

COLOR WORKS

D'Andrea

Color

A PRACTICAL GUIDE

Works

TO BUSINESS DESKTOP COLOR

TOM D'ANDREA

Lexmark International, Inc.

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A PRACTICAL GUIDE TO BUSINESS DESKTOP COLOR

LEXMARKTM

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Introduction

Color is one of the most powerful motivators available.

Color attracts attention, commands respect, clarifies details, increases comprehension and – in doing so – adds value to all types of print communications.

Until recently, however, color was impractical to use in everyday communications. Color was too expensive and too hard to use for anything other than formal communications – typically those printed in large quantities by commercial printers.

How times have changed. Desktop color is now readily available. Desktop laser and inkjet printers permit you to put the tremendous communicating power of color to work in a wide variety of documents produced in

small quantities using your personal computer. Never before has it been so easy for so many businesses to take advantage of the power of color in so many ways.

Making the most of color

Color must be used appropriately, and that's where this book comes in. Color is not a substitute for design. It must be used purposefully and with restraint.

This book describes some of the ways you can put desktop color to work enhancing your everyday communications. It contains numerous tips and techniques describing where to use desktop color and how to use it most effectively and efficiently.



What's Inside

COLOR WORKS is divided into three sections:

Section One shows typical applications of color and the emergence of practical, efficient desktop color in everyday business. This section describes how color can help you make more money by attracting attention, increasing the effectiveness of your print communications and enhancing your firm's image. This section also describes how color can help your firm increase productivity by eliminating waste and reducing errors.

Section Two contains specific tips that will help you make the most of desktop color by using it as effectively as possible.

Section Three describes how to work most efficiently with color and how to choose the right desktop color technology and printer model. A few simple techniques can greatly reduce your operating costs.



Section 1: The power of color





Exploring the potential of color

Color is one of the most powerful communication tools at your disposal – it can improve your sales and save you money.

Color can contribute to your bottom line by increasing the effectiveness of your print communications – helping your business sell more effectively. Now, with the availability of desktop color, the power of color can be added to a variety of your external communications, not just those printed in large quantities by commercial printers. Internally, color can reduce costs and improve organizational efficiency by reducing errors and speeding the analysis of complex information.

Following are some of the ways desktop color can add value to your external and internal communications – especially “everyday” documents printed in small quan-





A black and white mailing blends in with the rest of the mail in the recipient's mailbox. The same mailing in color attracts immediate attention, even though addressing and mailing costs are the same.

tities using departmental desktop computers and printers. Let's start by looking at some of the ways color can enhance the value of your external communications.

Understanding color's ability to sell

Color sells because it communicates better than black and white. Color information:

- Attracts attention
- Communicates at a glance
- Emphasizes information and increases comprehension
- Enhances your firm's image

Let's examine each of these points.

Color attracts attention

Color sells because it attracts the reader's eyes, separating your message from other messages competing for the reader's attention.

According to *Color for Impact* by Jan V. White*, the use of color increases readership up to 60 percent. Advertisements containing color are read up to 42 percent more often than the same advertisements in black and white.

Documents printed in color are immediately noticed; they attract the reader's eyes and command attention when they arrive at your customer's mailbox or desk. While a black and white postcard is easily overlooked, the same message in color draws immediate attention.

Likewise, color mailing labels shout "read me first!"



Mailing labels printed in color command immediate attention.

* Jan V. White, *Color for Impact*, Strathmoor Press 1996



Color communicates at a glance

Color sells because it communicates information up to 70 percent faster than black and white.

Color operates on a perceptual level. It immediately communicates its message to the brain – rather than requiring conscious reading and analysis. At a conference or trade show, for example, even a glance at a color-coded nametag helps readers quickly understand information like “who is this person?” and “what events are they entitled to attend?”

Color emphasizes information and improves comprehension

Color helps readers understand your message better by clarifying information, making it easy for readers to locate important information. Color helps separate the important from the unimportant. Words highlighted in color stand out as significant. Business graphics “pop” when memos contain charts and graphs printed in color.

A quick glance at color codes on nametags will be enough to categorize the individuals wearing them.



Color helps your customers quickly select the product they want.

Color helps focus the reader's attention on the most important part of the message. Studies show that information communicated in color is remembered better than the same information communicated in black and white.

Color enhances your firm's image

Documents printed in color project a professional image.

Color not only enhances the communicating power of your message but also the perceived value of your message. Your firm looks more professional when you communicate in color, especially if you use the same colors in your brochures, memos, nametags, newsletters and proposals.

Understanding how color saves you money

Color can reduce expenses by making employees more efficient.

In addition to increasing the effectiveness of your external communications, color can save money internally by speeding the analysis of complex data and reducing errors. Let's look at these points.



Analyzing too much information in black and white can be overwhelming. Color helps to separate and categorize complex information.

Color simplifies complex information

Information printed in color is more quickly analyzed and understood. Different colors can “decode” complex information. Imagine how hard it would be to use a complex road map printed in black and white. Using colors to separate different types of information helps us decipher complicated information, saving valuable time and money.

Color reduces errors

Color reduces errors by making it easy for your employees to separate categories of information and by selectively emphasizing the most important information – information crucial to correct performance.

This section has looked at just a few of the ways color can help your firm make more money as well as reduce expenses.



Color waybills reduce the chance that employees will overlook important information.

The changing role of color in business

Color today is very different from yesterday's color.

Desktop color, based on the latest desktop computer and printer technology, is a revolutionary advance that makes it practical to print low-circulation, on-demand documents in color rather than reserving color for documents printed in large quantities by commercial printers. Desktop color not only leads to improved communications but significant cost savings.





Color in the 1980s

Through the mid-1980s, for all practical purposes, color was limited to high-circulation, big-budget, formal documents with long shelf lives, such as annual reports and marketing brochures. Long lead times were previously required because of typesetting and preparation of four-color separations (separate plates for each of the four process ink colors – cyan, magenta, yellow and black).

Color in the early 1990s

During the early 1990s, costs dropped but limited run color documents were still impractical.

The spread of desktop publishing software reduced production (i.e. typesetting and separation) costs, making color feasible for a broader range of documents, although it didn't reduce printing costs significantly. Accordingly, color still remained a luxury limited to rel-

actively formal, long life documents printed by commercial printers. Although some color printers designed for office use appeared, their high purchase and operating costs limited their use primarily to proofing documents before taking them to commercial printers for quantity duplication.

Color in the late 1990s

Desktop color has taken on increasing importance in the late 1990s.

Beginning in the mid-1990s, in-house, or desktop, color became increasingly practical as hardware and operating costs declined and printers became easier to use. Today, desktop color makes it practical to prepare customized short-run documents like personalized brochures, postcards, point-of-purchase materials and limited-distribution newsletters.



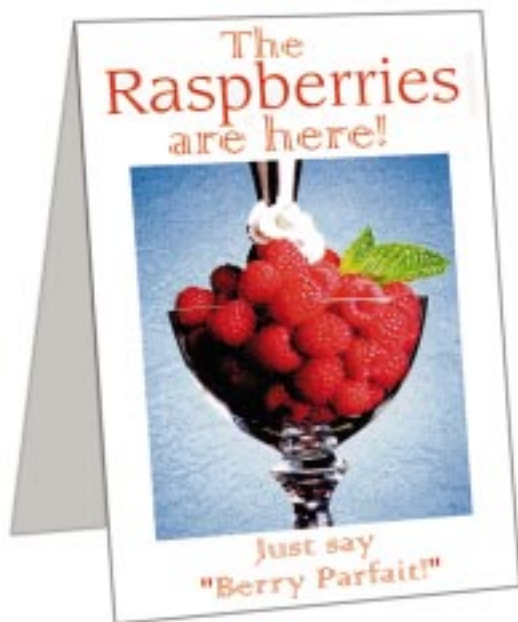
Desktop color reduces waste and obsolescence

Today, desktop color reduces costs because you can print-on-demand.



