Deinking... What Does It Mean to the Environment?

Service Areas

Business Development Strategies
On Demand Printing & Publishing
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Comments or Questions?
Key Highlights

- For environmental reasons, recovering fibers from previously-used paper is becoming ever more important.

- To allow for the production of bright paper grades, the ink must be removed during recycling through a process called deinking.

- In November 2010, INGEDE News reported deinkability issues for HP Indigo ElectroInk in a German paper mill. The incident involved liquid toner materials at less than 10% of the raw recycling waste.

- InfoTrends had the opportunity to interview Nils Miller of HP about the incident. According to Miller, lab scale testing by the Centre Technique du Papier (CTP) France was completed on six paper stocks (3 coated and 3 uncoated) using the single-loop wood-free deinking tests. During these tests, five of the six papers appeared to meet the INGEDE dirt count specifications.

Introduction

Recovered fiber is currently one of the most important raw materials in paper and paperboard production. Paper recovery and recycling continues to grow at a rapid pace. The American Forest & Paper Association (AF&PA), an industry association that tracks paper use, released its 2009 figures for paper recovery and recycling in March 2010. The association found that a record-high 63.4% of the paper consumed in the U.S. was recovered last year for recycling.

Recovered paper is recycled to produce cardboard, packaging paper, office papers, newsprint, and sanitary paper. It is also being used to produce higher-quality graphic papers. To enable the manufacturing of high-grade graphic arts paper other than cardboard and packing paper, the ink must be removed. As such, most recovered paper undergoes the deinking process. In the simplest of analogies, deinking is like pulp
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laundering. The ink and sticky materials like glue residue and adhesives are removed. According to TAPPI (The Technical Association for the Worldwide Pulp, Paper, and Converting Industry), papermakers use a combination of two deinking processes. Small particles of ink are rinsed from the pulp with water in a process called washing. Larger particles are removed with air bubbles in another process called flotation. A more detailed description of the deinking process has been published in the InfoTrends report entitled Challenges and Strategic Importance of Recycling Digital Print

INGEDE Cites Issues with HP Indigo Deinking

The November 2010 edition of the INGEDE (International Association of the Deinking Industry) News from the association stipulated that the deinking mills of its associate members should no longer accept HP Indigo liquid toner print for deinking because the material caused more than one hundred tons of paper to be dumped. The incident, which occurred at a German deinking mill that produces high-quality graphic arts paper, involved liquid toner materials at less than 10% of the raw recycling waste—a limit that was thought to be safe.

INGEDE was founded by leading European paper manufacturers in 1989. Its current members include 40 paper mills as well as the research departments of paper mills from Austria, Belgium, Finland, France, Germany, Italy, the Netherlands, Norway, Pakistan, Spain, Sweden, Switzerland, the Czech Republic, and the United Kingdom.

An Interview with HP’s Nils Miller

Given the importance of paper recovery and recycling in today’s market, InfoTrends contacted Nils Miller, the IPG De-Inking Program Manager for HP. According to Miller, “The HP Indigo ElectroInk 4.0 was released in March 2004. In addition to enabling other performance improvements for the HP Indigo product line, a reason to progress to ElectroInk 4.0 was its improved deinkability on a given paper. HP continues to be very committed to the environment and ensuring that paper using our consumables can be recovered properly. We have conducted and continue to conduct extensive research in this area.”

Miller sited lab scale testing by the Centre Technique du Papier (CTP) France that was completed on six paper stocks (3 coated and 3 uncoated) using the single-loop wood-free deinking tests. Five of the six papers appeared to meet the INGEDE dirt count specifications in this test. In addition, HP has engaged in ongoing deinking collaborations with Abitibi Bowater Inc., NewPage Corporation, Stora Enso, and UPM. The objective of these collaborations is to generate fundamental insight into the role of ink, paper, and the deinking process and conduct mill scale trials versus lab tests using significant quantities of HP prints. According to Miller, “Western Michigan University, working under the direction of NewPage Corporation, has completed a successful pilot-scale trial. This trial confirmed
deinkability of a batch consisting of 5% HP Indigo prints (a random mix of customer prints) and 95% standard mixed office waste using NewPage’s standard process conditions.”

Miller continued, “HP has not yet analyzed print or pulp samples from the incident that INGEDE described in its October 2010 press release about the German deinking mill. HP has already established plans to engage with the mill to help assess and understand this incident. There are a number of variables that can impact the deinking process, ranging from the paper used to any post-treatment of the specific materials. Our expertise in printing technology could be of significant assistance in identifying the prints involved, analyzing the deinking mill incident, and supporting additional tests as appropriate.”

**Environmental Implications**

The issue of recycled paper is certainly important to the environment. The U.S. uses more than 85 million tons of paper every year. Switching from virgin materials to a greater share of recycled content paper has significant benefits. Research from the Environmental Paper Network has found that compared to using virgin wood, paper made with 100% recycled content uses 44% less energy, produces 38% less greenhouse gas emissions, generates 41% less particulate emissions, uses 50% less wastewater, results in 49% less solid waste, and (of course) consumes 100% less wood.

The global trend in the paper industry is to reduce the consumption of virgin fibers and increase the recycling rate of secondary fibers. With the growth of high-speed inkjet presses and the acceleration of digital printing, the concept of deinking and recycled paper is critical.

While there was clearly an issue in a mill in Germany, HP has taken a proactive stance based on its commitment to be environmentally conscious. With the emergence of high-speed inkjet technology, vendors realize that deinking and recyclability are critical aspects of environmentally responsible printing. HP, Kodak, Océ, and Ricoh InfoPrint Solutions, formed the Digital Print Deinking Alliance in 2008 to assess the deinkability of inkjet-printed papers. There is an acknowledgement that deinking should limit any harm to the environment while also resulting in a high-quality product. To achieve these goals, strong collaboration is required between OEMs, paper manufacturers, and research organizations to identify system-based solutions including inks, papers, and deinking technologies that will be cost-effective, practical, and ecologically sound.

More research is needed to understand the complex relations between ink or toner, paper types, pre- and post-treatment, and deinking conditions. There is still a lot of trial and error involved when assessing the deinkability of new printing processes. What work might work with one type of ink and paper at a certain mill can fail under a different set of conditions.

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More investigation is essential to understanding all of the influencing factors required for continuous improvement. Therefore, it would be premature to call a relatively new printing process completely non-deinkable. The environmental commitment of suppliers is critical and it will be measured by the progress of deinkability in the future.

**InfoTrends’ Opinion**

When it comes to going green, we have reached a point where industry vendors are talking the talk and walking the walk. Digital printing is generally a green technology as it prevents overproduction and offers more targeted communication. Now vendors are focusing on areas where the environmental stance is less in favor of digital print. They are identifying environmentally-conscious printing practices and understand that a commitment to the environment can bring a competitive advantage.
About the Authors

Barb Pellow
Group Director
barb_pellow@infotrends.com
+1 781 616 2100 ext. 261

A digital printing and publishing pioneer as well as marketing expert, Barbara Pellow helps companies develop multi-media strategies. She assists companies in creating strategies to launch new products, building strategic marketing plans, and educating their sales force on delivering value.

Ralf Schlözer
Director
ralf_schlozer@infotrends.com
+ 011 44 1582 698052 ext. 201

As Director of the On Demand Printing & Publishing Consulting Service Europe, Ralf Schlözer is responsible for all service related publications and research in Europe. He is responsible for market trend analysis and forecasting, as well as creating research projects, presentations, and analysis reports.

Comments or Questions?