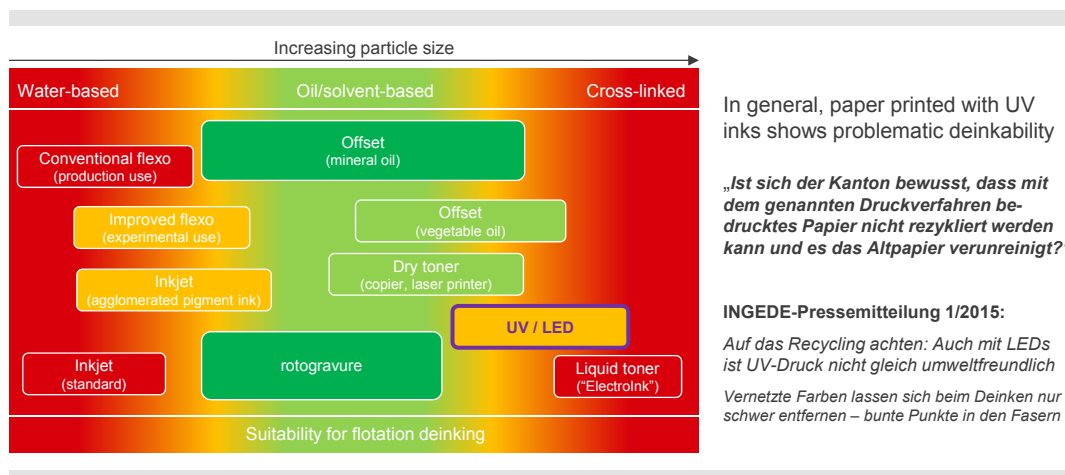




**UV/LED Deinkability**

**Actual situation**



In general, paper printed with UV inks shows problematic deinkability

*„Ist sich der Kanton bewusst, dass mit dem genannten Druckverfahren bedrucktes Papier nicht recycelt werden kann und es das Altpapier verunreinigt?“*

**INGEDE-Pressemitteilung 1/2015:**

*Auf das Recycling achten: Auch mit LEDs ist UV-Druck nicht gleich umweltfreundlich*

*Vernetzte Farben lassen sich beim Deinken nur schwer entfernen – bunte Punkte in den Fasern*

Background/task



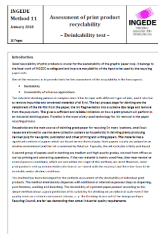
**Co-operation project** between Siegwirk and Stora Enso with the target to improve the deinkability of UV/LED cured prints

Evaluation

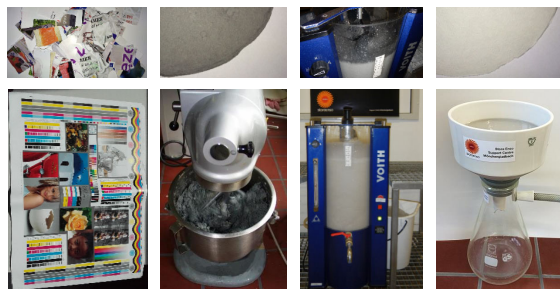
- **UV/LED Inks:** 8 different ink formulations, simplex printed
- **Substrates:** 2 coated papers, 1 uncoated paper
- **UV curing:** mercury, iron-doped and LED curing lamp technologies (printed on sheetfed + narrow web presses)
- **Deinkability:** checked @ Stora Enso Support Centre Mönchengladbach

How is the deinkability measured?

Officially approved deinkability lab test method  
**INGEDE Method 11 (01/2018)**



INGEDE Method 11



Sample preparation

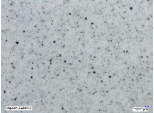
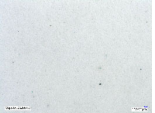
Pulping

Flotation

Sheet forming

Dirt specks (ink particles) before and after flotation

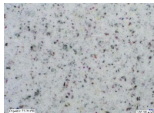

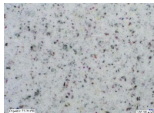

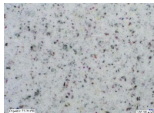

**CONVENTIONAL OIL  
BASED INK**

	
Dirt specks <b>before</b> flotation	Dirt specks <b>after</b> flotation

▼

**Most** dirt specks after pulping **can** be removed **efficiently** by flotation ... flotation works efficiently with hydrophobic particles of about 10–150 µm

