HELM Newsletter

ISSUE II

JULY 2013

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Editorial

Dear readers,

thank you for your interest in the HELM project and the second issue of this periodic newsletter.

In this 2nd issue you can read about:

The most recent achievements of HELM research. The first public deliverables have been released and can be downloaded from the HELM website:

www.helm-project.eu

HELM participation at the event EuroNanoForum 2013, this is Europe's largest nanotechnology event supported by the EC Directorate for Research and Innovation. Warrant Group has attended the event presenting the HELM project.

Three inside stories regarding HELM industrial applications. You can know more about what partners do in HELM and how they can contribute to the exploitation of results.

I hope you enjoy reading this newsletter and we would appreciate your feedback.

Andrea Lazzeri
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Most recent results of HELM

The HELM project is progressing according to the planned schedule.

A number of results have been already achieved from the Consortium. The design and assembly of innovative MW and RF furnaces for CVI, LSI, PIP and GE is going on rapidly: "Initial tests of the CVI reactor should start on July" said Mr Prentice of Archer Technicoat Limited (UK).

In the meantime some preliminary but promising outcomes have been obtained on silicon infiltrated MW pyrolyzed performs for automotive CMC brake disks.

The first public deliverables of the project have been released and can be downloaded from the HELM website. These report an overview of the state of the art on electromagnetic high frequency technologies for the above mentioned processes.

SPECIAL POINTS OF INTEREST:

- **HELM at EuroNanoForum 2013:**

- **HELM press kit** has been published in June. This is the full set project information for press and wide public. You can download it from HELM website.

- **Facebook page**: HELM has now 70 followers. Join us!

HELM

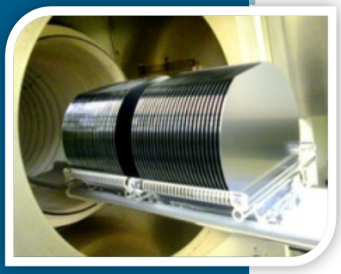
Grant Agreement No.: 280464
Programme acronym: FP7-NMP
Topic: *NMP.2011.4.01 New technologies based on physical processing of materials for mechanical or electrotechnical applications*
Start date: June, 1st 2012
End date: May, 31st 2016
EU contribution: 7,151,000 €
Total cost: 10,285,626 €

Aerospace

Aerospace applications are one of the major market segments of carbon matrix composites (C/SiC and SiC/SiC) to be developed in HELM.
C/SiC composites meet requirements for long term use in oxidizing atmospheres: aircraft engines, thermal protection systems, and structural components.
SiC/SiC composites offer better lifetime properties and resistance to high temperatures. They are particularly valuable for the hottest parts of aircraft engines: combustion chambers, turbine rings, afterburner distributors and systems.
EADS (Airbus) is seeking for technologies to manufacture CMC materials with better performance at lower cost. MW assisted CVI and pyrolysis can provide with improved microstructural features, reduce cycle-time of 90% and lead to processing energy saving of 25%.

EADS *is a global leader in aerospace, defense and related services. The Group includes divisions such as the aircraft manufacturer Airbus, the helicopter supplier Eurocopter, EADS Astrium or Defence & Security. EADS develops and manufactures oxide & non-oxide thermo-structural composites for aerospace application areas such as propulsion systems, thrusters, nozzle extensions, gas turbines, thermal protection systems, missiles or friction materials.*

Refractory materials



The production of CMC at Schunk involves a cascade of processes like: pyrolisis, silicon infiltration (LSI), CVI and CVD techniques as well as other heat treatments for graphitization.
In particular, the manufacturing of high quality and purity refractory components (heaters, thermal insulations, heat shields, crucibles and tooling) for polysilicon production requires faster and more cost effective CVI/CVD methods.
MW/RF assisted PIP and high temperature treatments have also tremendous influence on the microstructure of composites and monolithic materials impregnated with preceramic prepolymers like polyca bosilanes for example.
It is expected that, MW-CVI and RF-PIP heating technology developed in HELM will be able to reduce manufacturing time by one order of magnitude, reduce energy consumption and save 25% of final production costs.

