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**EsSENce Cost Action CA19118**

*Project Title:*

**“High-performance Carbon-based composites with Smart properties for Advanced Sensing Applications”**



<b>Deliverable No</b>	D2.1
<b>Deliverable Title</b>	Survey and report on industrial needs and main challenges underpinning industrial processes (M4)
<b>Working Group</b>	WG 2
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# 1 Introduction to the deliverable content

Working group 2 is expected to be a strong connection between industry and academia and its activities will focus on the identification of existing gaps in common industrial processes along with the main challenges that the industrial partners are currently facing towards technology advancements and the launch new smart products to the market.

The first step to be completed is to collect some information regarding in particular the industrial needs in terms of materials, desired functionalities, aspects related to safety issues and aspects related to manufacturing technologies. In order to answer to all these questions a survey was prepared by the working group 2 members and sent to some industries in order to start to collect their feedback.

Unfortunately, in the last two years Covid crisis strongly modified the industrial panorama and also for this reason the deadline of this deliverable was postponed. In the following the set of questions of the survey will be presented together to the results collected so far.

## 2 Survey on industrial needs and main challenges underpinning industrial processes



WG2



High-performance Carbon-based composites with Smart properties for Advanced Sensing Applications"

Survey on industrial needs and main challenges underpinning industrial processes

Question Number	Question
Q1	Which is the industrial sector in which you operate?
Q2	In the field of composite materials which is according to You the most important feature that you want/would like to exploit?
Q3	Are you interested in adding smart and sensing capabilities to your products? If yes, on which properties would you prefer to focus on?
Q4	Which is the main concern from the technological point of view in the introduction of carbon based composites with smart properties?
Q5	Do you know what a COST Action is?

**Figure 1: Extract of the sent survey**

The survey was organized with open question in order to leave the possibility to the companies to answer without any influence from our side, as we thought that a multiple-choice questionnaire would not be the right way to interview industrial partners that could come from different market sectors.

The five questions are listed below:

- 1) Which is the industrial sector in which you operate?
- 2) In the field of composite materials which is according to You the most important feature that you want/would like to exploit?
- 3) Are you interested in adding smart and sensing capabilities to your products? If yes, on which properties would you prefer to focus on?
- 4) Which is the main concern from the technological point of view in the introduction of carbon-based composites with smart properties?
- 5) Do you know what a COST Action is?

We sent the survey to some industrial partners (in particular known by Dallara) and the received answers are presented in the following paragraph.

### 3 Report and discussion on the survey results

The answered surveys were analyzed and the following graphs represent the collected answer for each question.

The first question is very general and is important in order to identify the industrial market and sector that was considered.

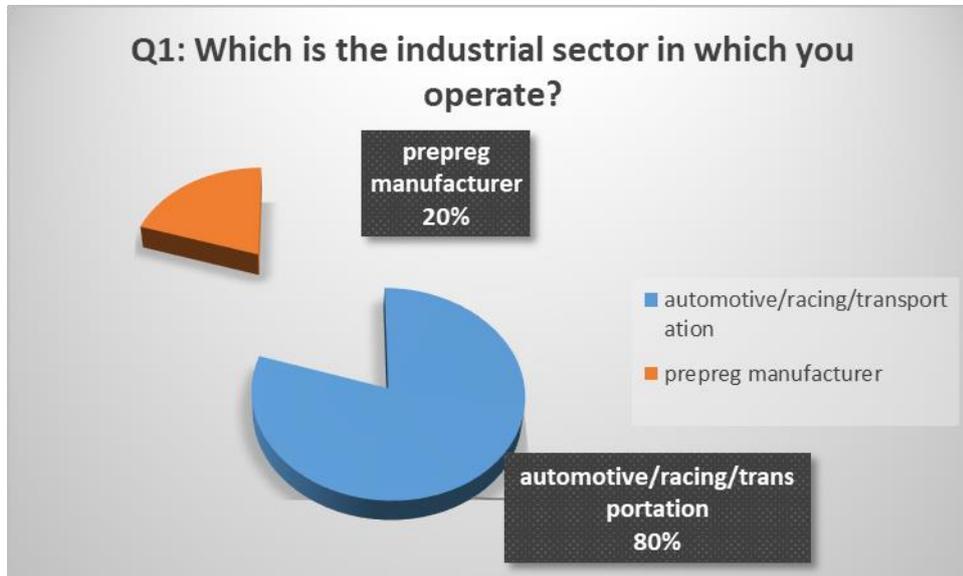


Figure 2: Answers collected for survey Q1.

