



Business Printing

HANDBOOK

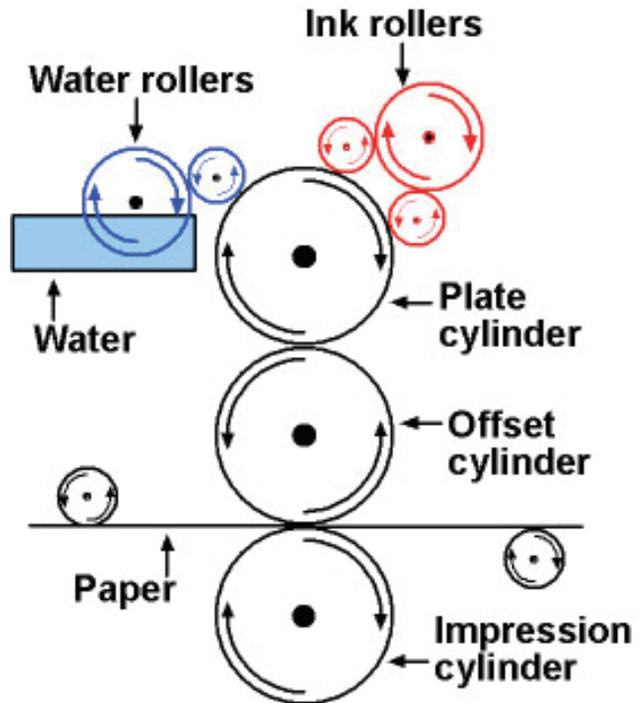


WORK DESIGNS
LLC

www.workdesigns.com

Offset Lithography

A Brief History of Offset Printing



Oil & Water

Offset printing is based in the lithographic process (litho- meaning 'stone' and -graph meaning 'to write'). It works on the principle that oil and water don't mix. Historically, images were drawn on smooth stones with fat, oil, or waxy crayons. The stone was then coated with water, which was repelled by the oily areas of the image, and inked with an oily ink that stuck to the greasy drawing but not the water. The inked image could then be transferred to paper using pressure to create a *reversed* or *mirrored impression* of the drawing.

Offset Printing

The offset press operates on the same idea, but replaces the stone with a metal plate and the wax crayon drawing has been replaced by a photosensitive film that

repels water in the same way. The offset method got its name from the addition of a rubber blanket into the process. Instead of transferring the image directly from plate to paper, it is first transferred to the blanket (offset) and then transferred from blanket to paper. This extra step prolongs the life of the plate and also means that the image *is not mirrored* when transferred to paper. The plates are kept wet and inked in the same way as lithography stones.

Modern Plates

It used to be that the image was burned into the film by exposure to light through a transparent positive and screens, but within the past few decades this process has been digitized and images are often printed directly onto plates now.

Halftone Screens

Creating a Range of Continuous Tones with Tiny Dots



Halftone Dots

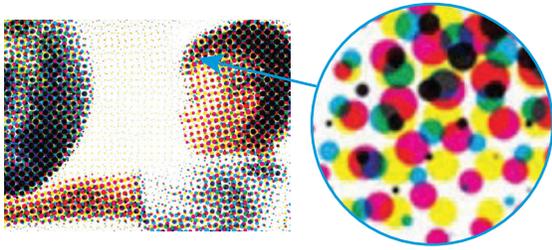
Because lithographic printing is only capable of printing solid areas of ink, a method of generating continuous tones was created by breaking the printed area into dots of varying size. This pattern of tiny dots was originally produced by placing a screen between the positive and the plate during exposure, but is now usually generated by computer software. The dots mix optically from a distance in order to create a wide range of light to dark values in a photographic image.

Moiré Patterns

Because of the way screens interact when overlaid, interference patterns can emerge in some images. These are called moiré patterns, and are now most commonly seen in printed images that have been scanned and reprinted. This is one of the reasons (aside from copyright) why we are unable to reuse magazine or other printed imagery in newly printed material.

Spot vs CMYK Process

Creating Full Color from Four Colors



Spot Color

We refer to prints made with inks that are *physically mixed* to produce a specific color as spot color. Spot color prints can involve one or more colors, though typically no more than two or three. The number of colors per side on a print is expressed as 1/0, 2/2, 2/0, etc. For example, 1/0 means one color on one side and no print on the opposite side.

