



SNAME NTUA

February 20, 2014

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UPCOMING EVENTS

• 20 March,
Technical Meeting
19.00, Auditorium
Maran Tankers, 354
Syngrou Ave.,
Kallithea

*"The Financials of
LNG"*

Speaker:
Dr. Panagiotis
Zacharioudakis

NEWSLETTER STAFF

Michael Foteinos,
Section Chair

Konstantina Stamou
Section Vice-chair

Ilias Soultanias,
Section Secretary
Treasurer

Massive attendance of Students at Mr Zachariadis Lecture in NTUA Campus

by Michael Foteinos and
Konstantina Stamou

On Wednesday, February 12, 2014 SNAME NTUA conducted its first technical meeting for 2014 in which, Mr Panos Zachariadis, Technical Director of Atlantic Bulk Carriers Management Ltd., gave a lecture on Ship Regulations, Shipbuilding and the role of IMO. It was the most successful meeting ever organized in NTUA and was attended by more than 60 students including freshmen, seniors and young professionals.

All the attendants had a great opportunity to learn about important industry matters. For instance, freshmen, learnt what IMO is, how it works and how it establishes regulations, while seniors and young professionals came in touch



Mr Panos Zachariadis during his presentation.



The audience in the Multimedia Auditorium of the NTUA Library.

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SNAME NTUA Recruitment Meeting

by Michael Foteinos and Konstantina Stamou

On January, 16 SNAME NTUA held its Recruitment Meeting, the first meeting for the academic period 2013-2014 in NTUA Campus.



Ship Regulations and Shipbuilding

The truth is not always comforting



Atlantic Bulk Carriers Management Ltd.

REGULATIONS FOR SHIPS:

OPERATIONAL & STRUCTURAL (Construction)

IMO
Mostly operational
but some **IMPORTANT**
Structural

CLASS (IACS)
Mostly **structural** in detail for shipbuilding.
(Longitudinal Strength, FEA, Buckling, deflections, etc. or lack of the above)

FLAG
Mostly Operational

Atlantic Bulk Carriers Management Ltd.



SNAME Snapshots (Top left) The title of the presentation “Ship Regulations and Shipbuilding, the truth is not always comforting. (Top right) A Snapshot from the presentation (Bottom Left & Bottom Right) The audience in the Multimedia Auditorium of the NTUA Library.

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with more technical and industry oriented matters.

During his lecture Mr Zachariadis also talked about the conflicting interests that usually exist when a regulation is discussed between countries. For example Greece, a country with many shipowners promotes regulations that would lead to stronger and better quality ships with minimum maintenance and operational costs. On the other hand, shipbuilding countries such as Japan, Korea or China promote regulations that minimize shipbuilding cost so as to make their product more attractive to the market.

In the last part of the presentation Mr Zachariadis showed some pictures

from his experience in Shipyards about common mistakes in Shipbuilding. He pointed out some important issues that a Naval Architect should observe in time and he also pointed the role of the Classification Societies in Shipyards.

When the presentation was over, students asked many questions about regulations and other industry matters.

A few words about Mr Zachariadis

Mr Panos Zachariadis is Technical Director of Atlantic Bulk Carriers Management Ltd, a major greek shipping company. He is a member of the Greek Delegation in IMO and he has been awarded the 2011 Efkranti shipping personality award for promoting Greek Shipping internationally. In addition, he has

been assisting the Union of Greek Shipowners and the Hellenic Chamber of Shipping to enhance the safety of Ships by trying to improve new regulations which are formulated at IMO. He was also extensively involved in the Greek study which reversed the IMO decision to make double hull bulk carriers mandatory and was instrumental in developing the new IMO coating standard for all ship's ballast tanks.

We would like to thank Mr Zachariadis for the great lecture he gave and the students that attended the meeting. We finally hope to a future visit from him in NTUA Campus.

SNAME NTUA Recruitment Meeting 2014

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The meeting attended almost forty NTUA students, the majority of them were freshmen, from the School of Naval Architecture and Marine Engineering.

In the beginning of this meeting, Mr. Petros Lalangas, SNAME Fellow, Manager of the European Regional Office, Secretary-Treasurer and past Chair of the Greek Section, gave a presentation in which he informed the attendees about the role of SNAME, its history and activities focusing on the Student Member benefits. Some of the benefits he mentioned are the discount to SNAME Publications, access in a huge technical database, T&R Committees, participation in events and meetings as well as networking opportunities.

Afterwards, the Chair of the SNAME NTUA Student Section, Michalis Foteinos, gave a brief presentation on the activities of the Student Section, its future plans, such as meetings, educational visits and trips,



as well as the benefits of a Student Membership, and active involvement in SNAME described by his personal view.

