

Recycling of Graphic Paper Products – Challenges and Trends

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(INGEDE)

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INGEDE

Recyclability

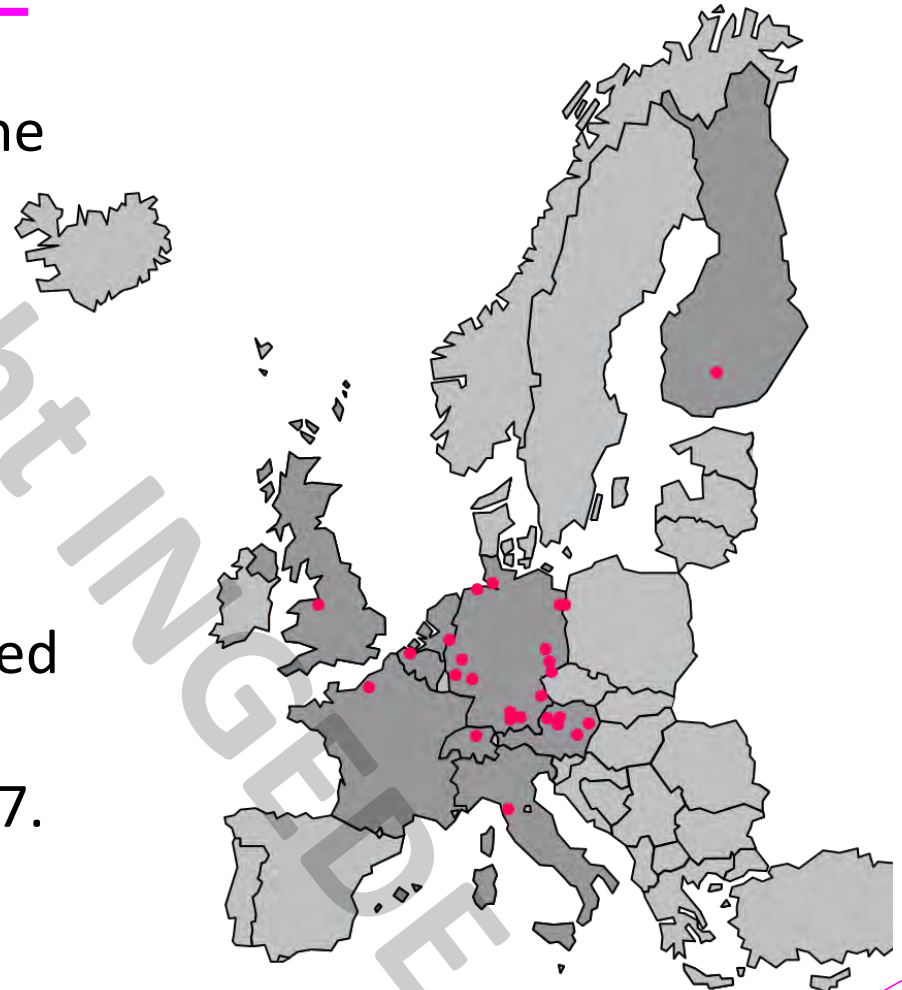
Paper for Recycling

Drinking Process

INGEDE is the organisation of the European deinking mills.

INGEDE was founded in 1989 by 12 companies.

Today **26 paper** mills are members of INGEDE, who utilised about **7,0 million tons** of Paper for Recycling (PfR) in 2017.



Graphic Papers

Special Writing

Special Packaging

Tissue

Activities of INGEDE

Recyclability

Paper for Recycling

Drinking Process

Research

Funding INGEDE research projects
Monitoring 3rd party funded projects
Developing INGEDE Test Methods

Communication

Standardisation, technical committees of the value chain, conferences, ecolabels, statistics, annual symposium

