

**COST Action CA18120**

**Reliable roadmap for certification of  
bonded primary structures**

**GENERAL MEETING**

*General Meeting*  
*WG Meetings*  
*Management Committee Meeting*

11-12 January 2021

Virtual Meeting

**Practical Information Guide  
Technical Programme**

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## About COST

The European Cooperation in Science and Technology (COST) is a funding organisation for the creation of research networks, called COST Actions. These networks offer an open space for collaboration among scientists across Europe (and beyond) and thereby give impetus to research advancements and innovation.



COST is bottom up, this means that researchers can create a network – based on their own research interests and ideas – by submitting a proposal to the COST Open Call. The proposal can be in any science field. COST Actions are highly interdisciplinary and open. It is possible to join ongoing Actions, which therefore keep expanding over the funding period of four years. They are multi-stakeholder, often involving the private sector, policymakers as well as civil society.

Since 1971, COST receives EU funding under the various research and innovation framework programmes, such as Horizon 2020.

COST funding intends to complement national research funds, as they are exclusively dedicated to cover collaboration activities, such as workshops, conferences, working group meetings, training schools, short-term scientific missions, and dissemination and communication activities. For more information, please go to the Funding section of the COST website (<https://www.cost.eu/>).

The COST Association places emphasis on actively involving researchers from less research-intensive COST Countries (Inclusiveness Target Countries, ITC<sup>1</sup>). Researchers from Near Neighbour Countries and International Partner Countries can also take part in COST Actions, based on mutual benefit. For more information, please visit the global networking page (<https://www.cost.eu/>).

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<sup>1</sup> Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Macedonia, Hungary, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Turkey

## **COST Action CA18120**

With the increasing pressure to meet unprecedented levels of eco-efficiency, aircraft industry aims for superlight structures and towards this aim, composites are replacing the conventional Aluminium. The same trend is being followed by civil, automotive, wind energy, naval and offshore industry, in which the combination (or replacement) of steel with composites can increase the strength-to-weight ratio. However, the joining design is not following this transition. Currently, composites are being assembled using fasteners. This represents a huge weight penalty for composites, since holes cut through the load carrying fibres and destroy the load path.

Adhesive bonding is the most promising joining technology in terms of weight and performance. However, its lack of acceptance is limiting its application to secondary structures, whose failure is not detrimental for the structural safety. In primary (critical-load-bearing) structures, fasteners are always included along bondlines, as “back-up” in case the bond fails. The main reasons for this lack of acceptance are the limited knowledge of their key manufacturing parameters, non-destructive inspection techniques, damage tolerance methodology and reliable diagnosis and prognosis of their structural integrity.

The Action aims to deliver a reliable roadmap for enabling certification of primary bonded composite structures. Despite the motivation being aircraft structures, which is believed to have the most demanding certification, it will directly involve other application fields in which similar needs are required. This Action will tackle the scientific challenges in the different stages of the life-cycle of a bonded structure through the synergy of multi-disciplinary fields and knowledge transfer.

### **General information**

Start of Action: 04/04/2019

End of Action: 03/04/2023

### **Main Contacts**

Sofia TEIXEIRA DE FREITAS  
Action Chair  
[s.teixeiradefreitas@tudelft.nl](mailto:s.teixeiradefreitas@tudelft.nl)

Anastasios P. VASSILOPOULOS  
Action Vice Chair  
[anastasios.vassilopoulos@epfl.ch](mailto:anastasios.vassilopoulos@epfl.ch)

Jose SENA CRUZ  
Science Communication Manager  
[jsena@civil.uminho.pt](mailto:jsena@civil.uminho.pt)

E-Mail: [certbond@tudelft.nl](mailto:certbond@tudelft.nl)

Action website: <https://certbond.eu/>

Domain website: <https://www.cost.eu/actions/CA18120>

## Action Management Committee

<b>Action Chair</b>	Sofia TEIXEIRA DE FREITAS
<b>Action Vice Chair</b>	Anastasios P. VASSILOPOULOS
<b>WG 1 - Adhesive and interface chemistry</b>	Ana MARQUES ( <a href="mailto:ana.marques@tecnico.ulisboa.pt">ana.marques@tecnico.ulisboa.pt</a> )
<b>WG 2 - Design phase</b>	Konstantinos TSERPES ( <a href="mailto:kitserpes@upatras.gr">kitserpes@upatras.gr</a> )
<b>WG 3 - Manufacturing phase</b>	Nicolas CUVILLIER ( <a href="mailto:nicolas.cuvillier@safrangroup.com">nicolas.cuvillier@safrangroup.com</a> )
<b>WG 4 - In-service life phase</b>	Wieslaw OSTACHOWICZ ( <a href="mailto:wieslaw@imp.gda.pl">wieslaw@imp.gda.pl</a> )
<b>WG 5 - Disassembly phase</b>	Laurent BERTHE ( <a href="mailto:laurent.berthe@ensam.eu">laurent.berthe@ensam.eu</a> )
<b>WG 6 – Certification</b>	Thomas KRUSE-STRACK ( <a href="mailto:thomas.kruse-strack@airbus.com">thomas.kruse-strack@airbus.com</a> )
<b>Grant Holder Scientific Representative</b>	Sofia TEIXEIRA DE FREITAS ( <a href="mailto:s.teixeiradefreitas@tudelft.nl">s.teixeiradefreitas@tudelft.nl</a> )
<b>Science Communication Manager</b>	Jose SENA-CRUZ ( <a href="mailto:jsena@civil.uminho.pt">jsena@civil.uminho.pt</a> )
<b>STSM/ITC Coordinator</b>	Loucas PAPADAKIS ( <a href="mailto:l.papadakis@frederick.ac.cy">l.papadakis@frederick.ac.cy</a> )
<b>Training Schools Coordinator</b>	Chiara BEDON ( <a href="mailto:chiara.bedon@dia.units.it">chiara.bedon@dia.units.it</a> )
<b>Database Coordinator</b>	Michal BUDZIK ( <a href="mailto:mibu@eng.au.dk">mibu@eng.au.dk</a> )

