
**Draft Project plan for the CEN-
CENELEC Workshop on
"MADRAS - Advanced materials
and processing in organic
electronics"**

**Requests to participate in the Workshop
and/or comments on the project plan are
to be submitted by
25th October to farribas@une.org¹**

Recipients of this project plan are kindly requested to name all patent rights known to them to be relevant to the Workshop and to make available all supporting documents.

Madrid, 29 September (Version 1)

¹ Applications for participating in the Workshop and comments on the project plan that are not received by the deadline do not need to be taken into consideration. Once constituted, the Workshop will decide whether or not to consider the comments received in good time.

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Summary

In-Mould Electronics (IME), also known as plastronics, is used to enhance the device integration process, increasing resistance to humidity and wear and tear, and adding custom-made connectors. IME will also serve as a manufacturing process for the advanced materials with better conductive and resistant properties proposed in the project.

This technology allows to create plastronic products combining electronics' functional printing and electronic components' hybridisation with traditional plastic transformation processes, such as thermoforming and injection moulding.

IME brings a wide variety of advantages in comparison to traditional manufacturing processes, like increased functionality or more durable electronics, as they are protected and embedded. It also eases automation, as those conventional processes are replaced with a single part that does not require any assembly during production. Additionally, the complexity of plastic products is reduced, thickness and weight are lowered, and electronics are integrated in products that have geometrically complex 3D shapes.

In Mould Electronics (IME) will be validated as a high-speed and competitive manufacturing methodology, building up on an already established mass production technology as plastic injection.

The objective of this Workshop is the development of two CEN Workshop Agreement on Hybridization, Thermoforming and injection moulding of rigid control units on in-mould flexible devices process and one CEN Workshop Agreement on the effect of plastic insertion on the design of antennas by simulation and material choice for in-mould tags.

1 Status of the project plan

Draft project plan for public commenting (Version 1.0)

This draft project plan is intended to inform the public of a new Workshop. Any interested party can take part in this Workshop and/or comment on this draft project plan. Please send any requests to participate or comments by e-mail to farribas@une.org

All those who have applied for participation or have commented on the project plan by the deadline will be invited to the kick-off meeting of the Workshop on **2 November 2022**

Approved project plan for CWA development adopted at the kick-off meeting of the Workshop on **2 November 2022** (Version 1)

2 Workshop proposer and Workshop participants

The proposer of this CEN Workshop is the Project MADRAS funded by Horizon2020 programme under Grant agreement n. 862492 and coordinated by:

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The main contact point for the CEN Workshop is:

Laura López Mir, PhD
Researcher | Functional Printing & Embedded Devices Unit
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Phone: +34 93 741 91 00

e-mail: laura.lopezm@eurecat.org

MADRAS project Partner

The CEN/CENELEC national member holding the Workshop secretariat is:

UNE – Asociación española de Normalización
 Calle Génova, 6. 28004 Madrid
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2.1 Workshop proposer

<u>Person or organisation</u>	<u>Short description and interest in the subject</u>
Horizon2020 project MADRAS GA 862492 Rosa Araujo (Coordinator of EU Project)	Technology Centre of Catalonia, EURECAT Eurecat is the result of the merging process of the main Catalan Technology Centres, a process which started in 2015 and still ongoing which counts already with the sum of capacities of seven originals Centres and beyond. Eurecat is currently participating in more than 70 EU funded collaborative projects, mainly in the Horizon 2020 Programme. Eurecat R&D, innovation and training activities span from Industrial Technologies (metallic, plastic and composite materials, manufacturing processes, autonomous and professional robotics, functional printing and fabrics, simulations and sustainability) to Digital Technologies (Digital Humanities, Big Data Analytics, IT Security and Smart Management Systems, e-health, data mining and multimedia technologies) and Biotech (Omic science and Nutrition & health). Additionally, EURECAT has been accepted by the European Commission as a KETs (Key Enabling Technologies) Technology Centre in order to collaborate with SMEs on close-to-market research and innovation activities.
Laura López Mir, PhD	Researcher Functional Printing & Embedded Devices Unit Technology Centre of Catalonia, EURECAT

2.2 Other potential participants

These CWA's will be developed in a Workshop (temporary body) that is open to any interested party. The participation of other experts would be helpful and is desired. It is recommended that:

- Academic and research bodies
- Funded European Projects (i.e. Horizon 2020, Horizon Europe)
- Industry and commerce
- Manufacturesrs of electronic devices
- Standards application

take part in the development of these CWA's.

