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Technology Request - Profile Template

Title	German industrial developer start-up of recyclable and reusable plastic packaging seeks machine builder to develop and build production unit together.
Reference	TRDE20220217020
Summary	A German start-up developed a novel plasma barrier coating for mono-material plastics, which can provide the same functional properties as a multi-material approach in terms of barrier and chemical resistance, but it is less expensive and fully recyclable. To be able to take the next step towards further industrialization of their pilot machine, the company is looking for a technical cooperation agreement with a cooperation partner for joint development.
Stage of Development	☒ Concept Stage ☒ Under development / lab tested
Description	A German start-up, emerging from the Institute of Plastic Processing (IKV) at the RWTH Aachen University that has been renowned in the world of plastics research already for decades, has in recent years been working on the development of a plasma coating technology that has the potential to replace multi-material plastic packaging, making it fully recyclable. The developed plasma technology is suitable for most common plastics already used in the packaging industry like polyethylene (both low- as well as high density, LD-PE, and HD-PE), polyethylene terephthalate (PET), polypropylene (PP), polyamide (PA), and post-consumer resins (PCR). When applied, the plasma technology creates a super-thin, glass-like layer that is chemically bonded to the treated packaging material. This super-thin coating that is chemically resistant gives the packaging material similar properties that are now achieved by multi-layer structures using barrier materials. In recent years, stringent requirements have been imposed on plastic packaging, particularly in the food, pharmaceutical, and chemical industries. The packaging must be permeation tight. Further, it must be ensured that the packaged liquids do not evaporate or diffuse out of the packaging over time. To guarantee this kind of properties of plastic packaging, different kinds of barrier materials and multilayer

	structures have been developed. As a result, plastic packaging materials cannot be recycled because different layers made from different materials are very hard to be separated from each other. In-depth research by the Institute of Plastic Processing (IKV) in Aachen has shown that their newly developed plasma technology offers at least the same, and in many cases even better protection against the challenges mentioned above (corrosion, permeation, contamination). The company´s developed technology consists of a new structure of a silicon oxide (SiOx)-coating and patented process to transfer the coating to any type of container, a development process to quickly adapt the coating to new shapes and forms, and a reactor concept which enables coating both from in- and outside. The developed coating distinguishes itself by: − Chemically resistant and stable coating − Coating with high barrier properties similar/better performing than currently used multilayer barrier materials − Fully recyclable − Cost competitive to multi-material − Due to chemical resistance of the coating, packaging can be easily cleaned and therefore reused − The coating is chemically bonded to the surface and hence does not suffer from mechanical stress applied to the container After having developed and tested the novel plasma reactor concept the company is now ready to further industrialize its technology by the technical implementation of an industrial prototype. To do so they are looking for a technical cooperation agreement with a key partner in machine building with the below-mentioned specific expertise.
Technical Specification or Expertise Sought	The developed plasma-reactor will be the heart of the new machine and has to be integrated into a newly to be developed production unit. The partner sought should be specifically experienced in the field of high volume handling and processing of plastic packaging such as containers, drums and bottles in mass production environments. The partner will be responsible for the handling of a wide range of packaging products (supply and removal) and of placing them in the reactor. Therefor key competences should be the design and manufacturing of automation & handling systems and the integration of such machines in existing production lines. Additional expertise in the field of vacuum and/or microwave technology and blow and/or injection moulding is not required but considered as a plus.

IPR Status	☒ Patent(s) applied for but not yet granted ☒ Secret Know-how
Responsible	Rim H.M. Stroeks (ZENIT GmbH) rs@zenit.de
Restrict Dissemination to specific countries	Germany, the Netherlands, Belgium, France, Switzerland, Austria.
Type and Size of Client	☒ Industry SME <= 10
Year Established	2021
Turnover (Euros – Millions)	☒ <1M
Languages Spoken	English, German
Client Country	Germany
Type and Role of Partner Sought	To further industrialize the developed plasma reactor concept into a production machine setup, the German company is looking for a key partner with machine-building and automation competencies. The partner sought will be responsible for the development, testing, and production of a handling system for the coating machine in close cooperation with the German startup. The partner sought may also be a potential partner in the sale of future machines and units. In order to do so the German company is looking for a technical cooperation agreement with the partner as mentioned above.
Profile is Opened for Expressions of Interest?	☒ Yes ☐ No

Type and Size of Partner Sought	☐ SME < 10 ☒ SME 11-50 ☒ SME 51 – 250 ☒ 251-500 ☒ >500 ☐ MNE >500 ☐ Inventor ☐ R&D institution ☐ University
Type of Partnership Considered	☒ Technical cooperation agreement
Attachments