EUROPEAN COOPERATION
IN SCIENCE & TECHNOLOGY

COST Action CA18120

Reliable roadmap for certification of bonded primary structures

Training School

September 20-22, 2021

University of Trieste – Trieste, Italy

Updated Announcement

(July 2021)

Funded by the Horizon 2020 Framework Programme of the European Union

EUROPEAN COOPERATION
IN SCIENCE & TECHNOLOGY

CertBond
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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

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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

CertBond
COST Action 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)
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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.

Training School

Training Schools Coordinator: Chiara BEDON

Context

The first CERTBOND Training School (TS) aims to identify young talented researchers and to increase their participation in the Action activities. Practical and theoretical activities in support of the characterization and certification of primary bonded composite structures will be offered by international experts. Laboratory visits, practical lectures, workshop activities, poster sessions will be offered in four days with the support of international experts and renowned facilities.

Who is eligible to take part in TS

PhD candidates and researchers are welcome. There are no registration fees to attend the Training School. However, a limited number of applicants will be selected by the organizing committee and will receive the financial support from COST.

Application process

Interested applicants must fill the online form (Click Here). Questions can be submitted by email to the Training School coordinator, chiara.bedon@dia.units.it (SUBJECT OF MESSAGE: "CERTBOND TS – name surname").

Important Dates

~~Application deadline: before January 31st, 2020~~
~~Notification of acceptance: February 29th, 2020~~
Training School: September 20-22, 2021

For any request on your application, please contact the Training School coordinator. Applicants are also requested to consult the COST Vademecum Chapter 6 for the updated information about TSs.

Agenda & speakers

The Training School will involve students in technical lectures, practical lectures, as well as technical visits to strategic labs & facilities in Trieste. Special care will be spent for the active contribution of students that will be able to interact in the “Workshop” and “Poster” session.

Time	Day 1 – 20/09	Day 2 – 21/09	Day 3 – 22/09
09:00 – 13:00	Registration/ Welcome	Lecture WG	Lecture WG
	Practical Lecture	Best Poster & Speaker	Technical visits
	Coffee-break	Coffee-break	Technical visits
	Lecture WG	Lecture WG	Technical visits
13:00 – 14:30	Lunch buffet	Lunch buffet	Lunch buffet & Closing
14:30 – 18:00	Workshop & Poster Competition	Practical Lecture	
	Coffee-break	Coffee-break	
	Lab visits	Lab visits	

All the lectures and practical activities will be secured by international experts, including:

- Plenary lectures – Dr. **S. Caillol** (CNRS) and Prof. **Christian Louter** (TU Dresden, DE)
- Adhesives chemistry – Dipl. Chem. **E. Stammen** (TU Braunschweig, DE)
- Design and simulation – Prof. **K. Tserpes** (University of Patras, GR)
- In-service life – Prof. **W. Ostachowicz** (Polish Academy of Science, PL)
- Assessment – Dr. **N. Cuvillier** (SAFRAN)

and many others.

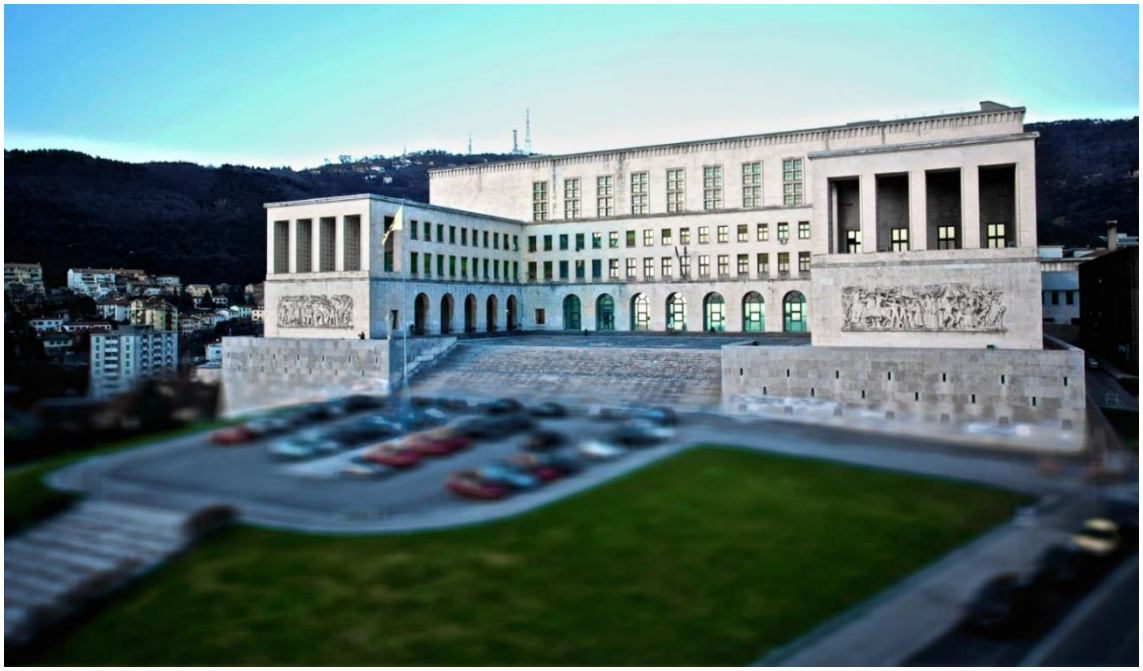
Important: due to sanitary emergency rules, the Training School lectures will take the form of blended talks (hybrid mode with face-to-face & online tools).