2.3 Participants at the kick-off meeting

The list of participants is not yet fully finalized. It will be available after the kick off meeting A high participation is expected from experts coming from different funded European projects (e.g. Horizon2020).

2.4 Registered Workshop participants

The following persons or organisations have registered as Workshop participants at the kick-off meeting and will actively participate in the development of the CWA.

<u>Person</u>	<u>Organisation</u>
<u>Workshop Chair</u> Laura López Mir, PhD	Functional Printing & Embedded Devices Unit Technology Centre of Catalonia, EURECAT
<u>Workshop Vice-Chair</u> Rosa Araujo (Coordinator of EU Project)	<u>Workshop Vice-Chair</u> Technology Centre of Catalonia, EURECAT
<u>Workshop secretariat</u> UNE - Asociación española de Normalización Francisco Luis Arribas Martin	<u>Workshop secretariat</u> UNE – Spanish Association for Standardization

3 Workshop objectives and scope

In-Mould Electronics (IME), also known as plastronics, is being used to enhance the device integration process, increasing resistance to humidity and wear and tear, and adding custom-made connectors. IME will also serve as a manufacturing process for the advanced materials with better conductive and resistant properties proposed in the project.

This technology allows to create plastronic products combining electronics' functional printing and electronic components' hybridisation with traditional plastic transformation processes, such as thermoforming and injection moulding.

3.1 Background

The objective of this Workshop is the development of **two** CEN Workshop Agreement on Hybridization, Lamination, Thermoforming and Injection Moulding and **one** CEN Workshop Agreement common requirement to laminate and thermoform electronic circuits-based PI substrates Background

- Motivation for the creation of this Workshop:** In Mould Electronics (IME) will be validated as a high-speed and competitive manufacturing methodology, building up on an already established mass production technology as plastic injection. This workshop will show the flexibility, transferability, replicability, reproducibility and yield of the IME process to manufacture a diversity of flexible plastronic products. Also, will proof a cost reduction for the structuring and processing of OLAE materials into device structures compared to standard devices due to: increased manufacturing yield from 30% to 50% when compared to non over moulded devices; development and use of chemical synthesis to enable cheaper transparent conducting materials; and application of low- cost encapsulant layers by injection moulding.
- Market environment:** The industrial and academic R&D communities are the target group being active in materials, chemical, manufacturing, consumer goods, electronics, energy production and storage, bioprocesses.
- Legal environment:** No known legal issues.

3.2 Scope

The purpose of the planned CEN/ Workshop Agreement(s) related In Mould Electronics is to develop two CWA's, namely:

“Injection moulding on hybridized rigid control units on flexible substrates”

Scope:

- Establish best practices for hybridization and injection moulding of rigid control units on in-mould flexible devices, in the case of study, an in-mould battery-free geolocation tag, a FR4-based control unit which has the function of enabling energy harvesting and communication of dedicated printed antennas, is directly hybridised on a flexible substrate which is ultimately integrated in a plastic piece through injection moulding. Procedures for the accurate attachment, alignment of the control unit on substrate with the injection mould and for reliable plastic over-moulding process are defined. Reproducibility, yield, and cost-effectiveness are evaluated.

“Integration of PI-based flexible electronics on conformable plastic substrate”

Scope:

- Establish a common requirement to integrate a device stack fabricated on PI carrier onto a plastic substrate suitable for in-mould processing as polycarbonate (PC), using a thermoplastic polyurethane (TPU) as intermediate layer. The adhesion of a TPU interlayer enables to overcome the poor stretchability and poor adhesion of PI with most polymers.

The purpose of the planned CEN/ Workshop Agreement(s) related design of antennas is to develop a CWA, namely:

“Design rules for simulations of in-mould antennas”

Scope:

- Establish best practices on the design of printed antennas (UHF and UWB) by simulation considering the presence of a TPU layer. Performance and dimensions of the antennas are linked to the dielectric permittivity and the thickness of the used substrate and superstrate. Therefore, any material used for over-moulding should be considered in the simulation for an accurate antenna design.

3.3 Related activities

The subject of the planned CWA is not at present the subject of a standard. However, there are committees, standards and/or other technical specifications that deal with related subjects and thus need to be taken into account - and involved, where necessary - during this Workshop:

- ISO/IEC JTC 1/SC 31 Automatic identification and data capture techniques
- ISO/IEC JTC 1/SC 6 Telecommunications and information exchange between systems
- IEC TC 119 Printed Electronics
- CLC TC 210 Electromagnetic Compatibility (EMC)

4 Workshop programme

4.1 General

The kick-off meeting is planned to take place on 2022-11-02 in Madrid. A draft for public commenting will be published for 30 days.

