

23RD COLLOQUIUM

MATERIALS FOR AEROSPACE & AERONAUTICAL APPLICATIONS



ORGANIZED BY
French Aeronautics and
Space Society

PROGRAMME



DECEMBER 7-8, 2009 – PARIS
SAGEM CONFERENCE CENTER
27, rue Leblanc 75015 Paris

GENERAL OBJECTIVES

Every two years the Materials Committee of 3AF (Association Aéronautique et Astronautique de France) organises in Paris the Colloquium on Materials for Aeronautical Applications.

Like previous meetings, the 23rd Colloquium is unique in format and contents since its main purpose is to promote discussions and interaction between academics, aeronautical and space industry and materials suppliers in an informal frame. An additional objective is to attract talented students from universities and engineering schools to the aerospace materials research and applications.

Although materials have constantly played a major role in improving the performance of aerospace systems, for the past few years the global environmental concerns have pushed the materials suppliers, researchers and the industry to pay specific attention to the environmental issues related to the use and processing of materials. Process simulation and modelling are now an integral part of both conventional and advanced materials development. Similarly, innovative processing is the key to cost reduction and weight reduction.

The 23rd Colloquium will therefore be focussed on four major themes:

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|--------------------------------------|------------------------------------|
| – Materials and environmental impact | – Innovative processes |
| – Advanced materials | – Process simulation and modelling |

PROGRAMME COMMITTEE MEMBERS

Chairman : Jean-Yves GUEDOU, Snecma

Daniel ALIAGA, EADS IW	Shigehisa NAKA, ONERA
Jean-Pierre BONNAFE, ASTRIUM	Michel PARLIER, ONERA
Pascal CHEREAU, DGA	André PINEAU, ENSMP
Georges DESARMOT, ONERA	André ROUQUET, Dassault Aviation
Tassaduq KHAN, ONERA	Hubert SCHAFF, Aubert & Duval
Alain LASALMONIE, Snecma	Gilles SURDON, Dassault Aviation

PROGRAMME

MONDAY DECEMBER 7, 2009

- 08:30 ■ REGISTRATION
- 09:30 ■ Welcome Address

Session 1 - MATERIALS AND ENVIRONMENT IMPACT

In this session, the impact of materials and processes implemented in Aeronautical Structures on Environment will be addressed. The first presentation deals with the current actions regarding the reduction of detrimental effects on Environment generated through casting of parts. The three subsequent papers will give an overview of the progress for the replacement of forbidden materials due to their harmfulness on Environment such as hexavalent chromium for surface treatment on aluminum alloys, paints without undesirable elements and cadmium free coatings for protection against oxidation on steels.

- 10:00 ■ The Response of the Investment Casting Industry to Environmental Concerns
David FORD (EICF, UK)
- 10:30 ■ Tartaric sulfuric anodizing, a CrVI free process for surface treatment of aluminum alloys
Martine VILLATTE, Stéphane SUEL, Catherine DRUEZ (EADS IW)
- 11:00 ■ COFFEE BREAK ■
- 11:30 ■ REACH and formulators
Claudie MATHIEU (FIPEC)
- 12:00 ■ Cadmium plating replacement
Roger PAYS (Snecma Propulsion Solide)
- 12:30 ■ LUNCH ■



■ Session 2 - ADVANCED MATERIALS

Following the previous colloquiums, this session aims at providing a quick survey of the state of the art of some of advanced materials for aeronautical and space applications. The presentations deal with a wide variety of materials ranging from a new titanium alloy (Ti 5553), considered in particular for landing gear applications, Ti-matrix with long SiC fibers composites for “BLING” applications, high temperature or even very high temperature structural materials such as Nb-Si based intermetallic alloys, heat-resistant structural composites, ceramic MGC (melt growth composites), up to high temperature Shape Memory Alloys for multifunctional devices.

