Isolago

Our projects

FlexModulo

Beneficiary Entities

COMPONIT

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UNIVERSIDADE D COIMBRA

Cofinanced by

COMPETE 2020

PORTUGAL 2020

UNIÃO EUROPEIA
Fundo Europeu de Desenvolvimento Regional

Production of PET-based high flexion module pipes

Water pipes are typically made of polypropylene (PP) or polyethylene (PET) with the addition of inorganic fillers such as calcium carbonate (CaCO3). With this process, the pipes have the necessary stiffness, but have disadvantages such as high density and, above all, deficient properties at the level of the flexion module. When buried, the pipes end up ovalising with the weight of the soil or even suffering from material rupture.

One way to achieve better mechanical properties in terms of flexion, but maintaining the necessary rigidity, would be to introduce polyethylene terephthalate (PET) to replace calcium carbonate. Thus, we seek to develop a material composed of PP and PET with the appropriate characteristics for the manufacture of water pipes. Such process is not industrialized, and it regarded as a novelty for this project. Not only is the material being developed on a laboratory and pilot scale, but the process is further developed until proof of concept in industrial injection and extrusion processes. For the creation of this material, it is necessary to develop suitable compatibilizers to overcome polymers natural immiscibility. This will be one of this project's main tasks, along with the processing studies of PP-PET mixtures.

An additional advantage of introducing PET is that it can be introduced in the recycled PET formulation, which makes the project more attractive from an environmental and economic point of view.

Objectives

1. PRODUCTION OF PP/PET-BASED PELLETS
Development and processing of compatible PP/PET-based formulations

2. INCREASE OF THE FLEXION MODULE
Decreased risk of pipe ovalisation

3. INCORPORATION OF RECYCLED PET
Incorporation of 30 % of recycled PET

4. INCORPORATION OF RECYCLED PP
Incorporation of 30 % of recycled PET

5. REDUCTION OF THE FINAL PIPE DENSITY
Decrease of density compared to PP/CaCO3 based pipes

Activities

1. Definition of the technical specifications of the material

2. Laboratory research (Development of compatibilizers and study of PET additives in formulations and processing)

3. Pilot-scale prototype construction

4. Validation tests on end customers (Production of PP/PET-based pipes)

5. Promotion and dissemination of results

Technical data sheet

Project name

FLEXmodulo - Production of PET-based high flexion module pipes

Project code

POCI-01-0247-FEDER-003362

Main Purpose

Reinforce research, technological development and innovation

Beneficiary Entities

Componit Lda. | University of Coimbra

Approval date

20/10/2015

Start date

01/01/2016

End date

31/12/2018

Total eligible cost

EUR 1 477 603.50

European Union financial support | FEDER

EUR 960 468.75