COLOR
Materials
Usage
Guide

ONCE YOU'VE MADE YOUR FIRST SMART DECISION,

SOLD **SOLD** **SOLD**

MAKE THE NEXT.

To maintain peak performance in your new color equipment, use only the best – Xerox Supplies. Designed side-by-side with the engineers who make the equipment, our supplies improve quality and productivity, and can even reduce service calls. For maximum color performance, make the next smart decision with Xerox Supplies.

THE
DOCUMENT
COMPANY
XEROX

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Color Materials Usage Guide

Introduction

Today, office documents are no longer limited to black and white. There are literally thousands of choices: colors, images, paper and multiple technology options. Desktop publishing, color laser printing, on-demand and digital full-color printing offer many document creation choices but also present some challenging questions — especially when it comes to choosing paper.

Making the best decision

Which paper is best for a full-color image? Which papers work best with different print technologies and applications? How does dry ink interact with paper? Which papers offer the highest performance and value? What about grades, weights, shades, textures and finishes?

Answers to these question and more

The *Color Materials Usage Guide* gives you an inside look at the differences in the way paper is made and how it influences reliability and image quality; how dry ink particles, ink and paper fibers interact; and how you can improve productivity by using papers that are compatible with your equipment and application.

Papers for today's business

Because of the growing demand for more sophisticated printing papers in digital print environments, paper mills are beginning to offer a wide range of papers specifically designed for optimum performance on today's advanced, full-featured color printers.This *Color Materials Usage Guide* explores the options and shows you how to specify the right paper for the best results.

About this guide

Symbols

The following symbols have been used to help you quickly find information you need.

The *Key* indicates that the information provided is important for you to know.

CAUTION: These statements inform you of actions that may result in mechanical damage to the copier/printer.

WARNING: These statements alert you to actions which may cause personal injury.

Terminology

On some Xerox copier/printers, the manual feed tray on the side of the machine is referred to as the *Bypass Tray* and on others it is referred to as *Tray 5*. You may also hear this tray referred to as the *Multi-Sheet Inserter.* All of these terms refer to the same tray.

Dry ink may also be referred to as *toner.*

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About Paper

Fundamentals of Paper

This guide will help you to understand the variables that occur during the paper-making process that influence paper performance, and why paper may not always work the way you think it should. You'll be able to use this knowledge where it really counts... when making paper choices for documents that are important to you.

Let's take a look at the papermaking machines.

Running at speeds of 3000 feet a minute, the typical paper machine produces about 800 tons of paper a day. This may sound like a lot of paper. But when you consider that companies produce more than a trillion documents each year, it's easy to see why large capacity paper machines are important to business.

Why do we produce so many documents?

The driving force is computer technology. Initially intended to create a paperless office, the digital revolution has had quite the opposite impact. Information now moves more rapidly, we work faster, and generate more paper documents. Paper is more important today than ever, as advanced print technology and desktop publishing applications enable users to create more sophisticated, professional-looking documents from their desktop computers.

What Happens When Dry Ink Meets Paper

**Printed images are actually
an optical illusion created
from a pattern or screen of dots.**

How dry ink interacts with a paper's surface directly influences how ideas are translated into the tones and values that make up an image. This section takes a look at the how dry ink, paper properties and the optical characteristics of paper impart certain qualities in finished documents.

**In xerography, dry ink is
heat fused onto paper fibers.**

When dry ink meets paper

Dry ink is a dry powder used in xerographic processes that is heat-fused onto paper fibers. Fusing permanently adheres the dry ink so that it won't flake, scratch or peel. Rough paper stocks may be less desirable for xerographic use as their texture may prevent dry ink from adhering to the paper's surface.

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Important Paper Properties for Color Xerography

Paper influences on document quality

Variables in the paper-making process can influence the quality and performance of the finished paper. While some variables are controlled to create specific stocks, others may result in imperfections.

- **Formation** – Formation is how fibers are distributed on a sheet. Poor fiber formation can cause mottle or uneven, spotty dry ink distribution in images with high solid area coverage. To gain insight into the formation of paper, hold a sample sheet up to a light. If the paper has good formation, it looks even and consistent. If it has poor formation, it will appear splotchy and uneven.
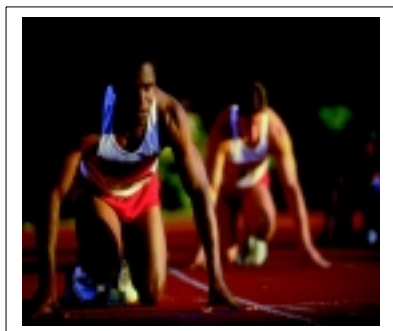
> *Hint:* *Fiber formation is especially important when documents include photographs or have high ink coverage. For best results, select a paper that has good formation.*

- **Grain Direction** – The grain of a paper is the direction in which most of the fibers lie. During the paper-making process, the majority of the paper fibers align parallel with one another. Depending on how the paper is cut to its finished size, it will be either grain-long (the grain is parallel to the longer dimension of the paper), or grain-short (the grain is parallel to the shorter dimension of the paper).

One method used to determine the grain is to fold a sheet of paper lengthwise, then make a crosswise fold. Compare the two folds. Paper folds smoothly with the grain. Cross-grain folds tend to be rough and cracked.

Another method you can use to determine the grain direction of a sheet of paper is to tear the sheet widthwise. Paper always tears straighter with the grain.

Grain direction is critical when running papers heavier than 120 g/m^2 in the copier/printer. These papers must be loaded in the (Also Called Tray 5) with the grain direction parallel to the leading edge of the sheet.

Hint: *Choose short grain papers when printing documents with images that cross over folds (i.e. brochure applications).*

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- **Stiffness** – Stiffness refers to the rigidity, or bending resistance of paper. Thicker papers are usually stiffer.

  In general, paper that is less than 16 lb (64 g/m^2) is more likely to bunch up or wrinkle in the copier/printer, causing jams and misfeeds. Heavier weight papers, over 28 lb (105 g/m^2), may have runability problems as well as print quality defects (skips, blurs, deletions) due to their reduced ability to bend around the transfer drum.

  Usually, reliable feeding rates can be obtained by feeding lightweight paper, 16 lb (64 g/m^2), with the grain direction the same as the feed direction. This will increase the stiffness. When feeding 32 lb xerographic/bond or heavier paper, the grain direction should be the opposite of the feed direction to decrease stiffness.

- **Porosity** – Paper that is too porous causes misfeeds or multifeeds as well as solid area mottle (spotty or uneven printing) and smears. Low porosity (denser) sheets tend to have more curl and are prone to image smears.

- **Weight** – Weight is another important consideration. Heavier sheets are often thicker because they contain more fibers. These papers may be too thick or rigid to pass through the paper path of certain printers. They may also crack or blister when folded (even when scored).

  > *Hint: When choosing paper, select stocks that are within recommended range for the print technology being used. Test the paper by folding a sample document.*
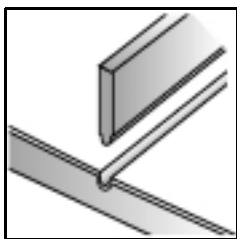
Binderies score thick papers before folding, especially coated stocks, or when heavy ink coverage will cross a fold.

- **Finish/Smoothness** – Finish is the smoothness or roughness of a paper's surface. Finish may be controlled by the surface (wire or felt) pattern used to carry the pulp mixture through the paper-making machine, by adding coatings, and through the calendering process which smooths and polishes the paper surface. Calendering is a series of polished stainless steel rollers which compress the surface fibers and add gloss to the sheet.

  The smoothness of paper has a significant impact on image quality. If paper is too rough, image quality degrades; with increasing roughness, expect a loss of image quality in solids and halftones (grainy colors). Extremely rough paper does not properly accept fused dry ink, which rubs or flakes off.

  Mottle (light patches in solid color areas) will occur on rough papers and on papers with poor or uneven formation. Paper smoothness and formation generally become worse as the paper weight increases

  Since surface irregularities may not be filled in with dry ink, the image on rough papers may appear lighter. A higher density setting (use the Lighter/Darker setting on your copier/printer) is required to achieve a density level equivalent to that on smoother papers.

  Xerographic papers for color are generally smoother than the average xerographic papers.

  > *Hint: Use smooth or coated finishes for documents that have fine detail, shaded areas or halftone images.*

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**Image on bright
white paper**

- **Impurities**– Impurities in the paper-making process can leave tiny specks in some paper stocks which may result in undesirable marks or spots on the image of your copy or print. (This is especially true with many recycled papers since some impurities may not be removed in the recycling process.)

