AMULET: Electric double layer capacitors with anodized aluminum foil

Summary

Profile type	Company's country	POD reference
Research & Development Request	**Slovenia**	**RDRSI20220606015**
Profile status	**Type of partnership**	**Targeted countries**
PUBLISHED	**Research and development cooperation agreement**	**• World**
Contact Person	**Term of validity**	**Last update**
Tomaz Lutman	**6/6/2022** **6/6/2024**	**06/06/2022**

General Information

Short summary

Slovenian producer of electric double layer capacitors (EDLC) is looking for solution to the following challenge. Challenge is to develop EDLC capacitors with anodized aluminum foil. In combination with a suitable electrolyte, it has a higher specific surface area, which in turn allows us to have higher capacitance values. By achieving higher capacitance values with less material, we are bringing lightweighting to the field.

Full description

Slovenian company is a globally recognized provider of intelligent industrial solutions and cutting-edge electrotechnical products. The company is looking for two or three SMEs which would address the following scopes and objectives within AMULET Open call.

The basis of this challenge is to create a product, an electric double layer capacitor (EDLC) capacitor that has an anodized aluminum foil. However, we must not forget that the capacitor is made from several different components and not just an anodized aluminum foil, and all components work together simultaneously to get the best capacitance values. Among these components, high importance is given to the cohesion between the anodized aluminum foil and electrolyte. Challenge is to develop EDLC capacitors with anodized aluminum foil. In combination with a suitable electrolyte, it has a higher specific surface area, which in turn allows us to have higher capacitance values. By achieving higher capacitance values with less material we are bringing lightweighting to the field of capacitors as well by reducing the materials and implementing new modern material CO_2 emissions are reduced as well as new production

technologies with aiming to reduce CO2 emissions will be developed and implemented.
The company has chosen the material for the heart of the capacitor - the capacitor roll as aluminum. The metal itself is very reactive and spontaneously forms a thin transparent oxide layer, which provides great stability. The oxide layer has the properties of a dielectric, and its surface is porous, which increases its active surface. Therefore, the company wants to use it as a dielectric, and with its properties significantly increase the capacitance of the capacitor at the same dimensions. It is possible to form an oxide layer to the correct thickness and porosity by various electrochemical processes. This allows us maximum capacity per unit volume. Therefore, in the field of technology, it will be necessary to develop the process of anodizing the aluminum foil to gain the required specific active surface needed.
In the presence of a layer of aluminum oxide formed on the anode foil and acting as a dielectric, a capacitor with a high capacitance value is obtained. In this case, the electrolyte has a cathode function. The basic properties of the electrolyte are electrical and ionic conductivity, chemical stability and compatibility with other capacitor components, superior impregnation characteristics, low viscosity and good surface tension.

IMPORTANT: This technical cooperation request refers to an innovation challenge published within the AMULET project (financed within the Horizon 2020 INNOSUP-01-2018-2020 call). If an organization (eligible are SMEs only) expresses interest before the closing date, it will be guided towards the AMULET project website (https://amulet-h2020.eu/), where all additional information and guidelines for submission are published. With the support of AMULET matchmaking activities or on their own, interested SMEs have to form micro-consortia of 2 or 3 SMEs, to prepare the solution to the specific innovation challenge and submit it through the AMULET application form.

Advantages and innovations

Stage of development

Concept stage

Sustainable Development goals

- **Goal 9: Industry, Innovation and Infrastructure**

IPR Status

No IPR applied

Partner Sought

Expected role of the partner

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Type of partnership

Type and size of the partner

Research and development cooperation agreement

- **SME 11-49**
- **SME <=10**
- **SME 50 - 249**

Dissemination

Technology keywords

- **02007015 - Properties of Materials, Corrosion/Degradation**
- **02007010 - Metals and Alloys**

Market keywords

- **08001012 - Speciality metals (including processes for working with metals)**
- **08001023 - Other chemicals and materials (not elsewhere classified)**
- **08001020 - Electronic chemicals**

Targeted countries

- **World**

Sector groups involved

- **Materials**