Mineral oils in Printing inks – State of actual research

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Requirements

Criteria almost identical to BLAUER ENGEL DAS UMWELTZEICHEN (January 21)

Image: Blauer Engel: DE-UZ 195-201501

- Aliphatic Hydrocarbons:
  - Substances C10 to C20
  - Highly molecular Compounds (> C35, Share of C20 to C35 max. 5 %) without solving properties: microcrystalline waxes, Vaseline, Polyolefin-, Paraffin-, or Fischer-Tropsch-Waxes
- Aromatic Hydrocarbons (Origin from Mineral oil):
  - < 0,1 % by weight
  - PAK according to EU-Regulation No. 1272/2013 → Different PAKs < 0,2 mg/kg; Sum of all PAKS should be < 1 mg/kg
- Not originating from deforestation of rain forest → **Must** originate from cultivations sustainability criteria; **Should not** be gen manipulated

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| Framework – Print trials

- Short term tests (1 day):
  - Roughly 50 kg Ink (CMYK)
  - Test form, 30,000 to 60,000 prints
- Long term tests (3 months)
  - Accompanying daily production
  - Regular quality control

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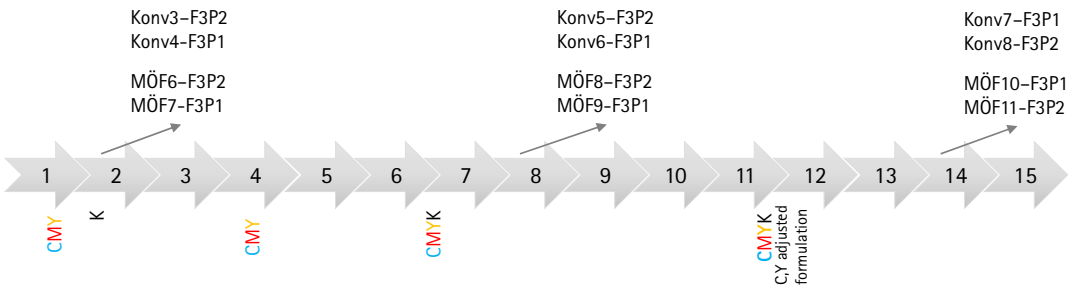
| Framework

- Tests performed according to INGEDE 11
- Sampling during production accompanying print trials



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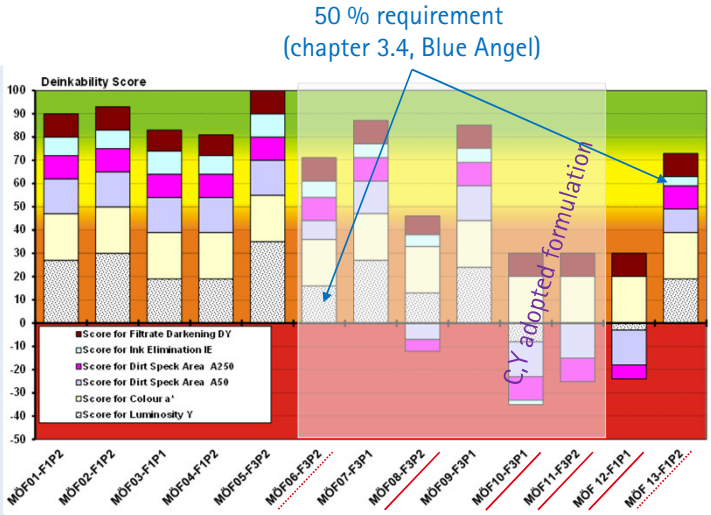
| Mineral oil free inks

