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Ph.D. thesis (2022-2025)
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in coll. with J. de Bardonnèche

Bio4Inks: Formulation of 100% biobased 4-colored inks for press printing

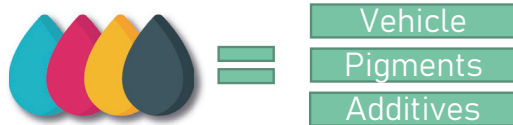
Formulation d'encre coldset quadrichromiques 100% biosourcées pour la presse imprimée

FunPrint
BioChip

Context / Objectives

Need for sustainability

Replacing petroleum-based pigments in offset inks



- Several biobased offset vehicles are already used
- Very few research on biobased pigments in inks

Finding suitable pigments for ink formulation

- Compatibility with oil-based vehicles and fountain solution
- Color strength
- Low ΔE between the new inks and the standard ones
- Stability of properties (light, pH)

Formulating inks with suitable properties

- Rheological properties
- Tack
- Permanence properties

End of life (recyclability, biodegradation)

Funded by:



In collaboration with Écograf, Sun Chemical & Grakom

Methods

Pigment grinding

Dry grinding using bead mill
Wet grinding using three-roll mills

Mixing

Mixing using a SpeedMixer device

Lab printing

IGT C1-5 on paper

10 successive prints
Transfer curves



Pigment characterization

- Pigment size (granulometry)
- Composition (proximate analysis)
- SEM imaging

Ink characterization

- Tack
- Rheological properties (thixotropy, viscosity)
- Colorimetric properties (optical density, color)
- Lightfastness (Xenotest)

Industrial tests

Deinking tests

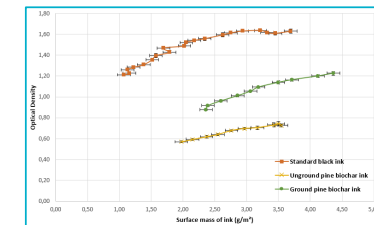
Results

Selection of biobased pigments

Lookout for pigments through literature and known historical biobased pigments

Black inks

Inks formulated with biobased pigments (1) are lighter than standard (2) but dark enough to be readable



(1)



(2)

→ Pilot tests on progress

Colored inks

Promising results for yellow and magenta inks
Only few biobased pigments for cyan inks

→ R&D project in partnership with a supplier

