

ADDITIVE MANUFACTURING FOR COMPOSITES

FACT PROJECT

The project has evaluated two additive manufacturing technologies, laser sintering of powder material (LS) and material extrusion (FFF, FDM), applied to high temperature polymers out of the groups of PAEKs, especially PEKK with and without carbon fiber reinforcement.

TECHNICAL AND ECONOMIC IMPACTS

- Improvement of mechanical properties (~25%)
- Improvement of cost-benefit ratio
- Improvement of productivity

KEYWORDS

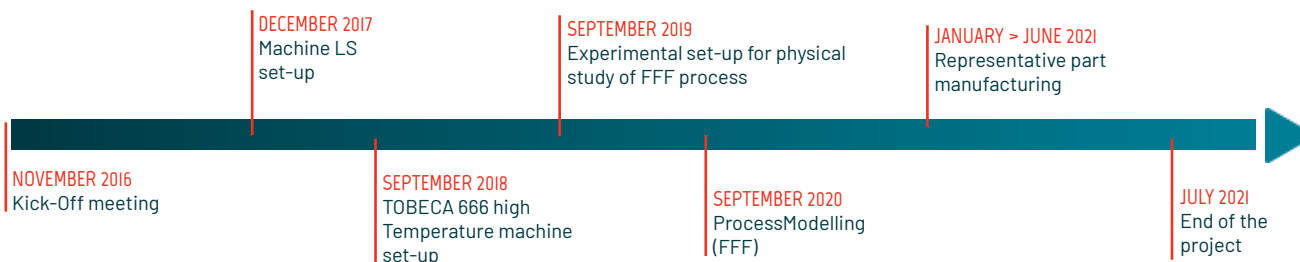
Laser Sintering (LS) - Fused filament fabrication (FFF) - PEKK - High performance plastics

PARTNERS

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BUDGET

6 577K€



INDUSTRIAL CONTEXT

Additive manufacturing technologies for polymers are fast-growing especially because of new more affordable machines and high visibility in the media. Nevertheless these technologies are still limited to non-functional parts because there was lack of process understanding and the available polymers were limited in properties. Especially materials with high usage temperatures and good flame resistance were widely requested from the industry.

The increasing interest is explained by several advantages related to additive manufacturing but as these processes are recent developments some obstacles to the deployment in industries have to be overcome.

The FACT project contributed to better understanding and developments related to the application of additive manufacturing to high performance plastic and composite materials.

PROJECT ACHIEVEMENTS

- Equipements procurement : EOS P810, TOBECA 666 high temperature, RFFF
- Evaluation of neat and filled powders and process parameters and powder recycling
- Characterisation of materials build with commercial and development powders improvement
- RFFF set-up
- FFF process instrumentation and simulation: Part scale and filament scale
- Powder aging study for LS and LASER powder interaction study
- Realisation of demonstrator parts for both technologies LS et FFF (EOS P810 & Tobeca 666 HT)

APPLICATIONS & INDUSTRIAL PERSPECTIVES

Different follow up projects are considered by the project members for further developments and maturing the technology.

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