



DIGITAL PRINTING 5.0

BEST PRACTICES FOR DIGITAL FINISHING



A NAPCO Research Study and White Paper
Sponsored by Canon U. S. A., Inc.

Best Practices for Digital Finishing

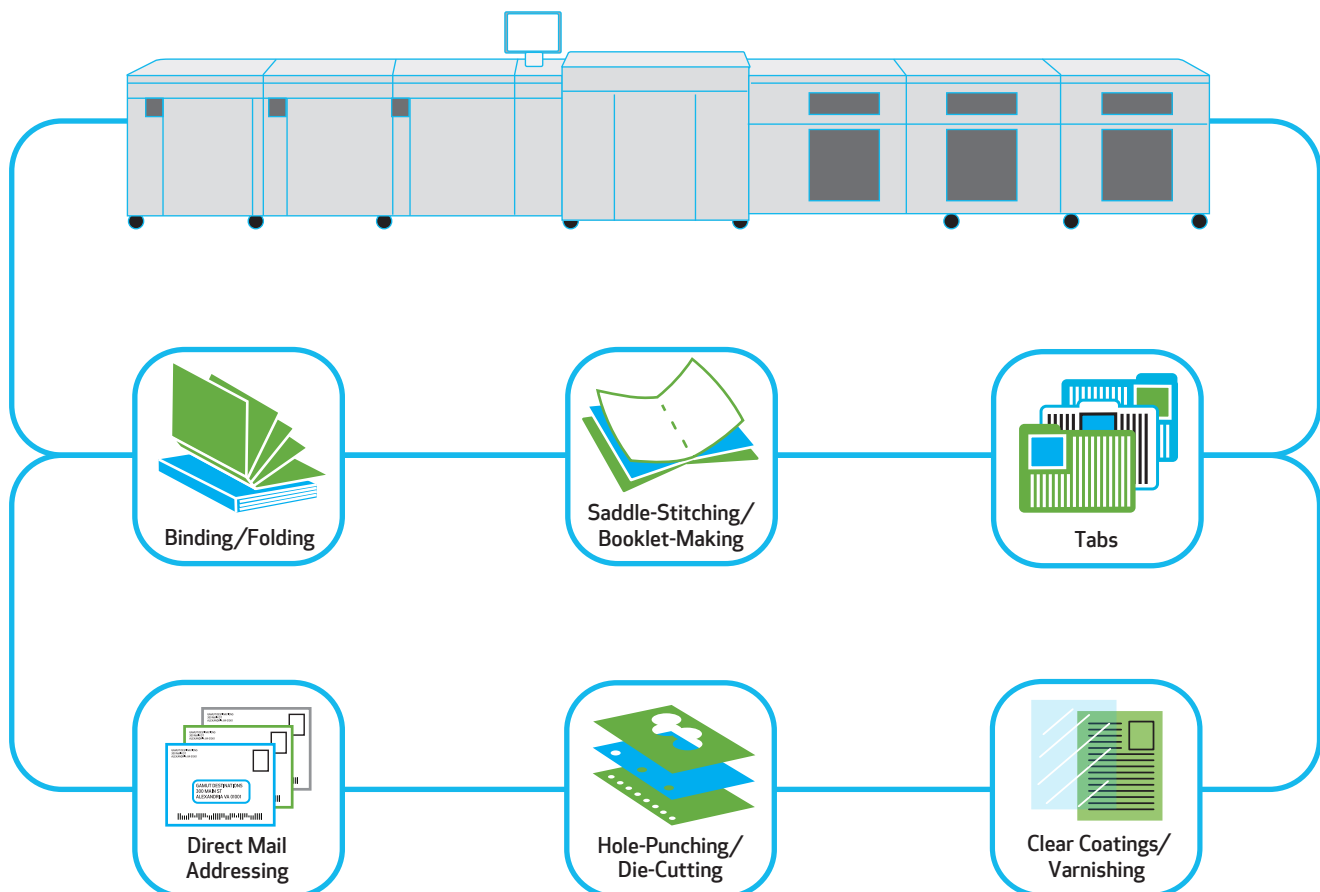
Advances in digital printing presses are prompting many commercial printers and in-plants to invest in finishing equipment to help capture significant productivity improvements, reduce costs, and expand product offerings. Once regarded as an afterthought and production bottleneck, print finishing is now considered a critical stage in print production and a way to differentiate products and create added value.

In the early days of digital presses, print providers didn't have many finishing options. This is not the case today, as printers can select from a variety of digital-print friendly postpress capabilities to meet many requirements. Innovations in finishing technology are expanding production capabilities and possibilities and helping to usher in a new printing phase:

Digital Printing 5.0.