  Hint: The specks in recycled papers may interfere with some images and fine type in documents. Although Xerox is a supporter of recycled papers, we recommend non-recycled papers when copying or printing documents containing high resolution photographs or fine type.

**Image on paper
containing impurities**

Optical paper qualities that influence image quality

The performance of dry ink is affected by the following paper characteristics: Shade - Opacity - Brightness - Reflectivity

- **Shade** – Paper shades may change the appearance of color images because dry ink is applied in dot patterns (or screens) which allow a certain amount of the paper color to show through. Paper shade can also vary significantly among brands.

    Hint: Select a true white paper for truer color and more natural looking skin tones.

- **Opacity** – Two-sided printing requires paper that is more opaque so that show-through isn't a problem. A paper with low opacity allows show-through of images and text from one side of the sheet to the other (e.g., newsprint). Opacity affects legibility, attractiveness, and quality.

    Hint: For better results on documents with large amounts of dry ink or ink coverage, use paper with higher opacity.

- **Brightness** –A paper's ability to reflect light is called brightness. When dry ink is applied to brighter papers, images have higher contrast which improves printability and quality.

    Hint: For best results, use brighter papers when copying or printing documents that contain photographs or complex graphics.

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Light   Light
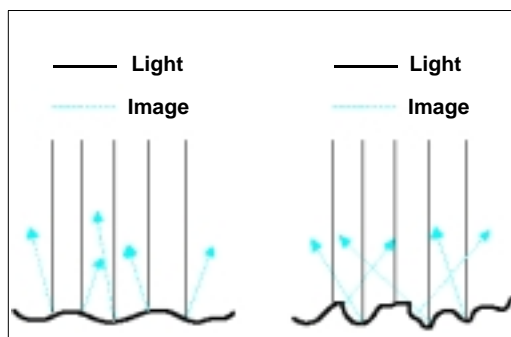
Image   Image

- **Reflectivity** – When dry ink is applied to a smooth surface paper, such as gloss, the resulting image is sharper because the image is reflected back in a straightforward direction. Images resulting from dry ink applied to a rough surface are not as sharp because the image reflection is scattered in several directions.

  > *Hint: Select paper with a smooth, reflective surface for sharper images.*

Reliability

- **Curl** – Excessive paper curl may cause jams. The selection of a low-curl paper within the recommended moisture range will make a significant difference in the performance of your copier/printer.

  Xerox papers are manufactured with built-in curl control and work well when loaded into the paper trays in the correct curl direction.

  Some papers are packaged with an arrow printed on one end of the ream wrapper. The arrow points to the wire side of the paper. The curl side of the paper, also known as the felt side, is the opposite side.

  Load the paper into the copier/printer's internal paper trays so the image will print on the wire side of the paper.

  Load the paper into the Bypass Tray (also called Tray 5) or High Capacity Feeder (if available) with the wire side up (curl side down). It is especially important to load heavy weight papers into the Bypass Tray with the curl side down.

  If more detailed information about loading paper is required, refer to the user guide for your copier/printer.

If the wrapper on a ream of paper is not marked with an arrow showing the wire side of the paper, the side of the paper facing the seam of the package is the wire side. Or, you can determine the curl side by holding a one-half inch stack of paper by one of the short edges.

Let the paper hang with the long edge parallel to your body. Either the lower edge or the two side edges will curl slightly toward the center. Observe which way the edge or edges curl. This is the curl side.

Paper handling and copy curl performance vary with room temperature, humidity, paper quality, and the image area on the copies. All of these variables interact, and, in some situations, you must experiment to determine which paper loading method provides the best performance.

Paper feeding hints

If persistent paper feeding problems occur, one of the following hints may help:

– Turn over the paper in the tray and make the copies again. This technique can be used for both the internal paper trays and the Bypass Tray (also called Tray 5). If feeding performance is improved, continue to load the paper in this manner.

– Open a fresh ream of paper. Load the fresh paper and run the job again. If the paper jams stop, discard the paper that was causing the jams.

– Occasionally, the top sheets of a newly opened ream will curl in the opposite direction to that of the remaining sheets in the ream, indicating that the paper is adjusting to the humidity level in the room. To obtain consistent curl for all sheets in the ream, allow the opened ream to remain in the room until all the sheets have acclimated to the environmental conditions.

– Change the paper feed orientation. For example, if feeding long-edge first (LEF), try feeding short-edge first (SEF).

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Moisture content

Moisture content directly affects reliability and image quality.

- Too much moisture can cause excessive paper curl, paper jams, and image quality problems. Moisture levels that are too low can cause static problems, which can also result in paper jams.

- Moisture content must be uniform within the ream. The ream should not be allowed to lose or absorb moisture during storage. Moisture-proof ream wrappers are essential to maintaining the correct moisture level. Xerox papers have a specially designed ream wrapper that resists the migration of moisture into and out of the package.

- A moisture level range of 4.0 to 5.0% is recommended for paper used in a copier/printer.

Electrical properties (conductivity and resistivity)

Paper that is highly conductive causes image deletion and paper jams. Highly resistive paper, on the other hand, causes static build-up between paper sheets, leading to multi-feeds, jams, and image offset problems. Electrical properties should be balanced to prevent deletions under humid conditions, or background (spots/streaks) and static under dry conditions.

Xerox papers have the correct balance to provide you with optimum performance.

Surface strength

For a paper to have acceptable surface strength, fibers and chemicals must be bonded well to its surface. Loose fibers and other materials within paper can cause developer contamination that can further cause premature developer failure in Xerox printers/copiers.

Friction coefficient

This term refers to the frictional differences between two adjacent sheets of paper and between paper and the copier/printer feed rolls or belts. Since most Xerox digital color copier/printers are designed with friction feeders, the correct frictional properties of the paper are important in order that friction be uniform throughout each sheet. Also, relative friction that is too high or too low causes misfeeds, multifeeds, and jams.

There is no way to measure friction coefficients outside of a testing facility. The safest procedure for you is to always buy your paper from reputable, reliable vendors of xerographic supplies. Xerox was the first to identify and specify frictional ranges needed for xerographic papers. Xerox papers possess the correct frictional properties for use in Xerox equipment.

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Paper Storage

Paper is normally shipped in fiberboard cartons. The number of reams in a carton depends on the size of the paper. If a large quantity of paper has been ordered, the cartons are stacked on wooden pallets.

Mishandled cartons (e.g., dropped, thrown, or struck with a fork lift), may result in damaged paper, some of which may not be immediately obvious. The use of damaged paper increases the frequency of paper jams and other feeding problems.

Do not store the cartons directly on the floor; this increases the possibility of moisture absorption. Store the cartons on pallets, shelves, or in cabinets in an area protected from extremes of temperature and humidity.

Do not open the sealed reams of paper until the paper is to be loaded into the copier/printer. Leave the paper in the original ream wrapper, and leave the reams in the shipping carton. The ream wrapper contains an inner lining which protects the paper from moisture. Removing the ream wrapper eliminates the protective barrier, exposing the paper to moisture fluctuations which can result in excessive curl and other undesirable effects.

Paper from an unopened ream will provide excellent performance.

When paper from an opened ream will not be used for a period of time, such as overnight, the ream wrapper should be re-sealed with tape. For best results, loose paper should be stored in a resealable plastic bag, or in the internal paper trays of the machine.

Do not store paper in the Bypass Tray (also called Tray 5). Load only enough paper in the Bypass Tray for the job being run.

If using paper from a ream that has been left open, take the sheets from the center of the ream.

Precaution for Coated Paper　　Store coated paper in re-sealable bags or storage boxes with covers.

Stacking

If the cartons or individual reams are to be stacked, they should be placed carefully on top of one another to avoid crushing the edges or causing any other damage.

The cartons should be stacked no more than five cartons high. Pallets of paper may be stacked three high.

Temperature and humidity

The temperature of the room where paper is stored can have a significant effect on how that paper performs in the copier/printer.

The control of humidity is one of the most important precautions that can be taken to ensure proper paper handling in the machine.

Paper should be stored within the following conditions:

Air conditioned Most environments with air conditioning systems provide the proper combination of temperature and humidity for good paper performance.

Non-air conditioned Use the following guidelines for storing paper in non-air conditioned environments:

- Minimum: 50° F (10° C) at 15% relative humidity.

- Maximum: 81° F (27.2° C) at 85% relative humidity.

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Conditioning paper

If the paper is moved from a storage area to a location with a different temperature and humidity, the paper should be conditioned to the new location before it is used.

All materials used in the copier/printer must be conditioned to the temperature/humidity of the room containing the copier/printer for optimum performance.