Dirt specks (ink particles) before and after flotation

<p style="background-color: red; color: white; padding: 2px;"><b>STANDARD UV/LED INK</b></p> <table border="0" style="margin: auto;"><tr><td></td><td></td></tr><tr><td style="text-align: center;">Dirt specks <b>before</b> flotation</td><td style="text-align: center;">Dirt specks <b>after</b> flotation</td></tr></table> <p style="text-align: center;">▼</p> <p style="text-align: center;"><b>Large</b> dirt specks after pulping <b>can't</b> be removed <b>efficiently</b> by flotation ... flotation works efficiently with hydrophobic particles of about 10–150 µm</p>			Dirt specks <b>before</b> flotation	Dirt specks <b>after</b> flotation	<p style="background-color: green; color: white; padding: 2px;"><b>SIEGWERK UV/LED INK</b></p> <table border="0" style="margin: auto;"><tr><td></td><td></td></tr><tr><td style="text-align: center;">Dirt specks <b>before</b> flotation</td><td style="text-align: center;">Dirt specks <b>after</b> flotation</td></tr></table> <p style="text-align: center;">▼</p> <p style="text-align: center;"><b>Small</b> dirt specks after pulping <b>can</b> be removed by flotation <b>efficiently</b></p>			Dirt specks <b>before</b> flotation	Dirt specks <b>after</b> flotation
									
Dirt specks <b>before</b> flotation	Dirt specks <b>after</b> flotation								
									
Dirt specks <b>before</b> flotation	Dirt specks <b>after</b> flotation								

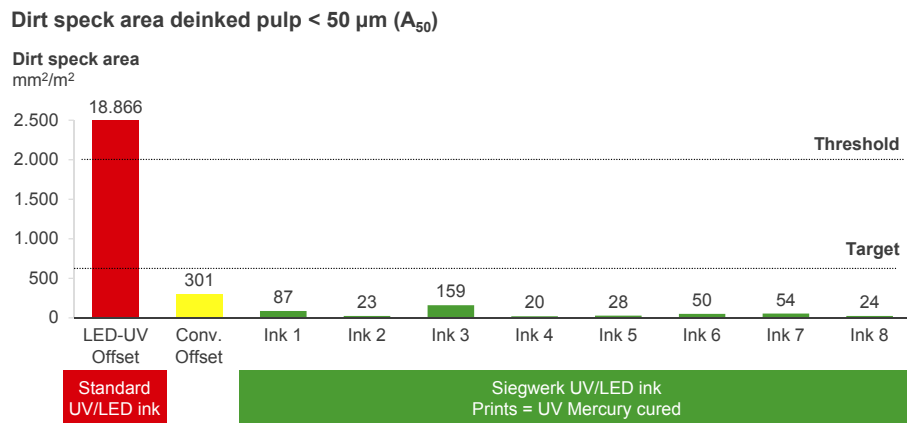
**UV/LED Deinkability**

**Dirt specks (ink particles) after flotation**

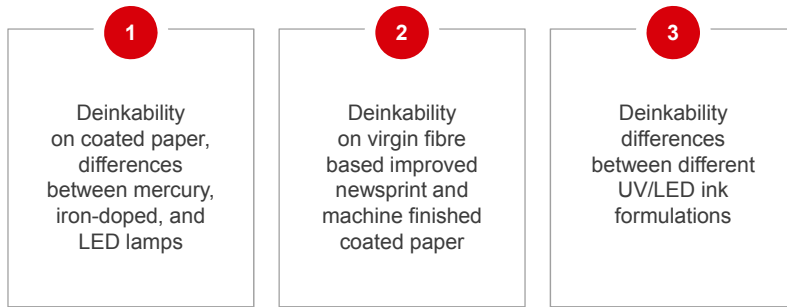


**UV/LED Deinkability**

**Dirt specks (ink particles) after flotation**

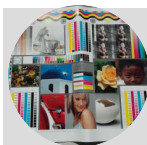


Results



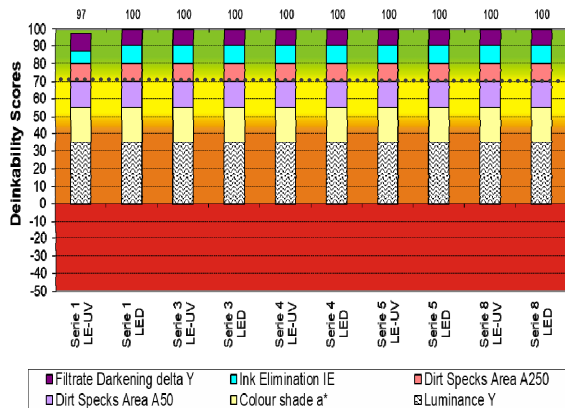
1 Coated paper – influence of iron doped / LED UV lamp