In the past, using outside printing, only large runs of documents were cost effective to print, due to the high start-up costs of printing presses. This often resulted in the waste of great amounts of money and paper, as changes in prices, procedures or marketing goals often rendered outsourced printed documents obsolete soon after they were printed.

Desktop color helps eliminate the cost and waste of conventional color by permitting you to print only as many documents as needed, only as they are needed. Brochures and price lists can be printed on-demand, rather than printed in large quantities and warehoused. Desktop color reduces storage costs and saves precious resources without sacrificing the impact of color.



Section 2:

What color can do for you





Things you can do with color

Color can increase the impact of your external documents as well as save you money internally by increasing comprehension of printed materials, reducing mistakes and document obsolescence. There's virtually no limit to the ways you can add the power of color to your internal and external documents.





Proposals take on a new importance when printed in color.

External marketing communications

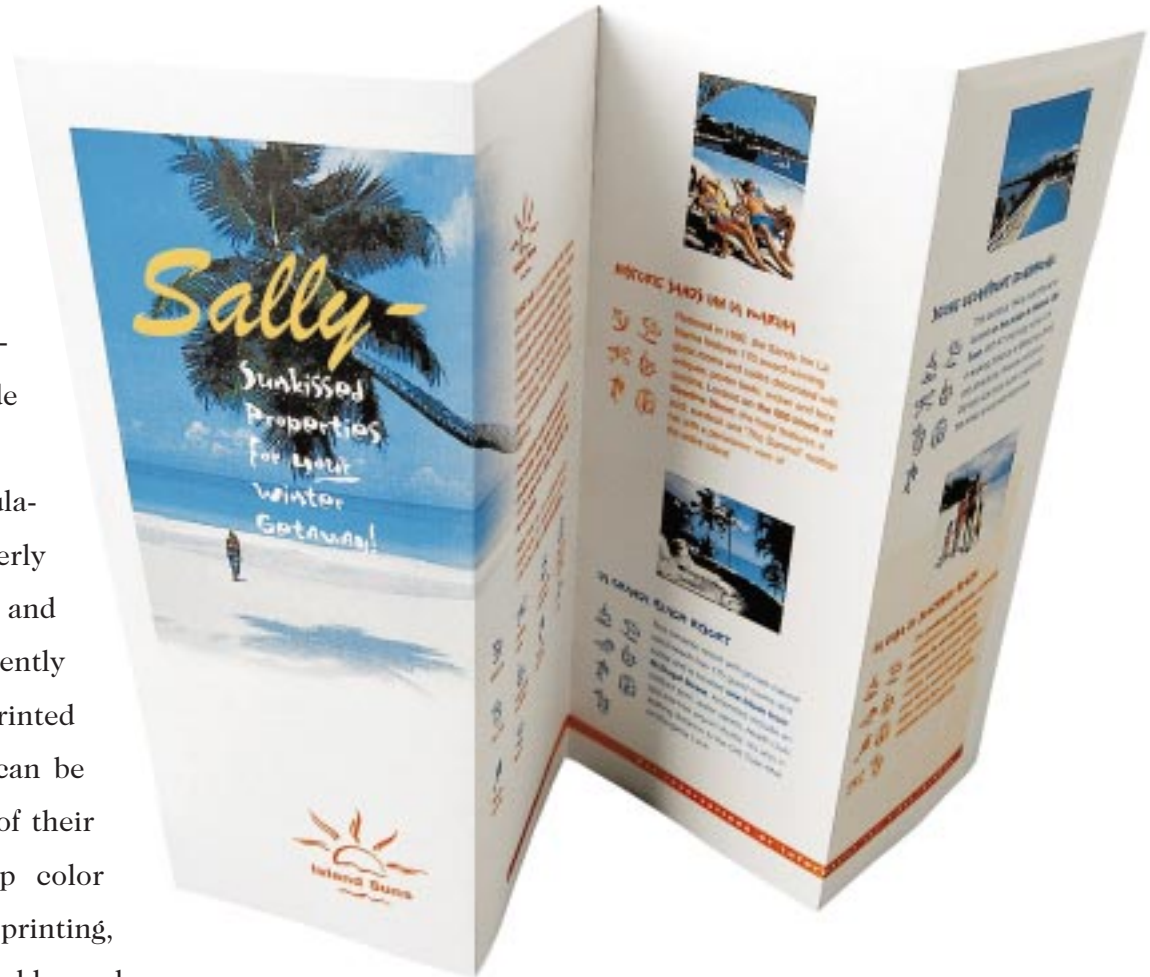
Desktop color makes possible high-impact color marketing materials that formerly had to be printed in lower-impact black and white. You can use desktop color to prepare limited-circulation documents where color would otherwise be impractical. For instance, small quantities of invitations can be printed with color, increasing response to the communication.

Proposals, which are an important opportunity to establish credibility with prospects, can be made to stand out from the pack with color. Words highlighted in color can direct the reader to your most important messages. Color graphics allow the reader to quickly and easily get and remember more of your message.

Brochures can now be customized and targeted to specific audiences – greatly enhancing their sales power. Desktop color makes it possible to produce small quantities of high-impact color brochures as needed. With small quantities now feasible, separate printings can be

completed for different target audiences – with information custom tailored to meet the needs of each group. Lead times are also shorter; you can print them just prior to distribution, allowing you to include late breaking information.

In addition, limited-circulation newsletters that formerly had to be printed in black and white, or couldn't be efficiently printed at all, can now be printed in color. These newsletters can be extremely valuable because of their timeliness. Because desktop color reduces the need for outside printing, they can literally be printed, addressed and mailed the day they are written.



Brochures gain impact when personalized with the prospect's name in color.

Color Works



Desktop computing makes it possible to print a custom “original” direct mail piece for each recipient.

Personalized External Marketing Communications

Sophisticated desktop computing combined with on-demand color printing makes it easy to customize your color communications to each recipient.

As we have seen, color can make external communications like direct mail, invitations, proposals, brochures, and newsletters more effective. Now it's easy not only to add the power of color to your communications, but also to customize your color communications to each recipient. Sophisticated software tools can enhance the effectiveness of documents by allowing you to vary the text, pictures or even the layout of each print — producing documents customized to the likes and/or needs of each recipient. The combination of this sophisticated software with color printing “on-demand” provides a powerful tool for producing highly personalized color communications.



Desktop color makes it possible to prepare customized up-to-the-minute newsletters for individual market segments.



Point-of-purchase displays can boost profits by encouraging additional spur-of-the-moment sales.

Proposals, orientation and training documents, even marketing literature can be customized with information specific to each recipient. When printed from a desktop color printer (rather than a press), each copy is an “original,” so personal information can be easily integrated into the body of the printed document. Full color documents personalized to the recipient will be read with greater respect, increasing their impact. A direct mail piece, for instance, is much more effective when printed in color and personalized to the needs of the recipient.

Instead of “one size fits all” newsletters, it is now practical to prepare newsletters focused on the interests and needs of various target markets. Desktop color makes it possible to prepare and print customized newsletters for highly-focused, special interest groups, and market niches where color newsletters would previously have been impractical.

Point-of-Purchase marketing materials

Often, your least expensive, most productive advertising is directed at people already in your place of business. Point of purchase marketing materials include “shelf-talkers” and freestanding tent-cards which can be placed next to the item on display. Color greatly increases the readership of these types of documents.

Internal communications

Desktop color also improves the power of your internal communications.

Color can also be used to enhance the impact of internal communications, helping your co-workers quickly comprehend the information they receive. You can put color to work increasing the impact and effectiveness of checklists, memos and spreadsheets.

Checklists printed in color, for example, subdivide information into meaningful categories, making it easier for readers to concentrate on one function at a time.



Memos containing color business graphics command more respect and are easier to understand.

