# DigiPass: Knowledge Valorisation for Innovative Advanced Materials Design and Development

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## 1. Introduction

The twin green-digital transition is a cornerstone of the European strategy. This transition should lead to a circular, sustainable, and net-zero-emission European economy that works for people. Advanced materials are the source of prosperity and form the backbone of a systematic approach to innovative products in-line with the European strategy as greatly analysed in the Materials 2030 Manifesto [1] and presented in the Communication of the Commission on Advanced Materials for Industrial Leadership [2].

DigiPass CSA project, started in April 2024, supports the twin green-digital transition accelerating digitalization processes in materials manufacturing through enhancing the digital maturity of industrial stakeholders and through harmonization of data and knowledge exchange using digital environments / platforms [3]. DigiPass promotes the exchange of digital material data between industry and research institutions, laying the foundations for a digital material and product passport [4].


*Figure 1: DigiPass Logo and Slogan.*

## 2. Digitalisation of Advanced Materials

The overarching objective of the DigiPass CSA project consists in enhancing the digital maturity of the European communities that develop materials and intermediate products by harmonizing and synergizing collected materials data sources and digital infrastructures. The project develops recommendations and clear routes toward digitalized circular business models. The overarching key result of DigiPass is to create a sustainable platform which includes support for Digital Materials & Product Passports and for collaborative innovation-by-design processes in a circular economy served by

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advanced materials. A business model for operating such a platform completes the overarching objective.

Accelerating the design, development, and production of safe and sustainable chemicals and materials, as they are necessary for innovative products, calls for a collaborative approach involving different stakeholders to advance circularity of the European economy at large. However, the stakeholder groups involved in product innovation based on advanced materials are today at heterogeneous levels of digital maturity. Digital Materials & Product Passports will create a coherent framework and minimum digital maturity across advanced materials and manufacturing in Europe. In addition, DigiPass will enable interoperability of data exchange and standardization of advanced materials data at all maturity levels.

## 3. Demonstration by industrial use cases

DigiPass will provide 4 demonstration cases for different industrial sectors:

- Advanced Composite Materials
- Advanced Materials for Renewable Energy Sources
- Health & Safety of Advanced Nanomaterials
- Innovative Materials for Pre-painted Metals

Partners from academia and industry, including industrial associations are working together to increase the competitiveness of European companies and boost their productivity. Digital materials and product passport contains all relevant information about the material, its origin, processing and environmental impact on all stages of its lifetime. At the end of its life, the collective product information will enable recycling companies to process materials more effectively, resulting in more sustainable solutions and helping minimise the material's overall environmental impact [4]. The ideal scenario will be provided for each demonstration case as a success user story.

## 4. Collaboration among Stakeholders and Projects.

DigiPass collaborates with projects and national initiatives working on digital aspects of materials design and development, in particular with the Materials Commons infrastructure components [5], EOSC, Platform MaterialDigital, Diadem [2], some EU funded projects like BIG-MAP, and CIRPASS-2.

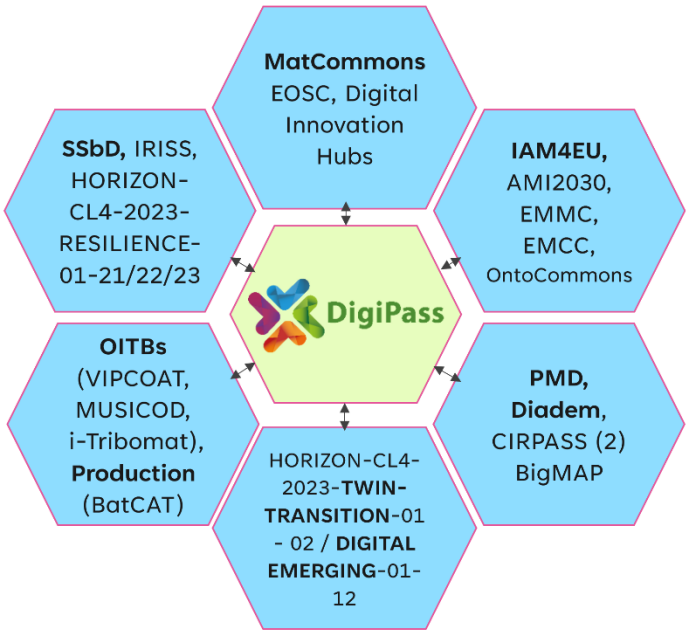


*Figure 2: DigiPass focused collaboration environment.*

Moreover, the SSbD projects lead by IRISS CSA and EU projects funded under following topics:

HORIZON-CL4-2023-TWIN-TRANSITION-01-02,

HORIZON-CL4-2023-RESILIENCE-01-21,

HORIZON-CL4-2023-RESILIENCE-01-22,

HORIZON-CL4-2023-RESILIENCE-01-23,

HORIZON-CL4-2023-DIGITAL-EMERGING-01-12

are in the focus of establishing collaborations with DigiPass. A schematic representation of the DigiPass cooperation network is presented in Figure 2.

DigiPass CSA is aiming to take on board all materials development communities. We are open for cooperation with any projects and stakeholders. Please contact us and register at the project homepage as a stakeholder to receive information about the project development and on-going actions [3].

## 5. Conclusions

Accelerating the materials innovation cycle calls for a collaborative approach involving different stakeholders in a circular economy to support manufacturing, durability, repair and overhaul, reuse, and recyclability of products. These requirements set the stage for all materials development communities in Europa and need to get implemented as targets in materials and product innovation processes as soon as possible [6]. The long-term vision of the DigiPass CSA is to enable industry to know their products in a systemic sense as entities in a circular economy.

## 6. Acknowledgements

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## 7. References

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