

**An Introduction to Letterpress and Relief Printing.  
Operation and Clean up: The Vandercook Presses  
All printing students. Harry Reese. Winter 2006.**

**Remember the fundamentals of relief printing:**

1. Quality or character of print surface, 2. Ink, 3. Paper, 4. Pressure, and 5. Clean up.

**A. Introduction to the Print Lab (all presswork)**

**1. Measurements**

Print measurements are most often made in terms of points and picas. One point equals  $1/72$  of an inch; or, there are 72 points in an inch. There are 12 points in one pica. A pica ruler (also called a line gauge) can be used to make these measurements, but you must remember that the finest measurements that the pica ruler allows are usually only in  $1/2$  picas, or 6 point measurements. For convenience, use the "6 and 12 point scale". The other gradations have their utility, though we will not use them here. These other measurements are used constantly in printing, publishing, and the graphic arts. Learn to use the pica ruler, and to think of the page in measurements expressed in points and picas.

**2. Leads and Slugs**

Leads are the spacing between lines. ("Lead" rhymes with head.) In these shops (Department of Art and CCS) we primarily have leads in 1 point, 2 point, and 6 point thicknesses. A lead cutter (or slug cutter) is in the room for cutting leads to the desired lengths. I employ what I call the "Rule of Five" when using leads. That is, in most cases, you should select lead lengths that are a multiple of 5 picas in length—such as 10, 15, 20, 25, 30 picas, etc. I urge this procedure because the "furniture" in this shop comes in increments of 5 picas in length. Of course, it is possible to use other lengths, and sometimes you may wish to do that. In general, it helps to select line lengths in 5 pica increments.

**3. Furniture**

We have both wood and metal furniture, in increments of 5 picas in length, which are stored according to their various widths and lengths. The thin furniture pieces are called "reglets." The furniture and leads the most reliable means for measuring and "locking up" type in supportive fixed locations on the press bed.

**4. Galleys**

The metal galleys are for storing type for a short period of time. Write in chalk the name of the type or types you are using. Tie up your type with string, and return the furniture to the furniture cabinet. Store galleys in the galley cabinet. Do not leave magnets or furniture on the galleys.

**B. Printing**

**I. Lock up**

I establish a "strong corner" on the press bed from which the furniture extends. Ordinarily I begin to build the furniture from the upper right corner of the press bed. In most cases, I place strips of furniture against the far side of the bed and continue out to the end of the lock up area. I have found

that if I create a "corridor" for the plate or type, then I can effortlessly make any minor alterations in the horizontal alignment of the printing area simply by adding small increments of spacing material to one side or the other of this "corridor".

I position the quoin on the near side of the press bed. From the far side of the press, across to the near side, the sequence of materials goes like this: (1) fixed amount of furniture against the press side rail, (2) variable amount of furniture next to the type, (3) the type nestled in its corridor, with a variable amount of lead at the top and bottom ends of the type block, (4) a variable amount of furniture on the near side of the type block, (5) the quoin(s), and (6) a fixed amount of furniture.

You should make it simple to set up again, which means that you might want to draw a diagram of how you set up the bed. When making multiple pages, using a similar format, it is important to follow similar lock up procedures.

Remember: do not leave anything on the press bed except what you want to print. Any large item will permanently damage the mylar draw sheet and its supported "packing," and create a permanent, irregular pressure.

## II. Packing

I have included this section on "packing" because it is so important and because there are many questions about it. But please do not permanently alter the packing on any press unless you have been given permission, and assistance, to do that,

The cylinder is fixed with a variable amount of packing. The normal packing for a medium-weight text weight paper (145-175 gm<sup>2</sup>) is 5 sheets of .006 oiled tympan paper, and 1 mylar draw sheet .007 thick. If you look closely you will see a number punched into the cylinder which gives a clue about what packing is needed to make a "normal" print. On the Vandercook presses – Universal I, the SP-15, the SP-20, and the 219's – you will find the number .040 on the press cylinder. This number indicates that the cylinder bearers are .040" higher than the body of the cylinder. Since the printing paper adds thickness to the final pack, the press is adjusted to take .040" packing plus paper of a few thousandths thick. You will notice that we have deliberately underpacked these presses. We have done this to allow for heavier papers than the makers of this press anticipated would be used on their proof press. We have numbered the pieces of tympan paper (1-5 accordingly) so that if one sheet is removed, the number of the next sheet will be visible. This way you can look at the cylinder and know the pressure without tearing apart the packing. If you cannot estimate your plate thickness easily, and you are making tests for packing, remember to build the pressure slowly, in measurable increments. If you overpack, then you risk permanently damaging the mylar drawsheet.

