RE-PACK EDOILS Project

Use of 100 per cent Post-consumer Recycled Polyethylene Terephthalate to produce packaging for edible oils

waste management | packaging | Waste sorting | recovery of waste

PROJECT DESCRIPTION

The RE-PACK EDOILS project aimed to produce and market packaging (preforms and bottles) for edible oils made of 100% recycled plastic, after carefully evaluating their functional properties and suitability for contact with food.

The idea is in line with the European legislation (EC Regulation 282/2008), which provides for the possibility of using post-consumer recycled plastic materials (those coming from the sorting of plastic) also for food products' packaging, provided that the material comes from a certified recycling process and meets all the requirements for contact with food.

The project responds to the need of reducing the quantities of the food packaging waste produced in Europe, which represent over 60% of the total packaging waste. The food industry has the task to reduce the environmental impact of packaging without compromising the quality and healthiness of the products.

PET bottles are one of the best products from this point of view because they are 100% recyclable.

The use of recycled plastic is highly advantageous from an environmental point of view, reducing both the quantity of material destined to disposal and dependence on fossil sources.

PROJECT PHASES

The project was organized in complementary phases to optimize both the post-consumer plastic material recycling process and the container production process.

The project activities had the aim of creating a product capable of ensuring functionality and food safety, and a possible wide application in the sector of edible oils.

- **Optimization of the recycling process**. With the collaboration of a certified company for the production of recycled polymer (C. I. E. R. S.r.l.), the technical characteristics of the material have been defined and the regeneration process has been optimized with reference to the functionality and health requirements. The applied recycling technology is VACUREMA Prime®, a mechanical recycling process in which the used plastics are collected, reduced into small flakes and decontaminated, before being transformed into new materials to be used in the food chain. The process got positive opinion from EFSA in 2012. (http://www.efsa.europa.eu/it/efsajournal/pub/2827)
- **Production of recycled PET packaging.** Starting from suitably regenerated post-consumer PET polymer, preforms and bottles for food oil have been created in 100% recycled plastic, in different colors.
- **Evaluation of the packaging's functionality**. The characteriziation to assess the packaging's functionality and compliance with the specific requirements for edible oils packaging was carried out in the laboratory of the company's research center.
- **Assessment of the packaging's healthiness**. The food safety of all products made of recycled PET was assessed through analytical determinations carried out by the company's laboratory in collaboration with external research institutes

(University of Salerno, Mérieux NutriSciences Italy)

- **Business plan**. A commercial plan has been developed for the introduction on the market of oil bottles made of 100% recycled plastic.

PROJECT RESULTS

The company concluded the main activities of the project by defining the technical characteristics of the recycled material, choosing the recycling process and producing preforms and bottles in up to 100% recycled PET.

The VACUREMA Prime® technology and a qualified supplier have been selected for the production of recycled polymer based on EFSA's scientific advice (EFSA Journal 2012; 10 (8): 2827 [18 pp.] and the implementation of the laboratory-based compliance analysis. The production of a recycled PET preform was designed and optimized, to be used for the production of bottles for high quality seed oils, which allowed a weight reduction of about 10% compared to conventional PET bottles.

The preforms and bottles, in three different colors and in 50-100% RPET (Recycled PET), were produced by optimizing the standard injection and stretch-blow moulding process without reducing the process speed compared to the processing of virgin PET.

The safety and functionality of use of the 100% recycled PET bottles was ascertained through a (global and specific) migration analysis in accordance with the EU Regulation No. 10/2011; moreover a *shelf-life,* i.e. conservation test was performed by internal and external laboratories (University of Salerno, Mérieux NutriSciences Italy) to evaluate the packaging's impact on the physical-mechanical and overall quality of the product.

The market analysis carried out within the project has shown that consumers show a strong predisposition to buy seed oils bottled in recycled packaging.

The current national legislation (Ministerial Decree No. 134 of 20 September 2013) allows the production of bottles in contact with food using max. 50% recycled PET.

This was the only constraint for the introduction of the innovative product packaging on the market. In fact, during the project about 1.800.000 preforms (in three colors) were sold on the national market, containing up to 50% of RPET.

