GVPPP

Glasvezel Versterking van PolyPropyleen Platen

"We showed that waste from glassfiber reinforced polypropylene can be regenerated into usable materials"

Introduction

The thermoplastic industry is increasingly using fibre reinforcements in their products, and is searching for recycling processes and the industrialization thereof. The formal research question is: "Is it technically possible to recycle Glass-PP waste and use it in the core of Glass-PP sandwich panels, and what are the recommendations for the industrialization of this circular process."
The TPAC field lab at Saxion in Enschede has experimental low-shear processing equipment available to pursue answers on above stated research questions.
The focus of the research will be on using and upgrading the low-shear processing equipment (Shredder, Extrusion, Moulding) and material properties.

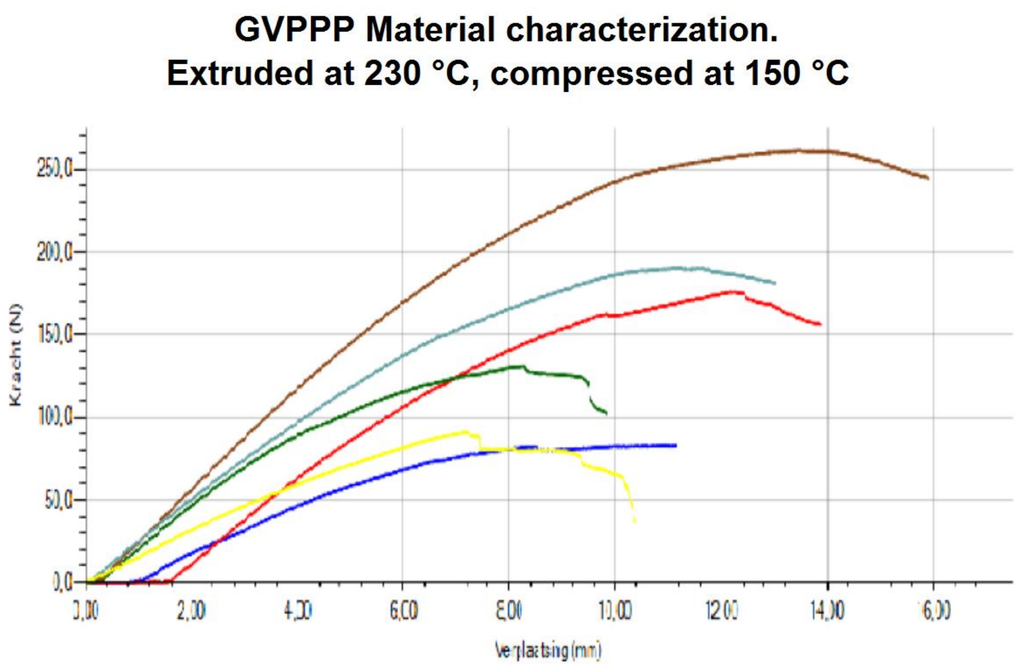
Approach

In this project, the production waste of Dutch Composites will be used as a backbone to research the recycling above mentioned chain. Dutch Composites is producing products made of Glass-PP sandwich and is generating tons of waste in China. They are also providing an opportunity for re-use of the recyclate: Closure profiles to seal the edges of the Glass-PP sandwich products.

Hasbro has an interest in the equipment used in the circular process: Shredders, Extruders, Shapers. They will advise in the equipment for the industrialising approach.

Results

A big part of the work done was the upgrade of the low shear extruder to us it safely in our field-lab. The safety was brought in line with the CE regulations (Including the documentation and safety by design). To create extrusion profiles of consistent thickness, a colander was designed, produced and included as an extension of the extruder, our so called: Extrudinator©.



Measurement graph of compressed recycled material

Our partner in the project had difficulties in the shipment of waste Glass PP sandwich material from china, which gave TPAC the opportunity to spend time of the equipment upgrade. In the final stages of the project, material was used to test and validate the proposed processes and equipment.
Shredding of the material was possible with standard shredding equipment, but attention should be given to the resulting consistency of the shredded material: Not too fluffy, and not too big.
The extruder was capable of using the recyclate, but we expect that a double screw extruder will be capable of using a wider range of recyclates. Some 20%-30% virgin PP has to be added to make a usable recyclate.

The resulting materials can be moulded into Fibre reinforced plates with required consistency.

Recycling

This research is co-financed by Regieorgaan SIA, part of The Netherlands Organisation for Scientific Research (NWO).

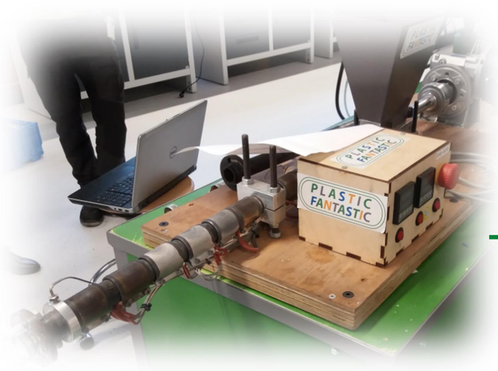
TPAC THERMOPLASTIC COMPOSITES APPLICATION CENTER
DUTCH COMPOSITES
SIA
HABRO HANDEL & ADVIES B.V.
University of Applied Sciences
SAXION

GVPPP

Glasvezel Versterking van PolyPropyleen Platen

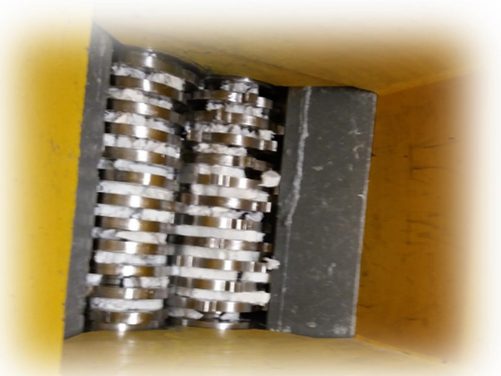
Composition

Existing extruder



Recyclate

Shredder



Upgraded extruder
with kalander

(Semi) finished
product

Recycling

www.compositetape.com
www.addcomp.nl
www.thermoplasticcomposites.nl
www.saxion.nl/lightweight

TPAC THERMOPLASTIC COMPOSITES APPLICATION CENTER

DUTCH COMPOSITES

SiA

HABRO HANDEL & ADVIES B.V.

University of Applied Sciences

SAXION