



BEHIND *the* SCENES

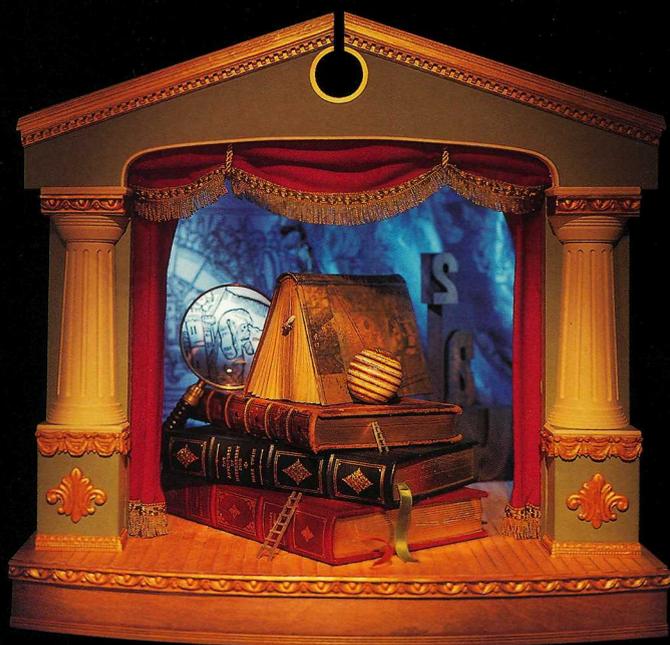
A COMPARISON GUIDE FOR POTLATCH PAPERS



TON  
SAFETY

179

19



*The ART of*  
**PAPER**

A LOT GOES INTO PAPER BEFORE IT GOES ON PRESS. Perhaps that's a bit obvious; still, it's worth remembering. A blockbuster performance may seem almost effortless when you're in the audience, but that's only because an amazing array of talent is hard at work behind the scenes.

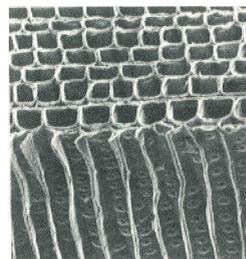
In this intricate choreography, both the stars and the stagehands have important roles. When it comes to printing paper, the designer and the printer are our stars. Yet only when the stage is set and the players are assembled can they truly shine.

That's paper's job. With paper, the key players are shade and brightness, surface texture and porosity. These are attributes of paper excellence. And they are set on a platform of fiber, coating and surface finishes, the elements of papermaking. Their composition, the way they are combined and applied, define paper quality.

At every stage of papermaking, Potlatch balances these components to create unique coated and uncoated printing papers of the very highest quality.

# FIBER

FIBER IS THE BASIC BUILDING BLOCK OF ALL TREES and, consequently, paper. Shaped like drinking straws, fibers' hollow structure allows water and essential nutrients to flow from the roots to the tree's leafy crown. Their strength comes from a combination of their cellulose walls and a compound known as lignin, which acts like glue to hold the fibers together.



Wood fibers are natural cylinders glued together by lignin.

Wood fiber is processed into pulp any number of ways. At Potlatch, we've recently invested a half-billion dollars in a massive modernization program of our pulp mill in Cloquet, Minnesota. At the center of the mill is our Superbatch pulp-cooking process, a highly efficient kraft process in which solid wood is converted to pulp through uniformly controlled cooking. The process renders the maximum amount of high-strength fiber from the wood.

Here, our select hardwood and softwood are reduced to uniform-sized chips, which are cooked under pressure to separate the fiber from the lignin. (Lignin is the stuff that turns paper yellow, just as your newspaper with time does.) Our pulp is then washed and filtered to remove the lignin, before it is bleached to the dazzling whiteness essential to crisp, intense color printing.

But this story takes place before an impressive environmental backdrop, in which impacts are controlled, minimized and, in many cases, eliminated. Simply put,

## FIBER: A CRITICAL REVIEW

Premium papers are made from wood fiber, but all wood fiber isn't created equal. And you cannot create the refined surfaces essential for fine printing when you start with the wrong fiber.

At Potlatch, we use a precise blend of fibers from select northern hardwood and softwood to make all of our high-quality papers including Potlatch McCoy and Vintage.

During long, cold winters and short, cool summers, these trees produce the short, thin fibers that are ideal for making high-quality paper that's smooth and strong.



Microscopic view of uncoated base stock reveals flattened fiber and open surface.

# GUIDE

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To test the opacity

of Potlatch fine

papers, place this

.25

chart behind an

.5

unprinted area on a

1

sheet of paper.

2

Then compare it

3

to competitive

4

papers in the same

5

basis weight.

6

**Potlatch**

Superbatch is a “closed-loop” process, which means chemicals are recovered and reused. Meanwhile, the lignin and other wood solids are burned to reclaim their energy. (Another cool thing is that the Superbatch process requires about the same amount of steam as the older technology to produce twice the pulp.)



Finished pulp is a pure, bright white.

Now, through yet another innovation—oxygen delignification—wood byproducts and color can be further reduced before bleaching. That way, bleaching can be completed in less time and with fewer chemicals to minimize environmental impact. (FYI: Six years ago, we completely replaced elemental chlorine with chlorine dioxide in our bleaching process. The pulp we manufacture is ECF, or Elemental Chlorine Free. Even the most sophisticated monitoring equipment cannot detect dioxin in our bleached pulp or wastewater.)

What results is pulp that’s strong, white and extremely bright. At this stage, the pulp looks a lot like cottage cheese—a wet, lumpy white mass. But if you look closely, you’ll notice that, although the fibers are no longer rigid, strawlike tubes, they’re still hollow. All the better for making white, opaque paper.

Why? Because these perfectly hollow fibers reflect light from every surface, off the outside surfaces and inside the fiber walls. Paper that reflects light offers greater opacity and cleaner, brighter images.

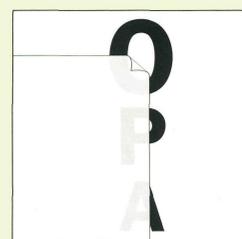
#### SHOW, RATHER THAN SHOW-THROUGH

Opacity, like the red velvet curtain drawn across the stage, keeps what’s behind a surprise. Opacity measures the amount of light passage through a sheet of paper. Good opacity prevents images printed on the other side of the page from showing through. Higher opacity also improves readability and

reduces eye strain.

