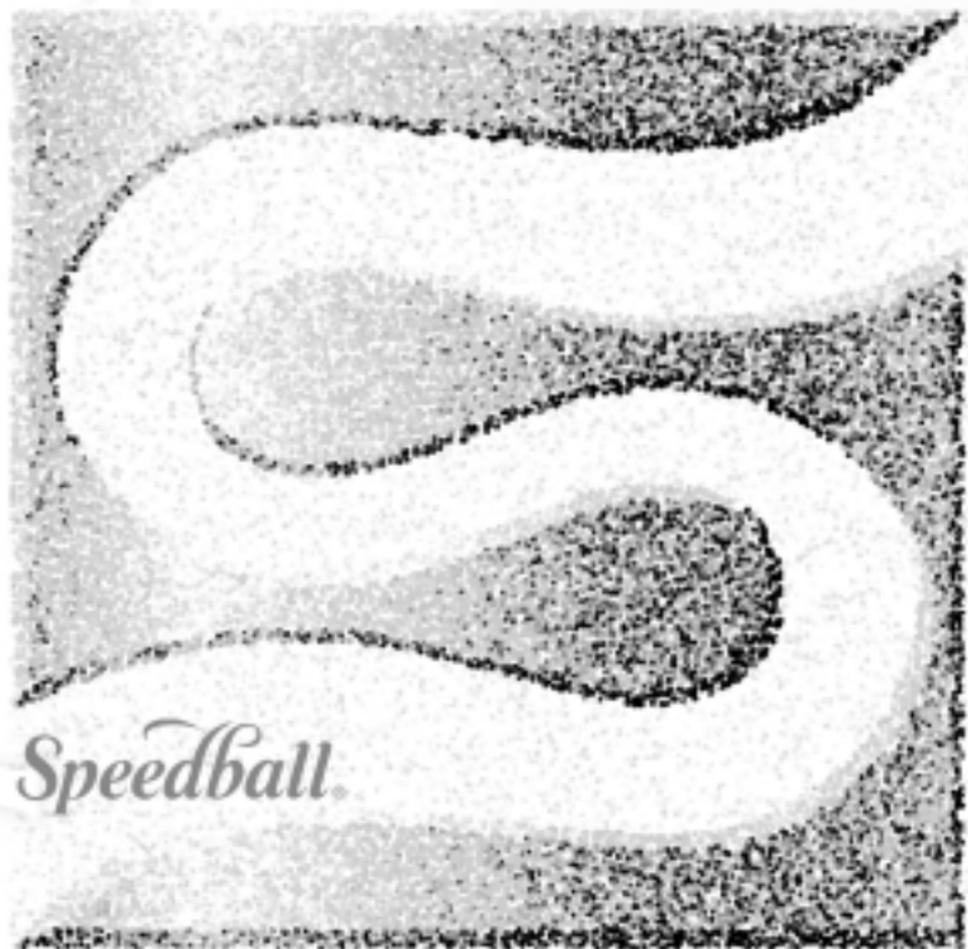


# Screen Printing

*Instructions*



*Speedball.*

## INTRODUCTION

Screen-printing, sometimes called silk screening or serigraphy, has long proved its worth as a fine arts and commercial medium. While SPEEDBALL® Screen Printing Materials meet the high quality standards of professionals, our hope is to bring the satisfaction and enjoyment of Screen Printing to the hobbyist, the hand crafter and the student as well.

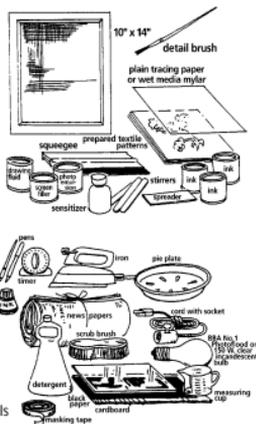
The Speedball® systems allow total flexibility. You can create screen stencils in a variety of ways and produce prints with three SPEEDBALL® water-based, solvent-free inks; water-soluble, permanent acrylic and fabric inks.

