



Annex 4 - Challenge Template

1. Name of the challenge:

Lightweight frame constructions using prefabricated carbon fiber and alloy elements.

2. Context:

The need for lightweight constructions which can be easily designed and mass produced is ever growing. Reducing the weight especially in the transport industries is a priority because it results in more efficient, more eco-friendly and safer transport vehicles. In civil engineering lighter constructions reduce the load on foundations which in turns reduces cost and transport expenses.

3. Problem:

Producing carbon fiber details and constructions is still expensive. Often hand work and special equipment is needed. Sometimes the shapes and constructions become complicated and difficult to calculate and predict without good FEA analysis. Mass production is also difficult. Developing a method for producing and joining prefabricated carbon fiber elements will have an impact on many industries. A proper connector should be designed, to form the basis for the introduction of forces into the space frame's composite truss members.

4. Additional info (for internal use):

The team is expected to deliver a prototype of a frame using prefabricated carbon fiber and alloy elements suitable for mass production. To Conduct tests which determine the strength of the prototype and other physical and chemical properties.

5. Skills of the team (for internal use):

Team members should have good knowledge in mechanics, science of the materials technology of materials, composite materials, adhesion methods, lightweight constructions, CAD software, FEM analysis.

5. About the Seeker:

- Department "**Combustion Engines, Automobile Engineering and Transport**" at Technical University of Sofia, Bulgaria conducts proactive research in the field of internal combustion engines, automobiles, tractors and fork-lifts and the management and organization of road transport.

Solving the above described problems will extend the research field of



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the department and allow the faculty in general to keep pace with the modern trends in the automotive industry.

Basic information, additional information
www.interreg-danube.eu/da-space