At Potlatch, consistent, uniform opacity is essential to our fine printing papers. That’s why we add carefully balanced and, frankly, expensive pigments to our pulp before it enters the paper machine. Why? To increase the number of reflective surfaces and fill in the voids between fibers in the base

stock, which ultimately defines the color, strength and smoothness of paper. That way, you control the show with bright, smooth paper that’s incredibly opaque. Ideally, you want a sheet with high opacity and little show-through, to improve readability, reduce eye strain and enhance the power of your printed work.



Place the opacity guide under a sheet of printed paper sitting on your desk. If you see words coming through, your sheet has low opacity—what’s also known as high show-through.

# COATINGS

UNCOATED BASE STOCK HAS AN OPEN SURFACE filled with tiny holes and thin channels ready-made for soaking up liquids. That's great in a paper towel, but not in a fine paper.

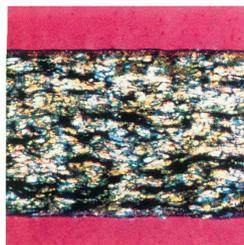
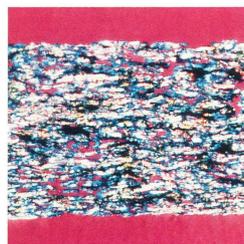
Enter our hero, stage left: A coating of great refinement. Coating is like a sophisticated primer applied to the bare walls of a stage set. It makes possible all the spectacular scenery to come.

It is coating's job to fill in the low spots between fibers, cover the high spots and create a smooth, uniform surface. Smooth and level for even light reflection and uniform ink films. Tight enough to hold ink out on the surface. And porous enough to absorb fountain solution and ink solvent, allowing ink to set.

The power of paper rests on its surface. Without coating, halftone dots and solid lines take on the fuzzy, random pattern of the fiber. Color tends to weaken and details soften. That's because uncoated paper is porous and absorbs ink into the base, scattering light.

Paper coatings are precisely formulated mixtures of calcium carbonate and clay suspended in a binder. The exact mixture depends on the way the paper is to be finished and the final brightness achieved. Pigments are mixed in a liquid binder, which binds

Uncoated paper— a slice of the edge of a sheet. The top and bottom surfaces are rough with open spaces that will not hold out ink.



Coated paper— again, a slice of the edge of a sheet. The top and bottom surfaces are much smoother with the coating to hold ink dots on the surface (see dots on next page).

## PAPER SURFACE'S AMAZING TECHNICOLOR WAVELENGTH, OR HOW COLOR WORKS

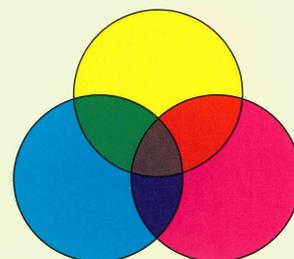
Color is a vital part of any performance, lending its vibrancy, contrast and richness to stage sets and costumes. And it's almost impossible to imagine a production without the creative illumination of the lighting director.

Here's how it works on the page. Pure white light—sunlight, for example—is composed of a full spectrum of

colored light. Neutral white paper reflects that total color spectrum, whose individual colors are determined by their particular wavelengths.

Indeed, what makes paper white is its reflection of red, green and blue light in equal amounts. That white surface is then printed with process inks, which are transparent and come in cyan, magenta, yellow and black. These inks

act as filters on the paper surface, altering the light by absorbing some wavelengths and allowing others to pass through to your eye. In color science, cyan absorbs or subtracts red, magenta absorbs or subtracts green, and yellow absorbs or subtracts blue. So the hue you see is more than it appears to be.



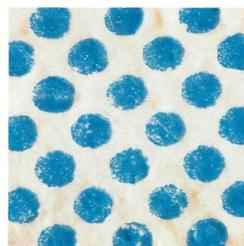
Subtractive color combinations using printing inks.

the coating particles to the base stock in just the right position to reflect light and provide opacity. What's more, our coating binders are flexible enough to allow the paper to bend, fold, score and crease without cracking.

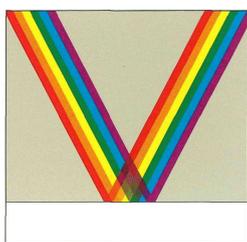
Each Potlatch coating is an exclusive blend unique to each grade and surface. The product of exacting research and constant, evolutionary improvement, our coatings adhere tightly to our base stocks while striking just the right balance between porosity and ink hold-out.

**A STANDING OVATION FOR INK HOLD-OUT** Ink can only deliver color at full intensity when it sits up on the paper surface, which is known as ink hold-out. How well ink stays on the surface is largely a function of paper porosity, or permeability to ink, and coating. The purpose of coating is to provide the perfect surface for printing. That surface must be tight enough—free from holes and channels into the base stock—to hold ink pigment out on the surface for intense color, crisp detail and precise lines and halftone dots. At the same time, it must be porous enough to allow the ink solvent to penetrate the surface to set the ink.

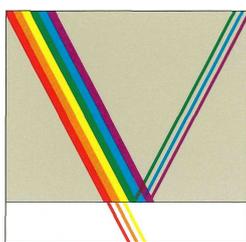
Halftone dots spread into uncoated paper, softening color while losing detail.



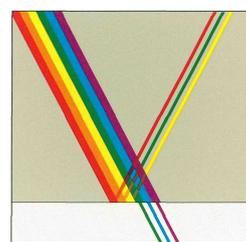
Refined coatings hold ink out for intense color and crisp details.



Neutral shade



Cool shade



Warm shade

#### SPOTLIGHT ON SHADE AND BRIGHTNESS

What's the difference? Shade is the uniformity of reflected light across the full spectrum—in essence, the color of white. Brightness is the amount of light reflected at one specific wavelength: 457 nanometers.

The terms are often used interchangeably, incorrectly. Shade determines how accurately a color image is reproduced while brightness,

like the wattage of a light bulb, enhances impact and creates contrast. Thus, a sheet with high brightness will make artwork and photography pop. A sheet with low brightness will drain art of its intensity.

Shade, we find, is not quite so cut and dry. Shade preferences can be quite personal. That's why Potlatch papers come in a spectrum of whites.

Today, sheets that are blue white like Potlatch McCoy—which is an ultra bright blue white—are more popular than ever. McCoy's dazzling blue white shade favors crisp, cooler tones and, at 96 brightness, it is nothing short of brilliant.

Yet neutral white sheets also yield remarkably true color reproduction. Reflecting all

the colors of light that reach it, Vintage Velvet is an excellent example—a neutral white classic.

All Potlatch papers are very bright. Whether warm, neutral or blue white, they reflect an extremely high percentage of the light that strikes them to yield strong, rich colors and crisp details.