Digital Printing 5.0

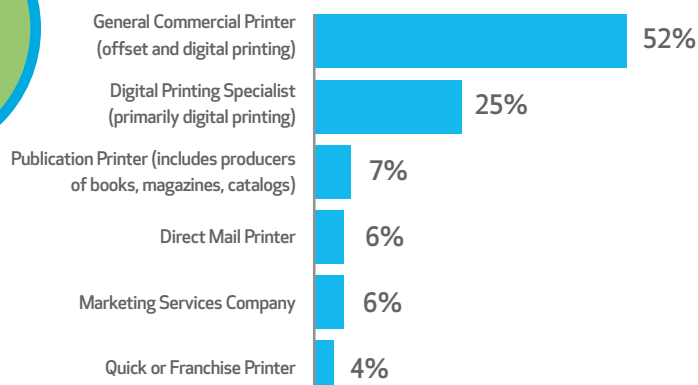
Innovations in Finishing Technologies are Expanding Production Capabilities.



A new NAPCO Research* study and white paper, sponsored by Canon U. S. A., Inc., offers insights on how print service providers (PSPs) are leveraging digital printing to boost efficiency, better serve customers, and output print products once considered not possible on digital devices. The study, *Digital Printing 5.0*, surveyed 233 commercial printers and 174 in-plants to uncover key and evolving trends that are advancing the use of digital printing. Figures 1 and 2 describe the types of printers participating in this study.

Figure 1
Commercial
Printer
Respondent
Base

Primary Business

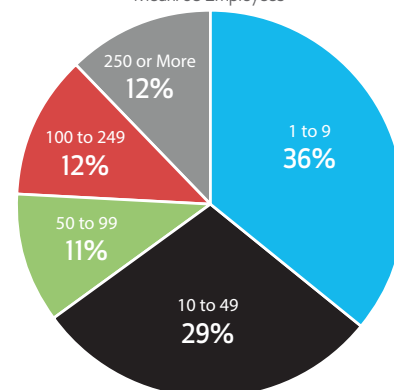


Q. Which category best describes your company's business? Single response.
N = 233 Commercial Printers

Source: Digital Printing 5.0 NAPCO Research 2019

Number of Employees

Mean: 68 Employees



Q. How many employees work at your company or in-plant?
N = 233 Commercial Printers

Figure 2
In-Plant
Respondent
Base

Operating Model

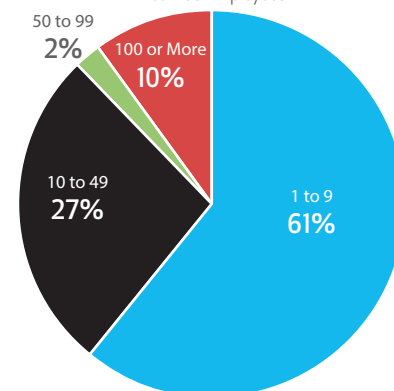


Q. Which of the following describes your in-plant operation?
N = 174 In-Plants

Source: Digital Printing 5.0 NAPCO Research 2019

Number of Employees

Mean: 33 Employees

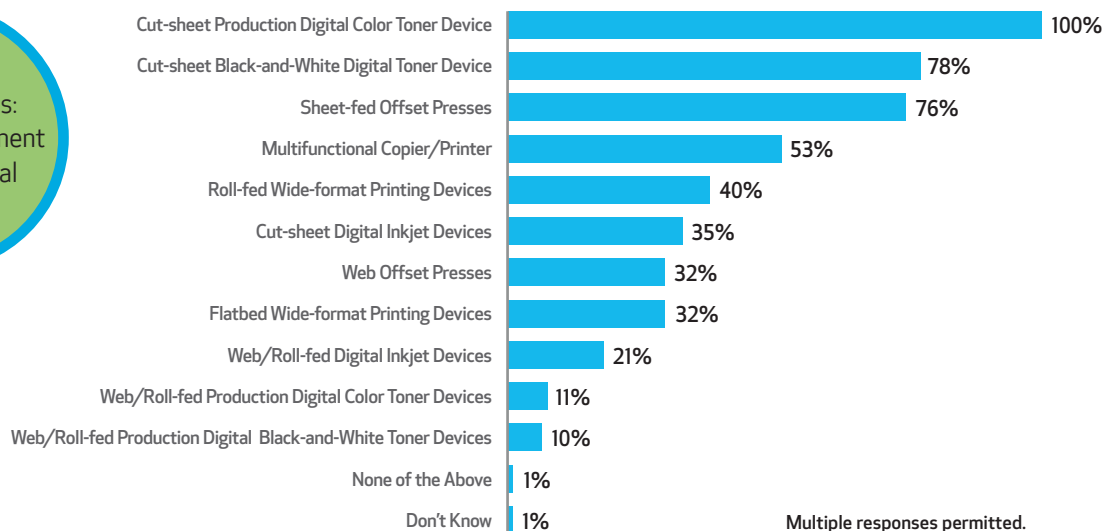


Q. How many employees work at your company or in-plant?
N = 174 In-Plants

*A unit of NAPCO Media, the parent company of Printing Impressions and In-Plant Impressions.

NAPCO Research's study found that digital printing is firmly entrenched in both the commercial print and in-plant segments. When asked to identify the types of printing equipment in their operations, nearly all respondents report they operate digital devices. All commercial printer survey respondents report owning at least one digital cut-sheet production color toner device, while 35% own some type of cut-sheet color inkjet device (Figure 3).

