D6.1: Call Announcement and Guide for Applicants

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Authors	Antonio Montalvo (FBA), Patrycja Kula (FBA)
Contributors	Iñaki Sainz (LOR), Aitor Irizar (LOR), Enrique Gil (DGH), Kevin Strehl (GROB), Christos Papaioannou (LMS), Vangelis Xanthakis, (INTRA), Raimund Broechler (INTRA)
Reviewers	Iñaki Sainz (LOR)
Abstract	This document contains requirements for Open Call applicants: an Open Call Announcement, a Guide for Applicants, Technical Guidelines and Frequently Asked Questions.
Keywords	Open Call, Open Call documents, Guide for Applicants

CHANGE CONTROL

Date	Version	Editor	Changes to document
2023/12/06	v1.0	Antonio Montalvo, Patrycja Kula	First release
2024/03/07	v1.1	Antonio Montalvo, Patrycja Kula	Comments and suggestions from partners

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Important remarks:

- The contributors listed in this table and on the front page are the report's primary editing authors. It is important to note that all COROB partners are contributing critical technical contributions to this ongoing work.

DISCLAIMER

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Nature of the deliverable:	**R**	
Dissemination Level		
PU	*Public, fully open, e.g. web (Deliverables flagged as public will be automatically published in CORDIS project's page)*	✓
SEN	*Sensitive, limited under the conditions of the Grant Agreement*	
Classified R-UE/ EU-R	*EU RESTRICTED under the Commission Decision No2015/ 444*	
Classified C-UE/ EU-C	*EU CONFIDENTIAL under the Commission Decision No2015/ 444*	
Classified S-UE/ EU-S	*EU SECRET under the Commission Decision No2015/ 444*	

* *R: Document, report (excluding the periodic and final reports)*

DEM: Demonstrator, pilot, prototype, plan designs

DEC: Websites, patents filing, press & media actions, videos, etc.

DATA: Data sets, microdata, etc.

DMP: Data management plan

ETHICS: Deliverables related to ethics issues.

SECURITY: Deliverables related to security issues

OTHER: Software, technical diagram, algorithms, models, etc.

EXECUTIVE SUMMARY

Deliverable D6.1 aims to provide guidance and requirements for Open Call applicants. The following list provides documents included in this Deliverable:

- Call Announcement
- Guide for Applicants
- Technical Guidelines
- Frequently Asked Questions

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COROB Open Call Announcement

Call Announcement	
Call title:	COROB OPEN CALL
Full name of the EU-funded project:	Cooperative robotics powered by AI and data for flexible production cells
Project acronym:	COROB
Grant agreement number:	101120640
Call publication date:	08/04/2024
Call deadline:	08/07/2024
Expected duration of participation:	12 months for 1st Funding Instrument: Solutions to challenges Stage 1 'Individual Mentoring Plan' Stage 2 'Solution development' Stage 3 'Solution Validation' 9 months for 2nd Funding Instrument: Experiments for Enabling technologies for digital service Stage 1 'Individual Mentoring Plan' Stage 2 'Digital service development' Stage 3 'Digital service validation'
Total EU funding available:	€ 2 000 000 (COROB Open Call)
Submission & evaluation process:	Submission through the application form available at: https://corob-oc.fundingbox.com/pages/corob-oc The selection of the Open Call proposals will be carried out in a six steps process. - Step one will check the proposals against admissibility and eligibility criteria. - Step two (In/Out Scope Screening) will involve a 'Selection Committee' to assess the proposal according to the criteria. - Step three will involve independent evaluators to assess the proposal according to the criteria. - Step four will involve the COROB Consensus Group to agree on a common position, including comments and scores for all evaluated proposals. - Step five will involve the 'Selection Committee' to decide the 'Provisional List of FSTP recipients' and 'Reserve List'. - Step six will check the ethical aspects and formal check of the pre-selected beneficiaries. For further information see the 'Guide for Applicants'.
Further information:	Application form: https://corob-oc.fundingbox.com/apply OC helpdesk: https://discord.com/invite/aMKmU5KdmH OC website: https://corob-oc.fundingbox.com/ OC complaints email: corob.complaints@fundingbox.com Project website: https://www.corob-project.eu/

Task description:	The exact amount of financial support to be granted to each selected entity under COROB Open Call is a fixed lump sum of up to EUR 150,000 per entity for the 1st Funding Instrument: Solutions to Challenges, and up to EUR 100,000 per entity for the 2nd Funding Instrument: Experiments for Enabling technologies for digital services.SMEs will be funded at a reimbursement rate of 70% of their eligible costs and Start-ups at 100%. Selected entities other than SMEs and start-ups will not be funded but will receive technical support from the COROB project.

Additional information

COROB is a HORIZON EUROPE project co-funded by the European Commission. It is coordinated by LORTEK with the participation of 8 Consortium Partners from 5 countries (see details at https://www.corob-project.eu/).

COROB will launch **1 Open Call**, aiming to fund up to **EUR 2,000,000** and to select up to **15** external solutions eligible for funding.

COROB has defined 2 different Funding Instruments which will be launched in the same Open Call procedure:

- **1st Funding Instrument. "Solutions to challenges"** to fund up to 10 technology providers aimed to develop technical solutions covering the use cases challenges, to be further integrated and validated in the project use-cases
- **2nd Funding Instrument. "Experiments for Enabling technologies for digital service"** to fund up to 5 technology providers aimed to develop digital services answering to the challenges and applicable in the use case areas and interoperable with the data acquisition platform of COROB.

The exact amount of financial support to be granted to each selected entity under COROB Open Call is a fixed lump sum of up to **EUR 150,000**[1] per entity for the **1st Funding Instrument: Solutions to Challenges**, and up to **EUR 100,000**[2] per entity for **the 2nd Funding Instrument: Experiments for Enabling technologies for digital services** .

We are looking for individual entities. The entities eligible for funding can be SMEs and Start-ups. Other entities (companies of any size) are eligible to participate in the open call, but they cannot receive any funding.

[1] This amount could be decreased depending on the quality and the accomplishments of the requested deliverables during the milestones review (see section 5)

[2] Ibidem.

GUIDE FOR APPLICANTS

COROB

OPEN CALL

Submission of applications starts: *April 8th, 2024 at 0:00 Brussels Time*

Submission deadline: *July 8th, 2024 at 17:00 Brussels Time*

Project co-funded under Horizon Europe Programme of the European Union under Grant Agreement no. 101120640

Co-funded by the European Union

COROB

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1. Basic Info about COROB

COROB is a HORIZON EUROPE project co-funded by the European Commission. It is coordinated by LORTEK with the participation of 8 Consortium Partners from 5 countries (see details at https://www.corob-project.eu/).

COROB aims to develop a flexible, cooperative and intelligent multi-robotic solution for arc welding-based manufacturing processes (joining and additive manufacturing), to offer new operational capabilities that allow to increase the efficiency and improve the flexibility of industrial processes.

Conceived as a global solution, COROB will employ a cooperative multi-robot system powered by Inspection, Monitoring, Control and AI techniques to optimise the welding process, and the adjacent manufacturing stages for time, cost, energy, and resource reduction.

The data generated will be processed in a data acquisition platform to feed the AI technologies, addressing optimisation, search, planning, and analysis, ensuring AI robustness and trustworthiness.

Robots have historically been employed in businesses involving mass manufacturing to carry out repetitive activities at reasonable costs and quality standards, giving up flexibility in exchange for efficiency. Multiple robots working together and using AI and data technologies provide enhanced operating capabilities in many industrial processes by enhancing their manoeuvrability and manipulability. For flexible and reconfigurable manufacturing to meet HMLV[1] industrial production demands in the present technological framework of Industry 5.0, COROB suggests developing an intelligent cooperative multi-robotic system. Innovations in robotics, inspection, monitoring, control, and artificial intelligence (AI) developed by consortium partners and 15 external third parties through an Open Call will be integrated into the human-centric system. It will contribute to resilience, resource-saving, circular economy, cost savings, and digital supply chain, fostering European industrial competitiveness.

In COROB the solution will be validated in two semi-industrial use cases focused on arc-welding joining and Wire Arc Additive Manufacturing (WAAM), also referred as Directed Energy Deposition-Arc (DED-Arc) for repairing. The provided solution at the end of the project may be scaled and replicated to additional processes such as assembly, painting, and finishing. Manufacturing processes will utilise cutting-edge technology, including cooperative and intelligent robotic solutions while keeping humans involved to create a more sustainable and competitive sector. The use cases have been chosen to be complementary so that the validation is representative enough for different potential scenarios of application, maximising the impact and ensuring the future transferability of COROB technologies to other sectors or manufacturing processes.

[1] HMLV - High-Mix Low-Volume.

USE CASE 1

This use case will focus on a cooperative multi-robot system for flexible manufacturing. The welding process will be performed using a jigless robotic approach, defined as robotic welding without tools/jigs in which two manipulator robots hold and present the workpieces to one welding robot.

USE CASE 2

This use case will deploy a multi-robot cooperative robotic cell for the repair of tooling. The main industrial robot will be responsible for the processing operations, equipped with a Wire Arc Additive Manufacturing (WAAM) or else referred as Direct Energy Deposition Arc (DED-Arc) head as an end effector, taking care of the repair tasks. Together with a 2-DoF[2] rotary table, it will constitute an 8-DoF processing system, capable of repairing very complex geometries.
Additionally, a smaller, collaborative robot will be integrated in the cell and will be responsible for the auxiliary processing tasks. A core technology integrated in the robot will be 3D scanning, while other technologies (e.g. inspection, part treatment, finishing, etc.) will be examined through the Open Call of the project.

COROB will launch **1 Open Call,** aiming to fund **up to EUR 2,000,000** and to select up to 15 external solutions eligible for funding that will be tested, validated and demonstrated through the COROB use cases.

COROB has defined 2 different Funding Instruments which will be launched in the same Open Call process :

- 1st Funding Instrument. "**Solutions to challenges**" to fund up to 10 technology providers aimed to develop technical solutions covering the use cases challenges, to be further integrated and validated in the project use-cases.

- 2nd Funding Instrument. "**Experiments for Enabling technologies for digital services**" to fund up to 5 technology providers aimed to develop digital services answering to the challenges and applicable in the use case areas and interoperable with the data acquisition platform of COROB.

[2] DoF" refers to "Degrees of Freedom," indicating that the rotary table can independently rotate along two axes. Considering the robot arm's 6 joints, the total degrees of freedom sum up to 8.

2. What do we offer?

The exact amount of financial support to be granted to each selected entity under COROB Open Call is a fixed lump sum of:

- up to EUR 150,000 [3] per entity for the 1st Funding Instrument: Solutions to Challenges, and
- up to EUR 100,000 [4] per entity for the 2nd Funding Instrument: Experiments for Enabling technologies for digital services.

Start-ups[5] are covered for 100% of their eligible costs, while SMEs that are not Start-ups[6] can receive 70% of their eligible costs, with the remaining 30% required to be self-funded.

NOTE! Companies[7] of any size, other than SMEs and Start-ups, are welcome to apply, but only SMEs and Start-ups can receive financial support. If selected, other types of companies will receive technical support from the COROB consortium partners, but they will not receive any financial support. Such companies must cover 100% of their costs independently.

Following the topic conditions, SMEs/Start-ups will be funded:

- 1st Funding Instrument: fixed requested amount of up to EUR 150,000.

  Start-ups: Fixed requested amount will be 100% of the total eligible costs , i.e. EUR 150,000.