# SURFACES

AT THIS STAGE, OUR HIGH-QUALITY PULP has made it through the papermaking and coating processes. Now, this smooth, bright white surface is ready to polish its act much like actors honing their craft before opening night.

For our matte coated papers, finishing means the application of a refined, high-solids coating. End of story. But for most Potlatch papers, finishing follows the application of the coating in a final, separate step called supercalendering.

A supercalender is a stack of cylinders—some highly polished steel, others softer. Soft roll covers may contain cotton, wool or synthetic fibers. The two types are set in opposition to each other, with a steel cylinder rotating against a softer cylinder. The coated but unfinished paper is fed between the sets of cylinders and given a final polish.

The latest addition to the McCoy family, however, is neither coated nor calendered. The smooth surface and superior formation of our new premium uncoated text and cover sheet owe instead to a special pulp and filler formulation designed for optimal reliability and consistency throughout the printing process.

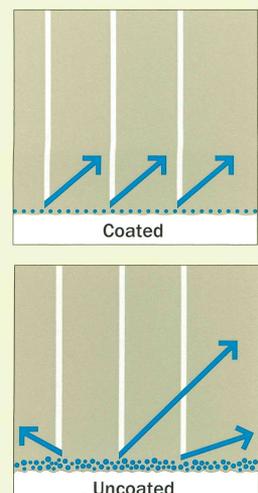
Potlatch Premium papers are available in five distinct finishes: uncoated, matte, velvet, silk and gloss. The choice is up to you. For specific recommendations, please refer to the chart on the next page.

## INNER BEAUTY VS. MERELY SKIN-DEEP

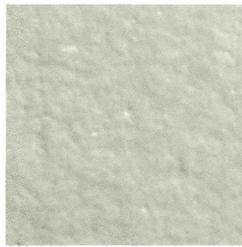
In the paper biz, just like in show biz, it's important to distinguish smoothness from surface gloss. Gloss is an optical attribute that makes the surface appear shiny; smoothness is a physical attribute that refers to the evenness of the paper surface.

Smoothness is critical to quality print production as it determines how evenly ink sits up on the surface. Paper with a rougher, more uneven surface keeps ink from laying flat. As a result, the printed image may appear mottled or soaky, losing its detail.

Potlatch soft-finished papers are remarkably smooth and even, but are not lustrous; they provide excellent ink hold-out without gloss. Potlatch gloss papers combine a smooth surface with a high gloss for uniform ink coverage and light reflection. The result is brighter color and sharp, clear detail.

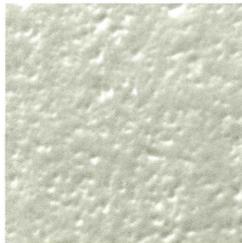


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**GLOSS**

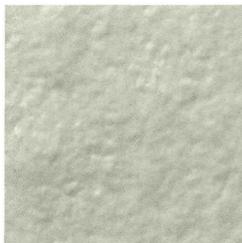
A shiny gloss surface created by supercalendering coating pigments so they reflect light off the surface in the same direction. The result is high reflectance for subjects that require strong ink gloss retention, such as the gleam of paint on a car, the sparkle of glassware and the shine of chrome.

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**SILK**

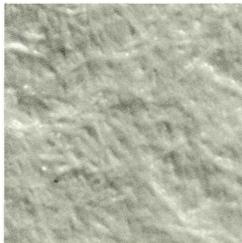
A soft-finished surface with moderate paper gloss. Coating pigments are oriented so that light scatter is controlled. Silk is best for printing subjects that have a tactile sense and require high resolution without high gloss, such as people and fine art. Silk also allows for smooth, flat, solid ink lay and excellent readability.

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**VELVET**

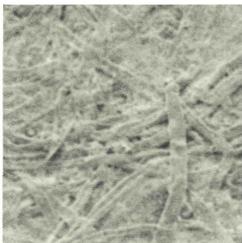
A velvet surface that offers low to moderate paper gloss. Coating pigments and binders are combined to create a surface that scatters light. The velvet surface is best for printing images that need high resolution without high gloss, such as textiles, earth tones and illustrations. Velvet also provides high readability and a tactile feel.

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**MATTE**

A smooth, level surface that is not supercalendered, so it scatters light and retains a soft, "toothy" feel. To create our matte-finished papers, clays, pigments and binders are combined with the base stock to offer the look and feel of uncoated with the print reproduction quality of a coated sheet.

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**UNCOATED**

An uncoated surface in a smooth premium text and cover sheet finish that softens the image and enhances the tactile quality of the surface, adding dimension to fabrics, wood and other touchable materials. The paper is made with the ideal combination of fibers and fillers to achieve good formation and surface, resulting in good print quality.

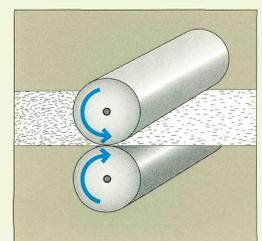
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**SURFACE OR SUBSTANCE: A TRADE-OFF**

Paper is calendered for all finishes—except matte and uncoated. The calendering process, however, carries a price. Just as a laundered shirt flattens when pressed, so too does calendered

paper, causing it to lose caliper, or thickness. As a result, paper that's calendered is not as stiff or as opaque. Potlatch compensates for these effects in our base and coating formulations.

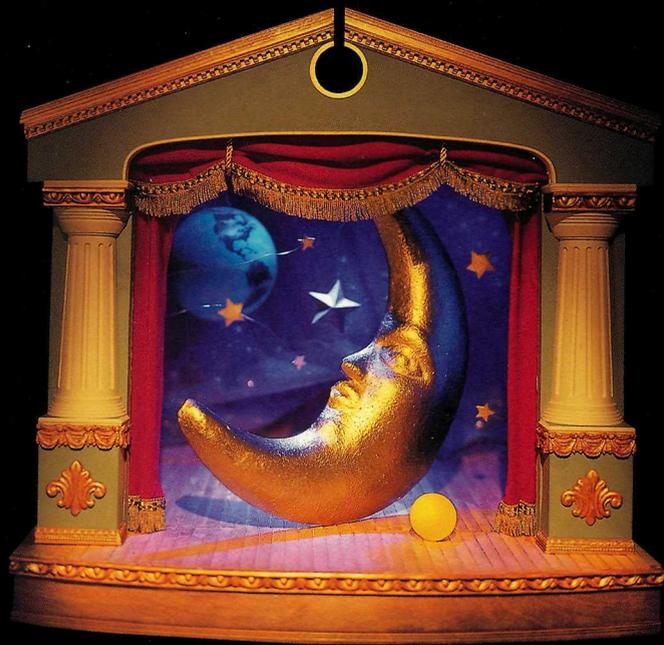
All premium Potlatch papers meet our opacity targets, no matter their finish.