## Action Working Groups

<p><b>WG 1 - Adhesive and interface chemistry</b>            Leader: Ana MARQUES            Vice-leader: Åsa LUNDEVALL</p> <ul style="list-style-type: none"> <li>• Evaluate current common practice in industry: adhesive chemistries and surface treatment processes for bonded joints.</li> <li>• Collect the requirements and needs of the stakeholders and certification agencies, in terms of regulations (REACH).</li> <li>• Propose novel non-toxic and environmentally friendly surface treatment processes and adhesive chemistries.</li> <li>• Evaluate the quality of the new proposed eco-friendly solutions.</li> </ul>	<p><b>WG 2 - Design phase</b>            Leader: Konstantinos TSERPES            Vice-leader: Norbert BLANCO</p> <ul style="list-style-type: none"> <li>• Explore new design concepts (geometrical configurations and new crack arresting design features).</li> <li>• Compare testing procedures for bondline characterization and models validation (under static, fatigue and impact loading, creep phenomena, imperfect bonding and environmental effects).</li> <li>• Evaluate different design methodologies for the structural behaviour and progressive damage analysis of adhesively bonded structures.</li> </ul>
<p><b>WG 3 - Manufacturing phase</b>            Leader: Nicolas CUVILLIER            Vice-leader: Rūta RIMAŠAUSKIENĖ</p> <ul style="list-style-type: none"> <li>• Specify and select the key-parameters that influence the manufacturing process on an industrial scale.</li> <li>• Evaluate destructive and non-destructive testing for quality control of manufacturing process.</li> <li>• Propose novel embedded sensing solutions for the evaluation of adhesion strength.</li> <li>• Evaluate of the effect of different manufacturing defects on the bondline performance.</li> </ul>	<p><b>WG 4 - In-service life phase</b>            Leader: Wieslaw OSTACHOWICZ            Vice-leader: Theodoros LOUTAS</p> <ul style="list-style-type: none"> <li>• Propose diagnostic tools for the structural integrity assessment of the bonded structure.</li> <li>• Propose prognostic tools for the remaining useful life of the bonded structure.</li> <li>• Develop guidelines towards bonded repairs application.</li> </ul>
<p><b>WG 5 - Disassembly phase</b>            Leader: Laurent BERTHE</p> <ul style="list-style-type: none"> <li>• Description of the state-of-the-art about disassembly technologies.</li> <li>• Evaluation of the technologies and selection of the most promising technology.</li> </ul>	<p><b>WG 6 - Certification</b>            Leader: Thomas KRUSE-STRACK            Vice-leader: Ranko PETKOVIC</p> <ul style="list-style-type: none"> <li>• Define common nomenclature for all WG's activities and deliverables.</li> <li>• Integrate the outcomes and build the roadmap.</li> <li>• Establish contact with relevant certification bodies and large industry manufacturers in naval, civil, offshore, automotive and wind energy and disseminate the progress of the Action and the roadmap.</li> </ul>

## Short Term Scientific Mission

STSM & ITC conference grants coordinator: Loucas PAPADAKIS

### STSM application

Short Term Scientific Missions (STSM) are institutional visits aimed at supporting individual mobility, fostering collaboration between individuals. The selection of applicants is based on the scientific scope of the STSM application which must clearly compliment the overall objectives of the Action. Applications that contribute to the fulfilment of the Action deliverables will be given priority. Applications which advance the overall objectives of Certbond will be also considered on their merit and contribution, as far as the STSM funding is available. Action members are encouraged to promote their projects to potential STSM applicants thus encouraging collaboration between institutions whilst strengthening the Actions outputs and network.

### Who is eligible to take part in STSM

STSM applicants must be engaged in a research programme as a postgraduate student or postdoctoral fellow, or be employed by or officially affiliated to an institution or legal entity. This institution is considered as the Home institution. Institutions may be public or private entities.