Figure 3
Digital Presses:
Essential Equipment
for Commercial
Printers

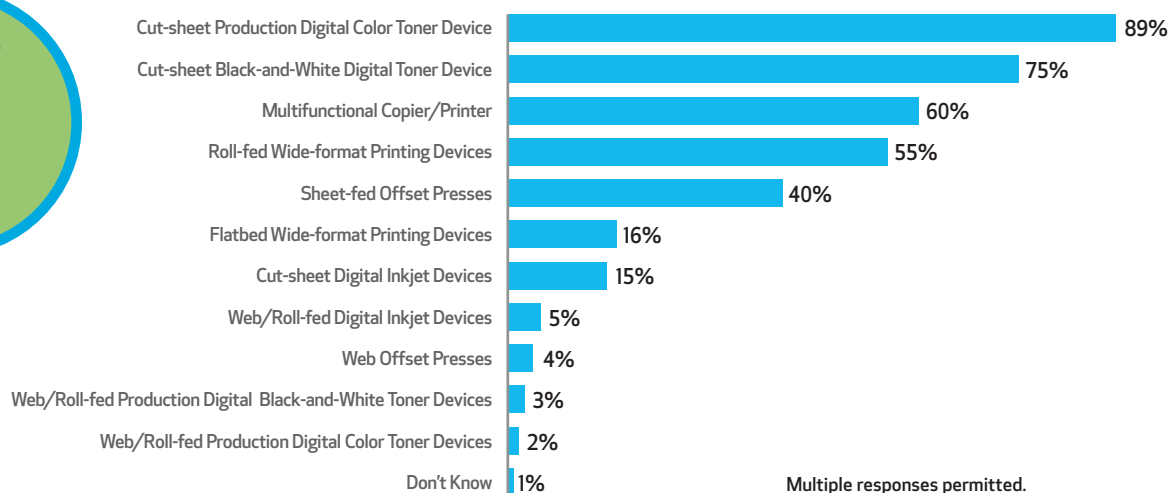


Q. Which of the following printing equipment do you use in your operation?
N = 233 Commercial Printers

Source: Digital Printing 5.0 NAPCO Research 2019

In-plants were one of the first print segments to embrace digital production printing. According to the survey, 89% of respondents operate at least one digital cut-sheet production color toner device, and 75% have a monochrome toner device. Inkjet, on the other hand, has not yet made headway into the in-plant market; only 15% of the respondents have a sheet-fed production inkjet device, and 5% have a web/roll-fed production inkjet press. (Figure 4).

Figure 4
In-Plants
Powered
by Digital
Devices



Q. Which of the following printing equipment do you use in your operation?
N = 157 In-Plants

Source: Digital Printing 5.0 NAPCO Research 2019

As the migration to digital printing continues and the share of work printed on digital presses increases, many print providers recognize that their conventional finishing equipment isn't ideally suited to digital formats and quantities.

Digital printing is changing manufacturing options and meeting customer demands for faster turnaround times, shorter print runs to reduce obsolescence, and increasing job frequency. The ability to affordably print more versions or materials personalized to individual recipients is increasingly important in strengthening print in today's digital media landscape.

Printers are installing digital presses along with new in-line and near-line finishing devices to improve cost efficiency, streamline shorter-run print production workflows, and implement variable-data custom applications.

The growth in digital printing is linked to an array of technological innovations that can result in faster speeds, longer run capabilities, larger formats, improved and expanded ink sets, greater substrate flexibility, more digital finishing options, wider color gamuts, and the ability to create eye-catching special effects that enable pieces to stand out and help drive business.

As a result, many operations are evaluating more automated digital finishing systems to address new requirements. For example, digital printing of both static and variably printed jobs is becoming the norm in many plants. As a result, there's little tolerance for spoilage and rework as a result of finishing mistakes.

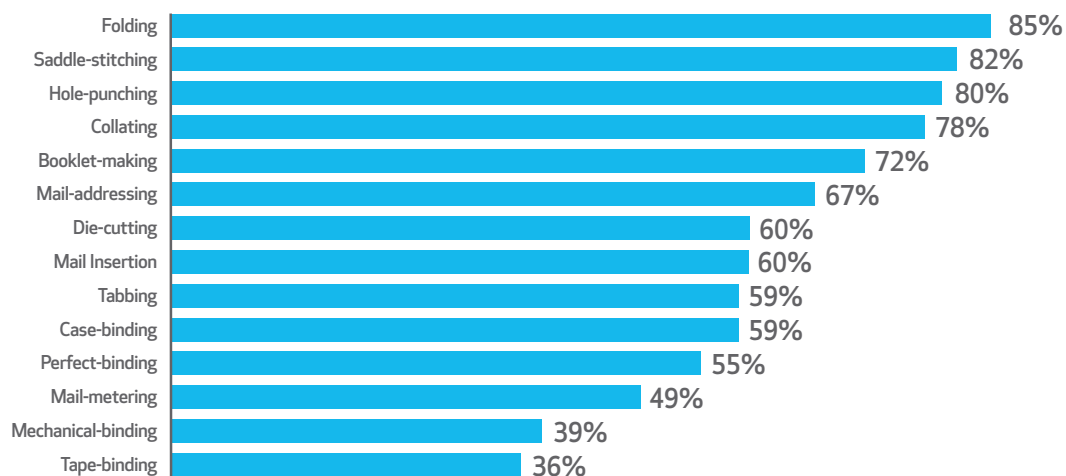
Another digital press innovation influencing finishing is production speed. High-speed printing devices need to be paired with finishing processes that can keep up. Matching the productivity of finishing devices to press output results in maximum output efficiency and higher profit margins.