  SMEs: Fixed requested amount will be 70% of the total eligible costs, which have to be EUR 214,285.

- 2nd Funding Instrument: fixed requested amount of EUR 100,000.

  Start-ups: Fixed Total requested amount will be 100% of the total eligible costs,, i.e. EUR 100,000.

  SMEs: Fixed requested amount will be 70% of the total eligible costs, which have to be EUR 142,857.

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[3] This amount could be decreased depending on the quality and the accomplishments of the requested deliverables during the milestones review (see section 5)

[4] Ibidem.

[5] **Start-up** refers to a tech-oriented company. It should employ less than 10 people (but more than 2 full time equivalent staff) that has operated for less than three years and has attracted more than €50k early stage private sector investment or has demonstrable sales growth over 50% pa.

[6] An **SME** will be considered as such if it complies with the European Commission's Recommendation 2003/361/EC. As a summary, the criteria defining an SME are:

• Headcount in Annual Work Unit (AWU) less than 250;

• Annual turnover less or equal to €50 million OR annual balance sheet total less or equal to €43 million.

Note that the figures of partners and linked enterprises should also be considered as stated in the SME user guide. For detailed information check EU recommendation:

https://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

[7] A **Company** is a for-profit entity.

In order to verify the compliance of the above-mentioned rules, all applicants are required to submit a budget estimation using the Excel table that you can find in the COROB Open call microsite "Guides & Documents", or can be directly downloaded here.

3. Admissibility and Eligibility Criteria

We will check the admissibility and eligibility of all proposals submitted before the deadline on July 8th, 2024 at 17:00 Brussels Time via our online application form at https://corob-oc.fundingbox.com/. All the admissibility and eligibility criteria are listed in this Section of this Guide for Applicants. The projects that do not comply with those criteria will be excluded and marked as ineligible. We will check the admissibility and eligibility criteria based on the information provided in your application during the whole evaluation process.

3.1 Who are we looking for?

We are looking for individual entities. The entities eligible for funding can be SMEs and Start-ups. Other companies of any size are eligible to participate in the Open Call, but they cannot receive any funding. It is essential to highlight that non-profit organisations are not eligible to apply for this Open Call.

The entities have to be established in any of the:

- The Member States of the European Union[8] and its Overseas Countries and Territories (OCT)
- Associated Countries (AC) to Horizon Europe[9] .

The applicants who are subject to EU restrictive measures under Article 29 of the Treaty on the European Union (TEU) and Article 215 of the Treaty on the Functioning of the EU (TFEU)[10] are not eligible to participate in this open call.

[8] Following the Council Implementing Decision (EU) 2022/2506, as of 16th December 2022, no legal commitments can be signed with Hungarian public interest trusts established under Hungarian Act IX of 2021 or any entity they maintain. Affected entities may continue to apply to calls for proposals. However, in case the Council measures are not lifted, such entities are not eligible to participate in the COROB Open Call. In case of consortium, co-applicants will be invited to remove or replace that entity. Tasks and budget may be redistributed accordingly.

[9] AC as of 20.02.2024: Albania, Armenia, Bosnia and Herzegovina, Faroe Islands, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, North Macedonia, Norway, Serbia, Türkiye, Tunisia, Ukraine, UK, for the most up-to-date list please first part of this document.

[10] Please note that the EU Official Journal contains the official list and, in case of conflict, its content prevails over that of the EU Sanctions Map.

The COROB Consortium partners, their affiliated entities, employees or permanent collaborators CANNOT be involved in the grantees' projects. They are not eligible to act as applicants in the COROB Open Call.

3.2 What types of activities can be funded?

- 1st Funding Instrument: Solutions to challenges

The activities should address the development of technologic solutions and systems applicable to the 2 use cases of the COROB project: multi-robot cooperative welding and multi-robot cooperative WAAM, in the identified challenges. Therefore, the activities that qualify for financial support will cover the development and integration of NDT methods for monitoring and quality inspection, considering problematic environments, including:

- ➢ Picking solutions using AI for multi-geometry parts
- ➢ Modular grippers
- ➢ Layer height control systems
- ➢ Preheating systems integrated in the robot
- ➢ Advanced sensors for quality monitoring and/or NDT purposes
- ➢ Obtain real CAD and quality check in pre-process and post-process stages. Virtual validation.

- 2nd Funding Instrument: Experiments for Enabling technologies for digital services

The 2nd funding instrument will fund activities for digital services linked to the deployment of the multi-robot systems in the project use cases, and should be interoperable with the data acquisition platform of the project for data processing. These services will solve the identified challenges of the use cases including:

- ➢ Digital product passport.
- ➢ Friendly user interface.
- ➢ Advanced algorithms for real time interpretation of multi-modal data for improved monitoring / NDT in problematic environments (light, heat, etc.).
- ➢ Wearable vision system for human-centred process monitoring.

The solutions will use, whenever possible, common resources from other digital resource platforms (AI-onDemand platform, Digital Industrial platform for Robotics, amongst others).

The activities that qualify for financial support have to fall within the scope of the COROB project, which is to develop a flexible, cooperative and intelligent multi-robotic solution for arc welding-based manufacturing processes (joining and additive manufacturing), to offer new operational capabilities that allow to increase the efficiency and improve the flexibility of industrial processes.

Please find a link to the 'Technical Guidelines' where you can find a more detailed description of the challenges.

Your project should have a clear European Dimension, meaning fostering projects that generate a substantial positive impact for European citizens.

When applying to COROB Open Call, please note that all activities are expected to start at TRL[11] 3-5 and finish at TRL 6-7. You can find examples of ideal projects in the 'Technical Guidelines' where all the challenges are described in detail.

3.3 How to apply

Proposals must be submitted through the COROB microsite:

https://corob-oc.fundingbox.com

When applying to COROB Open Call, please also note that:

- Be on time and use our system: Make sure you submit your proposal through the COROB Open Call microsite (https://corob-oc.fundingbox.com) before the deadline 8th of July 2024 at 17:00 Brussels Time. If you submit the form correctly, the system will send you a confirmation of your submission. Get in touch with us if it is not the case. You need to know that we will not be evaluating any proposal sent after the deadline and submitted outside the dedicated form.
- English Language: your proposal must be written in English in all mandatory parts to be eligible. Only parts written in English will be evaluated. If the mandatory parts of the proposal are in any other language, the entire proposal will be rejected (admissibility criterion). If only non-mandatory parts of a proposal are submitted in a language different from English, those parts will not be evaluated, but the proposal is still eligible.
- Choose only one challenge: Your project should directly address one of the topics proposed by the COROB in the 'Technical Guidelines'. You can not take part in both Instruments at the same time.
- Every question deserves your attention: all mandatory sections - generally marked with an asterisk - of your proposal must be completed (admissibility criterion). The data provided should be actual, true, and complete and should allow assessment of the

[11] TRL - Technology Readiness Level - Technology Readiness Levels (TRLs) are indicators of the maturity level of particular technologies. This measurement system provides a common understanding of technology status and addresses the entire innovation chain. There are nine technology readiness levels; TRL 1 being the lowest and TRL 9 the highest. In our project, we refer to Annex B of the General Annexes for Horizon Europe Work Programme 2021-2022 for a full description of TRLs.

proposal. Additional material not specifically requested in the online application form will not be considered for the evaluation.

- Be exhaustive: You have to verify the completeness of the form, as it won't be possible to add any further information after the deadline. After the proposal is submitted, you will be able to modify the form until July 8th 2024 at 17:00 Brussels Time.
- Absence of conflict of interest: we will take into consideration the existence of potential conflict of interest among you and one or more Consortium partners. Consortium partners, their affiliated entities, employees and permanent collaborators cannot take part in the COROB programme. All cases of potential conflict of interest will be assessed case by case.
- Healthy finances and a clean sheet are a must: we don't accept entities that are under liquidation or are an enterprise under difficulty according to the Commission Regulation No 651/2014, art. 2.18, or that are excluded from the possibility of obtaining EU funding under the provisions of both national and EU law, or by a decision of both national or EU authority. We also don't accept entities that are meeting national regulations regarding bankruptcy.
- It is your proposal: your project should be based on your original work or your right to use the IPR must be clear. Going forward, any foreseen developments must be free from third-party rights, or those third-party rights must be clearly stated. Any work related to the implementation of the project described in the application may not violate the IPR of third parties, and the IPR of the application project may not be the subject of a dispute or proceedings for infringement of third-party IPR. However, during the lifetime of the COROB project, you should grant the COROB Consortium partners access to the background and results generated within your project. If you do not consent on this, your proposal cannot be eligible.
- Scope. The objectives of the proposal must fit within the scope of the project as it is described in section 3.2 of this Guide for Applicants.
- Submission and modification of the Applications: It will not be possible to update any information or modify your proposal application after the deadline. The only exception is if a mistake has been made in the key administrative data (e.g. contact mail or phone, name of the company, etc.). In this case, the applicants have to contact us by e-mail indicating the proposal ID, their username, and the data which should be corrected.
- We do not accept multiple submissions: You can submit only one proposal to COROB in this open call. If more than one proposal is identified, only the last proposal which has been submitted in order of time will be evaluated.
- Acceptance of the open call rules: to apply for this open call you have to accept its rules and regulations detailed in this Guide for applicants.
- COROB is planning a certain number of online webinars about this Open Call. They will be announced at the COROB Open Call Microsite and in the Connected World Community in Discord.

4. How will we evaluate your proposal?

Our evaluation process is transparent, fair and equal to all our participants with a clearly defined complaint procedure (see section 6 - Contact us). We will evaluate your project in 6 phases. We encourage you to put in the effort to present your project in the best possible way, offering as much detail as you can. This will assist us in evaluating your application and identifying how your proposal aligns with the overall scope of COROB.

Figure 1 - COROB Selection process

4.1 STEP 1: Admissibility and Eligibility Check

After the closure of the Open Call, we will review the proposal to ensure it meets the admissibility and eligibility conditions outlined in Section 3. This assessment will be based on the statements provided in your proposal.

At this stage, the eligibility criteria are checked against the Declaration of Honour included in the application form, and they will be continuously verified throughout the evaluation process, including the final formal check.

Projects that do not comply with the above-mentioned criteria will be rejected. As a result of the checking, a 'List of eligible applications' will be produced.

We will inform the rejected applicants about the results of the admissibility and eligibility check phase.

4.2 STEP 2: In/ Out Scope Screening

The In/Out Scope Screening will be done by the 'Selection Committee' members (COROB Consortium partners).

The 'Selection Committee' will review the proposal in terms of the general objectives of all proposals proposals included in the 'List of Eligible Applications' assessing the following aspect:

- Scope. The objectives of the proposal must fit within the scope of the COROB project as described in section 3.2 of this Guide for Applicants

We will inform all the eligible applicants about the results of In/Out Scope Screening generating an 'In Scope List'. Be aware that proposals that do not comply with any of the aspects described above will be rejected. The ones complying with all of them will move on to the experts' independent individual evaluation phase.

4.3 STEP 3: Independent Individual Evaluation

An Independent Individual Evaluation will be done for all 'In Scope' proposals.

In this phase, each project will be evaluated by two Independent Experts. They will be appointed according to the specific characteristics of the applicants from the COROB's pool of External Experts.

These external experts must be independent[12] from the applicants and cannot be Consortium partners employees, permanent collaborators, nor board members.

