Don't fear - control!

DACOMAT

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Damage Controlled Composite Materials

Objective & Impact

The objective of DACOMAT is to develop more damage tolerant and damage predictable low cost composite materials in particular aimed for used in large load carrying constructions like bridges, buildings, wind-turbine blades and off-shore structures. The developed materials and condition monitoring solutions will provide high tolerance for manufacturing imperfections and high capacity to sustain damages. This will enable large composite structures to be manufactured and maintained at low cost.

Outcomes

- Composite materials and structures with significantly improved durability and damage tolerance
- Guidelines and modeling tools for reliable design of critical load carrying composite structures
- Guidelines for materials qualification
- Structural health monitoring and damage assessment solutions
- LCCA & LCA methodology for large composite constructions

Demonstration cases

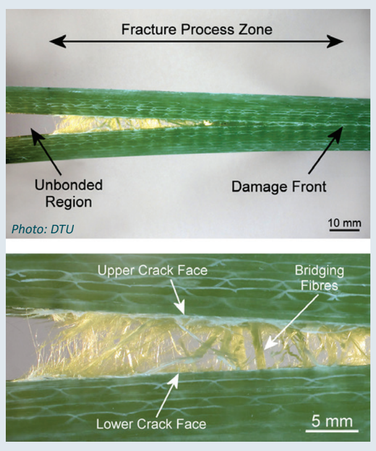
Bridges targeting 30 % improvement in durability and 30 % lifetime cost reduction	
Challenges	**DACOMAT solution**
High maintenance cost	High environmental resistance and mechanical durability
Severe traffic interruption in construction phase	Fast installation of prefabricated light weight elements
Large need for reinforcement of deteriorated old bridges	Reinforcement adding minimal additional weight preventing need for new fundamentation

Wind turbine blades targeting 30 % improvement in durability, and considerable reduction in blade related costs (offshore)	
Challenges	**DACOMAT solution**
Low accessibility for inspection and maintenance	Remote damage detection and assessment.
Revenue loss due to downtime	High damage tolerance preventing need for shutdown
High demands to upscaling at low costs	Higher tolerance for production imperfections and lower safety factors

(Additional applications: Marine structures, marine vessels, buildings, pipes, power transmission towers)

Technical developments

- Optimised systems of resins, fibres and fabrics to control and enhance fracture mechanical properties at micro and macro level
- Design to control initiation and arrest of cracks
- Combined fibre optics and acoustic damage detection tools
- Fracture mechanics based modelling tools for composite design



Example:
Delamination of
a glass fibre composite

Fracture process zone

- large-scale crack bridging in composites

Consortium

Coordinator SINTEF

DTU Technical University of Denmark

POLITÉCNICA

University of Strathclyde Engineering

ayming

LM WIND POWER a GE Renewable Energy business

AIRTIFICIAL

Polynt Composites

Binani 3B BRAJ BINANI GROUP

HEXCEL

DNV·GL

FIBRE REINFORCED COMPOSITES FiReCo FIRE RESISTANT COMPOSITES

JCH

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Duration: January 2018 to December 2021
Budget: 5.9 M€
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