Member activities

Exchange of experience (working groups, project meetings), projects



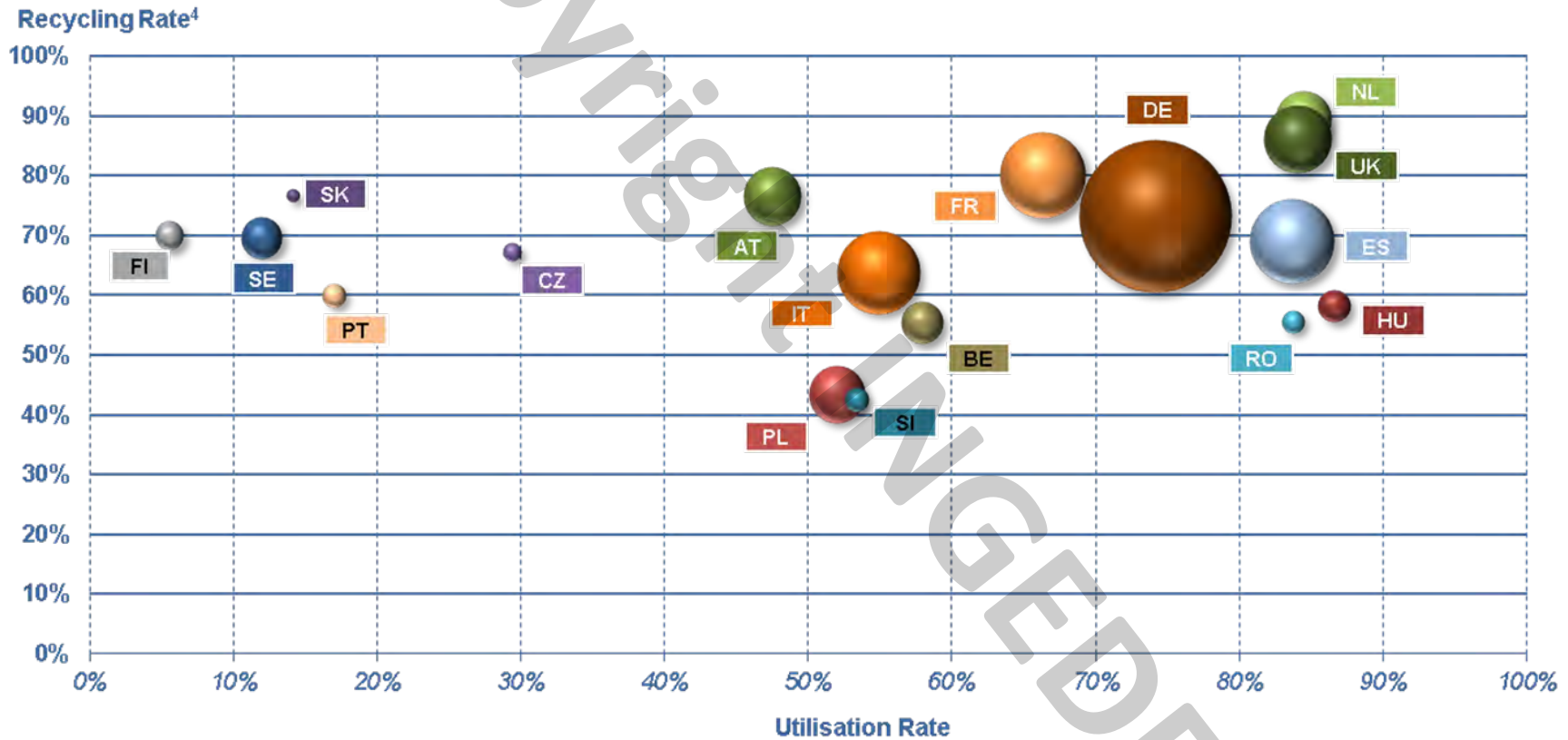
The importance of paper recycling in European Countries

Recyclability

Paper for Recycling

Drinking Process

Recycling Rate
72,3 %
(average 2017)