Meeting Checklist *Sampler Inn*

Event title _____
Date _____ Time _____
Client _____
Address/phone _____
Schedule: set-up _____ end _____ tear-down _____

Seating

No. of attendees _____
Type of table: round long rectangle short rectangle
Tablecloths: green blue violet
Arrangement: classroom conference racetrack
Other _____

Media

Coordinator _____
Rental firm _____
Staging for: 35mm slides computer dry-erase board
 flip chart overhead video projector
 other none

Mood

Music: classical jazz popular
Lighting: low medium high
Centerpieces: dried flowers fresh flowers none
Compliments: pad/pens candy jars coffee/tea/trink
Other _____

Checklists printed in color are easier for employees to follow.

Color checklists reduce the chances that important steps or procedures will be overlooked, and they also project a professional image that symbolizes your firm's professionalism and attention to detail, motivating readers to do their best.

Memos are most efficient when written with short, concise wording, in order to relay information with speed and clarity. Color can be useful in highlighting the most important information in a memo, allowing readers to quickly scan the text for critical content. Charts and graphs added to the memo can make information more easily and quickly understood.

Even departmental documents like spreadsheets take on a new meaning when color is added. Color makes it easy for readers to skim a document and go directly to the most important information. In doing so, color simplifies complex information and makes it more understandable.

Corporate Assets

	Actual 1998	1Q99	2Q99	3Q99	4Q99
Assets					
Current Assets	\$452,000	\$91,495	\$295,392	\$140,025	\$393,030
Cash and equivalents	\$120,000	\$120,030	\$49,000	\$72,000	\$240,000
Accounts Receivable	\$340,000	\$250,000	\$420,000	\$372,000	\$292,043
Inventory	\$5,000	\$30,000	\$45,000	\$73,030	\$50,000
Other Assets					
Total Current Assets	\$917,000	\$491,525	\$809,392	\$377,005	\$975,073
Fixed Assets					
Land	\$150,000	\$212,500	\$175,000	\$127,500	\$150,000
Buildings	\$1,820,000	\$1,420,000	\$1,450,000	\$1,450,000	\$1,450,000
Equipment	\$400,000	\$725,000	\$725,000	\$725,000	\$725,000
Subtotal	\$2,370,000	\$2,357,500	\$2,350,000	\$2,302,500	\$2,325,000
Less Accumulated Depreciation	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
Total Fixed Assets	\$1,870,000	\$1,857,000	\$1,850,000	\$1,802,500	\$1,825,000

Desktop color can improve the communicating power of all your print communications, whether they're external marketing brochures, newsletters and proposals, or internal memos and spreadsheets.

Color helps readers quickly locate and easily understand important data.



Designing for effective use of color

You and your employees don't need professional art or graphic design training to effectively use color in your documents.

The effective use of color is based on just a few key concepts:

- Restraint
- Consistency
- Legibility
- Choosing the right colors





Instead of introducing new colors, use the same ones in different locations of your publication.

Restraint

Less is always more where color is concerned. Success comes from consistently using a few, well-chosen colors.

Instead of adding new colors to a document, try using the same colors in different places. In the Cappuccino brochure, for example, notice how only three colors are used, but are rotated between foreground and background placement on each of the three panels shown.

Color should never be used as a substitute for design integrity. Never forget that the first purpose of your document is to communicate. Color should not be used to decorate, but instead to purposefully highlight or separate information.

Restraint implies understanding your message before you work with color. It is generally a good idea to design your document first in black and white or shades of grey, then substitute colors judiciously. Unless you can separate important from unimportant parts of your message, you will be unable to use color with restraint.



Consistent use of color projects a unified look that enhances your firm's image.

Consistency

Consistency involves using the same colors over and over again. This reinforces your firm's unique "look" and sets your communications apart from that of your competitors. Consistency can be developed in your firm by creating and distributing color palettes that define the colors to be used for foreground and background in software applications.

Legibility issues

Legibility, based on foreground and background contrast, is vital to the success of color communications.

When you view a colored object, you determine its color in the context of surrounding colors. Objects may appear to wash out or change size if placed against similar colors. For these reasons, the right choice of background and foreground colors is important in assuring good legibility.

Readership drops if readers have to struggle to make out the words against their backgrounds. You can ensure adequate contrast by making sure there is sufficient difference in color between the text and the background it is set against.

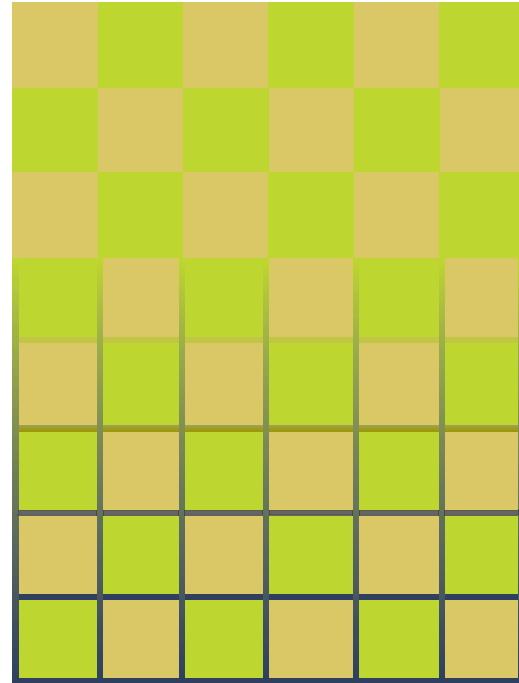
There are additional ways you can enhance text legibility. When setting text in color, you can make it easier to read by using the following techniques.

Increase the size of type set in color

Even a one point difference in type size might be enough to make type set in color appear more crisp and legible.

Increase text weight

Use a bolder or heavier typeface, that is, a typeface variation with thicker strokes.



When similar colors touch, both colors appear to wash out.

10 point type
11 point type
12 point type

A one- or two-point difference in font size can make colored type more legible.

Caslon Book
Caslon Bold
Caslon Black

Selectively-used bold and black forms of a typeface can be very effective in color.

SERIF Font
SANS SERIF Font

Notice how much more impact a word set in a sans serif typeface has than the same word set the same size in a serif typeface.

Choose a sans serif font

Serifs are those fine lines which extend from the ends of the strokes of a letter. Sans serif fonts are typefaces without those fancy lines. Sans serif fonts are typically constructed of thicker strokes than serif typefaces. In addition, the characters are usually uniform in thickness, as they lack the thick-to-thin changes in stroke width, which is characteristic of serif typefaces. This means there will be less chance that delicate characters or serifs will get lost when printed in color or against a color background.

The same tips also apply when printing text against colored backgrounds, i.e. increase the type size, increase the text weight or consider using a sans serif typeface.

Choosing the right colors

To make colors work effectively for you in your documents, it helps to know about how colors are related and how they interact with each other. Certain combinations

23rd Annual Conference of the
Sampler
ASSOCIATION
Saturday, March 9

Session One - 9am

ORIENTATION
At this informal session, you will receive information about Conference events, exhibitors and workshops. Keynote speaker: James Mills.

Session Two - 11am

THE NEW PHARMACISTS
Where will the future take us? Who will lead changes in the industry? A bold new breed of pharmacists are emerging on the scene with radical ideas.

Session Three - 1pm

SAFETY IN NUMBERS
Find out what your peers in the business are up to. Are they prescribing generics, or playing it safe and sticking with brand name drugs?

Session Four - 3pm

AWARDS DINNER
Come on out and applaud the winners of this year's top industry awards!

Sampler Inn & Conference Center
Sampler Township, Maryland

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Find out what your peers in the business are up to. Are they prescribing generics, or playing it safe and sticking with brand name drugs?

Session Four - 3pm

AWARDS CEREMONY
Come on out and applaud the winners of this year's top industry awards!

Sampler Inn & Conference Center
Sampler Township, Maryland

Insufficient foreground/background contrast makes this conference schedule visually boring and hard to read. Placing darker text against a lighter background makes it much easier to read.

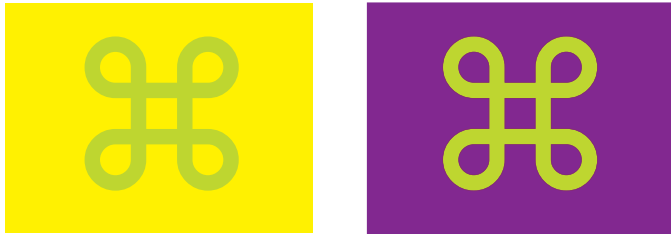
can create distractions or unexpected illusions which reduce their effectiveness.