These instructions have been prepared in simple language. If followed, they will produce satisfying results. Additional and replacement materials are available from all stores where SPEEDBALL® Art Products are sold.

In addition to the materials supplied in the SPEEDBALL® Kits, you may want to have the following items on hand:

- Water resistant masking tape (1" wide)
- Screw Driver
- Old newspapers
- Sheet of Cardboard
- Small nylon scrub brush
- Scissors
- Timer
- Small lamp or lamp cord with a standard socket BBA No. 1 Photoflood or a clear 150 watt incandescent bulb  
*NOTE: Light bulbs may be found at most photo supply stores or you can order through Bulb Direct: 1-800-772-5267*
- Reflector shop light (available at any hardware store)
- Cellophane tape
- Paper cups
- SPEEDBALL® Super Black Ink
- SPEEDBALL® Pens
- Old towels, rags, paper towels
- 9" x 12" piece of glass, Plexiglas, or Lucite
- Rubber gloves
- Apron or Smock

An added luxury is an electric fan. This can be used to cut down the required drying time in preparation of screens for printing as well as the drying of prints.



## PREPARING A WORK AREA

A card table will provide enough work area for most projects. It is necessary to locate your work area with easy access to a large sink or laundry tub with hot and cold water.

If you plan to make a large number of prints, you may wish to string a line through spring-type clothespins or bulldog clips, or make a rack to keep prints from smearing while they dry.



Use clothespins or bulldog clips

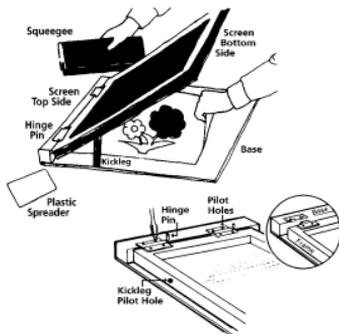
## PREPARING YOUR TOOLS

### Step A

Two hinges with screws and removable pins are included in some Speedball® kits. These are easily attached by first joining the halves together with hinge pins. It is best to mount the side of the hinge with two bearings to the base and the side of the hinge with one bearing to the screen frame. Then, position the assembled hinges over the "pilot" holes on top of the frame and base and screw them in place. Be sure they are right side up. Speedball® offers heavy duty hinge clamps for bigger screens (see list of products on page 10). Follow this by screwing the kickleg to the side of the frame. A "pilot" hole has been provided for this also. Note the kickleg should be "free-swinging."

### Step B

The next important step in preparation is to detach the frame from the base and scrub both sides of the screen fabric with a nylon brush and trisodium phosphate/water or dishwasher powder/water solution.

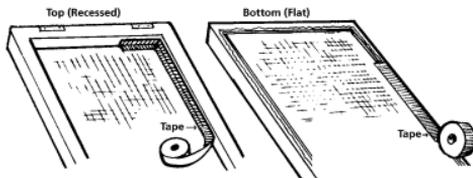


Let it dry thoroughly after rinsing. For water-based inks, use 1" wide water-resistant masking tape. Lay the tape so it is divided equally half on the screen fabric-half on the screen frame. Turn the frame over and cover the groove with tape. Be certain that the tape extends beyond the frame and onto the fabric. For solvent-based inks, use seal gummed water-soluble tape with several coats of polyurethane.

Taping in this way helps to maintain a "tight" screen, and prevents ink from leaking under the screen frame during printing and will keep the edges of your prints clean. To get maximum adhesion of the tape, rub it with a spoon or wooden stirrer. When choosing your pattern or design make sure to leave a generous border from the taped edges (*minimum of 1" from taped edge*).

#### Step C

There are a number of ways to prepare a screen to print the picture or message you want. While the methods are different, the basic principle is to make a stencil on the screen fabric which allows ink to be forced through its "open" areas to produce a design.



### PREPARING SCREENS

These instructions explain 4 of the more popular methods used for preparing screens. Read and Follow them carefully.