Spot colors are mixed according to standard Pantone (PMS) formulas. Each color formula is associated with a color name or number which can be found in PMS swatch books. Although spot colors can be screened to produce a range of tones, they are generally only used in this fashion for monotone or duotone images.

CMYK Process Color

Process color is also often referred to as 4-Color, Full Color, or CMYK printing. These prints are made by splitting the image onto four color plates that are screened into halftone dots and overlaid with very close registration (careful alignment). The term

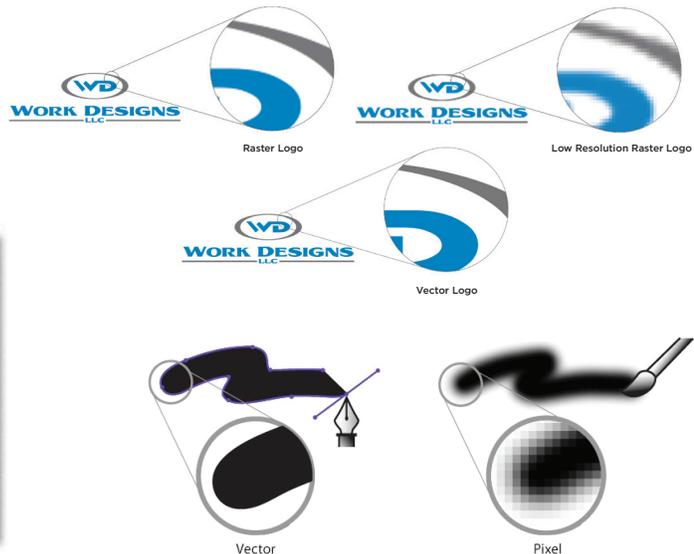
CMYK comes from the colors that are always inked onto these plates: Cyan, Magenta, Yellow, and blacK. From a distance, the human eye blends these four colors together *optically* in order to produce a very wide range of colors. This process is used to produce photographic quality imagery, however it is important to know that not all spot colors can be perfectly reproduced in the CMYK process.

RGB Color

Another type of optical full color mixing occurs with RGB color. RGB stands for Red, Green, and Blue. RGB color mixture is created with light instead of ink and generally refers to colors that appear on televisions or computer monitors. Due to the nature of ink on paper vs light, CMYK process printing is not able to produce as wide a range of color as RGB, which can produce much brighter and more vivid colors. *For this reason, we are often unable to match colors that are created in an RGB color space.* This also applies to HEX color codes, which are colors used in web design.

Raster vs Vector Graphics

Good Prints Come from High Resolution Photos and Vector Art



Raster Images

Raster or bitmap images are digital images that are composed of a grid of small rectangles called pixels. The level of detail and clarity in an images increases as the number pixels it contains in a given area increases. This is referred to as *resolution* and is measured in terms of DPI (dots per inch) or PPI (pixels per inch). Typical raster file formats would be .jpgs, .psds, .gifs, and .pngs although there are others.

High vs Low Resolution

Generally speaking, a higher DPI leads to a higher resolution in a raster image. For commercial printing, the minimum resolution to produce a high quality print is 300dpi. For images with rasterized text, we prefer to use 600dpi. Web graphics are concerned with reduced files sizes (for better download speeds) and are therefore usually set to 72dpi. For this reason, we are almost never able to produce a high quality print from imagery taken from a website, unless that website specifically offers high resolution photos. We can always reduce

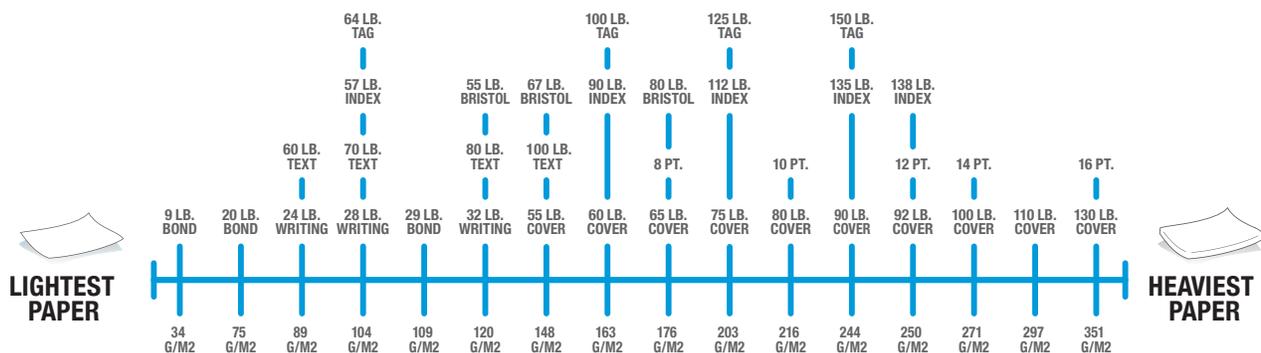
resolution in a file, but we cannot safely increase resolution. Although photoediting software allows for an increase in resolution, this is an approximation based on nearby pixels and does not truly increase clarity within an image. Resolution in an image is also tied to physical dimensions and therefore, for this same reason, raster images can be reduced in size but not safely enlarged (or scaled up).