The projects will be evaluated within the following awarding criteria:

1. EXCELLENCE will evaluate:

- **Ambition:** The applicants have to demonstrate to what extent the proposed solutions contribute to the project scope and have a human-centred approach. In particular identifying the COROB challenge they will tackle, and how. They have to describe the innovative approach behind it (e.g. ground-breaking objectives, novel concepts and approaches or new products, services).
- **Innovation:** The applicants should provide information about the level of innovation within their market and about the degree of differentiation that this project will bring, as well as a brief analysis of the State-of-the-Art and what is the project contribution beyond it.
- **Soundness of the approach and credibility of the proposed methodology** for covering the challenge, and the needs and steps for integration / interoperability with the use cases of COROB.

2. IMPACT will analyse:

- **Advancing AI, Data and Robotics**: the applicants will have to demonstrate their added value for a flexible and intelligent manufacturing environment using robotics powered by AI and Data, in alignment with COROB proposed technologies.
- **Market opportunity and Scalability:** The applicants have to demonstrate the level of market potential of their solutions for multi-robot systems in the sectors of the use cases and its scalability in other areas and processes, for maximising their business opportunities.
- **Competition:** The applicants have to describe and analyse the degree of competition of your product/service and to what extent your proposal is disruptive and breaks to the market, i.e. the products/services to be brought to market can be clearly differentiated from the competition.
- **Environmental and social impact:** The applicants have to demonstrate the project contribution, aligned with COROB objectives, towards environmental, social and economic impacts to contribute to sustainable development and Green Deal targets , as well as a substantial positive impact for European citizens (European Dimension).

[12] By 'independent from the applicants' we refer to "they cannot be personnel working for the applicant under an employment contract (or equivalent appointing act); they cannot be a person who works under conditions similar to those of an employee (under direct contract) and SMEs (partner of a consortium) owner or similar situations".

3. IMPLEMENTATION will consider:

- **Work Plan:** The work plan of the applicant's proposal has to be clearly described and fully aligned with the objectives, including Work packages and tasks. The time plan should be realistic and achievable, coherent and effective. A risk assessment should also be provided.

- **Team:** The applicants have to demonstrate their management and leadership qualities, their ability to take a concept from ideas to market, their capacity to carry through their ideas and understand the dynamics of the market they are trying to tap into. The team should be a cross functional team, with a strong background and skills base and taking into account its gender balance.

- **Resources:** Demonstrate the quality and effectiveness of the resources assigned in order to get the objectives/deliverables proposed. Start-ups will be funded 100% of their eligible costs, but in the case of SMEs the compromise of 30% self-financing of activities should be secured by each beneficiary. For applicants not having start-up or SME status, the compromise of 100% self-financing of activities should be secured by each beneficiary. The applicants will have to upload a budget estimation in pdf, by fulfilling the corresponding tab in Excel table provided here.

The evaluators will score each award criterion on a scale from 0 to 5:
0 = Proposal fails to address the criterion or cannot be assessed due to missing or incomplete information
1 = Poor – criterion is inadequately addressed or there are serious inherent weaknesses
2 = Fair – proposal broadly addresses the criterion, but there are significant weaknesses
3 = Good – proposal addresses the criterion well, but a number of shortcomings are present
4 = Very good – proposal addresses the criterion very well, but a small number of shortcomings are present
5 = Excellent – proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

Each evaluator will produce an Individual Evaluation Report. Once the Individual Evaluation Reports are submitted, the final score for each individual criterion will be calculated as the average of the scores provided by each evaluator. The final score of each application will be calculated as the sum of the scores for each criterion.

The final score per application will be calculated as the sum of the score for each individual criterion. The threshold for individual criteria will be 3. The overall threshold, applying to the sum of the three individual scores, is 10 points. Each proposal will be evaluated by 2 independent experts.

All proposals that reach the threshold or are scored above the threshold, will pass to the next phase. Please note that we need time to process all the proposals in this phase, so you probably won't hear back for a while.

4.4 STEP 4: Evaluation Consensus Group

After carrying out the 'Independent Individual Evaluation', external experts who have evaluated the proposals will join a Consensus Group, to agree on a common position, including comments and scores for all evaluated proposals.

The Consensus Group will specially discuss the cases where there is a significant divergence between the evaluators' scoring. In case no consensus is reached between the evaluators, an additional evaluator will be included to provide an extra evaluation.

In case of ties, the following criteria will be used to rank the projects, in order:

- The highest score in the Impact Section;
- Gender balance among the personnel responsible for carrying out the activities.

As a result of the Independent Evaluation, a 'Ranking List' will be produced.

All proposals obtaining a score above the threshold will pass to the next phase. Please note that we need time to process through all the proposals in this phase, so you probably will not hear back from us until the process is done.

4.5 STEP 5: Consensus Meeting

The 'Selection Committee' -with the potential support of two external experts and the ethics expert (with voice but without vote)- will decide, by Consensus, the 'Provisional List of FSTP recipients' and a 'Reserve List'.

The decision will be based on the 'Ranking List' obtained as a result of the previous step. In order to ensure a balanced portfolio of supported activities in the different challenges, 'Selection Committee' will make sure that at least the highest ranked proposal per challenge will be funded in each Funding Instrument, provided that it attains the scoring thresholds.

Whilst normally the highest ranked proposals will be selected for funding, the Selection Committee might have fair reasons for objecting to a specific third party, like the alignment with COROB goals and scope, the ability to achieve the highest impact possible, commercial competition, as well as the existence of significant ethical concerns or a potential conflict of interest. In this case, the choice may pass to the next-ranked proposal.[13]

[13] Please note that this is not a closed list of reasons.

The exact number of proposals approved will be decided based on the overall quality of the proposals. In principle, for the 1st Funding Instrument: “Solutions to challenges”, up to 10 beneficiaries will be selected for funding and for covering the use case challenges, while for the 2nd Funding Instrument “Experiments for Enabling technologies for Digital Services”, up to 5 beneficiaries will be selected for funding and for covering its respective challenges.

4.6 STEP 6: Ethics Assessment

The ‘Ethics Assessment’ will be done by an ethics expert according to the ethical guidelines of Horizon EU. The resulting ‘Ethics Summary Report’ may lead to include either specific requirements (contractual obligation) in the ethics section of the Sub-Grant Agreement and/or countermeasures tackling Ethical issues within the Individual Mentoring Plans. Beneficiaries must provide thorough answers to the Ethics Requirement queries before final approval and disbursement of funds.

4.7 Formal Check, Sub-grant Agreement Preparation and Signature

Before you get started with the COROB programme, you need to sign the Sub-grant Agreement with the COROB Consortium.

Before signing the Agreement, you should provide documents regarding your formal status. The COROB Consortium will verify them to prove your eligibility (for the details please check our ‘Frequently Asked Questions’). Please do it within the deadlines that will be communicated to you.

Be extremely vigilant with respect to:

1. The nature of the documents we request.
   If the documents you provide do not prove your eligibility, the process will end here for you.
2. The deadlines that we will give you to hand us these documents.
   If you do not deliver the requested documents on time, without a clear and reasonable justification, we will have to exclude you from further formal assessment. Another applicant from the ‘Reserve List ‘will then replace you.

5. Our Support Programme and Payment Arrangements

Once your eligibility has been confirmed following the formal check and the Sub-grant Agreement signed, you will become an official beneficiary of the COROB programme. As a selected grantee, you will receive a fixed lump sum of up to EUR 150,000 for 1st Funding Instrument or up to EUR 100,000 for 2nd Funding Instrument. As stated in previous sections, please note that only Start-Ups are eligible for 100% coverage of their eligible costs, while SMEs that are not Start-ups can receive 70% of their eligible costs. The Support Programme will last 12 months for 1st Funding Instrument and 9 months for 2nd Funding Instrument.

The lump sum is a simplified method of settling expenses in projects financed from Horizon Europe funds. It means that the grantee is not required to present strictly defined accounting documents to prove the cost incurred (e.g. invoices), but is obliged to demonstrate that the implementation of the project is in line with the milestones set for it. Simply speaking, it means that we will carefully assess your progress and the quality of your work during Interim Reviews, The milestones (deliverables, KPIs[14] and ethical recommendations) will be set in the 'Individual Mentoring Plan' elaborated at the beginning of the programme.
The lump sum method does not exempt you from collecting documentation to confirm the costs under fiscal regulations.

Payment Arrangements

1st Funding Instrument: Solutions to challenges

Payment milestones	Deliverable	Payment Milestone (instalments)	%Total Grant
Stage 1 IMP	IMP[15]	up to EUR 5,000	3.3%
Stage 2. Solution development	Solution development report	up to EUR 100,000	66.7%
Stage 3. Validation	Final report	up to EUR 45,000	30%
		EUR 150,000	100%

Table 1 Payment Milestones for 1st Funding Instrument: Solutions to challenges

[14] KPI stands for key performance indicator, a quantifiable measure of performance over time for a specific objective. KPIs provide targets for teams to shoot for, milestones to gauge progress, and insights that help people across the organisation make better decisions.
[15] The Individual Mentoring Plan [IMP] is the document that establishes the individual budget, KPIs, Deliverables and a schedule that will be taken into account when evaluating the FSTP recipients' performance at the Milestones Review.

2nd Funding Instrument: Experiments for Enabling technologies for digital services

Payment milestones	Deliverable	Payment Milestone (instalments)	%Total Grant
Stage 1 IMP	IMP[16]	EUR 5,000	5%
Stage 2. Digital service development	Digital service development report	EUR 75,000	75%
Stage 3. Validation	Final report	EUR 20 000	20%
		EUR 100 000	100%

Table 2 Payment Milestones for 2nd Funding Instrument: Experiments for Enabling technologies for digital services

In case of SMEs that are not StartUps, the grant cannot exceed 70% of the costs estimated for the execution of the project.

A Milestone Review will be organised for each payment milestone established at the project level.

	1st Funding Instrument: Solutions to challenges	**2nd Funding Instrument: Experiments for Enabling technologies for digital services**
1st Milestone Review	Individual Mentoring Plan	Individual Mentoring Plan
2nd Milestone Review	Solution development	Digital service development
3rd Milestone Review	Solution Validation	Solution Validation

Table 3 Milestones Review

The evaluation of the beneficiaries performance at the Milestone Review will be done by the Technical and Business mentors and Ethics Partners (in the case of a beneficiaries where specific requirements on ethics have been included as deliverable in the Individual Mentoring Plan). The evaluation will be done based on the following criteria:

- Deliverables' quality (Weight 30%)
- Technical and/or Business performance indicators (Weight 60%)
- Deadline Compliance (Weight 10%)

Each criterion will be scored from 0 to 10 and, based on the weight of each criteria, the final score will be calculated. The threshold to continue in the programme is 7 points. The 'Selection Committee' will review and validate the evaluations, putting special attention to the 'under

[16] ibidem

threshold' cases, if any, by taking into consideration all possible objective reasons for underperformance (i.e. external factors which might have influenced the beneficiaries' performance). The 'Selection Committee' will make the final decision, and approve the payments or invite beneficiaries which have not reached the threshold to leave the programme.

6. Contact us

How can we help you?

If you have any questions regarding our application process, feel free to post your questions in the Connected World Helpdesk in Discord. Here you can find out how to access the Community.

In case of any technical issues or problems, please include the following information in your message:

- Your username, phone number and email address;
- Details of the specific problem (e.g. error messages you encountered, bug description, i.e. if a dropdown list isn't working, etc.);
- Screenshots of the problem.