Choosing the right background and foreground combination, for instance, is important in assuring that objects appear as intended. A corporate logo, for instance, may take on a different appearance when surrounded by different backgrounds.

Note in the illustration here, for instance, how the same object may appear to have a very different color when the background color is changed.

The color wheel is a useful tool for choosing harmonious color schemes. It separates the color spectrum into categories and shows color relationships, providing a logical formula for the color selection process. The placement of the colors in the color wheel, and the relationship between colors on the color wheel, indicates the effect that different color combinations will project.

On the color wheel, the printing primary colors are yellow, magenta and cyan; secondary mixed colors lie



Two symbols in the same color appear to be different, due to changes in the background color.

between the primaries. The color wheel progresses from warm (magenta to yellow) to cool (yellow to green and blue).

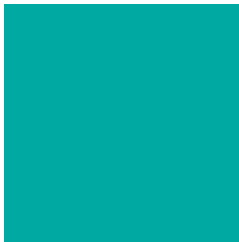
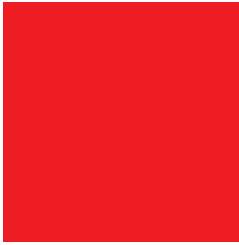
Some tips for using the color wheel

Complementary colors are those directly across from each other on the color wheel (blue and yellow, for instance). Choose complementary colors when you want maximum contrast. Avoid using equal amounts of two contrasting colors, however. Try to let one color dominate the visual area by using one for the background and one for the foreground or accent color.

Analogous colors are those adjacent to each other, separated by one segment of the color wheel (yellow and green, for instance). Analogous colors work together to create harmony. Use analogous colors to present a quiet, conservative image.



The placement of colors in the color wheel determines the image they project alone and in combination with each other.



Hot versus cool colors

Colors carry strong emotional connotations.

It's important that you choose colors that reflect your communication's goal (i.e. "warning" versus "all is well"). Different colors or color combinations can impart specific feelings or emotions. Part of this is culturally determined – in the western world we tend to respond to red as "danger" and yellow as "caution." But, there are also physiological factors involved in how we perceive individual colors and color combinations.

Colors located in the yellow and red spectrum of the color wheel are "hot" or "advancing," colors. These colors arouse excitement and appear to come forward.

Colors in the blue spectrum of the color wheel are "cool" colors which "recede." These tend to project a restful appearance and are ideal for use as backgrounds.

Greens fall in the middle and can be considered warm or cool, depending on the amount of yellow or blues contained in the green.

Shades of color

You can simplify your documents by using different shades of the same color, instead of introducing new colors.

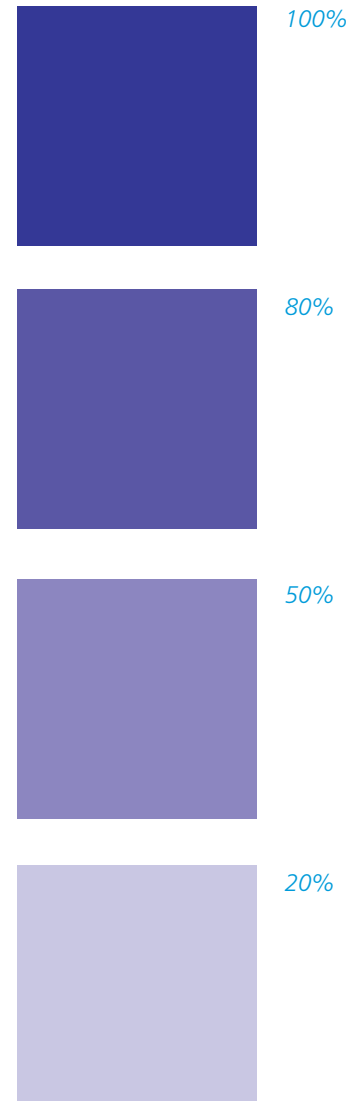
It's not necessary to always use colors at full-strength. Mixing the colors found on the color wheel with white or black lightens or darkens the colors, creating a virtually unlimited number of colors. Accordingly, instead of introducing new colors to your document, try using different shades of the same color. This can produce a “quieter,” or more sophisticated effect.

Deciding where to use color

After deciding which colors to use, the question remains, where to use colors?

Keep in mind that color is best used to:

- Apply selective emphasis
- Reduce clutter
- Establish an image
- Create unity





The title of this newsletter set in blue lacks impact.

Apply selective emphasis

Desktop color makes it easy to draw your reader's eyes to important points in your documents. There are numerous options you can choose: you can reverse text against a colored background (white characters against a dark blue background) or you can place text against a lightly shaded background (black text against a light blue background.)

Often, text reversed out of a colored background attracts more attention than text printed in color.

Reduce clutter

Color can help separate information into easily viewable sections. Using color to segment information into different categories can be a useful way to make a document easier to view. Highlight special notes in color or place a color frame around a specific group of information to separate it from the main body of your work.

Establish an image

Choose colors appropriate to the image you want to project.

Your choice of primary or secondary colors influences the image your communication projects.

Primary colors — reds, blues and yellows — project a straightforward, positive, youthful, “no-nonsense” image.

Secondary colors result from mixing the primary colors together. For example, green results from blue mixed with yellow, and purple results from mixing red with blue.

Secondary colors project a quieter, more sophisticated image. A document printed in secondary colors projects a quieter, more elegant image than the same document printed in primary colors.



The same typeface, type size and type style reversed out of a color background has more impact.



A sign printed using primary colors projects a strong message.



The same sign printed using secondary colors projects an entirely different message.

Specific colors tend to project particular images, based on both cultural and physiological influences. Use the following tips to establish an image consistent with your message.

- Red connotes passion or intensity.
- Yellow is viewed as sunny and uplifting.
- Blue feels breezy, sedate or dignified.
- Purple is associated with royalty, sophistication and whimsy.
- Green is seen as restful, fertile, suggestive of nature, but also as the shade of poison and envy.
- White conveys innocence and purity.
- Black has many associations: cold, evil, powerful, elegant and expensive.

Create unity

As discussed earlier, by using the same colors in all of your publications, you can establish and project a strong identity, one which will set your firm apart from the competition.

Alternately, you can use desktop color to “code” the various sections of your memos, proposals or newsletters. For example, instead of using randomly-chosen accent colors, you could use color to visually organize chapters into sections. You could use one color for the initial caps and graphic accents in Section One, a second color for the initial caps and graphic accents for Section Two, and a third color for the initial caps and graphic accents in Section Three.

There is virtually no limit to the ways you can put desktop color to work in your internal and external communications. When used appropriately and purposefully, color can be a powerful ingredient in improving your communications.

1	Agenda & Evaluation Form	1
2	T200 & T260r Product Overview	2
3	Product Development	3
4	Supplier Overview	4
5	IT Drive Overview	5
6	Public Relations & Advertising	6
7	Market Overview & Competitive Information	7
8	RDR Program	8
9	Royal Process/Sample/Order Preparation	9
10	Peripherals	10

Color can simplify your communications by organizing them into meaningful sections.

Achieving the best possible results

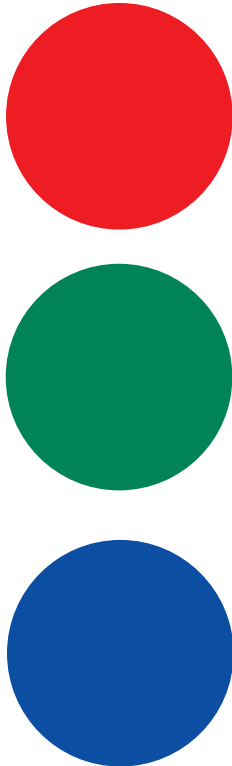
It's easy to achieve good results and work efficiently with desktop color, making the most of your printer investment and supplies cost.

