Water based PHA formulation for coating and printing

This project has received funding from the Bio Based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 837761.

Centexbel

WHO ARE WE?

Centexbel

- Competence Centre
  - textile & plastic converting industry
- Industry driven organisation
  - For & with the industry
- 180 staff at 3 locations – BE

Activities of Centexbel

biontop

Accredited laboratories

ISO 17025
BELAC
056-TEST

Microbiology lab

Physical lab

Chemical lab

Fire lab

biontop

Services

OEKO-TEX®
CONFIDENCE IN TEXTILES
STANDARD 100
00000000 Institute
Tested for harmful substances.
www.oeko-tex.com/standard100

RECYCLED CONTENT
QA
ECO-DATA
POLYMERS

standards for .be

PATLIB

Research

Functional thermoplastic textiles

Meltprocessing of polymers in textiles and composites

Plastic processing

Material characterisation
Plastic processing technologies
Recycling

Textile functionalisation & surface modification

Coating, finishing and surface modification for new and superior functional performances

Health, safety and security

Textile products for health, safety and security purposes

Biontop

PHA

PHA

- Many different PHA's exist
- Bacterial polymer made by certain organisms when
  - High abundance of carbs (oils, sugars, …)
  - Low availability of nutrients
- Thermoplastic
- Very fast biodegradation
- Large expectations
- Currently low availability

PHA can be produced from many different raw materials

Waste oils

Marine Biomass

hemicelluloses

Polyhydroxy alkanoates

Biontop

PHA PLASTISOL COATING

PHA PLASTISOL COATING

Use in coating or screenprinting

Direct coating

Screenprinting

PHA PLASTISOL COATING

PHA coating on linen fabric

Heat Press
Calender
Meyerbelt

190°C

PHA coating on linen fabric

Abrasion resistance

sample	martindale
PHA + plasticizer	100000
PHA + plasticizer	90000
PHA + plasticizer	100000
PHA + plasticizer	10000
PHA + PLA + plasticizer	30000
PHA + PLA + plasticizer	30000
PHA + PLA + plasticizer	20000
PLA + plasticizer	20000
PLA + plasticizer	20000

Flexibility

First findings with PHBV/PLA coatings

- *PLA is stiffer than PHBV*
- *PHBV is very fast in degradation (soil burial)*
- *PHBV has less migration of plasticiser*
- *PHBV and PLA could easily be blended*
- *PHBV can take more plasticiser*
- *PHBV powder needs specific attention towards formulation*

Coating durability

PHA screenprint with crosslinker after washing

Conclusion

biodegradable ⟷ *durable*

fillers → **coalescents**

crosslinkers → **Plasticiser blends**

coalescents + **Plasticiser blends** → **Product specific solutions**

Thank you!

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