F1: Ink manufacturer 1

F2: Ink manufacturer 2

P1: Paper1: 50 % DIP

P2: Paper2: 100 % DIP



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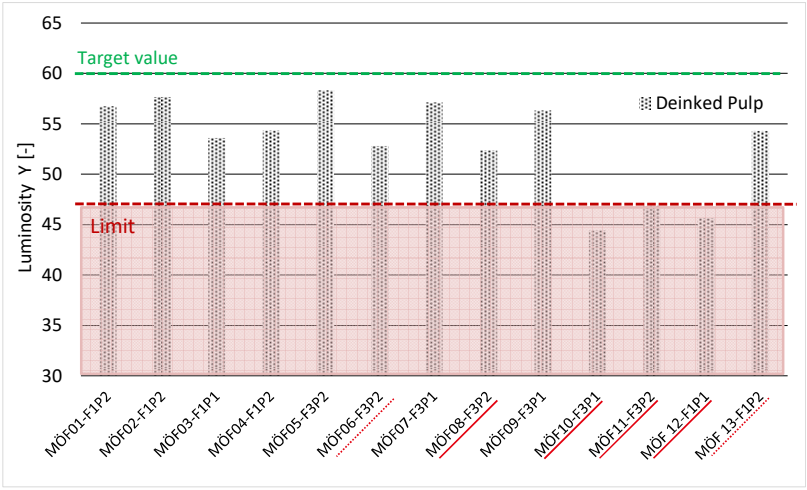
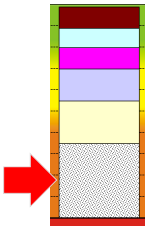
| Luminosity





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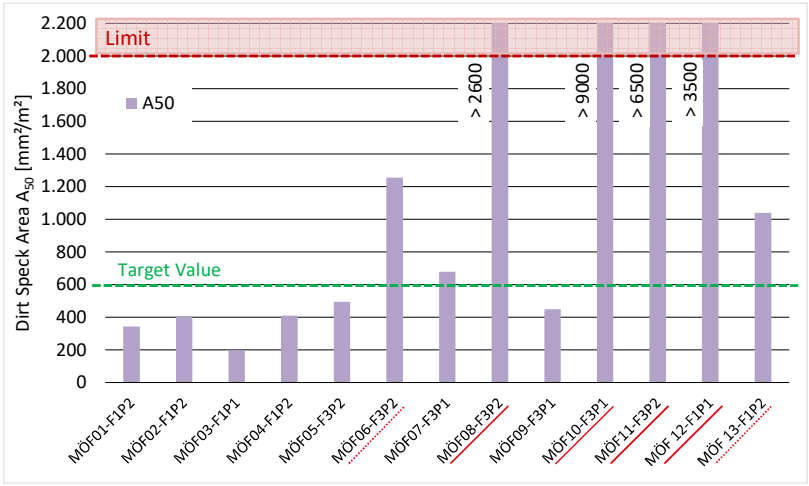
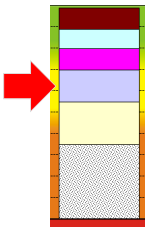
Dirt Speck Area A_{50}





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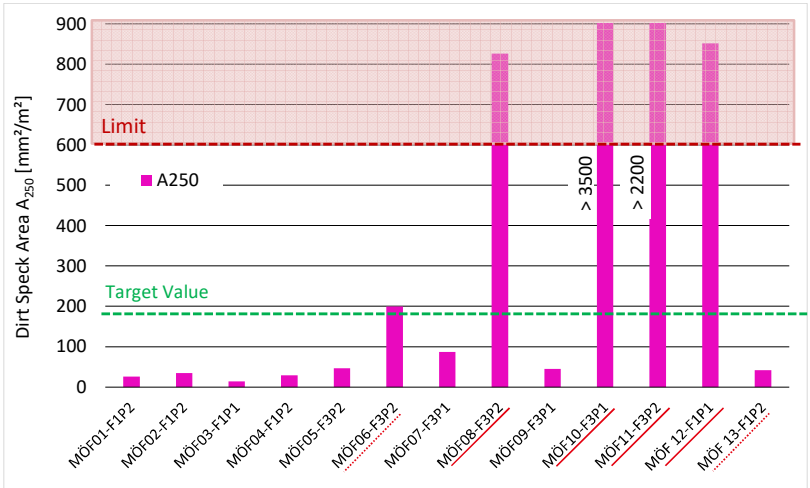
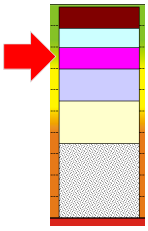
Dirt Speck Area A_{250}





