



Live & Virtual Conference 20 Amsterdam

The Future Composite Footprint

Date 30 September - 1 October 2020
Location Beurs van Berlage, Amsterdam
Organization SAMPE Benelux and SAMPE Europe



WEDNESDAY 30 SEPTEMBER

8.00 - 9.00 **Registration & Coffee**
 9.00 - 10.30 **Opening & Plenary Session**

- Welcome, by Bart Vangrimde, Huntsman, Chairman of SAMPE Benelux
- Opening, by Prof. Rinze Benedictus, TU Delft, President of SAMPE Europe

9.15 - 10.30 **3 Key-note Speakers**

- 'The Future Materials & Processing Footprint in Aerospace', by Bert Thuis, Royal NLR, Netherlands
- 'Sustainability in Aviation Materials and Manufacturing', by José Enrique Román, Boeing Research & Technology Europe, Spain
- 'The Future Composite Footprint in Automotive', by Prof. Frank Henning, ICT Fraunhofer, Germany

10.30 - 11.00 **Coffee Break**
 11.00 - 13.00 **3 Parallel Sessions**



Bart Vangrimde



Prof. Rinze Benedictus



Bert Thuis



José Enrique Román



Prof. Frank Henning

Room 1	Room 2	Room 3	Room 4
AUTOMATION	AUTOMOTIVE COMPOSITES	CIVIL ENGINEERING	
<p>Session chair: Arnt Offringa, GKN/Fokker, Netherlands</p> <ul style="list-style-type: none"> Creating tailored thermoplastic composite products using ATL by Peter Boer, DTC - Dutch Thermoplastic Components, Netherlands Process Simulation of the Automated Tape Laying Process for Thermoplastic Composites by Daniel Fricke, DLR-German Aerospace Center, Germany An integrated robotic work cell for highly automated ultrasonic inspection of complex CFRP parts by Klaus Schlachter, PROFACTOR Austria A post lay-up tack peel test for aerospace grade prepreg tapes by Klaus Heller, Technical University of Munich, Germany Vacuum Bag Only Consolidation of Fiber Placed Thermoplastic Composite Structures by Jagadeesh Swamy, ThermoPlastic composites Research Center (TPRC) / University of Twente (UT), Netherlands Temperature measurements in laser-assisted thermoplastic tape placement close to the nip-point by Alexander Peitz, Aachen Center for integrative Lightweight Production, AZL, Germany 	<p>Session chair: Bert Rietman, SABIC, Netherlands</p> <ul style="list-style-type: none"> Enhanced Characterisation and Simulation Methods for Thermoplastic Overmoulding (ENACT) by Alasdair Ryder, Surface Generation, UK Intelligent process monitoring of a Compression RTM reactive thermoplastic automotive door by Nikos Pantelelis, Synthesites, Greece Structural thermoplastics composites using JM innovative in-situ polymerization technology with covalent resin to glass bonding by Dany de Kock, Johns Manville, Belgium Investigation of smc flame retardants for application in battery electric vehicles by Patrick Griesbaum, Karlsruhe Institute of Technology, Germany Introducing thermoplastics to serial production: thermoplastic resin transfer molding using caprolactam by Thomas Stefani, DLR - German Aerospace Center, Germany Laser-assisted thermoplastic tape placement: effects of consolidation roller geometry on wedge peel strength of CF/PA6 by Vincent Backmann, TU München, Germany 	<p>Session chair: Ronald Grefhorst, Siris, Belgium</p> <ul style="list-style-type: none"> World's First Large Bridge Fully Relying on Carbon Fiber Reinforced Polymer Hangers by Urs Meier, Empa, Switzerland CEN Technical Specification – Design of Fibre-Polymer Composite Structures by Thomas Keller, École Polytechnique Fédérale de Lausanne, Switzerland Effects of High Temperature on Mechanical Performance of Carbon Fiber Reinforced Polymer Straps by Danijela Stankovic, University of Edinburgh, UK InfraCore® structures consist of Oblique Layered Materials, inspired by many examples found in nature by Edwin Kanters, Infracore Company, Netherlands Building Innovation – Tenax® Carbon Fibers for ground-breaking construction technologies by Sabrina Beverungen, Teijin Carbon Europe, Germany to be announced, by Nico Huntink, Teijin Aramid, Netherlands 	