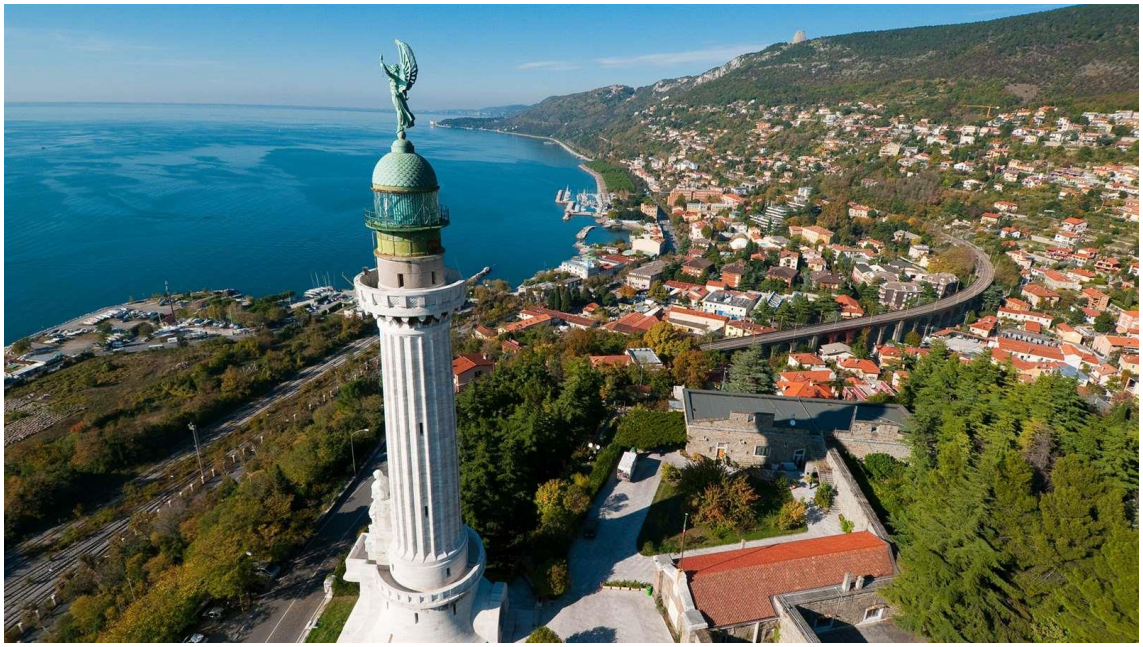
Venue

University of Trieste – Department of Engineering and Architecture

Piazzale Europa 1

34127 Trieste – Italy

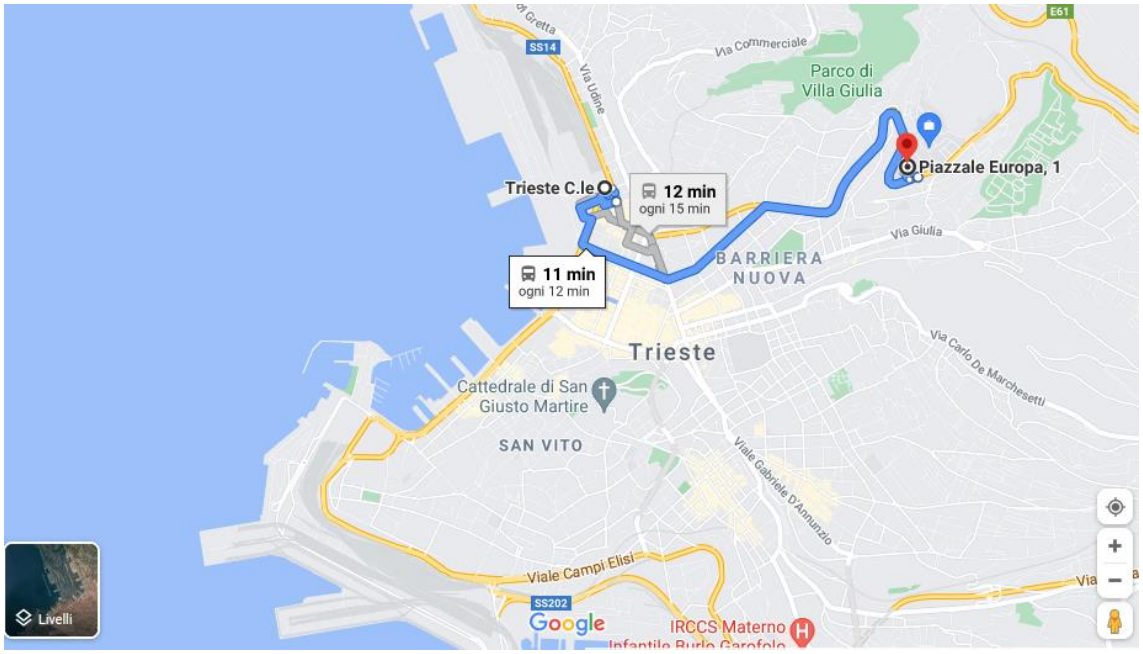




LOCAL HOST (contact details): Chiara BEDON (chiara.bedon@dia.units.it)

How to reach:

The Training School venue can be easily reached by using public transportation.
From the main train station (Trieste Centrale): Bus 17



