Large composite propeller blades for both navy and commercial vessels.

Summary

A leading Dutch composites design and manufacturing company developed a manufacturing technology for composite blades for ship propulsion. Specialized computer software was developed to investigate and optimize the blades for hydrodynamic performance in combination with structural performance. A prototype of the propeller is currently being tested. The Dutch company is interested in technical co-operation to further develop the technology and commercial agreements with technical assistance.

Creation Date	05 June 2014
Last Update	02 July 2014
Expiration Date	02 July 2015
Reference	11 NL 60AH 3N7M

Details

Description

Ship propeller propulsion design involves a number of competing variables, including blade surface area, the rake and pitch of the blades in relation to the propeller centerline, the risk of cavitation and the overall diameter. All of these factors affect a vessels top speed, fuel efficiency and handling. The developed concept consists of a full composite blade attached to a bronze foot which is mounted on a bronze hub. Finite element analysis was performed to determine the stresses in the blade foot and the blades under operational load conditions. A modal analysis for vibration response also was conducted. Because the composite blades tended to deform under loads more than metal blades, the deformed geometry was used in the analysis of the propeller’s hydrodynamic performance. This analysis was done in co-operation with a Dutch institute specialized in maritime research. An important outcome of this analysis was that the blade tips change pitch as they bend under dynamic loads. This condition could delay the onset of cavitation and lead to quieter operation. In addition the pitch change also has the potential to increase ship fuel efficiency which could lead to substantial cost savings in large oceangoing vessels. Based on the models and initial lab tests a blade structural design was selected that comprises a glass fiber/epoxy core and carbon fiber/epoxy skins, with dry fabrics that account for the stresses at the root. The core and fabrics were assembled in a proprietary layup and with a epoxy resin as matrix. A polyurethane coating, applied to the demolded blades, provides impact protection and reduces algae growth. Current and Potential Domain of Application:

Advantages and Innovations

Diameter propeller 2,5m/1,4 MW, with full composite blades Blade flexure under load provides (potentially controlled) a hydro-elastic characteristic that is expected to improve cavitation performance and enhance fuel efficiency. Combination of carbon, glass, and epoxy resin produces a

strong replacement for nickel/ aluminum/ bronze metal, the current propeller standard. Specific reinforcing techniques strengthen the highly stressed region at the highly loaded propeller blade root area.

Stage of Development

Field tested/evaluated

IPR Status

Secret Know-how

Profile Origin

National R&D programme

Keywords

Technology

002006005	Mechanical Engineering, Hydraulics, Vibration and Acoustic Engineering related to construction technology
002007005	Composite materials
002009	Transport and Shipping Technologies
002009005	Shipbuilding

Market

008003	Industrial Equipment and Machinery
008003006	Power transmission equipment (including generators and motors)
009001005	Motor vehicles, transportation equipment and parts
009001007	Other transportation

NACE

C.28.9.9	Manufacture of other special-purpose machinery n.e.c.

Dissemination

Send to Sector Group

Maritime Industry and Services

Client

Type and Size of Organisation Behind the Profile

Industry SME 50-249

Year Established

1995

Turnover

1 - 10M

Already Engaged in Trans-National Cooperation

Yes

Langages Spoken

English
German
French
Spanish

Client Country

Netherlands

Partner Sought

Type and Role of Partner Sought

- Type of partner sought: industry, defence - Specific area of activity of the partner: ship building, maintenance, repair and overhaul commercial and navy ships - Task to be performed by the partner sought: further development and implementation of the proposed technology; in case of a commercial agreement the Dutch partner will provide technical consultancy.

Type of Partnership Considered

Commercial agreement with technical assistance
Technical cooperation agreement

Photoactive molecules for decontamination and disinfection

Summary

A South West France laboratory has developed new photoactive molecules which are able to decontaminate and disinfect. This technology is efficient even at low concentration. Moreover, the photoactive molecules are stable and can be grafted onto several kind of materials as textile and paper fibers, glass. The laboratory is seeking industrial partners for licensing agreements.

Creation Date	05 June 2014
Last Update	30 June 2014
Expiration Date	30 June 2015
Reference	TOFR20140528002

Details

Description

Titanium oxyde is used for confering decontamination and disinfection properties to materials but the drawback of this technique is that it requires UV irradiation. The offered technology is based on a photoactive molecule able, in the presence of UV or visible, natural or artificial light, to transform the oxygen (or water) into reactive oxygen. This one can then selectively oxidize organic pollutants by oxidation or destroy certain microorganisms. Furthermore, the original molecule operates according to the following scheme: oIt is activated by wavelengths from 400 to 450 nm with a absorption peak at 420 nm oIn the presence of oxygen, it generates a reactive form: the singulett oxygen. It can degrade pollutants, particularly sulfur derivatives (Sulfides, disulfides) or microorganisms (Bactericidal activity was validated on Escheridia Coli in aqueous solution by a laboratory specialized in this type of analysis). The technology is interesting for air and water treatment, deodorization and disinfection applications. The laboratory is looking for partners as manufacturers of glass, cements, paper, textile, or air purifiers for granting a license and developping products from this technology.

