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NEW MATH AND THE FUTURE OF THE 40-INCH PRESS

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Another White Paper in a series from the manroland, Inc. Print Technology Center

The printing business always has been highly competitive, with constant price pressures and low margins; never more so than nowadays.

Yet for decades, presses in the 36- to 43-inch range (“the 40-inch press” for purposes of this discussion) have answered the challenge, becoming dominant players as the bread-and-butter machines for a host of print operations. Today more than 3000 of them in North America alone go through 30,000-plus makereadies a day, churning out over 300 million impressions or the equivalent of nearly 3 billion 8-1/2” x 11” pages in a single 24-hour period.

But one of life’s certainties is change. The 40-inch slice of the pie has steadily eroded on virtually all fronts. Smaller machines keep grabbing business. Large format presses are eating away, too. Digital printing has achieved quality and speed levels sufficient to pull away work that traditionally was solidly in the 40-inch commercial sheetfed offset print-production column.

Shorter run lengths and increased demands for customized, variable data output also play roles in the production shift, trends that are predicted to continue.

The 40-inch press could be considered to have reached a mid-life crisis. Is the 40-inch press your ticket to the future? Could it be? Should it be? Predicting the future is iffy, at best. But when it comes to business decisions, the ultimate issue is:

Payback on Capital Invested: How much? How soon?

And a related question: What (if any) new productivity and efficiency machine features could make your payback “more” and “sooner”?

In this White Paper, we will help you find viable answers as we cover:

- A bit of 40-inch press history and why it has figured so prominently in the success of so many operations
- Trends in press population, press-run lengths and their impact
- Recent advances in 40-inch press technology and what they deliver day-to-day
- Math. Numbers you can use to help you make sound investment decisions

In the future, business-as-usual will be something new. Even if popular wisdom says to stand pat, renewing your capital base with the right technology may be wiser still.

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The Next Level: could Multitasking make the numbers add up?

The venerable 40-inch sheetfed press has long been the mainstay of many-a print operation for many reasons.

It's big enough to deliver a myriad of multiple-up pieces as well as relatively large format posters, displays and such, without requiring special post-press production or ancillary large format equipment. It's fast enough to do it all in a timely fashion, cost-effectively.

The broad-scope, flexible productivity of this popular mid-width full-sized machine also made it the press on which manufacturers designed and brought to market numerous new, advanced systems.

A distinguished past, driven by automation.

During the 1980s and even more so in the 1990s, the 40-inch became the press of choice and the go-to machine for

“It outperforms everything (else) we have in our pressroom. Changing 10 plates at a time, we’ve reduced makeready time and as well as substrate waste 50 percent after only three months.”

more and more operations, due largely to leading-edge automated technology.

The resulting increases in productivity enabled more than a few shops to replace two non-automated machines with a single updated press.

Not surprisingly, automation frequently focused on shortening makeready time, including automated plate loading and much more. Digital prepress came into its own during this era — most significantly, computer-to-plate (CTP) technology — which made it possible to eliminate registration issues from stripping and platemaking. CTP also solidified the ability to create Print Production Files (PPF) which, in turn, drove development of computer-controlled inking systems, press presets and related advances that directly affected registration, color and overall quality of jobs coming off the press.

First with the latest, more often than not, was the 40-inch press, delivering quality output with fewer wasted startup sheets along with job-to-job time savings.

Even today, an updated, automated 40-inch offset machine is a highly viable production tool.

Pressure from smaller and larger offset options.

Technological advances are a nonstop reality among all press sizes and types, however. And today the 40-inch press finds a growing list of competitors reaching for and grabbing slices of its traditional print-run “pie.”

- Highly automated 13” x 18” to 14” x 20” 4-page presses offer up to 10 printing units with coating, perfecting, in-line die cutting and other value-added features.
- Likewise, 19” x 26” to 24” x 29” eight-to-12-page offerings from nearly every manufacturer provide a high degree of automation along with in-line options.

Fewer presses across-the-board

Multicolor Sheetfed Offset Presses

(Estimated North American Installed Base)

	2005	2011	Decrease (~%)
14” x 18” & under	26,235	19,675	- 6560 (25%)
up to 20” – 21”	3,235	2,585	- 650 (20%)
21” – 36”	5,310	4,510	- 800 (15%)
36” – 43” (40”)	3,510	2,985	- 525 (15%)
Large Format (> 43”)	265	225	- 40 (15%)

Sheetfed press numbers continue to decline across all size categories in a largely replacement market where one new, advanced press may replace two or three older machines. Industry experts also suggest that digital printing is a key force behind the more-rapidly eroding smaller-size sheetfed numbers.