Paper Put paper in the same room as the copier/printer the night before it is used in the copier/printer.

Transparencies Leave transparencies in the same room as the copier/printer for 24 hours before they are used in the copier/printer.

Label stock Condition label stock for 72 hours in the copier/printer area before it is used in the copier/printer.

Separating the cartons or reams of paper (or boxes of transparencies or labels) from each other can accelerate the conditioning of materials.

Do not unseal the reams of paper until you are ready to load them into the machine.

Why Paper Doesn't Always Work the Way it Should

Coated paper and offset

The high gloss papers used in magazines, brochures, and direct mail have long been the choice of graphic designers and offset press operators because the smooth, glossy finish has reflective qualities which provide an optimum surface for photographs, color illustrations and text.

Coated paper and xerography

Because many of today's applications have moved from offset printing to digital, users are beginning to demand fine printing papers for their xerographic equipment. Although many offset papers may be used in xerographic equipment, there are some limitations to the performance of coated stocks with this technology. Coating materials used in the manufacture of these papers impact performance and reliability (i.e., smearing, blurring and flaking).

Moisture and xerography

Xerography is a dry process where papers run at about 4.5% moisture content. If too much moisture is present, the heat of the fuser will draw out the moisture, causing curl. If there is not enough moisture, static electricity becomes a problem. For best results, keep paper sealed in a temperature/moisture controlled environment until ready for use. Re-seal open reams with tape or plastic wrap, or place in a moisture-proof container.

Imaging drum on rough surface
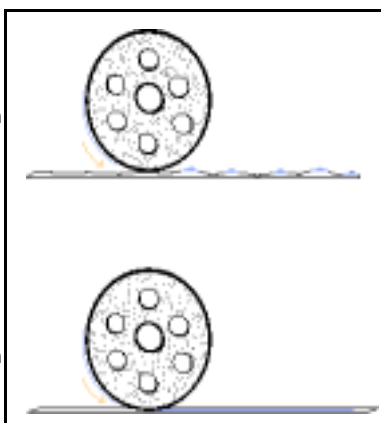
Imaging drum on smooth surface

In xerography, textured surfaces may not allow the imaging drum to make close contact with the surface, resulting in uneven printing and loss of detail.

Textured stock and xerography

In order to duplicate or print fine lines and detailed images on xerographic equipment, the paper surface must come in close contact with the imaging drum for dry ink particles to adhere. If the paper texture is too rough, some particles may never come in contact with the paper, and parts of your image won't print.

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Technology and Paper

Choosing the right paper calls for a strong knowledge of paper characteristics and how they relate to different print technologies.

Whether making color copies, printing from a digital office or production printer, or a workgroup laser printer, you'll need to consider the variables associated with different equipment and how they influence paper buying decisions.

Digital production printing

This type of printing is often the choice for production printing of forms, manuals, training materials and other business documents. Digital production printers, such as the Xerox DocuColor 40, enable color and/or black and white on-demand publishing, eliminating the need for large inventories of pre-printed documents. Digital printing is best for quantities of less than 1000.

Office laser printing

With easy access to sophisticated desktop publishing applications, full-color scanning, and high-speed color technology, office laser printing is becoming the output device of choice for many business documents. This is especially true for documents that need to be customized, changed and updated to reflect rapidly changing business. The quantities typically recommended for laser printing are 1-50.

Office digital copying and printing

People want the freedom and flexibility to create high quality color documents in smaller quantities – in multiple variations – with a wide degree of depth and dimension. They want their presentations, reports, and business documents in general, to look sharp and bright.

Xerox Papers and Xerox Digital Copier/Printers

Xerox papers are carefully researched and developed to be the perfect link to Xerox digital technology. This seamless science means benefits for you: less equipment contamination and downtime, fewer paper jams, lower service costs and, above all, unprecedented color image quality time and time again.

Xerox paper is the only paper…

- that is designed and tested in Xerox digital color copier/printers at environmental extremes;

- that has unique and proven specifications that tie to copier/printer performance and customer productivity;

- with qualification/quality assurance programs specific to the manufacturing equipment that applies to reams, not rolls of paper at the mill;

- that guarantees consistency, with no changes to the product or process without Xerox approval.

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How to Order Paper like a Pro

When you order paper, it's important to know the differences between papers so that you'll know what to ask for. Professionals divide papers into large categories or grades according to their end use, method of printing, and pulp content.

Refer to the chart, *Types of Paper,* for a description of many paper types, their features, surfaces, sizes, weights, and common names.

How paper is categorized – in the USA and Canada

Business papers

This category of paper is also called bond paper, communication paper, correspondence paper and writing paper. This paper is used in stationery, business forms, and as copier papers.

- Bond paper (strong durable writing paper, most commonly used for letterheads, stationery, business forms, etc.)

- Xerographic papers (strong, durable paper used for electrostatic photocopiers and printers)

- Laser (laser printing)

- Dual purpose (printing, copying)

- Writing (stationery)

- Ledger (bookkeeping)

- Form (computer paper/business forms)

- Translucent bond (blueprint copy)

Book papers

A large classification of papers produced primarily for book and publication printing and a wide variety of commercial printing applications. Book papers include coated and uncoated papers in a wide variety of basis weights, colors, and finishes.

Premium text

Premium text is a high quality text paper that is typically chosen for its lavish surface texture, unique visual effects and soft textured images. Premium text makes a sophisticated statement for annual reports, announcements, fliers, and simple brochures; however, it is not suitable for images with high color saturation or fine line resolution.

Uncoated book

Also called offset or text paper, uncoated book comes in a variety of rough to smooth finishes. Used for books, newsletters, and direct mailers, this paper is often referred to as the workhorse paper for general purpose use.

Coated book

Additional pigments and binders are used to enhance the surface quality and printability of coated book. In offset printing, coatings help set ink on the paper's surface rather than allowing it to absorb into the fibers. This results in more vibrant colors and crisper detail.

Coated paper is the best choice for offset printing of magazines, calendars, posters and brochures. Coated stocks are primarily designed for offset printing, however, because of the important role coated stocks play in color applications, companies are developing coated stocks optimized for digital printing.

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Cover

Living up to its name, cover paper is a heavier weight, durable paper used for book covers, tabs, folders, postcards, and business cards.

Cover stocks are available in a variety of finishes for offset printing:

- Coated one side (C1S)

- Coated two sides (C2S)

- Coated high gloss

- Uncoated

Some cover papers are too heavy for laser printing and copying. These heavy cover stocks are not flexible enough to bend around the curves of the paper path in some digital copier/printers.

Index

This is a rough, less expensive paper with poor formation. This stock is characterized by stiffness and its receptivity to writing inks. Index paper is used whenever an extremely durable, stiff, inexpensive paper is required, such as for tabs, pocket folders, signs, or flip charts.

Speciality materials

This category includes transparencies, pressure sensitive labels, transfer paper, and more. Refer to the chart *Types of Paper* for more information on these materials.

