
INK USER'S GUIDE To Color Making

with Kelsey Color Plates and Helpful Hints on getting best results with all inks including black and colors

How To Get the Greatest Value Out of Your Ink-Mixing Plate Set

These plates are not in numerical order, nor in order of color, but we suggest, to familiarize yourself with them, that you assemble them either in numerical formation, or, better yet, by colors or tints. If assembled by color, you will be able to look in one place for all your reds, for instance, if called on to match a certain shade.

In order to protect and preserve your color plates, we suggest you keep them in a filing box, or container of some sort. The cards will fit an ordinary 3 x 5 card file box not more than 2 or 3 inches deep—the kind you can get in any stationery or chain store.

Be sure not to mix too much ink. A little ink goes a long way, and if you need more, you can mix it. No matter how much you prepare, be sparing of the amount you put on your ink table. Too much on table and rollers means a poor, muddy job. If you find you need more later, you can put it on—and be sure it is well spread out and worked up before the rollers pass over your type form.

Before you start mixing, or putting any ink, other than straight black, on your press, be sure that your rollers, ink table and form are completely clean. For light colors this may mean washing the rollers as many as three times (use Printoclene or some other simi-



Use either a hand roller (brayer) or one of the press rollers to spread the ink.

lar cleaner). They may look clean the first time, but still have just enough black in them to neutralize a color.

If your rollers have cuts or pinholes in them, it will be best to set them aside for black ink jobs, and get a new set for color work. Later when you need better black rollers you can return the poorest set for recasting, and use them for color when they come back, always keeping your best set for color printing. Extra rollers cost no more in actual dollars and cents, in the end, and they save a lot of valuable time.

The first ten color cards of your set are for straight, unmixed colors, just as they come out of the tube or can, IF you start with clean equipment. Should the colors seem in any way dull, you will know that the old ink from rollers, table or form is present in your work.

Colors 11 to 18, made with one part of standard color to 40 of mixing white, and 19 to 26 (10 of color, 40 of white*) show you what a wide range you can make with nothing but white added. Colors 11 to 18 are, of course, for tint blocks and tinting only, not for printing of text matter. Colors 19 to 26 have more uses, although use of the yellow, and to some extent the orange, is limited, same as 11 to 18.

*Colors 19 to 26 were listed as 10 parts of color to 40 parts of white (rather than 1 to 4), so that for comparison, with colors 11 to 18, it would be easier to see the effect of adding color. Colors 11 to 18 and 19 to 26 all start with 40 parts of white.

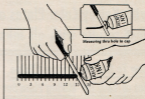
Mixing Colors Not Shown

On Color Cards

If a color is needed midway between the 1-40 and 10-40 formulas, always start with the lightest color (the 1-40 formula in this case) and add the darker one — 2, 3, 4, or more parts until the desired shade is attained.

Measure the quantity of each color carefully. You can do this with a teaspoon, or by the length of the ribbon of ink as it comes out of the tube. You can use any convenient unit of measure. You can rule off lines on a piece of paper with half inch marks, or smaller.

A piece of window glass over the paper allows it to be used again, and the marks are clearly seen. Any way you do—the main thing is accuracy.



Use any convenient measuring unit: a pica, an inch, etc.

Another Easy Way to Measure Small Quantities of Ink

Before throwing away an old ink tube, take off and clean the cap. Drill a hole in it approximately $\frac{3}{16}$ of an inch in diameter. A No. 39 drill will give you about the right size.

When you are mixing inks according to the color cards, you can use this cap in place of the regular one on the tube for measuring out small quantities of color. A ribbon of ink one inch long squeezed through a hole this size will be approximately $\frac{3}{16}$ the amount of a one inch ribbon taken out of the tube without a cap.

When not in use, caps with holes may be kept in a jar of water. This will prevent the ink in them from hardening. The regular cap should be put back on the tube when you are through measuring out the ink.

Larger or smaller holes may be drilled in ink caps, but the size

given above is most convenient for matching the colors on theelsey plates.

Make sure the colors are thoroughly mixed together. Watch especially to see that some un-mixed colors are not left on the ink knife or the mixing surface. For the mixing surface use a piece of window glass, the back of a steel galley, or any non-porous surface which can be cleaned without damage.