If you've been given permission, this is how the packing is changed: Move the cylinder to the center of the bed (on "trip" if there is a form or plate on the bed) so that the reel rod is in the up position. Unlatch the reel rod ratchet with the crescent wrench and prepare to loosen the drawsheet. Though it may at first sound unusual, you must tighten the drawsheet in order to loosen it. Tighten the draw sheet slightly, which then releases the tension of the ratchet. Once the mylar drawsheet is peeled back, you may add or subtract packing sheets. If you add a sheet of packing (regardless of its thickness) for a print, remove it at the end of your press run. If you take out a sheet, replace it after you complete your run. The mylar needs to be changed every so often, particularly when someone who preceded you has printed with too much pressure. You can also add packing on

top of the mylar. The difference between a "soft pack" and a "hard pack" can determine some qualitative consequences for your print, and you should keep that in mind. For expediency, and in most cases, adding a small bit of packing on the top of the mylar is adequate. For highest quality prints, it is usually best to add packing under the mylar.

### III. The Rollers

The geared roller goes on first. Make sure the gear is stable, as it has a tendency for the screws on it to loosen. Strange sounds emerge from this gear area when screws are loose. The second form roller, without the gear, goes in front. Remember to keep the rollers in the up position at all times when the press is not in use. There are screws on both ends of the rollers that occasionally loosen up. They should be tight at all times, and if they become too loose they will scrape against the rails, first making a slight sound and then, as the screw loosens more, it may lodge against the rail. As a matter of simple precaution, make sure the screws at the roller ends are tight. If you can unscrew them with your fingers, you know they should be tightened.

The rollers should be adjusted frequently. See the information from the Vandercook manual, about adjusting the rollers. Use the .918 (type-high) gauge that is kept under the press bed. To adjust the rollers, first loosen the setscrew that secures the black knob into position. On many of these old presses the knobs turn effortlessly, whether the setscrew is tight or not. The black knob controls the height of the roller. To raise the roller, turn the knob to the right. To lower, turn left. (Right = raise; Left = lower.) The rollers should leave a stripe no more than 1 pica wide. A stripe larger than 1 pica indicates that too much pressure has been applied to the rollers. A stripe smaller than 1 pica indicates that the roller should be lowered. Often the type will appear to ink up all right and the print will look satisfactory even if the rollers are slightly out of adjustment. In most cases, however, a close examination of the print will reveal that adjustment to the proper height will improve the print quality.

### IV. Ink

I have heard it said that when you mix inks, you often get the worst qualities of each ink. That is, inks have a purpose, or rationale, that often is compromised by an unwitting or aggressive enthusiast. At the same time, all ink makers mix their ingredients. The best way to understand the ink is to use it, examine it as best as you can, and make notes about what you see, how it covers, how it dries, how it offsets, etc. It is good to remember that even though inks may have the same names, they may not necessarily remain the same ink over time. In both the CCS and Art Studio Print Rooms the workhorse inks are the rubber base inks, especially the "Pantone Matching System" series (both rubber base and oil base).

Rubber base inks are adequate for proofing and all your projects. Rubber base inks do not dry as fast as the oil base inks, which makes them more versatile than oil base inks for some projects, and less desirable for others. They have less drier, less tack, and lower viscosity than oil base inks; and while they can be mixed with the oil base inks, for the best results you should not mix the rubber base and the oil base inks. Consult the *Pantone Matching Guide* for the basic colors and the recommended combinations of them into multiple color combinations.

Daniel Smith's Traditional Relief #79, a versatile oil-based relief ink, contains lampblack pigment, and is recommended for block prints, line-quality polymer images, linoleum, large type,

etc. Some printers say it is good for type, but I do not like it for small sizes of text, whether lead type or polymer. It has no drier, smudges easily, and has less viscosity than Kramer ink. It has a blue-black color, a fairly low tack level, and medium body; sometimes I mix it with Kramer ink (a mix of colors and some drier).

Another oil base ink in these labs is "Kramer 46-B Letterpress (L/P) Bond Black" ink. I ask the chemist to mix it "extra slow," which means that some of the drier ordinarily found in this ink has been omitted. I want the ink to last longer, not to dry so quickly, especially on the rollers of the press. The ink dries quickly enough on paper, but will also dry on the rollers during a longer (all day, for example) printing session. I recommend the 46-B for making proofs, since it dries quickly and will smudge less than other black inks. If you are mixing Kramer colors, then remember to use the 5-pound can of Kramer "mixing black" ink for combining Pantone colors that require black. This black does not have blue pigment or toner as an ingredient, unlike many other so-called black inks.

Handschy Crayon Black is a good stiff oil base ink, a little on the pale side, without drier. I mix it with Graphic Chemical letterpress black, which is much more fluid than Handschy, and has a rich black that covers well. Sandra and I use about 8 parts Handschy to 1 part Graphic Chemical for our primary letterpress black ink for text printing, both lead and polymer.

There are a number of lithographic inks in the Print Lab that may look enticing at first, but most of them have no drier, and they can make more of a mess in relief printing that you normally want to have. Save these inks for advanced projects in which additives will increase drying time.