Vector Graphics

Vector graphics, on the other hand, are visual interpretations of mathematical curves and are, in theory, infinitely scalable (up or down). This means that flat graphics and text are best handled in vector formats, and logos should always be designed and printed in vector. Typical vector file formats are .pdf, .svg, .eps, and .ai, but please note that although these files *can* contain vector graphics, they *do not always* contain vector graphics. Because separating print colors during prepress is much easier with vector graphics, vector art is also required for most *spot color* printing.

Paper Choices

Selecting Weights and Coatings



Pounds & Points

Paper thickness—or weight—is expressed in terms of *pounds* (written as ‘lbs’ or ‘#’) and *points* (‘pt’). Points are pretty easy to compare, because they are a direct measurement of the thickness of the paper. Each point is equal to 0.001 inch; for example, a 10pt stock is .010 inches thick. When a paper weight is expressed in pounds, however, it can be more complicated.

The ‘Basis Weight’ of a paper is the weight of 500 sheets in that paper’s basic sheet size, but the “basic sheet size” is not the same for all types of paper. *This means that we cannot know if a 100# sheet of paper is thicker than an 80# sheet of paper without knowing what type of paper it is.* The chart at the top of this page gives an idea of Equivalent Weights and can be used for a *rough* comparison.

Another unit of measurement is G/M2 (grams per square meter) but this is a metric measurement and not something that we encounter very often here.

Cover vs Text

Paper weights *can* be confusing but, when a specific paper is not requested, we can simplify things by choosing between 100# cover or 100# text (two standard options). Cover vs text is easy to remember if you think about a catalog or paperback book. The cover is generally thicker

and often printed on cover stock, while the inside pages (where the text goes) is thinner and often printed on text stock, like the pages of a magazine. The distinction between cover and text weight paper gives us an idea of what the customer is looking for and a good place to start when selecting paper types.

Coatings

Papers also come in different coating options, for example: uncoated, gloss, matte, aqueous, silk laminate, etc. This is often expressed by ‘C1S’ (coated on one side) or ‘C2S’ (coated on both sides). Additionally, some papers can receive a high gloss UV coating either on the entire print or on spot areas (called a ‘spot varnish’). Please note that coating *will* affect ink color. When selecting PMS colors for an uncoated stock, the uncoated Pantone swatches should be referenced.

Other Paper Types

We sometimes receive requests for other paper types, such as sythetic, vellum, plastic, recycled, textured, etc. These are often difficult and expensive to produce, however the most common exceptions to the cover vs text paper choice are with envelopes and NCR forms, which we do print often. Another common paper choice is linen textured paper.

Other Options

There Are Many Specialized Options — Please Ask Us for More Information

Foil & Embossing

Foil stamping is the application of a shiny metallic or colored foil to a print.

Embossing is the creation of a raised area of the print. Embossing can also be 'blind,' meaning it can occur on areas of the paper without ink or foil, creating interesting textures or subtle designs. Both of these processes involve the creation of a die, which is material that has been cut into the shape of the application. This means that these processes are often expensive and involve additional setup charges.

Die Cuts

Die cuts are special cuts made into the paper in order to shape it, such as with rounded corners or custom edges. Business card slits are also die cuts. Like foil and embossing, die cuts require the creation of a die and therefore additional fees if the cut does not use a standard die.

Thermography

Thermography uses heat and special inks to create a raised, textured print. This is a spot color process.

Perforations & Numbering

Perforations and numbering options are available on many items. For perforations, we will need to know the location and number of 'perfs.' For numbering, we will need to know the location and color of the numbers as well as the starting number.