13.00 - 14.00 **Lunch**
 14.00 - 15.20 **3 Parallel Sessions**

Room 1	Room 2	Room 3	Room 4
THERMOPLASTIC COMPOSITES	GENERAL MANUFACTURING & TOOLING	SUSTAINABLE COMPOSITES	
<p>Session chair: Ferrie van Hattum, TPAC, Netherlands</p> <ul style="list-style-type: none"> Study on bend-forming behavior of thermoplastic tape-braided CFRTP profile by Simon Eckhardt, Technische Universität Dresden, Germany Direct stamp forming of flexible hybrid fibre preforms for thermoplastic composites by Christoph, Schneeberger, ETH, Switzerland Rilsan® Matrix tapes and an innovative manufacturing process for new applications by Arthur Babeau, Arkema, France TP-RTM Interfacial & Impact properties of Anionically Polymerised Polyamide 6 Composites by James Murray, Edinburgh University, UK Improved Impact Response of Carbon Fibre-Reinforced Polyether Ether Ketone (PEEK) Panels Toughened Using Polyether Imide (PEI) Film Layers by Kenneth Frogner, Corebon, Sweden 	<p>Session chair: Prof. Peter Middendorf, Stuttgart University, Germany</p> <ul style="list-style-type: none"> Metallization of thermoset and thermoplastic composite aeronautics structure through robotized deposition Cold Spray technologies by Henri Perrin, LIST, Luxembourg Image processing algorithm for error detection during the manufacture of carbon fibre reinforced plastics pressure tanks by Nicolas, Roza Lopez, Institute for Plastic Processing (IKV), Germany Tooling of Tomorrow – Large Scale Additive Manufacturing (LSAM) tool production with 3D Printech Technology by Phil Lunn, Airtech, Luxembourg Compact Manufacturing Technology with Integrated Process Monitoring for Production of Near-Net-Shape Prepregs with Tailored Properties by Björn T. Riecken, CompriseTec GmbH, Germany Strategies for the manufacturing of wrinkle-free composite parts by Michael Thor, University of Applied Sciences Upper Austria, Austria 	<p>Session chair: Prof. Aart van Vuure, KU Leuven, Belgium</p> <ul style="list-style-type: none"> Thermo-mechanical recycling of continuous fiber reinforced thermoplastics into long fiber thermoplastics by Amandine Codou, TNO-Brightlands Materials Center, Netherlands Development of (interactive) facade elements on base of waste materials of (waste) water companies by Willem Böttger, NPSP and Centre of Expertise Biobased Economy, Netherlands EcoGlide. Biodegradable autonomous cargo glider by Clemens Dransfeld, TU Delft, Netherlands Bamboo biobased fibers for high-performance composite applications by Carlos Fuentes, KU Leuven, Belgium New 3R Bonding Technology for Rearable, Recyclable and Reprocessable Aerospace Composite Materials by Alaitz Ruiz de Luzuriaga, Cidetec, Spain 	

15.20 - 15.50 **Tea Break**
 15.50 - 17.10 **3 Parallel Sessions**

Room 1	Room 2	Room 3	Room 4
3D PRINTING	INDUSTRIAL INNOVATION	TESTING AND CHARACTERISATION	
<p>Session chair: Bert Thuis, Royal NLR, Netherlands</p> <ul style="list-style-type: none"> Seamless solution for industrial-grade continuous carbon fibre 3D-printed composites by Yannick Willemin, 9T Labs AG, Switzerland Fabrication of highly aligned discontinuous fibre thermoplastic filament feedstock for fused deposition modelling by Narongkorn Krajangsawadi, University of Bristol, UK Optimization and monitoring of mechanical performance of 3D printed fiber reinforced products by Tessa ten Cate, Brightlands Materials Center, Netherlands Mechanical response of structural 3D printed polymers: an experimental and numerical study by Robin Delbart, The University of Edinburgh, UK 	<p>Session chair: Ron van Hoorn, Evonik, Germany</p> <ul style="list-style-type: none"> Filament winding system Solution for Pressure Vessels by Ralf Möller, Roth Composite Machinery GmbH, Germany Requirements and performance of high precise functional coating technologies for the production of Prepregs for thermosetting and thermoplastic applications by Andrea Glawe, Kroenert GmbH & Co KG, Germany Metalized thermoplastic tapes for lightning protection solve common problems associated with automated manufacturing of composite aircraft structures by Koen Hollevoet, Compolam, Belgium From Non-Destructive Part Inspection to Numerical Simulation in Additive Manufacturing by David Harman, Synopsys Northern Europe, UK 	<p>Session chair: to be announced</p> <ul style="list-style-type: none"> Failure characterisation of carbon/epoxy sub-components with the aid of Digital Image Correlation and Acoustic Emission by Kalliopi-Artemi Kalteremidou, Vrije Universiteit Brussel, Belgium Efficient detection of production defects in a CFRP aircraft component by means of flash infrared thermography by Gaétan Poelman, Ghent University, Belgium Robust and Baseline-free defect detection in aircraft CFRP components using full-field guided wave analysis by Joost Segers, Ghent University, Belgium Replacing strain measurements by vibration measurements for the identification of orthotropic engineering constants of composite sheets by Hugo Sol, Bytec BVBA, Belgium 	