A total of 3 Workshop meetings (kick-off meeting and Workshop meetings) and web conferences will be held, during which the content of the CWA(s) will be presented, discussed and approved.

The CWA will be drawn up in **English** (language of meetings, minutes, etc.). The CWA will be written in **English**

The drafting process is open and all comments will be considered, first by the chair person and secondarily by the participants of the workshop.

In order to minimise travelling, meetings will mostly be done remotely. If a physical meeting is desirable, it will be organised.

4.2 Workshop schedule

Table 1: Workshop schedule (preliminary)

CEN/CENELEC Workshop	Sep 2022	Oct 2022	Nov 2022	Dic 2022	Jan 2023	Feb 2023	Mar 2023						
Initiation													
1. Proposal form submission and TC response													
2. Project plan development													
3. Open commenting period on draft project plan (mandatory)													
Operation													
4. Kick-off meeting													
5. CWA(s) development (including 30-days open consultation)													
7. CWA(s) finalised and approved by Workshop participants													
Publication													
8. CWA(s) publication													
Dissemination													
Milestones			K		M		V		M		A		P

- K** Kick-off
- M** Workshop meeting
- V** Virtual Workshop meeting
- A** Adoption of CWA
- P** Publication of CWA
- D** Online distribution of CWA

5 Resource planning

The administrative costs of CEN Workshop Secretariat will be covered by resources from the H2020 Project MADRAS.

6 Workshop structure and rules of cooperation

The workshop will be lead by a chair or vice-chair. The workshop secretariat is responsible for the organisation and management of the workshops.

a. CEN Workshop Chairman:

PhD Laura López Mir

Functional Printing & Embedded Devices Unit Technology Centre of Catalonia, EURECAT

Chairman main responsibilities include:

- Chairing the CEN Workshop meetings.
- Representing the CEN Workshop in outside meetings in cooperation with CCMC and with the Workshop secretariat.
- Monitoring the progress of the CWA in line with the Project Plan.
- Managing the consensus building process.
- Interface with CEN/WS Secretariat and CEN Management Centre regarding strategic indications, external relationships, problems arising in the development of the CWA

b. CEN Workshop Vice-Chair

The Workshop vice-chair shall be appointed in the Kick-off meeting. The vice-chair shall support and assist in all responsibilities outlined for the chairperson. In the absence of the chairperson, the vice-chair will represent the CEN Workshop at outside meetings in cooperation with CEN/WS Secretariat and will interface with CCMC regarding strategic directions, problems arising, external relationships etc.

c. CEN Workshop Secretariat

The proposed CEN Workshop Secretariat is by UNE - Spanish National Standard Body.

CEN Secretariat is providing the formal link to the CEN system. The following main activities will be carried out by the Workshop Secretariat:

- Organizing CEN Workshop plenary meetings,
- Producing CEN Workshop minutes and action lists,
- Forming the administrative contact point for CWA project,
- Managing CEN Workshop attendance lists,
- Managing CEN Workshop document registers,
- Following-up action lists,
- Assisting Chairperson in monitoring and following-up of electronic discussions, in case the CEN Workshop is mainly working by electronic means,
- Administrating the liaison with relevant CEN/TCs, if applicable.

The Secreteriat will also provide public dissemination of the CEN workshop and CWA, either via online tool (e.g. website, social media) and with dedicated seminars and workshops, exploiting liaison with international innovation community.

The proposed contact detail for UNE Secretariat is:

Francisco Luis Arribas Martín

6.1 Participation in the Workshop

The Workshop will be constituted during the course of the kick-off meeting. By approving this project plan, the interested parties declare their willingness to participate in the Workshop and will be formally named as Workshop participants, with the associated rights and duties. Participants at the kick-off meeting who do not approve the project plan are not given the status of a Workshop participant and are thus excluded from further decisions made during the kick-off meeting and from any other decisions regarding the Workshop.

As a rule, the request to participate in the Workshop is closed once it is constituted. The current Workshop participants shall decide whether any additional members will be accepted or not.

Any new participant in the Workshop at a later date is decided on by the participants making up the Workshop at that time. It is particularly important to consider these aspects:

- a. expansion would be conducive to shortening the duration of the Workshop or to avoiding or averting an impending delay in the planned duration of the Workshop;
- b. the expansion would not result in the Workshop taking longer to complete;
- c. the new Workshop participant would not address any new or complementary issues beyond the scope defined and approved in the project plan;
- d. the new Workshop participant would bring complementary expertise into the Workshop in order to incorporate the latest scientific findings and state-of-the-art knowledge;
- e. the new Workshop participant would actively participate in the drafting of the manuscript by submitting concrete, not abstract, proposals and contributions;
- f. the new Workshop participant would ensure wider application of the CWA.