A supercalender is a stack of cylinders—some highly polished steel, others softer. The two types are set in opposition to each other, with a steel cylinder rotating against a softer cylinder.

COATED *vs* UNCOATED  
THE CHOICE IS YOURS

*Under the glare of the spotlight, which paper will perform best? High-quality coated sheets win raves for superior ink hold-out, minimal dot gain, and outstanding ink gloss, while premium uncoated papers earn accolades for warmth, richness and nuance of expression. One way to ensure top performance all the time: Stick with a quality company, where you can expect the best from every member of the troupe.*



# BEYOND PAPER

SO NOW YOU'VE GOT A BEAUTIFUL, bright white sheet that is ideally suited to your project at hand. Now what?

The sheer number of things you can do with your printed work boggles the mind. After all, printing is for communicating, which means you need to get your work into other people's hands.

Want to create a brochure or magazine? Bind a book? Send a piece of direct mail? Then you'll want to know how to transform that fine flat sheet into a three-dimensional tool.

On the pages that follow, you'll find a treasure trove of illustrations and tips to spark ideas and guide your decisions. Because, at Potlatch, we want to help you make sure each project comes out right, on press, post-press and well beyond.

## GOING WITH THE GRAIN

Ever notice how, when you tear an article out of the newspaper, one direction rips straight and smoothly and the other way tears more jagged? That's because paper has a natural grain direction.

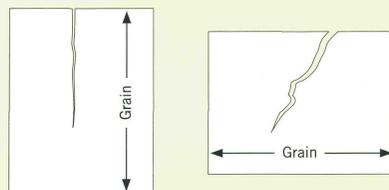
During papermaking, fibers align in the direction in which the Fourdrinier wire moves, which establishes the paper grain. The grain remains no matter what finish gets applied.

Understanding grain direction is especially useful when

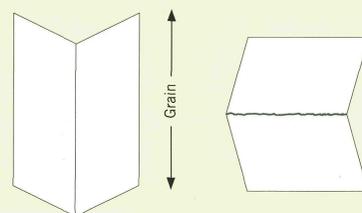
designing for folding and binding, and it can work to your advantage. Pages with the grain parallel to the binding lie flat, turn easily and are less likely to develop waves.

Paper grain and how it relates to stiffness are also important factors to consider. To avoid sagging, the grain direction should be perpendicular to the supporting edge of display cards, file folders and index cards.

### Tear and fold test



Paper tears straighter with grain



Paper folds more easily with grain

## STANDARD FORMS

TODAY'S MODERN PRESSES, whether sheet fed or web, handle thousands of press sheets an hour, a rate so fast it would boggle the mind of Johannes Gutenberg, who invented movable type. As such, today's paper must perform. In all steps of the printing process, it must act smoothly, consistently and in a manner that's most efficient to meet the rigors and economics of a technologically advanced printing plant.

Much of this efficiency comes from paper that is specially designed to run beautifully on press, time after time. Another important ingredient is the press professional or planner, who evaluates each item to be printed and transforms it into a format that makes the best use of pressroom operations.

That's why a typical project, presented to a planner in a designer's or reader's layout resembling the final printed product, will soon become a collection of forms or signatures in the printing plant. These terms refer to the way pages are printed not individually but on a single, multi-page spread and, once printed, are folded together.

How these pages are set up on the press is called an "imposition." An imposition is the arrangement of pages on a press form to ensure the correct order after the printed sheet is folded and trimmed. The imposition layout verifies the page sequence, margins, trims, fold marks and cutting and score lines. It also takes into account how the final printed piece is to be bound.

### PRESS PRIMER

The layout selected depends on the job's requirements and the type of press on which it will be run. Let's examine some of the press terms printers use.

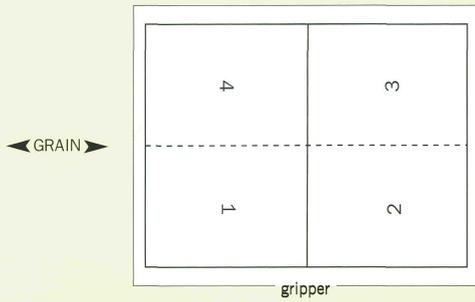
**Sheetwise:** A printing procedure in which a single sheet is printed front and back. Run through the press on one side, the sheet is then flipped and printed with a different image. The gripper, which is a set of metal fingers that holds the paper onto the impression cylinder of the press, and guides remain the same in both passes.

**Work and turn:** More widely used than work and tumble, this printing procedure prints one side of a sheet of paper, then turns it over from left to right and prints the flip side using the same gripper and plate but opposite side guide. This process saves plates and make ready.

**Work and tumble:** This printing procedure prints one side of a sheet of paper, then turns it over from gripper to back using the same side guide and plate to print the second side. This process also saves plates and make ready.