The following describes some of the issues that different organizations have faced – and how they've solved them.

Viewing Conditions

Color is a perceptual phenomenon. The same colors may look different when viewed under different conditions. Factors such as room lighting or paper color can affect the perceived colors. These factors should be taken into account when assessing whether a color





Your monitor displays colors as additive RGB colors.

scheme meets your needs. Judge the document based on the type of medium on which it will be viewed - paper, monitor, overhead transparency or screen projector. Try to duplicate the expected viewing conditions, such as lighting and viewing distance.

RGB versus CMYK Color

Colors displayed on your computer screen do not always match the colors on your printed output.

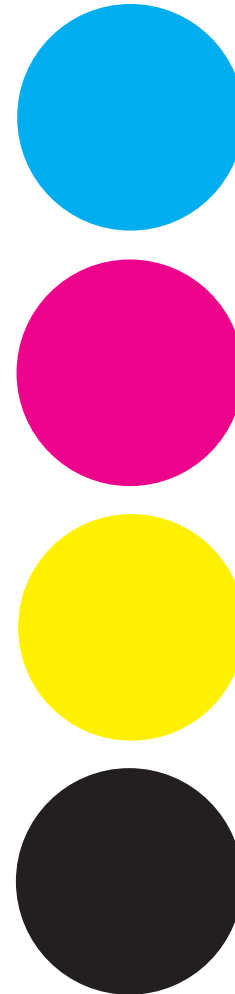
Because they use different methods for creating color, there are differences between what you see on your computer screen and the output of your color printer. In some cases they can be quite different. As a result, producing attractive printed documents involves compensating for these differences.

Color displayed on your computer monitor is created by projected or additive light. Red, Green and Blue lights (hence the term RGB) are projected in differing strengths to form various color combinations. White

results from combining Red, Green and Blue at full strength.

Printed color, however, is reflected or subtractive color. The printed inks absorb (subtract) certain colors from the visible light spectrum – what you see is actually the light which is reflected off the printed matter (paper and inks). Printed color is referred to as CMYK color because Cyan, Magenta, Yellow and black inks are used to create the colors. (In theory, Black results from printing Cyan, Magenta and Yellow at full strength. A true black ink, however, is often used to provide more solid blacks and cost savings.)

As a result of these different methods for creating color, color mismatches often occur between monitors and printers. The range of colors which can be produced on a monitor differs from that of a printer – both devices produce some colors which the other cannot. Further problems occur because computer monitors are rarely calibrated to any standard settings and their colors shift as they age.



Your color printer uses subtractive CMYK colors.

Color Management Systems

Color management systems attempt to compensate for the differences between monitors and printers.

For most business users, the monitor is the reference device for their color selections. They want printed copies to match the colors they see on-screen. Color management systems shift the printed colors in an attempt to simulate the colors on the screen. To do this, the systems work by specifying colors in terms of an objective, device-independent standard. The color management system acts as a “filter” that converts a monitor’s original color definitions into those the printer needs to produce matching output. To operate, these systems must have “profile” information on all the color input and output devices, such as the monitor, printer and scanner.

Some color management is being built into operating systems, such as Windows (ICM) and Macintosh System



7.x and later (ColorSync). Vendors of input and output devices often provide profiles of their devices for these color management systems, calibrated to meet the needs of typical business use.

For graphic design and other critical applications where more exact colors are required, there are color management systems which provide methods for users to regularly calibrate printers, monitors and scanners. Agfa FotoTune™ is an example of this type of color management system.

In order for these systems to work, it is important that users install color profiles for each input device (scanners) and each output device (printers, computer monitors). Without all the device profiles installed, the color management systems use default profile information which could be quite different from the actual devices being used. The resulting color correction could be quite disappointing.

Due to the different methods monitors and printers



use to create color, a complete monitor-to-printer match cannot be assured. However, these systems can help reduce unexpected “surprises” due to dramatic color shifts. If you are surprised by a difference in color between what you see on your monitor, and what comes out of the printer, calibrating your monitor may help. Refer to the User’s Guide that came with your Operating System or software for more information on this process.

Color Matching Systems

Color Matching Systems make it easy to print specific colors.

If you want to print a specific spot color, such as a company logo, the best way to choose colors is to choose them by number. Popular alternatives include the PANTONE® Color Systems and the Trumatch® Process Color System. These systems numerically specify colors and shades of colors. Color matching systems are intended to assure a particular color (or as close as possible) is print-

ed – they do not attempt to match screen colors to printed colors.

Some color printers allow you to print numbered charts of PANTONE or Trumatch color samples, so you can see exactly how the colors you choose will appear on the printer you are using.

Color Matching Systems are typically associated with advanced graphics design work and are rarely used in most office printing.



Section 3:

How to save money working with color





Practical issues involved in using color

Making the most of color in office settings.

Although desktop color offers your firm communicating power never before available, there are a number of practical issues you must address. Here are some concerns your firm may encounter and some suggested ways of handling them:

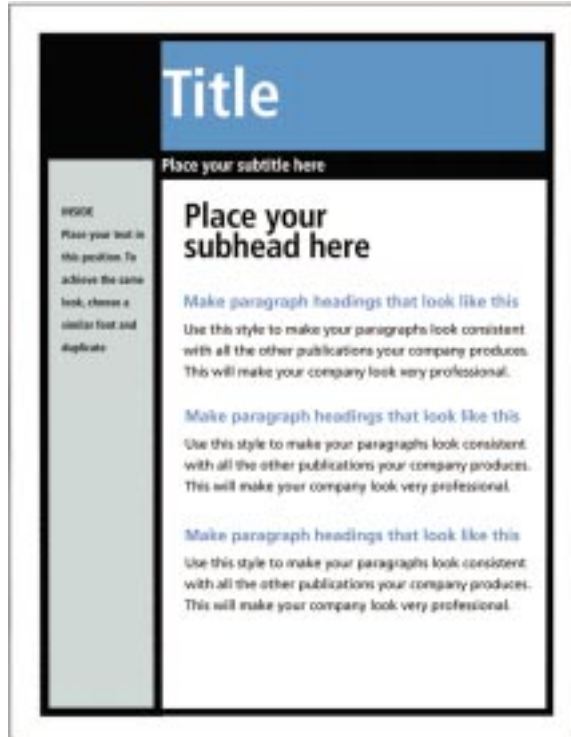
- How to avoid color chaos
- How to design documents to reduce the cost of supplies
- How to use printer software to work with color



How to avoid color chaos

Remember when desktop publishing software became available? Suddenly, everyone became an art director. Documents characterized by the over-enthusiastic use of numerous typefaces on a single page became a problem as “ransom note typography” replaced carefully created corporate identities. With color capability now widely available, the same situation can occur as users develop “color creativity.”

You can avoid color chaos by creating templates – “ready-to-complete” publication files for brochures, letterheads, mailing labels, memos, newsletter and proposals. These templates can contain palettes – or combinations of approved colors which will reinforce your corporate image. By encouraging your co-workers and staff to limit their color choices to the “approved” color palette on your approved templates, you can avoid the “everybody has their own favorite color” anarchy. Consider having these palettes issued by top management, to assure immediate and widespread use.



Templates contain not only page layouts but also color palettes with color choices used throughout your organization that reinforce your firm's corporate identity.

In addition to ensuring consistency between color documents throughout an organization, templates and palettes avoid the need to “reinvent the wheel” every time a project has to be printed. Templates also save time and money by eliminating unnecessary design work. Production efficiency and consistent results are achieved by distributing templates of frequently used documents.

