

Composites Design and Manufacturing Workshop "Future vision of opportunities in Composites Design and Manufacturing"

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THEMATIC DISCUSSIONS REPORT

Responsible:

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Summary

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Group 1: Multi-functional composites

Challenge: 1) Controlling the dispersion and interactions in nanostructured composites;

2) Self-healing composites

Participants:

Name		Institution	Contact
Danilo Carastan (Leader) Marcello Menezes Eifler Pontus Nordin Rosario Castro		UFABC Brazilian Army Saab Group Lindholmen Science Park	danilo.carastan@ufabc.edu.br agich@dct.eb.mil.br pontus.nordin@saabgroup.com rosario.castro@lindholmen.se
Ideas	 Intelligent coating materials (I.e. electrical conducting, IR), such as functional paints and pre-manufactured coatings based on thermoplastics and nanoparticles; Damage tolerant composites; Nano-engineered carbon fiber reinforced polymers for tough mechanical applications. 		
Applications	 Aircraft Industry; Army (To increase durability in vehicles, armor and other devices). 		
Project	Stakeholders;		
Structure	• Nex	Department of Science	Military Engineering institute (IME), Army's ce and Technology (DCT); cosite Manufacturing Industry



Group 2: Manufacturing process modelling

Stakeholders.

Challenge: Predict manufacturing induced defects as a function of the manufacturing parameters and experimentally characterize their effect on strength

Participants:

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Name	Institution Contact		
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Ideas	Certification of the Surface manufactured;		
	New simulation tools.		
Applications	People very Experienced with the process that do not know computer		
	Modelling;		
	Software to calculate the porosity that grows during the cure of resin.		
Project	Partnership Between Universities and Companies for modelling prepeg		
Structure	Lay-up;		
	 Simulating issues (controlling the process with on-line 		
	measurements)		
	 Simulation tool development 		
	 Model of technology challenges: overlaps and gaps 		

Industry: Saab, Embraer and Inbra Universities: To be determinated



Group 3: Design and design optimization

Challenge: Optimize the stacking sequence for a laminate subjected to stiffness and strength requirements. The current design guidelines (10% rule, use of 0, 90, 45 and -45 degrees orientation only, number of repeated plies, etc) should be further evaluated.

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José Everardo Baldo Junior	Research	josebaldo@ipt.br

Ideas	 Multi-disciplinary optimization; Performance Material selection Manufacturing Cost Manufacturing process development; 3D Weaving; Pultrusion High toughness matrix systems Technology transfer between different application areas. 	
Applications	 Prefebly wide; Aerospace Automobile Solutions for high stress areas. 	
Project Structure	To Be further Discussed.	



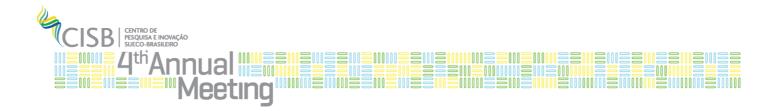
Group 4: Fatigue

Challenge: review the current design practices to design components prone to fatigue.

Participants:

Structure

Name		Institution	Contact
Amauri Gavazzi Anders Johansson Gustavo Miranda Guimarães Luiz Cláudio Meniconi Tonny Nyman (Leader) Walter Jesus Paucar Casas		Embraer Saab Group Embraer Petrobras/Cenpes Saab Group UFRGS	Anders.a.Johansson@saabgroup.com gustavo.guimaraes@embraer.com.br meniconi@petrobras.com.br tonny.nyman@saabgroup.com walter.paucar.casas@ufrgs.br
Ideas	 Simplified models for dimensioning and analysis to increase the allowables loads; Reliable monitoring systems; Damage assessment and corrective actions. 		
Applications	 Aerospace; Underwater systems (oil and gas included); Land vehicles; Ships. 		
Project	• To l	To Be further Discussed.	



Contact

Group 5: Design and Manufacturing

Challenge: include manufacturing aspects (process limitations, ply drop offs, draping, manufacturing induced defects, etc) to the design procedure.

Institution

Participants:

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corgress rucomo ao			nacomo enanci, con gromacomo e grinamocini
Ideas	Ena the Rev suit. Cor Imp Project Ide Coll Coll	able designers to use material; vise the design criteriable solutions for composites developmer rove use of 3d arrangers: the shelf solution for Ongoing project, Interested so far: laborative multidiscipe Ongoing project, Interested so far: mposite materials and embly Research environ of Brazilian reseauler mindset of engine	automated composite manufacturing LiU can send PhD to Brazil Inbra, LiU, Saab Ilinary design optimization in preliminary design LiU can send PhD to Brazil ITA, LiU, Saab, Akaer If flexibility design for manufacturing and Iment exist in at LiU, Possible accommodation rcher into this group ITA, LiU, Saab
Applications			
Project	• To l	Be further Discussed	
Structure			