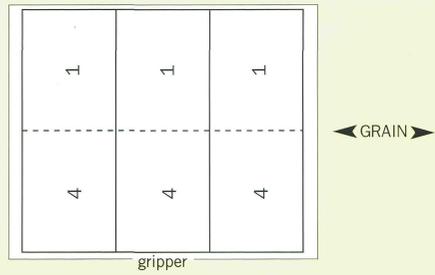
**Four-Page Cover**

9" x 12", one up, two out work and turn



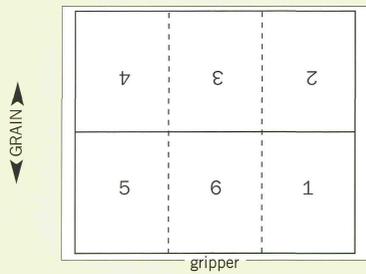
**Four-Page Oblong**

8 1/2" x 11", three out sheetwise



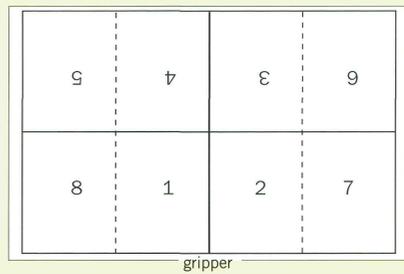
**Six-Page Folder**

8 1/2" x 11", upright, one up, work and tumble, two out



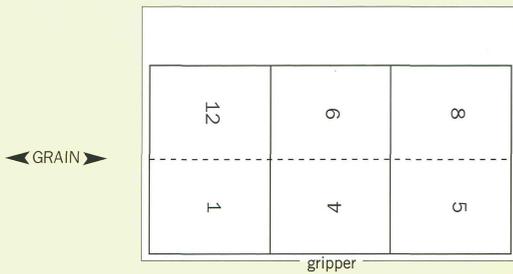
**Eight-Page Booklet**

8 1/2" x 11", one up work and turn, two out



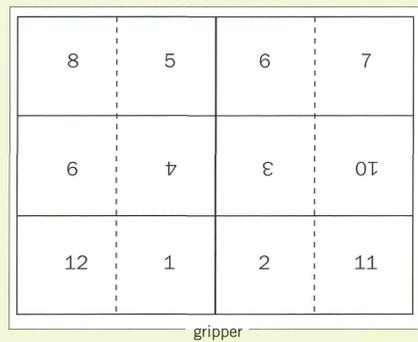
**Twelve-Page Booklet**

8 1/2" x 11", one up sheetwise



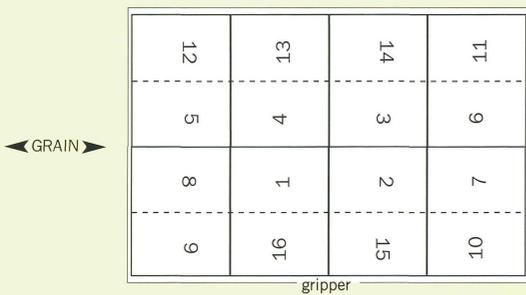
**Twelve-Page Square Booklet**

7" x 7", one up work and turn, two out per sheet



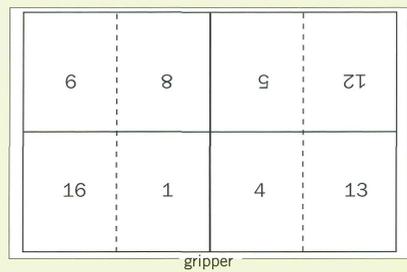
**Sixteen-Page Booklet**

6" x 9", work and turn, two out



**Sixteen-Page Booklet**

8 1/2" x 11", one out sheetwise



Saddle-stitched projects should be designed with page quantities divisible by four, because each sheet, once bound, makes four pages.

For work that is to be perfect bound, the number to remember is two, comprising the back and front of the sheet. Above are sample forms representing some

standard impositions. Count on your printer to determine the form that's most appropriate for your project.

# SCORING

NO, WE'RE NOT TALKING ANDREW LLOYD WEBBER HERE. Scoring is what you do when, without a pair of scissors handy, you fold a piece of paper back and forth, maybe even running a fingertip across the folded edge.

In other words, to score is to crease a sheet to facilitate folding. It's especially useful for heavier text-weight and all cover papers. The thicker the paper, the thicker the scoring rule must be to create a clean fold that also withstands cracking.

There are several types of scores, among them Standard Rule or Matrix method, String (similar to Wire) method and Cut Scoring method. Though they differ in their individual mechanics, each method delivers a firm, clean hinge.

Here's how scoring works: A steel rule or string is used to create an impression in the paper. The score presses the paper into a former and, thus, a bead is created on the back. (In the case of a cut score, the score slices lightly into the paper base stock.) This impression and bead act as a hinge for the paper to bend around.

In general, the score that works best and places the least amount of strain on the paper crease is one in which the bead arcs upward, running with the grain. In other words, a scored sheet when laid flat and face down should contain a bump, not a dip. (See the illustrations below.)

A close relation to scores are perforations. Frequently seen on reply cards, recipes or anything that is to be ripped apart, perforations are the regular cuts into paper that form a predetermined seam for easy tearing. They are measured by the number of cuts per inch. A perfect example is the Opacity Chart, in the section titled Fiber.

## TO SCORE OR NOT TO SCORE

In general, you will want to channel score if your stock is 100-lb. text or heavier, or if the job's height/width ratio is greater than 3:1. If your stock is 80-lb. text and folds against the grain, ask your printer or binder for advice.

The score that works best and places the least amount of strain on the paper crease is one in which the ridge bends inward, running with the grain. Simply put, a scored sheet when laid flat should contain a bump, not a dip.

**Right**  
(face down)



Hinges



Minimum Stretch

**Wrong**  
(face down)

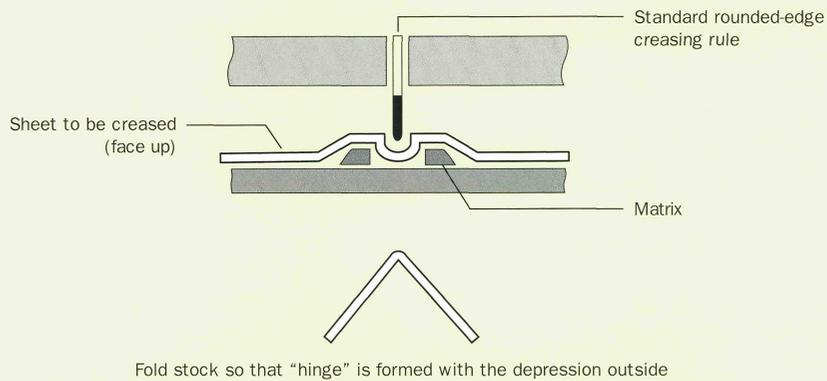


Hinges

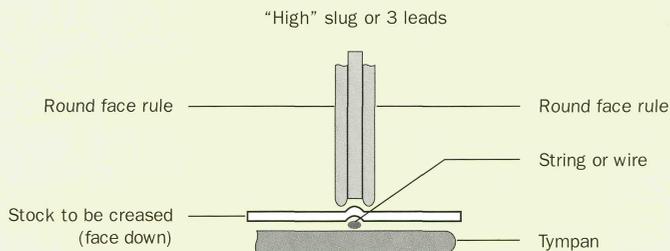


Maximum Stretch

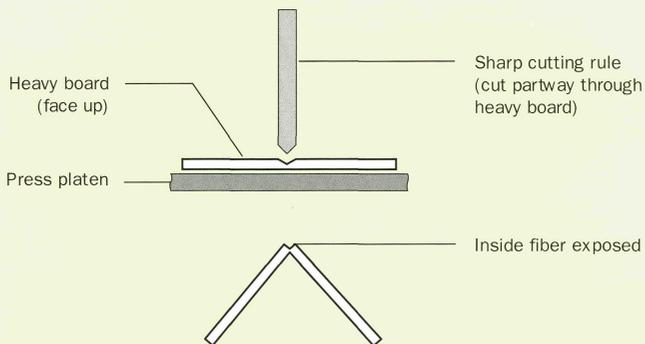
### Standard or Matrix Scoring Rule Method



### String or Wire Scoring Method



### Cut Scoring Method



When it comes to scoring, a diagram says a thousand words. As always, depend on a scoring professional to select the method that best suits your project requirements.