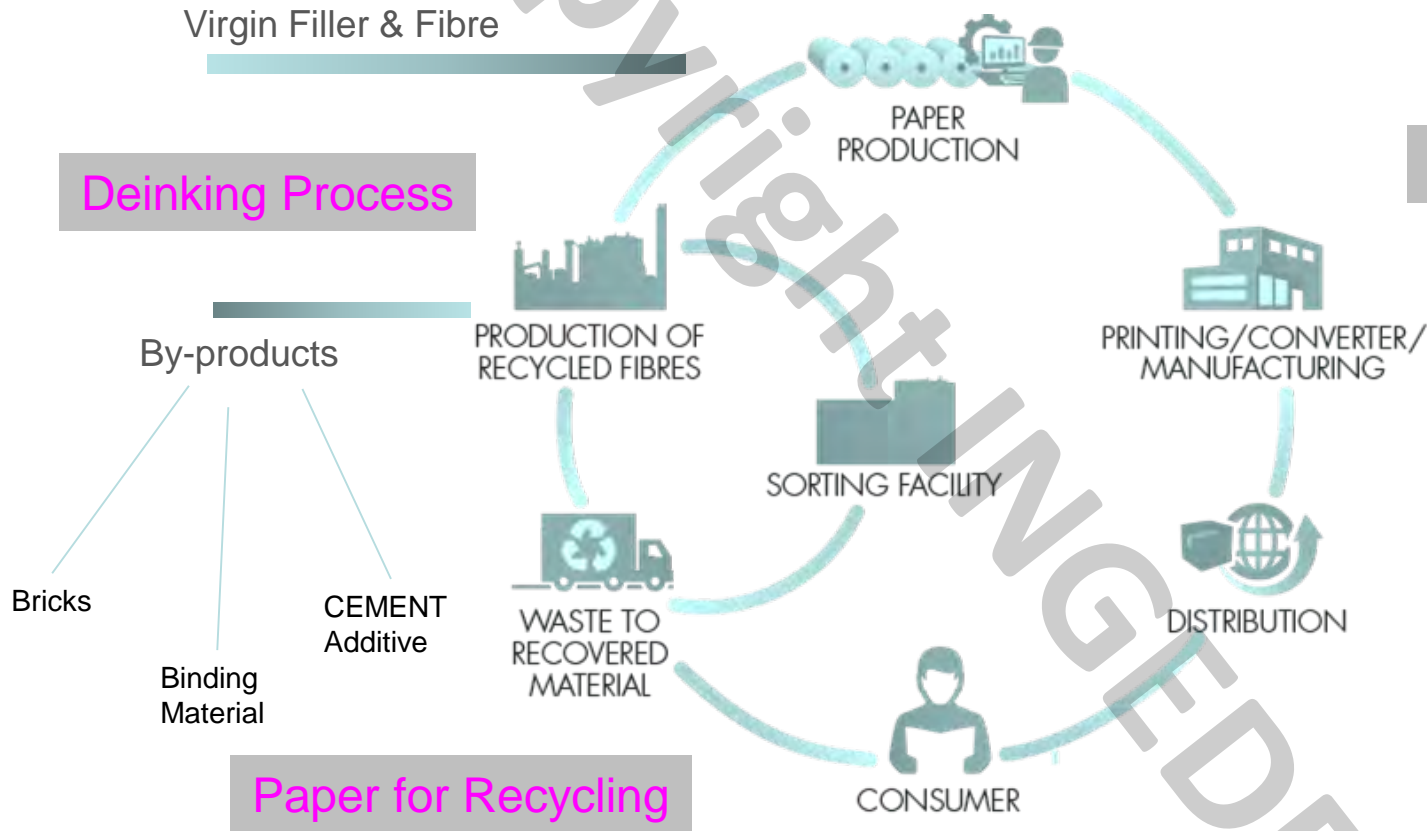
Bubble size is proportional to the Utilisation of Paper for Recycling – Source: CEPI

The Paper Value Chain

Recyclability

Paper for Recycling

Deinking Process



Recyclability

Paper for Recycling

INGEDE Thematic Pillars – General Trends

Recyclability

Paper for Recycling

Deinking Process

Recyclability

- Higher diversity of printing technologies
- New converting technologies and materials