Enhancing Value and Profitability with Finishing

As most printing requires some type of finishing, all respondents offer some type of finishing services to customers. Finishing can also be a value-added service that helps print providers to boost profits, enhance print value, and stand out from the competition. In a world of shorter runs, product customization, faster time to market, shrinking margins, and competitive pricing, successful printing operations are looking for ways to improve efficiency and differentiate their product offerings. Innovations in finishing hardware and software are prompting print providers to enhance their offerings with more automated and/or high-value print embellishment finishing solutions.

Respondents to the survey report providing many finishing options for digitally printed work. Popular services offered to digital printing customers include folding, saddle-stitching, hole-punching, collating, and booklet-making. Commercial printers report offering many finishing options to their digital printing customers, with more than three-quarters offering folding, saddle-stitching, hole-punching, and collating (Figure 5).

Figure 5
Commercial
Printers — Digital
Printing Finishing
Services

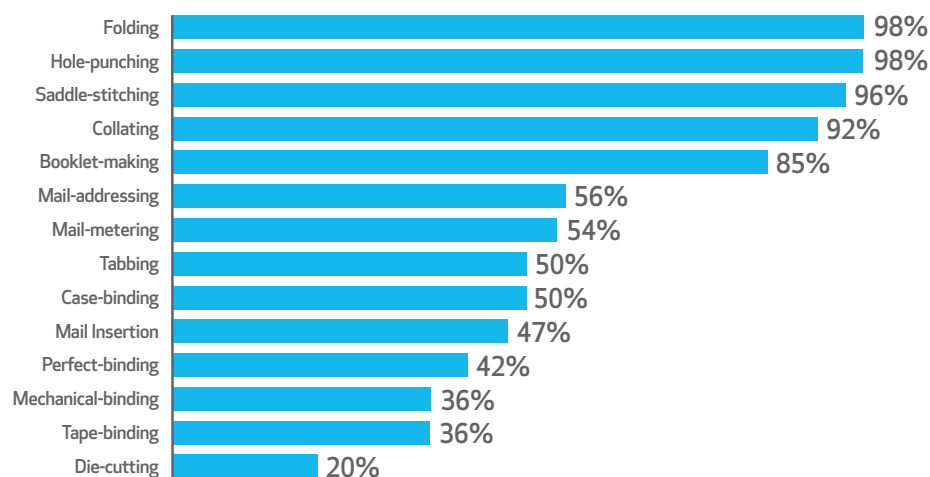


Q. Does your operation offer the following finishing processes to your digital printing customers?
N = 176 PSPs

Source: Digital Printing 5.0 NAPCO Research 2019

In-plant respondents also report a high incidence of offering folding, hole-punching, saddle-stitching, collating, and booklet-making (Figure 6).

Figure 6
In-Plants —
Digital Printing
Finishing
Services



Q. Does your operation offer the following finishing processes to your digital printing customers?
N = 118 In-Plants

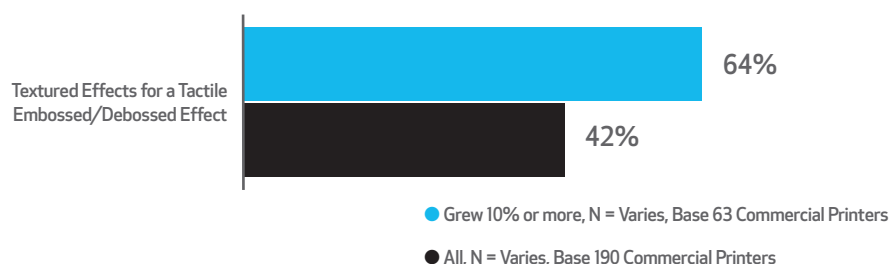
Source: Digital Printing 5.0 NAPCO Research 2019

Another area adding value to digital output is unique finishing options like foiling, embossing, textures, special coatings, and overprinting. Many of these value-add techniques and processes that print buyers covet are applied via finishing equipment. A key part of the research focused on print providers' use of techniques to enhance the value of digital printing and better understand the utilization and challenges associated with these print applications. Many printers are looking for new value-add print applications to help boost their profit margins and differentiate their offerings. As a result, there's a growing interest in incorporating special effects/techniques that enhance visual appeal.

A number of today's commercially available digital printing devices and finishing solutions support the printing of special effects and embellishments to enhance digital output. These imaging capabilities can help transform printed materials from commodity, price-sensitive offerings to higher-value products that command a premium.