Folding & Scoring

There are many folding options available, from z-folds to gate folds, but by far the most common is tri-fold. For prints that have

a lot of ink coverage or that use a cover stock, scoring is recommended. This helps to prevent the ink from cracking along the fold and helps to make sure the fold sticks.

Booklet Binding

We have a few booklet binding options available: spiral, perfect-bound, and saddle stitched. Of the three, saddle stitched is what we usually use for booklets and it is done by folding the pages in half and inserting metal staples into the spine. It is important to remember that, because of the fold, the total number of pages in a saddle stitched booklet (including the cover) must be divisible by four. If the page count is not divisible by four, additional blank pages will need to be added. We will also need a final page count in order to quote booklets.

Padding

Notepads, graph pads, etc. come in various sizes and are typically glued together on one edge. In order to provide an estimate on pads, we will need to know how many sheets per pad (usually 25 or 50) in addition to number of pads and size.

NCR Forms (No Carbon Required)

For NCR forms, we will need to know the number of parts (and sets) as well as their colors in order to generate an estimate.

Envelopes

In addition to size options, envelopes come with choices of window and inside tint. Some envelopes also have a 'peel & stick' adhesive option or a choice between catalog or booklet opening.

Estimate Requests

This Additional Information Is Needed in Order to Provide a Quote

Quantity

One of the most important pieces of information needed in order to get an estimate on a job is the quantity. Not only does the quantity determine the price per printed item, it also determines the printing method (digital or offset) and in some cases the printer. If a customer is unsure of an exact quantity, we will be happy to provide several options, but we still need a rough idea of quantity to work from.

Often printers will have minimum quantities, determined by the item. The reason for this is that our printers gang-run print jobs. Since the setup of an offset press is a time-consuming process, printers often print multiple jobs from different customers at once on very large sheets which are cut down. This keeps the cost down. If you are unsure about a minimum quantity on a project, please ask and we will be happy to find an answer for you.

Page Count

In addition to overall quantity, we will also need a page count for items that have multiple pages (such as booklets, pads, and NCR forms). Paper printing is priced by the page (or impression) rather than by the final product.

Size

Knowing the final size is equally important when pricing a job. Other sizes are available, but some common sizes are:

Business Cards: 2x3.5

Flyers/Brochures: 8.5 x 11 (letter) or 8.5x14 (legal)

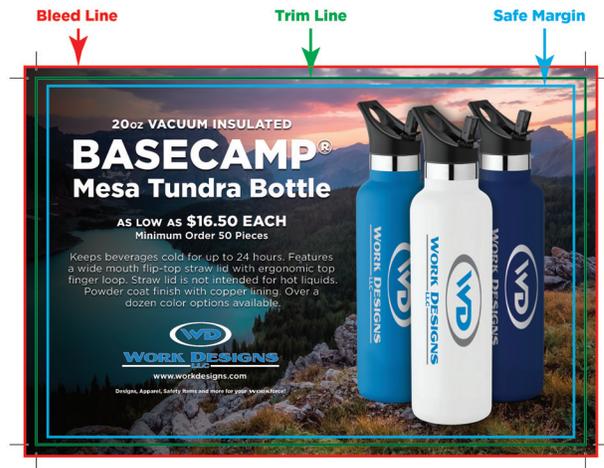
Pocket Folders: 9x12

Push Cards or Rack Cards: 4x9

Postcards: 4x6 and 5x7

Notepads: 5.5x8.5

and occasionally we print 11x17 (tabloid) items.



Bleed & Gripper

If the art or background on a print extends all the way to the edge, the item must be printed on a larger sheet of paper and cut down to size. Because paper can shift slightly during trimming, the artwork needs to be extended beyond the cut edge by 0.125 inches in order to avoid areas of bare white paper along the edges. This extra space on a design is called a bleed. The art will also require a 0.125 inch safety margin inside the trimline to avoid cutting off important text and images.

If artwork is printed at actual size, there will need to be a blank 0.25 inch margin around the art. This margin may also need to be extended 0.375 to 0.5 inches along one edge to allow for grripper space. This is the unprintable area where the press grips the sheet.

Other Concerns

Please be sure that images provided by the customer are not copyrighted or that the customer owns the images. If stock images or custom illustrations will be required, please inform us when requesting a quote.