How to design documents to reduce the cost of supplies

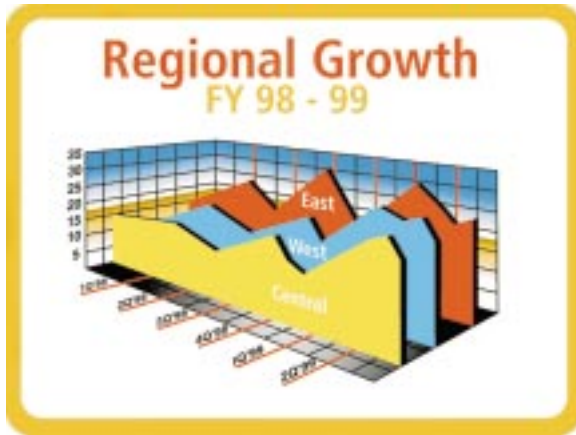
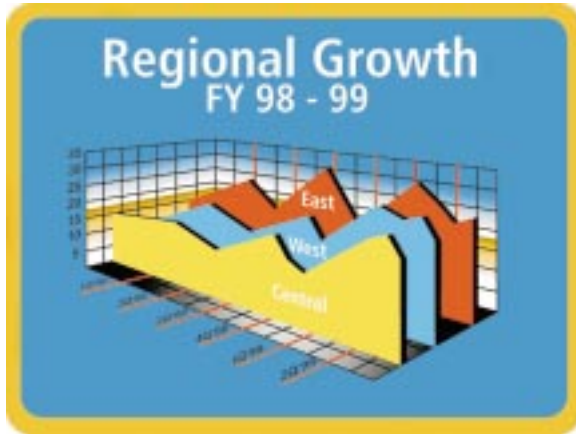
Design decisions can reduce the costs of the toner, ink and paper used in desktop color.

The way you use color in your documents has a great influence on the cost of supplies, or cost per page printed.

One of the easiest ways you can reduce supplies costs is to use less background color in your presentation and document designs. Restricting color to document high-



Templates save time and ensure that the proper colors are used in the right places each time.



Solid backgrounds increase costs, whereas simplified backgrounds reduce costs.

lights can save you significant amounts of money, while still providing the power of color.

The best way to reduce costs company-wide without sacrificing the benefits of color is to create and distribute presentation and document templates containing limited amounts of background color.

Another way of reducing costs when printing in color is to print drafts and proofs at reduced magnification. Instead of printing at actual size, reduce the image size to 75 percent of actual size. Text will still be large enough to be read, yet you can reduce supplies costs up to twenty-five percent.

How to use printer software to work with color

There are many ways today's printer software helps you print more effectively and reduce supplies costs.

To start with, the software "drivers" that come with

many printers can automatically rotate and reduce magnification size, allowing you to print more than one page on a single sheet of paper. This is called multi-up printing. For example, two letter-sized pages can be printed on a single sheet of paper without loss of legibility.

You can also print drafts of your presentation visuals and presentation audience handouts four-, six- or even sixteen-to-a-page.

Use printer naming to make it easy for users to adopt money saving practices. Today's operating systems allow you to create several different printer icons or names for the same actual printer device – each with different settings.

Memo

TO: Chamber of Commerce
FROM: Dan Sampler
DATE: Monday, January 5th, 1999
SUBJECT: An opportunity not to be missed!

We have an opportunity to work together on a project which could make a tremendous difference to our town.

Together, Mucho Dinero and you, as Chamber members, could put in place a park and wildlife refuge system that would be the envy of towns twice the size of ours.

The property that would be available for the State Matching Program is 1500 acres on the river, which was the site of the Junction

Ferry until 1970. It is largely unspoiled and is currently home to several endangered species.

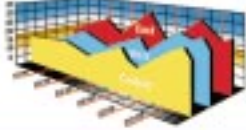
The chart below shows the percentage of available tourism dollars that could result from this program.

Category	Percentage
No park or wildlife refuge	15%
Park only	20%
Wildlife refuge only	25%
Park + wildlife refuge	40%

Please review the attached documents and call me if you have any questions.

Sincerely,
Dan Sampler
President, Mucho Dinero

Two-up printing preserves legibility while reducing toner use and saving paper.

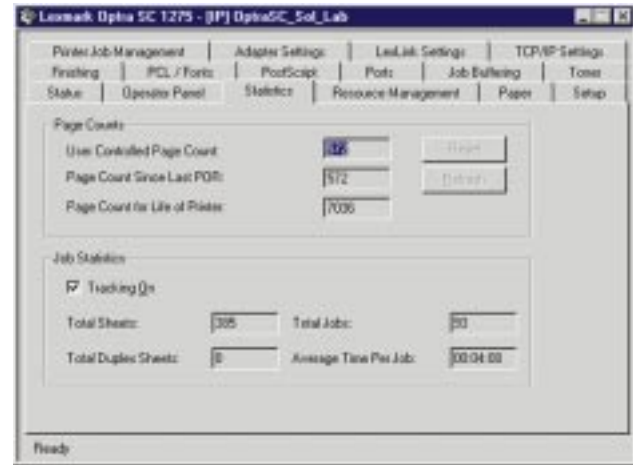
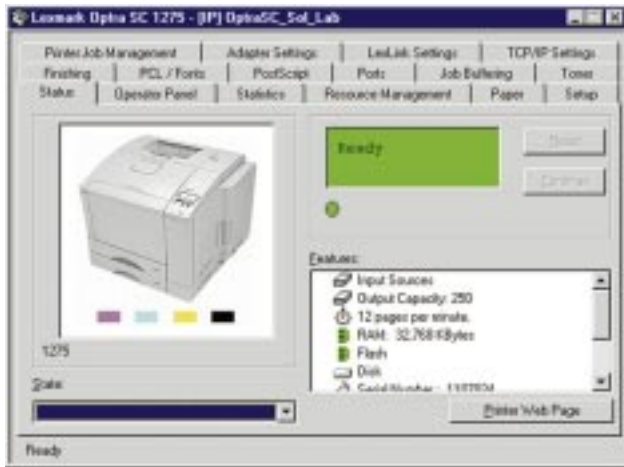
<p>Introduction</p> <p>How to save money on your color presentation printing</p>	<p>Regional Growth FY 98 - 99</p> 
<p>Design with Clear Backgrounds</p> <p>This saves toner. For instance, the following slide:</p>	<p>Print handouts 8-up</p> <p>Your handouts will be easier to read and store.</p>
<p>Regional Growth FY 98 - 99</p> 	<p>8-Up handouts look professional</p> <p>And they save both toner AND paper!</p>
<p>Uses lots of toner!</p> <p>The following slide, with its clear background is a toner-saver.</p>	<p>So, use your color printer wisely</p> <ul style="list-style-type: none">• Clear backgrounds• 8-Up handouts

Each printer icon can change how a print job is processed – by containing different set-up characteristics – so that you don’t have to make set-up choices each time you print. For instance, when you want to print two pages on a single sheet, choose the printer icon which has been pre-configured for 2-up printing. Use this “virtual” naming capability to remind employees to make use of these money saving business practices. One innovative firm even offered quarterly bonuses to employees if their department reduced printing supplies costs – then motivated them by naming the network printers such things as “Tree Eater” (the full-page virtual printer configuration) and “Quarterly Bonus” (the 4-up configuration).

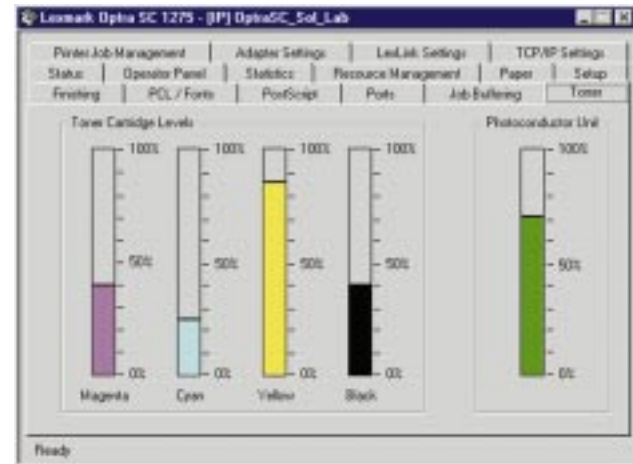
You can also often print documents in draft or “toner saver” mode which further reduces supplies requirements. In addition, most software permits you to print draft documents without graphics, reducing printing time and supplies costs.