## #1 PAPER STENCIL METHOD

This is the best method for a beginner. It is the fastest, least expensive, and simplest way to prepare a screen. The Paper stencil method is good for geometric shapes and basic patterns. It is not intended for complicated designs or lettering. Begin by cutting an illustration from paper. Keep the paper flat and not wrinkled. For more accurate and durable cut paper stencils, use freezer wrap (*shiny side up*). Designs can be cut with scissors or stencil knife or they can be "torn" to create a textured appearance.

#### Step A

Cut your paper stencil. You may wish to create a design by folding and cutting your paper as illustrated. For your stencil, you can use either the cutout or the paper remaining.



#### Step B

Position printing paper under the frame. Lay your cutouts on this paper as desired and lower the screen

#### Step C

Follow the directions found in section "Making Prints." Press down on the screen frame to insure complete contact with all cutouts. Make your first print. You will find with the first pass of the squeegee, the ink will cause the cutouts to stick to the underside of the screen creating a stencil effect.

Once you see how simple this method is, you may wish to try variations by creating two or three designs with torn paper of various shapes and printing each in a different color or hue. Do not overlap cutout pieces on the screen.

*NOTE: Generally ten to fifteen prints can be satisfactorily produced by this method. When a larger number of prints are desired, you should use one or more "permanent" methods.*

## #2 SCREEN FILLER METHOD

(Direct block-out or "Negative Method")

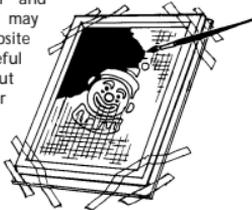
Using Screen Filler is another simple means of preparing a screen for printing. The Screen Filler is used to block out those areas that you do not wish to print. This allows the ink to be forced through the screen wherever the Screen Filler has not been applied.

#### Step A

On a sheet of plain paper, make up the illustrations or message you wish to print with your screen. Place this layout on a tabletop. Place your screen over this layout and trace your design directly on the screen fabric using a soft lead pencil.

#### Step B

Stir the Screen Filler until it is thoroughly mixed to a smooth consistency. Using a paintbrush, paint the screen filler on all areas of your layout that you do not want to print. Be certain that the bottom of the screen is elevated (*not touching the table*). When all areas to be blocked out are covered with Screen Filler, flip the screen over and smooth out places the Filler may have collected on the opposite side of the screen. Be careful during this smoothing out process not to distort your work.



### Step C

Leave the screen to dry in a level position. Make sure nothing touches the areas covered with Screen Filler. Thorough drying is necessary. Overnight drying is recommended to assure best results.

Check for pinholes in the blocked-out areas. You can do this by holding the screen up to a light. Fill any pinholes with Screen Filler and allow to dry completely. You are now ready to print.

**NOTES:** Since Screen Filler is applied to all areas which are not to be printed, this – along with all traditional “direct” methods – is considered to be a “negative” method of printing. Your print will be the opposite of that which you created in your screen.

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## #3 Drawing Fluid – Screen Filler Method

*(Tusche – resist or “positive” method)*

### Step A

On a sheet of plain paper, make up the illustration or message you wish to print with your screen. Place this layout on a tabletop. Place your screen over this layout, top side up. Trace your design directly on the screen fabric with a soft lead pencil.

### Step A (alternative)

The preparation of a layout is to help guide the application of Drawing Fluid. If you feel such a guide is unnecessary, go directly to Step B.

### Step B

You can work on either side of the screen. Remember, however, that your printing will be done from the top (or “ink-fill”) side of the screen.

Be certain that the screen is elevated – not touching the table. Using a paintbrush, paint the Drawing Fluid over those areas of your layout that you want to print. Leave the screen to dry in a level, flat position. Make sure nothing touches the areas covered with Drawing Fluid.

### Step C

After the Drawing Fluid is completely dry, open the Screen Filler and mix it thoroughly to a smooth consistency. Spoon it onto the screen fabric on the same side of the screen used for the application of Drawing Fluid.

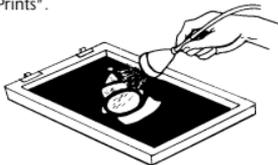
Use the squeegee or the plastic spreader to apply an evenly smooth coating over the entire screen. Make only one pass. Multiple passes of Screen Filler will dissolve the Drawing Fluid and prevent character washout. Regular scoop coaters are available through screen printers suppliers.