After the presentation, attendees were treated snacks and beverages and had the opportunity to meet and chat.



Participate in the Offshore Technology Conference via the “Mentor for a Day Program”

The OTC is the biggest and the most important conference about Offshore structures in the world, organized by SNAME. This year, OTC will be held in Houston Texas from 5-8 May, 2014.

Students from the Greek Student Section have the opportunity to participate in this huge conference

via the “Mentor for a Day Program”. In this program, students are paired with experienced industry professionals from the Texas Section who guide them around OTC, explaining different aspects of the industry and introducing key individuals and companies.

The program was launched in 2010 upon Peter Noble’s initiative (SNAME current President), with the goal of introduc-



ing students to opportunities in the offshore industry.

If you have a direct academic or professional relationship with the Offshore industry and you are interested in applying contact us by email in snamen-tua@gmail.com.

Funds will be available only for SNAME students.

SNAME Student Work: Direct Laser Metal Deposition of Titanium Matrix Composites and Analysis of Microstructure and Mechanical Properties

by Yvonne-Effrosyni Damianidou

The extremely rapid technological developments and the constant need for new innovative solutions to complex problems, has reinforced the interest among the scientific society to better understand the use of composite materials in various applications and via various processes.

Metal Matrix Composites (MMCs) are widely used in today's most challenging industries such as biomedical engineering, the aircraft industry and the aerospace industry due to their advanced properties in comparison to the 'natural' materials. A MMC can be defined as a material in which a continuous metallic phase (the matrix) is combined with another phase (the reinforcement) to strengthen the metal and increase high-temperature stability. Thus, MMCs have attracted a lot of attention over the last years. In particular, Titanium Matrix Composites (TMCs) are very often used as they present numerous advantages such as: high specific strength, elevated temperature resistance, low density, high elastic modulus and good corrosion resistance. Because of their high price

though, it is very significant that new ways of processing them should be found to eliminate to the maximum the waste of the material that can occur during the process.

Rapid prototyping techniques and in particular Direct Laser Metal Deposition [DLMD], present this opportunity. Although the waste during the process is not negligible, the ability to recycle and reuse the material minimizes the overall waste at significant amounts. During [DLMD], by acquiring data from a CAD file of a component, powder is fed at a controlled rate into the focal point of the laser while they are both deposited simultaneously. Particles are melted and with the movement of the laser defined by the CAD file, a new layer is produced. This process presents various advantages such as the ability to form small quantities of functional prototypes, and to construct complex geometries.

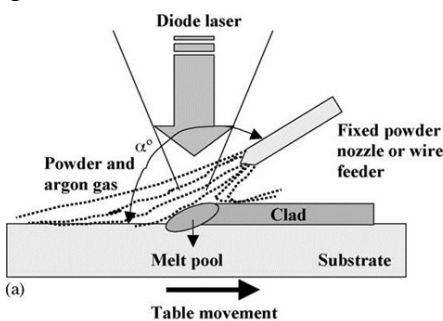


Figure 1 Schematic diagram for wire/powder feeding-rear feeding

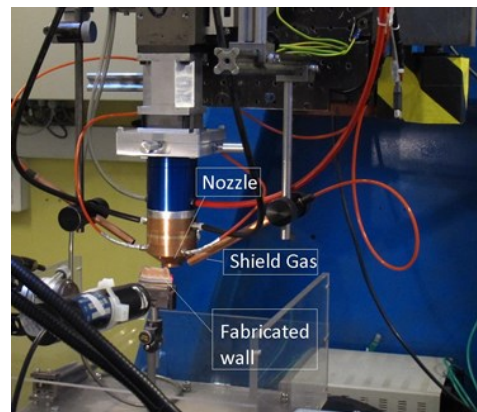


Figure 2 PIMM's DLMD facility

The aim of this current project is to investigate and advance the research concerning the relationship and the connection between the laser parameters and their effects on the microstructure obtained as well as on the mechanical properties of the manufactured samples. The study focuses on Ti-TiC composites after being processed by Direct Laser Metal Deposition. TiC-Ti6Al4V powder was

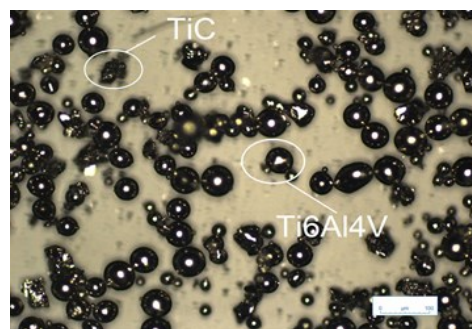


Figure 3 Power composition after mixing process

About the Author...



