



# **CONTEXT meeting**

**BARCELONE**

2019, 31 January



# The company MAPEA

- **Création:** 2003 – **Location:** Fraisses (close to Saint-Etienne - Loire - France)
- **Expertise :** **Plastics formulations, plastics technology and compounding**

## ➤ **Services :**

Industrial R&D, consulting, training

## ➤ **Development :**

New plastics in the circular economy: **REGALEX, REGAFIB**



## **REGAFIB :**

PP ou PA reinforced by used textiles (coton / Polyester) fibers

## **REGALEX® :**

Polyolefins/Polyester alloys from used textiles or plastics

## Basic research of MAPEA: The plastic recycling.

**Our strategy : to give an added value to the material to be recycled.**

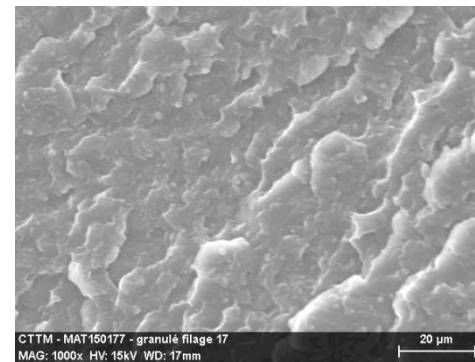
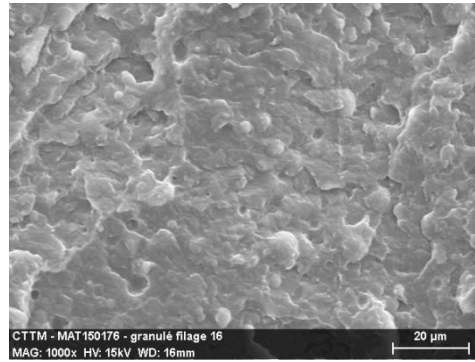
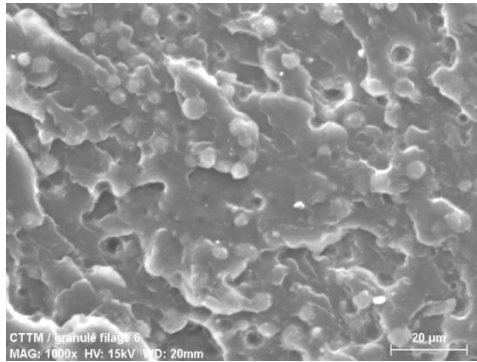
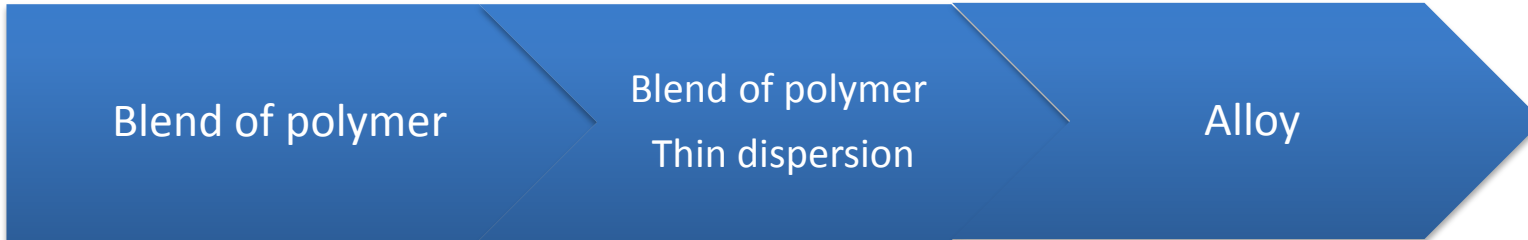


**Our proposal : REGALEX<sup>®</sup> , PP or PE/PET alloys**

**A high level of technical performances**

**(close of the mechanical and thermal performances of PA6)**

# Recall: Definition of alloy of polymers

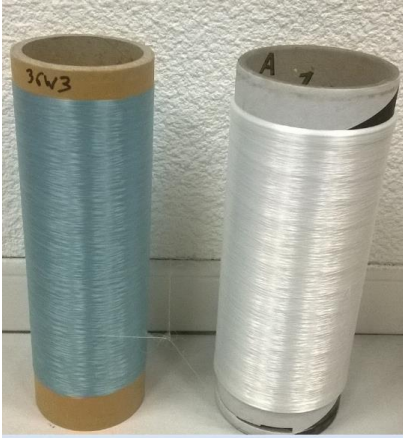


Particle Size >10µm

Particle Size  
From 1 to 5 µm

Co-continuous structure

## Extension of the initial research, Application to the textile industry



- **Spinning** of polyolefins/polyester **alloys**
- **Spinning** of Polyolefins/polyester **alloys** from **recycled textiles.**
- **Dyeing** of knits in virgin Polyolefins/Polyester **alloys**