The ***Schunk Group*** *is a global player in the field of carbon, graphite, ceramics and composite materials. The company is particularly engaged in the development, manufacturing and marketing of carbon graphite and silicon carbide based specialties for different applications in the chemical, electrical and semiconductor industry.*

Antiballistic components

Personal ballistic body armor, particularly vests, helmets, and other antiballistic articles, are formed generally of antiballistic materials which serve to prevent penetration of a bullet.
In order to prevent penetration of the bullet at a reasonable weight, in the 1970's manufacturers began to make ballistic armor from aluminum oxide that is one third the weight of steel for the same antiballistic effect.
More recently a new generation of ceramics, Silicon Carbide (SiC), has been developed that is lighter than alumina and has significantly better multi-hit capabilities. However, SiC is still about 10 times more expensive than alumina thus reducing the production cost is a crucial aspect.
The MW-LSI approach proposed in HELM should bring about 15% processing time saving, about 50% energy cut and a strong cost reduction.
If this project will be successful, Petroceramics would be able to produce SiC breastplates more cheaply than any other manufacturer in the world.

Petroceramics *is an Italian SME founded from University of Milano in cooperation with industrial companies, such as Brembo SpA. The company has acquired a key position in the R&D of novel ceramic materials, trying to reconcile the rigorous and systematic approach of basic science to pragmatic solutions of engineering problems.*

Euronanofum 2013 - Dublin, Ireland

http://www.enf2013.eu/

June, 18-20th, 2013 Dublin-Ireland

The sixth and largest ever EuroNanoForum conference has taken place on June.
Approximately 1,500 delegates from 50 countries have gathered in Dublin Convention Centre for the conference focused on the impact of nanotechnology in solving societal problems related with health, energy and environment.
The conference, organised by Enterprise Ireland and Spinverse Ltd and supported by the EC-DG Research and Innovation, brings on stage more than 100 speakers and 300 poster presentations.

Warrant Group has attended the event to present the HELM project. A short talk has been held by Mr Massimo Rinaldi, EU funding division of Warrant. The HELM poster was also selected for presentation.
HELM flyers and gadgets have been distributed among the participants who have given very positive feedbacks.

TC, ExC, SC, IAB Meetings - Peine, Germany

June, 19-20 2013 Peine, Germany

The 1st year review meeting of HELM has been held in Peine (Germany) at Fricke und Mallah Microwave Technology GmbH (FM).
FM was founded in 1995 by Dirk-H. Fricke and Marcel Mallah and is one of the leading German suppliers of microwave ovens for industry and research.
The technical review meeting has been attended by the Project Technical Advisor, Dr. Peter Nagy who gave prompt useful feedbacks to the consortium.

Peine general assembly was an opportunity to present to the consortium the members of the Industrial Advisory Board of HELM. They have been selected among the most outstading exponents in the field of electromagnetic heating technologies and carbon ceramic composites.
You will find more on IAB members on the HELM website.

TC Meeting - Barcelona, Spain

March, 18-19 2013 Barcelona, Spain

The 4th HELM technical meeting has been held in Barcelona (Spain) at Sairem Ibérica S.L. headquarters.
Sairem Ibérica S.L. is a Spanish company, subsidiary of Sairem SA (France), specialised in design and manufacturing of MW and RF equipments.
HELM partners had a chance to visit the company structure and laboratories.

The technical discussion was focused on furnace design and simulation activities which are carried out by various partners. The development of all reactors is in progress.
Encouraging results have been shown by TECNALIA (ES) in collaboration with BSCCB (IT) and PETROCERAMICS (IT). Silicon infiltration tests on MW pyrolyzed performs gave comparable mechanical properties of conventional PIP together with huge reduction of processing cycle time up to 90%.

Past Events

Future meetings

December 2013

5th TC meeting

Universidad de Alicante - Alicante, Spain

June, 2014

ExC, SC and TC Meetings

Baltic State Technical University "VOENMEKH" - Saint Petersburg, Russia

Upcoming conferences and events

July, 14-19, 2013
Carbon 2013
Rio de Janeiro-Brazil

July, 28-August, 02, 2013
ICCM19
Montreal-Canada

September, 1-6, 2013
Euro CVD
Varna-Bulgaria

September, 8-13, 2013
Euromat 2013
Sevilla-Spain

September, 22-26, 2013
HT_CMC08
Xi'an-China

Sept, 29 -October, 4, 2013
ICSCRM2013
Miyazaki-Japan

October, 6-8, 2013
Manufuture
Vilnius-Lituania

October 29-31, 2013
4th Int. Carbon Composites Conference
Arcachon, France

March 11-13th 2014
JEC Europe
Paris, France

March19-20 2014
Microwave & RF 2014
CNIT, Paris La Défense, FR

October 28-30th 2014
JEC Americas
Boston, US

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HELM Website

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HELM on Social Media

http://www.facebook.com/pages/HELM/441410005901081

If you would like to contribute an article or have any events that you would like us to include in the newsletter contact us at info.helmfp7@gmail.com.

If you would like to be added to the mailing list or no longer wish to receive the newsletter please email us at info.helmfp7@gmail.com.