Survey respondents report these offerings are supporting sales growth and charging higher prices for enhanced printing. An interesting research finding is that commercial printer respondents reporting double-digit sales growth charge higher premiums for print enhancements (Figure 7). Commercial printers report charging the most for textured effects for tactile embossed/debossed effects, with respondents offering these services saying they can get, on average, a 42% price premium. Firms reporting double-digit sales growth, however, are commanding a 64% premium.

Figure 7
Premiums
Commercial Printers
Charge for Print
Enhancements

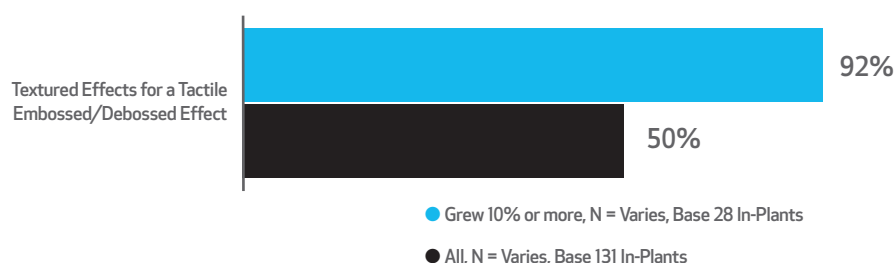


Q. Compared with digital CMYK-only printing, how much of a premium or percentage increase can you charge for print enhancement beyond standard four color?

Source: Digital Printing 5.0 NAPCO Research 2019

In-plant respondents also report reaping benefits from offer printing enhancements. High-growth in-plant respondents report greater use of special effects on their digitally printed output. Similar to commercial printer respondents, in-plants report capturing the highest premiums for textured effects. (Figure 8).

Figure 8
High-Growth
In-Plants Offer
Special Effects/
Techniques



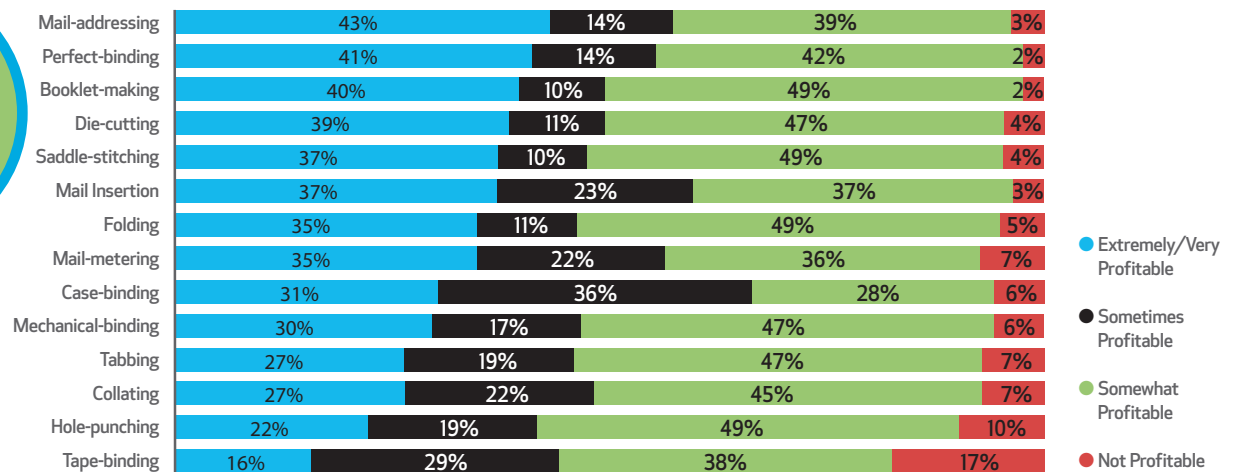
Q. Compared with digital CMYK-only printing, how much of a premium or percentage increase can you charge for print enhancement beyond standard four color?

Source: Digital Printing 5.0 NAPCO Research 2019

Profitability of Finishing Services

Respondents report finishing can be a highly profitable service to offer to digital printing customers. Commercial printers offering mail-addressing, perfect-binding, booklet-making, die-cutting, saddle-stitching, and mail insertion describe them as very profitable services. Overall, more commercial respondents than not report that the bindery services they offer are profitable (Figure 9).