Advantages and Innovations

The molecule has several competitive advantages over commercial products but also complementarities with TiO2 (Titanium oxyde) : oNo photo-aging observed: the molecule remains functional beyond 5 cycles oStable in many solvents and up to 150 ° C oThe oxidized products stay on the matrix surface oEasy cleaning and regeneration by a simple washing oPossibility of deposition on silica monoliths by keeping an activity at depth of several centimeters oActivity to very low concentrations oExcellent absorption properties of the light and high efficiency This molecule which is neither soluble nor volatile, has the advantage of being graftable onto various types of rigid or flexible supports such as clay, polymers, textile fibers, glass. By grafting the molecules on the TiO2 nanoparticles, the advantages are complementary with the photocatalytic properties of the nanoparticles.

Stage of Development

Under development/lab tested

IPR Status

Patents granted

Comment Regarding IPR status

The technology is protected by a patent registered in France since 2010 and extension to other countries would be possible if needed.

Profile Origin

Other

Keywords

Technology

002002002	Coatings
002007018	Advanced Textile Materials
002007024	Paper technology
003004005	Man made fibres

Market

008001007	Coatings and adhesives manufactures
008001019	Speciality/performance chemicals
008004001	Air filters and air purification and monitoring equipment
009004003	Textiles (synthetic and natural)

NACE

M.72.1.9	Other research and experimental development on natural sciences and engineering

Dissemination

Send to Sector Group

Materials

Client

Type and Size of Organisation Behind the Profile

University

Year Established

0

Already Engaged in Trans-National Cooperation

No.

Langages Spoken

English
French

Client Country

France

Partner Sought

Type and Role of Partner Sought

The laboratory is looking for industrial partners in the field of glass, cements, paper, textile, or air purifier for licensing. The partner would have to acquire the technology and the know-how, to test the molecules on their materials, to run decontamination/disinfection test.

Type and Size of Partner Sought

>500

Type of Partnership Considered

License agreement
Manufacturing agreement
Technical cooperation agreement

Spin casting - advanced method of plastics components production

Summary

A Slovak institute has developed a new spin casting method. This method is a modern, fast, low-cost alternative to injection moulding or pressure moulding and represents a fully proven tool for manufacturing prototype and/or functional components. The casting materials are quick-setting liquid thermosets, which readily fill the silicone rubber moulds at room temperature. The producer offers supply, expertise and advisory services and is seeking joint venture or licensing agreements.

Creation Date	15 November 2013
Last Update	30 June 2014
Expiration Date	30 June 2015
Reference	04 SK SKBB 0AY8

Details

Description

A Slovak institute has developed a new spin casting method that is a fully proven tool for manufacturing prototype and/or functional components. The casting materials are the quick-setting liquid thermosets, which readily fill the silicone rubber moulds at room temperature. Many of them closely match the properties and characteristics of typical injection moulded thermoplastics. They included polyesters, epoxies, and mainly polyurethane. The available equipment allows producing parts of the maximum dimensions 250 x 190 x 85 mm. Current and Potential Domain of Application: It is possible to apply it in mechanical and automotive industry.

Advantages and Innovations

With silicone rubber mould material, a mould can be made and prototypes or development parts cast in as little time as a day. Design changes in size, function, fit, or appearance are quickly reproduced without making or wasting a large tooling or machine-time investment.

Stage of Development

Under development/lab tested

IPR Status

Secret Know-how

Comment Regarding IPR status

Current Stage of Development: Development phase - Laboratory tested Intellectual Property Rights: Secret know-how Exploitation of RTD Results: PRIVATE RESEARCH

Profile Origin

Private (in-house) research

Keywords

Technology

002001	Design and Modelling / Prototypes
002002010	Machining (turning, drilling, moulding, milling, planning, cutting)

Market

008003007	Other industrial equipment and machinery
009004008	Other manufacturing (not elsewhere classified)

NACE

C.25.5.0	Forging, pressing, stamping and roll-forming of metal; powder metallurgy
C.28.4.1	Manufacture of metal forming machinery
C.28.4.9	Manufacture of other machine tools
M.74.9.0	Other professional, scientific and technical activities n.e.c.

Client

Type and Size of Organisation Behind the Profile

R&D Institution

Year Established

0

Already Engaged in Trans-National Cooperation

No.

Langages Spoken

English
Slovak

Client Country

Slovakia

Partner Sought

Type and Role of Partner Sought

Type - Industry. Activity - Mechanical/Automotive. Role - Licensing of the technology, or entering a joint venture agreement, with the profile author providing supply, expertise and advisory services at the customer's application site.

Type of Partnership Considered

License agreement
Joint venture agreement