**Standard Rule or Matrix Method:** Used for a wide range of materials, from text to cover stocks, to make what's considered to be a highly accurate score. The rule typically creates a 2 point bead. "Matrix" describes a plastic channel, available in many widths, into which the rule is pressed. Its width is determined by the stock weight, with heavier paper suggesting a thicker channel.

**String or Wire Method:** Often recommended for lighter weight text sheets up to 100 lb. text. Allows scoring to occur on both sides of the sheet in a single pass, handy for reverse folds in projects with multiple panels.

**Cut Scoring Method:** Suggested for heavy stock and boards. Slicing into the stock in effect weakens its memory, which allows for bending. One advantage is the cut-scored sheet will remain flat when unfolded. A disadvantage? Because the score cuts into the base stock, a white stripe often results, which can detract from the project's aesthetics.

## STANDARD FOLDING

FOLDING IS AS SIMPLE as making a single parallel crease across a sheet of paper, like that which forms the spine of a common greeting card. Complexity comes in with the number of folds you desire. For instance, one sheet with two faces—front and back—can develop anywhere from four to 16 faces, or pages, all depending on the number of standard folds you make.

Thankfully, folding machinery makes the job easy. Here's how it works: Using a buckle type folding machine, the sheet is carried by conveyor belt from an automatic feeder, and rollers force the sheet into an adjustable fold plate. There, the sheet hits a stop, buckles, and is then carried between two other rollers, which finish the folding job. Depending on the thickness of your paper stock, you may need to score the job before it is folded. Cracking is often a challenge for papers that are folded. Using binders that are flexible and strong, Potlatch coatings are formulated to withstand cracking. In general, folds along the paper grain reduce cracking.

Sometimes a job will call for more intricate folding, which may be done by hand. These types of folds, while enhancing a project's appeal, can greatly add to its overall cost. Make sure you factor them in.

### INTO THE FOLD

Folds come in two types: parallel and right angle. The folds you make before you put a standard-size sheet of paper into a business envelope are good examples of parallel folding; two creases in the same direction, ideally along the paper grain.

A right angle fold is two or more folds, with each fold at right angles from the one before it.

To make clean folds, many jobs require small variations in panel size. While they may look similar, individual

panels are sized at slight differences to accommodate for paper thickness.

It's also worth remembering that the more folds you have, the lighter the weight of paper required. That's because heavier stock may build up too much thickness

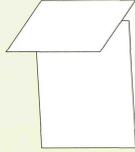
to roll into itself a number of times, or may require wider scoring.

To really understand folding, simply pull out a piece of paper and try making these yourself.

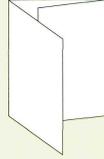
4-page



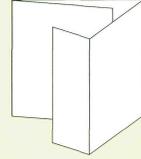
6-page



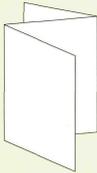
6-page



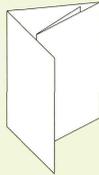
6-page  
with flap



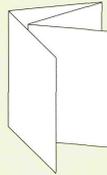
6-page  
Accordion



8-page  
Barrel roll or Roll fold



8-page  
Parallel fold



8-page  
Accordion



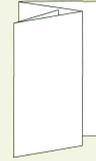
8-page  
Gate fold



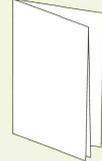
8-page  
Map



8-page  
Reverse map



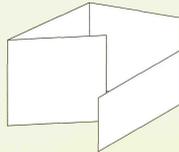
8-page  
Broadside



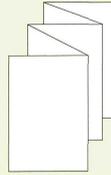
8-page  
Short fold



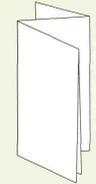
8-page  
Die-cut



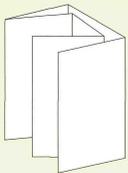
10-page  
Accordion



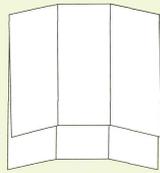
12-page  
Letter fold



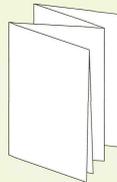
12-page  
3 Parallel folds



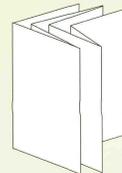
12-page  
Broadside



16-page  
Broadside



16-page  
Booklet



Don't be offended if your paper merchant asks you if you'd like to see a paper dummy. You haven't just been insulted.

Instead, you're being offered a preliminary layout made from blank sheets of paper, folded and bound, with the correct number of pages and folds, in the weight, texture and color you desire, to give you an accurate feel of the final piece.

Is it too stiff? Flimsy? Do the folds work the way you want? You'll want to pay special attention to what the dummy shows you, as it may suggest a modification to your design or paper choice.

# BINDING

BINDING IS THE ULTIMATE STEP, the final hurdle. Once again, you're faced with all kinds of options—though, truth is, they must be weighed much earlier in the design process, well before your project goes to binding. Your design layout, printing methods, folding and trimming—and, not least of all, your budget—depend on it!

The most popular binding methods include saddle stitch, side wire stitch, Wire-O or spiral wire, perfect and case. It's important to consider your choices well, because the binding you choose will impact your project's performance as well as its overall appearance. This book was Wire-O bound for ease of study and presentation.

*Don't forget!* When designing a book that is to be side-stitched, wire or perfect bound, check with your printer so that you leave ample space in the gutter to allow for the extra space required by wire, hole punches or grinding. Otherwise, you'll lose valuable information on the inside margin!