Figure 9
Profitability of
Services



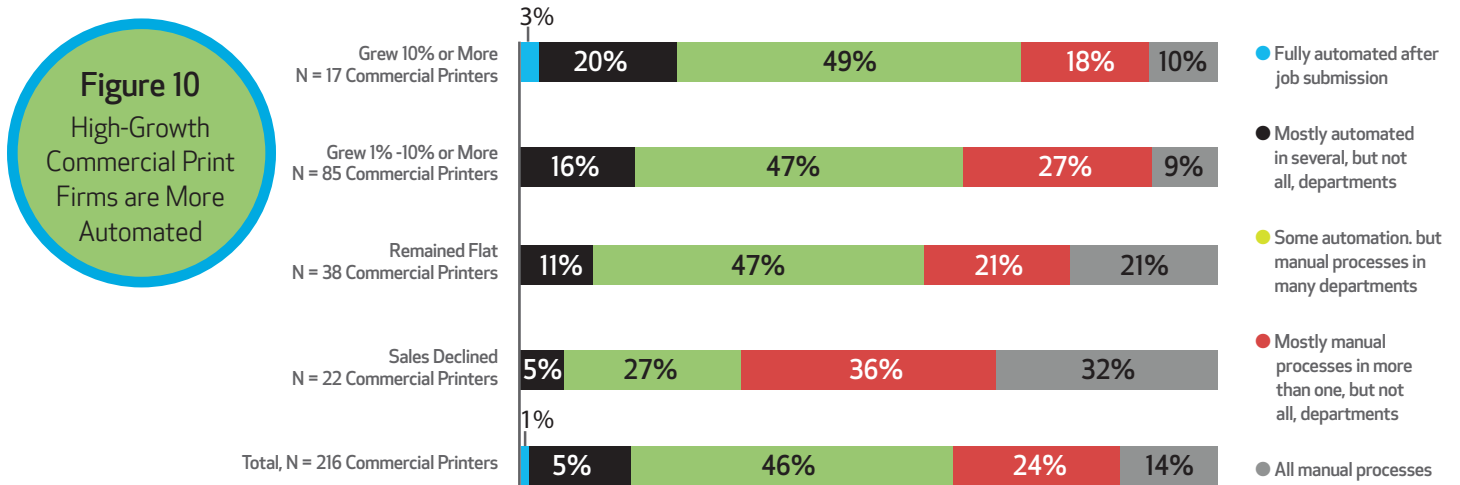
Q. Please rank the profitability of the finishing services you offer.

N = Varies, Base 166 Commercial Printers

Source: Digital Printing 5.0 NAPCO Research 2019

Successful Providers Pursue Workflow Automation

Print providers experiencing growing sales and productivity are pursuing higher levels of automation. According to the NAPCO Research survey, commercial printers reporting double-digit sales growth incorporate higher levels of automation (Figure 10). Of survey respondents reporting sales growth of 10% or more, 3% were fully automated and 20% were mostly automated. These high-sales-growth respondents report higher degrees of automation than the other respondents.



Q. What best describes your operation's level of workflow automation?

Source: Digital Printing 5.0 NAPCO Research 2019

Alternatively, commercial printer respondents reporting flat or declining sales report the highest incidence of all-manual processes.

In-plants, too, derive benefits from workflow automation. Of in-plant respondents reporting an increase of budget or revenue of 10% or more, 3% indicate they were fully automated and 17% were mostly automated.

The goal of workflow automation is to create efficiencies that lead to more capacity, lower costs, and higher profitability. As the market continues to get more competitive, margins are continuing to shrink. Print providers need to be more efficient in all areas of production, including finishing. Automation in all production areas allows shops to remove as many touch points as possible, enabling jobs to move through production faster. In addition, automation is crucial for increasing productivity and quality control, decreasing errors and bottlenecks, freeing up staff to do other work, and improving customer satisfaction.

Today's finishing equipment can be fully integrated with prepress and printing in a workflow based on relaying digital job specifications from process to process. Many devices are equipped to connect and share, set themselves up for operation, and instruct other machines how to join in the workflow. An essential objective of Digital Printing 5.0 is to enable "smart factories": manufacturing environments where zero-touch, "lights-out" production becomes routine. In-line finishing solutions are a key component to "lights-out" manufacturing, as they can enable "white-paper-in, finished-product-out" production. As the printing industry's analog-to-digital transformation continues, print providers are embracing tools to create "smart" manufacturing workflows.

Expanded Range of Substrates

Digital presses can print on a wide variety of substrates, including synthetic media, card/board stocks, envelopes, and canvas. The expansion of media options is an important factor to keep in mind when making finishing decisions. According to NAPCO Research's study, commercial printers are leveraging the expanded range of substrates available for use on their digital printing devices. Ninety percent of commercial printer respondents report printing cover weight/card stock, 73% pressure-sensitive labels, 64% envelopes, and 60% synthetic materials on their digital presses. Looking at the in-plant respondents, 98% have run cover weight/card stock, 80% pressure-sensitive labels, 53% synthetic materials, 28% static cling, and 26% magnetic materials.

Taking Action to Drive Efficiency

Finishing, or postpress, is one of the most labor-intensive stages of print production. Many tasks and processes required to finish printed pieces are time-consuming, labor-intensive, and prone to errors. When it comes to finishing, print providers are taking action to:

- Eliminate manual steps and touchpoints
- Minimize errors
- Reduce waste and cost
- Increase throughput, machine uptime, and turnaround
- Optimize labor utilization

Workflow automation is a key factor in the value finishing can deliver to digital printing. It's especially critical in jobs containing variably printed elements or multiple components — for example, book blocks with tabbed inserts and covers — that have to be brought rapidly and precisely together.