### Application process for STSM

The applicant can submit an STSM application through e-Cost by clicking on the STSM application tab. If the applicant's e-COST profile is incomplete, they will first have to fill in the missing information (affiliation, education details, CV). Any already submitted applications are available for consultation in the applicant's e-COST profile. To submit a new application, the applicant clicks on 'Create a new STSM Request'. The application page contains the following sections:

- Applicant details
- STSM details
- Bank details
- Host details (must be located in a different country than the country of the applicant)
- Financial support
- Supporting documents

*Further information can be found on the Action website (<https://certbond.eu/>), including the STSM user guide.*

*Applicants are also requested to consult the COST Vademecum Chapter 8 for the updated information about STSMs.*

## Programme

11 January 2021		
09:00	Welcome, aim of meeting & announcements	Vice Chair
09:10	Update on STSM	STSM/ITC coordinator
09:20	Presentations of selected STSMs' from GP1	STSM
<b>10:30</b>	<b>Coffee break</b>	
10:45	Dissemination (website, social media)	Science Communication Manger
11:00	Online courses/ITN or other programs for European funding	Vice Chair
11:15	Training School	Training School Coordinator
<b>11:30</b>	<b>Wrap-up &amp; closure</b>	<b>Vice Chair</b>

12 January 2021		
09:00	Welcome & aim of the day	Chair
09:10	Parallel WG meetings (5 or 6 parallel)	WG Leaders
<b>10:15</b>	<b>Coffee Break</b>	
10:30	Outcome WG meetings	WG Leaders
11:00	Wrap-up & closure	Chair
<b>11:15</b>	<b>MC meeting</b>	<b>MC members</b>
12:00	Closure	Chair



## Selected STSM's and ITC's

### **ADVANCED DIC TECHNIQUES ON FRACTURE ANALYSIS OF DISSIMILAR ADHESIVE JOINTS | Panayiotis Tsokanas**

*Beneficiary Institution:* University of Patras, Greece

*Hosting Institution:* Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

*Relevant Working Groups:* WG2

### **ADHESION CAPABILITY OF ECO-EPOXY ADHESIVES OBTAINED BY THE ADDITION OF MODIFIED TANNIC ACID | Nataša Z. Tomić**

*Beneficiary Institution:* Innovation center of Faculty of Technology and Metallurgy in Belgrade, Serbia

*Hosting Institution:* TU Delft, Netherlands

*Relevant Working Groups:* WG1

### **FRACTURE CHARACTERIZATION UNDER MIXED-MODE LOADING OF COMPOSITE-METAL ADHESIVELY BONDED JOINTS UNDER AGEING CONDITIONS | Silvio de Barros**

*Beneficiary Institution:* Capacités (NANTES), France  
*Hosting Institution:* TU Delft, Netherlands

*Hosting Institution:* TU Delft, Netherlands

*Relevant Working Groups:* WG2

### **MOISTURE ABSORPTION CHARACTERISTICS AND EFFECTS ON MECHANICAL PROPERTIES OF FABRIC/EPOXY COMPOSITES | Vera Obradović**

*Beneficiary Institution:* Innovation Center of the Faculty of Technology and Metallurgy, Belgrade, Serbia

*Hosting Institution:* Klokner Institute, Czech Technical University in Prague / Czech Republic

*Relevant Working Groups:* WG2

### **ISOCYANATE MICROCAPSULES FOR COMPOSITE ONE-COMPONENT ADHESIVES | Mónica V. Loureiro**

*Beneficiary Institution:* Instituto Superior Técnico University of Lisbon (Lisboa) / Portugal

*Conference:* 27th Annual International Conference on Composites or Nano Engineering, Granada, Spain

### **STAB RESISTANCE OF p-ARAMID FABRIC PROTECTIVE COMPOSITES REINFORCED WITH NANOSTRUCTURES OF TUNGSTEN DISULFIDE | Danica M. Simić**

*Beneficiary Institution:* Military Technical Institute (MTI, VTI), Belgrade, Serbia

*Conference:* AUTEX2019 – 19th World Textile Conference on Textiles at the Crossroads, 11-15 June 2019, Ghent, Belgium

## Meeting Format

Given the COVID-19 pandemic, the meeting will take place virtually. Below you can find the meeting links.

**11 January 2021 | 09:00 AM (CET)**



**Link:** <https://tudelft.zoom.us/j/93437401480?pwd=a0RNeFBDbW1hYVpXOUxCUGFHU2JiQT09>

**Meeting ID:** 934 3740 1480

**Passcode:** 045238



**Link:** <https://tudelft.zoom.us/skype/93437401480>

**12 January 2021 | 09:00 AM (CET)**



**Link:** <https://tudelft.zoom.us/j/99673341878?pwd=N2pvMTBZSFloQzIESWlIekJYb3Z3Zz09>

**Meeting ID:** 996 7334 1878

**Passcode:** 602920



**Link:** <https://tudelft.zoom.us/skype/99673341878>

<https://certbond.eu/>



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