

**Proposal for a CEN-CENELEC
Workshop on " ADVANCED
MATERIALS AND PROCESSING
IN ORGANIC ELECTRONICS' —
'MADRAS"**

1 Proposal Form for the Workshop proposer

Details of the Workshop proposer:

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Already known partners:

- <Add names of persons and organizations who will presumably take part in the Workshop>
- FUNDACIO EURECAT (EURECAT)
- NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO (TNO)
- INFINITYPV APS (INF)
- UWINLOC (UWL)
- ARJOWIGGINS FRANCE (AWCP)
- TECNOPACKAGING
- GENESINK
- COC
- UNIVERSITY OF PARDUBICE

Title of the proposed Workshop:

ADVANCED MATERIALS AND PROCESSING IN ORGANIC ELECTRONICS

Background/Objectives:

The MADRAS project use In-Mould Electronics (IME), also known as plastronics, 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, Lamination, Thermoforming and Injection Moulding and one CEN Workshop Agreement common requirement to laminate and thermoform electronic circuits-based PI substrates Background

Scope of the proposed Workshop (planned area of application):

The planned Workshop is applicable to hybridization and injection moulding of rigid control units on in-mould flexible devices process, it establishes best practices for the printing of plastronic devices taking into account the reproducibility, yield, functionality and cost of the In Mould Electronics processing.

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

“Injection moulding on hibridized rigic 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 subtsrate”

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.

Are the following aspects potentially affected?

	YES	NO
Safety matters	<input type="checkbox"/> ¹	<input checked="" type="checkbox"/>
Management system aspects	<input type="checkbox"/> ²	<input checked="" type="checkbox"/>
Conformity assessment aspects	<input type="checkbox"/> ³	<input checked="" type="checkbox"/>
Security matters	<input type="checkbox"/> ⁴	<input checked="" type="checkbox"/>

<Add information/explanations to the points marked „yes“>

Theme related standardization Technical Bodies, standards or regulations, if applicable:

- 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)
-

¹ For CEN: The CEN/CENELEC Workshop proposal shall be submitted to CEN/BT for decision. For CENELEC: Work on the proposed CEN/CENELEC Workshop shall not be initiated.

² The CEN/CENELEC Workshop proposal shall be submitted to the CEN/CENELEC BT(s) for decision.

³ CEN/CENELEC Internal Regulations - Part 3, 33 applies.

⁴ For projects dealing with security matters the security risk analysis provided below (item 3) shall be carried out.

Optional attachments:

The Kick-Off Meeting is foreseen in October-Novemeber 2022
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.
Completion of the drafting by the end of the MADRAS project

2 Proposal Form for the Workshop secretariat

CEN-CENELEC Workshop on "Hybridization and injection moulding of rigid control units on in-mould flexible devices "

Details of the Workshop secretary:

Name: Francisco Luis Arribas Martin
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Finance:

Horizon 2020-NMBP-TR-IND-2019 GA No. 862492

Drafting and Dissemination:

1. "Injection moulding on hibridized rigid control units on flexible substrates"
2. "Integration of PI-based flexible electronics on conformable plastic subtrate"
3. "Design rules for simulations of in-mould antennas"

Distribution and dissemination through NSBs

Does the proposed CWA conflict with an EN or an HD?

	YES	NO
EN	<input type="checkbox"/> ⁵	<input checked="" type="checkbox"/>
HD (CENELEC)	<input type="checkbox"/> ⁵	<input checked="" type="checkbox"/>

<please add information/explanations to the points marked „yes“>

Is the proposed CWA within the domain of an existing CEN and/or CENELEC Technical Body?

– <CEN/CENELEC TC>

CEN/CENELEC Management Centre (to be completed by CCMC):

Name of the CCMC project manager:
Organization: CCMC
Postal address: Rue de la Science 23, 1040 Brussels
Email:
Phone: +32 2 550 xxxx
Webpage: <https://www.cencenelec.eu/aboutus/MgtCentre/Pages/default.aspx>

⁵ Work on the proposed CWA shall not be initiated.

Response of identified potentially affected CEN/CENELEC TCs

	YES	NO
Is there an active work item covering the scope of the planned CWA?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are there arguments against the topic of the planned CWA?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<Add information/explanations to the points marked „yes“>		

3 Security risk analysis

3.1 General

Security risk analysis is a process of identifying and analysing the main negative factors that may affect a standardization project's objectives. The following is targeted at secretariats of CEN/CENELEC Workshop Agreements (CWA) dealing with security issues. Its purpose is to help them identify and mitigate the risks associated with their project. It is structured around two main security threats that can affect the success of the work: major diverging interests among stakeholders and sensitive information.

3.2 Risk analysis on major diverging interest among stakeholders

Diverging interests among stakeholders can impede the process in reaching agreement on the CWA and even lead to failure to deliver the planned CWA. In order to identify and possibly mitigate the risks, the following questions should be reviewed:

- Is the planned CWA expected to have a major impact on the security policy/strategy of the core stakeholders?
- Does the scope of the CWA cover products or services with a clear dual-use purpose (i.e. which can be used for military purposes)?

3.3 Risk analysis on sensitive information

- In light of the scope of the CWA, is it likely that it may deal with sensitive information? If so, what is the information sensitivity level?
- Is there a need for a (non-)disclosure agreement?
- Is there any conflict of interest for stakeholders involved in the CEN/CENELEC Workshop, regarding especially the use they may make of any information they receive during the development of the CWA?
- What steps should be taken to manage information dissemination and storage (e.g. memory stick, emailing, storage) during the development process of the CWA?

<Add statement here>