If possible, please provided printed samples for items that must be closely reproduced.

Glossary

Common Terms Used in the Design and Printing Industry

BLEED refers to the area of an image that generally extends 1/8th of an inch beyond the final, trimmed dimensions of the artwork on each side. After printing, the final product is cut to size and the bleed portion is discarded. This allows for an image to take up the entire surface of a print, from edge to edge, without a margin.

CMYK is the standard abbreviation for “Cyan Magenta Yellow black,” the ink colors used in four color process printing.

CROP MARKS are small lines that appear just outside the corners of a trimmed image and indicate where the print is to be cut.

DPI stands for “Dots Per Inch,” and is used to measure the resolution of a printed image.

DUOTONE An image that uses two ink colors in combination along with halftones in order to create a range of values, such as a sepia tone image.

EMBEDDING fonts in your PDF helps to prevent issues resulting from missing or conflicting fonts. If a font is not embedded or outlined, it can sometimes be substituted by a completely different font. In order to ensure that correct artwork is printed as intended, it is necessary to outline the typography or embed all fonts.

FILM POSITIVES are the color-separated images printed on transparent film for masking exposures in the screen printing process. A film positive contains all of the color data for any single color that appears in the artwork.

FOUR COLOR PROCESS is sometimes abbreviated as 4CP or simply called “process.” It refers to “full-color” images printed with cyan, magenta, yellow, and black ink (CMYK). Generally this printing method is used for printing photographic imagery or for art that would otherwise require more than four spot colors, as the combination of these inks can produce a wide variety of colors.

HALFTONE refers to the pattern of tiny dots used to create screened tones of colors on plates and screens. Halftone dots range in size and shape depending on the application and process. When juxtaposed, these dots of limited solid colors mix visually to produce a wide range of color in process printing.

ILLUSTRATOR is a computer application used for creating vector imagery.

INDESIGN is a computer application often used for creating multiple page or text-heavy print documents, and for setting up documents for press.

KERNING refers to the space between letters or characters. To “kern” is to adjust these spaces for balance and readability.

LEADING refers to the amount of space between lines of type.

LETTER SPACING refers to the average distance between letters or characters.

MARGIN refers to the space between the edge of the page and the boundary of the printed image or text.

MOIRÉ refers to an unintended pattern of dots or lines in an image that can occur from misaligned screens or from making a screen of an image that has already been screen (for example, printing a scanned magazine image in four color process). In order to avoid moiré patterns, we ask that all submitted artwork be original digital files.

MONOTONE An image that uses a single ink color, often making use of halftones to create a range of light and dark values such as a grayscale image.

OFFSET PRINTING is a method of printing whereby an image is burned onto a plate, which is then inked. A roller passes over the inked plate and picks up a reversed impression of the image, which is then reversed again when transferred to paper as the final print.

OUTLINED fonts are vector fonts that have been converted from editable type to shapes in a program such as Adobe Illustrator. Work Designs maintains an extensive font collection, however there are a great many fonts out there and there can be many different versions of any one font. In order to prevent issues with conflicting or missing fonts, Work Designs requests that the type in submitted artwork be either outlined or embedded in the file.

PHOTOSHOP is a computer application used for editing photographs and designing raster imagery.

PIXELATION occurs in digital images when the image resolution is too low for the desired output. Pixelation refers to the visibility of the tiny squares that make up a raster image, and most often occurs when a low resolution image is enlarged.

PLATE generally refers to the sheet of metal or plastic on which an image is “burned” and inked for printing. It can also refer to the artwork that will appear on the plate.

PMS is an abbreviation for Pantone Matching System, and refers to spot color printing. Colors are chosen from a book of swatches rather than on-screen in order to ensure consistency. Some PMS colors are named but most are labeled number and often followed by a letter or letters which indicate additional information such as coated or uncoated, for example: PMS 187c.

POINT or “point size” often refers to the size of a font. A point is 1/72 of an inch. Point can also refer to paper thickness. For paper, a point is equal to 0.001 inch.

PPI stands for “Pixels Per Inch,” and is used to measure the resolution of a digital image.

Glossary

Common Terms Used in the Design and Printing Industry

PREPRESS is the process of preparing art files for printing and involves all post-design work done in order to get the artwork onto plates, screens, etc prior to printing.