(Source: 2006 Strategies for Management Analysis of Mail Survey Data, et al.)

Top-down pressure comes from a growing list of Large Format as well as other options, including:

- Large format sheetfed, a range of increasingly automated and flexible presses in 56-, 64-, and 73-inch sizes.
- More-efficient web presses that can match the makeready times of many current 40-inch machines.

In case you didn't notice: technology has leveled the playing field in makeready times to a considerable degree, at least partially nullifying advantages that many 40-inch presses once-upon-a-time enjoyed.

Shorter runs, more customization, more JIT.

Few in this industry would argue that the length of print runs has been dropping. While data pegs the "average" multicolor sheetfed offset run length for presses 28 inches and up at nearly 32,000 in 2005, most observers contend that the majority of 40-inch press runs today fall somewhere between 3,000 to 5,000 and 10,000.

The state of the economy is, no doubt, a contributing cause. More-often cited as the prime reason for this downward trend, however, is increased customization of print jobs. Total quantities typically remain much the same, but several runs incorporating variable data are required to complete the overall project.

The packaging industry, perhaps more than general commercial printing, has seen a significant increase in Just-In-Time (JIT) production, as marketers strive to minimize inventories and otherwise reduce costs. An up-tick in tighter targeting and customized output is a factor here, too.

Digital printing inroads.

It's no secret that customer demands for variable data as well as decreases in the length of many print runs have significantly contributed to the rise of

"This is a one-of-a-kind press. It's perfect for short-run jobs (which we do a lot) as well as the rest. We're running jobs from 150 sheets to 1 million."

digital printing. The average digital color print run in 2005 was around 1,250. (Source: *Strategies for Management Analysis of Mail Survey Data*)

With no plate-making or related tasks, higher speed and improved-quality digital machines have managed to grab a growing share of business, a trend that's virtually certain to continue.

Of course, every technology has its nuances. While there is no makeready as we know it in offset, inkjet ink must be closely tuned to substrates in order to adhere properly. This typically requires adding a pre-printer station to pre-coat or otherwise treat specific substrate media in order to achieve the necessary adhesion. Also, proper jetting of ink onto specific media by digital print heads can limit the capabilities of some digital machines.

Digital's greatest impact to date, not surprisingly, has been on the smaller-size segments of the sheetfed offset market. Some ink jet machines can turn out 2700 29-inch sheets an hour. Others can run 220 pages a minute, or about 13,000 an hour. As these and other higher-speed printers arrive, their impact within larger-size sheetfed offset segments could increase, too.

Using digital to complement and build more offset business.

Meanwhile, we're seeing more conventional printers add digital as a tool to bring in both digital and sheetfed offset business. Some printers point out that, in the eyes of many customers,

digital is the latest thing and they like the idea that it's available to them.

Some industry observers have likened this phenomenon to the suburban commuter who buys a new hybrid car and drives it to the train station and on other short hops. It's doing what he bought it for; those around him are impressed. And when it's the weekend or a family outing or a lengthy trip, out comes the high-capacity, trusty SUV and away they go.

Of course, the digital printer enables any operation to take in and deliver a variety of short-run jobs cost-effectively, which they otherwise may have to bypass.

Frequently they're marrying offset and digital work into the same saddle-stitched book or brochure and the like. Much of this involves variable, customized info, with offset-printed base sheets that contain blank pages or open areas. The sheets are then trimmed down and the variable data is run on the digital machine.

As one printer put it, "If it wasn't for our digital machines, we'd be losing offset work because most of our customers want both, and they want it all under one roof."

In short, most commercial sheetfed offset operations find themselves dealing with the new reality imposed by evolving technologies, competition in their own market area, and changing customer demands.

Regardless, the only way to effectively compete in today's marketplace with 40-inch commercial sheetfed offset is to have a *very* efficient press.

Technology drives the bus and makeready is the name of the game.

The good news is that newer 40-inch options are now available, with advanced systems and technologies that answer the call and respond to the challenge.