- 14:00 ■ High Strength Titanium Alloys for Landing Gears
David BOND (Messier Dowty- UK)
- 14:30 ■ Titanium Matrix Composites: Designing and Processing of a turbo engine part
Jean-Michel FRANCHET (Snecma),
Serge KRUCH (ONERA)
- 15:00 ■ Niobium and Molybdenum silicide based materials for high temperature applications
Stefan DRAWIN (ONERA)
- 15:30 ■ COFFEE BREAK ■
- 16:00 ■ Ceramic Matrix Composites for Aircraft Engines Applications
Eric PHILIPPE, Caroline LOUCHET, Eric BOUILLON (Snecma Propulsion Solide)
- 16:30 ■ Potential of directionally solidified eutectic ceramics for high temperature applications
Michel PARLIER, Loic PERRIÈRE, Léo MAZEROLLES, Roger VALLE (ONERA),
Sylvie LARTIGUE-KORINEK (ICMPE-MCMC Thiais)
- 17:00 ■ High Temperature Shape Memory Alloys based on the Ru-Nb and Ru-Ta systems
Anne DENQUIN, Karine CHASTAING, Anna MANZONI (ONERA),
Philippe VERMAUT, Richard PORTIER (ENSC Paris)
- 18:30 ■ COCKTAIL ■

Session 3 - INNOVATIVE PROCESSES

This session deals with innovative processes for weight and cost saving, and cycles reduction. It will give you an idea of some potential future processes. The first presentation is focused on structures and will present the main evolution on design and manufacturing of aeronautical structures. Comparing composite and metallic parts the presentation will analyze the future trends for innovation. The second presentation is concerning fibre placement which is a physically complex process particularly at the level of tape contact area where dynamics of thermal exchanges governs the strength. Regarding the more traditional metallic materials, the session presents four new promising technologies which are not yet used in large scale. For these technologies there will be an increasing number of applications in the next few years and the colloquium objective is also to look for new applications, to promote exchanges and discussions and to create contacts.

- 09:00 ■ Trends and prospects for aeronautical structures
Didier LANG (EADS IW)
- 09:30 ■ Fibre Placement
Catherine DUVAL (EADS IW),
Mourad CHOHRRA (Dassault Aviation)
- 10:00 ■ Laser peening, an emerging process to extend fatigue life of structures and engine components and to shape metallic parts such as wing panels
Olivier HIGOUNENC (MIC)
- 10:30 ■ COFFEE BREAK ■
- 11:00 ■ Shaping of nanostructures materials or coatings through Spark Plasma Sintering
Claude ESTOURNES, co workers (CIRIMA Toulouse)
- 11:30 ■ Laser Direct Manufacturing project PROFIL outcomes
Gilles SURDON (Dassault Aviation)
- 12:00 ■ Robot assisted Incremental Sheet Forming
Joachim ZETTLER (EADS IW-G)
- 12:30 ■ LUNCH ■

Session 4 - PROCESSES SIMULATING AND MODELLING

Process simulating and modelling is now a wide field of materials science in constant development. This is illustrated in the last session through examples on metallic and composite materials and on a mixed case. The objective of the first presentation is to provide an overview of an “Alloys By Design Approach” applied to nickel base superalloys, in order to select the most appropriate alloy fitting with the requested mechanical properties and economical criteria. Solidification modelling is also an important issue and sophisticated and realistic models now describe material phenomena occurring in complex alloys casting steps. It is often necessary to control processes in real time and in that way mathematical models describing them have to be solved faster than they evolve. As an application, the third presentation deals with “model reduction” for PMC composite curing control in infusion-type processes. The two last presentations address analysis and modelling the behavior of hybrid structures which are more and more used in the new projects: the knowledge of adhesive behaviour in these metal-composite bonded assemblies is necessary for long lifetime design.