PROOF refers to a sample of the finalized artwork that is submitted to the customer for approval before going to print. Proofs may be printed samples, but generally we present digital proofs in the form of PDFs and JPEGs unless requested otherwise.

RASTER or “rasterized” graphics are digital images, like photos, that are composed of a pixel grid.

REGISTRATION involves positioning an image relative to the surface on which it will be printed (paper, shirt, etc.) as well as the aligning of plates or screens. If plates or screens are not perfectly registered, the print can appear blurry or out of line. Small target graphics or crosshairs that appear outside of the image are usually used to aid in registration, and are referred to as “registration marks.”

RESOLUTION refers to the crispness of an image and is measured in DPI or PPI. An image with a low resolution will have visible dots when printed or, in the case of digital art, will appear pixelated. As a rule of thumb, standard resolutions for printed images are between 150 and 600dpi, with 300dpi being the preferred resolution. On-screen graphics are typically more forgiving, therefore the resolution for web-based images is 72dpi. Because of this, photos taken from the internet are generally poor choices for printed imagery.

RGB stands for “Red Green Blue” and refers to on-screen colors used in digital imagery and web graphics. Due to the nature of RGB, special care should be taken in converting colors to CMYK for printing as not all RGB colors can be replicated using CMYK. When designing graphics for print, it is usually best to begin work in CMYK in order to produce on-screen colors that will more closely match printed material.

SANS SERIF translates to “without serif” and references typefaces that lack the decorative lines at the ends of strokes. Sans-serif typefaces are also sometimes called “gothic,” and examples include Helvetica and Franklin Gothic.

SCALE refers to the size of an image, and typically to the resizing of the image by a percentage amount while maintaining the same proportions.

SCREEN refers to the dot pattern of an image when printing less than 100% of the ink (eg. a 50% screen). “Screen” can also refer to the screens that are used instead of plates in screen printing.

SCREEN PRINTING is the process we use for printing on shirts and apparel. It involves coating a mesh screen with a photosensitive emulsion and exposing the screen to a bright light masked by a positive film of the design. The areas that are exposed to light become fixed, while those blocked from light by the

positive wash away during the “blow out” process. The areas where the emulsion has hardened and not washed away resist ink being pushed through the screen. This means that when ink is pushed through the screen with a squeegee, it only flows through the areas containing an image. Once the ink passes through the screen onto the shirt, it is dried in a high temperature oven. Multiple color prints use a separate screen for each color.

SEPARATIONS refers to artwork that has been separated into the various colors necessary for the printing process. In color printing, the colors in images must be broken down and split between the plates or screens. In spot printing this is usually straightforward, but in four color process printing and simulated process screen printing special attention needs to be paid to screening individual colors so that they mix visually to produce new colors in the final print. We also refer to the process of teasing out colors into film positives as “separations.”

SERIF refers to the small decorative lines that project from the ends of main strokes in roman typefaces, such as Garamond and Times New Roman.

SEW OUT refers, essentially, to an embroidered proof and is presented to the customer for approval before embroidering the actual items.

SIMULATED PROCESS is a method of screen printing that tries to recreate the complex color transitions and mixing that occurs in images such as photographs on items such as t-shirts. Due to the interaction of screen printing inks with fabrics and fabric colors, CMYK printing is not always the optimal method for printing this sort of imagery. Simulated process printing tries to pick out the most important colors in an image and, through clever mixing by screening back and layering sometimes more than seven or eight colors, use those to create a range of color options that would not be possible with the standard four color process inks.

SLAB SERIF or “Egyptian” typefaces have thick, blocky serifs. Examples include Clarendon and Rockwell.

SPECS or “specifications” refers to all of the details of a print job, such as size, quantity, number of colors, paper or other print surface, etc.

SPOT COLOR is generally used to distinguish CMYK or “process” printing from prints made with non-standard or pre-mixed inks, such as Pantone (PMS) inks.

STITCH COUNT is a measure of the total number of stitches used in an embroidered design.

THREAD COUNT refers to the number of threads (horizontal and vertical) in a square inch of fabric.

VECTOR refers to graphics that are electronically coded as lines rather than pixels, allowing them to be scaled perfectly without pixelation, Vector graphics are therefore ideal for creating and submitting logos and type.