Complaints

If you believe that a mistake has been made after receiving the results of one of the evaluation phases (when foreseen), you may submit a complaint. To do so, please email us your complaint in English at corob.complaints@fundingbox.com and include the following information:

- Your contact details (including email address);
- The subject of the complaint;
- Information and evidence regarding the alleged breach.

You have 3 calendar days to submit your complaint, starting from the day after the communication was sent. We will review your complaint within seven calendar days of its reception. If we need more time to assess your complaint, we will inform you about the extension by email. We will not review anonymous complaints as well as complaints with incomplete information.

Please take into account that the evaluation is run by experts in the relevant field, and we do not interfere with their assessment. Therefore, we will not evaluate complaints related to the results of the evaluation other than those related to the mistakes in the evaluation of the eligibility criteria.

7. Last but not least - final provisions

Any matters not covered by this Guide will be governed by Polish law and rules related to the Horizon Europe and EU grants.

Please take into account that we make our best effort to keep all provided data confidential; however, for the avoidance of doubt, you are solely responsible to indicate your confidential information as such. Your IPR will remain your property, but as stated in section 3, during the lifetime of the COROB project, you need to grant the COROB Consortium partners access to the background and results generated within your project. Further agreements may be needed in case of IPR generated from work carried out jointly by you and one or more COROB Partners after the COROB project has ended.

For the selected grantees, the Sub-grant agreement will include the set of obligations towards the European Commission (for example: promoting the project and giving visibility to the EU funding, maintaining confidentiality, understanding potential controls by the EC/ECA, EPPO and OLAF).

The COROB Consortium might cancel the call at any time, change its provisions or extend it. In such a case we will inform all applicants about such change. Signature of the Sub-grant agreement is an initial condition to establish any obligations among applicants and any Consortium partners (with respect to the obligation of confidentiality of the application).

Did not find what you were looking for? You may check our 'Frequently Asked Questions' section. You can also contact us and we will happily answer all your questions.

8. Extra hints before you submit your proposal

A proposal takes time and effort and we know it. Here are a few crucial points you should read before submitting your proposal.

- Is your project in line with what COROB is looking for? You are not sure? You can consult this section 3.1 as well as the COROB project website.
- Did you present your project in a way that will convince evaluators? Not sure if you did? Go back to this section.
- Is your project fulfilling all eligibility requirements described in the Guide? Check again this section.
- Are you sure you are able to cope with our process of the Sub-grant agreement signature and payment arrangements for selected proposals? You may want to go over this section.
- Did you check our Sub-grant agreement template? You didn't? Check it here for 1st Funding Instrument and here for 2nd Funding Instrument.

Do you need extra help? Contact us

ANNEX 1

Information clause for personal data processing in the Open Call organised under COROB Project

Grant Agreement No. 101120640

CONTROLLER`S IDENTITY AND CONTACT DETAILS

The data controllers are all entities in the FundingBox capital group as the Joint Controllers. All FundingBox entities have agreed on common data processing purposes. In all matters regarding personal data, you can contact us using the following email address: privacy@fundingbox.com.

The essence of the arrangement is available here.

PURPOSES, LEGAL BASIS AND PROCESSING PERIOD		
The purpose and legitimate interest of processing	Legal basis for processing	Period
1) To run an Open Call and collect data necessary to evaluate applications submitted in the Open Call.	Legitimate interest of FundingBox (based on Art. 6.1.f) of GDPR) which is fulfilling the obligations and our other interests related to implementation of the Project.	6 years from the end of the year in which the Project ended.
2) To realise the Project goals described in the Grant Agreement (e.g. communication, reporting, collaborating with other project partners).		
3) To consider potential complaints and defend against them.		
4) To investigate a potential conflict of interest (processing includes, among others, examining family, financial, business or organisational links).		
5) To gather feedback from applicants when the Open Call is over to improve processes.		

6) To send newsletters about other FundingBox activities (e.g. information about other funding opportunities).		
If an applicant has been selected to become the beneficiary of the project:		
7) To collect the applicant's details and documentation necessary to verify its legal status. Data will be collected in separate form via FundingBox platform.	Processing is necessary for the performance of a contract (based on Art. 6.1.b) of GDPR).	

Important:

Data collected for the purpose of investigating a potential conflict of interest will be stored for the indicated retention period and will not be deleted even at the request of the applicant before the end of the retention period.

DATA RECEIVERS

The Joint Controllers will transfer personal data only to trusted recipients such as IT service providers, accountants, law firms, postal and courier companies (who process personal data on the controllers' behalf).

Due to the fact that we use the services of Google LLC, your data may be transferred to the USA. We have concluded an agreement with those entities – the so-called Standard Contractual Clauses. This means that in accordance with the decision of the European Commission No. 2021/914 EU of June 4, 2021, your personal data may be processed by this company in the USA. More information about the decision at: https://fundingbox.com/trust/transfer-outside-eea/.

To realise the Project, data can be transferred also to Project Partners (complete list of the project partners is available at the email address: privacy@fundingbox.com) and European Commission.

RIGHTS OF DATA SUBJECT

Due to the fact that we process your personal data, you have the right to:

1) request access to your personal data,
2) demand the rectification of your personal data,
3) request to remove or limit the processing of your personal data,
4) data portability,
5) complain with the supervisory authority (https://edpb.europa.eu/about-edpb/about-edpb/members_en).

You also have a right to object to processing of your personal data for all purposes indicated above (according to the Article 21 of GDPR).

INFORMATION ABOUT VOLUNTARY OR OBLIGATORY DATA PROVISION

Providing data is voluntary, although it is necessary to participate in the Open Call. Without providing your data, it is not possible to contact you and evaluate the application.

MEET THE CONSORTIUM

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

GIZELIS ROBOTICS

LMS Laboratory for Manufacturing Systems & Automation

LORTEK MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

DIGITAL FOR PLANET

FundingBox #FundingChampions

DHI ingeniería mantenimiento industrial

netcompany intrasoft

TECHNICAL GUIDELINES

COROB OPEN CALL

Co-funded by the European Union

Project co-funded under Horizon Europe Programme of the European Union under Grant Agreement no. 101120640

TABLE OF CONTENTS

1 INTRODUCTION

To ensure its alignment with the COROB project, applicants are requested to propose solutions or experiments in compliance with a set of technical requirements that are grouped in two main categories:

- Solutions to challenges should address the development of technology and systems solutions applicable to both use cases of the COROB project: multi-robot cooperative welding and multi-robot cooperative WAAM, in the identified challenges. Integration and testing of innovative technologies to enhance the capabilities of the project's use-cases.

- Experiments for Enabling technologies for digital services are activities for digital services linked to the deployment of the multi-robot systems in the project's use cases. These experiments should be interoperable with the project's data acquisition platform for efficient data processing.

The following sections provide more information of these requirements. The "Technical Guidelines" includes the necessary templates, background materials and explanations to assist in preparing a successful application from the technical perspective.

2 1ST FUNDING INSTRUMENT – SOLUTION TO CHALLENGES

2.1 PICKING SOLUTIONS USING AI FOR MULTI-GEOMETRY PARTS

Conventional welding workstation consist of a welding robot, a positioner, and a tooling. In the case of high-mix low-volume (HMLV) production scenarios, different complex and expensive jigs and fixtures are required for each reference. The COROB project poses a cooperative multi-robot system for flexible manufacturing. A gas metal arc welding (GMAW) process will be performed using a jigless robotic approach. In a jigless arc welding setup with two manipulator robots and one welding robot, the two manipulators are responsible for precisely positioning and aligning the workpieces, while the welding robot controls the welding torch. To achieve this objective accurately, the first step involves a precise picking of the parts to be welded. An AI-based multi-geometry picking solution is envisioned for this purpose.

The parts to be welded initially consist of plates and tubes of different sizes and thicknesses randomly placed on a bin. However, the solution should be scalable and capable of handling more complex geometries, based on a provided CAD file.

The metallic parts to be picked are installed on a robotic cell in an industrial facility, where potential shines or reflections may appear and with uncontrolled lighting conditions. The parts will be randomly distributed on the highly cluttered bin, sized to allocate a sufficient number of references.

The solution will consist of a stationary vision system will be installed for part detection and position and orientation identification.

The following sequence is suggested:

- Firstly, the operator requests a job, consisting of the two parts to be welded, which references will be transmitted to the picking system.
- The picking system identifies the requested references and their corresponding positions and orientations. If the references are not available, the operator is informed.
- For a given modular gripper, the picking system computes the position and orientation at which the parts need to be grasped. If one reference cannot be grasped, the operator is informed and the picking system computes the position and orientation for another part with the same reference, if available.
- The gripping positions and orientations are then transmitted to the robot controller, which commands a collision free trajectory (trajectory calculation is out of the scope of this topic). The picking system make sure that the transmitted position is reachable (the COROB project team will provide the information about the robots, including 3Ds and other relevant information)

An example of a non-reachable part is a part that is either occluded or in close proximity to other objects.

The interaction with the operator will occur through the project user interface (topic 3.2). The picking solution will have to communicate with this interface.

Communication with the user interface and the robot controller will be by means of extended fieldbuses.

The provided equipment, including software, shall be easy to install and usable.

The final solution will include vision hardware and software execution, and the necessary software, including any required licenses. The given solution must also provide the installation fixture.

The beneficiary will have to closely collaborate with the COROB consortium for its implementation in accordance with the COROB software architecture.

2.2 MODULAR GRIPPERS

Conventional welding workstation consist of a welding robot, a positioner, and a tooling. In the case of high-mix low-volume (HMLV) production scenarios, different complex and expensive jigs and fixtures are required for each reference. The COROB project poses a cooperative multi-robot system for flexible manufacturing. A gas metal arc welding (GMAW) process will be performed using a jigless robotic approach. In a jigless arc welding setup with two manipulator robots and one welding robot, the two manipulators are responsible for precisely positioning and aligning the workpieces, while the welding robot controls the welding torch. To achieve this objective accurately, the manipulator robots shall be equipped with lissom grippers to adapt to multiple references.

The references consist of plates and tubes of different sizes and thicknesses (minimum thickness 2 mm), but it is desirable that the provided solution is extendable to other geometries. All the parts to be grasped will be made of steel.

The beneficiary of this technological solution will supply two identical modular grippers that will be installed on the manipulator robots of the COROB project.

Note that the grippers' objective is to grasp parts for welding and they can be exposed to relatively high temperatures.

They should, at least, meet the following requirements:

- Load capacity: Grippers must have sufficient gripping force to prevent the piece from moving during de process, while ensuring that no damage occurs. The load capacity shall be at least 45 kg. This force corresponds to the pulling force of the welding beam during the contraction phase.

- Adjustable design: flexibility and modularity to grip pieces of different geometries and dimensions.

- Universal mechanical interface: they must integrate a universal mechanical interface, considering that they will be assembled on a 6-DoF industrial robot with zero backlash.

- Grounding connection: the grippers shall transmit grounding connection to the parts to be welded. Since it is an arc welding process, grounding needs to be provided though the gripper.

- Temperature: Grippers must stand welding temperatures in close proximity.

- Agile production: if modules need to be interchangeability, the process must be quick.

- Feedback: Grippers must provide status feedback to the control system.

- Energy consumption: the grippers should operate with minimal energy consumption.

And the following requirements will be desirable:

- Material: the material should be lightweight and able to withstand high temperatures and work in dusty environment.

- Automation and connectivity: ideally full connectivity with external controller for command and status monitoring is desired. Connectivity, ideally, by means of EtherCAT fieldbus.