17.10 - 18.00 **Student Seminar**
 18.30 - 21.30 **Cocktail & Dinner**



09.00 - 10.40 **4 Parallel Sessions**

Room 1

AUTOMATION

Session chair: Tjark van Reden, MAI Carbon, Germany

- *Processing Technology for the fully automated Production of tailored thermoplastic Composite Blanks* by Norbert Müller, ENGEL AUSTRIA, Austria
- *An automated and digital approach to manufacture complex, one-off composite structures* by Anders Brødsjø, Airborne, Netherlands
- *Effective emissivity characterisation and correction for accurate control of Automated Fibre Placement processes* by Philip Druiff, National Composites Centre (UK), UK
- *CoRe HeaT – Continuous Resistance Heating Technology for high-speed carbon fibre placement processes* by Yannis Grohmann, DLR - German Aerospace Center, Germany
- *The Influence of Thermal Contact Resistance on the Thermal History in Laser Assisted Fiber Placement* by Ozan Çelik, Delft University of Technology, Netherlands

Room 2

GENERAL MANUFACTURING & TOOLING

Session chair: Oliver Bottler, Airtech, Luxembourg

- *Efficiency and Usability of Industrial Laser Assistance Systems in Composite Preforming – a Comparative User Study* by Hannah Dammers, Institut für Textiltechnik (ITA) of RWTH Aachen University, Germany
- *Effect of process routing (direct vs. preformed) on part infiltration during Wet Compression Molding (WCM) of a complex demonstrator* by Fabian Albrecht, Karlsruhe Institute of Technology, Germany
- *Functional integration in FRP Parts via Hybrid-matrix-injection* by Kalle Kind, Technical University of Munich, Germany
- *Examination of learning models and inference of manufacturing methods of CFRP by deep learning using their ultrasonic images* by Kaori Miura, Teijin Composites Innovation Center, Japan
- *Estimation of mechanical properties of CFRP and detection of CFRP with defective fracture strengths by deep learning using its ultrasonic images* by Chihiro Imanaka, Teijin Composites Innovation Center, Japan

Room 3

HYBRID & SANDWICH

Session chair: Prof. Clemens Dransfeld, TU Delft, Netherlands

- *Novel Core Material for automated high-volume Sandwich Composite Aerostructures* by Alexander Roth, Evonik Resource Efficiency, Germany
- *Impact Behavior of Epoxy-Polyamide Hybrid Laminates* by Diana Heflin, Purdue University, United States
- *Experimental Parameter Study on the Manufacturing of Sandwich Structures Based on Sheet Moulding Compounds* by Jesper Buck, Helmut Schmidt University Hamburg, Germany
- *Robust development, validation and manufacturing processes for hybrid metal-composite lightweight structures* by Daniel Haider, TU Dresden, Germany
- *Net-shape wet compression moulding* by Felix Nusser, Technical University of Munich, Germany

