EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

COST Action CA18120

Reliable roadmap for certification of bonded primary structures

Certbond meetings

General Meeting
WG Meetings
MC Meeting

22-23 September 2021

Trieste, Italy

Practical Information Guide
Technical Programme

(Draft Version)

Funded by the Horizon 2020 Framework Programme of the European Union

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

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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[1]). 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/).

[1] 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

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

Action Management Committee

Action Chair	Sofia TEIXEIRA DE FREITAS
Action Vice Chair	Anastasios P. VASSILOPOULOS
WG 1 - Adhesive and interface chemistry	Ana MARQUES (ana.marques@tecnico.ulisboa.pt)
WG 2 - Design phase	Konstantinos TSERPES (kitserpes@upatras.gr)
WG 3 - Manufacturing phase	Nicolas CUVILLIER (nicolas.cuvillier@safrangroup.com)
WG 4 - In-service life phase	Wieslaw OSTACHOWICZ (wieslaw@imp.gda.pl)
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Training Schools Coordinator	Chiara BEDON (chiara.bedon@dia.units.it)
Database Coordinator	Michal BUDZIK (mibu@eng.au.dk)

Action Working Groups

WG 1 - Adhesive and interface chemistry
Leader: Ana MARQUES
Vice-leader: Åsa LUNDEVALL

- Evaluate current common practice in industry: adhesive chemistries and surface treatment processes for bonded joints.
- Collect the requirements and needs of the stakeholders and certification agencies, in terms of regulations (REACH).
- Propose novel non-toxic and environmentally friendly surface treatment processes and adhesive chemistries.
- Evaluate the quality of the new proposed eco-friendly solutions.

WG 2 - Design phase
Leader: Konstantinos TSERPES
Vice-leader: Norbert BLANCO

- Explore new design concepts (geometrical configurations and new crack arresting design features).
- Compare testing procedures for bondline characterization and models validation (under static, fatigue and impact loading, creep phenomena, imperfect bonding and environmental effects).
- Evaluate different design methodologies for the structural behaviour and progressive damage analysis of adhesively bonded structures.

WG 3 - Manufacturing phase
Leader: Nicolas CUVILLIER
Vice-leader: Rūta RIMAŠAUSKIENĖ

- Specify and select the key-parameters that influence the manufacturing process on an industrial scale.
- Evaluate destructive and non-destructive testing for quality control of manufacturing process.
- Propose novel embedded sensing solutions for the evaluation of adhesion strength.
- Evaluate of the effect of different manufacturing defects on the bondline performance.

WG 4 - In-service life phase
Leader: Wieslaw OSTACHOWICZ
Vice-leader: Theodoros LOUTAS

- Propose diagnostic tools for the structural integrity assessment of the bonded structure.
- Propose prognostic tools for the remaining useful life of the bonded structure.
- Develop guidelines towards bonded repairs application.

WG 5 - Disassembly phase
Leader: Laurent BERTHE

- Description of the state-of-the-art about disassembly technologies.
- Evaluation of the technologies and selection of the most promising technology.

WG 6 - Certification
Leader: Thomas KRUSE-STRACK
Vice-leader: Ranko PETKOVIC

- Define common nomenclature for all WG's activities and deliverables.
- Integrate the outcomes and build the roadmap.
- 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.

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.

Agenda

22 September 2021		
12:00	**Lunch**	
14:00	Welcome, aim meeting & general project overview	Chair
14:15	Presentations of selected STSMs' from GP2	Nataša Tomić Eliana Inca Cabrera
14:45	Presentations of selected ITC' from GP2	Nataša Tomić Filipe Ribeiro
15:15	**Coffee break**	
15:30	Presentation 'Virtual testing for product certification: can we trust computational models'	WG6: Fabio Santandrea, RISE Thomas Kruse, Airbus
16:00	Training School - Highlights - Poster presentation	Training School coordinator
16:30	Dissemination	Science Communication Manager
16:45	Wrap-up & closure of day 1	Chair
18:30	City centre walk and dinner (Optional)	Chiara Bedon

