Deinking of HP digital commercial prints

Minedys Macías, Hewlett-Packard
Digital transformation is accelerating

2008-2009 Worldwide page growth for production printing

Source: HP internal analysis based on multiple industry reports
Digital printing
Sustainable growth

• The advantage of digital printing
  - Helps reduce carbon footprint → reduced inventory, spoilage, over-runs

• Digital print recyclability
  - Digital prints are a small percentage of the total paper stream
  - HP is committed to ensuring a smooth transition for the paper recycling industry once the percent of digital prints increases
  - HP conducts internal testing and sponsors independent lab tests
  - These tests show positive deinkability results for HP Indigo Electroink (LEP) and HP Inkjet Webpress pigmented inks
INKJET DEINKABILITY STUDIES

Deinking studies carried out at PTS, Germany
Experimental conditions are similar to those in INGEDE Method yet modified to study the effects on inkjet ink deinkability
chemicals: NaOH, Na₂SiO₃, H₂O₂ and soap
Fig. 1: Pulping conditions have a significant impact on deinkability
HP black pigmented ink on Xerox Office paper and M11 chemistry

lower shear

- 30%
- 44%
- 44%
- 48%

15°C, 120rpm, 20min
15°C, 120rpm, 15min
15°C, 62.5rpm, 15min
15°C, 62.5rpm, 10min
12°C, 62.5rpm, 10min
Fig. 2: Enhanced deinkability as a function of printing media
HP black pigmented ink deinked using MM1 conditions
Deinking studies carried out at WMU
Results for 2 different experimental conditions

1. Pilot scale simulation of standard New Page recycling process
2. Pilot scale study using HP Labs HPES conditions
   - combination of collectors
Fig. 3: Dirt count as a function of flotation process stage

Process Conditions → Pilot scale simulation of New Page conditions using 5% HP ElectroInk 4.0
Fig. 4: Dirt count as a function of flotation process stage
Process conditions → Pilot scale HPES conditions using 20% ElectroInk 4.0

Sample Location

Dirt Count

Hydopaper 1761
1st Float Accepts 1059
Primary Reverse Cleaner Accepts 806
Primary Forward Cleaner Accepts 617
Sidelift & Bell Press 736
2nd Float Accepts 146
Final 97

PPM
Data collected at independent labs using commonly available deinking conditions show that LEP and Inkjet inks are deinkable.

Finding an optimum deinking solution requires collaboration.

- Inter-industry cooperation will be key.