I recommend Kramer #1946 Transparent Base (aka Mixing White, aka Tint Base) for mixes with oil paints or all other non-drier inks. Transparent inks have the vehicle of the ink, but no pigment. Kramer #1946 has drier, mixes easily, and rescues last-minute printing. I have used Schmincke "Mussini" oil paints when making my "sandragraph" prints and monotypes, and I have enjoyed them very much. They have a "resin-base" which appeals to me when printing on paper. Oil destroys paper over time, and it is never a good idea to put oil paint directly on paper. When using oil paint, use very sparingly, not in globs or clumps or impasto – unless you are attempting to create decidedly yellow coloring around the image area that shows through the paper's backside.

## V. Clean Up

### 1. In General

Clean up for inks and paints should be restricted to mineral spirits. Keep the rags in their proper container after clean up. Use the Yellow Pages for cleaning up quantities, but remember the laws of spontaneous combustion. **In other words: be careful at all times when dealing with solvents.**

There are many kinds of ink in the print room. Most of the relief inks appear to be a mess, since relief and letterpress inks (with drier) develop a skin on them as they dry. There may be an old can of ink with the designation "for proofing only" written on it. Be careful not to scrape off the ink skin when you roll out your ink. Use the stiff putty knife to go down the side of the ink can. Fresh ink awaits you underneath the skin on the surface. Keep the ink cans lid clean. Replace the lids quickly on the ink cans. Clean off excess skin and replace the "rabbit ears" if needed. Check with instructors and assistants before opening a new can of ink. We save the newest ink for printing finished work. There are several kinds of ink in the print shop, and they all have different qualities and capabilities.

## 2. The Clean Up Process

- Wear gloves whenever you are using solvents.
- Wipe surfaces first with a dry rag, then clean with a very light amount of mineral spirits.
- Remove to galley, or your locker (if it's your plate).
- Put dirty rags in the rag cans whenever you are not using them. Make sure the lid fits onto the can.
- Clean brayers, knives, cans. Clean up around the proof press.
- Put away furniture, galleys, printing plates, lead, scrap paper. Clean up everything else.

## 3. Automatic Washup

There is an **automatic washup** feature on several of the Vandercooks. Here is a quick lesson, if you have the automatic washup feature.

- a. Put a few drops of mineral spirits on rollers. Turn on switch. Engage rollers.
- b. Engage automatic washup. Turn clockwise. (If automatic washup not in use, or if the press has no automatic washup function, then remove rollers and wipe off ink by hand, using clean gray rags.)
- c. Add mineral spirits to the rollers, very slowly. If the solvent is added too quickly, then the rollers will not spin around. If this happens, wait until the rollers begin to turn again, and then add more solvent. Keep adding mineral spirits until the rollers look clean. Do not use type wash on anything but type.
- d. After most of the ink has been removed from the rollers, stop the motor and take off the rollers. Wipe each of them with the mineral spirits and rag until dry. Then return them to the storage cabinet under the press. Remember to put the front roller in first. The roller with the gear comes off next; it should rest on the front support. This way, when the rollers are put onto the press again they will be properly installed: the roller with the gear always goes closest to the ink drum.
- e. Clean off the doctor blade of the automatic washup. Replace the paper in the tray (half a sheet of newsprint is OK) and wipe everything clean. Return automatic washup tray to proper place.

## 4. Solvents

For letterpress work, we use primarily two kinds of solvents: oil-based and water based. Oil-based cleaners are more volatile and reliable, but a number of water-based solvents (such as "Mirachem" and "California Wash," both which we have in the Print Lab) are adequate for clean-up, better for your health, and available in our Lab. We use Mineral spirits (also known as paint thinner) for the final of cleaning all rollers and soft surfaces, such as linoleum or "sandragraph" plates.

For lead type, we sometimes use a non-flammable type wash. Type wash is much more harsh than the mineral spirits, and it never should be used on rollers, brayers, linoleum, or soft plates. Use type wash only if you have been instructed on how to use it properly. There are solvent cans with labels clearly marked which should indicate what you are using. If you cannot identify a solvent, please bring it to our attention immediately.

There are other solvents in the room at any given time, but in most cases you will not need to use them. If you run out of mineral spirits, you may use kerosene, which is oily enough to clean rollers. Lacquer thinner has been used in the past by some people who have no regard for their mucous membranes. Alcohol is used as a solvent for shellac. None of these solvents should be used for polymer plates, linoleum, or large type.

**5. Rags for Clean Up**

We use shop rags provided for the print shop by Aratex, paid for by lab fees. Clean rags are kept in the several places around the shop. Soiled rags should be kept in the metal cans with the covered lids, and saved for pick up. Check with us before you dispose of a solvent.

**6. Storage**

Space is always at a premium, but with your cooperation and best efforts we can find appropriate places to store paper, plates, and printed work within the print room. Type can be stored on the galleys. Remember not to leave composing sticks, magnets, or furniture on the galleys.