23 September 2021		
09:00	Welcome & aim of the day	Vice Chair
09:10	Parallel WG meetings (5 or 6 parallel)	WG Leaders
10:40	**Coffee Break**	
11:00	Continuation WG meetings (5 or 6 parallel)	WG Leaders
12:30	**Lunch Break**	
14:00	Outcome WG meetings (plenary) (10 min each)	WG Leaders
15:00	Wrap-up	Vice Chair
15:15	**Drinks**	
15:30	MC meeting	Chair
17:00	Closure of MC meeting	Chair

About Trieste

Trieste is a city and seaport in the north-eastern part of Italy, right next to Slovenia. It is located at the head of the Gulf of Trieste on the Adriatic Sea with a population of around 200,000. It is the capital of the autonomous Friuli Venezia Giulia Region that enjoys a special status and constitution granted by the Italian government. Popular tourist destination, Trieste was one of the oldest parts of the Habsburg Monarchy, belonging to it from 1382 until 1918.

The city is home to **University of Trieste** and many other scientific centers, like **ICTP** (Abdus Salam International Centre for Theoretical Physics), **SISSA** (International School for Advanced Studies), and **ELETTRA SINCROTRONE** (a multidisciplinary international research centre specialized in generating high quality synchrotron and free-electron laser light and applying it in materials and life sciences).