A spatula, putty knife or the regulation ink knife with flexible blade is best for mixing. All of the color must be mixed evenly throughout the mixing white (or the lighter of two or more colors) to assure the same tint as on the



An ink knife or a piece of brass rule and a piece of window glass are desirable, altho you can use inks on the back of a steel galley.

ard, with the formulas furnished. Use only enough ink in the actual printing to cover the paper or card evenly without allowing the stock (color of the paper or card surface) to show through. It is better to go a little lightly on the ink than to over-ink. Too much ink will cause a muddy, mottled effect, and may prevent the ink drying for a long time.

One other point should be remembered when making colors, or

reproducing them. The color and texture of the stock you are printing makes a lot of difference in the effect the color will have. If you are taking a proof for color, be sure to use the same stock as that on the finished job.

If the paper itself has a color or tint, this will reflect itself in or through the ink so that the hue will be changed. Rough stocks and smooth, bonds and books, all will give their own particular reflective power to the ink, and that is why you need to take them into consideration when mixing your colors.

Once you get the hang of it, you will find the mixing of colors fascinating. And it will enable you to dress up your work for your customers far more satisfactorily than by the hit-or-miss method. Show them the color card, let them make the selection, and they will have a lot more respect for the quality of work you turn out.

The proper use of the color cards and the information here will save you money through less wastage in getting the right ink tint or shade.

The color cards themselves have substantial blocks of color on them in order that you may gauge the shades easily. We do not advocate or recommend that you print large areas of a tint in block formation like this with two roller printing presses. You can print tint blocks and cuts with two roller machines, but the size of the block should be kept down for ease in printing. If you have a three roller or a bigger chase machine, you can do bigger work. Experimenting on this will determine for you the practical limits of your equipment.

About Inks

In general, inks are made in consistencies to suit the speed of the press. Ordinary platen presses use a comparatively stiff ink. At the other end of the scale are thin inks for magazine and newspaper printing — in fact some of them are so volatile they dry almost before they hit the paper.

Various varnishes and other substances provide the ink with its drying qualities. Ink making has always been a matter of chemistry, and much chemical research is going on to improve the qualities of inks and make them more adaptable to present day pressroom operating conditions.

For convenience in measuring, inks are mostly sold by weight, but there is a wide variation in the volume of a pound in different colors. This must be taken into consideration when figuring the amount required to do a job.

Carbon black, which has a lot of hiding power or coverage, is used in black ink. Because it is so effective, the proportion of varnishes and other lightweight ingredients in black inks is larger — and the weight less in proportion to bulk. On the other hand, a heavy cover or opaque white requires more pigment in proportion to varnish to give it equal hiding power, so it is heavier. Exact proportions vary with different kinds as well as colors of inks, and no percentages can, therefore, be accurate for specific inks. As you purchase and use the various kinds and hues, you will learn what to expect in the varieties you need for your

business. In general, you will find that colors have less bulk than black.

What Ink Volumes To

Expect In Various Colors

The volume of inks in proportion to weight varies widely, but the following will give you an approximation for use in figuring the amount of ink you need for mixing purposes.

One 4 oz. tube of white, yellow, green or orange contains approximately a 25 inch ribbon of ink as it is squeezed out of the tube. A 4 oz. tube of deep red, blue, purple, fire red, brown or half-tone black will give you a ribbon approximately 35 inches long.

Ink Colors and Shades

Ink makers and printers have been making efforts to develop standardized terms which will enable them to understand each other when buying, selling and specifying various types of ink.

First is HUE, which distinguishes one color from the other, such as red from yellow, or blue. Next is VALUE, which is the lightness or darkness of a specific color, just as we measure the various shades of black down through the greys to white. Third is CHROMA, which is the strength of the color. This latter is a little more difficult to describe, but such strength, or chroma is apparent, for instance, in a bright blue, rather than in grey blue.

The diagram shown has two purposes. In the first place, the colors opposite each other on this chart

are complementary; that is, taken together they include all the elements of light. Between them they obtain all the colors. These opposites also offer the strongest contrast, when used together. The chart also shows the colors which may be blended together to make a pleasing hue or shade.