Apart from one material manufacturers, the companies that answered to our request come from automotive/transportation market.

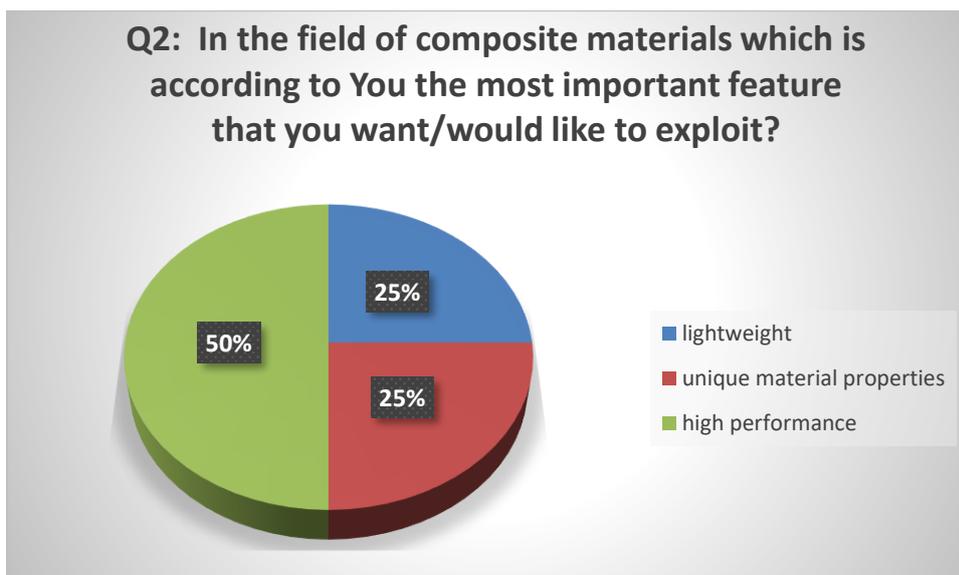
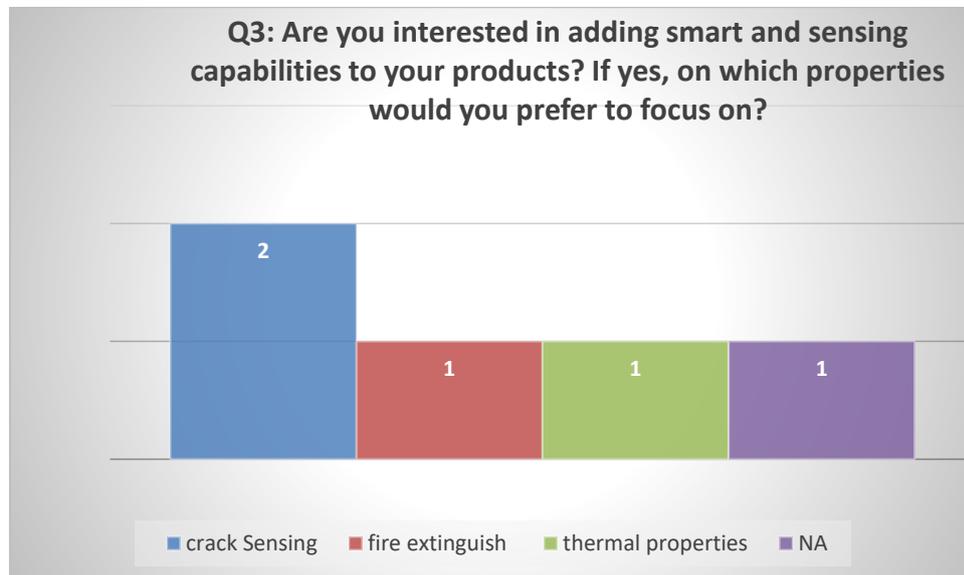


Figure 3: Answers collected for survey Q2.

