REVOLUTION project

REVOLUTION is proposing a disruptive innovation that will bring open-loop recycling to the forefront of automotive injection moulding. REVOLUTION will use machine learning and artificial intelligence to OPTIMISE the input of recycled materials and injection moulding process to deliver high-quality parts.

✓ **14** Partners
✓ **10** Countries
✓ **5.927.475 €** Budget
✓ From **01.01.2021** to **31.12.2023**
✓ H2020, Innovation Action
✓ **4** Use cases

USE CASES

Back seat panel

B-Pillar cover

Crash Box

Lower rear bumper

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Partnership

Project Overview

REVOLUTION is proposing a disruptive innovation that will bring open-loop recycling to the forefront of automotive injection moulding.

➢ The project will develop this platform, and a range of recycled formulations, including self-reinforced materials to deliver innovative components that offer:

LIGHT WEIGHTING

SUPERIOR PERFORMANCE

END–OF–LIFE ADVANTAGES

➢ REVOLUTION will use machine learning and artificial intelligence to optimise the input of recycled materials and injection moulding process to deliver high-quality parts.

➢ The AI-Platform will use data from three areas of the production process to predict part quality when using recycled materials.

FOR FUTURE ELECTRIC VEHICLES!

Goals

REV(C)LUTION

Reduce the weight of the components between 10% and 40% compared to the current alternatives

Demonstrate that at least 80% of the components of the selected use cases can be recovered for recycling and/or reuse

Implementation

Optimisation of advanced light material

Development of advanced process control

Modelling and design

Demonstration and validation

- ✓ The feedback of these activities will give inputs for *environmental and social assessments*

- ✓ An *exploitation plan* for the results of the project will be performed

- ✓ *Communication and dissemination* activities will be running through the project implementation

Use Cases

Back seat panel

This component is currently made of a formed steel sheet that is welded to a metallic frame. REVOLUTION will build on CRF's previous efforts to convert this component to a SRPO, with a _weight saving of ~55%_.

Use Cases

B-Pillar cover

During the REVOLUTION project, the manufacturing of a 2k dual-part will be transformed into a *mono-material injection moulded component* using post-industrially recycled PMMA.

Use Cases

Crash Box

Nowadays, most crash boxes are commercially produced using steel. The rear crash box demonstrated in REVOLUTION will be a *100% polymer solution*.

Crash Box demonstrator. Souce: *TOFAS partner*

Use Cases

Lower Rear Bumper

It is a coloured aesthetical part. Many times, it is difficult to attain the appropriate colour and gloss using post-consumer recycled materials and, at the same time, keep mechanical and physical properties. REVOLUTION project will optimise the use of PCR PP, aiming to achieve a *20% weight reduction*.

Environmental assessment highlights

- Raw material production is the principal source for the Global warming impact in the four-case studied.
- Transport of materials start to be relevant in the impacts when transport distance is high (around 5000 km).
- In the metal pieces, welding is an important source of impacts, due to the electricity mix of the country and the production of fume welding (gases mixtures made of metals).

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REVOLUTION Project

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