- The modular gripper should ensure a certain angle of orientation to make miter welds.

No specific preference exists for the type of actuation (electrical, magnetic, pneumatic, others…), as long as the above requirements are met. But some consideration must be taken:

- Magnetic activation: especial consideration shall be paid to the temperature and arc current that will be present in the parts to be grasped.

- Electric activation: the activation voltage will be 24 Vdc or 230 Vac.

- Pneumatic activation: the pressure will be limited to 6 bar.

A 3D model (step or similar) of the grippers must also be provided.

The beneficiary will have to closely collaborate with the COROB consortium for its implementation in accordance with the COROB software architecture.

2.3 LAYER HEIGHT CONTROL SYSTEMS

Directed Energy Deposition-Arc (DED-Arc) or else referred as Wire Arc Additive Manufacturing (WAAM), is a manufacturing process that uses an electric arc as the heat source to melt and deposit metal wire layer by layer, and at the end form three-dimensional shapes. Within COROB, the Gas Metal Arc Welding (GMAW) WAAM technique is used, where the processing head is manipulated by a YASKAWA 6-DOF industrial robot. Maintaining a consistent stand-off distance, which is the distance of the torch relative to the workpiece, is crucial to for the final quality of the deposition (e.g. poor geometrical accuracy). During the process, the torch undergoes a step-height elevation once a layer is deposited. In some cases, inconsistencies in the deposited layer height occur, leading to deviations in the stand-off distance. After multiple layer depositions, the stand-off distance may exceed the acceptable threshold.

This challenge, targets in the development of a solution able to continuously monitor the stand-off distance and controlling it from exceeding an acceptable threshold, that is already pre-defined. This included the solution to:

- The solution shall include all the hardware and software components required for the system to be operational and ready for integration, except for the robot controller interfaces.

- The solution shall provide the appropriate software/user interfaces in order to input the desired height threshold, where the beneficiary shall closely collaborate with the COROB consortium for its implementation in accordance with the COROB software architecture.

- The provided solution shall be able to measure the stand-off distance directly or in-directly with an accuracy of +-0.2mm, with existing data available from the WAAM processing unit and/or through external sensorization.

- In the case of external sensorization, the sensing elements shall not surpass the cost of 10,000 euros, in order to ensure the economic viability, integrability and scalability of the proposed solution. In any case, the beneficiary shall provide a complete solution including the necessary hardware.

- Any External sensors shall be integrated in the end-effector of the robot.

- The system should operate with a latency not exceeding 200ms.

- The system should operate with minimal energy consumption.

The final layer height adjustment value needs to be provided to the robot controller, where the beneficiary shall closely collaborate with the COROB consortium on the development of the solution in order to be integrated in the final robotic cell.

2.4 PREHEATING SYSTEMS INTEGRATED IN THE ROBOT

Directed Energy Deposition-Arc (DED-Arc) or else referred as Wire Arc Additive Manufacturing (WAAM), is a manufacturing process that uses an electric arc as the heat source to melt and deposit metal wire layer by layer, and at the end form three-dimensional shapes. Within COROB, the Gas Metal Arc Welding (GMAW) WAAM technique is used, focusing on the repair of large-scale tooling. The processing head is manipulated by a YASKAWA 6-DOF industrial robot. An auxiliary collaborative robot is employed for executing process supportive tasks. One supportive task that is proposed to be funded and enabled through this open call, is the development of a preheating system of the workpiece to be repaired, which will help in reducing the first layer cracking when using difficult-to-deposit materials and achieve higher build-up rates. From the proposed system the following are expected:

- The system shall include all the hardware and software components for its operation.

- The heating element shall be designed to undergo on/off automatically, without human intervention, therefore designed to be able to be controlled (Temperature, On/Off) through the robot program.

- The beneficiary shall conduct research on the desired preheating temperatures focusing on steel alloys, but the solution provided shall provide the space for its replicability and direct use in other materials.

- The beneficiary shall select among the suitable heating method and heating elements.

- The heating on the to-be processed area of the workpiece shall be as uniform as possible and the preheating process shall be performed in an industrial-viable timeframe.

- The surface areas to be heated may be considered as medium sized, ranging from 40mmx40mm to 500mmx200mm or more. A modular heating system able to be adapted to scale up the dimensions of the surfaces that can be preheated may be considered as an advantage.

- Sensorization for monitoring the achieved on the workpiece temperature is needed as well as a closed-loop control system for it.
- The system shall be developed to be mounted in the collaborative robot as an end-effector.
- Overall weight of the proposed solution shall not exceed 3kg.
- The robot side flange of the system and overall all contact points of the system with the collaborative robot shall not surpass the temperature of 45°C, for safety reasons (mainly electronics). The beneficiary shall provide evidence that the solution does not surpass that limit, or integrate a cooling system in order to ensure that temperature.
- The beneficiary shall conduct research on the necessary safety systems that shall be deployed overall for the proper operation of this solution in an industrial environment, as well as develop these within this open call.
- The system should operate with the minimum available energy consumption, thus focusing in efficiency of the proposed system is necessary.

The beneficiary shall closely collaborate with the COROB consortium on the development of the solution in order to be integrated in the final robotic cell.

2.5 ADVANCED SENSORS FOR QUALITY MONITORING AND/OR NDT PURPOSES

The cooperation of multiple robots offers new operational capabilities in terms of manoeuvrability and manipulability in several industrial processes such as assembling, transporting, painting, packaging and joining. The COROB project addresses these challenges in the form of two use cases. On the one hand, the arc welding case focuses on a cooperative multi-robot system for flexible manufacturing. A gas metal arc welding (GMAW) process will be performed using a jigless robotic approach. In a jigless arc welding setup with two manipulator robots and one welding robot, the two manipulators are responsible for precisely positioning and aligning the workpieces, while the welding robot controls the welding torch. On the other, the Gas Metal Arc Welding (GMAW) WAAM technique is used, focusing on the repair of large-scale tooling. Directed Energy Deposition-Arc (DED-Arc) or else referred as Wire Arc Additive Manufacturing (WAAM), is a manufacturing process that uses an electric arc as the heat source to melt and deposit metal wire layer by layer, and at the end form three-dimensional shapes.

Recently, sensors have undergone a great deal of development that allowed their application in monitoring and quality control of processes. Arc-based processes are quite complex, involving several non-stable inputs and high heat and electromagnetic radiations. The use of sensors to monitor a process can further assist the quality assurance of the final product. Arc-based process related sensors can include but not limited to optical cameras, infrared (thermal) cameras, spectrometers. Additionally, sensors can be used to perform Non-Destructive Testing (NDT) to detect both surface and sub-surface defects. Within literature use of Ultrasonic, Acoustic Emission, Eddy Current, Thermography and optical sensing elements have been used. In this sense, sensors will be integrated in the COROB robotic cell to improve the real-time monitoring and defect detection capabilities.

This Open Call proposes the development of sensing solutions, able to detect one or many of the followings:

- Surface imperfections: these are imperfections that are visible on the surface of the weld, such as cracks, porosity, slag inclusions and others.

- Subsurface or internal imperfections: these are imperfections that are not visible on the surface of the weld, such as lack of fusion, incomplete penetration and internal cracks.

- Melt pool monitoring: referring to the observation and the ability to analyze the characteristics of the molten metal that is formed during processing.

During processing and after processing sensing solutions will be admitted, but during processing sensing solutions will be preferred. That is, sensing solutions that provide real time data during the arc based process, without having to stop.

Evaluated solutions shall be Non-Destructive.

Additional Requirements include:

- The sensing solution will consist of the necessary sensor, the acquisition equipment, the processing unit and the necessary algorithms. Compact and embedded solutions are preferred.

- The system shall be easily integrated into a robot's end-effector that manipulates the GMAW welding or DED-arc processing head.

- Each sensing element is expected to generate data at a rate of at least 30 values per second. Deviations may be accepted if these are technically justified. Higher rates will be positively valued.

- The overall cost of the hardware elements of the system may not surpass the cost of 20,000 euros, in order to ensure the economic viability, integrability and scalability of the proposed solution. In any case, the beneficiary shall provide a complete solution including the necessary hardware, software and execution licenses if necessary.

- The system should operate with minimal energy consumption.

2.6 OBTAIN REAL CAD OF MANUFACTURED PARTS FOR QUALITY ASSESSMENT

Conventional welding workstation consist of a welding robot, a positioner, and a tooling. In the case of high-mix low-volume (HMLV) production scenarios, different complex and expensive jigs and fixtures are required for each reference. The COROB project poses a cooperative multi-robot system for flexible manufacturing. A gas metal arc welding (GMAW) process will be performed using a jigless robotic approach. In a jigless arc welding setup with two manipulator robots and one welding robot, the two manipulators are responsible for precisely positioning and aligning the workpieces, while the welding robot controls the welding torch. Apart from the geometry of the welding bead itself, the overall geometry of the welded parts plays a vital role in the quality inspection during the postprocessing. For geometrical quality inspection of the manufactured parts a 3D scanning is envisioned.

There are different systems on the market based on these techniques (stereoscopic, laser triangulation, etc.) that allow the acquisition of this information in a robust, reliable way and with high quality data. The most convenient technology will be presented for the given use case.

A four-step sequence is suggested:

- Data capture: in this step the manufactured product is scanned, and a point cloud is obtained. Data capture can be by means of a camera, a laser scanner, or other technologies. The manufactured part will be manipulated by a 6-DOF industrial robot and presented to the stand still acquisition hardware.

- Point cloud reconstruction: this phase encompasses the necessary processing of the point cloud, if necessary. Typically, this step covers the necessary roto-translations, correction of overlapping and underlapping points, detection of outliers and blind spots, smoothening, and others.

- CAD conversion: converting the processed point cloud into a CAD file.

- Assessment: comparison of the measured CAD against the theoretical CAD and obtain quantitative metrics with the results.

Optionally, it would be appreciated to add a prior step to calculate the necessary points of inspection for a given CAD. These points will be then transmitted to the manipulation robot to position the part (the generation of collision free trajectories covering these points will be out of the scope of this solution).

The parts to be inspected will be metallic parts installed on a robotic cell in an industrial facility, where shines or reflections may appear and with uncontrolled lighting conditions. The solution should be scalable to scan parts of multiple sizes (10-140 cm).

The provided equipment, including software, shall be easy to install and use, and the results shall be easily interpretable and exportable.

There is no hard constrain for the scanning time, as long as reasonable (i.e. few minutes is acceptable).

The beneficiary will have to closely collaborate with the COROB consortium for its implementation in accordance with the COROB software architecture.

The final solution shall consist of the hardware for data capture and software execution, and the necessary software, including licenses if required. If the acquisition equipment cannot be installed on a magnetic arm, or equivalent, the given solution shall also provide the installation fixture.

3 2ND FUNDING INSTRUMENT – EXPERIMENTS FOR ENABLING TECHNOLOGIES FOR DIGITAL SERVICES

3.1 DIGITAL PRODUCT PASSPORT

The cooperation of multiple robots offers new operational capabilities in terms of manoeuvrability and manipulability in several industrial processes such as assembling, transporting, painting, packaging and joining. The COROB project addresses these challenges in the form of two use cases. On the one hand, the arc welding case focuses on a cooperative multi-robot system for flexible manufacturing. A gas metal arc welding (GMAW) process will be performed using a jigless robotic approach. In a jigless arc welding setup with two manipulator robots and one welding robot, the two manipulators are responsible for precisely positioning and aligning the workpieces, while the welding robot controls the welding torch. On the other, the Gas Metal Arc Welding (GMAW) WAAM technique is used, focusing on the repair of large-scale tooling. Directed Energy Deposition-Arc (DED-Arc) or else referred as Wire Arc Additive Manufacturing (WAAM), is a manufacturing process that uses an electric arc as the heat source to melt and deposit metal wire layer by layer, and at the end form three-dimensional shapes.

