MADE IN EUROPE 2026

ONLINE PITCHING

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INTRODUCTION TO AMIC

AMIC is an advanced manufacturing Research & Technology Organisation (RTO) based at Queen's University Belfast, Northern Ireland.

- Underpinned by research excellence & academic expertise.
- Delivering collaborative innovation projects at TRL 4-7 using the latest Industry 4.0 tech, automation, smart design & materials.
- Harnessing £100m of city growth deal funding to establish a collaborative, open-access platform of advanced manufacturing: new Factory of the Future facility opened in Q1 2026 – a 10,000m² open-access manufacturing and engineering innovation centre.
- Leveraging established local industrial use cases in aerospace & defence, materials handling, energy & transport, advanced construction, agritech, life sciences, and more.

CAPABILITY GROUPS

CALL TOPIC 1

HORIZON-CL4-2027-01-MAT-PROD-03: Factory processes and automation for de- and re-manufacturing

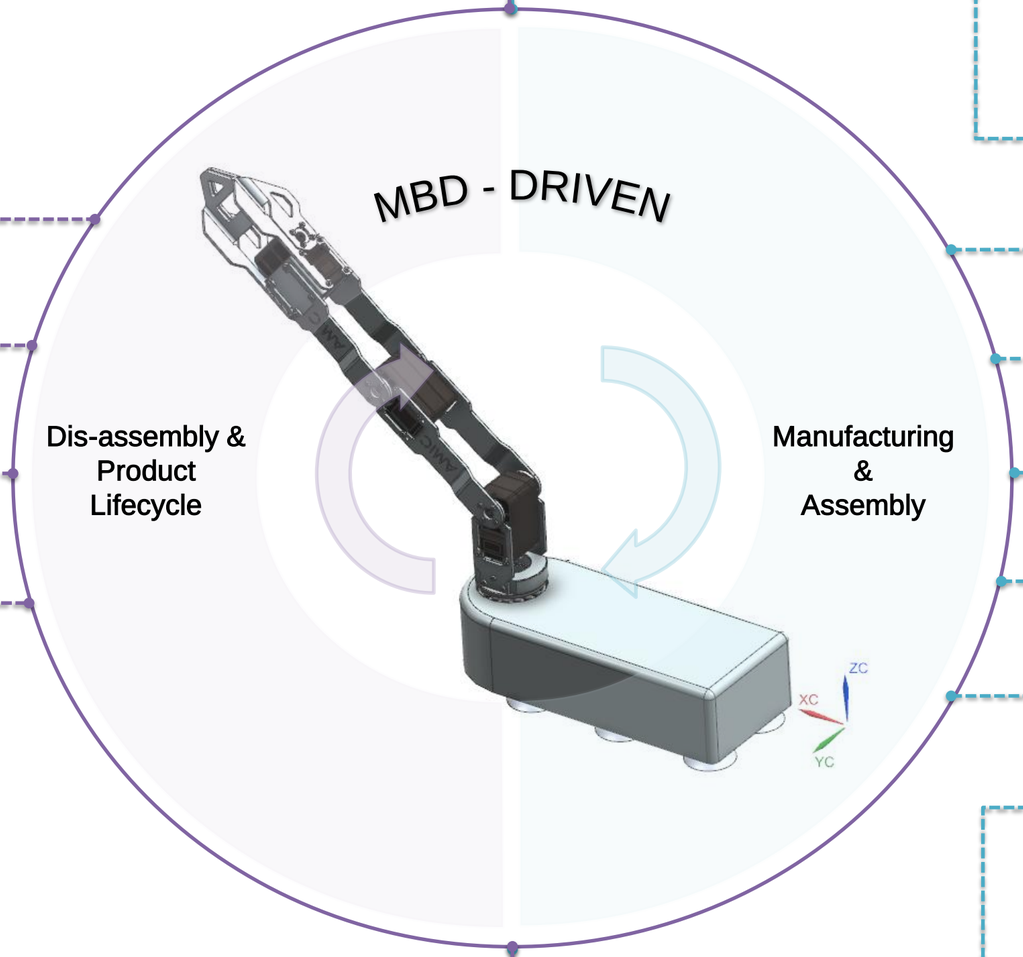
AMIC Smart Design: Integrates **innovation**, **digital intelligence** and **automation** into the design process to create products and systems that are more efficient, sustainable and reliable – enabling a streamlined end-to-end product cycle.