In using and making colors, their effect on the eye, and the idiosyncracies of vision have to be taken into account. Using two colors together will often change their appearance to the eye, particularly if the background color is complementary to the overprint. For instance, use a green on yellow background and the green will look bluer. Such apparent variations have to be reckoned with when you are making a close match.

Mixing White

In any formula calling for mixing white, Light Mixing & Tinting White can be used to keep the ink thin for soft papers, and Heavy Mixing &

Cover White can be used to keep the ink thick for the hard-surfaced papers and cards.

Ink Compounds

Ink reducer makes the ink cover evenly without mottling, and the dryer, as its name implies, promotes the drying. Dryer and reducer will help in the standard colored inks as well as in the mixtures, especially on work other than straight type. It will not hurt for type printing, but it's not so important.

First, try straight ink from the tube or can; then, if necessary, use the compounds in the following ways:

Drying Compound

Drying Compound is recommended for adding to Many Purpose Inks to hasten the drying, or wherever ink must dry on the surface of the stock being used. It may be added when Reducing Compound is added and the drying appears to be slow.

Add Drying Compound as required, not more than one part dryer to ten parts of ink, to make it dry faster than usual. If you add Reducing Compound to an ink, you may need to add up to an equal amount of Drying Compound to make sure ink will dry.

Reducing Compound

Reducing Compound is recommended for adding to the Many Purpose Inks when printing large solid areas, such as tint blocks, cuts with solid color portions, or wherever mottling, caking, picking, or offsetting (some call it set-off) occurs. When ink dries so fast that it dries on rollers and ink table while press is running,

adding up to one part in ten of Reducing Compound, will usually overcome this condition. In this case *do not* add any dryer.

Add one part of Reducing Compound to ten parts of ink, and if necessary, add one part of Drying Compound for each part of Reducing Compound added.

Fixing or Binding Compound

Fixing Compound is recommended for adding to the Many Purpose colored inks for printing on bond papers, many plastics, glassine, cellophane, etc., and all surfaces on which the ink must dry on the surface, rather than penetrate the stock.

Mix thoroly not more than one part of Fixing Compound plus approximately an equal amount of Drying Compound to ten parts of ink, and on some card jobs or on ivory card and coated finish stock, one part of Fixing Compound to 30 parts of ink may be all that is necessary. Experience will be your best guide as to the exact proportions.

Using Ink Economically

While ink purchased in pound or larger containers is cheaper than in tube lots, there will be no economy unless care is taken about removing it or sealing the can when not in use. Contact with air dries ink on the surface in the can as well as on paper, and to dig down into the can without smoothing out the surface afterward will cause oxidation, skinning over and drying in the holes gouged out.

Don't put lumps or skin on your ink table — dispose of them first. After you are through with the

can and have levelled off the remaining ink, replace the waxed paper if possible or find another piece of paper to take its place — it is not serviceable. Vaseline or any other similar grease may be used on a piece of ordinary paper in place of waxed or glassine, and the same ingredient rubbed around the rim of the can so that the lid or top will fit easily and tightly.

Tubes have the advantage that they present only one small opening which will skin over, but care must be used, that they do not burst when squeezing. If one hand is used on the bottom (turned over end) and the other up close to the top or opening end, pressure can be exerted at both points and the tube will not suffer. Be sure, however, that there isn't a hard plug of dried ink blocking the opening, because it may seal the tube so effectively that too much pressure will burst the tube. Dig out the end before you squeeze, if there seems the least inclination for the ink to balk about coming out.

Inking

The thickness or consistency of the ink has something to do with the ease with which you can do a good job. Many purpose job black ink is a remarkably good all-purpose ink, but sometimes you will find it necessary to thin it ever so little. Thinning job ink will seldom be necessary, except when running halftone cuts on coated or enameled paper, when the paper has a tendency to pick — that is, the stickiness of the ink causes the type to tear minute pieces of the paper surface away, leaving white

spots on the printed impression, and gradually muddying up the ink with paper particles. Bond papers have a hard surface, so that they do not pick — in fact, unless a fairly stiff ink is used they will often refuse to take it. Bond ink is, therefore, made quite stiff, and more than one new printer has assumed that he has received old stock ink, not realizing that bond ink is made that way purposely.