Bus 17/ (15 min)

Meals & Accommodation

Meals & coffee breaks

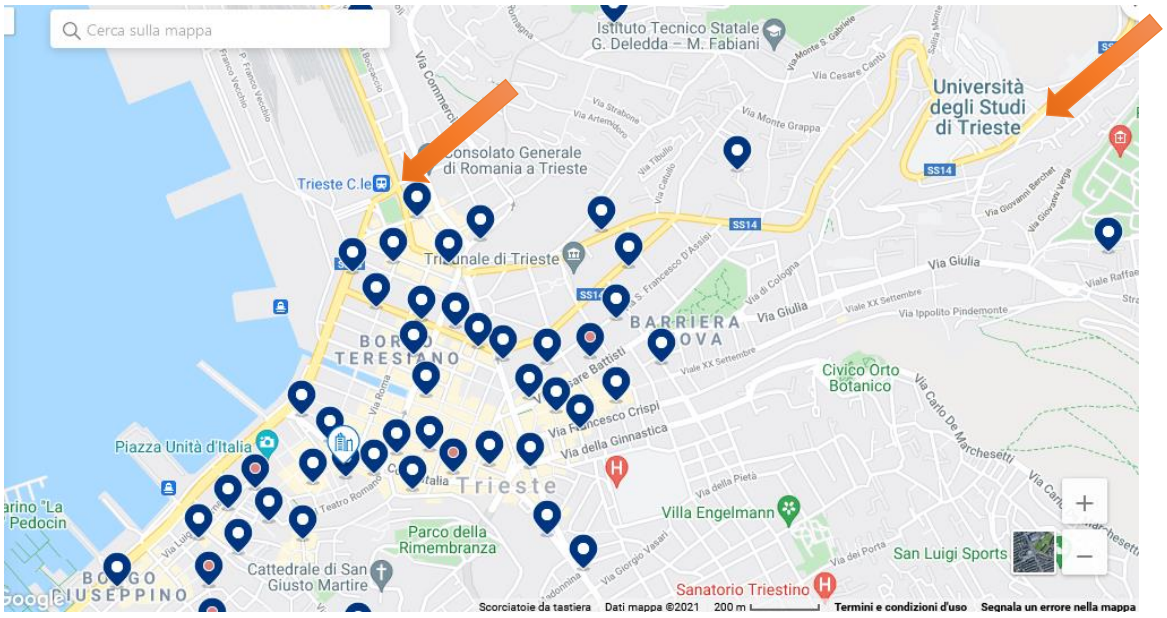
Lunches, drinks and coffee breaks will be provided by the local organiser.

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. Several accommodations are conveniently located in the city centre.



https://certbond.eu/

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