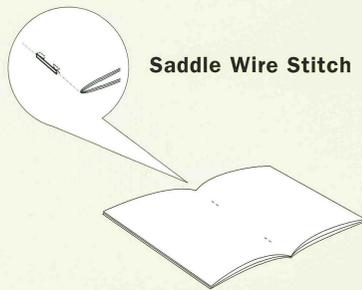
## THE ADVANTAGES OF EACH BINDING METHOD

**Saddle Wire Stitch:** For an example of saddle-stitching, pick up just about any magazine or catalog. With this method, pages are spread open at the center, then hung on a saddle to be stitched, or stapled, through the fold line at the spine. Ideal for projects with no more than about 60 pages, depending on the sheet weight, this is the simplest and most

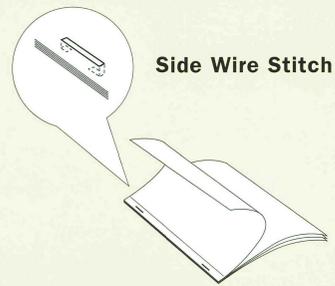
economical way to bind.  
*Advantages:* Allows the book to lie flat for reading ease; can be bound with either a self-cover or a separate cover; economical.  
*Disadvantages:* Page count must be divisible by four, restricting number of pages; least flexible of all binding options.

**Side-Wire Stitch:** A useful alternative for materials that are too thick to saddle-stitch, this method passes wire from the front page to the back about a 1/4" from the interior seam.  
*Advantages:* Useful when used to reinforce perfect bound projects; accommodates multiple sheet weights and sizes; offers single-sheet insertion for flexible page

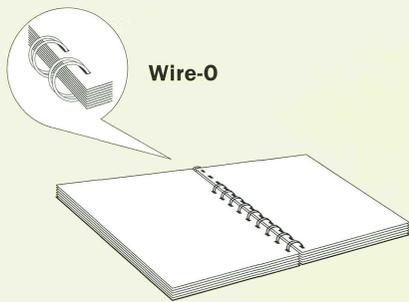
count; can enhance aesthetics for specialty pieces.  
*Disadvantages:* Prevents pages from opening flat.  
**Wire-O® and Spiral:** A method in which pages and cover are held together by a metal coil. Though more expensive than wire stitching, mechanical bindings allow their contents to open wide and lie perfectly flat.



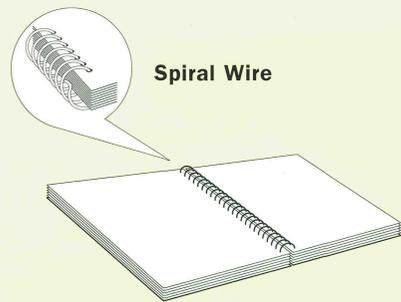
**Saddle Wire Stitch**



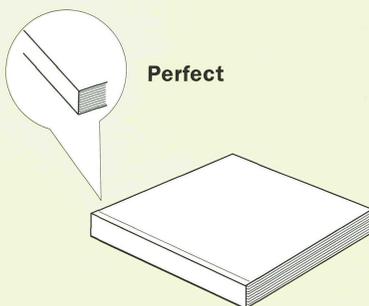
**Side Wire Stitch**



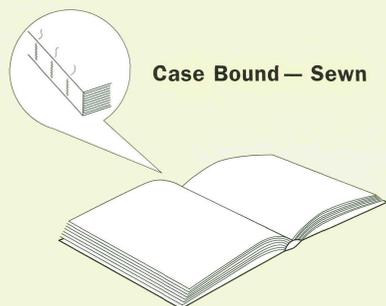
**Wire-O**



**Spiral Wire**



**Perfect**



**Case Bound — Sewn**

**Advantages:** Lays flat; pages can be removed without detection; adaptable to different paper types; offers single-sheet insertion for flexible page count; bindings come in a wide variety of colors.  
**Disadvantages:** Expense; can detract from project aesthetics.

**Perfect:** Most annual reports and bigger catalogs employ this attractive method, in which pages are assembled in groups, or signatures, and bound together with flexible adhesive, then covered.  
**Advantages:** Accommodates greater number of pages and higher page weights than saddle-stitch; accommodates multiple sheet weights and

sizes; allows intermix of stocks, provides clean, finished edge.  
**Disadvantages:** After pages are collected into signatures, binding edge is ground off to improve adhesion. Does not lay flat; crossover images and type may be lost in the gutter.

**Case or Edition:** The conventional method used in most hardcover books. Sheets are folded into 16- or 32-page signatures, pasted with end leaves and sewn together. This process culminates in a hard cover, which ensures durability for years to come.  
**Advantages:** Provides perfect crossover of images page to page; archival quality.  
**Disadvantages:** Most expensive binding method.

## GLOSSARY

**Balance:** The adjustment of paper variables, attributes and materials such as thickness, weight, gloss, pigments and binders to achieve the best possible finished product.

**Base Stock:** Uncoated paper, created in the first step of the paper-making process on which coating is applied.

**Binder:** The liquid component of coating that serves to bind the pigment particles together and bind the coating to the base stock.

**Blade Coater:** An angled blade in the paper or coating machine that controls the thickness of the applied coating and smooths the surface.

**Brightness:** The amount of light reflected by a paper sample at a specified wavelength. (457 nm.)

**Calcium Carbonate:** White pigment used as a filler and coating pigment in papermaking. A number of types are available depending on particle size and shape.

**Cellulose:** Material that forms the cell walls of trees from which fiber is taken.

**Clays:** Natural, fine-grained, plate-like white pigment used as a coating pigment. A number of grades are available depending on particle size and shape, as well as brightness.

**Coating:** A combination of binders and pigments applied to paper which defines the color and creates the printing surface. Each coating is formulated to match the finish.

**ECF Elemental Chlorine Free:** Chlorine compounds replace elemental chlorine in the bleaching process. The result is the same bright white pulp, with no detectable chlorine levels.

**Fiber:** The cylindrical cells of trees used as the primary ingredient in making paper.

**Filler:** Material added to pulp to fill the voids between fibers.

**Finish:** The final paper surface characteristics, mainly imparted mechanically. Potlatch offers four distinct paper finishes: Matte, Silk, Velvet, and Gloss.

**Fourdrinier Table:** The first stage of a papermaking machine consisting of a rapidly moving, porous belt whose purpose is to give the paper its initial formation and to remove a high percentage of the water from the pulp.

**Freesheet:** Paper from whole wood fiber which has been freed of lignin.

**Gloss:** An optical attribute which causes a shiny appearance.

**Gloss Finish:** Extra-smooth finish applied to paper to achieve even light reflectance, ink hold-out and uniform ink films.

**Grain Pattern:** Alignment of fibers roughly parallel to the direction of the papermaking machine.

**Gripper:** Metal fingers that clamp on paper and control its flow as it passes through a printing press.

**Ground Wood:** Mechanical pulping process in which wood blocks are mechanically ground into pulp. Also lower cost, rougher types of paper, such as newsprint, made with pulp generated in this process. All Potlatch papers are ground wood free.