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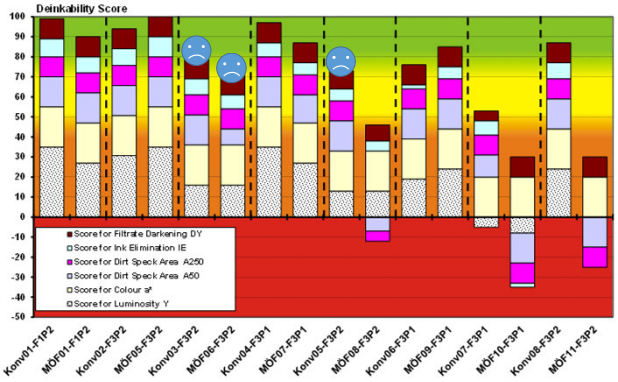
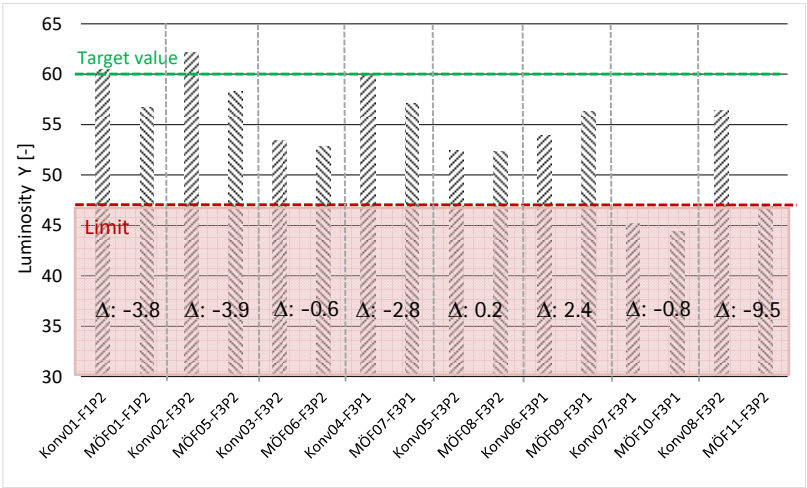
| Comparison MOF – conventional

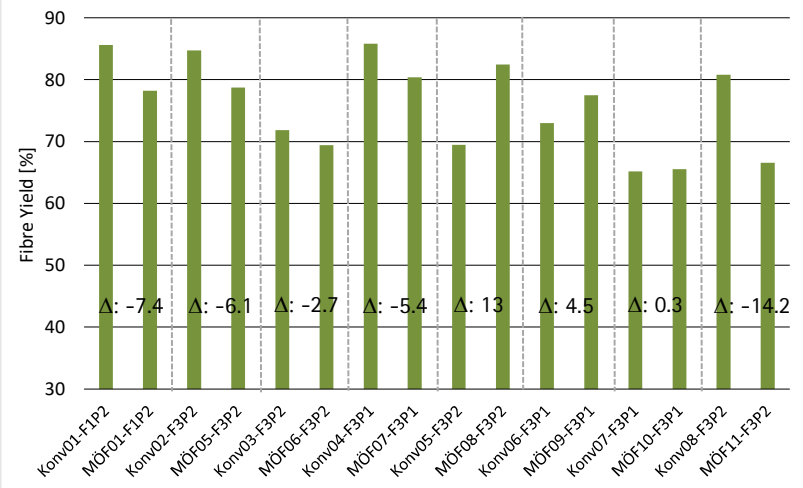


- Conv. inks better deinkable (6 of 8)
- Crucial Parameters:
  - Luminosity Y
  - Dirt Speck Area A_{50} & A_{250}
  - Ink elimination IE
  - (50 % requirement (blue Angel) ☹)
- 1 Sample with conv. ink not deinkable
- 2 Samples good deinkable with no deinkability using MOF inks
- Fibre yield after INGEDE 11 with conv. inks better in 5 out of 8 pairings

| Luminosity



Fibre Yield



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Conclusion

- Products with mineral oil free (MOF) inks can be deinkable
- Main differences:
  - Luminosity Y lower with MOF inks
  - Dirt Speck Areas can lead to failing deinkability
  - Fibre Yield after INGEDE 11 test mostly lower with MOF inks
- No valid statement about the influence of paper possible

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