Paper for Recycling

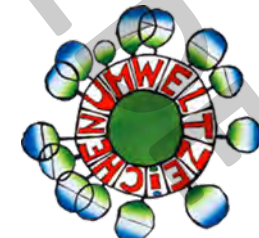
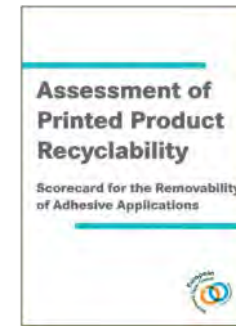
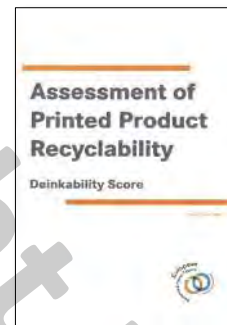
- Declining share of graphic products in PfR collection
- Increasing share of board in deinking grades
- Declining availability of deinking grades

Deinking Process

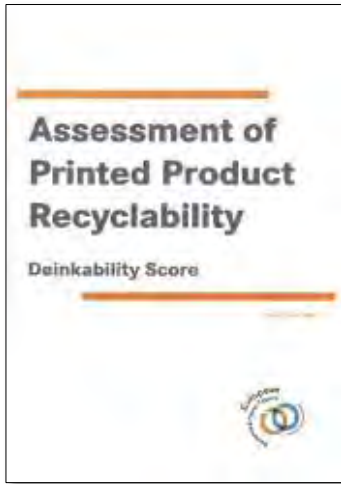
- Increasing load of non-paper components
- Decreasing brightness potential
- Increasing problems with “Stickies”

Recyclability assessment

- The European Paper Recycling Council issues scorecards
 - Deinkability
 - Removability of adhesive applications
- Ecolabels for printed matter are based on these scorecards



Deinkability assessment



| Objectives | Evaluated Parameters |
|---------------------------------|-------------------------------|
| High Reflection | Luminosity Y of Deinked Pulp |
| High Optical Cleanliness | Dirt Area A* of Deinked Pulp |
| No Color Shade | a* Value of Deinked Pulp |
| High Ink Removal | Ink Elimination IE |
| No Discoloration of White Water | Filtrate Darkening ΔY |

Quality Parameters

Process Parameters



| Score | Evaluation of deinkability |
|--|---|
| 71 to 100 Points | Good |
| 51 to 70 Points | Fair |
| 0 to 50 Points | Tolerable |
| negative (failed to meet at least one threshold) | Not suitable for deinking (may be recyclable without deinking) |