Types of Paper

Grade and Basis Size (inches)	Common Names	Features	Surfaces	Standard Sizes (inches)	Weight (lbs)	Weight (g/m^2)	Calliper (mils)	Name of Xerox paper
Business papers 17x22	Bond, Forms, Ledger, Laser, Xerographic, Writing	Lightweight, matching envelopes, pastels, light colors, water-marked	Cockle, Laid, Linen, Parch-ment, Ripple, Wove	**8.5x11**, 8.5x14, **11x17**, **12x18**, 17x22, 17x28, 19x24, 18x28, 22x34, rolls	16, 30, **24**, **28**, **32**	60, 75, **90**, **105**, **120**	.002–.006	**Color Xpressions** 24, 28, 32 lb Bright White
Premium Text 25x38	Text	Deckle edged, textured, wide range of colors	Antique, Embossed, Felt, Laid, Linen, Vellum	**8.5x11**, **11x17**, **12x18**, 17.5x22.5, 23x35, 25x38, 26x40, rolls	**70**, 75, **80**, 100	**105**, 113, **120**, 150	.005–.008	**Color Xpressions** 24, 28 lb Bright White, 28 lb Ultra White
Uncoated book papers 25x38	Book, Offset, Opaque	Easy folding, wide range of colors	Antique, Smooth, Vellum, Wove	**8.5x11**, **11x17**, **12x18**, 17.5x22.5, 23x29, 23x35, 25x38, 35x45, 38x50, rolls	30, 35, 40, 45, 50, **60**, **70**, **80**	44, 52, 59, 67, 75, **90**, **105**, **120**	.003–.006	**Color Xpressions** 24 lb Bright White
Coated book papers 25x38	Coated, Offset, Dull, Enamel, Gloss, Matte, Slick	Good ink hold-out, smooth surfaces, usually white only	Cast, Dull, Embossed, Gloss, Matte	**8.5x11**, **11x17**, **12x18**, 19x25, 23x29, 23x35, 25x38, 35x45, 38x50, rolls	Sheets; **60**, **70**, **80**, 100 Rolls; 40, 45, 50, **60**, **70**, **80**, 100	Sheets; **90**, **105**, **120**, 180 Rolls; 59, 67, 75, **90**, **105**, **120**, 180	.003–.007	**Color Xpressions** 80 lb Gloss Coated Text
Cover 20x26	C1S, C2S, Cast coat, Cover, Text, Cover	Durable, stiff, strong	Uncoated: Antique, Embossed, Felt, Laid, Linen, Smooth, Vellum, Wove Coated: Cast, Dull, Embossed, Gloss, Matte	**8.5x11**, **11x17**, **12x18**, 20x26, 23x35, 25x38, 26x40	50, 60, **65**, 70, **80**, 100; **8pt**, **10pt**	135, 160, **175**, 190, **215**, 270, **180**, **220**	.006–.015	**Color Xpressions** 80 lb Ultra White Uncoated Cover; 80 lb Gloss Coated Cover; 8, 10pt High Gloss Coated Cover
Index 25.5x30.5	Board, Bristol	Stiff, strong, thick	Antique, Smooth, Vellum, Wove	**8.5x11**, 22x28, 22.5x28.5, 23x29, 23x35, 24x36, 25.5x30.5, 28x44	**90**, 110, 125, 140, 170	**160**, 200, 225, 250, 310	.006–.050	**Xerox 90 lb Index**

This chart summarizes the characteristics of papers for digital color copying and printing. It is not intended to be an exclusive guide to ordering paper. Rather, use it to create new ideas for using papers in jobs. Remember, not all paper in a grade comes in every combination of size, weight, and/or finish.

The size and weight combination of **Xerox papers** are underlined and in bold face type.

You may obtain the latest version of the Xerox Color Xpressions paper compatibility chart from our web site at http://www.xerox.com

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Types of Paper

Specialty Materials	Features	Surfaces	Standard Sizes (inches)	Weight (lbs)	Weight (g/m^2)	Calliper (mils)	Name of Xerox material
Transparency	Specially coated for crisp color projection, heat stabilized	Special coating layers on a plastic substrate	**8.5x11**	–	–	0.004	**Color Xpressions** 3R5765 Digital Color Removable Stripe
Pressure Sensitive Label	Variety of con-figurations	Uncoated, Coated, (Gloss, Matt, etc.)	**8.5x11**	–	–	Varies	**Color Xpressions** 3R5771, 4up Glossy Label
Transfer Paper	Lasts longer, image stands up to more washings	Specially coated for easy image transfer and improved productivity	**8.5x11**, **11x17**	–	–	.003–.007	**Xerox Transfer Paper;** 3R5811 for 8.5x11, 3R5812 for 11x17
Synthetic Films	Durable, tear-proof, water resistant	Smooth, textured	**8.5x11**, **11x17**	–	–	0.003 – 0.010	**Xerox NeverTear Paper**
Newsprint	Inexpensive, lightweight	Vellum	Rolls, 8.5x11, 11x17, 12x18, 13x19, 22x28, 24x36	32, 40, 50, 60, 70, 80, 90, 100, 125, 150	52, 65, 81, 105, 114, 130, 146, 163, 203, 244	.003–.007	–
Presentation Folder	Easy to assemble, on-demand presentation	Bright, white folders for sharp images	**9x11**	–	200	0.007	**Color Xpressions** 3R5570

This chart summarizes the characteristics of specialty materials for digital color copying and printing. It is not intended to be an exclusive guide to ordering these materials. Rather, use it to create new ideas for using specialty materials in jobs. Remember, not all materials come in every combination of size, weight, and/or finish.

The size and weight combination of **Xerox materials** are underlined and in bold face type.

Equivalent Paper Weights

Business Papers	Book Papers	Covers	Tag	Index	Bristol	Coated Board	
Xerographic Bond Laser	Premium text Uncoated book Coated text/ book	Coated Uncoated Opaque				(Sold by calliper not weight - weights are approximates)	
17x22"	25x38"	20x26"	24x36"	25.5x30.5"	22.5x28.5"	*Point Scale (1pt = .001)	
Basis Weight (in pounds, lb.)							g/m²
	20						30
9							33
10	26						38
	28						42
	30						44
12							46
13	33						49
	35						52
	38						56
	40						59
16							60
18	45						67
20	50						75
	55						80
24	60						90
28	70						105
32	80						120
					57		125
36	90	50					135
			90				146
					67		147
40	100					6pt/150 µm	150
	105						155
	110	60	100	90			160
		65			80		175
	120					8pt/200 µm	180
		70					190
			125	110			200
							210
		80					215
					100	10pt/250 µm	220
				125	120		225
		88					240
		90	150				245
				140		12pt/300 µm	250
							260
		100					270
			175		150		285
		110					300
				170			310
			200				325
							330
	130						350

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Applications for Paper

	Business Papers					Book Papers			Cover	Index	Specialty Materials				
Color Xpressions	Bond	Forms	Laser	Ledger	Xerographic	Premium Text	Uncoated Book	Coated Book	Coated and Uncoated	Index	Transparency	Labels	Transfer Paper	Synthetic Film	Newsprint
Annual Reports				X	X	X		X	X						
Announcement						X		X	X						
Art Reproductions						X									
Back Lighting											X			X	
Banners									X		X			X	
Booklets	X				X	X	X	X	X						
Brochures	X			X	X	X	X	X	X						
Business Cards								X	X						
Business Forms		X				X									
Calendars	X				X	X	X	X	X						
Catalogs	X				X		X	X	X						
Certificates	X	X	X	X	X										
Classroom Handouts	X				X										
Diplomas	X					X		X	X						
Direct Mailers			X		X		X	X							
Directories	X	X	X	X	X			X	X						X
Fliers	X	X	X	X	X				X						X
Folders				X			X	X	X						
Greeting Cards															
Image Transfer													X		
Index Cards										X					
Letterhead	X	X	X	X	X										
Magazines						X	X	X							
Mailing Labels												X			
Maps														X	
Menus			X			X	X	X	X	X				X	X
Newsletters	X	X	X	X	X	X	X	X							
Newspapers															X
Newspaper Inserts							X	X							
Paperback Books							X								X
Point-of-purchase Displays									X						
Posters						X		X	X					X	
Postcards									X	X					
Presentations						X					X				
Product Identification												X		X	
Resumes	X	X	X	X	X										
Signs									X	X				X	
Tags														X	
Telephone Books															X
Tickets									X						
Yearbooks						X	X	X							

This chart reflects common applications for various types of paper. It is not intended to restrict usage or establish guidelines to using paper in any of the categories.

How Paper is Measured in Terms of Weights and Sizes

Papers are packed in reams, cartons, and on skids. The more paper you buy, the less you pay per unit. For example, buying a partial or "broken" carton costs more per unit than a full carton.

Terms used to describe paper weight

- Basis weight - In the United States and Canada, the basis weight is equal to the weight measured in pounds of 500 sheets of paper cut to a specific size. For example: in Business papers, the basis weight is 500 sheets of 17 x 22" paper. Basis weight is also known as substance (S or Sub) weight.

- Grams - In countries using ISO paper sizes, g/m^2 is the weight in grams of one square meter of paper.
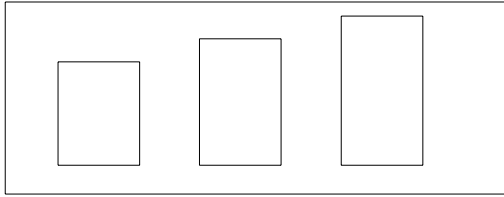
Refer to the *Equivalent Paper Weights* chart to obtain the comparable basis and gram weight of papers.

Ways paper can be ordered

- Ream – 500 sheets

- Junior Carton – A case of ten reams.

- Carton – Unit of paper weighing approximately 150 pounds (60 kilos). Cartons contain 500-5,000 sheets depending on size and basis weight.

- Skid – Cartons stacked three or four high (depending on weight) and wrapped in plastic. Skids in the USA and Canada weigh about 2,500 lbs. (1,139 kilos). Skids from mills in the rest of the world weigh 1,200 lbs. (540 kilos).

