

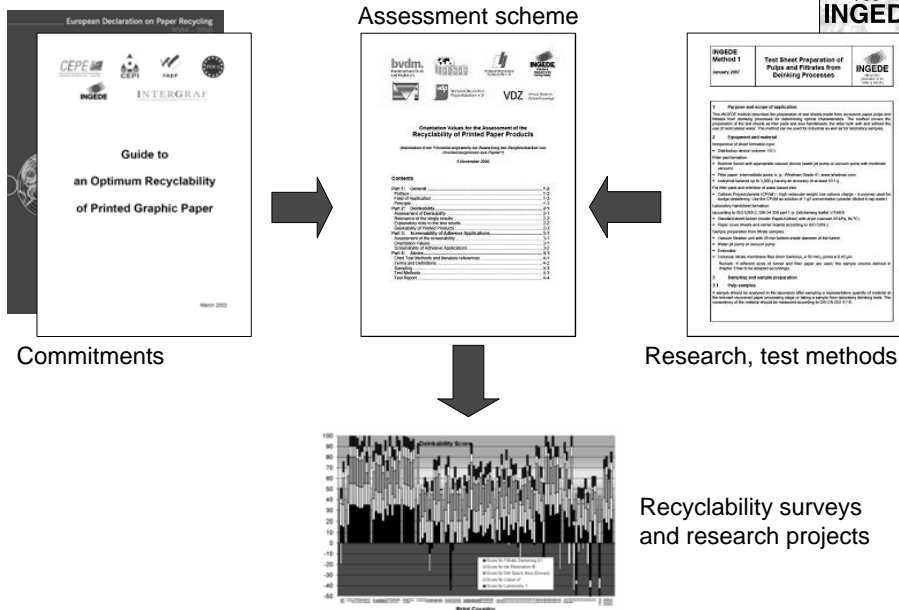
# Aspects of Recyclability



For good recyclability, paper products have to be:

- **Repulable** – all types of paper products
- **Adhesives have to be removable** – all types of paper products
- **Deinkable** – all white grades

## The way to adopt an assessment scheme



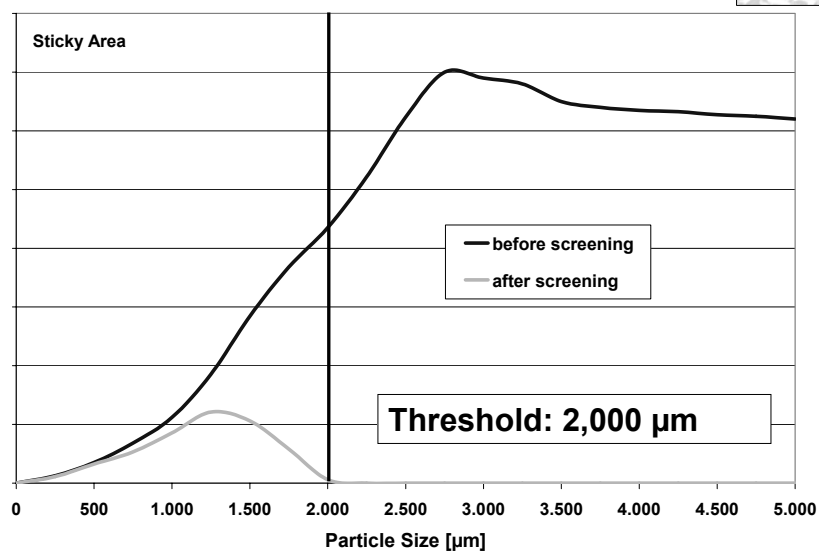
## Requirements for Adhesive Applications in view of a good Recyclability



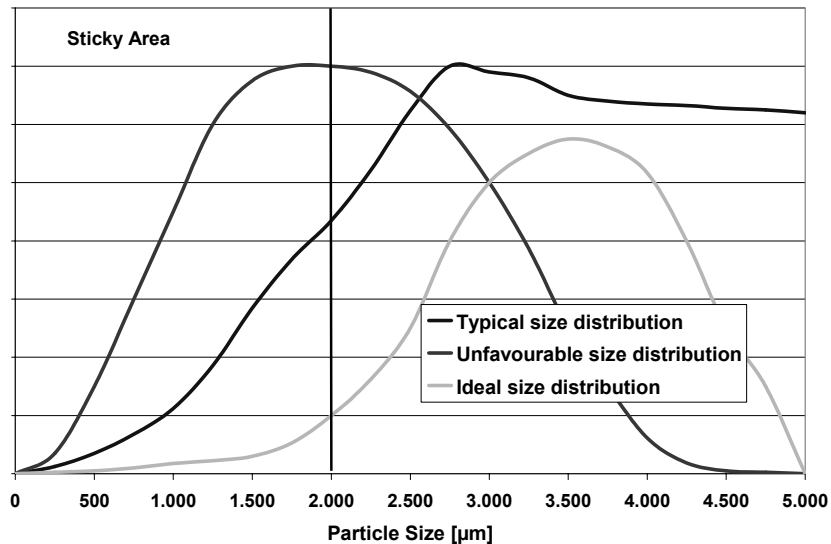
Adhesives should be engineered and applied on paper that they will:

