

Profile View

Details

Title:	Innovative enhanced dry fabrics and prepregs for fibre reinforced polymer composite materials
POD Reference:	TOCY20210329002
Summary:	<p>A Cypriot SME offers an innovative process to address the problem of strength-weight ratio in material applications. The company is looking for composite material component manufacturers and manufacturers of pre-impregnated textiles (prepregs) for the polymer composites industry that currently uses or needs enhanced dry fabrics and/or prepregs for high performing fibre reinforced polymer (FRP) composite components. Collaboration via commercial agreements with technical assistance are envisioned.</p>
Description:	<p>The Cypriot company was founded in 2013 by two experienced mechanical engineers and a senior economist aiming to create an innovative company in the field of advanced polymer composite materials that will put Cyprus on the world map of innovative composite materials.</p> <p>The company focuses on the design and manufacturing of advanced composite materials, by identifying the problems and needs of customers in a variety of industries such as aviation, defence, sports, automotive, shipping etc. and by providing them with a variety of material services and product solutions in the field of materials. The company has access, either within its premises or through external partners, to a variety of specialized technical equipment and processes, which enables it to deliver both intermediate materials and end-products.</p> <p>The company's innovative proprietary technological process can improve textiles such as carbon, glass, aramid, hybrid, and other fabrics.</p> <p>The innovative process is based on "scaled nanotechnology" and inspired by structures found in nature and consists of 3 phases:</p> <ol style="list-style-type: none">1) Nanomaterial creation2) Nanomaterial insertion to fabrics3) Nanomaterial Consolidation with fabrics <p>The resulting fabric product in a multilayer FRP structure presents the following properties compared to conventional fibre reinforced polymer (FRPs):</p> <ul style="list-style-type: none">• up to 300% stronger in terms of Mode II fracture toughness,

- up to 70% stronger in terms of Mode I fracture toughness,
- up to 20% in terms of tensile strength and
- up to 80% in terms of impact and compression after impact

The company can provide its innovative product for testing in the following manner:

1. Signature of Non-Disclosure Agreement
2. Definition of application of innovative material technology
3. Receive technical fabric (carbon, aramid, glass, etc.) from the manufacturer (either directly from supplier or from inventory).
4. Processing of technical fabric through the innovative process and preparation in complete package.
5. Send enhanced technical fabric back to the manufacturer for testing in specific composite part application.
6. Upon evaluation of the material and implementation, feedback is sent to the company together with or not expressed interest for collaboration.

The company is looking for industry partners in the business of composite material component manufacturing and manufacturing of pre-impregnated textiles (prepregs) for the polymer composites industry.

These manufacturers could be producing composite material components and/or prepregs for the following sectors:

Telecommunications, Transportation, Automotive, Space, Aviation, Defence.

Collaboration is envisaged by means of commercial agreements with technical assistance.

Advantages and Innovations:

Technology achievements: The product has been applied to certain carbon fabrics in carbon fibre reinforced polymer (CFRPs) composites and has been tested with qualified industrial procedures.

Compared with conventional CFRPs, it is:

- <300% stronger in terms of Mode II fracture toughness,
- <70% stronger in terms of Mode I fracture toughness,
- <20% in terms of tensile strength and
- <80% in terms of impact and compression after impact.

Current state-of-the-art solutions improve CFRP composites performance, but most of the existing solutions focus on the improvement of 1 or 2 mechanical properties only. The company's technology is a solution adjustable to any textile (carbon, glass, aramid, etc.) and offers a multi-dimensional improvement of the FRP material.

Business Model:

High performing materials are needed in several applications has led the company to develop a wide range of different nano-enhanced combinations to address the many different needs of several customers. Thus, the company offers:

- 1) enhanced dry fabrics (carbon, glass or aramid) to either prepreg manufacturers or composite component manufacturers for high performing applications, mainly from a mechanical point of view (sales).
- 2) enhanced prepreg systems (carbon, glass or aramid) to composite component manufacturers for high performing applications, mainly from a mechanical point of view (sales).

Base material can be sent to the company, get enhanced and sent back to the customer.

Cost:

The technology results in a product, which is significantly less expensive than normal CFRPs since up to 15% material savings can be achieved to acquire similar level of strength in structures. In general, the further processing of dry fabric is in the range of 15-20 EUR/sqm and the impregnation processing in the range of 12-18 EUR/sqm.

Environmental aspects:

Due to the reduced weight, significant fuel consumption reduction and lower CO2 emissions are achieved, in transport applications

Stage of Development:

Available for demonstration

**Comments
Regarding Stage
of Development:**

The innovative material technology is currently manufactured in house with industrial scale machines and demonstrated in industrial methods of composite materials manufacturing.

Upon industrial manufacturing of the technology and enhancement of carbon textiles, the enhanced carbon textiles have been tested in a certified industrial laboratory through a comparison with standard CFRP specimens. Noteworthy, the industrial laboratory is using same standards as the ones used at AIRBUS for multilayer CFRPs.

The technology has also been demonstrated through structural applications.

Technology Readiness Level (TRL): Considering the industrial demonstration and the qualification of the product through extensive testing, the technology product is currently at a TRL 8 (EU scale: 0 to 9). Increased capacity of the production line will help achieving TRL 9.

IPR status::

Granted patent or patent application essential
Patent(s) applied for but not yet granted
Secret Know-how
Trade Marks

**Comments
Regarding IPR
Status:**

- IP protection:
- Patent application (November 2016)
- Current status: Patent Granted (In some States) / Pending (In some States)
- Trademark Registration: Classes 22 & 24 / Europe & USA

Profile Origin:

National or Regional R&D programme

Keywords

Technology 02002016 Microengineering and nanoengineering

Keywords: 02007005 Composite materials
02007018 Advanced Textile Materials
02007019 Lightweight materials
03005007 Textile fibres

Market Keywords: 08001004 Fibre-reinforced (plastic) composites
08001005 Other fabricated plastics
08001018 Polymer (plastics) materials
09003001 Engineering services
09004003 Textiles (synthetic and natural)

NACE Keywords: C.13.1.0 Preparation and spinning of textile fibres
C.13.2.0 Weaving of textiles
C.13.3.0 Finishing of textiles

Partner Sought

Type and Role of Partner Sought:	<p>The company is looking for industry partners of any size in the business of composite material component manufacturing as well as manufacturing of pre-impregnated textiles (prepregs) for the polymer composites industry.</p> <p>These manufacturers could be producing composite material components and/or prepregs for the following sectors: Telecommunications, Transportation, Automotive, Space, Aviation, Defence.</p> <p>Collaboration with such industrial partners via commercial agreements with technical assistance will lead to the development of highly performing prepreg systems, which will further result in FRP components with multifunctional and improved properties.</p>
Type and Size of Partner Sought:	<p>>500</p> <p>>500 MNE</p> <p>251-500</p> <p>R&D Institution</p> <p>SME <10</p> <p>SME 11-50</p> <p>SME 51-250</p>
Type of Partnership Considered:	<p>Commercial agreement with technical assistance</p> <p>Joint venture agreement</p> <p>Manufacturing agreement</p>

Client

Type and Size of Client:	Industry SME 11-49
Year Established:	2013
Already Engaged in Trans-National Cooperation:	Yes
Languages Spoken:	English
	Greek
Client Country:	Cyprus

Dissemination

Relevant Sector Aeronautics, Space and Dual-Use Technologies
Groups: Materials
Nano- and Microtechnologies

