INGEDE Projects

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(INGEDE)

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Project work – INGEDE Projects

Recyclability | Paper for Recycling | Deinking Process

Project No.	Name	Status / remarks
145 14 PMV	FTIR Spectroscopy	Report pending
147 15 CTP	DisperStick	Finished
148 15 DIN	DIN SPEC 55700	Published in Aug. 2016
149 16	Recyclability 2016	Individual results in recyclability databases
150 16 DIN	ISO/TC 6 WG 14	In progress
151 16 CTP, PMV, PTS	Revision of INGEDE Method 11	In progress
152 17	Recyclability 2017	Individual results in recyclability databases
153 17 PMV	Deinkability Survey 2017	In progress
154 17 PTS	Moisture Measuring Device	Starting

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Project 145 14
FTIR Spectroscopy

- **Project "Entrance Quality Control of Recovered Paper Regarding Deinkability of Printed Products by FT-IR Spectroscopy"**
- Executed by PMV
- Started in October 2014. Final report shall be ready in February 2017
- Research Targets:
  - Evaluate the usability FT-IR spectroscopy for simple and fast analytics for identification of difficult to deink print products
- Approach:
  - Collection of spectroscopic FT-IR data and deinkability results of the same samples of a wide range of printed and converted products
  - Linking the FT-IR analysis with the deinking results

Project 145 14
FTIR Spectroscopy

Recyclability Paper for Recycling Deinking Process

(M)IR-ATR Measuring device

Platinum-ATR-Messgerät mit ATR-Diamant-Modul

Hersteller: Bruker Optik GmbH, Ettlingen

Figure: Bruker Optik „Grundlagen der FT-IR Spektrometrie"

Project 145 14
FTIR Spectroscopy

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Main findings (PMV presentation at the final meeting on 22.11.2016):

- Identification of flexo printed products in comparison to offset printed products is not possible
- Detection of UV printed and varnished printed products is possible
- Digital printed products show different behaviour in FT-IR measurements
- Varnishes, coatings and additional plastic layers on the printed products are mostly good detectable
- No correlation between IR signals and deinkability

- A spectra database was created and can be used by INGEDE members
- Test run of the FT-IR spectrometer for income control at a INGEDE member mill is planned

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Project 147 15
DisperStick

Recyclability | Paper for Recycling | Deinking Process

- Executed by CTP from January 2014 – Mai 2016
- CTP had emphasised the need to evaluate glues which are partly or fully dispersible in the paper recycling process. These can't be evaluated with INGEDE Method 12. Glues may be classified in 3 groups:
  - Removable glues are the preferred option:
    INGEDE Method 12 and the "ERPC Scorecard for the Removability of Adhesive Applications" are the basis for the evaluation of such glues.
  - Dispersible glues:
    CTP proposes as second best option glues which are good dispersible and have no or little negative impact on the recycling and papermaking process.
  - Glues with intermediate behaviour:
    These shall be avoided because of their tendency to disperse into small particles which can't be removed by screening and/or which disturb the processes.

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Project 147 15 DisperStick

Recyclability | Paper for Recycling | Deinking Process

Results:

- CTP developed a complete lab method to measure many parameters about the behaviour of fully or partly dispersible glues in the recycling process.
- 39 glues were tested.
- CTP proposed an evaluation scheme.

Next steps from INGEDE:

- Start to define a project to evaluate the correlation of the test method and evaluation results with the real behaviour in paper mills.

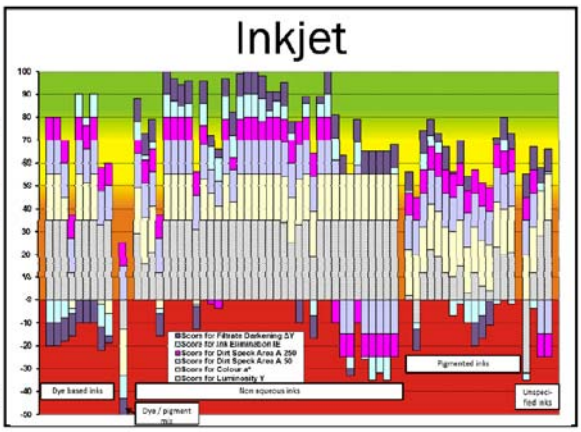
Project 149 16 Recyclability 2016

Recyclability | Paper for Recycling | Deinking Process

- Main target is evaluating the development of the deinkability of new technologies as well as from printed products on the market
- Much info about digital printed products was gained the last years
- All data of deinking tests are collected in a confidential data base
- An yearly overview of the results is published in the INGEDE News. See the INGEDE News January 2017

Project 149 16
Recyclability 2016

Most of the inkjet products where examined by Michael Pabsdorf in his master thesis. Not all of the investigated inks or ink-paper combinations are really praxis relevant for mass market. **Non aqueous inks are commonly used for large-sized external applications.** Dye based or pigmented inks are often printed on cheaper paper than the special inkjet paper witch were mainly used in the thesis.
All nine dye based inkjet prints were printed with the same ink on different paper. Also the nine latest non aqueous inkjet inks which failed by dirt specs were printed all with the same ink but different paper.



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Project 153 17
Deinkability Survey 2017

- Executed by PMV; started in January 2017
- Main target is the evaluation of the deinkability of a selected range of printed products which are decisive for the deinkability of the 1.11 grade mix.
- Program:
  - Test of up to 40 sample mixtures of 5 to 10 print products from the same paper/printing technology category
  - All main paper/printing technology categories shall be included, e.g. LWC printed in HSWO
  - Revised INGEDE Method 11 with some additional tests is used
  - PFR effects on the recycling process and RCF quality parameters shall are studied by measuring e. g. fibre length distributions, strength parameters, contents of ash, calcium carbonate and clay, foaming behaviour, COD, and particle charge.

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Project 154 17
Moisture Measuring Device

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- PTS Multi-client project with INGEDE funding
- Starting 1.2.2017
- Targets and execution:
  - Evaluation of the precision of moisture measuring equipment for income control of PFR
  - Equipment tested:
    Emco AP 500
    PTS PBS II
    HPNA Dunakontroll measuring frame
  - Variables: density, ash (filler) content, moisture inhomogeneity …

Future project plans

Recyclability | Paper for Recycling | Deinking Process

- Improving PFR sorting plants
- Improvements in income control measurements and procedures
- Evaluation of glues and reduction of their negative impact
- Continuous improvement of methods and development of needed new methods
- Scorecards to link lab method results to industrial reality

Project work – Third party funded projects

Project No.	Name	Status / remarks
IGF 17756 N PMV	Extraction by supercritical CO_2	Finished
IGF 18288 N PMV	Synergistic effects in deinking	
IGF 18698 PMV, PTS	Process water in deinking	Follow-up of INGEDE Project 132 10
IGF 19080 SID, PTS	Mineralölfreie Druckfarben	
Fogra	Mineralöloptimierter Zeitungsdruck	(on hold)
ITENE (coord.)	IMPACTPapeRec	Presentation today

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