Room 4

JOINING & BONDING

Session chair: Irene Fernandez Villegas, TU Delft, Netherlands

- *A dynamic induction welding development for fuselage panel* by Pierre Couarraze, Jules Verne Institute, France
- *Modified Epoxy Matrix Resins for Reduced Dependence on Redundant Fasteners in Secondary-Bonded Composite Structures* by Frank Palmieri, NASA Langley Research Center, United States
- *Tailored repair procedure for (impact-damaged) thermoset CFRP components by UV-initialized (radically-oxidic) matrix removal* by David Hoffmann, ITM-TU Dresden, Germany
- *Towards Continuous Resistance Welding for Full-Scale Aerospace Components* by Manuel Endrass, DLR-German Aerospace Center, Germany
- *Method to characterize electrical conductivity of woven thermoplastic composites* by Sebastiaan van den Berg, TPRC/GKNFokker/UTwente, Netherlands

10.40 - 11.10

Coffee Break

11.10 - 12.50

4 Parallel Sessions

Room 1

AEROSPACE

Session chair: Martin Nagelsmit, Royal NLR, Netherlands

- *Shear and compression buckling of PPS matrix composite panels stiffened by induction welded stringers* by Alfonso Maffezzoli, University of Salento, Italy
- *Eco friendly production method for composite grid stiffened panels* by Peter Nijhuis, Royal NLR, Netherlands
- *Automated Kitting implementation: A case study from the aerospace industry* by Marcus Kremers, Airborne, Netherlands
- *Generative Structural Design and Optimization of a composite wing section of a Modern Electric Aircraft* by Gaëtan Van den Bergh, 4RealSim, Netherlands
- *Smart-X* by Tigran Mkhoyan, TU Delft, Netherlands

Room 2

STRUCTURE & PROCESS SIMULATION

Session chair: Guy Larnac, Ariane Group, France

- *A digital twin for compression moulded sheet moulding compound* by Connie Qian, The University of Warwick, UK
- *Integrated process simulation as key for the efficient product and process development of thermoplastic composites and hybrids* by Dominik Dörr, SIMUTENCE GmbH, Germany
- *Process Modelling of Diaphragm Forming with UD Semi-Finished Prepregs* by Franz Maier, University of Applied Sciences Upper Austria, Austria
- *Optimization of the determination of Kamal's parameters in SMC process simulation* by Anna Julia Imbsweiler, Technical University Munich, Germany
- *Probabilistic prediction of the effect of defects in long fiber composites* by David Dumas, Cenaero, Belgium

Room 3

TEXTILE COMPOSITES

Session chair: to be announced

- *Forming Characterisation of Non-Crimp Fabrics using Textile-applied printed Strain Sensors* by Prof. Peter Middendorf, Institute of Aircraft Design, University of Stuttgart, Germany
- *Mesoscale modelling of woven composite materials with manufacturing defects* by Christian Fagiano, ONERA, France
- *Development of Drape Forming Process for Composite Structure Using Forming Simulation* by Yusei Kondo, Mitsubishi HeavyIndustries, Japan
- *Development of Web Based Composites – a highly moldable material for semi structural applications* by Felix Teichmann, Institut für Textiltechnik (ITA) Augsburg, Germany
- *Virtual Fiber Modelling: a Viable Multi-Scale Approach for Mechanical Modelling of Textile Materials* by Lode Daelemans, Universiteit Gent, Belgium

Room 4

INDUSTRIAL INNOVATION

Session chair: to be announced

- *Advanced Fiber Placement AFP - Agility for Production* by Markus Feiler, Coriolis Composites GmbH, Germany
- *RTM Multicell Structures – The Success of a Risk Mitigation Approach* by André Bertin, Coexpair, Belgium
- *Pushing the automation envelope for multi-material aerostructures* by Thorsten Groene, Cevotec, Germany
- *To be announced* by Axel Seifert, Plastic Omnium, Belgium
- *Composite structures manufactured without the waste from tooling using 3D Composite Kits* by François Geuskens, Curve Works, Netherlands

12.50 - 13.50

Lunch

13.50 - 14.50

3 Parallel Sessions

Room 1

ENERGY

Session chair: Marcus Kremers, Airborne, Netherlands

- *Testing of a 6m Hybrid Glass/Carbon Fibre Powder Epoxy Composite Wind Blade Demonstrator* by Christophe Floreani, The University of Edinburgh, UK
- *Composite production methods for a cost-effective airborne wind energy system* by Edward Fagan, National University of Ireland Galway, Ireland
- *The Impact of Viscoelasticity on Wind Turbine Blade Leading Edge Protection* by Imad Ouachan, University of Bristol, UK