- 14:00 ■ An Alloys-By-Design Approach for Nickel-Based Superalloys
Roger REED (University of Birmingham - UK)
- 14:30 ■ Solidification modelling for aeronautical parts
Charles André GANDIN (CEMEF),
David LOCATELLI, Serge FARGEAS (Snecma)
- 15:00 ■ Methods for models reduction applied to thermosetting composites curing
Riadh ATA, Pierre BEAUCHÊNE, Bertrand LAINE (ONERA)
- 15:30 ■ COFFEE BREAK ■
- 16:00 ■ Analysis of the behavior of hybrid bonded assemblies with composites
Jean-Yves COGNARD, Laurent SOHIER, Peter DAVIES (ENSIETA Brest)
- 16:30 ■ Modelling of the behaviour of an adhesive in bonded assemblies
Romain CRÉAC’HCADEC, Jean-Yves COGNARD, Laurent SOHIER
(ENSIETA Brest)



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REGISTRATION FORM

To be sent to : 3AF - 6, rue Galilée – 75016 Paris - France

Phone : 33 (0)1 56 64 12 30 - Fax : 33 (0)1 56 64 12 31 – E-mail : secrexec@aaaf.asso.fr

REGISTRATION WILL HAVE TO BE RECEIVED BEFORE 30 NOVEMBER 2009

Mr Mrs Ms

Name :

First Name :

Company :

Address :

.....

Zip Code : City :

Country :

Phone : Fax :

E-Mail :

– I wish to become 3AF member and I pay my membership (optional): 100 €

– I wish to attend the conference as: – 3AF Members 500 €

– Participants 600 €

– Speakers and Chairmen 400 €

– Students/University Speakers 150 €

TOTAL€

REGISTRATION FEES INCLUDE: CONFERENCE ATTENDANCE, CONFERENCE DOCUMENTATION, COFFEE BREAKS, LUNCHES AND COCKTAIL.

PAYMENT

by cheque in Euros to the order of AAAF

by Credit Transfer to the account: N° 30003-03300-00037260771-18 Société Générale
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Please don't forget to mention the participant's name on the credit transfer. Substitutions may be made at any time. However, cancellations will only be accepted until 7 days prior to the conference and must be received in written. After 7 days, there will be to 300 € cancellation fees. Registrants who do not cancel before the conference date will be liable for the full registration fees.

Date :

Signature :

GENERAL INFORMATION

VENUE :

Sagem Conference Center
27, rue Leblanc – 75015 Paris - France

ACCESS :

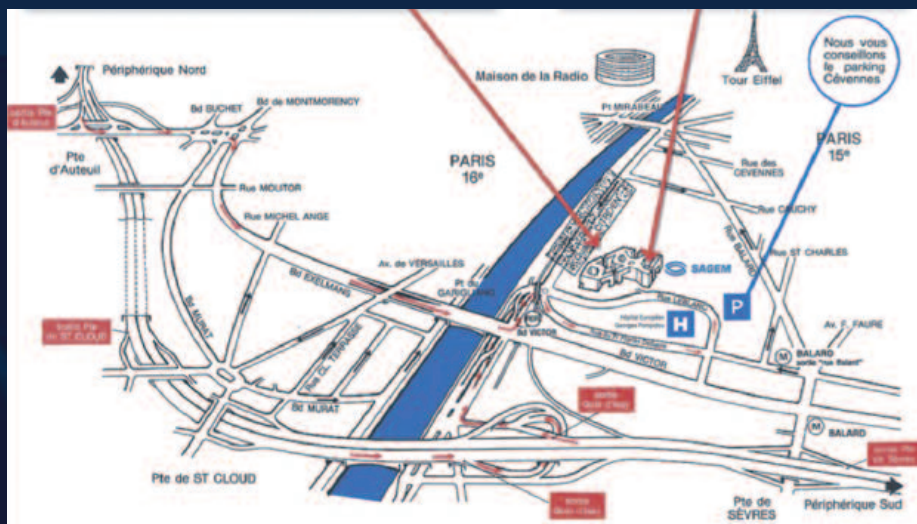
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ACCOMMODATION :

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OFFICIAL LANGUAGE :

Presentations will be made in English.

For further information concerning the conference, please contact:

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