Fold & Envelope Types

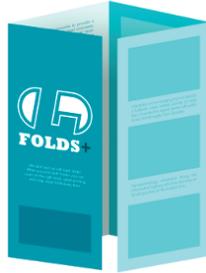
Availability May Depend on Size



**4 PANEL
ACCORDION FOLD**



**4 PANEL
ROLL FOLD**



**CLOSED
GATE FOLD**



**DOUBLE
PARALLEL**



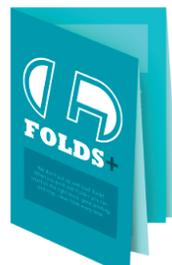
HALF-FOLD



**HALF FOLD
TRI-FOLD**



**OPEN
GATE FOLD**



QUARTER FOLD



TRI-FOLD



Z-FOLD



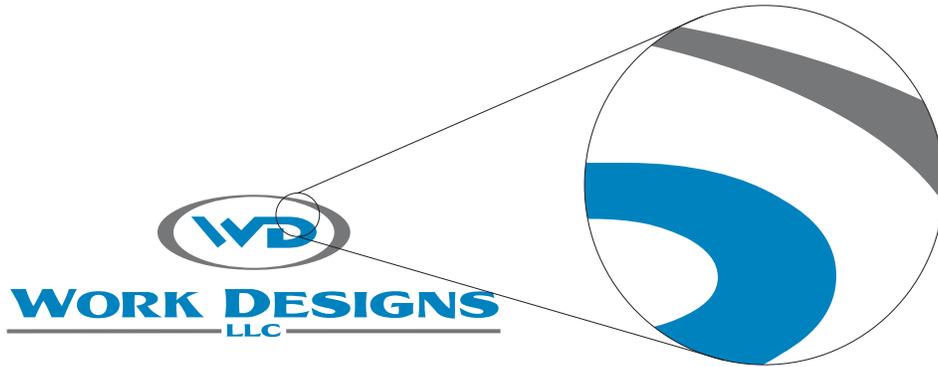
CATALOG ENVELOPE FLAP



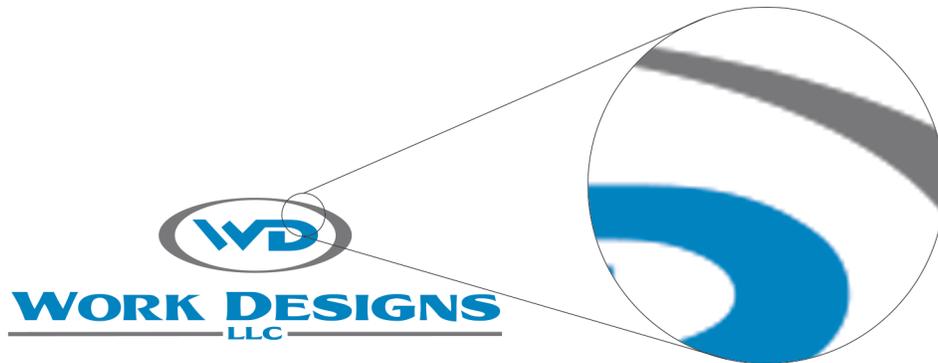
BOOKLET ENVELOPE FLAP

Resolutions

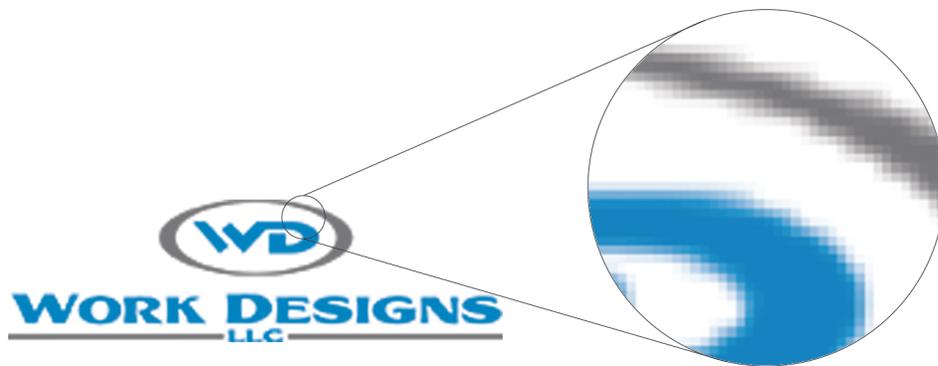
Examples of Vector and Raster Versions of a Logo



vector



300dpi



72dpi