All Workshop participants who voted for the publication of the CWA or its draft will be named as authors in the European Foreword, including the organisations which they represent. All Workshop participants who voted against the publication of the CWA, or who have abstained, will not be named in the European Foreword.

6.2 Workshop responsibilities

The Workshop Chair is responsible for content management and any decision-making and voting procedures. The Workshop Chair is supported by the Workshop Vice-Chair and the responsible Workshop secretariat, whereby the Workshop secretariat will always remain neutral regarding the content of the CWA(s). Furthermore, the Workshop secretariat shall ensure that CEN-CENELEC's rules of procedure, rules of presentation, and the principles governing the publication of CWA(s) have been observed. Should a Workshop Chair no longer be able to carry out her/his duties, the Workshop secretariat shall initiate the election of a new Workshop Chair. The list below covers the main tasks of the Workshop Chair. It is not intended to be exhaustive.

- Content related contact point for the Workshop
- Presides at Workshop meetings
- Ensures that the development of the CWA respects the principles and content of the adopted project plan
- Manages the consensus building process, decides when the Workshop participants have reached agreement on the final CWA, on the basis of the comments received
- Ensures due information exchange with the Workshop secretariat
- Represents the Workshop and its results to exterior

The Workshop secretariat, provided by a CEN/CENELEC national member, is responsible for organising and leading the kick-off meeting, in consultation with the Workshop proposer. Further Workshop meetings and/or web conferences shall be organised by the Workshop secretariat in consultation with the Workshop Chair. The list below covers the main tasks of the Workshop secretariat. It is not intended to be exhaustive.

- Administrative and organisational contact point for the Workshop
- Ensures that the development of the CWA respects the principles and content of the adopted project plan and of the requirements of the CEN-CENELEC Guide 29
- Formally registers Workshop participants and maintains record of participating organisations and individuals
- Offers infrastructure and manage documents and their distribution through an electronic platform
- Prepares agenda and distribute information on meetings and meeting minutes as well as follow-up actions of the Workshop
- Initiates and manage CWA approval process upon decision by the Workshop Chair
- Interface with CEN-CENELEC Management Centre (CCMC) and Workshop Chair regarding strategic directions, problems arising, and external relationships