Presentation handouts printed 8-up save money.

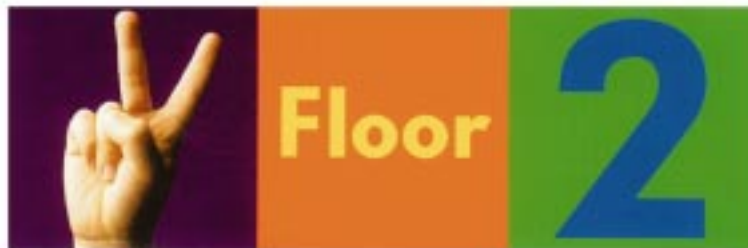
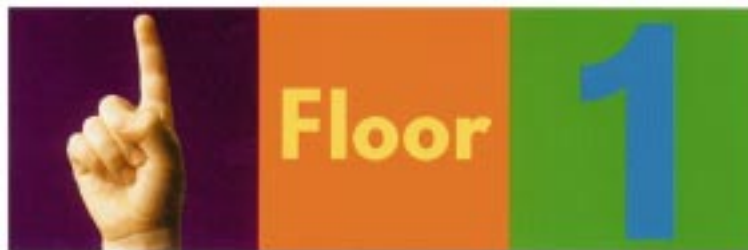
How to save money working with color



Finally, software for managing printers remotely makes it easy for organizations to monitor color printing in networked environments. This helps you keep track of the files printed on networked color printers. By monitoring color printer usage, you can ensure that color printers are used optimally and appropriately.



Printer management utilities easily track color print jobs.



Choosing the right color printer technology and model

Saving money also involves choosing the right printer technology and the printer model that matches your needs.

Successful decisions often involve balancing long-term and short-term expenses. Often, an initially higher printer investment results in greater efficiency (through faster printing speeds) and lower operating costs (toner and paper) over the life of the printer.



How technologies differ

There are several desktop color printer technologies available, including:

- Color inkjet
- Color laser
- Solid ink and thermal wax
- Dye sublimation

Color inkjet

Color inkjet printers have been around for a long time, although only recently have they begun to eclipse other forms of desktop color printing with their quality, speed and economy.

Color inkjet printers offer economical and quiet printing on a variety of media, including plain papers. Supplies costs can be surprisingly low. Recent advances in ink technology have resulted in inkjets capable of near-photographic quality. Print speeds are suitable for not only personal needs, but often for small or mid-sized workgroups.

When evaluating color inkjet printers, check for ink durability. Under some circumstances, inks will run, or spread, if they come in contact with moisture. Inkjet printer speeds vary widely depending on the printer model; make sure the model you choose can print fast enough to keep up with your printing needs. When evaluating different models, make sure that the resolution, or detail, is high on the types of media you expect to use most often. Note that some printers may produce different resolutions for color and black & white.

Color laser

Color laser printers can offer great performance and flexibility.

Color laser is the right choice for demanding applications requiring the fastest-possible *throughput* – or time it takes from the time you press “print” to the time the first sheet emerges from the printer – as well as high print quality on a wide range of media, including plain





paper and labels, postcards and nametags printed on various sizes of cardstock.

In addition to bright, vivid images, color laser printers offer excellent output for business text and graphics. Cost per page can also be significantly lower than many other technologies.

While generally priced higher than other types of office color printers, color laser printers are the ideal choice for departmental printing, where the combination of speed and quality permits them to be shared by several users. In addition, a central location makes it easier to keep track of supplies and reorder them before you run out. Many color lasers offer proactive alerts to warn when toner and paper are becoming low.

Solid ink and thermal wax

Solid ink and thermal wax printers are popular in presentation graphics applications.

Solid ink and thermal wax printers enjoyed an early popularity based on their ability to create vivid trans-

parencies. Supplies are easy to load too.

The primary disadvantage of solid ink and thermal wax printers is the waxy feel or texture on paper, particularly noticeable on plain papers. Text quality often is not as sharp as that produced by other alternatives. Because of the waxy texture, it is hard to write notations on pages printed with these technologies.

Durability is also an issue, as they can easily be scratched. Pages can stick to the glass in a copy machine, or become stuck together, especially if inadvertently left in an automobile on a hot summer day.

Speed can be an issue, especially when printing black-only pages. Many business documents, such as reports and proposals, contain a mix of black-only and color pages. Some solid ink and thermal wax printers can take more time to print one-color, or black pages than do other printer technologies – limiting their ability to meet the performance needs of many office environments.





Dye sublimation

Specialized printers are used for optimal photographic quality.

Choose dye sublimation printers when your most important criteria is photographic quality. These specialized printers are often used in graphic design departments to produce mock-ups of documents prior to going to press. Because of their slow speed and high supplies and media costs (they require special paper), dye sublimation printers are unlikely to be appropriate for general office color printing.

Choosing the right printer model

Just as each technology offers its own blend of pros and cons, individual models offer their own combinations of advantages and disadvantages.

When choosing a color printer, look beyond the basic specifications typically used to compare printers. Judge

printers based on the actual environments in which you expect them to be used – often printers which appear to have comparable speed and print quality characteristics will perform quite differently when placed in your actual work environments. Understand what capabilities are provided with the printer, and what are more expensive options. Following are some things to look for.

Print quality in your typical environment

Evaluate print samples based on what you actually expect to print. Don't judge print quality for a text/business graphics application by looking at samples of photographic output, for instance. Different printers are optimized for different types of output.

Quality output on a wide variety of media, not just special coated stocks

The broader the range of output media your printer supports, the more you can do with it (i.e. labels,



brochures, point-of-purchase signs, etc.). In addition, operating costs will be lower with printers that perform well using plain paper.



Throughput versus paper handling speed

What's most important is not the rated speed of the printer or the maximum speed at which it can print a page, but how long it actually takes the printer to receive, process, and print your job. You should test various printers using a variety of text and graphics, under conditions which simulate your actual printing environment.

The ease with which various printer models can be attached to networks

If you will be sharing your color printer among several users, evaluate the networking capabilities of each printer. Some models have built-in networking capabilities, but networking is an extra-cost option on other models.

Standard features versus “feature upgrades”

Make sure the printers you evaluate have the performance characteristics you need and expect for your environment. Some printers may appear to have capabilities which are actually offered only as expensive add-ons. Look for printers which offer the features you need (such as PostScript® printer language and enhanced resolution) standard, without requiring costly upgrades.

Compatibility with your environment

Ensure that your color printers integrate easily with your existing environment. Your business can save time and money by integrating color printers which support the same printer languages (PostScript or PCL, for instance) as your black and white printers – so users can quickly and easily move jobs between printers. Look closely to assure that the printer allows color printing from the print languages you need – some printers offer black-only printing when using certain printer lan-

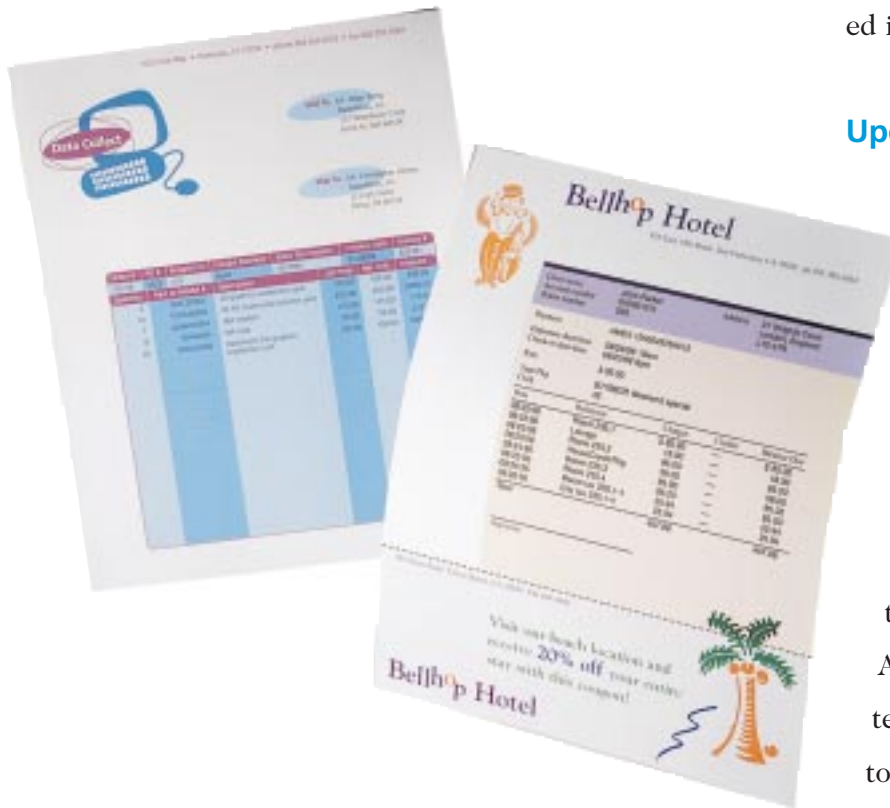
guages. Also assure that your printer selection supports the type of networking or direct connection that is needed in your business.