- Carload (CL) – Unit of paper that may weigh anywhere from 20,000 to 100,000 pounds depending on the mill. Printers buy carloads for use as house sheets.
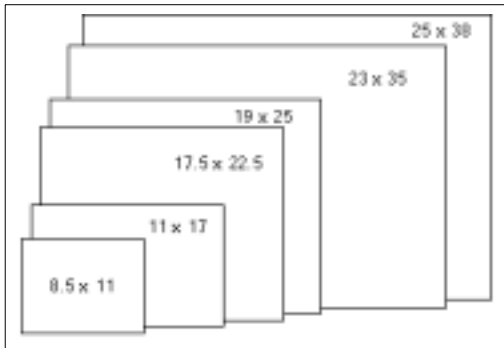
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Paper sizes in the USA and Canada

Not all papers are available in all sizes. Paper size is dependent upon the paper mill's sheeting capabilities. Paper can typically be ordered in three ways: Cut Sheet, Folio Sheet, and Web Rolls.

- **Cut Sheet** *United States* – This paper is typically used on small presses, laser printers and duplicators. Basis weight for cut sheets is determined by the weight per unit area of a ream of 500 sheets of paper.

Standard cut sheet sizes:
8.5 x 11"   8.5 x 14"   11 x 17"

- **Folio Sheet** *United States* – These are used for sheet-fed offset presses. Images are laid out in printer spreads from which they can be later cut and folded into postcards, booklets, brochures or other odd-sized documents. Folio sheets can also be used to print custom-sized posters, envelopes, boxes, and folders.

Standard folio sheet sizes:
25 x 38"
23 x 35"
19 x 25"
17.5 x 22.5"
11 x 17"
8.5 x 11"

A0

A1	

ISO paper sizes are based on a rectangular shape continually divided in half. The rectangular shape retains its proportions regardless of how many times it is halved.
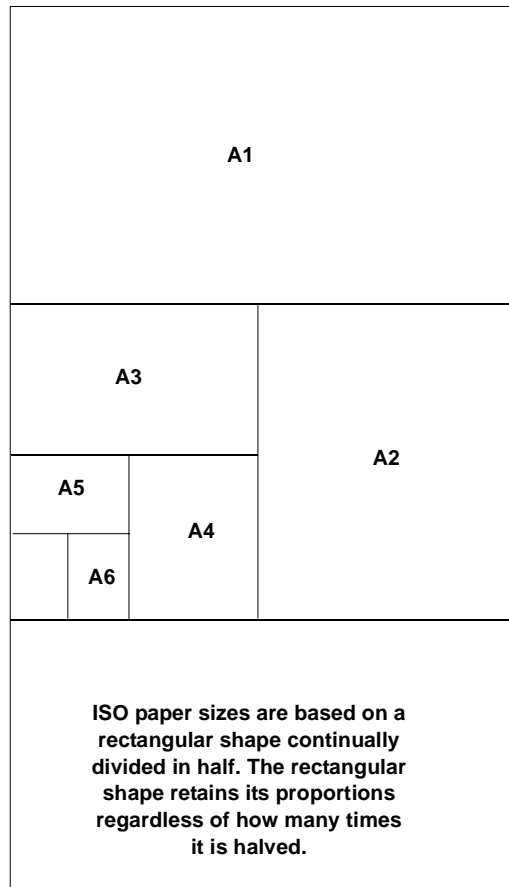
International Standards Organization (ISO) paper sizes

ISO sizes are widely used in countries utilizing the metric system. Paper sizes are named by having a letter designate the series of the paper and a number to designate the size.

A series papers are used for general print.

B series papers are used for wall charts and posters.

C series papers are used for folders, postcards and envelopes.

Numbers indicate sizes available within each series (i.e., 2A0, A0, A1.) Each size is equal to half the preceding larger size. A prefix may also be added to indicate whether the paper is cut to accommodate normal trims (R) or special trims and/or bleeds (SR).

- **Cut Sheet** *ISO International*

  Standard ISO cut sheet sizes:

A Series		B Series	
4A0	1682 x 2378 mm	4B0	2000 x 2828 mm
2A0	1189 x 1682 mm	2B0	1414 x 2000 mm
A0	841 x 1189 mm	B0	1000 x 1414 mm
A1	594 x 841 mm	B1	707 x 1000 mm
A2	420 x 594 mm	B2	500 x 707 mm
A3	297 x 420 mm	B3	353 x 500 mm
A4	210 x 297 mm	B4	250 x 353 mm
A5	148 x 210 mm	B5	176 x 250 mm
A6	105 x 148 mm	B6	125 x 176 mm
A7	74 x 105 mm	B7	88 x 125 mm
A8	52 x 74 mm	B8	62 x 88 mm
A9	37 x 52 mm	B9	44 x 62 mm
A10	26 x 37 mm	B10	31 x 44 mm

- **Folio Sheet** *ISO International*

  RA and SRA sizes:

RA Series		SRA Series	
RA0	860 x 1220 mm	SRA0	900 x 1280 mm
RA1	610 x 860 mm	SRA1	640 x 900 mm
RA2	430 x 610 mm	SRA2	450 x 640 mm
		SRA3	320 x 450 mm

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How to Select the Right Texture/Finish

Some grades of paper are available in a variety of finishes. Depending on which one you choose, a paper finish can be responsible for the feeling or mood projected from a printed piece. The right finish can add personality, richness, and appeal to your document. The selection is virtually endless as paper manufacturers continue to develop and market new finishes every day.

The following are descriptions of common paper finishes.

Smooth finishes

- **Satin** – Also called dull finish, this coated stock has a reduced gloss finish.

- **Gloss** – This smooth shiny surface is coated and Supercalendered, resulting in high reflective qualities. A Supercalender is a series of polished stainless steel rollers which compress the surface fibers and add gloss to the sheet.

- **Matte** – Matte-finished papers are smooth with non-glare surfaces; used for photographic or coated stocks.

- **Dull** – Flat, reduced gloss finish on coated paper; slightly smoother than matte.

- **Laser** – Flat, smooth finish that is Supercalendered for optimum performance on laser and xerographic equipment.

Rough finishes

- **Vellum** – Vellum is a rough, toothy paper Supercalendered just enough to make the surface uniform.

- **Wove** – A fine mesh screen used to make this paper leaves a slight crosshatch or woven pattern on one side.

- **Laid** – The wire used to create a laid finish leaves a "striped" finish.

- **Felt** – Richer, thicker papers that are ideal for embossing, watermarks, or special textures.

- **Linen** – Steel rollers emboss a pattern on both sides of the paper to simulate a linen cloth pattern.

How to Specify Paper

Paper can be specified or ordered in several ways: from a mill, paper distributor, paper retailer, supply catalog, print facility, or local office supply store. The decision on where to order should be based on quantity, paper stock and printing method. When ordering a few reams, a catalog or office supply store is the best choice. For ordering quantities by the carton, order from a paper merchant. When ordering by the truckload, order directly from a mill.

Once you've decided on a paper and the best method for ordering, you'll need to be prepared to describe it clearly to prevent confusion. Specifications needed to order paper include:

- **Brand name** – The name of the entire line of paper made by a specific mill.

- **Color** – The exact name of the color as specified by the mill (i.e., bright white).

- **Grade** – Category, class, rating, finish or brand of paper (i.e., bond, book, cover, or text.)

- **Grain direction** – Direction of the paper fibers. Long grain means grain is parallel to the long dimension of the paper. Short grain means grain is parallel to the short dimension. Show grain direction by underlining the appropriate numeral (i.e., a 20 x 26 sheet is a long grain paper).

- **Quantity** – The number of sheets or pounds.

- **Quality** – The numerical quality rating (i.e., # 1, # 2, # 3) A number one grade is brighter and more costly.

- **Size** – Sheet or roll size in inches or grams.

- **Texture or Finish** – The roughness or smoothness of the sheet (i.e., matte, gloss.)

- **Weight** – Use the basis or sub weight listed in the sample book or price page.

- **Coating** – When ordering a coated stock, specify whether it is coated on one side (C1S) or two (C2S).

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How to Cut Your Costs

Paper is one of the largest expenses of a print job. You can reduce your costs significantly by following a few simple guidelines.

Ten ways to keep your costs down

1. **Use standard sizes:** Design your printed pieces to take maximum advantage of common sheet sizes. For example, in the USA think in multiples of 8.5 x 11".

2. **Explore on-demand printing:** Print up-to-the-minute forms, manuals, catalogs, reports and other printed materials that are suited to an on-demand print environment. This will reduce over-runs and storage costs.