As print providers experience increases in the share of work they print digitally, they often find that their conventional finishing equipment isn't ideally suited to digital formats and quantities. Increasing pressure to turn around short runs on tight delivery schedules has many print providers pursuing new alternatives. One option they're considering for digital printing is in-line finishing.

Key Considerations in Finishing Methods

When it comes to finishing digitally printed jobs, an important consideration is either to place the finishing equipment in-line with the digital press to complete jobs in a single pass, or finish the pieces off-line. The three basic methods of finishing work printed on a digital press include:

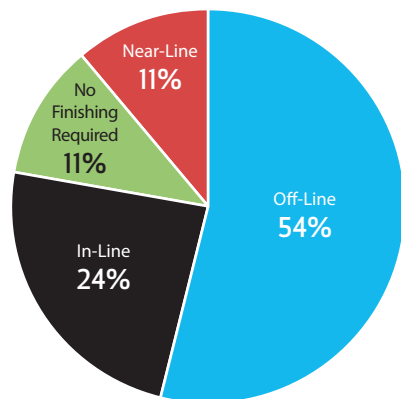
- **In-line** – The finishing equipment is attached to the digital press. A key benefit of in-line finishing is that, because the press and its finishing stations are physically linked, substrates can pass straight through from the printing engine to the postpress modules without detours or delays: “white-paper-in, finished-product-out.”
- **Near-line** – The finishing equipment is not directly connected to the printer, but there’s still some degree of communication between the two. The finishing line receives job instructions either through an electronic interface or by optical mark recognition via a bar code or other printed markings.
- **Off-line** – The finishing device is completely separate from the press, and there’s no communication between equipment. This method is suited for longer print runs and can accept work from multiple printing presses (digital or offset). Also, if there’s a problem with the printing device, finishing will remain unaffected because it’s a separate function.

Off-line Versus In-line Finishing

Commercial printer respondents report that more than half of their digital printing is finished off-line, while close to a quarter is produced in-line (Figure 11). Alternatively, in-plant respondents indicate that 41% of their digital printing is finished either in-line or off-line.

Figure 11
Digital Printing
Finishing
Methods

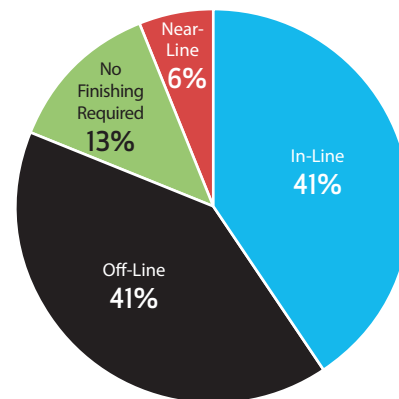
Commercial Printers



Q. What percentage of your digital printing is finished in the following ways?
N = 166 Commercial Printers

Source: Digital Printing 5.0 NAPCO Research 2019

In-Plants



Q. What percentage of your digital printing is finished in the following ways?
N = 115 In-Plants

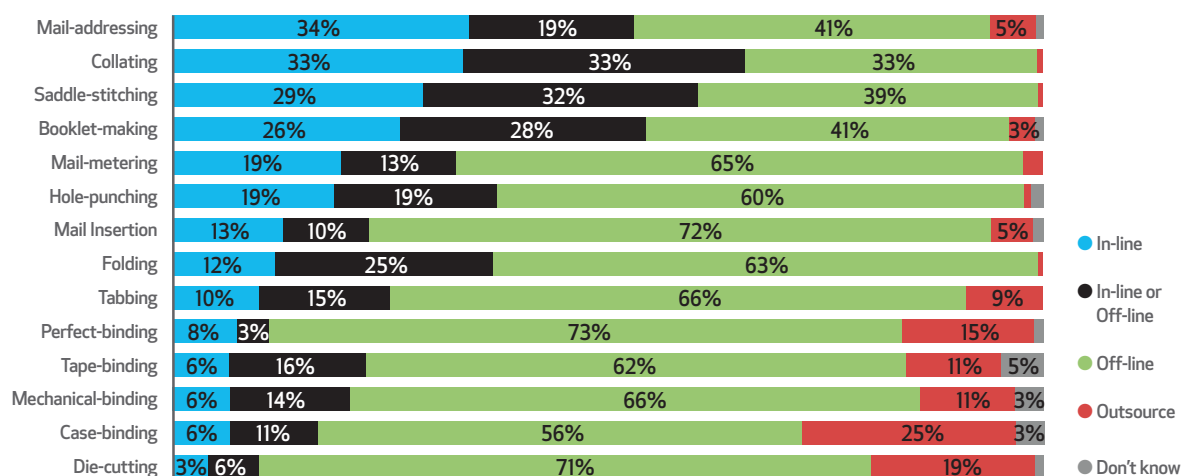
Source: Digital Printing 5.0 NAPCO Research 2019

Commercial printers' high use of off-line finishing likely reflects past investments made for offset production and established workflows. The in-plants' higher use of in-line finishing reflects that segment's early adoption of digital printing.