Upgrade options

These options should include the ease with which you can add memory or a hard disk to increase printing speed as well as the printing of forms or complex graphics.

Ease of use

Ensure that users can easily choose the print quality settings needed for their printing applications, if the default settings are not satisfactory. Always take support costs into account if the printer technology you are considering requires special operators and a dedicated support staff.



Avoid underbuying

Beware of false economies.

When choosing a desktop color printer, avoid the temptation to buy a low cost personal, or home printer, when what you really need is a departmental, or network printer.

Personal or home printers are excellent for individuals or small groups, but are unlikely to offer long-term satisfaction for workgroups, due to their speed and duty cycle characteristics. In many cases, the added capabilities and convenience of network-ready color laser printers quickly offsets their initially higher cost.



Conclusion: Everyday color

Now is a great time to take advantage of desktop color in your everyday external and internal documents.

Desktop color makes it possible to communicate more effectively both externally (to your customers and prospects) and internally (among your co-workers). Color helps you save money by reducing errors and speeding the comprehension of complex data.

Let's review some of the ways desktop color can help your firm communicate more effectively and save money.



What can color do for you?

Color can help your firm make more money by enhancing the communicating power of all of your firm's printed communications.

- Desktop color helps make you money by increasing the effectiveness of external communications.
- Color attracts more attention, makes messages easier to locate and easier to understand. In doing so, color increases the reader's retention of your message.
- Color projects a more professional image for your firm.
- Color motivates better because it can be used to emphasize important information.
- Color can also save you money by making you more efficient.
- Printing smaller quantities using desktop color reduces document obsolescence.

- Distributing documents electronically and printing them as needed reduces distribution and warehousing costs.
- Color reduces errors and speeds information exchange by highlighting critical information and simplifying the analysis of complex data.

New technologies make desktop color practical

Until recently, color could only be justified when printed in large quantities by commercial printers.

Now, however, desktop color is practical for a wide variety of relatively low distribution, personalized documents. Personalized brochures, and newsletters, as well as a wide variety of memos, proposals, reports and newsletters can now be efficiently produced in your office without long delays and without high production and printing costs.



Desktop color is easy and economical

Templates and printer management software make it easy for your firm to use desktop color as efficiently as possible.

Color saves money when properly managed. Proper management includes preparing and distributing templates and palettes that define where color will be used in each category of a document. Managing color also involves distributing templates that define the placement and choice of colors — particularly background color. Supplies costs drop when colored backgrounds are used with discretion.

Economical color use also involves choosing the right printing mode. Instead of printing drafts at full size, they can be printed at a reduced size (e.g. 75 to 90 percent of actual size) without loss of comprehension. In addition, two pages or four pages can be rotated and printed on a single sheet of paper. Audience handouts can be printed 8-up or 16-up.

Choosing the right technology

The effective use of color in business depends on choosing the right printer technology as well as the right printer make and model.

The effective use of color involves, first, choosing the right color technology and, second, choosing the right printer model. Each technology has its advantages and disadvantages, although, for general office use, inkjet and color laser printers offer significant advantages in terms of speed, supplies costs and compatibility with a wide range of paper stocks.



Asking the right questions

Asking questions is the best way to choose the right technology and printer for your firm.

The first step in choosing the right desktop color technology and printer is to understand where color printing can improve your business.

Fill out the Printer Qualification Worksheet on the following pages and use your responses as a guide to decide where to use color and what type of color technology best meets your needs. Feel free to make additional copies of the worksheet and distribute them to your co-workers and employees.

After a little analysis, you'll probably quickly agree that — internally and externally — *desktop color pays!*



Printer Qualification Worksheet

1. What are some of the ways you could use desktop color to improve external communications?

— Chances are, desktop color could generate significant additional income by improving the communicating power of your external marketing currently printed in black and white. In addition, your response may indicate that desktop color could make several additional types of marketing practical.

2. What are some of the ways desktop color can reduce costs internally?

— By reducing errors and speeding the analysis of complex information, desktop color could save money by helping your employees avoid errors and communicate more effectively.

3. Where are you currently paying too much for color?

— *Be alert for opportunities where desktop color can replace high-cost commercial color printing.*

4. What is the shelf-life of your marketing and internal materials?

— *Materials with a short shelf-life are often good candidates for print-on-demand.*

5. What types of documents could better be distributed electronically and printed as needed, eliminating the true costs of distribution, warehousing and obsolete documents?

— *Be alert for occasions when commercially printed and distributed documents are thrown out before they run out.*

6. How much extra revenue would you make if you could personalize your marketing materials for each prospect?

— Analyze the number of direct marketing materials and proposals you distribute and add up the additional revenue your firm would enjoy if you could improve your response rate 40 to 60 percent!

7. Finally, how much more effective will your documents be if printed in color?

— Put a price tag on time savings and reduced errors.

Glossary of important terms

Advancing colors. Colors like red and yellow, which are best used for text and graphic accents because they attract more attention than receding colors, which are best used for backgrounds.

Analogous colors. Colors separated by one segment of the color wheel. Because they are so close to each other, they tend to harmonize, or work well together.

Color depth. The amount of color information stored in a graphics file to be displayed or printed. The more color information there is, the larger the file grows and the more time it takes to process the file.

Color wheel. Diagram showing the locations of the various colors which helps you anticipate how they will interact with each other.

Gradient. Background or object coloring in which one color blends smoothly to another, or transitions to white or black. The direction of the transition can be top to bottom, bottom to top, side to side or diagonal.

Hue. The distinguishing characteristics between colors as identified by

name, e.g. red, blue, green, as contrasted to their brightness or saturation.

Palette. A limited number of colors which have been chosen on the basis of their ability to project a unified image. A well-chosen palette contains background, or receding, color as well as foreground, or advancing colors for text.

PMS. Refers to the PANTONE® Matching System, a widely used color-coding system that allows you to define colors by numbers instead of relying on the often-inaccurate colors shown on the screen of your computer.

Process colors. Colors created by mixing the four basic ink colors, cyan, yellow, magenta and black, on a page. Colors are first separated into their cyan, yellow, magenta and black components and then printed together to recreate all the original colors.

Receding colors. Colors like blues and green, best used for backgrounds.

Resolution. Resolution is a measure of the sharpness with which text and images are created. Increased resolution is one factor which results in sharper images and smoother graduated background fills.

Saturation. A measure of color strength; i.e. colors printed at full, or 100 percent strength, compared to colors printed at tints like 10 percent, 20 percent, or 50 percent of full strength.

Spot Color. A specific color, typically solid and flat. Often specified according to some standard matching system, such as the PANTONE® Matching System. A spot color is the opposite of a process color.

Throughput. A measure of a printer's speed, which includes both paper handling and the time it takes to prepare the image prior to printing.

Suggestions for future reference

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Let Lexmark help you put the power of color to work in your business!

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