



**3D printing with seamless
transitions between
different materials zones**



smart

advanced manufacturing

ORGANISATION PROFILE

- RISE – Research Institutes of Sweden is the state-owned national research institute of Sweden. It supports R&D across all industrial sectors.
- RISE in number (year 2020)
 - Five divisions - Bioeconomy and health, Digital systems, Materials and production, Build environment, Safety and transport.
 - Employees – about 2800.
 - Annual turnover – 3396 MSEK or 339 M€.
- Forest-based composites and 3D printing solutions are some expertise we may contribute to this call.

PROPOSAL INTRODUCTION (I)

Vision:

- A new generation of AM (FDM) system that enables creation of a unified 3D structure having different functional (material) zones and seamless transitions between the zones. The materials will be in pellet form.

Motivation: why the project is necessary

- At present a multi-material FDM system equips with multiple print-heads (extruders), one for each material. Switching the print-head (materials) creates discontinuity in the 3D structure, which deteriorates the quality and robustness of the 3D printed object.
 - A filament-based multi-color FDM printer uses essentially the same base material.
- Co-processibility and compatibility between the materials are crucial. Lists of material that supports the industrial applications are needed.

Content: which are the developments to be made in the project

- To develop a new generation of FDM system that enables creation of a unified 3D structure having different materials / functional zones and seamless transitions between the zones.
- A material solution that supports the industrial applications using the multi-material FDM technique.

PROPOSAL INTRODUCTION (II)

Expected outcome: descriptions of the results to be obtained in the project

- A prototype FDM machine that enables creation of a unified 3D structure having different material / functional zones and seamless transitions between the zones.
- Lists of materials for the chosen industrial applications with focus on their co-processability, chemical compatibility and so on in addition to mechanical properties, environment impacts etc.

Impacts: what will be the expected market impact of the project

- New generation of FDM machine.
- Competitive edge in 3D printing of products or components for prototyping and short-series production and services.
- Materials solutions.

Schedule: From 2023-07-01 to 2026-06-30. Duration: 36 months.

PARTNERS

Current Consortium: list of partners already involved in the project

- RISE – coordinator
- Hexpol TPE
- KFM machine
- Embreis AB
- Ortopedtek I Örebro län.
- Supporting partner: Stora Enso

Partner search: type of partner searched and countries of origin (if necessary).

- Industrial companies and research institutes that have the willingness to share a journey and to provide complementary expertise & skills, resources, market-reach, and network.
 - Chemical and material producers
 - Manufactures
 - End users
 - ...

CONTACT INFO

Contact info: of the person coordinating the project proposal

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