In-line finishing offers many benefits to digital printing. This configuration makes printing extremely small job quantities possible — even a single copy. In-line finishing can help print providers address the workflow challenges of producing smaller jobs and shrinking production times. Commercial printers may be accustomed to off-line finishing workflows, but in-line options, in some cases, may reduce costs and improve efficiency.

The research study also offers insight into how providers were producing various finishing tasks. By finishing application, commercial printers report heavy use of off-line finishing. The applications with the highest production on in-line devices were mail-addressing and collating (Figure 12). On the other hand, in-plants tend to produce more finishing applications in-line as compared to commercial printers (Figure 13). In addition, commercial printers and in-plants may use both in-line or off-line finishing for a particular service depending on the application or the equipment producing a job.

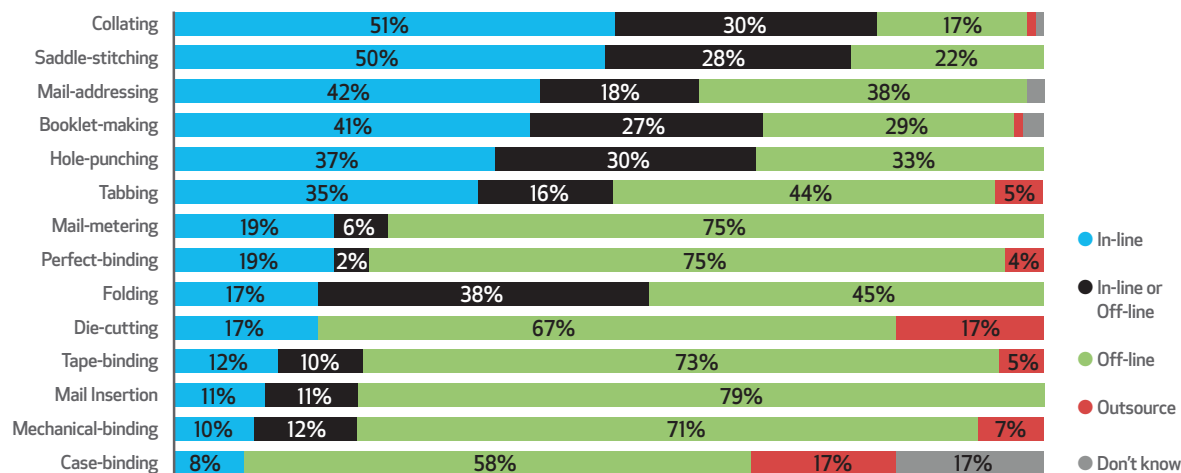
Figure 12
Commercial
Printers —
How Finishing
Services are
Produced



Q. Of the finishing services you offer, how are they produced?
N = 166 Commercial Printers

Source: Digital Printing 5.0 NAPCO Research 2019

Figure 13
In-Plant —
How Finishing
Services are
Produced



Q. Of the finishing services you offer, how are they produced?
N = Varies, Base 115 In-Plants

Source: Digital Printing 5.0 NAPCO Research 2019

In-line digital finishing is the most sophisticated of the three methods and offers many benefits to digital printing, including one-pass production. If the press and the finishing equipment are optimally matched, the paper can be finished as fast as the press can print it.

Selecting The Best Options

Each finishing method has advantages and limitations. A method that works well in one set of production circumstances may not be as efficient in a different scenario. Most finishing experts agree that the job determines the finishing workflow, not the other way around.

The right finishing options are the ones that best align with the kinds of work a printing operation most commonly produces. Short-run, personalized printing is more suited to in-line solutions while the versatility and speed of off-line finishing systems could be better suited for offset printing.

A digital press dedicated to a particular print application is an ideal candidate for in-line finishing. This scenario offers minimal setup and helps allow for more automated production.

Alternatively, if a provider's print workload requires frequent press changeovers of short-run jobs with different finishing requirements, near-line finishing may be the more efficient option. That way, the press can proceed from one job to the next, without adjustment for finishing. Another advantage is that because near-line equipment isn't tied to a single press, it can support multiple printing presses.

No matter the method, an efficient finishing process produces work with the least amount of manual intervention required. No matter what approach it takes, every operation wants finishing to be a profit center — or at least an activity in which costs are always kept firmly under control.

Conclusion

Innovations in finishing and digital printing technologies are offering print providers many opportunities and benefits to better serve customers and improve operations. Print providers have many finishing options to complement investments in digital presses. As digital printing is now an integral part of commercial and in-plant printers' printing production technology, it's time for providers to maximize those investments with the right finishing processes and leverage the benefits of Digital Printing 5.0.

About Digital Printing 5.0

Digital Printing 5.0 is a series of thought-leadership content pieces based on a NAPCO Research survey of commercial and in-house printing that was sponsored by Canon.

1. Digital Printing: Where Are We Now?
2. Beyond the Press: Defining the Infrastructure for Operational Success
3. Optimizing Color Across Print Platforms
4. The Rise of the Digital Enhancement Opportunity
5. Best Practices For Digital Finishing



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