3. **Use paper specifically designed for the equipment you're using:** For example, paper designed specifically to optimize the performance of xerographic equipment may significantly reduce waste due to jamming and offer a better surface for dry ink adhesion.

4. **Reduce basis weight:** Heavier basis weight sheets cost more per sheet than lighter ones. Lighter weight stocks will also reduce mailing costs.

5. **Keep paper wrapped when not in use:** Make sure paper is wrapped in a moisture proof container to avoid moisture problems which may cause jamming, curl, and waste.

6. **Consolidate print runs:** Think about ways to consolidate jobs so that you can order larger quantities of paper. Higher quantities will reduce your per unit cost.

7. **Reduce size:** Smaller sizes mean less paper (if within standard sheet size dimensions). Look for ways to reduce the size and/or number of pages in your printed piece.

8. **Ask about price breaks:** When planning a print job, ask your paper retailer about ways to take advantage of price breaks. For example, partial cartons cost 15-60% more than full cartons.

9. **Use house sheets:** Printers keep huge quantities of basic papers in stock. Because they buy in volume, they are able to get better prices and pass a savings on to customers.

10. **Select the right paper for the job:** Choosing the right paper is key. Consider factors such as image quality, brightness, equipment choice, and end use (is folding required?). Then select a paper that will ensure the best results.

Usage Guidelines for Xerox Color Copiers and Printers

Xerox has an ongoing materials test program where new papers and other materials are continuously evaluated and approved for use in specific Xerox copiers and printers. Your Xerox representative can provide the address of World Wide Web site where you can obtain the most current list of recommended materials for your Xerox copier or printer.

This section of the *Color Materials Usage Guide* provides information on materials that are commonly used in many Xerox copiers and printers.

Standard (or Normal) Weight Papers (Uncoated)

Description and expectations

Standard weight papers include those that are run from the internal trays:

- 16 - 28 lb, 64 - 105 g/m^2 xerographic/bond papers

- Papers within this range provide optimum performance when used in Xerox copier/printers. The benchmark paper used to define image quality and performance specification is 24 lb (g/m^2) Color Xpressions Bright White. Refer to the *Recommended Materials* list for your Xerox copier/printer for the performance rating of other papers.

Use this bright, white paper to create color business reports, fliers, newsletters, and resumes with impact.

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Heavy-Weight Papers

Contact your Xerox representative or visit the Xerox website for the current list of recommended materials for your copier/printer.

Description and expectations

Heavy-weight papers can be classified as different weights of paper for different machines. Always refer to the user guide for your copier/printer for the weight range of heavy-weight papers acceptable for that machine.

Compared to the benchmark 24 lb (90 g/m^2) paper, heavy-weight papers offer increased stiffness and as a result, must be run from the (Also Called Tray 5). As paper weight and stiffness increases, the likelihood of jams also increases. The possibility of image mottle also increases because of the rough surface and coarse formation of the paper.

Two-sided copying of heavyweight paper may not be recommended for your copier/printer because of increased jams and degraded image quality on the second side. Refer to the *Recommended Materials* list for your machine for information on the paper weight limit for two-sided copying.

Hints, tips and testing results

Extensive Xerox testing has shown the following:

- When the recommended heavy weight papers are run as recommended, with the correct tray, mode, orientation and curl, feeding performance is good but should not be expected to equal that of 24 lb (90 g/m^2) Color Xpressions paper.

- Image quality on the recommended papers is good, but should not be expected to equal image quality on 24 lb (90 g/m^2) Color Xpressions paper. Image quality degradation is more likely to occur as paper weight increases. The rough formation of heavy papers increases the likelihood of mottle (light patches) with some images. Mottle is more likely to occur on images with uniform halftone areas. As humidity increases, mottle usually increases.

Coated Papers

Contact your Xerox representative or visit the Xerox website for the current list of recommended materials for your copier/printer.

Description and expectations

Coated papers have binders, adhesives, and pigments applied to their surfaces on one or both sides. As compared to the benchmark Color Xpressions 24 lb (90 g/m^2) paper, coated papers provide improved image gloss but will generally cause an increase in jams.

Two-sided copying or printing of coated papers may not be recommended for your copier/printer because of more frequent jams and likely image quality/offsetting problems. Contact your Xerox representative for the current list of recommended materials for your copier/printer.

Coated papers must be run with the curl side of the paper up and the grain direction perpendicular to the lead edge.

CAUTION: Running coated papers with the grain direction parallel to the lead edge, or with the curl side down can cause pressure roll wrap jams requiring a service call.

CAUTION: Refer to the user guide for your copier/printer for the maximum coated paper weight that can be run. Failure to adhere to recommended weights may result in damage to the machine that will require a service call.

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Hints, tips and testing results

Xerox testing has shown the following:

- Coated papers are very susceptible to humidity. Image mottle (light patches in solid areas) or light images overall will occur if paper is not kept packaged in environments with more than 40% humidity. To avoid this, keep packages sealed, use sheets from the center of the ream, or store unused paper in a resealable bag. Multifeeds are also much more likely with humidity greater than 40%.

- Two sided copying (duplexing) of coated papers may not be recommended for your copier/printer. The most common problems are: (1) light image patches (mottle) and deletions on side two, especially in large halftone areas; (2) image offsetting. Image offsetting can be caused on side two by dry ink contamination of rollers in the fusing system when the sheet is run through again for the side two image, or on side one by paper-to-paper contamination in the output tray.This is most likely to occur with high density images and will usually appear within the first 10 copies.

  Offsetting will become worse as more copies are run and can lead to permanent damage to the fuser and pressure rolls requiring a service call. The extent of this problem can be highly variable and is dependent on the type of image being run and the condition and age of the machine.

- If attempting to run two sided copies, run the side with the lightest image, or the side with no color (black-only) on side one, and the higher density, or the color image on side two. Load the side one copies in the (Also Called Tray 5) so that the trail edge of side one is used as the lead edge for side two.

  While running side two, continuously monitor the copies as they exit the machine. Look at the back side (side one) of the copy to see of any image offsetting has occurred. If offsetting is seen, stop the job immediately and clean the fusing system. This condition will only get worse if more copies are run.

  To clean the fusing system, run about 10 blank sheets of paper through the machine. When the bottom side of the blank sheets comes out clean, continue to run the side two copies. To run a large quantity of two-sided copies, you may need to intersperse short runs of two-copies between single-sided runs to keep the fusing system from becoming contaminated again.

- Dry ink coverage on electronic originals should be limited to a total of 280% (70% for each color). Higher dry ink coverage can result in poorly fused prints.

If using a coated paper that has not been recommended, first try a small quantity to test its performance, then consult your local Xerox representative for agreement on its use.

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Recycled Papers

Description and expectations

Most recycled papers are made from a combination of new pulp, waste from the paper-making process, and paper that has been returned by consumers for recycling. Because the nature of paper returned for recycling is unpredictable, recycled papers are less uniform in content and quality than papers made from entirely virgin fiber.

The recommended Xerox recycled papers offer the best feed performance and image quality available. These papers undergo exclusive screening procedures to minimize the amount of harmful inks and plastic particles in the final product. The recommended recycled papers will run well in Xerox copier/printers, but the reduced smoothness, formation and brightness will result in degraded image quality as compared to the benchmark Xerox 24 lb (90 g/m^2) Color Xpressions paper.

Hints, tips and testing results

Xerox testing has shown the following:

- Severe image quality problems are likely if non-recommended recycled papers are run. If you plan to use a recycled paper other than the Xerox brand, first try a small quantity to test its performance, then consult your local Xerox representative for agreement on its use.

- The wide variation in recycled paper fibers increases the tendency for these papers to curl, which may result in jams. If an obvious curl is detected, load that paper in the (Also Called Tray 5) with the curl side down for best feeding performance.

- Two-sided copying with recycled papers is not recommended. The inherently poor image quality of recycled papers only becomes worse when the second side is run.

- To avoid making a marginal material worse, all recycled papers should be stored in sealed packages when not in use. Image quality on exposed papers will degrade even more as humidity increases.

Hole-Punched Papers

Description and expectations

Hole-punched papers have two or more holes along one edge for use in ring binders and notebooks. This paper is often referred to as predrilled paper. Most hole-punched papers that fit into the standard paper size and weight ranges for Xerox copier/printers should run reliably. The recommended hole-punched papers meet Xerox's high quality standards and will provide reliable feeding and good image quality.

Hints, tips and testing results

Xerox testing has shown the following:

- When copying from a hole-punched original onto hole-punched paper, special actions must be taken to prevent the holes from printing as dark spots on the copy. If your copier has an Edit Pad, these spots can be eliminated by using the Delete Outside editing feature to eliminate the holes. If you do not have an Edit Pad, you can use the Image Shift or Edge Erase feature, or place the original on the glass and cover the holes by placing a white sheet of paper over the holes before copying.