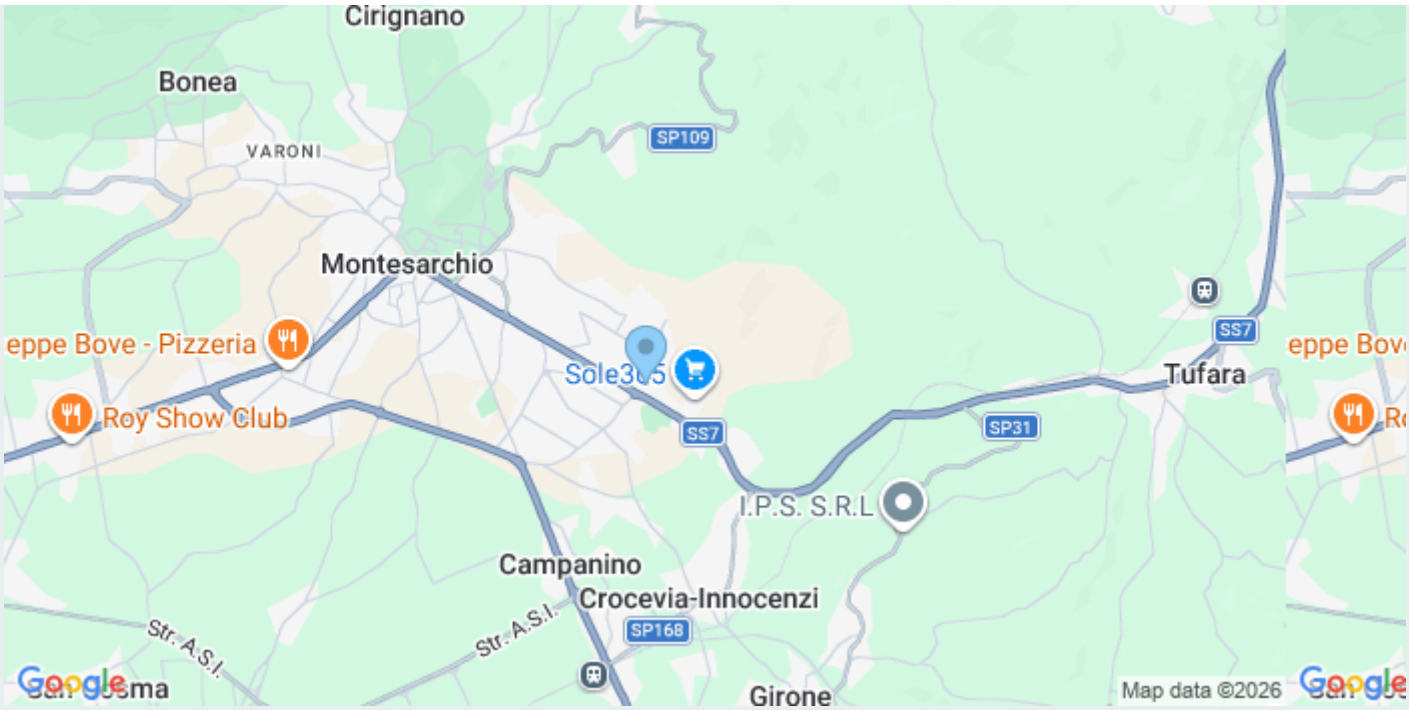
During the project, preforms and bottles containing up to 100% recycled PET, complying with the European regulations in force, were designed and produced for those countries where it is possible to use 100% recycled PET in contact with food.

Environmental performances improvements due to the project's innovations have been registered in terms of reduction of CO2 (-12%), particulates (-5%), water consumption (-10%) and energy consumption (-13%), as well as an increase in the recycling of materials (+ 13%).

The production of RPET bottles optimized the production of plastic packaging for food as it allows to reuse the post-consumer material.

The technical information obtained during the project made it possible to verify the possibility of extending the use of recycled PET for the production of bottles with different shapes and weights, even higher and more difficult to realize than those designed for the REPACK EDOILS project. In fact, it is possible to use the same equipment in use for virgin PET's production by optimizing the same process conditions.

Furthermore, the *shelf life* and migration tests have underlined that the RPET preforms are also suitable for bottles destined for more delicate and prestigious products, such as olive oils and extra virgin olive oils.



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Acronym
RE-PACK EDOILS

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Reference Programme
COMPETITIVENESS AND INNOVATION FRAMEWORK PROGRAMME (CIP) ECOINNOVATION

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367.580,73

Call Year
2010

Start Year
2011

End Year
2014

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