Design-Led Digital Thread • **Design for Manufacturability, Assembly & Disassembly** • Costing Framework • Advanced Simulations • End-to-End Product Development • Design for Sustainability

CALL TOPIC 1

DESIGN FOR MANUFACTURING, ASSEMBLY, DISASSEMBLY

- Modular Replacement
- Dis-assembly Instructions
- Maintenance Access
- Tool Standardisation & Assessment
- Traceability - Digital Product Passport
- Re-manufacturing Readiness



- Design Intent
- Automated/Assisted Design Rules
- DFM/DFMAD Analysis
- Design Optimisation
- BOM Maintenance
- Manufacturing Readiness
- Compliance, Criteria, Regulations

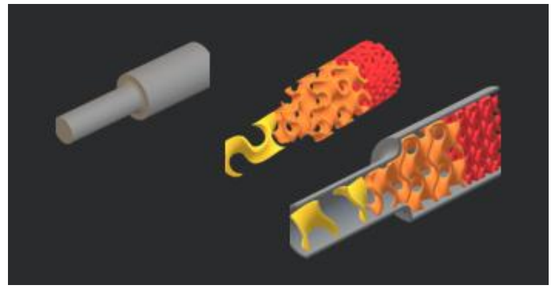
CALL TOPIC 1

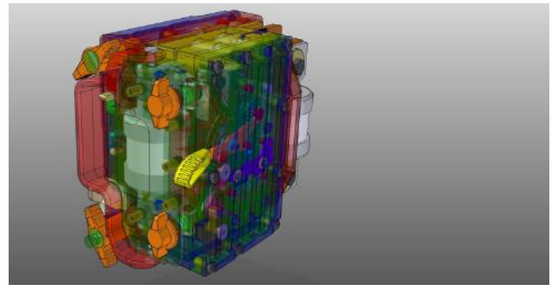
HORIZON-CL4-2027-01-MAT-PROD-03: Factory processes and automation for de- and re-manufacturing

AMIC can contribute digital engineering, lifecycle assessment, structural integrity, repairability evaluation and circular design methodologies to enable trusted & scalable de- and re-manufacturing workflows:

- **MBD Driven Assembly/Disassembly & Digital Twins,** e.g.:
  - Model-Based Definition (MBD) frameworks to support inspection, assembly/ disassembly & remanufacturing decision-making.
  - Development of digital twins for structural integrity, degradation assessment & repairability evaluation.
- **Digital Product Passport for End-to-End Product Visibility**, e.g.:
  - Definition of engineering data requirements for remanufacturing & lifecycle extension.
  - Integration of inspection, repair, maintenance & validation records into DPP.
  - Development of repairability and remanufacturability indicators within the DPP.
- **Design for Circularity**, e.g.:
  - Design-for-inspection methodologies to facilitate condition assessment & qualification.
  - SSbD approaches for circular product development.

Ability to leverage strong **local use cases** in aerospace, clean-tech & materials handling.





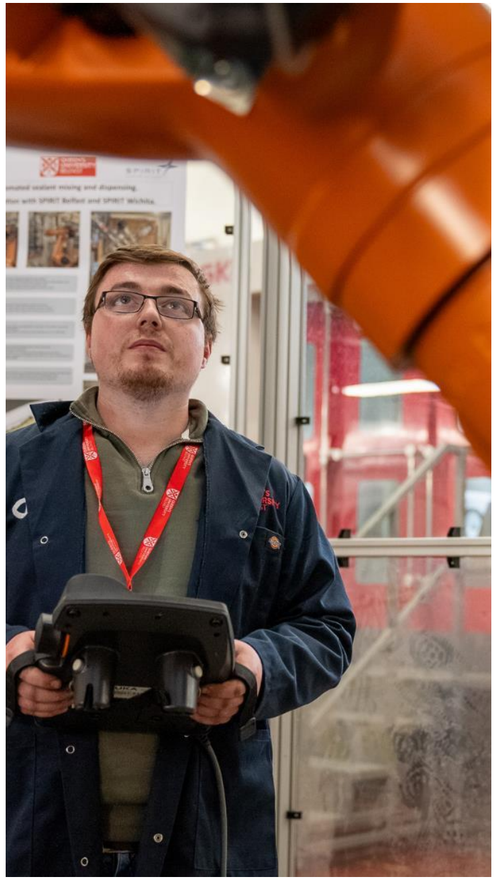
CALL TOPIC 2

HORIZON-CL4-2027-02-DIGITAL-EMERGING-52-two-stage: New approaches for Human/AI collaboration for the workforce of the future

AMIC Digital Factory: Expertise in advanced manufacturing processes & systems, coupled with advanced connectivity and digital technologies. Strong capability in industrial data spaces, interoperability standards & digital twins; established links with industrial partners.