As noted earlier, with automated systems, makeready for almost all sheetfed presses is about the same.

What is the next level in press evolution? An advance that provides more than a mere tweak in day-to-day pressroom output?

Try multitasking.

Simultaneous performance of automated tasks, especially in the makeready process, can make a major difference. It's a difference that offers tremendous payback opportunities, a real plus any time, but even more so in today's economy and whenever you're looking at an increased number of short-run, niche-market jobs to deliver your daily bread.

Very few presses currently offer multitasking capabilities. Some do, however. Basic multitasking activity involves automated changing of all press plates at once, which could be called Multi-Plate Changing.

“Multi-Plate” vs. Multitask.

More-advanced multitasking presses, however, go one big step further. These machines not only can change 4, 6, 8 or up to 12 plates simultaneously, in just one minute, but they can also automatically wash blanket cylinders and impression cylinders at the same time.

The result is, in effect, zero-time plate changing. As soon as washing ends, your press is print-ready with a total time-savings of 7 to 10 makeready minutes on each job, every day.

Note that these numbers are for makeready on 6-color single- vs. multitask presses. If your press is 8-color, you'll save 9 to 12 minutes with multitasking. On a 10-color press, it's 11-14, and 13-16 minutes if you're running a 12-color machine.

How many makereadies do you go through during an average shift, or a typical day? Those time savings can add up fast and keep right on adding. (See graph on next page)

Turning non-productive press Downtime into production Uptime.

Press downtime — defined as anytime
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Multitask Makeready Technology: *The most advanced multitask makeready presses not only can change all print-unit plates at once, but can concurrently wash blanket cylinders and impression cylinders. Depending on the job and changeover tasks required, with a 6-color press this can save from 7 to 10-plus minutes on every single job — and another two minutes, each, if your press is 8-, 10- or 12-color.*

“This press has certainly lived up to its reputation as a high-speed makeready machine. How fast you can change plates, clean the blankets and go from straight printing to perfecting is very impressive.”

it's not producing saleable sheets — is, of course, a necessary evil. You must take time for routine maintenance and such.

Changeover from one job to the next simply doesn't happen magically in an instant. But every minute you don't spend in makeready, could be used productively in the fullest sense of the word.

One user of a new multitasking press in a short-run shop (5,000 – 500 – 2,000 – 1,000 ...) was able to increase the number of runs by more than 50%. With other fully automated single-task makeready

machines, they were doing four to five jobs per hour (5 over 5, 4 over 4 and the like) on 10-color presses. With the multitask machine, they can easily do 7-1/2 to 8 jobs an hour. When the job-ticket workflow brings the right mix, they can nearly double their output in sheets per day.

Multitasking makeready machines bring new meaning to the phrase “time is money.”

Of course, using saved press makeready time to print more jobs ultimately makes you more money.

How much? Obviously, many variables come into play. But a little simple math using the single- vs. multitask numbers you see in this White Paper and your own shop's job records will quickly give you a good idea.

Although the added production and dollar “payback” may look promising, the term “free press” only applies to news media, not equipment used to print things.

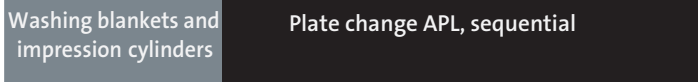
Cost-per-Hour: the latest 40-inch offerings.

How much will you need to invest in one of these multitasking marvels vs. a fully

Single-task Automation vs. Multitask Makeready (6-Color Sheetfed Offset Press)

