COST 526 - 'Automatic Process Optimization in Materials Technology' – (APOMAT)

Final Report – 31 July 2005

Summary sheet

Project Code	CH1
Title	Optimisation of properties and dimensional stability of composites by controlled fibre placement
Project Leader	Dr. Martyn Wakeman
Organization Address	Laboratoire de Technologie des Composites et Polymères (LTC) Ecole Polytechnique Fédérale de Lausanne (EPFL) CH-1015 Lausanne, Switzerland
Tel Fax E-Mail Main collaborators involved	+41 (0)21 693 8803 +41 (0)21 693 8870 Martyn.wakeman@epfl.ch Dr. Niklas Jansson, Dr. Martyn Wakeman

Funding Situation (for the whole project)

Amount of money received specifically for COST	87 kEuros
Other resources partially used for the project	kEuros

International Collaboration (mention group and type of work done in collaboration during the whole project)

Swiss Working Group Meeting (CH1, CH2, CH3, CH4)

Industry participation (mention name of companies and work done in collaboration during the whole project)

ABB, DaimlerChrysler, DuPont, Tenax, Johnson Controls, Quadrant and Saint Gobain Vetrotex International

Meetings, visits, exchange of scientists, short term scientific missions (mention main events during the whole project)	Location, date
- Kick of meeting of Swiss APOMAT groups	University of applied Sciences, Windisch, Switzerland, 11. September 2002

Main Outcome of the project (mention only the major points)

Development of a methodology for simulation and effective optimization of non-linear composite structures.
Benchmarking of simulation of textile thermoplastic composites against experiments.
Addition to knowledge by comparison of Kriging to other approximation methods for a realistic problem. Successful use of genetic algorithms in conjunction with approximations.

Publications, related to this project

Published

Mechanical Analysis of Thermoplastic Polymers Reinforced with Robotically Placed Continuous Fibre Tows
P.-O. Hagstrand, N. Jansson, M. D. Wakeman, F. Bonjour and J.-A. E. Månson
Proceedings of the 14th International Conference on Composite Materials (ICCM-14)
San Diego, California, USA, July 14-18 2003.

Finite Element Modelling and Testing of an Injection Moulded Generic Tow Reinforced Structure
N. Jansson, P.-O. Hagstrand, M. D. Wakeman and J.-A. E. Månson
Composites: Part B, 2005; 36: 487-495

Optimization of Properties and Dimensional Stability of Composites by Controlled Fibre Placement
N. Jansson, M. D Wakeman, J.-A. E. Månson
First Invited COST 526 Conference APOMAT for Automatic Process Optimization in Materials Technology
Morschach, Switzerland, May 30-31 2005.

Submitted for publication

In preparation

Optimization of Hybrid Thermoplastic Composite Structures Using Surrogate Models and Genetic Algorithms
N. Jansson, M. D Wakeman, J.-A. E. Månson

Will you continue the actual cooperation with your partners after the end of the action?

X Yes ❑ No

Would you participate in a possible “spin-off” action continuing the present one?

X Yes ❑ No

Will you continue your present work/collaboration with another European action?

❑	X
Yes	No