Yvonne-Effrosyni Damianidou holds the degree of Naval Architecture and Marine Engineering from the National Technical University of Athens since June 2013. During her studies, she had kept busy completing part of her thesis at École Nationale Supérieure d'Arts et Métiers (member of ParisTech), volunteering to teach English through the Global Volunteer Network Program in Peru and following a summer course with BEST (Board of European Students of Technology) at Ghent University (Belgium) Faculty of Engineering. She has also completed several internships including at United Nations High Commissioner for Refugees in Geneva, Switzerland, an internship at Fivos Zoukis Marine Technical Bureau & Consultants where she participated in ship inspections and surveys and an internship at COSCO Shipping Agency – Hellas and Piraeus Container Terminal S.A. Currently, she is a trainee at Lloyd's Register involved in various projects undertaken by the classification society.

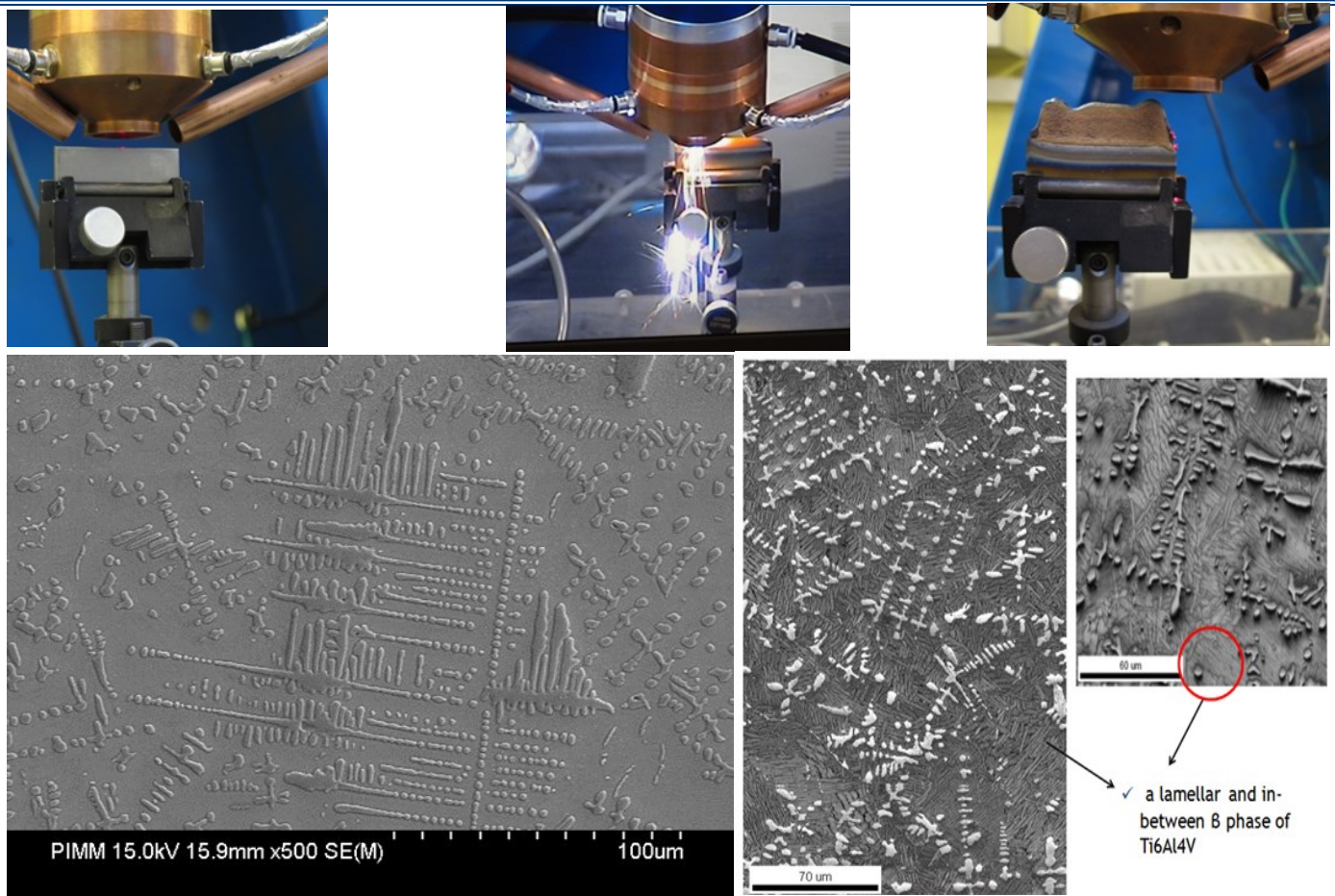


Figure 4 (i-iii) (Top) DLMD in Progress , Figure 5(Bottom left) SEM Observation: Sample without the remelting factor: longitudinal view; center clear observation of the distribution of the dendrites; homogenous and with no preferred orientation, Figure 7 (Bottom Right) Ti matrix observed with EBSD

(Continued from page 4)

used at a proportion of 10%-90% respectively. The experiments were conducted at the Process and Engineering in Mechanics and Materials laboratory (PIMM) of the École Nationale Supérieure d'Arts et Métiers (ENSAM) (member of the ParisTech).