- Disintegrate during pulping in fractions large enough which can be removed by standard screening procedures to a maximum degree.
- Not lead to the forming of secondary stickies during the deinking and papermaking processes.
- Effective removal of adhesives requires a high share of particles larger than 2000 microns

## Size Distribution of Macrostickies in the Recovered Paper Treatment Process



## Size Distribution of Macrostickies in the Recovered Paper Treatment Process



## Deinkability – why is it an issue?



- Flotation is a complex process
- It requires a certain surface chemistry (hydrophobicity) and size (about 10 to 100 microns) of the ink particles
- Flotation works well for most of the oil- and solvent based inks – offset and rotogravure
- Small and hydrophobic ink particles create grey or coloured shades of the deinked pulp
- Large and cross-linked ink particles cause visible dirt specks



## Deinkability Scores Principle



- Allocation of a score for each parameter by
- Threshold & target values and the individual results
- Failing to meet thresholds results in “not suitable for deinking”
- Meeting or exceeding the target results in full score for this parameter
- The total score of all parameters allows an overall assessment of a product’s recyclability
- Thresholds are equal for all product categories
- Targets depend on the category of printed product

## Deinkability Score Draft Threshold Values



Parameter	Y [Points]	a*-Value [-]	A [mm <sup>2</sup> /m <sup>2</sup> ]	IE [%]	ΔY [Points]
Lower Threshold	47	-3,0		40	
Upper Threshold		2,0	2.000		18

## Deinkability Score Draft Target Values



Category of print product	Y [Points]	a*-value [-]	A [mm <sup>2</sup> /m <sup>2</sup> ]	IE [%]	ΔY [Points]
Newspapers	≥ 60	≥ -2.0 to ≤ +1.0	≤ 600	≥ 70	≤ 6
Offset magazines & flyers, uncoated	≥ 65			≥ 70	
Offset magazines & flyers, coated	≥ 75			≥ 75	
Rotogravure magazines & catalogues, uncoated	≥ 70			≥ 80	
Rotogravure magazines & catalogues, coated	≥ 75			≥ 85	
Toner prints on woodfree paper	≥ 90			≥ 80	

## Deinkability Score Maximum Score per Parameter (Draft)



Parameter	Y	a*-Value	A	IE	ΔY
Maximum Score	35	20	25	10	10

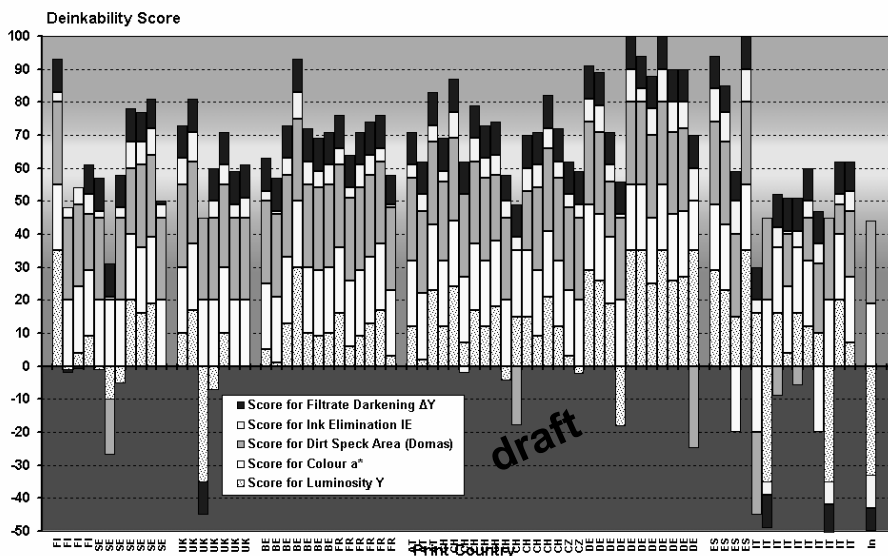
## Deinkability Score Evaluation (Draft)



