

COST - A Framework for European Cooperation in Scientific and Technical Research in Deinking

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Founded in 1971, COST is an intergovernmental framework for European COoperation in the field of Scientific and Technical Research that promotes co-ordination of nationally funded research on a European level. COST Actions cover basic and pre-competitive research as well as activities of public utility. The goal of COST is to ensure that Europe holds a strong position in the field of scientific and technical research for peaceful purposes by increasing European cooperation and interaction. For more information refer to the COST web site: <http://www.cost.esf.org/index.php?id=985>.

Cost Action E46 – Deinking: This Action began in September 2004. The objective of the Action is to improve the efficiency and effectiveness of deinking technology even as new printing methods and vehicles are being introduced in response to increasing customer expectations and increasingly stringent environmental considerations. The Action has helped the European paper industry create a platform for exchanges among leading institutes involved in research; universities which have activities in deinking; a number of key suppliers; and individual paper companies.

Main research results in the framework of COST Actions E46--Through the participation of 27 organizations (including 13 universities and 10 research institutes) the results of a large number of research projects have been presented and discussed at semi-annual working group meetings.

For example, the **“Basics Studies” working group (WG1)** has focused on developing a better understanding of the mechanisms involved in deinking -- particularly for flotation process variables. Other WG1 research areas include surface chemistry of components; chemical modification of surfaces; flotation of sticky materials and ink; ink particle analysis and modelling of the flotation cell.

In order to maintain long term sustainability of recovered paper deinking, inks used during printing should be Eco-designed. Eco-design considers all aspects of the ink's life cycle analysis--from ink manufacturing to printing and subsequent deinking. The Working Group **“Printing Technology and Deinking” (WG3)** focus has been on the last aspect of ink's life cycle--i.e. deinking. Standardized methods to test deinkability have been discussed and agreed by all the participants. The main areas focused on were testing of the deinkability of all major European newspapers & magazines; identification of digital prints that were difficult to deink; initiation of Eco-design work on ultra-violet (UV) inks and varnishes; and evaluation of Eco-designed flexographic inks for newsprint.

Various other aspects of the deinking process have been discussed in the **“Deinking” Working Group (WG2+4)** with the inputs from other working groups such as: 1) an overview of neutral and enzymatic deinking technologies compared to conventional alkaline deinking and 2) a demonstration at industrial scale of flexographic print deinking combining Eco-designed ink and process adaptation.

Networking: Action E46 has provided a forum to improve “Deinking networking” within Europe as all the European research organizations involved in deinking have participated in the Action. Short Term Scientific Missions (STSM) – a COST tool – have particularly helped networking¹. Extensive contacts have been developed among research organizations via STSM, particularly with respect to dissemination of test methods.

Technology Transfer to the Industry: The European paper industry has been participating directly in Action E46 through the International organization; INGEDE (the International Association of Deinking). The main results presented in each COST Action E46 meeting have been made available to all interested paper companies.

¹ These Missions (Exchange Visits) are aimed at strengthening the existing networks by allowing scientists to go to an institution or laboratory in another COST member country to foster collaboration, to learn a new technique or to take measurements using instruments and/or methods not available in their own institution/laboratory. They are particularly intended for young scientists.

Publications--Deinking Primer: Organizations with long-term deinking involvement participating in COST Action E46 have provided papers describing the main deinking aspects as a way to disseminate information to practitioners and other scientists. These papers are available on the Action E46 website (<http://www.cost-e46.eu.org/>). Some of the research results have been presented at PTS-CTP deinking symposia. For example, at the 2008 Symposium 14 of the 34 presentations were from COST participants.

Final Conference: Action E46 ended in October 2008 with a major conference to be held in Bordeaux, France entitled "Deinkability of Graphic Printed Materials: An Updated Review." This reviewed the major activities and highlights of Action E46 over the last four years.



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The best (not already published) results are included in this special issue of PPR. The Management Committee of the Action considered two options: publishing these papers in a special book or requesting PPR to publish them. The second option has been preferred considering that PPR is the reference magazine in the area of paper recycling and that it reaches all the international community interested in paper recycling. The Management Committee of the Action thanks PPR for accepting to publish these papers.

Introduction of Computer Print-Outs in the Recycling Process of Printed Folding Box-Board

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ABSTRACT

Packaging paper grades are nowadays rarely considered as furnish for chemical deinking flotation processes. However, there are trends towards lower basis weights and the need to lower the chemical contaminants of food packaging papers, while maintaining the specified quality of fibers and the finished paper. In this study the offset printed folding box-board samples were subjected to the double-stage laboratory deinking flotation process. The flotation had positive effect on recycled handsheets properties. Results of the study show improvements in brightness value of the recycled papers up to 2%, reduction of inorganic matter (ash content) from 13.2 % to 7.4 % and improvements in mechanical properties of 17%.

As a case study, the mixture of office laser print-outs and offset printed folding box-board samples were subjected to double-stage laboratory deinking flotation process as well. The office laser print-outs were introduced to the offset printed box-board furnish in order to improve the mechanical and optical characteristics of recycled handsheets. The role of primary paper grades, with its longer and more flexible fibers, was to help the weaker brown grade fibers to knit the stronger paper. Primary paper fibers have contributed to improved mechanical sheet characteristics up to 40% on average and have improved handsheet optical properties as well (lightness increased up to 9%).

KEYWORDS: Computer printouts (CPO), Double – stage chemical flotation, Flotation, Office laser print-outs, Offset printed folding box-board

INTRODUCTION

Most of the recovered paper used in the paper and board industry is not deinked and is used in production of packaging papers. According to CEPI Special Recycling 2005 Statistics [1], packaging papers utilize about 62.5% of total volume of the recovered paper, meaning that about two thirds of total recovered paper consumption is used in packaging produc-