Again, put the screen to dry in a horizontal position making sure nothing touches the fabric. It is important that the Screen Filler dries completely.

### Step D

When the Screen Filler has thoroughly dried, spray cold water on both sides of the screen. Concentrate the spray on the areas where Drawing Fluid was applied. These areas will wash out and the screen will open at those points so that ink can flow through them. If some areas remain slightly blocked, scrub them lightly with a small stiff brush on both sides. *(An old toothbrush will do a great job.)* If necessary you can use Greased Lightning or Washing Soda (an Arm & Hammer Product) Washing Soda must be dissolved in warm water (1 cup per gallon of water). **DO NOT USE HOT WATER DURING THIS STAGE.** Allow your screen to dry in a level (horizontal) position, bottom-side up. Using a hair dryer or fan may accelerate drying time. Move to the section marked “Making Prints”.



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## #4 PHOTOGRAPHIC EMULSION METHOD

Use polyester screen fabric. Nylon will stretch with water-based inks and is not suitable. Do not use silk or organdy if you wish to reclaim the screen.

This is one of the most exciting methods of Screen Printing because it offers the widest range of possibilities. It makes possible the printing of fine line drawings, various hand and commercial lettering techniques, as well as photographic half-tone positives.

All methods of photographic Screen Printing require three things: (1) A screen prepared with a light-sensitive coating. (2) A film positive, or equal. (3) A light source that will enable you to transfer the opaque images on your positive to the light-sensitive stencil you have prepared.

### Step A – Mixing the photo emulsion

**Diazo System:** Follow the mixing instructions given on both containers. Store the sensitized emulsion in a cool and dark place. Shelf life for the sensitized emulsion is 4 weeks at 90° F, 8 weeks at 70° F, and 4 months when refrigerated.

### Step B – Coating the Screen

Coat the screen by first pouring a bead of the solution on one end of the bottom side of the screen. Spread it evenly and thinly with the squeegee or the plastic spreader. Use more solution where necessary. Pour a bead of the solution on one end of the inside of the screen and spread it evenly with the squeegee or the plastic spreader. Work to achieve an even continuous coating on both sides of the screen fabric. Perform the final spreading on the inside of the screen. Return any excess solution to your mixing container. Be careful to clear away any extra drips of solution to obtain proper exposure.



### Step C – Drying the coated screen

In an area **AWAY FROM LIGHT AND HEAT**, set the screen to dry horizontally, bottom side down. This will provide the most even, flat “film” on the underside of the screen. It will, however, require your elevating the four corners of the underside of the frame during the drying stage with push pins or other suitable devices. An empty drawer, cupboard, closet, or under a cardboard box will work fine. Allow the screen to dry thoroughly. If more than 300 prints are to be run, it is best to apply a second coating of the sensitized Photo Emulsion to the bottom of the screen after the first coat is dry. Remember, work for a smooth even **THIN** coating. Repeat the drying process away from heat and light.

Once the sensitized screen is dry, it must remain in a darkened area until it is ready to be exposed. A fan in the dark area will greatly speed up the drying of the emulsion on the screen.

### Step D – Preparing a positive

With Speedball’s Diazo System, the maximum allowable time between application of the sensitized emulsion to the screen and the exposure is four weeks at room temperature, in a completely dark environment.

A “positive” is any opaque image (*usually black*), on any transparent or translucent surface. There are many ways you may choose to prepare them.

An excellent transparent film for this purpose is prepared acetate or wet media acetate. The printed sheets (*positives*) have copy and illustrations that may be used to create a picture or message. With the plain sheets, you may make artwork of your own with Speedball® Super Black Ink and an artist’s brush, Speedball® Drawing Pens or enamel paint pens. Excellent results can also be obtained by using dry transfer, or pressure sensitive letters and symbols. These can be applied directly on the tracing paper or clear plastic. The graphics must be opaque to light. Natural items such as leaves may be used between the glass and stencil.