For general book work where you are going to print on soft surface paper like eggshell or antique, it is best to use the book ink. Although the other ink can be thinned, the characteristics of the various inks are not made the same by simply thinning. On coated stock, halftone black is best. Where ink does not dry readily, particularly on hard surfaced paper, an ink dryer will be of help. However, in that regard, you will find the use of as little ink as possible to get a good job the best assurance of drying. If too much ink is used, offsetting results; or the oil and pigment are likely to separate later, to say nothing of the difficulty in drying.

Much difficulty in distribution of ink, muddiness of impression, etc., can be laid to the temperature of the room in which the press is being operated. Be sure that your printing room is at least 70 degrees for at least an hour before you start using the press, so that the rollers, ink, ink table and all parts are thoroughly warmed up.

The amount of ink used on work has a great bearing on how fast printing will dry. Carry less ink on the ink table, and ink more frequently, both for good results

and quicker drying. The grade of paper also affects drying, or to be more exact, the kind of paper. Bond paper, having a hard surface, does not absorb much ink and dries slower than book paper or newspaper, which are more or less absorbent. Careful make-ready will make less ink necessary, and in addition to a cleaner nicer job, will give quicker drying. It is, of course, necessary to carry a little heavier ink anyway on work with heavy bold faces of type or heavy cuts, than on finer type, such as ordinary six and eight, ten and twelve point faces, and it is likewise necessary to carry enough ink to take care of the heaviest part of the form you are running, so that unless care is taken when mixed work is being run, the ordinary lighter face type will appear overinked. Good make-ready and the proper amount of impression is, therefore, doubly advisable to make the necessary amount of ink as small as possible.

Filling In of Characters, Picking or Specking

Ink for printing halftones cannot be too stiff without running the risk of picking—that is, lifting minute pieces of the paper surface and getting them mixed up with the ink on the press and the cut. Dust and dirt particles on the ink table, the form or in the air are added, with resulting spots on the cut.

This picking is increased if the ink film is too heavy (tacky). Too much impression will sometimes cause it, also. If the rollers are too hard, ink distribution can be poor, and in the

attempt to better the distribution, too much ink may be carried, with picking and filling in the end result. If the press is operated too fast in that part of the motion when the sheet is being pulled from the form, the paper may be picked.

Such picking will be minimized if halftone or book ink is used. Ink reducer or anti-offset, anti-picking compound will help, too, especially if, in an emergency, these two inks are not available.

Mottling

If you are using a thin ink on hard surfaced or non-absorbent stock, add some Fixing Compound. If you are going to mix a color or tint to use on such stock which calls for mixing white use Heavy Mixing & Cover White, so as to keep up the stiffness of the ink.

Mottling is also caused by uneven penetration into the stock, and reducing compound will help when this seems to be happening.

Gloss Varnish

To give your printing a shine, first print as usual, in any color. Then when this is dry, print over it with Gloss Varnish instead of ink. A little Gloss Varnish mixed with your ink may help to give a shine. But, be careful—too much will dilute the color.

Speeding Up Drying

If, on any given job, your ink seems to be giving you trouble, and you want to try modifying it, do so to as little ink as possible, and print two or three sheets. You can add more of a compound to your ink, but there

is no way to take it out once it is in.

Damp or humid weather will sometimes add enough moisture to paper so that ink will not dry properly on it unless more dryer is added. Offsetting (or setting off) from one sheet onto the other may be caused by too heavy a film of ink, or the stock may be of such a nature that the ink does not penetrate it. A very little ink reducer or anti-offset compound may correct this.

Slow Drying

If the ink is easily smeared or smudged after a fair amount of time after printing, here are a few ideas you can use NEXT time you run a similar job under the same circumstances:

- with ink that dries by absorption, like our Book Black, use less ink.
- with ink that dries by oxidation, like our Bond Black, add Drying Compound, or Fixing Compound, or both
- in moist, humid weather, warm the paper before printing, and add some Drying Compound, or Fixing Compound to the ink.
- when printing on soft, absorbent stock like our Eggshell White, the ink may be too stiff. Use a small amount of ink reducer, and be careful not to over ink.

A Tip on Gold Printing

Two impressions of gold ink give a nice job if the second impression is printed soon after the first is dry. This gives a much better appearance, especially on paper and card stocks which are not coated.