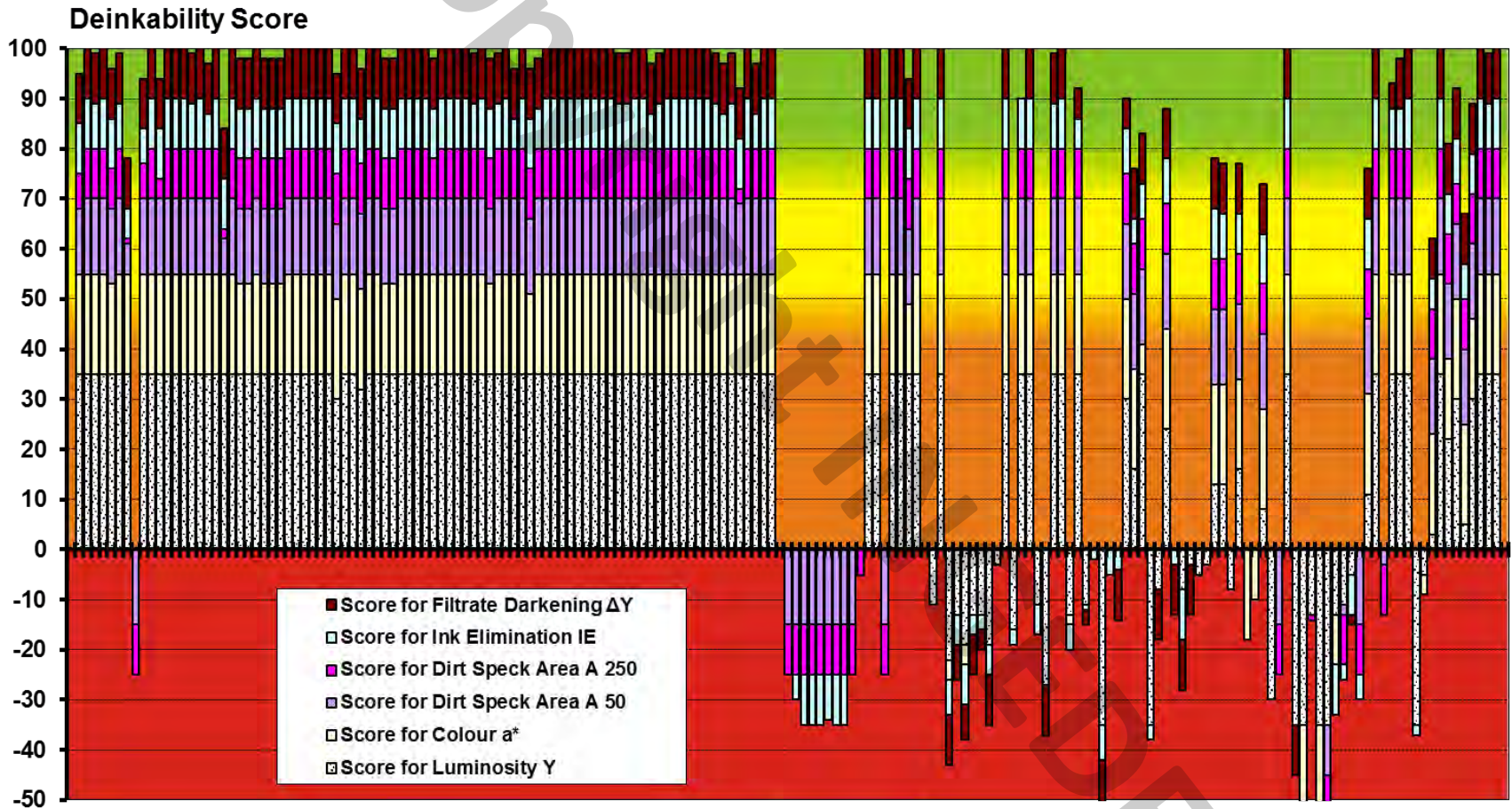
Deinkability of printed products (low ink > 75)