Another way of producing positives is through copy machines that have the capability of reproducing very opaquely on film,

tracing paper etc. In order to satisfactorily produce a positive using a copy machine, the following conditions must be met: (1) Black and White line work. (2) Must be opaque Photographic print. (3) Must have high contrast.

For an in-depth treatment of photographic screen procedures, we highly recommend the book “Screen Printing-Contemporary Methods and Materials” by Frances and Norman Lassiter. This book is available at most artist materials stores.

Using a desktop computer, you can download many copyright free images suitable for screen-printing from any simple graphic program. You can print that image directly on to transparency material. You can also make copies on a copier that will accept transparencies.

**IDEA:** To get a bold solid image, try making 2 copies of the same image on transparencies. Match the designs and tape together for use as a positive.

### Step E – Light Source

The BBA No.1 Bulb is preferable, particularly for fine graphics, because the exposure time is less. To set up your “Light Station” place the screen on top of a piece of black paper and center it 12 inches directly below a 150W clear incandescent bulb or a BBA No.1 Photoflood Bulb. You can also use a light table with 20W fluorescent tubes. Either should be fitted with a reflector shop light.

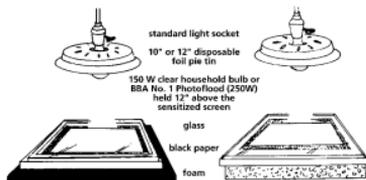
Unfiltered Black Light tubes will cut exposure time considerably. Maybe as little as 3-5 minutes. You need to test for accuracy.

The positive can be placed in contact with the coated (*dry*) screen by either of the above methods.

### Step F

Before you remove the sensitized screen from the dark drying area, make sure everything you need to print with is on hand. Set up your exposure lamp as described in Step E. Copy and illustrations (*positives*) can be fixed in place with cellophane tape. Do not let two layers of tracing paper overlap. A better alternative than taping the “positives” to the screen fabric is to lay a piece of clear glass, Lucite, or Plexiglas on top of them. One of these must be used if thin lines or lettering less than 1/4” tall is to be printed. Whichever you use, once you are sure all “positives” are in place and flat against the fabric, you are ready to expose the screen. A screen using positives made with tracing paper and India ink could now look something like this:





## SPEEDBALL® SCREEN PRINTING SYSTEM

### Recommended Exposure Chart

#### 150-Watt Bulb, Clear Incandescent

Screen Size	150W Bulb Height	Exposure time
8" x 10"	12 inches	45 minutes
10" x 14"	12 inches	45 minutes
12" x 18"	15 inches	1 hr. 14 minutes
16" x 20"	17 inches	1 hr. 32 minutes
18" x 20"	17 inches	1 hr. 32 minutes

#### BBA No. 1 Photoflood (250W)

Screen Size	Lamp Height	Exposure time
8" x 10"	12 inches	10 minutes
10" x 14"	12 inches	10 minutes
12" x 18"	15 inches	16 minutes
16" x 20"	17 inches	20 minutes
18" x 20"	17 inches	20 minutes

**PLEASE NOTE:** This chart has been prepared using an aluminum foil pie-plate reflector as indicated in our instructions. More sophisticated light sources, reflectors and equipment can, of course, be used. (See previous note) However, as any variable is changed, you will have to adjust the exposure times and distances. This will require experimentation through the use of test strips or other light testing devices or procedures. Turn on the light and note the time. Expose according to time and distance indicated in chart. After exposure remove positive and take screen to sink.

### Step G

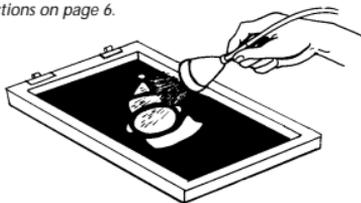
Apply a forceful spray of water (*body temperature*) to both sides of the screen. **DO NOT USE HOT WATER.** Concentrate this spray on the light images on the topside of the screen. After a few minutes, these areas will become "open". Continue spraying until all unwanted emulsion is gone. Perform final spraying with cold water.

Once you have completely washed the screen, let it dry thoroughly in a level flat position.