Small Job Change

Typical Automated Press

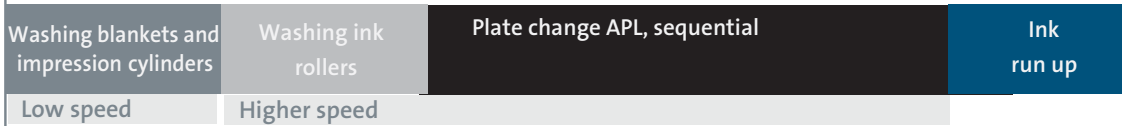


Multitask Press

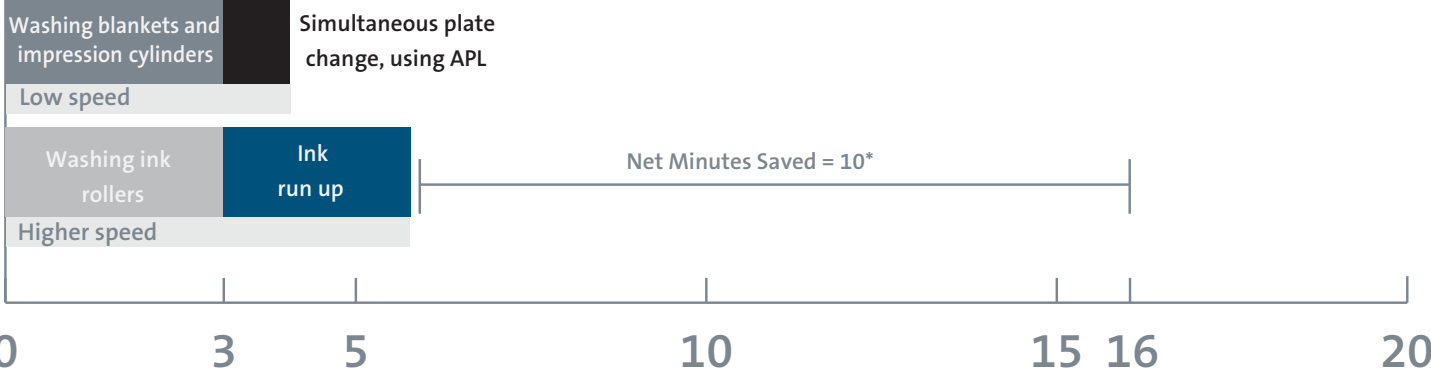


Big Job Change

Typical Automated Press



Multitask Press



SMALL JOB CHANGE (Make Ready Minutes): Running relatively routine, quick-changeover jobs, a multitasking press knocks more than two-thirds off this makeready time vs. fully automated plate loading with a modern machine that, nevertheless, can only change plates sequentially, rather than simultaneously. The typical press must handle washing chores separately, too.

* For 8-, 10- or 12-color presses, add two minutes, each.

BIG JOB CHANGE (Make Ready Minutes): The bigger the job and the more makeready you need, the more time you save with a multitasking press. How many jobs do you run in a typical shift? How about in a typical day? Multiply that by 10 minutes. How many more jobs (pending press speeds) could you run, day after day, week after week? And how many more saleable sheets could that put on skids at the end of the day?

* For 8-, 10- or 12-color presses, add two minutes, each. ** Note: Blanket/cylinder wash + plate change takes only 5 min.; but ink run-up after ink-roller wash extends total minutes to 6.
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automated but single-task makeready machine? What will that mean in terms of Cost-per-Hour when you run the numbers?

You'll have to consult with the manufacturers for actual prices and related charges to get either type of press up-and-running in your shop in order to make exact calculations.

In a typical shop, the following Cost-per-Hour differences for a multitasking press are reasonably accurate:

- two shifts per day: less than 15% more
- three shifts per day: about 10% more

Combine the cost figures you come up with and the added income-generating production that you could realize and your view of a multitasking, 40-inch press will become much clearer.

Technology Bonus: on-the-fly image adjustment saves time, broadens high-speed print options.

You would expect presses such as this to come with a bevy of other automated systems and features that speed start-ups, reduce waste, detect-and-correct defects and more. They do.

The most advanced multitasking machines also include a feature that can save tons of time during a run, especially when you're printing on lighter weight, lower cost and/or higher recycle-content stocks.



On-the-Fly Image Registration Adjustment: The latest-generation multitasking 40-inch presses enable the operator to adjust image length on-the-fly from the console in seconds, which saves downtime while also allowing you to maintain high-speed production with lighter weight stocks.

As you well know, particularly when running at high speeds, stretching can occur and distort the image. With most presses, this costs you big in two ways.

- Downtime: You need to stop the press, go to the problem unit (hopefully, just one), roll the cylinder, loosen the blanket, pull out packing behind the blanket cylinder and more on the plate cylinder, and add less packing. You know the drill all too well.

It can take 5-10 minutes per affected print unit. You could easily spend as much time adjusting a couple of them as

it takes for the whole makeready process. And don't forget the wasted sheets.