Score	Evaluation of Deinkability
71 to 100 Points	Good deinkability
51 to 70 Points	Fair deinkability
0 to 50 Points	Poor deinkability
negative (failed to meet at least one threshold)	Not suitable for deinking*

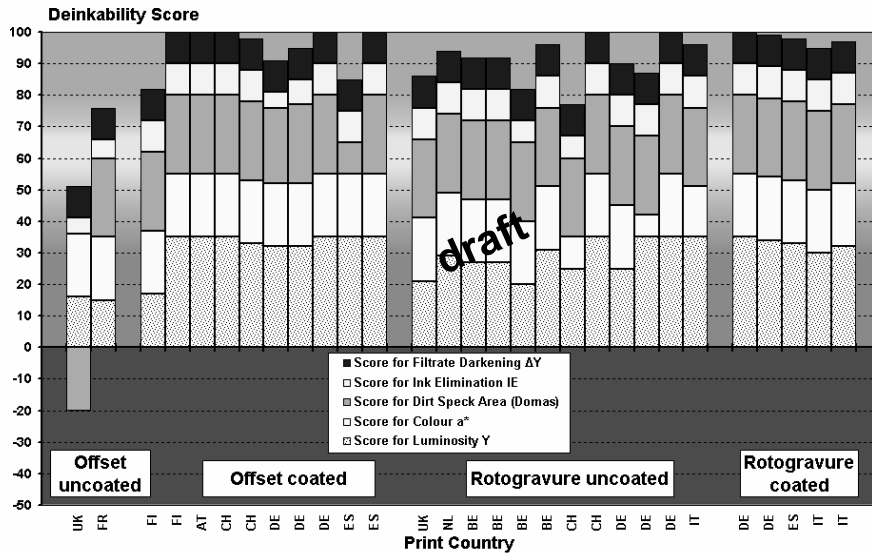
\*The product may be well recyclable without deinking

## Deinkability Scores – Newspapers (INGEDE Project 100 05 – Recyclability Survey)



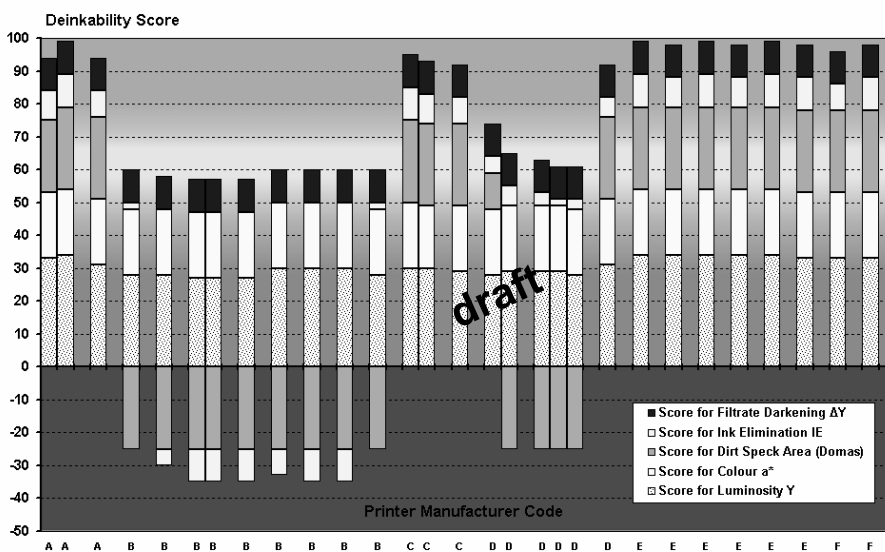
# Deinkability Scores – Magazines

(INGEDE Project 100 05 – Recyclability Survey)



# Deinkability Scores – Toner prints

(INGEDE Project 115 06 – Digital Deinkability Survey)



## Development of “Recyclability Scores” Outlook



- The proposed values for deinkability are in discussion in Europe and in Germany
- A similar scheme has to be developed and discussed for adhesive applications
- Surveys and research work has to deliver results how to improve recyclability or at least to avoid recycling problems
- These results have to be used as recommendation for printers and converters

## INGEDE International Association of the Deinking Industry



### INGEDE Office

Gerokstr. 40  
74321 Bietigheim-Bissingen  
Germany

Phone +49 7142 7742-81  
Fax +49 7142 7742-80  
Mail [office@ingede.org](mailto:office@ingede.org)

### Public Relations

Oetztaler Str. 5 B  
81373 München  
Germany

Phone +49 89 769-2332  
Fax +49 89 769-2338  
Mail [info@ingede.org](mailto:info@ingede.org)

[www.ingede.org](http://www.ingede.org)