In order to identify which is the most important composite materials properties felt by the industrial panorama, we asked to the audience to express according to their expertise and activities, which is the most important feature that they already exploit or they would desire to exploit.

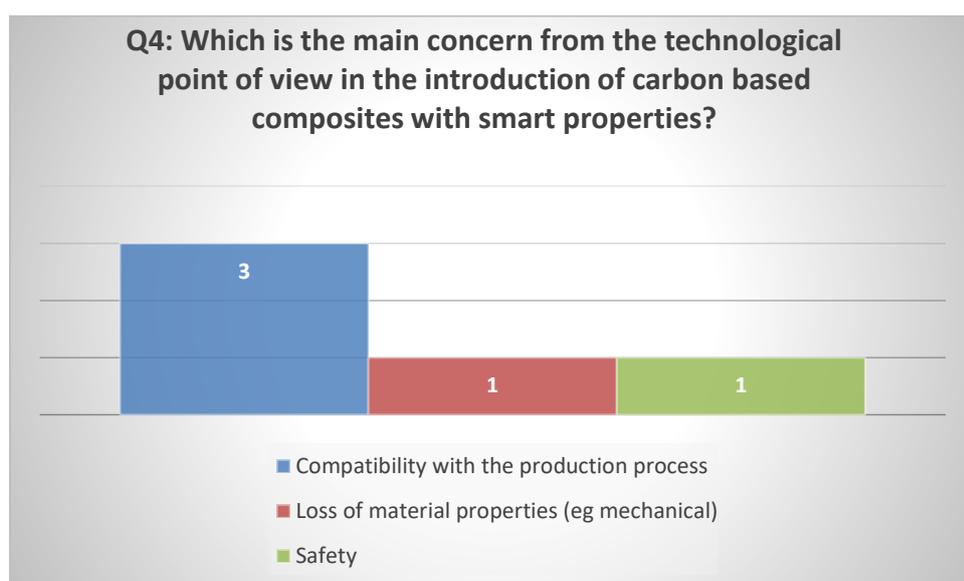
The most frequent answer is high performance; thus, we should consider that high performances in terms of mechanical, thermal conductive, smart... properties should be considered a priority for the development of our activities



**Figure 4: Answers collected for survey Q3.**

The third question deals with the smart property that is considered crucial by the industrial partners. Even if the number of answers is not so high, sensing appeared to be the most critical and interesting properties to be added as an extra functionality to composite materials.

This result is extremely interesting as it indicates that the activities of the Essence Cost Action are centred and in good agreement with industrial needs.



**Figure 5: Answers collected for survey Q4.**

The main concern regarding the introduction of high-performance composite materials with smart and sensing properties (topic of Q4) is related to the compatibility of the innovative materials with the

production processes. This is an important information to consider, in particular in the framework of WGs that deal with materials and sensors development.



**Figure 6: Answers collected for survey Q5.**

As a final question we asked if they knew what a Cost Action is, in order to understand which is the gap between industry and EU projects that are characterized by a different aim and structure with respect to standard RIA projects. The obtained result underlines the urgent need of disseminating in a more effective way our COST Action activities and results.

## 4 Conclusion

The presented results showed a great interest in the field of high-performance Carbon-based composites with Smart properties but we would like as Work group 2 to further extend to other industrial partners the survey. This is crucial as there is a lack of knowledge from the industrial partners in terms of what a Cost Action is and, as a consequence, which could be the benefits in terms of know how and international connections that could be gained by joining and working actively in a Cost Action.

Another important aspect is related to the fact that the developed innovative materials should be as much as possible compatible with the industrial processes. In this way the introduction of innovative materials developed within the Project will be much more effective and successful.

In conclusion, we can consider this document as a first release of the D2.1, that will be updated during the Project as WG 2 would like to extend the survey to other companies in order to collect other comments and to help the Cost action Work Groups in the development of innovative materials that could be proposed to the market.