**Halftone:** Print or printing plate in which details and tone value of an image are recorded by means of tiny dots of varying size, shape and proximity.

**Hardwood:** Wood produced, generally by broadleaf, deciduous trees (which lose their leaves in fall) such as aspen, maple, oak and birch. Hardwoods, particularly northern species, tend to produce short, thin fibers, ideal for smooth papers.

**High-Solids Coating:** Coatings which are 65% or more solids for superior printability.

**Ink Hold-Out:** The resistance to the flow of ink pigments into the paper surface. Good ink hold-out assures uniform halftone dots, intense color and crisp details.

**Kraft Process:** Chemical pulping process which yields whole wood fibers and is noted for producing the strongest pulps. The word "kraft" means strength in both German and Swedish.

**Lignin:** The natural substance which binds wood fibers together for strength.

**Matte Finish:** Finish with good smoothness, but without gloss.

**Opacity:** The obstruction of the passage of light through a sheet of paper.

**Pigment:** Refined materials, such as titanium dioxide, calcium carbonate and kaolin, used to color paper. White pigments are commonly employed as fillers in papermaking finishes and are the principal ingredient in coating mixtures.

**Point:** The basic measurement of paper thickness, equal to 0.001 inches.

**Polish:** The amount or degree of glossiness of paper finish.

**Porosity:** The quality of paper surface. Uncoated papers have very open, porous surfaces. Coated papers are more closed or tight with lower porosity. Porosity relates to the degree to which the surface will hold ink out.

**Pounds:** The weight of paper. Paper is sold by the pound or hundred weight.

**Reflectance:** The reflective qualities of a paper surface. Papers with good reflectance reflect a high degree of the light which strikes them.

**Signature:** The name given to a printed sheet after it has been folded.

**Silk Finish:** A smooth soft-finished surface with moderate paper gloss. Coating pigments are oriented so that light scatter is controlled.

**Smoothness:** The degree to which a surface is regular or free from high and low spots.

**Soakiness:** Extreme ink absorbency where ink penetrates the paper surface.

**Softwood:** Wood produced by coniferous trees such as Red and Jack pines. Typically, softwood trees have needles which don't drop in Autumn.

**Solvent:** Solvent portion of printing ink which is removed to allow ink setting to occur, and principal of lithography. Oil and water, or ink and solvent, do not mix.

**Supercalendering:** The final paper finishing operation in which coated paper is fed between a stack of alternating steel and fiber rolls to be polished to various levels of gloss.

**Tightness:** The degree of openness or porosity of the paper surface. The tighter the surface, the less ink and ink pigments will penetrate into the surface.

**Tradeoffs:** The reduction or expansion of one paper attribute because or at the expense of another. For example, to achieve a high-gloss finish, thickness will be reduced.

**Velvet Finish:** A unique Potlatch finish where blade-coated paper is processed through a supercalender to develop smoothness with a minimum of gloss.

**Weight/Basis Weight:** The weight of paper per ream or per a specified area.

*The* POTLATCH  
**P R O M I S E**

POTLATCH PAPERS

*are*

**100 % GUARANTEED.**

**IF FOR ANY REASON**

*you are* **NOT SATISFIED** *with how*

**OUR PRODUCT PERFORMS**

*on* **PRESS,**

**WE WILL REPLACE IT.**



## POTLATCH SERVICE

For answers to print-related questions, call our Graphic Arts Helpline at 800-832-8966.  
Visit Potlatch on the web for detailed product information at [www.potlatchpaper.com](http://www.potlatchpaper.com)

## PRINTING ON SOFT FINISHES

Soft and inviting, Silk, Velvet and Matte finished papers have their own set of production needs. The very surface and finish qualities that make them attractive—including their good opacity, bulk, and readable/writable non-glare surface—also make marking a concern. Using inks formulated with hardeners, Teflon® or scuff resistors will reduce the problem. Applying dull or gloss varnish over inked areas helps prevent inks from rubbing off onto facing pages. Varnishes and metallic inks may lose some reflective qualities.

## PRODUCTION NOTES

### PAPER

*Cover:* Potlatch McCoy Gloss 120-pound cover.  
*Divider tabs:* Vintage Gloss 120-pound cover.  
*Text pages:* Potlatch McCoy Velvet 100-pound text.

### COLORS

#### *Cover*

*Outside:* Standard four-color process with red touch plate, two hits match red, two hits black, overall satin aqueous coating.  
*Inside:* Two hits black, two hits match red and tritones consisting of two blacks and match cream, overall gloss aqueous coating.

#### *Divider tabs*

*Front side:* Standard four-color process, two hits black, overall gloss aqueous coating.  
*Back side:* Two hits black, two hits match red, overall gloss aqueous coating.

#### *Color portrait comparison*

Standard four-color process, in-line spot gloss and dull varnishes.

#### *Color still-life comparison*

Standard four-color process, in-line spot gloss and dull varnishes.

#### *Black and white comparison*

Standard four-color process, black and match gray duotone, in-line spot gloss and dull varnishes.

#### *Illustration comparison*

Standard four-color process, in-line spot satin and dull varnishes.

#### *Solid color comparison*

Two hits match red, match gold metallic, two hits match purple, two hits match black.  
Dry trap spot dull and gloss varnishes.

#### *Uncoated vs. coated comparison*

Standard four-color process, match red, match gold metallic, four-color black.  
In-line spot dull and gloss varnishes.

#### *The art of paper/Beyond paper*

Standard four-color process, match red, dull cream tint varnish, match gray.  
and spot satin varnish.

## PRINTING

### *Separations*

Original transparencies scanned 200 line for coated papers, 175 line for uncoated papers, with stochastic yellow on a Linotype Hell 3900 scanner. Separations for the uncoated papers were adjusted to compensate for gain on press.

### *Proofing*

Kodak Approval Digital Proofing System. Barco to Creo direct-to-plate interface for composing and plating.

### *Presses*

Printed on 28" x 40" Heidelberg CD 6 and 8 color presses with in-line coating.

*Inks:* Process inks, match inks and varnishes – Toyo.

## CREDITS

Front cover, divider stage scenes, knight portrait, french horn: Joe Paczkowski, RipSaw, Minneapolis.

Inside front and back cover: Jeff Corwin, Seattle.

Black and white dancers: Bill Phelps, New York.

Cinderella illustration: From *The Thread of Life: Twelve Old Italian Tales* by Domenico Vittorini, illustrated by Mary GrandPré illustration ©1995 by Mary GrandPré.

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Concept, copy and design:  
Kuester Partners, Inc., Minneapolis

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