Substrate	coated paper LumiArt 100 g/m <sup>2</sup>
UV/LED inks	5 versions (CMYK)
UV lamp	Iron-doped / LED 385 nm
Deinking score	97–100 points = good deinkability



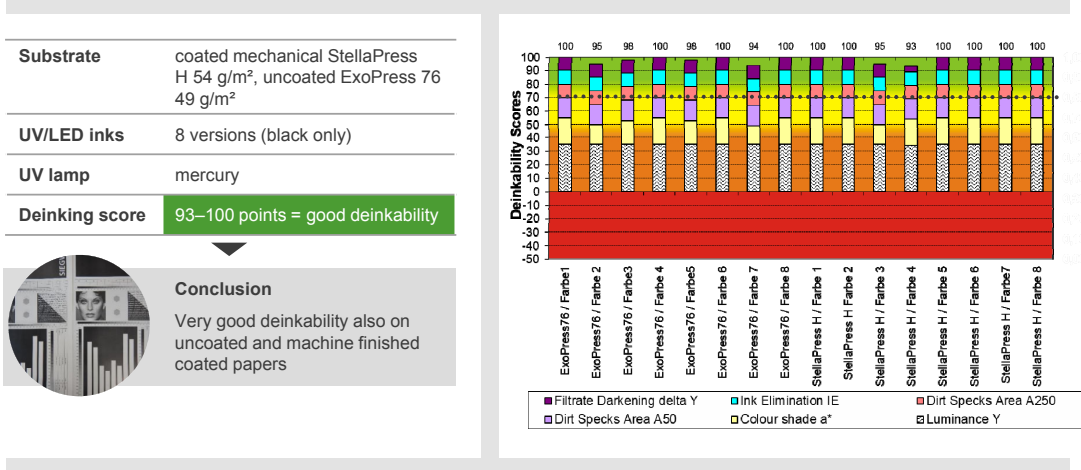
Conclusion

No difference in deinkability between mercury, iron-doped, and LED lamps has been observed.



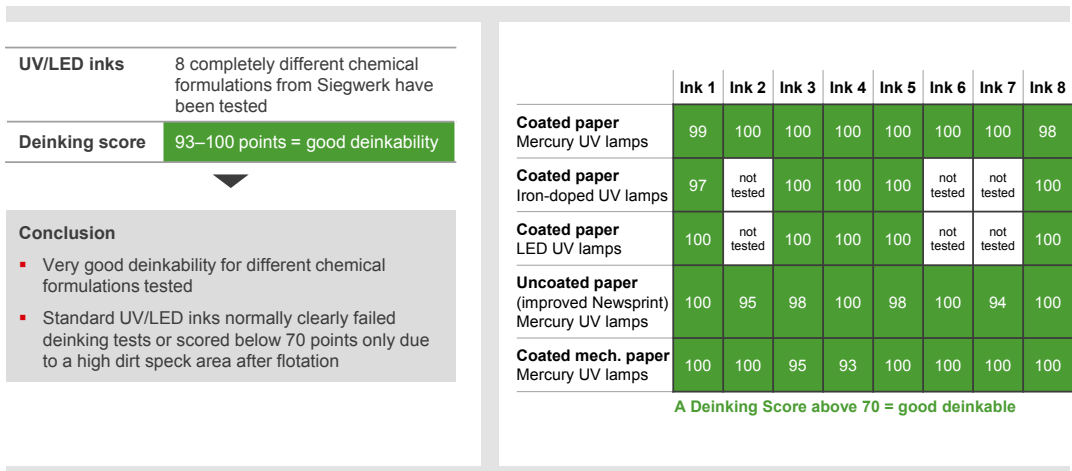
## UV/LED Deinkability

### 2 Virgin fibre based improved newsprint and machine finished coated paper



## UV/LED Deinkability

### 3 Influence of different chemical formulations



## Summary – ready for a greener printing

### Siegwerk LNRGY ink series for UV/LED

- state of the art in commercial UV/iron-doped/LED printing
- Easy recycling due to good deinkability



### Iron-doped UV/LED printing

- no mercury (LED only)
- no VOCs
- no spray powder
- low energy consumption
- no ozone
- free of reclassified PIs\*

\* Free of reclassified photoinitiators 369, EDB, EHA, PBZ

## Contact



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