We aim to support these manufacturing processes with a Digital Product Passport (DPP) to promote more informed and sustainable processes. A DPP acts as a documentation tool, offering information about a product's lifecycle, including materials, manufacturing processes and sustainability attributes. It is promoting transparency and sustainability across various sectors, fosters collaboration and may reveal unexpected benefits for stakeholders and participants, driving toward a sustainable model of consumption. Serving as a holistic approach to product design, production, distribution, usage, and collection of data allows the circulation of products and materials along value chains. Nevertheless, the digital nature of the DPP raises concerns about data security and privacy that must be addressed by proper cybersecurity measures to protect sensitive information.

In general, the DPP should store information and protocols as long as the following principles apply: i) The DPP's focus is on identifying and connecting products or components ii) All standards utilized must be open iii) Access to DPP data should be strictly regulated based on the actual need of the data.

Data to be included into DPP

Although the envisioned DPP should be flexible enough to accommodate data from any manufacturing process, an excerpt of the data that will be generated in the COROB project is listed below. The DPP should also admit other more generic information, not only related to the manufacturing process. The data below is only provided as an example, the final selection will need to be worked together with the COROB project team during the project. For arc welding case:

- Information of the subcomponents to be welded
- Captured data during the welding process (e.g. electrical parameters of the welding power supply: job, voltage, current, wire speed…)
- Geometrical data of the welding bead obtained using a profilometer.
- Other welding inspection data (e.g. using thermography, ultrasonic, Acoustic Emission, Eddy Current or others)

- Theoretical and real CAD files of the manufactured part and comparison.
- Others (e.g. Durability, Reliability, Reusability, Upgradability, Energy used, Environmental Impact or Waste Materials…)

And for WAAM case:

- Information of the component to be repaired
- Points cloud or CAD file of the volume to be repaired
- Captured data during the pre-heating process (e.g. evolution of the temperature)
- Captured data during the WAAM process (e.g. electrical parameters of the welding power supply, layer height…)
- Other welding inspection data (e.g. using vision, thermography, ultrasonic, Acoustic Emission, Eddy Current or others)
- Final CAD file of the manufactured part.
- Others (e.g. Durability, Reliability, Reusability, Upgradability, Energy used, Environmental Impact or Waste Materials…)

DPP Generic Architecture

The DPP should contain at least three main components:

- A **unique identifier** (Serial Number, RFID, QR code etc.) which should provide to a stakeholder access to product information. This should be globally unique identifying a product instance.
- A **data storage** and **access control** system to ensure data security, and access to data.
- A **data collection** system for collecting and encoding data into the DPP

For the implementation of the aforementioned components various technologies can be utilised. The most prominent is the Blockchain DPP technology, and more specifically the tokenized (NFT) blockchain, having DPP information as NFT on an open public blockchain in which access and editing functionality is granted by the use of encryption keys. Other technologies include i) simple Blockchains where access management is performed by the ecosystem's owner and data resides on a private environment accessible only to platform members, and ii) a non-Blockchain, centralized environment where data are stored in central storages managed by a third party which is also responsible of permission management. The beneficiary should suggest the most prominent technology to meet the specifications.

The beneficiaries shall provide a complete solution to generate, edit and consult DDPs of manufacturing parts (arc-based processes and other manufacturing processes) and meeting the requirements from above. For the "data collection" component the COROB Digital platform should be utilized as a data source which provides an IIoT solution (mainly for shopfloor production data inclusion) supporting MQTT, OPCUA, REST interfaces out of the box (more can be developed utilizing the platform's java API). Apart from the IIoT part, the platform serves also as an Asset Administration Shell repository which supports modelling capabilities for all other data that would be needed for DPP generation.

The result will be utilized as a DPP ecosystem and will be integrated in COROB solution enhancing certification of the developed product as well as providing specifications required in subsequent operations throughout its life cycle (i.e. manufacturing-remanufacturing, assembly, disassembly etc.).

The beneficiary will have to closely collaborate with the COROB consortium for its implementation in accordance with the COROB software architecture.

3.2 FRIENDLY USER INTERFACE

The cooperation of multiple robots offers new operational capabilities in terms of manoeuvrability and manipulability in several industrial processes such as assembling, transporting, painting, packaging and joining. The COROB project addresses these challenges in the form of two use cases. On the one hand, the arc welding case focuses on a cooperative multi-robot system for flexible manufacturing. A gas metal arc welding (GMAW) process will be performed using a jigless robotic approach. In a jigless arc welding setup with two manipulator robots and one welding robot, the two manipulators are responsible for precisely positioning and aligning the workpieces, while the welding robot controls the welding torch. On the other, the Gas Metal Arc Welding (GMAW) WAAM technique is used, focusing on the repair of large-scale tooling. Directed Energy Deposition-Arc (DED-Arc) or else referred as Wire Arc Additive Manufacturing (WAAM), is a manufacturing process that uses an electric arc as the heat source to melt and deposit metal wire layer by layer, and at the end form three-dimensional shapes.

The Friendly Welding Interface aims to revolutionize the welding experience by providing a user-friendly, web-based solution that not only monitors robots and equipment in real-time but also empowers operators with intuitive controls and secure parameter management, ensuring efficient and traceable welding operations.

A key aspect is to ensure that the user interface and its basic interaction mechanism adhere to standard usability guidelines, in terms of efficiency and effectiveness, and also take into account non-technical operators. To accommodate such user groups specific mechanisms like gameful learning tutorials, gameful elements or simulations for trainings with the UI can be considered. Other possible approaches are novel interpretations of command-and-control scenarios, for example changing from the policy to present errors and error states towards the users, towards a command-and-control error scenario that only informs users about the possible actions (for error recovery or task completion) at this stage.

The UI shall support the two use cases of the COROB project.

The friendly user interface should at least meet the following requirements:

- Application Scope : the user-friendly interface shall enable real-time monitoring of robot states, movements, and actions during arc based processes; displaying historical data; and commanding the processes and robots.

- Web-Based Interface: the application will be designed as a web-based platform.

- Data integration: the system must be able to integrate and present aggregated information from the project platform. It should include data from the robots in the cell, as well as information specific to the welding process (including numerical data, text, images and cameras).

- Information accessibility: the information will be available in the project platform on real time. This will allow remote access, permitting operators to inspect and validate arc based processes from remote locations.

- Modularity: it should be as modular as possible, to ensure proper scalability and replicability.

- Usability and user experience: the design and interface of the system must be intuitive and easy to use for the operator, minimizing the learning curve and maximizing efficiency in process monitoring. This includes standard usability principles like learnability, ease of use and (limited) customizability.

- Appearance: the user interface should be visually appealing, modern and clean.

- Parameter Control and User Roles: a crucial aspect is the ability to set and modify welding parameters. The UI should implement a user identification system with distinct roles such as "operator," "supervisor," and "manager." Each role will have restricted access to specific parameters or configurations, ensuring secure and controlled operations.

- Production Traceability: The application should maintain a comprehensive production history or traceability feature. This functionality will record data on welded pieces, including welding parameters and results. Operators should be able to extract production statistics from this historical data.

- Extendibility: the application should be designed extendable (e.g. modular UIs) to include other statistics like predictions or optimization. It should be designed in a way that AI models can be easily integrated. These models can correspond, for example, to quality assessment of manufactured parts (e.g. by comparison with historical data) … and others.

- Display of 3D information: it will be appreciated that the UI can display 3D data. This data can consist of, for instance, CAD models from different sources.

More modern approaches for command-and-control, specific visualization techniques for digital twins in terms of monitoring (and if possible, beyond, for optimization or predictions based on the data), or alternative user interaction principles for reporting errors, task progress and overall learning should be considered.

The beneficiary will have to closely collaborate with the COROB consortium for its implementation in accordance with the COROB software architecture.

3.3 ADVANCED ALGORITHMS FOR REAL TIME INTERPRETATION OF MULTI-MODAL DATA FOR IMPROVED MONITORING / NDT IN PROBLEMATIC ENVIRONMENTS (LIGHT, HEAT, ETC.)

In the arc welding and WAAM cases, the need for using NDT technologies for structural integrity verification is cumbersome. This topic aims to get solutions for advanced algorithms for real-time interpretation of multi-modal data for different challenges. It is expected that the selected solutions provide useful insights, linked to the process quality, regardless of the industrial environment conditions.

Each proposed solution should target at least one of the challenges listed below. The solution can consist of multiple sensors, with their corresponding algorithms and sensor fusion techniques, to enhance the approaches using a single sensor.

The challenges are listed below:

- **Thermal monitoring:**
  - A characteristic example is the thermal drift of the thermal cameras. During the operation of a thermal camera the heat produced by the camera itself and the IR ambient radiation slowly raise the measured intensity leading to false decision by the human operator or the subsequent algorithm. Dynamic drift compensation.
  - Temperature mapping for different materials
  - Application independent image/video features for heat accumulation
- **Optical monitoring:**
  - In an industrial site, the ambient conditions are not perfectly regulated, and consequently the captured signals may include noise. For the case of optical cameras for example changes in light conditions, may affect the operation of a decision-making algorithm, which could generate false alarms or miss a defect case.
  - Application independent melt pool image segmentation.
- **Reflexions using profilometers:**
  - Reflective surfaces can cause scattered light or glare, interfering with the profilometer's sensor signal. This "noise" makes it difficult to accurately distinguish actual surface features from reflections, leading to erroneous measurements.
- **Welding bead monitoring:**
  - Defects on welding beads can be predicted using a variety of measurements. Some consist of measuring the geometrical aspects of the welding, while others rely on other measurements such as data from the welding power supply (voltage, current, wire speed…), process speed, gap… and others. We envision a measuring system that merges data from many sources to predict defects.

During processing and after processing sensing solutions will be admitted, but during processing sensing solutions will be preferred. That is, sensing solutions that provide real time data during the arc based process, without having to stop.

Evaluated solutions shall be Non-Destructive.

All the solutions shall communicate with the project platform for dumping data.

The provided equipment, including software, shall be easy to install and use, and the results shall be easily interpretable and exportable.

The final solution shall consist of the hardware for data capture and software execution, and the necessary software, including execution licenses if required. This includes the provision of the necessary sensors, acquisition system and processing unit. If the acquisition equipment cannot be installed on a magnetic arm, or equivalent, the given solution shall also provide the

necessary installation fixtures. Deviations on this requirement may be accepted, but need to be justified.

The beneficiary will have to closely collaborate with the COROB consortium for its implementation in accordance with the COROB software architecture.

