Annex 4 – Challenge Template

1. **Name of the challenge:**

   - *Measurement of micro-hardness of engineering non-metal composite materials*

2. **Context:**

   - *A new non-metal composite material is created but in order for it to be accepted as a reliable material to work with a new system or approach should be developed for measurement of the surface hardness of this new composite material in order to confirm its properties as a viable replacement for metals.*

3. **Problem:**

   - *Although traditional metal hardness measurement techniques and standards such as HB (Hardness Brinell), HRC (Hardness Rockwell) and HV (Hardness Vickers) are applicable to some extend for polymer and composite non-metal materials, some extrapolation should be made insted or new equipment or technique should be used in order the get proper measurements of polymer (non-metal) composite materials.*

   - *This is important because the new technology or approach will be used as a basis for all future researches comprising polymer and non-metal materials on which the future is based.*

4. **Additional info (for internal use):**

   - *The team is expected to deliver a measuring system for micro- and nano-hardness of engineering polymer materials.*

   - *The team will be provided with samples from new composite material made out of Carbon Nanotues (CNTs) and UHMWPE polymer and standard equipment for measurement of hardness using the traditional approaches (HB, HRC, HV) in order to have a starting point.*

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

   - *Knowledge about polymer and non-metal materials;*

   - *Knowledge about measurement techniques and equipment;*

5. **About the Seeker:**

   - *The Technical University of Sofia is the largest educational and*

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scientific complex in Bulgaria in the field of technical and applied science with an institutional accreditation grade of 9.5 (on the scale of 10) for the period 2012 – 2018. As the first and largest polytechnic center, which supported the establishment of most of the higher technical colleges in the country, it sets the educational standards and national priorities for the development of engineering education and science.

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

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