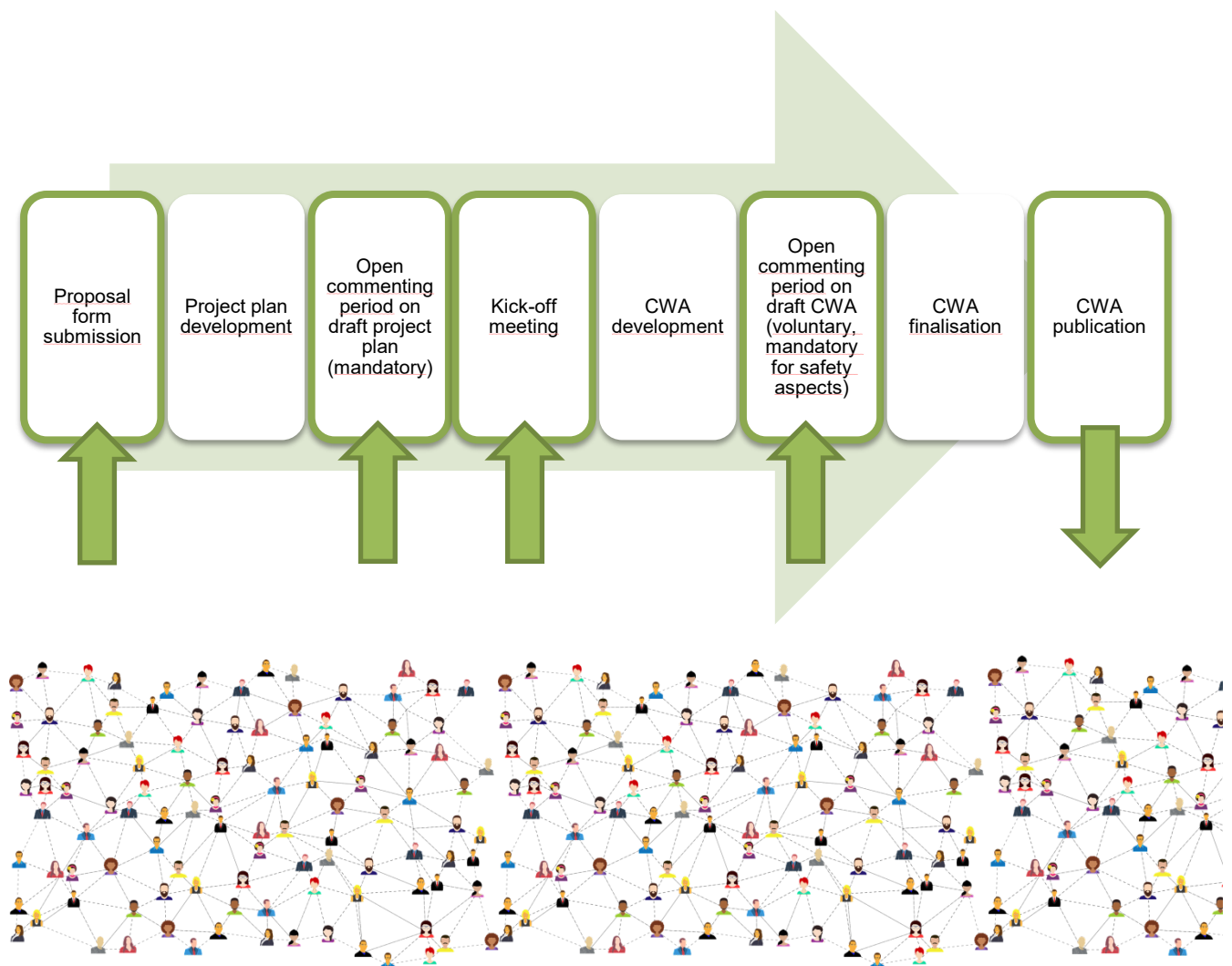
- Advises on CEN-CENELEC rules and bring any major problems encountered (if any) in the development of the CWA to the attention of CEN-CENELEC Management Centre (CCMC)
- Administrates the connection with relevant CEN or CENELEC/TCs

6.3 Decision making process

Each Workshop participant is entitled to vote and has one vote. If an organisation sends several experts to the Workshop, that organisation has only one vote, regardless of how many Workshop participants it sends. Transferring voting rights to other Workshop participants is not permitted. During voting procedures, decisions are passed by simple majority; abstentions do not count.

If Workshop participants cannot be present in the meetings when the CWA or its draft is adopted, an alternative means of including them in the voting procedure shall be used.

7 Dissemination and participation strategy



Proposal form submission

The Workshop proposal will be disseminated to the following relevant stakeholders and bodies for consultation:

- standards committee, working group etc.
- publisher of technical rules
- sector forum^{Error! Bookmark not defined.}
- focus group^{Error! Bookmark not defined.}
- coordination group^{Error! Bookmark not defined.}
- others

Open commenting period on draft project plan

The project plan will be disseminated to the following relevant stakeholders and bodies for commenting:

- standards committee, working group etc.
- publisher of technical rules
- sector forum^{Error! Bookmark not defined.}
- focus group^{Error! Bookmark not defined.}
- coordination group^{Error! Bookmark not defined.}
- others

In addition to the CCMC website, the project plan and the date of the kick-off meeting will be advertised on <XYZ> to raise awareness. Interested parties are requested to contribute either through commenting of the project plan (short term) or through Workshop participation (long term).

Open commenting period on draft CWA

The draft CWA will be disseminated to the following relevant stakeholders and bodies for commenting:

- standards committee, working group etc.
- publisher of technical rules
- sector forum^{Error! Bookmark not defined.}
- focus group^{Error! Bookmark not defined.}
- coordination group^{Error! Bookmark not defined.}
- others

In addition to the CCMC website, the draft CWA will be advertised on <2022-10-02> to raise awareness. Interested parties are requested to contribute through commenting of the draft CWA (short term).

CWA publication

The final CWA will be disseminated to the following relevant stakeholders and bodies:

- standards committee, working group etc.
- publisher of technical rules
- sector forum^{Error! Bookmark not defined.}
- focus group^{Error! Bookmark not defined.}
- coordination group^{Error! Bookmark not defined.}
- others

In addition to the CCMC website, the final CWA will be advertised on:

- sector specific newsletter
- social media, such as
 - Facebook
 - Instagram
 - LinkedIn
 - Twitter
- Research Gate
- EC Newsroom
- others

8 Contacts

- Workshop Chair:

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- Workshop proposer

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