

for Affiliates this month in Center research:

Papers for Digital Printing, Part II

Last month's eReview explained that the chemical composition, spatial distribution of components, and thickness uniformity are more critical of papers used in digital printing than those used in other printing processes. This month's eReview summarizes the remainder of the Printing Industry Center research monograph *An Investigation into Papers for Digital Printing*, by Mary Anne Evans, Ph.D., and Bernice A. LeMaire (PICRM-2005-06).

The objective of this research study was to identify constraints and potential solutions for the improved performance and quality of digital papers. A total of 103 U.S. and Canadian printing companies that offer digital printing services responded to a telephone survey that was designed to:

- identify the paper grades commonly used for the market segment of production digital printing,
- identify the number of brands used and the nature of printing companies' relationships to suppliers,
- determine the factors that affect brand purchase decisions,
- discover the relative importance of different paper properties and characteristics,
- assess the deficiencies in currently-available paper grades, and
- determine what improvements are required by digital printers, and what limitations are currently imposed by press design.

Respondents were also asked for their perceptions of the change in paper costs to the printer over the years 2002–2004, and to what extent, if any, changes in paper costs affected the prices charged to print buyers.

Demographics

The survey sample was dominated by smaller companies, with 68% of participants generating 2004 revenues of less than \$3M. The job categories predicted to generate the greatest revenues were marketing and promotional materials, direct mail, and transactional and business communications. There was some ambiguity in the definition of "digital printing" among the participants, based on the press brands and technologies reported by the respondents. Evidently some computer-to-plate and direct-to-press technologies were regarded as "digital" by certain respondents.

Most participants in the survey were commercial printers with some digital equipment. When asked to specify the year of entry into digital production, about 15% of the respondents reported purchasing their first digital presses in 1995. This may

Center Spotlight

Take advantage of these great resources at RIT



Industry Education Programs (IEP) draws from RIT's excellent resources and 50 years as a leading provider of graphic arts education, to provide workforce training in both traditional and digital technologies. IEP also offers customized programs to suit your company's specific needs, delivered either on the RIT campus or at your facility.

More information at www.seminars.cias.rit.edu



As the industry's most comprehensive facility for printing, paper and material evaluations, the **Printing Applications Laboratory (PAL)** provides the industry with practical, measurable information to control and improve the quality of their products. Connect to PAL's resource of substrates that meet standard performance criteria in our press qualification programs--HP Indigo and NexPress.

More information at www.printlab.rit.edu

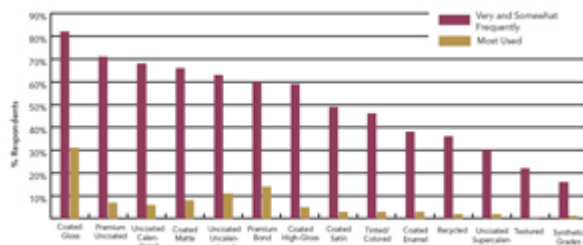
correspond to the market introduction of the Indigo and Xeikon digital color presses. There was another significant boom in 2002, when 12% purchased their first digital presses, closely followed by a decrease in 2003 when only 6% entered the market. Eighty-five percent of the respondents used only digital sheetfed presses, and only 5% had only digital web capabilities, indicating that the survey sample did not capture the web-fed high-speed transactional segment that is currently responsible for a significant portion of digital production volume.

Paper Grades for Digital Printing

There was a wide range of substrates used within the research sample for digital printing, but based on two separate questions, coated gloss was found to be the leading paper grade (see Figure 1). The top five other paper grades used most frequently were premium uncoated, uncoated calendered, coated matte, uncoated uncalendered, and premium bond, in that order.

Figure 1. Papers used very and somewhat frequently for digital printing applications, and the percentage of grades used most often.

[click to view full size](#)



The Paper Selection Decision

Respondents were asked how the paper selection decision was made: by an individual within the printing company, by the customer (print purchaser), or jointly, by both parties (Figure 2). This is important for paper producers to understand because it will affect their advertising strategies for new paper brands. Generally there seemed to be a tendency to collaborate on the selection of paper grades: about 46% of the respondents reported that they collaborate with customers to make paper decisions. However, the distribution of responses to this question indicated mixed paper selection practices. In an open-ended question, respondents were asked who within their organization makes the paper grade selection. The responses were categorized and are shown in Figure 3.

Figure 2. The paper grade selection decision.

[click to view full size](#)

The *eReview* is a monthly publication of the Printing Industry Center at RIT for registered Affiliate companies. Articles are also published in the quarterly printed publication *PrintReview*.

Subscriptions

You are receiving this newsletter because you registered as an Affiliate of the Printing Industry Center.

[unsubscribe](#)

Contact the Center

Co-Directors (email):
Frank Cost and Pat Sorce

Communications Manager (email):
Ashley Waltz
(*Web site, publications, general info*)

Mailing Address:
Printing Industry Center
at RIT
College of Imaging Arts
and Sciences
Rochester Institute of
Technology
55 Lomb Memorial Drive
Rochester, NY 14623

Phone: (585) 475-2733
Fax: (585) 475-7279

About the Center

Dedicated to the study of major business environment influences in the printing industry precipitated by new technologies and societal changes, the Printing Industry Center at RIT addresses the concerns of the printing industry through educational outreach and research initiatives.