CAUTION: Not using one of these methods will result in heavy deposits of dry ink onto the copy paper at the hole area. This excess dry ink will be transferred onto the back of copies/prints when the next job is run. Permanent fuser damage can occur if this is done repeatedly.

- There are a wide variety of hole configurations available for hole-punched paper. Not all variations have been tested. Frequent jams are possible with some hole configurations. Pretesting a small quantity is recommended before making a large purchase.

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Pressure-Sensitive Labels

Contact your Xerox representative or visit the Xerox website for the current list of recommended materials for your copier/printer.

Description and expectations

Pressure-sensitive label stock consists of three layers: the face sheet, the pressure sensitive adhesive, and the backing or release sheet. There are many types of face sheets and label weights available. To avoid feeding and image quality problems, it is very important to run labels with the correct balance of properties. The recommended Xerox copier/printer labels have been specifically designed to give optimum performance. They have low weight/low stiffness for improved feeding. USA versions have a pattern-printed adhesive (no adhesive within 1/16 inch of the edges of the sheets) to reduce fuser contamination.

Refer to the *Recommended Materials* list for your copier/printer to determine if you can run labels on your machine, and if so, which labels are recommended.

Hints, tips and testing results

Xerox testing has shown the following:

- When the recommended materials are run, with the correct tray, mode and orientation, feeding performance and image quality is good but will not equal the performance of 24 lb (90 g/m^2) Color Xpressions paper.

- Do not use the Normal paper mode when running labels. Use the Heavy Weight or Thick paper mode. See your *Recommended Materials* list for more specific information.

- In general, labels with a low weight face, backing sheet, and a pattern-printed adhesive will run successfully. Overall weight should be less than 203 g/m^2. Run labels with the grain parallel to the leading edge.

    If attempting to use labels that have not been recommended, first try a small quantity to test the performance, then consult your local Xerox representative for agreement on its use.

CAUTION: Do not use dry gum labels (those that require moistening before being applied) as they can cause severe machine contamination problems.

Preprinted Papers

Description and expectations

This category encompasses a wide variety of materials. Offset printed letterhead papers and xerographic prints within the recommended paper weight range will feed reliably in Xerox copier/ printers. Copies produced on laser, ink jet, or dot matrix printers, carbonless paper, raised/engraved papers, and preprinted forms, using various inks (with and without MICR), have not been tested and should be considered as not recommended.

Hints, tips and testing results

Xerox testing has shown the following:

- Some inks from preprinted materials may cause deletions, offsetting or contamination. Select a surface-drying, laser-compatible ink designed for reproduction on color copier/ printers. An example is TuffText by Vanson. Your offset printer representative may be able to specify an ink with similar characteristics.

- Two-sided copying/printing onto preprinted materials is not recommended. In many cases, deletions will occur if you attempt to copy an image onto an area on side two that is directly opposite a preprinted area on side one. The preprinted area can disrupt the transfer of dry ink onto side two, causing a deleted area. This can be due to the conductivity of the ink itself or because the ink on side one caused a slight ripple in the paper.

- Always pretest a small amount of material to determine image quality and feeding performance before purchasing a large quantity.

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Single-Step Transfer Paper

Contact your Xerox representative or visit the Xerox website for the current list of recommended materials for your copier/printer.

Description and expectations

Single step transfer papers enable you to transfer full color images directly from copies or prints onto almost any fabric and other types of materials. A popular application is image transfer onto T-shirts. The recommended materials have been extensively tested and have been selected to provide optimum performance.

Hints, tips and testing results

Xerox testing has shown the following:

- When the recommended materials are run as recommended for your copier/printer, feeding performance will be good but should not be expected to equal the performance of Xerox 24 lb (90 g/m^2) Color Xpressions paper.

- Refer to the *Recommended Materials* list for your copier/printer for the correct mode to use when running transfer papers.

- To avoid problems (jams and poor image quality) caused by both dry and humid environments, store Xerox transfer paper in its resealable bag with desiccant pack. Other brands should also be stored in resealed packages when not in use.

- Dry ink saturation on electronic originals should be limited to a total of 280% (70% for each color). Higher dry ink saturation can result in poorly fused prints.

- T-shirts consisting of a 50/50 blend of polyester/cotton provide better image durability than shirts made of 100% cotton. Tight weave fabrics (heavy T-shirts) provide better results than loose knit fabrics (sweat shirts).

- Thorough testing has not been done on brands of single step transfer papers other than Xerox papers. High rates of multifeed jams and potentially damaging fuser jams may be encountered with brands that have not been recommended. Run only the recommended materials.

Transparencies

Contact your Xerox representative or visit the Xerox website for the current list of recommended materials for your copier/printer.

Description and expectations

Transparency stock is used primarily to create images that can be projected onto a wall or screen. Transparencies are made of polyester film that is specially coated to make dry ink readily adhere to it. The base material and coating type are both very important in the final quality of the projected image.

The recommended Xerox transparencies meet the critical parameters for friction, clarity and dry ink adhesion required for optimum feeding and color image quality. When run as recommended, feeding performance will be good, but will not equal the reliability of Xerox 24 lb (90 g/m^2) Color Xpressions paper.

Hints, tips and testing results

Xerox testing has shown the following:

- The Xerox Premium Transparencies, USA/Canada 3R5765, provide brighter, cleaner colors than other standard transparencies.

- Some Xerox copier/printers can run paper-backed transparencies. Refer to the *Recommended Materials* list for your copier/printer to determine if they are recommended or not.

- Be careful when handling transparencies. Dry ink cannot penetrate into the surface of the transparency. Therefore, any damage to the surface of the transparency will affect the quality of the image.

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- A light, oily residue may be present on the transparency after copying. This residue will eventually disappear, but it may be removed by gently wiping the surface with a cloth or tissue.

CAUTION: If you cannot find or clear a transparency that is jammed in the copier/printer, do not run another transparency or paper copy. Damage to the machine will occur if another sheet is run while a transparency is jammed in the fuser area and out of your viewing area.

CAUTION: Do not attempt to remove a transparency that is firmly jammed in the fuser. Only a Xerox service representative should attempt to remove this type of transparency jam.

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Glossary

A

Acid-free paper:

Paper made from pulp containing little or no acid so it resists deterioration from age. Also called alkaline paper, archival paper, neutral pH paper, permanent paper and thesis paper.

A4 paper:

ISO paper size 210 x 297mm used for letterhead.

B

Base stock:

A paper that can be further processed.

Basic size:

The standard size of sheets of paper used to calculate basis weight in the United States and Canada.

Basis weight:

In the United States and Canada, the weight, in pounds, of a ream (500 sheets) of paper cut to the basic size. Also called ream weight and substance weight (S or Sub weight). In countries using ISO paper sizes, the weight, in grams, of one square meter of paper. Also called grammage and ream weight.

Bleed:

Printing that extends to the edge of a sheet or page after trimming.

Blocking:

Sticking together of printed sheets causing damage when the surfaces are separated.

Bond paper:

Category of paper commonly used for writing, printing and photocopying. Also called business paper, communication paper, correspondence paper, and writing paper.

Book Papers:

Category of paper suitable for books, magazines, catalogs, advertising and general printing needs. Book paper is divided into uncoated paper (also called offset paper), coated paper (also called art paper, enamel paper, gloss paper, and slick paper), and text paper in a wide variety of basis weights, colors, and finishes.

Brightness:

The reflective ability of a paper at a standard wavelength.

Business paper:

Also called bond paper. Designation for printing papers with textured surfaces such as laid or linen. Some mills also use text to refer to any paper they consider top-of-the-line, whether or not its surface has a texture.

C

C1S and C2S:

Abbreviations for coated one side and coated two sides.

Calendar:

To make the surface of paper smooth by pressing it between rollers during manufacture.

Caliper:

Thickness of paper or other substrate expressed in thousandths of an inch (mils), pages per inch (ppi), thousandths of a millimeter (microns) or pages per centimeter (ppc).

Carbonless paper:

Paper coated with chemicals that enable transfer of images from one sheet to another with pressure from writing or typing.

Carload:

Selling unit of paper that may weigh anywhere from 20,000 to 100,000 pounds (9,090 to 45,454 kilos), depending on which mill or merchant uses the term. Abbreviation is CL.

Carton:

Selling unit of paper weighing approximately 150 pounds (60 kilos). A carton can contain anywhere from 500 to 5,000 sheets depending on the size of sheets and their basis weight.