Room 2

Room 3

TESTING AND CHARACTERISATION

Session chair: to be announced

- *Measurement of Permanent Deformation, Stiffness Degradation and Strength of Open Hole Glass/PA6 UD Thermoplastic Composite in Tension and Compression* by Ruben Sevenois, Ghent University, Belgium
- *Experimental and Numerical Investigation of the Tensile Response of Novel Fiber Placement Architectures* by Rutger Kok, University of Edinburgh, UK
- *Machine learning approach for damage detection in lightweight structures* by André Tavares, Siemens Digital Industries Software, Belgium

Room 4

14.50 - 15.20

Tea Break

15.20 - 16.40

3 Parallel Sessions

Room 1

3D PRINTING

Session chair: Christian Weimer, Airbus, Germany

- *Big Area Additive Manufacturing of a Thermoplastic Tooling for a large Thermoset Composite Structure* by Patrick Consul, Technical University of Munich, Germany
- *Production of Continuous Carbon Fiber Reinforced Polyamide Filaments for Microwave Additive Manufacturing* by Nanya Li, Karlsruhe Institute of Technology, Germany
- *Developing localised inkjet printing of resin additives for selective property and formability enhancement* by Kirk Willicombe, University of Bristol, UK
- *Modeling thermal behavior of cooling channels in big area additive manufactured structures* by Matthias Feuchtgruber, Technical University of Munich, Germany

Room 2

SPACE APPLICATIONS

Session chair: Javad Fatemi, Airbus Defence and Space, Netherlands

- *Development of a lean production process for a Thermoplastic Composite Upper Stage propellant tank* by Lars Brandt, DLR-German Aerospace Center, Germany
- *Development of fibre-placed pre-preg lattice structures for satellite central cylinder applications* by Bart Smeets, ATG Innovation Ltd., NL / Ireland
- *Impact damage behavior of light organic thermal protection for CFRP launcher* by Carlos Mangas, Airbus Defence and Space, Spain
- *Technology Development for Composite Rocket-engine Frames* by Gerard Poort, Airbus Defence and Space, Netherlands

Room 3

FIBRES, RESINS & INTERFACES

Session chair: Prof Aart van Vuure, KU Leuven, Belgium

- *Recent Advances in LIBS for Real-Time Detection of Silicone Contaminants on CFRP Surfaces* by Rodolfo Ledesma, National Institute of Aerospace, United States
- *Creation of Creep-less Composites Using Multi-functional Tg-less Epoxy* by Hirofumi Nishida, Kanazawa Institute of Technology, Japan
- *Investigation of the bonding behavior of melt blended or adhesion promoter modified polypropylene to a concrete matrix by single fiber pull out tests* by Michael Sigrüner, Rosenheim Technical University of Applied Sciences, Germany
- *Extended pot life resins for out-of-autoclave processing for large and complex part* by Malgorzata Holynska, ESA, Netherlands

POSTER PRESENTATIONS

- *Automation of composite repairs* by Maaik Borst, Hogeschool van Amsterdam, Netherlands
- *Predicting the damage development in epoxy resins in FRPs using an anisotropic damage model and cohesive-zone-elements* by Jonas Müller, Institute for Plastics Processing at RWTH Aachen University, Germany
- *CF/PEEK 3D printed materials microstructure characterisation by X-ray computed tomography* by Silvano Sommacal, The Australian National University, Australia
- *Investigating the Resin Flow Through an Intricate Manifold System for Large Scale Vacuum Resin Infusions* by Petar Zivkovic, National Composites Centre, UK

16.40 - 17.10

Plenary-keynote

- *'The Flying V – A Composite Challenge'*, by Malcom Brown, TU Delft, Netherlands



Malcom Brown

17.10 - 18.00

Fare well drink

POST-CONFERENCE - FRIDAY 2 OCTOBER

Composite related Plant visits to GKN Fokker, NLR, TCY (Airborne / KVE / Promolding)

08.30 **Departure Bus station Amsterdam Central Station**
14.30 **Back in Amsterdam - Amsterdam Central Station**

GKN Fokker - Hoogeveen
NLR - Marknesse
TCY - Ypenburg

Update: 17-09-2020