– impact of printing methods

Recyclability

Paper for Recycling

Deinking Process

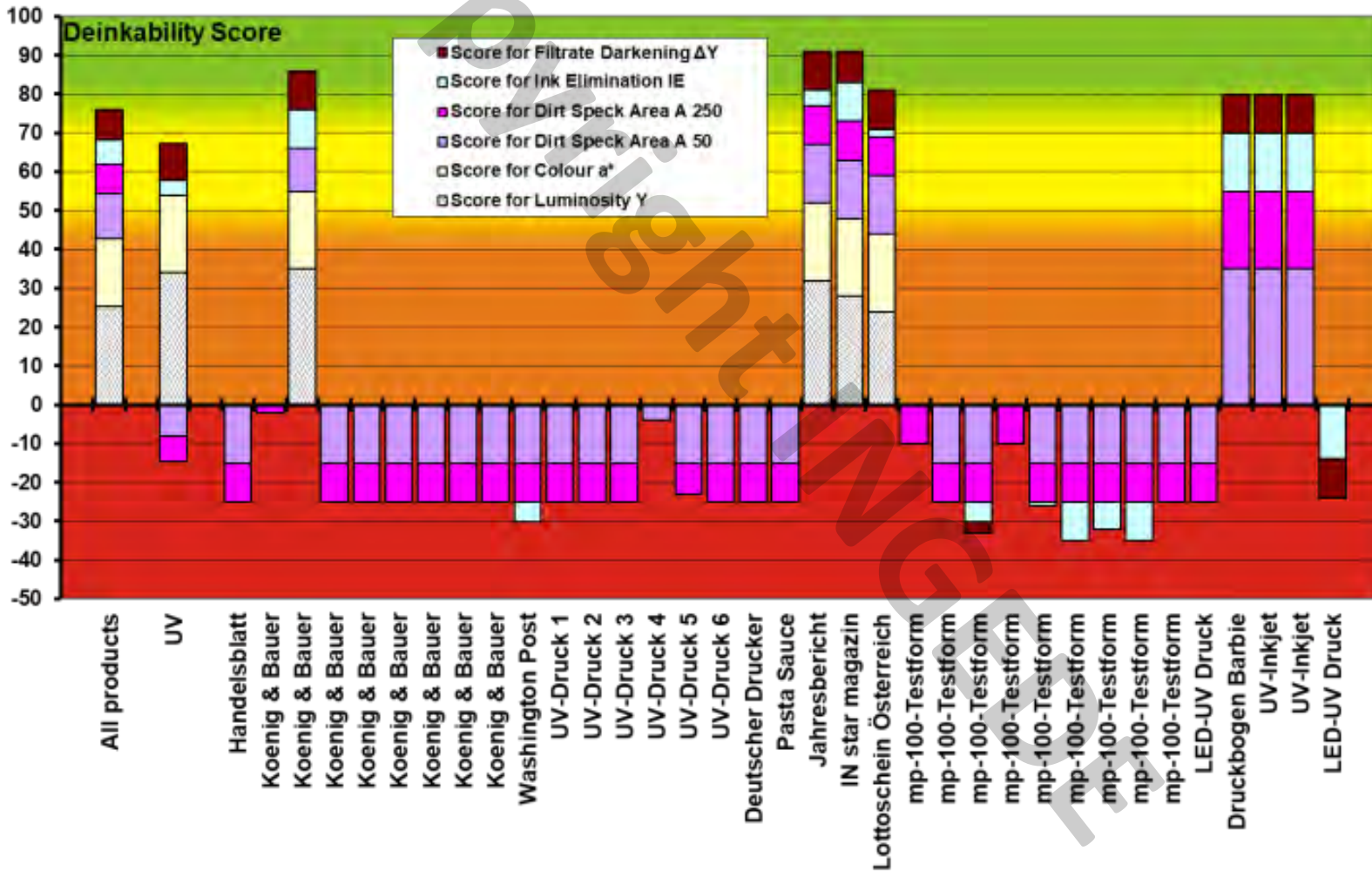


Toner Dry

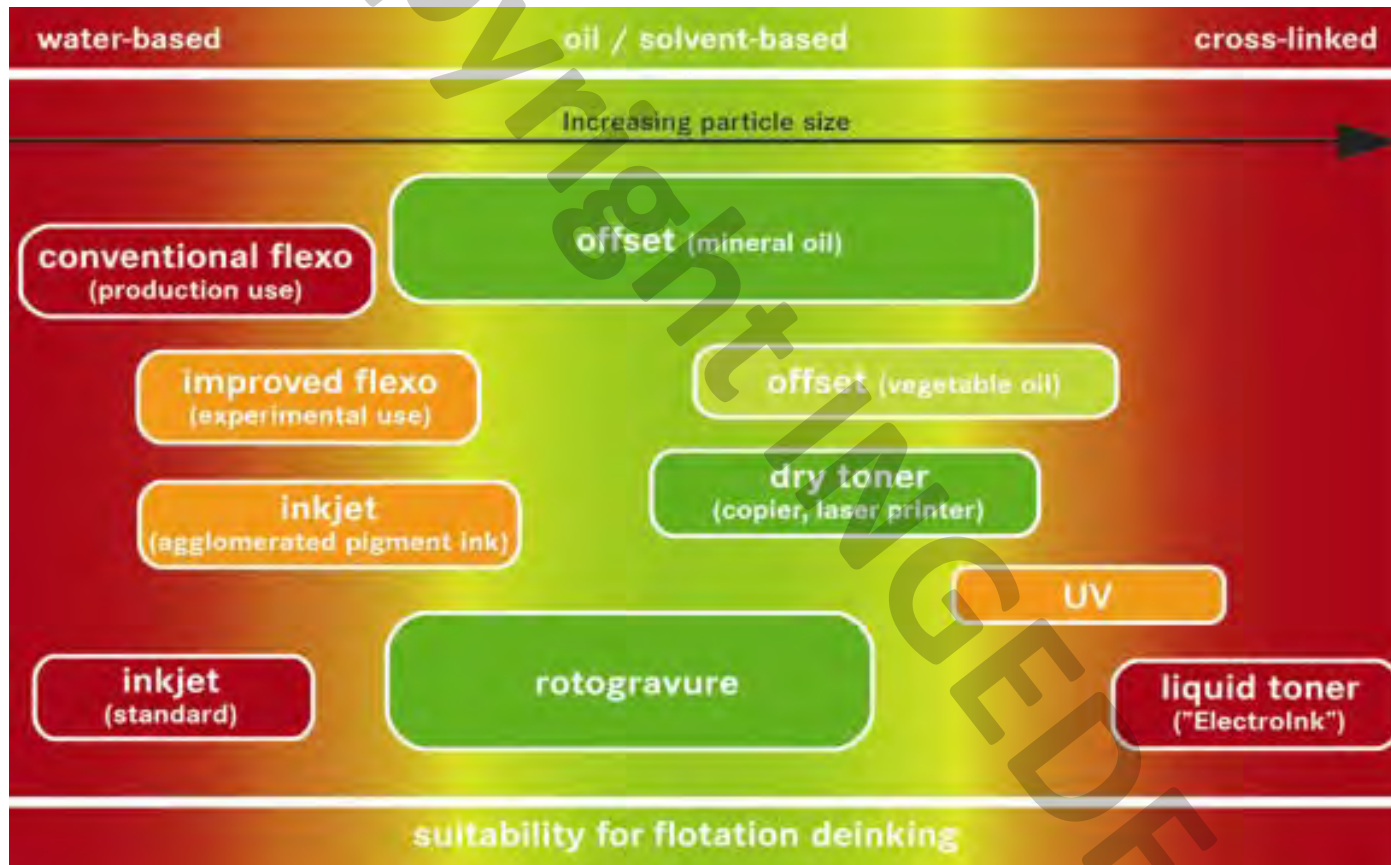
Toner
Liquid

Inkjet

Deinkability test results of UV cured prints



Deinkability of printed products – impact of printing methods



INGEDE Project 153 17

Deinkability Survey 2017

- Scope
Survey on deinkability of different print product mixtures relevant to 1.11.00 (sorted graphic paper for deinking)
- Boundary Conditions
No tests of single print products but tests of print product categories with 3–13 different samples
- Test Method
Deinkability test according to INGEDE Method 11 (new version of January 2018)
- Assessment
Assessment of deinkability score according to EPRC (version of January 2017)



Recyclability of Printed Products

– Current results of Major Topics

- Results from Deinkability Assessment
 - Most printed products are sufficiently deinkable – standard offset, rotogravure, dry toner
 - Digital printing methods
 - Pigment based inkjet – mostly low brightness, sometimes ok
 - Dye based inkjet – mostly low brightness and often (green) colour shade
 - Liquid toner – market leader insufficiently deinkable due to dirt specks
 - UV cured systems – mostly problematic due to dirt specks
- Market Developments and Trends
 - Mixtures of printing products from household collection are sufficiently deinkable, problems reported with printing house collection
 - Digital printing and especially UV cured printing are gaining market share
 - Low Deinkability will arise when certain thresholds are exceeded
 - Monitoring the development of “mineral oil optimised” ink

→ **Development of Recyclable Printing Methods inevitable**

Do you want to print on such papers?

Recyclability

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Deinking Process



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