- Slow-speed production: While your press could cruise at 15,000 sph, these image issues often force you to run at, say, 12,000 sph in order to prevent it from recurring. Gone is that high-speed press-power you paid for, and your hourly output has been cut by 20% or more.

But not with new-generation multitasking 40-inch presses. The operator can adjust image length on-the-fly from the console in seconds on each print unit, independently. Longer

Turning Minutes into Money

Single-Task vs. Multitask Makeready (6-Color Sheetfed Offset Press)

	Net Minutes Saved		Press Speed 15,000 sph Sheets/Minute	=	Extra Production Available (Additional Sheets)		Jobs/Day
SMALL JOB	10 min. – 3 min. = 7 min.*	X	250	=	1750	X	(?)
BIG JOB	16 min. – 6 min. = 10 min.*	X	250	=	2500	X	(?)

Whether or not most of your makereadies require ink-roller washing, net time-savings with a multitask press can quickly translate into more sheets printed. Factor-in your own daily job data, plus the total number of days per month or year, and you may discover far more potential capacity than you imagined.

* For 8-, 10- or 12-color presses, add two minutes, each.

“The way this machine handles sheet distortion is a huge advantage. If my high speed press is running recycled stocks or lighter-than-80 lb. text, the sheets sometimes distort above 14,000 sph, causing registration problems. To minimize this, you have to drop below 12,000 — so your ‘high speed’ is lost. But the multitask press lets the operator adjust speed on individual units from the console, even at 15,000 sph and up, to bring the register back in.”

or shorter, whatever it takes to get that image back in-register. There is no need to stop or even slow down.

In addition to this automated adjustment magic from the operator console, some presses are engineered with a dual drive system that eliminates backlash from gears when speeding up or slowing down the press, further ensuring precise circumferential registration, nonstop.

Payback on Capital Invested: Do the numbers add up for a 40-inch multitasking press?

With multitasking, the 40-inch press regains its pole position as the advanced-

technology leader. More importantly, it offers very real and significant efficiency and productivity advantages that will benefit print operations now and for years to come.

Overall ROI involves more than makeready minutes saved or additional sheets printed, even more than the cost of a new press for your shop. Consider, for example:

Some in the industry have long alleged over-capacity and the glut of 40-inch presses. As economic pressures mount and the number of print operations as well as offset machines declines, another new reality comes into play.

“It can remove six plates, hang six plates, wash six blankets and make the first pull in about 3 minutes. With short runs becoming the norm, controlling makeready time is critical to the profitability of any commercial printer.”

Positioning your shop to not only take on more business, but to deliver for current as well as new customers at an advanced level of speed and efficiency could pay dividends beyond the norm.

In any case, there’s never been a better time to take a closer look and do a little pencil-pushing. So go ahead; apply new multitask math to your operation.

Chances are, it will show that a new-generation multitasking press could provide a significantly more productive, efficient future for your shop. A more profitable future as well.

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Multitasking 40-inch Commercial Offset Press makes Guinness Book of World Records

As of May 27, 2009, there is an official “World’s Fastest Makeready Press” in the Guinness Book of World Records.

On May 26 -27, at Rosler Druck GmbH, Schorndorf, Germany, a 6-color multitasking press with double coating system completed 169 1000-sheet runs — 169 form changes (676 plates) — within a single 24-hour period.

That’s seven such jobs per hour, or one every 8-1/2 minutes, complete with printing, plate changing, washing and the works.

Observers emphasize the record was set by and in a print shop. Unlike demonstrations frequently seen at trade shows or other venues, these were all different, actual jobs that had been done for customers with substrate, ink and

other variables from one run to the next.

According to the KLR (cost accounting and results) of the German Print and Media Association (bvdM), up to 60% of conventional makeready time can be saved with this type of multitasking press vs. the average press.

And 169,000 printed sheets at the end of one day is, to say the least, quite respectable.

The Print Technology Center



Located at manroland U.S. headquarters in Westmont, Illinois, the Print Technology Center serves as a focal point for addressing customer-specific as well as industry issues. At any given time, a combination of press owners and operators, industry experts, engineers, field sales and technical specialists may be exchanging viewpoints along with data and information, while advancing new ideas and practical recommendations for meeting both current and perceived future challenges.

On-site presses may be used to test and/or verify concepts and suggestions. The Center also functions as a demo site, frequented by prospective and current customers.

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