AN INTRODUCTION TO PRINTING, PAPER and BINDING OPTIONS
by Philip Zimmermann

Five Printing Options: The choice of printing process is critical, from durability and cost standpoints to overall aesthetics. Take time to select the combination of printing process with a compatible paper that will best visualize your content.

Letterpress

- A relief printing process that makes a 3-dimensional impression on soft paper
- Used for printing text and line art on uncoated paper; consider for printing text in your book, title pages and essays for special editions and portfolios.
- DIY: Learn to print letterpress at regional book art centers, then rent time on the press for your needs.

Risograph

- A brand of duplicator that uses a hybrid automated screen technology using Stencils. Has a 'low res" look distantly related to the old mimeograph machine.
- Uses prioritary inks that are not Pantone numbered and do not make process colors (CMYK); does not easily process and register multiple colors. Easy to change colors by swapping the special Riso ink drums with no press clean-up. Ink system does not adhere to coated or shiny surfaced papers.
- Low per-print costs when compared to laser inkjet printers, can run nearly 100 copies per minute.

Inkjet

- **Archival pigmented inkjet:**
  - Produces imagery and type that is very color-accurate. Many varieties of inkjet technology exist today; most artists and photographers use vibrating piezo crystals to spray fine streams of ink onto paper (sheet fed or paper rolls) following the digital instructions delivered from a computer.
  - Broad choices in inkjet printer colors; papers come in two options: dye-based (cheaper) and "Archive Quality" pigment-based (more expensive).
  - DIY: Artists can affordably produce all or selected pages of their books and/or special edition prints in their home studio on their own inkjet printers.

- **High speed web inkjet (newsprint):**
  - Web inkjet newspaper printers offer various grades of papers (see "Papers")
  - Printed pieces are delivered with loose page gatherings, unbound, just like a daily newspaper (no binding provided by printers).
  - Fast turnarounds from PDF upload to delivery of printed project.
  - Inexpensive solution for generating full-color newsprint broadsheet, tabloid, or 'mini'- sized printed piece from one to thousands of copies.

Digital

- **Laser toner:**
  - An electrostatic digital printing process: a laser beam, guided by digital data from a computer, passes over a negatively-charged drum to define type or the halftone dots of an image. The parts of the drum that have the type or image are now positive and attract a powdered toner. This toner powder is then passed on to a sheet of paper and then fused onto the paper by way of another drum, this one heated.
  - If connected to an addressable computer that manages variable data, text and images can be changed print to print during a run.
  - Laser printers are relatively inexpensive to buy, and toner cartridges less expensive than archival pigment inkjet ink.

- **HP Indigo:**
  - An electrostatic digital printing process that is similar to laser printing but instead of powdered toner uses proprietary liquid ink called ElectroInk™.
  - Produces high-quality images that can rival offset and archival pigmented inkjet.
  - Recent improvements offer increasing print area and broadening color options.
  - Inks are proprietary and archival inks can be expensive; select the combination of paper (both digital and uncoated) that best visualize your content.
  - When printing under 500 copies of a book, HP Indigo is usually the most affordable method of print production as no "make ready" is required and printing a few copies is feasible.

Offset

- A lithographic printing process that depends on the concept that ink and water repel each other. Ink is rolled on to a dampened aluminum plate that has the photographic polymer containing the image and text on it.

- Grey values in images must be broken down into halftone dots of various sizes according to the tonal values, comprised of different rulings such as 85 lines (or dots) per inch, also known as 'lpi', and can get as fine as 300 lines per inch.

- Where there is halftone image or text the ink adheres, where there is only dampened plate the ink does not adhere. The image on the inked plate is then transferred to a rubber blanket (hence "offset") and in turn transferred onto a sheet of paper that has been fed through the press.

- Most larger commercial printers have multi-color presses. Each of the four-color stations apply a different process color to the paper (C-M-Y K, with K being black), arriving at the end of the press with a full color image.

- Can print one-color, or produce multiple negatives for wider tonality and depth (duotone, triton and quadtone).
- When printing over 500 copies of a book, offset is usually the least expensive method of print production (many find the HP Indigo digital printing a more economical choice).

Five Paper Types: Applying ink on paper offers a full spectrum of technical capabilities and aesthetic interpretations. Archival papers made with primarily cotton and linen pulp can be expensive. Take time to select the combination of paper and a compatible printing technique that best visualizes your content.

- **Uncoated papers**: Inks tend to be absorbed into the porous paper fibers, offering a softer and warmer non-glare surface.

- **Matte coated papers:** Matte surface applied to both sides come in two grades: matte (less shiny) and dull. Coated papers hold ink and contrast better than uncoated papers, allowing more fidelity and accuracy in the reproduction of photographs.

- **Gloss coated papers:** Have a shiny layer of gloss on top that is bold and reflective, often used on commercial 'coffee table' photobooks. Offers accuracy in reproduction, but some printing processes have a difficult time with these papers.

- **Digital coated papers**: Intended for use with digital printers like HP Indigo and inket. Some digital coated papers can crack when folded. Explore results from both digital and uncoated papers

- **Newsprint**: Never coated; much of the ink is absorbed into the fiber, lowering contrast. Available in various grades of newsprint, but none are acid-free or archival. Printing on newsprint is affordable compared to other commercial printing papers.

Five Bindery Options: Considerations for holding the folded pages of your book together include: the number of pages and types of papers to be bound, durability, whether a flat spine is desired for title / author information to be visible when shelved, and cost.

- **Smyth-sewn:** The standard method of sewing the signatures of most books bound on one side or "codex" style, using thread to sew the folded printed signature sections together, usually in groups of 16 or 24 pages. Durable, will lay flat, and no area of the spread will be lost to the 'gutter.' Can be more costly than other options.

- **Perfect binding:** A machine process of cutting the book block and fixing the pages together with hot glue, then wrapped with a printed cover. Quick and

inexpensive, but a slow process, so not often used for other than small, softbound editions.

- **Side-stitch:** Staples are used to hold the pages together instead of thread or glue, applied just inside the spire area, through the entire book. Often covered with a cloth tape, or a printed hard or soft cover is adhered to the spine area, covering the staples. Can hold multiple types of pages as a folded gutter is not needed for binding. Often used by print-on-demand publishers.

- **Saddle-stitch / Pamphlet stitch:** The most basic binding for holding folded pages together. Most commercial printers have automated saddle stitcher on site that gathers the book signatures together and put staples through the spine, then trim to final size. Common for 'zines, and some print-on-demand companies. Book dummies or small editions can use a hand-sewn pamphlet stitch to accomplish the same. Does not lay flat, can't stitch a large number of pages (even fewer if using coated papers).

- **Spiral/Coil or Wire-O**: A special machine punches holes on the spine edge of each sheet and then either a spiral is wound through or a loop-type Wire-O metal piece is closed down through the holes with the same machine that punched the holes. Books lie flat, but the binding edge is impacted. As pages are collated prior to binding, any variety of papers can be bound together. Some over-wrap the cover to hide this type of binding, which offer a flat space for title/author info when shelved.

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