Cast-coated paper:

High gloss, coated paper made by pressing the paper against a polished, hot, metal drum while the coating is still wet.

Coated paper:

Usually a glossy paper with a smooth surface, but sometimes dull coated.

Cockles:

Wrinkles and spots in paper that are defects.

Cover paper:

Category of thick paper used for products such as posters, menus, folders and covers of paperback books.

Curl:

The bending of paper as a result of differences on each side.

Cut-Size:

Paper used for printing and copying.

D

Deletion:

Spots on an image where the dry ink is missing.

Dimensional stability:

The degree to which paper maintains its form as a result of environmental changes.

Dual-purpose bond paper:

Bond paper suitable for printing by either lithography (offset) or xerography (photocopy). Abbreviated DP bond paper.

Dull finish:

Also called dull coated. Low gloss, supercalendered paper.

E

Electronic publishing:

Providing information in electronic (digital) form to a xerographic, laser, ink jet, or other electronic printing device.

Embossed finish:

Pattern on the surface of a paper achieved by pressing it against an engraved metal roll.

Enamel paper:

Also known as coated paper, with a high gloss.

English finish:

Most commonly used for magazines, it is a smooth, calendered finish.

Equilibrium Moisture content:

The inability of a paper to absorb moisture when its moisture content equals the relative humidity of the environment.

Equivalent weight:

The term used to denote the respective weights of the same paper of two different sheet sizes.

F

Felt:

The fabric belt that carries the water and pulp through the papermaking machine.

Felt finish:

Soft woven pattern in text paper. It is applied at the wet end of a paper machine.

Felt side:

Side of the paper that was not in contact with the Fourdrinier wire during paper making, as compared to wire side. Felt side of the paper is recommended for receiving printing and giving the best results.

Film laminate:

Thin sheet of plastic bonded to a printed product for protection or increased gloss.

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Fine papers:

Papers made specifically for writing or commercial printing, as compared to coarse papers and industrial papers. Also called cultural papers and graphic papers.

Finish:

Surface characteristics of the paper, such as vellum, antique, or smooth.

Formation:

Describes the distribution of fibers on a sheet. When held to a light, a paper with good formation will appear even and consistent, whereas with poor formation it will appear splotchy and uneven. Poor formation can cause mottle or uneven, spotty dry ink distribution in images with high solid area coverage.

Form bond:

Lightweight bond, easy to perforate, made for business forms.

G

Gloss:

Characteristic of a paper that makes it shine.

Grade:

The classification given to paper due to its unique characteristics, which includes brightness, opacity, cotton content, etc.

Grain:

The direction of fibers in a paper due to their flow on the papermaking machine.

Grain direction:

The direction of the fibers in paper. Grain long is when fibers run in the same direction as the longest side of the sheet. Grain short is when the fibers run in the direction of the shortest side of the sheet.

Grammage:

Metric method of measuring the basis weight of paper.

Graphic arts:

The name given to the various segments and processes that are used in producing printed products.

Graphics:

A visual representation formed by writing, drawing, photography or engraving.

Groundwood pulp:

A wood pulp that has not been chemically processed, and which is used to make an economical paper such as newspaper.

Gummed paper:

Paper with an adhesive coating on one side.

H

Heavy weight paper:

Papers classified as having a basis weight greater than 105 gsm (i.e., 28 lb business papers, 40 lb Cover, 70 lb book papers).

I

Index paper:

A stiff stock used when an extremely durable, inexpensive paper is required. With a rough surface and poor formation, it does not provide good quality for color images.

Insert:

A printed brochure or single page that is inserted and bound with the regular copy in a publication.

ISO sizes:

Widely used in countries utilizing the metric system, these sizes are named by having a letter designate the series of the paper and a number to designate the size.

L

Laser bond:

Bond paper made especially smooth and dry to run well through laser printer.

Leaf:

One page in a book.

Lead edge:

The edge of the paper that feeds first into the copier.

Ledger paper:

A durable, smooth business paper with a heavy basis weight used for keeping business records.

Letter paper:

In North America, 8.5 x 11" sheets. In Europe, A4 sheets.

Lightfastness:

The amount of resistance of a color of ink or paper to any kind of light. Also known as colorfastness.

Lightweight paper:

Book paper with a basis weight of less than 40 lb (60 gsm).

M

M value:

The weight of some materials is described by the M value printed on the package (i.e., 21.64M). The M value is the weight in pounds of 1,000 sheets of the size of the paper in the package. To convert the M value to gsm for 8.5 x 11" paper, multiply the M value by 7.527. To convert the M value to gsm for 11 x 17" paper, multiply the M value by 3.763.

Matte finish:

A flat, dull, low gloss finish on photographic paper or coated printing paper.

Mottle:

Spotty or uneven image areas of printing.

N

Natural color:

Very light brown color of paper. May also be called antique, cream, ivory, off-white, or mellow white.

Neutral gray:

Gray with no hue or cast.

Newsprint:

Paper used for printing newspapers, made from groundwood or mechanical pulp.

Non-impact printing:

Printing using lasers, ions, ink jets or heat to transfer images to paper. Abbreviated NIP.

O

Opacity:

Characteristic of paper or other substrate that prevents printing on side from showing through to the other.

Opaque:

The more opaque a sheet of paper is, the less transparent it is. High opacity in printing papers is a good characteristic as print from the other side of a printed sheet has less show-through.

P

Page:

One side of a leaf in a publication.

Page-per-inch:

Also known as PPI, it is the number of pages in a one inch stack of papers.

Pixel:

Short for picture element, a dot made by a computer, scanner, or other digital device.

Point (pt.):

The measure of paper thickness. One point is one-thousandth of an inch.

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Printability:

The ability of paper to be reproduced with high quality printing.

Publishing paper:

Paper made in weights, colors, and surfaced suited to books, magazines, catalogs and free-standing inserts.

Q

Quick printing:

Printing using small sheetfed presses, called duplicators, using cut sizes of bond and offset paper.

R

Ream:

500 sheets of paper.

Recycled paper:

Paper manufactured from used paper pulp.

Resolution:

Sharpness of an image on film, paper, computer screen, disc, tape, or other medium.

Runability:

The capacity of a paper to perform on the press without difficulties.

S

Saddle stitch:

The method of binding pamphlets or small books with staples.

Satin finish:

A finish on paper that is smooth like satin. It is an alternate term for dull finish on coated paper.

Score:

An indentation made in paper or cover stock to make folding easier. Also called crease.

Shade:

Hue made darker by the addition of black, as compared to tint.

Shadows:

Darkest areas of a photograph or illustration, as compared to midtones and highlights.

Short grain:

Paper with the fibers paralleling the shortest side of the sheet

Show through:

When paper allows the see-through of printing from the other side. Increased opacity of paper reduces this problem.

Side stitch:

To bind by stapling through sheets along one edge, as compared to saddle stitch.

Signature:

A section of a book that contains 4, 8, 16, 32, etc., pages (depending on the size of the paper and press) that fold into one unit after printing.

Size:

Compound mixed with paper or fabric to make it stiffer and less able to absorb moisture.

Skid:

A wooden form on which a large quality of paper or printed matter is shipped.

Smooth finish:

A finish on paper that has been made smooth by passing through various rollers.

Stock:

Another name for the paper on which printing will be done.

Stocking papers:

Popular sizes, weights and colors of papers available for prompt delivery from a merchant's warehouse.

Substance weight:

Another word for basis weight.

Substrate:

Any surface or material on which printing is done.

Supercalendered paper:

Paper calendered using alternating chrome and fiber rollers to produce a smooth, thin sheet. Abbreviation: SC paper.

SWOP:

Abbreviation for Specifications for Web Offset Publications.

T

Text paper:

Designation for printing papers with textured surfaces such as laid or linen. Some mills also use "text" to refer to any paper they consider top-of-the-line, whether or not its surface has a texture.

Trail edge:

The edge of the paper that feeds last into the copier

Translucent papers:

Papers that will allow information to be seen through them but not totally clear like an acetate.

U

Uncoated paper:

Paper that has not been coated with clay. Also called offset paper.

V

Vellum finish:

Somewhat absorbent, rough, toothy finish.

Virgin paper:

Paper made exclusively of pulp from trees or cotton, as compared to recycled paper.

W

Wire side:

Side of the paper that rests against the Fourdrinier wire during papermaking, as compared to felt side.

Writing paper:

A paper with a hard surface which makes it good for writing on it with pen or pencil.

X

Xerographic paper:

A strong, durable paper used for electrostatic photocopiers and printers.

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