**Yarns of alloys made  
from recycled textiles •  
(spinning BMI)**

## Second extension : the Dyeing of Yarn PP (in fact alloy PP)

- The produced yarns were characterized and tested for a dyeing application.
- The dyeing study was made under the following conditions :
  - Temperature : 130°C
  - Type of Dye : Disperse Dye
    - » Blue Fantagen BGS200 – 1%
    - » Pink Neon Setapers FBSM – 1% (HiVi's)

# Dyeing of Yarn PP

- First results of the study shows an excellent dyeing efficiency (more than 98%), and excellent reproducibility compare to Polyester reference

100% PP	Modified PP	100% Polyester
Poor efficiency	98% - absorption of the dyestuff	-



# Dyeing of PP

- Fastness of the dyed PP knit shows good result compare to Polyester reference

Fastness test	PET (ref) 1% Blue	PP Alloy 1% Blue	PET (ref) 1% Hivi	PP Alloy 1% Hivi
Abrasion Fastness ISO 105-X12 – Dry	4	4	5	4/5
Abrasion Fastness ISO105-X12 – Wet	4/5	4/5	5	5
Light Fastness ISO 105-B02 (60h)	5	4	4	1
Washing Fastness ISO 105-C06 60° Polyester	4	3	5	4/5





# Different tests on PP dyed knits shows excellent results.

Fastness test	PET (ref) 1% Blue	PP Alloy 1% Blue	PET (ref) 1% Hivi	PP Alloy 1% Hivi
Water Fastness ISO 105-E01 Polyester	4/5	5	5	5
Acid Sweat ISO 105-E04 Polyester	4/5	5	5	5
Alkaline Sweat ISO 105-E04 Polyester	4/5	5	5	5

## Conclusion on dyeing of PP

- **Yarns and fabrics produce with this alloy show a very good dyeability**
- **Excellent dyeing efficiency (more than 98%)**
- **Excellent reproducibility of the color**
- **Excellent fastness to light, washing and abrasion.**



# Third extension : modification of the PES to the hydrophobicity of the textile PES (a program EUROSTARS)



MAI 2016 - DECEMBER 2018

E! 10085 SUPERHYDROPEs

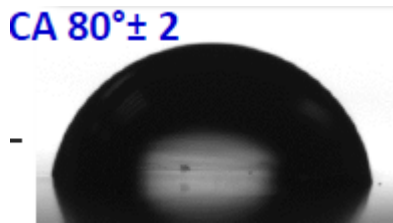


# Project SUPERHYDROPEs

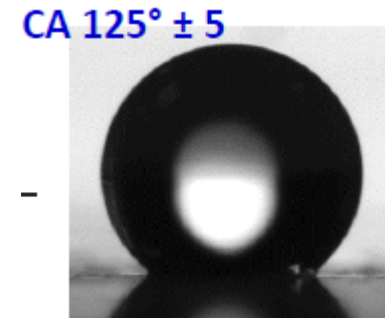
## THE Hydrophobe PES

**Result: Contact angle (CA) for water on molded plate of PES**

**Traditionnal  
Polyester**



**Modified Polyester by  
SHPES**





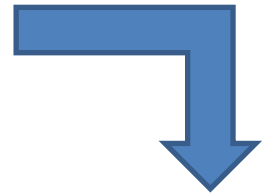
# Projet SUPERHYDROPEs



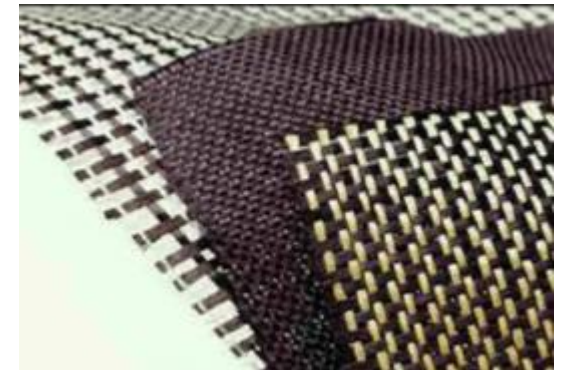
Modified PES compounds



spinning



Exemple of waterproofing fabrics.





**The next creation ? ... A secret!**

**Thank you for your attention**