Venue

University of Trieste – Department of Engineering and Architecture

Piazzale Europa 1

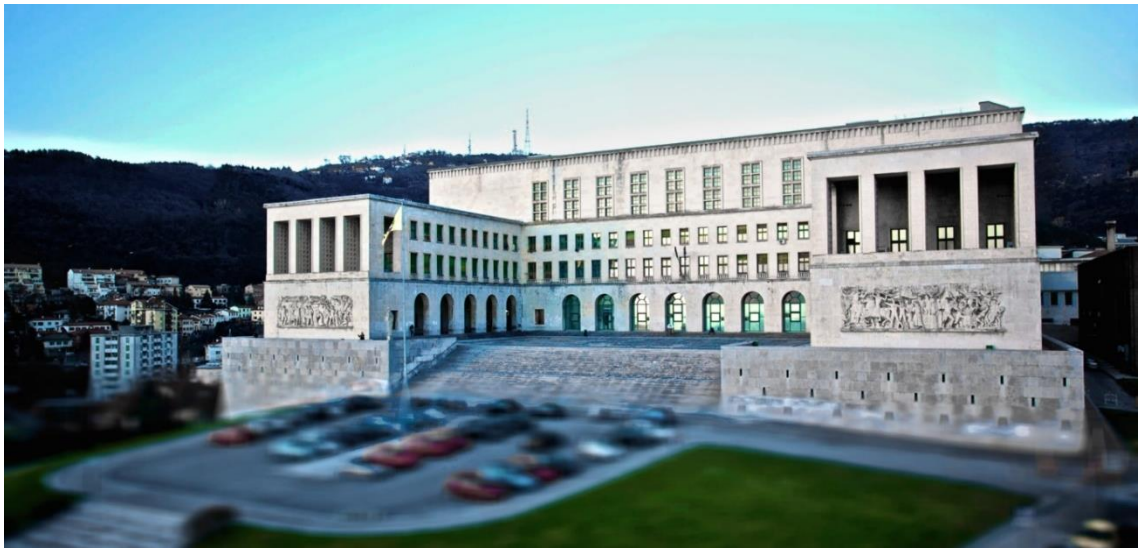
34127 Trieste

ITALY

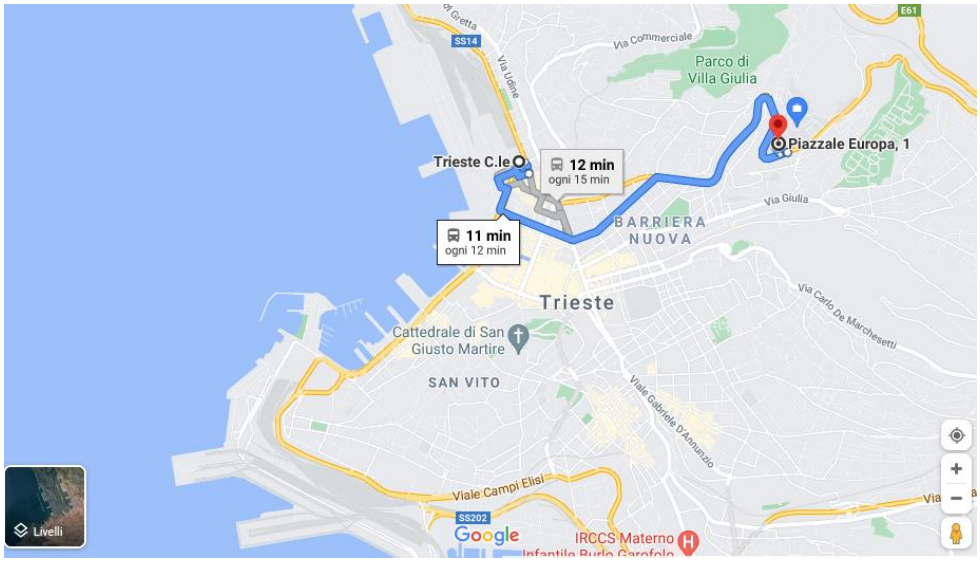
LOCAL HOST (contact details): Chiara BEDON (chiara.bedon@dia.units.it)

UNIVERSITÀ DEGLI STUDI DI TRIESTE

Dipartimento di Ingegneria e Architettura



How to reach: The venue can be easily reached by using public transportation. From the main train station (Trieste Centrale): Bus 17/ towards Piazzale Europa (main campus, 15 minutes)



Meals & Accommodation

Meals & coffee breaks

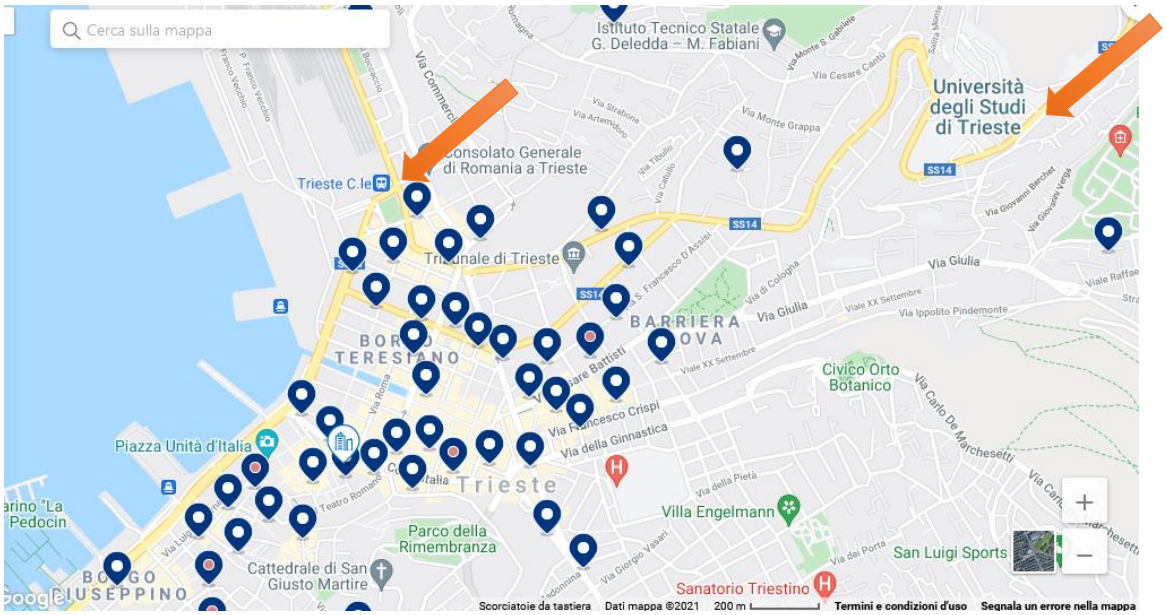
Lunches, drinks and coffee breaks will be provided by the local organiser.

Note: if you have any restrictions (e.g. any dietary preferences and/or allergies), please take care of these details when filling the online form.

Accommodation

The University campus is located in the centre of Trieste.

Accordingly, the venue is well connected by public transportation. The University Campus can be also easily reached by foot. Several accommodations are conveniently located in the city centre.



https://certbond.eu/

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