Strategic research interests:
Human/AI collaboration for shopfloor decision-making, following an '**optimiser proposes – AI explains – human decides**' model:

- **On-premise agentic AI for the factory floor with no cloud dependency:** Local LLMs run on-site, orchestrating constraint solvers and surfacing recommendations.
- **Multimodal capture of tacit operator knowledge:** Converting experienced worker problem-solving into structured operational software and decision support.
- **Adaptive human-AI task allocation in human-robot collaborative cells:** Using physical testbed to study dynamic re-allocation of tasks between operator and machine based on cognitive load, skill and fatigue.
- **Explainability & trust calibration:** Trust, comprehension & appropriate reliance are primary outcomes instrumented via the digital twin & telemetry.



CALL TOPIC 2

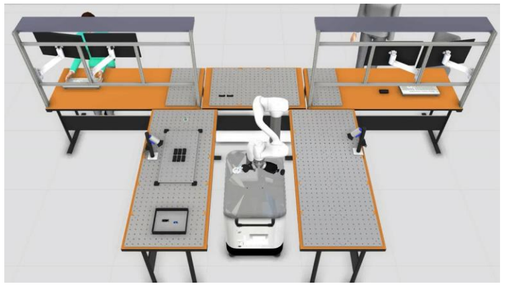
HORIZON-CL4-2027-02-DIGITAL-EMERGING-52-two-stage: New approaches for Human/AI collaboration for the workforce of the future

Contributions:

Lead demonstration/test bed/technology transfer work package:

- **Living-lab demonstrator and validation:** Integrated human/AI collaborative cell hosted at AMIC Factory of the Future.
- **Reference architecture & interoperability layer:** Definition of the data model that lets human/AI collaboration tools plug into heterogeneous shopfloor systems.
- **On-premise AI infrastructure & deployment patterns:** Hardware/software stack & supporting security architecture.
- **Digital twin/simulation environment for human/AI scenario testing:** Virtual factory for safe rehearsal of collaboration scenarios.
- **SME technology transfer & validation**
- **Cybersecurity & trustworthy-AI assurance**

Ability to leverage established links with industrial use cases including food & drink manufacturing (e.g. high-throughput packaging lines); aerospace (where traceability is key). Applicability in processes including discrete machining/precision engineering, human-robot collaborative assembly & injection moulding.



CALL TOPIC 3

HORIZON-CL4-2027-01-MAT-PROD-06: Circular innovative advanced materials: facilitating the transition from design to markets

AMIC Sustainable Polymers & Composites: Formerly the QUB Polymer Processing Research Centre. Expertise in 3D preforms for advanced aerostructures; use of natural fibre & bio-based resin systems; industrial-scale pilot line facilities.

Strategic research interests – energy applications:

- High-pressure hydrogen gas storage and transport; Composite over-wrapped pressure vessel (COPV); Cryogenic hydrogen storage.
- Powering heavy-duty equipment, e.g. off-road construction machinery.
- Renewable energy: wind turbines.

Contributions:

- Polymer processing: material compounding, recycling, extrusion, injection moulding, world-leading expertise in rotational moulding.
- Composite processing: thermoforming, overmoulding, RTI, RTM, fibre placement, 3D woven preforms, autoclave, composite machining.
- Characterisation & testing of material performance, including structural mechanical testing, non-destructive testing.
- Lifecycle assessment (LCA) & SSbD analysis.

OTHER CALL TOPICS

HORIZON-CL4-2027-05-DIGITAL-EMERGING-03: Advanced integrated photonic devices for extended features and ultra-low power consumption (Photonics Partnership)

AMIC Nanotechnology & Photonics: AMIC's newest capability group, leveraging Northern Ireland's strong regional photonics capability. Facilities include:

- **600 m² state-of-the-art cleanroom** comprising 500 m² ISO 6 cleanroom space for etching, deposition of semiconductor materials & photonics packaging; 100 m² ISO 5 cleanroom space configured as a dedicated photolithography cell.
- Further investment in advanced nanofabrication & photonics tools in 2027.

Strategic research interests:

- Novel approaches for wafer-scale semiconductor lasers (beyond GaAs).
- Integration of low-cost lasers and diodes into high-volume applications.

Contributions:

- **Fabrication & process integration lead:** Lithography & topography patterning; Advanced passivation & insulation; Metallisation & ohmic contact optimisation; On-wafer screening & automated testing.
- **Back-end integration & prototyping hub:** Precision dicing & facet preparation; Die-attach & thermal management; Wire bonding & electrical interconnects; Prototype assembly & optical alignment.

THANK YOU

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