** Cork-based composites, composite manufacturing methods
- **Module-5:** Aerospace applications of cork demanded properties from the aerospace sector

Learning Module Outline

Learning Objectives	
Learning Objectives for the modules	Upon completion of this module, attendants will be able to: ● Understand the different stages of cork: cultivation, harvesting and processing ● Understand how the processing of cork affects the manufacturing of cork composites ● Understand why cork is considered a sustainable material. ● Know and clarify the concept of carbon footprint and the different steps for its calculation. ● Get an introduction of different uses of cork material and the characteristics that makes it suitable for the aerospace sector. ● Plan and assess the results of mechanical testing experiments for cork materials. ● Understand the current and prospective application areas of cork composites in aerospace structures. ● Understand the advantages of cork composites over the other materials in aerospace applications.

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Learning Module Outline

Target Groups	
Targets	• Engineering students (Aerospace, Aeronautical, Materials and Mechanical Engineering) • Engineers, technical staff and leaders in Aerospace and Aeronautical Industries

Learning Resources	
Resources	• Scientific Articles • Audiovisual material • Field trips • Books and Thesis

Self-assessment and Learning Activities	
Self-assessment and Learning Activities to be created	• Quizzes • Oral presentations • Module summaries • Video lectures

Acknowledgements

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Thank you!...

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