Support for the Center comes from:

Sloan Foundation
Rochester Institute of
Technology

Adobe
Baldwin Technology

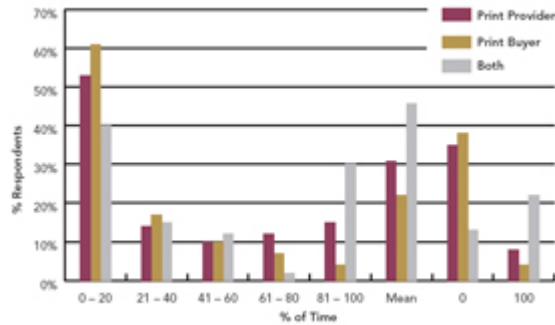
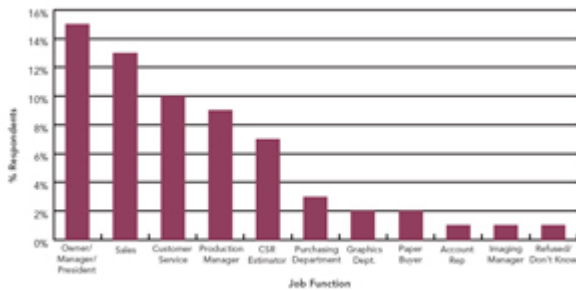


Figure 3. Job function or title of person selecting paper grade within the printing company.

[click to view full size](#)



In exploring brand and paper supplier relationships, there was some ambiguity in the definition of the term “brand,” which complicated the data interpretation. However, 50% of respondents indicated 5 or fewer brands in their portfolios. This indicates a degree of brand loyalty, but 71% of respondents reported that they are not limited to a specific brand choice.

Respondents were asked to rank seven factors that impact their evaluation of different sources or brands of paper for digital printing. These factors were rated as follows:

- runnability and print quality (two separate factors that were given equal weight by respondents),
- availability of grade,
- appearance properties,
- price,
- multipurpose functionality across different printing technologies, and
- product range.

In general, the leading paper characteristics considered when making a purchase decision were found to be:

- toner / ink adhesion,
- accurate sheet dimensions,
- dimensional stability, and
- moisture level.

Table 1 gives a more comprehensive picture of how respondents evaluated paper characteristics, and demonstrates that performance parameters were considered to be more important than appearance-related factors.

Table 1. Relative importance of paper characteristics in

Company Inc.
 Eastman Kodak Company
 Heidelberg
 HP
 IBM Printing Systems
 MeadWestvaco
 NPES
 RR Donnelley
 Standard Register
 U.S. Government Printing
 Office
 Vertis
 VIGC
 Weyerhaeuser
 Xerox Corporation

selecting a grade.

click to view full size

Property	Percent Respondents						
	Critically Important	Quite Important	Somewhat Important	Not Important	Don't Know	Most Important*	Second Most Important
Toner/ink Adhesion	84	11	4	0	1	52	17
Uniformity	69	22	4	1	4	7	10
Accurate Sheet Dimensions	48	17	10	2	3	10	12
Dimensional Stability	51	24	19	5	1	4	13
Moisture Level	45	27	21	6	1	4	6
Surface Finish	39	38	25	2	2	3	5
Surface Smoothness	31	34	25	7	3	4	7
Basis Weight	30	31	29	5	5	2	1
Brightness	24	31	41	3	1	0	10
Opacity	24	35	36	1	4	3	0
Color	21	31	37	10	1	0	0
Surface Strength	19	30	35	11	5	0	2
Storage and Handling	14	40	32	13	1	1	1
Lightfastness	14	32	29	19	6	0	0
Stiffness	13	28	38	14	7	2	0
Sheetweb Strength	10	20	37	28	5	0	4

Acceptability of Current Digital Paper Grades

The area of improvement in digital papers that printers want to see most is an extended product range, with more sizes, finishes and basis weights available for their digital presses. The presses currently owned impose paper choice limitations on size, basis weight, thickness, and surface treatment requirements. Only eight respondents indicated that they would like to see a lowering of paper price. This is consistent with the observation from previous questions that price is not a leading driver in the brand selection and purchase decision.

Paper costs to printers were reported by 70% of respondents to have increased either significantly or somewhat over the last two years (2002–2004). Nearly half of the companies experiencing paper cost increases pass these on to their customers.

Looking to the Future

Overall, it appears that there is room for product development to meet the growing potential for digital printing applications. This imposes a significant challenge to paper manufacturers since there are currently many different press technologies with a wide range of required sheet and roll sizes. In 2005, a wide range of new digital papers and new product lines were introduced, with more color options, a wider range of basis weights and sizes, and new textures and finishes. But technical issues remain, and printers will continue to look for papers with improved runnability, printability, and fitness for use in the new generation of production digital presses.

2005 Research Monographs:

To read about this research in detail, download the monograph from: <http://print.rit.edu/pubs/picrm200506.pdf>

Other research publications of the Center are available at: <http://print.rit.edu/research/>

[BACK TO TOP](#)