3.4 WEARABLE VISION SYSTEM FOR HUMAN-CENTRED PROCESS MONITORING

The cooperation of multiple robots offers new operational capabilities in terms of manoeuvrability and manipulability in several industrial processes such as assembling, transporting, painting, packaging and joining. The COROB project addresses these challenges in the form of two use cases. On the one hand, the arc welding case focuses on a cooperative multi-robot system for flexible manufacturing. A gas metal arc welding (GMAW) process will be performed using a jigless robotic approach. In a jigless arc welding setup with two manipulator robots and one welding robot, the two manipulators are responsible for precisely positioning and aligning the workpieces, while the welding robot controls the welding torch. On the other, the Gas Metal Arc Welding (GMAW) WAAM technique is used, focusing on the repair of large-scale tooling. Directed Energy Deposition-Arc (DED-Arc) or else referred as Wire Arc Additive Manufacturing (WAAM), is a manufacturing process that uses an electric arc as the heat source to melt and deposit metal wire layer by layer, and at the end form three-dimensional shapes. Since it is not safe for an operator to work next to an arc based processing robot, the robots typically work inside opaque cells. In order to support and empower the human operators in the monitoring and therefore the execution of arc-based processing, a wearable vision system in the form of glasses will be evaluated.

The objective of this wearable vision system is to develop an advanced information visualization solution that allow operators in arc-based process cells to monitor the process situation in real-time.

The system shall support the two use cases of the COROB project: cooperative arc welding and wire arc additive manufacturing for repair. The first use case will consist of a robotic cell with 2 manipulator and 1 welding robots; and the second use case will consist of a processing robot and an auxiliary collaborative robot.

The beneficiary should provide a complete solution consisting of necessary software and hardware for each use case.

The solution should explore the integration of advanced technologies such as digital twin, interactive 3D spaces, augmented/virtual reality by means of wearable devices.

The system must fulfil the following requirements:

- Applicable technologies and devices: such as augmented reality glasses, smart bracelets, or virtual reality helmets may be proposed to offer a useful and ergonomic experience to operators. They must be able to present critical welding process information in real time, facilitating intuitive interaction and allowing operators to make informed decisions without distractions or interruptions. They must be wireless.

- Data integration: the system must be able to integrate and present aggregated information coming from the project platform. It should include data from the robots in the cell, as well as information specific to the welding process (including numerical data, text, images and cameras).

- Information accessibility: the information will be available in the project platform on real time. This will allow remote access, permitting operators to inspect and validate welding processes from remote locations.

- Modularity: it should be as modular as possible, to ensure proper scalability and replicability.

- Usability and user experience: the design and interface of the system must be intuitive and easy to use for the operator, minimizing the learning curve and maximizing efficiency in process monitoring. It will be appreciated to enable a personalized user experience through the ability to easily customize the information displayed.

- Intuitive interaction: currently, the necessary techniques for the generation and acquisition of 3D information of the environment are highly evolved and mature. There are different systems on the market based on these techniques (stereoscopic, laser triangulation, etc.) that allow the acquisition of this information in a robust, reliable way and with high quality data. It wil be appreciated that the system may support at least 5 gesture recognition for intuitive interaction (e.g. initiating actions, stopping the process, interfering with process parameters).

All the real time data will be provided by the COROB project, including cameras inside the robotic cells.

The layouts of the robotic cells in 3D can also be provided by the COROB project, if necessary. This may be desired for a Virtual Reality, an Augmented Reality or a Mixed Reality solution.

The beneficiary will have to closely collaborate with the COROB consortium for its implementation in accordance with the COROB software architecture.

MEET THE CONSORTIUM

TU/e
EINDHOVEN UNIVERSITY OF TECHNOLOGY

GIZELIS ROBOTICS

LMS
Laboratory for Manufacturing Systems & Automation

LORTEK
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

DIGITAL FOR PLANET

FundingBox
#FundingChampions

DGH ingeniería mantenimiento industrial

netcompany
intrasoft

FREQUENTLY ASKED QUESTIONS

COROB OPEN CALL

Submission of applications starts: April 8th, 2024 at 0:00 Brussels Time

Submission deadline: July 8th, 2024 at 17:00 Brussels Time

FAQ

Project co-funded under Horizon Europe Programme of the European Union under Grant Agreement no. 101120640

Thank you so much for your interest in the COROB Open Call and welcome to our Frequently Asked Questions (FAQ). We hope these questions can help you solve your doubts about the application and submission process of the COROB Open Call.

Please remember that this is a complementary document for the Guide for Applicants that you should read first. This FAQ will be updated based on the questions we receive and if you cannot find the answer to your question here, please submit your question(s) at COROB HELPDESK.

This document refers to the Open Call under the COROB project, which launches on April 8th, 2024 at 0:00 Brussels Time and has a submission deadline on July 8th 2024 at 17:00 Brussels Time. Please refer to https://corob-project.eu for more information about the COROB project and to the 'Guide for Applicants' (GfA) for information about the call. You can submit your application at the Open Call microsite https://corob-oc.fundingbox.com/.

Co-funded by the European Union

COROB

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1. WHERE CAN I FIND MORE INFORMATION ABOUT THE PROJECT?

Project website: https://www.corob-project.eu/

Open Call website: https://corob-oc.fundingbox.com/

Open Call helpdesk: https://discord.com/invite/aMKmU5KdmH

LinkedIn: https://www.linkedin.com/company/corob-project/

Complaints email: corob.complaints@fundingbox.com

2. WHAT IS COROB?

COROB is a HORIZON EUROPE project co-funded by the European Commission. It is coordinated by LORTEK with the participation of 8 Consortium Partners from 5 countries (see details at https://www.corob-project.eu/).

COROB aims to develop a flexible, cooperative and intelligent multi-robotic solution for arc welding-based manufacturing processes (joining and additive manufacturing), to offer new operational capabilities that allow to increase the efficiency and improve the flexibility of industrial processes.

3. WHAT IS TRL?

TRL - Technology Readiness Level - Technology Readiness Levels (TRLs) are indicators of the maturity level of particular technologies. This measurement system provides a common understanding of technology status and addresses the entire innovation chain.

There are nine technology readiness levels; TRL 1 being the lowest and TRL 9 the highest. In our project, we refer to Annex B of the General Annexes for Horizon Europe Work Programme 2021-2022 for a full description of TRLs.

DEPLOYMENT	TRL9	Actual system proven in operational environment
	TRL8	System complete and qualified
	TRL7	System prototype demonstration in operational environment
DEVELOPMENT	TRL6	Technology demonstrated in relevant environment
	TRL5	Technology validated in relevant environment

	TRL4	Technology validated in lab
RESEARCH	TRL3	Experimental proof of concept
	TRL2	Technology concept formulated
	TRL1	Basic principles observed

TABLE 1: TRLS

4. WHO CAN APPLY?

The entities eligible for funding can be SMEs and Start-ups. Other entities (companies of any size) are eligible to participate in the open call, but they cannot receive any funding, only technical support.

5. WHAT IS AN SME?

An SME will be considered as such if it complies with the European Commission's Recommendation 2003/361/EC. As summary, the criteria defining an SME are:

- Headcount in Annual Work Unit (AWU) less than 250;
- Annual turnover less or equal to €50 million OR annual balance sheet total less or equal to €43 million.

Note that the figures of partners and linked enterprises should also be considered as stated in the SME user guide. For detailed information check EU recommendation:

https://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

6. WHAT IS A START-UP?

Start-up refers to a tech-oriented company. It should employ less than 10 people (but more than 2 full time equivalent staff) that has operated for less than three years and has attracted more than €50k early stage private sector investment or has demonstrable sales growth over 50% pa.

7. CAN I APPLY IF I AM NOT AN SME OR A START-UP?

Yes, you can. Companies other than SMEs and start-ups are welcome to apply, but only SMEs and Start-ups can be selected to receive financial support. If selected, companies other than SMEs or Start-Ups will receive technical support from the COROB consortium partners, but they will not receive any financial assistance. Such entities must cover 100% of their costs independently.

8. HOW WILL WE CHECK YOUR SME/START-UP STATUS?

Before signing the Agreement, you should provide documents regarding your formal status. The COROB Consortium will verify them to prove your eligibility.More specifically, we will ask you to complete the application form with your company data (in case of having a partner or linked entities also the data of those entities) and provide the following documentation:

- Official, valid and current (up to date) registration document of the enterprise. An extract from the current official registration document (or its equivalent: Company Register, Official Journal) indicating the name of your organization, the address of the head office, its registration number, and authorised representatives. The enterprise registration document is a written statement from the Government or other authority which confirms that the company legally exists and confirms its data.

- Document showing the holding structure of the Applicant enterprise - shareholders and the percentage of shares that they own in the applicant enterprise. We can accept an official and signed declaration indicating shareholders and the percentage of shares that they own in the organisation.

- VAT Registration - a copy of an official and valid document proving your VAT registration. The VAT number can be confirmed by the VAT Information Exchange System (VIES) - http://ec.europa.eu/taxation_customs/vies/vatRequest.html.

- Financial statements of the Applicant enterprise, containing information about the annual balance, turnover and staff headcount. In cases where the number of employees is not clearly identified in the financial statements, any other supporting documents which demonstrate the staff headcount such as statistic reports, annual reports, national or regional records. If the number of employees is not clearly indicated in the above-mentioned documents, we can accept other supporting documents such as an official and signed declaration on the staff headcount expressed in Annual Working Units.

- In case of start-ups, to prove whether a company has attracted more than €50k in early-stage private sector investment or has achieved demonstrable sales growth over 50% per annum – you will be requested to provide an investment agreement or financial statements confirming the investment or sales growth exceeding 50% per annum

- Additional documentation of partner and linked enterprises (mandatory in case of having partner and/or linked entities):

    - financial statements of partners and/or linked enterprises (showing the turnover, balance total sheet, employment). In cases where the number of employees is not clearly identified in the financial statements, any other supporting documents which demonstrate the staff headcount such as statistic reports, annual reports, national or regional records. If the number of employees is not clearly indicated in the above-mentioned documents, we can accept other supporting documents such as an official and signed declaration on the staff headcount expressed in Annual Working Units.

    - document showing the holding structure of partner/linked enterprise, e.g. official extract of the shareholders from the Chamber of Commerce or any other Official Register or instead we can accept an official and signed declaration indicating shareholders and the percentage of shares that they own in the organisation.

- the Bank Identification form – the Bank Identification form. The Bank identification form helps us to know the banking coordinates, necessary for the authorisation of payments from the EU.

9. CAN I APPLY TOGETHER WITH ANOTHER ORGANISATION?

No, you can not. We are looking for individual entities.

10. CAN I SUBMIT MY APPLICATION IF MY ENTITY IS NOT YET ESTABLISHED?

No, you can not. Application is only for entities registered before COROB Open Call starts on April 8th 2024.

Remember! Register means that the entities must be legally registered in the relevant national company/business registers before 8th of April 2024.

11. CAN I CHOOSE MORE THAN ONE CHALLENGE IN ONE PROPOSAL?

No, you can not. You must select exactly one challenge from the list provided by COROB. All the challenges are described in the 'Technical Guidelines'.

12. HOW DO I SUBMIT MY APPLICATION TO THE OPEN CALL?

Applications to the COROB Open Call must be submitted through the COROB Open Call microsite at https://corob-oc.fundingbox.com/. Applications submitted by any other means will be rejected. Inside the online application form, there are specific fields to provide descriptions. Please make sure you submit your application on time. All requirements are described in the 'Guide for Applicants', section 3.

13. WHAT SECTIONS SHOULD I FILL IN THE APPLICATION FORM?

- Basic Information
- Legal Information
- Excellence
- Impact
- Implementation
- Ethics self Assessment
- Statistical section
- Declaration of honor
- Processing of Personal Data

All mandatory sections of your application- generally marked with an asterisk - must be filled in (admissibility criterion) and written in English.