Two were the main parameters that differentiated the manufactured samples, which were afterwards examined with several methods; the velocities that were examined; 200 mm/min and 400 mm/min and secondly and most importantly, of the eight samples that were produced half of them were remelted (laser pass without powder deposition).

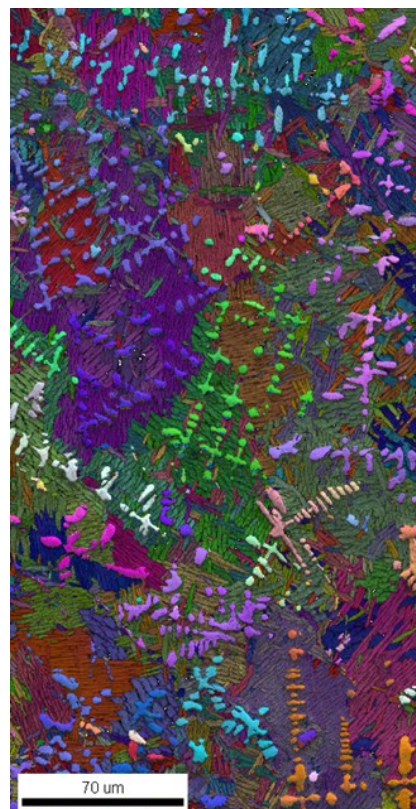
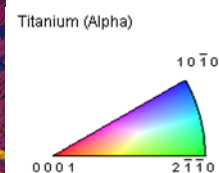


Figure 6 EBSD results of samples with remelting (longitudinal view): one dendrite is expanded to more than one Ti matrix which makes the material more brittle

To examine the impact of the aforementioned parameters, the following methods were realized; Surface roughness analysis, Optical Microscopy (OM), Scanning Electron Microscopy (SEM), X-ray diffraction (XRD) and Electron Backscattered Diffraction (EBSD) for the material and microstructure characterization. In addition, micro-hardness analysis for the eight samples and tensile tests on three new [DLMD] samples were also realized to examine the mechanical properties of the samples produced by the technique in survey.



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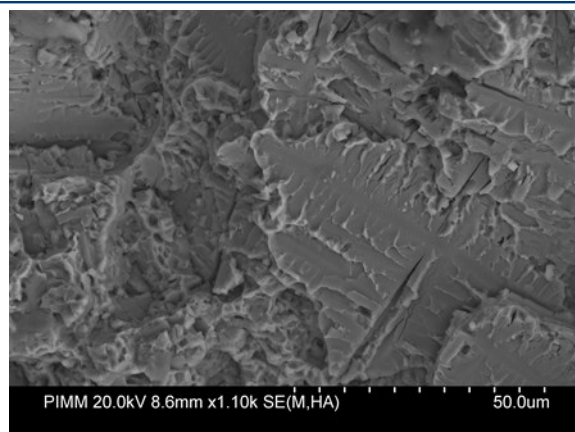
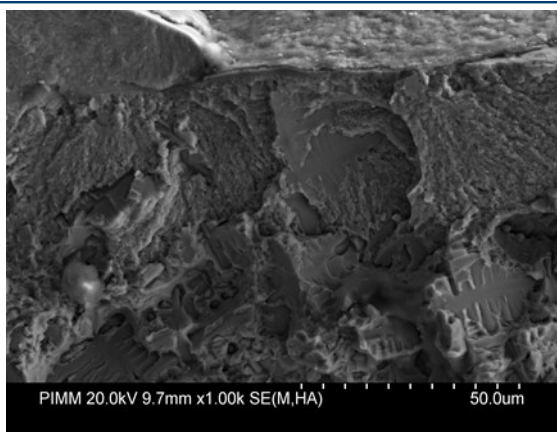


Figure 8 SEM micrographs of the fracture surface

In summary, the overall outcome of this research project is that the novel remelting factor is indeed advantageous as it improves the homogeneity along the microstructure of the fabricated samples. Although the presence of TiC particles significantly decreases their plasticity, the samples have increased hardness. Lastly, even though the velocity did not greatly differentiate the results among the samples, samples manufactured with a velocity of 200 mm/min presented somewhat better results.

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