14. CAN WE UPLOAD A LETTER OF INTENT (OR ANY OTHER DOCUMENT) THAT WE HAVE ACQUIRED FOR THE SUPPORT OF OUR PROPOSAL?

In the Application Form, you can only include Budget Estimation and GANTT of your project in a pdf file. We propose sharing the file on ShareDrive (SharePoint, Google Drive, etc.) and putting the link in one of the text boxes.

15. HOW LONG DOES IT TAKE TO FILL IN THE APPLICATION?

In order to successfully fill in the application form, you will probably need 2-3 days of writing. You can divide your work between your team members . You'll be able to add contributors to your application so that each team member can tackle their application area.

Please take into account that specific character limits have been established in each section of the online application form, so we encourage you to keep your application focused on the requested information keeping in mind the topics and verticals covered by COROB Open Call. We also recommend that you start the submission process quite before the deadline in order to avoid last-minute circumstances.

16. WHAT SHOULD THE IDEAL PROJECT BE LIKE?

Please check the "Technical Guidelines" which you can download from the Open Call microsite. You will find examples of ideal projects depending on the challenge you are going to address.

17. CAN ONE ENTITY SUBMIT TWO PROJECT IDEAS?

No, it is not possible. We do not accept multiple submissions. You can submit only one proposal to COROB in this Open Call. If more than one proposal is identified, only the last proposal which has been submitted in order of time will be evaluated.

18. CAN I APPLY IF I HAVE RECEIVED FSTP GRANTS FROM OTHER PROJECTS BEFORE?

Yes, it is possible. The only point that you should pay attention to if you are selected (funded) for multiple EU projects is the "no double funding" rule. "Double funding" means the situation where the same costs for the same activity are funded twice through the use of public funds. It is not allowed in any circumstances. That means that you have to be able to confirm that funding received from the COROB project will not cover the same costs/tasks which were already funded by other EU projects (if you have received any).

19. ARE APPLICANTS REQUIRED TO INCLUDE THEIR BUDGET ESTIMATION IN THE APPLICATION?

Yes, you need to fulfill the budget estimation of your proposal using the Excel file template - which you can download from the open call microsite - and then upload it in pdf format when applying.

20. WILL I BE ABLE TO MODIFY MY PROPOSAL AFTER SUBMISSION?

You can modify the application as many times as you need after submission but before the Open Call deadline.

REMEMBER! You need to submit it before the July 8th 2024 at 17:00 Brussels Time. You won't be able to modify your application after this deadline.

21. WHAT HAPPENS IF I DO NOT SUBMIT MY APPLICATION WITHIN THE DEADLINE?

Applications must be submitted before the deadline (July 8th 2024 at 17:00 Brussels Time). We do not accept applications after the deadline. We strongly encourage you not to wait until the last minute to submit your proposal. Failure to meet the submission deadline for any reason will result in the rejection of the proposal.

22. WHAT TYPE OF SUPPORT IS AVAILABLE FOR PREPARING THE APPLICATION?

The 'Guide for Applicants' is the main reference document. It provides detailed information about the application requirements, evaluation, and selection processes. A Helpdesk service for the COROB Open Call is at hand to clear up any doubts you may have relating to the application process (eligibility rules, application form information requests, etc.).

Further information on the 'Challenges' for the support of your proposal preparation will be available during the online Info Days and webinars to be announced at the COROB Open Call microsite and Helpdesk. The events will explain COROB support activities to individual entities and the opportunities and benefits they entail, answering questions that might arise from the audience.

23. WHAT HAPPENS AFTER MY APPLICATION HAS BEEN SUBMITTED?

The applicants will receive communication from the system indicating that their application has been submitted. Get in touch with us if it is not the case. Right after the submission deadline on the 8th of July 2024 at 17:00 Brussels Time, there will be an admissibility and eligibility check if the applicants meet the eligibility criteria included in the 'Guide for Applicants'.

24. HOW TO WRITE A PROPOSAL THAT CONVINCES EVALUATORS?

Make sure you do not leave any information out of your proposal. Be specific and provide precise answers to the questions in the application form. If you want to stand out, quality is the way to go. The proposed project should provide a solution to the specific challenge while keeping in mind the overall goal of the COROB project.

25. HOW WILL WE EVALUATE YOUR PROPOSAL?

The evaluation process has 6 steps + formal verification,

STEP 1: Admissibility and Eligibility Check.

STEP 2: In/Out Scope Screening.

STEP 3: Independent Individual Evaluation.

STEP 4: Evaluation Consensus Group

STEP 5: Consensus Meeting.

STEP 6: Milestones Review.

Formal verification: SubGrant Agreement Preparation and Signature.

Before signing the SubGrant Agreement, you should provide documents regarding your formal status. The COROB Consortium will proceed to a verification of these documents to make sure you are eligible.

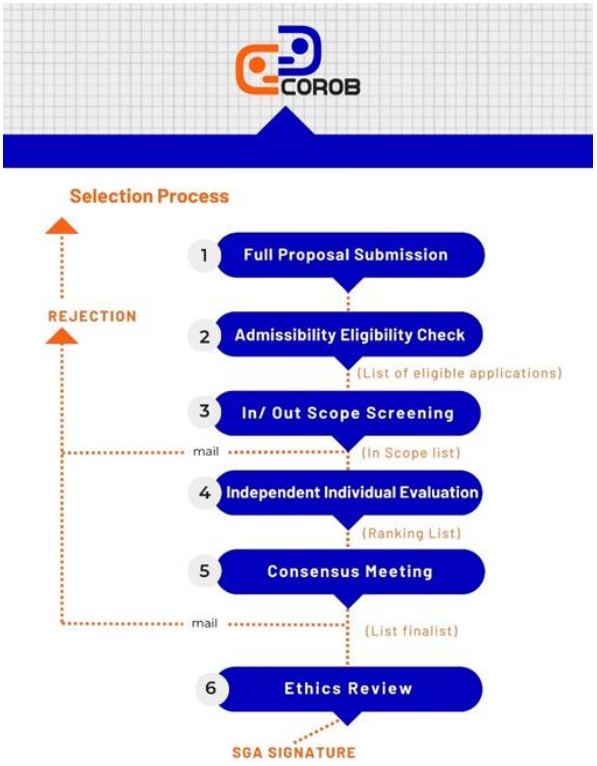

FIGURE 1 - COROB SELECTION PROCESS

26. WHO ARE THE EXTERNAL EXPERTS?

The External Evaluators are external, independent experts with proven experience in the verticals in which the COROB Project. The External Experts come from relevant industry and academia.

These external experts cannot be Consortium partners, employees, permanent collaborators nor board members.

27. WHAT HAPPENS AFTER THE CONSENSUS MEETING?

After the Consensus meeting, the COROB project team will be carrying out an 'Ethics Review' and 'Formal Check'. In case some finalist fails to comply with the formalities required, the next-ranked proposals on the 'Reserve List' would be approved.

28. WHAT COSTS WILL BE ELIGIBLE?

Lump sum budgets are based on a cost estimation which means that you need to provide us with a budget estimation with realistic cost estimations for each cost category (personnel costs, necessary travel costs for industry partner visits, and other costs, costs for providing open access to scientific publications directly related to the Experiment, consumables, equipment costs) per beneficiary. You need to include these estimated costs in the budget estimation you need to provide using the Excel template from the Open Call microsite.

Remember that Start-ups are eligible for 100% coverage of their eligible costs, while SMEs that are not Start-ups can receive 70% of their eligible costs, with the remaining 30% required to be self-funded.

29. CAN I APPLY IF ME OR MY ORGANISATION IS ASSOCIATED WITH PARTNERS OF COROB?

Applicants cannot have any direct or indirect affiliations with any of the COROB Consortium Partners. This includes employees, board members, affiliated entities or permanent collaborators. All cases of potential conflict of interest will be assessed case by case.

30. WHAT IS A CONFLICT OF INTEREST?

Conflict of interest may occur, if there are capital or personal connections between two or more entities (Applicant, COROB Consortium Partner, or any person involved in the selection process), in particular, it should be understood as:

- any ownership relations - ownership of shares, financial links and economic connections - like joint venture, holding, joint participation, silent partner, e.g. Applicant's entity owns shares in the COROB Consortium Partner company or the COROB Consortium Partner company owns shares in the Applicant's company (it also refers to the Applicant's partners/linked enterprises).As an economic connection, we can understand exclusive licenses and sale agreements if they concern products or solutions covered by your application etc;

- family and personal relationships, in particular: marriage, kinship, a relationship or affinity to the second degree in a straight line or lateral line, adoption, custody or guardianship or actual life and other close personal ties binding the Applicant and the COROB Consortium Partner or any person involved in the selection process – e.g. person representing the COROB Consortium Partner company has family/personal ties with anyone representing the applicant company;

- the existence of material, especially financial relationships (such as the receipt by a person involved in the selection process from Applicant any significant gifts, donations, future contracts or employment, etc;

- relationships based on employment, cooperation or existing civil contract between the COROB Consortium Partners and people involved in the Applicant's structure, including managerial or supervisory functions, position in managing or supervising bodies, board members. E.g. Director of the COROB Consortium Partner is involved in the management bodies of an Applicant company; the applicant's employees involved in the Project are employed or contracted by the COROB Consortium Partner company etc;

- remaining in a legal or factual relationship that may give rise to justified doubts as to the impartiality of the people involved in the selection process (expert/evaluator/employee/member of the management bodies of any of the organisations taking part in the application process).

The reasons set forth above may result in a conflict of interest if they occur at the time of an action or have occurred in the past (during the last 3 years before the action starts). Time limits do not apply to family and personal relationships.

The situations listed above are mere examples, all cases of conflict of interest will be assessed on a case by case basis.

31. WHAT ARE THE DIFFERENT EVALUATION PHASES AND THE EXPECTED SCHEDULE?

Phase	Approximate Dates	Number of applicants
Applications	April 2024- July 2024	No limitations
Admissibility & Eligibility Check	July 2024 - August 2024	-
In/Out Scope Screening	July 2024 - August 2024	-
The Independent, Individual Evaluation	August 2024 - September 2024	-
Evaluation Consensus Group	August 2024 - September 2024	-
Consensus Meeting	August 2024 - September 2024	-

SME check + SGA signature	August 2024 - September 2024	
Support Programme for 1st Funding Instrument. “Solutions to challenges”	October 2024 - August 2025	up to 10 entities
Support Programme 2nd Funding Instrument. “Experiments for Enabling technologies for digital services”	October 2024 - June 2025	up to 5 entities

32. WHERE CAN I ASK MY QUESTIONS?

If you still have any doubts regarding our Open Call process, feel free to get in touch with us. Ask your question in the Helpdesk space of the COROB Community.

33. WHAT ARE THE GENERAL PAYMENT TERMS?

- All payments will be made in Euros (€);
- Expenditures incurred before the SubGrant Agreement signature (before the start of the programme period of your project) or after the programme period of your project are ineligible;
- Costs incurred for the implementation of the project must be used for the sole and close purpose of achieving the objectives of the project and its expected results.

You can find detailed information and the schedule of the payments in section 5 of the Guide for Applicants.

34. WHICH ORGANISATIONS ARE THE PARTNERS OF THE COROB CONSORTIUM?

It is coordinated by LORTEK with the participation of 8 Consortium Partners from 5 countries Please see details of the COROB Partners at https://www.corob-project.eu/about-the-project-2/.

LORTEK MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE	LMS Laboratory for Manufacturing Systems & Automation
netcompany intrasoft	DGH ingeniería mantenimiento industrial

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY	FundingBox
GIZELIS ROBOTICS	DIGITAL FOR PLANET