Hold the dry frame to the light and check for pinholes. These can be covered with Speedball® Screen Filler or pieces of masking tape stuck to the bottom of the screen. If Screen Filler is used, let the screen dry again.

Follow the directions found in the section "Making Prints".

**NOTE:** Photo Emulsion should not be left in the screen indefinitely unless a permanent stencil is wanted. It should be washed out as soon as the run is completed. See Clean-up instructions on page 6.



## MAKING PRINTS

### Step A: Preparations

Attach your screen frame to the base by inserting the hinge pins. For off-contact printing tape a penny or a nickel to each of the four corners on the underside of the screen. Place a sheet of your printing paper under the screen and position it as it is to be printed. Allow for margins. When you are certain that the paper is in the correct position, lift the screen gently and mark where each edge of the paper should be placed.

Cut three pieces of cardboard about next to 1" x 2" and use these for registration guides. Place these next to the lines you drew on the base so you can correctly locate each sheet to be printed.

These guides should be fastened securely with tape or rubber cement. Good guides are particularly important if you intend to print more than one color on any print.



### Step B - Selecting Inks for Printing on Paper

#### WATER SOLUBLE INKS

Art prints require porous-surface papers of high quality. (We recommend 100% rag or heavy paper for best results.) For most other printing applications, construction paper, drawing paper, charcoal paper, pastel paper, most board items (except railroad board) and cover stock (especially good for greeting cards) will be fine. Ink remains water-soluble after drying.

Avoid slick coated, high gloss papers or vinyl or plastic coated papers.

Stir the ink completely until you achieve a "buttery" or "creamy" consistency. If too thick, add one or two drops of water or Water Soluble Transparent Extender Base. Mix thoroughly. Colors may be intermixed. Water Soluble Extender Base may be used to make the colors more transparent.

## PERMANENT ACRYLIC INKS

Fine art acrylic require smooth matte finish, medium or heavy weight papers. To overcome "buckling" caused by water penetration, after each color run is dry, place a flat weight on stacked prints. This will cause them to dry flat and is especially important for good color registration.

These water-based acrylic inks dry water resistant.

To achieve transparency or economy, SPEEDBALL® Extender Base (*preferred*) or Transparent Base may be added. Never add more than 10-15% Transparent Base. Do not allow ink to dry in screen.

For most other printing applications like posters, greeting cards, book covers, etc., 20# weight and thicker cover stock paper is recommended.

Avoid slick coated, high gloss papers or vinyl or plastic coated papers.

Stir the ink completely until you achieve a "buttery" or "creamy" consistency. If too heavy or thick, add one or two drops of water, SPEEDBALL® Acrylic Extender Base or SPEEDBALL® Acrylic Transparent Base. Never add more than 10-15% Transparent Base. Mix thoroughly.

### Step B – Alternative

Selecting inks for printing on non-paper surfaces.

**WATER SOLUBLE INKS** – These can be used on wood or masonite if first coated with an acrylic emulsion base coat such as SPEEDBALL® Gesso. To achieve water-resistance, use an acrylic a spray fixative or a solvent-based varnish as a topcoat.

**FABRIC INKS** – These can be used on almost any fabric that can be subjected to a hot iron (275° - 375°) Do not use on non-porous fabrics such as nylon.

**ACRYLIC INKS** – These inks can also be used on wood, masonite and many coated surfaces. Always pre-test before using.

### Step C – Printing on Paper

Spoon the ink across the end of the screen nearest to you. With the screen lifted slightly from the base, apply an even blanket of ink onto the print area. Be sure to use an easy, smooth stroke with the squeegee at a slight angle away from you. This is the flood stroke. Drop the screen onto your paper. Lift the squeegee over the ridge of ink and make the print stroke by pulling towards yourself. Keep the squeegee at a 45° angle with enough pressure to scrape the ink from the screen. Lift the screen from the print, make the flood stroke, set the kick leg, remove the print and put it to dry on your rack or line. Insert new paper, release the kick leg and repeat the process.

Sharp clear prints can be produced provided you (1) maintain an adequate quantity of ink on the screen, (2) use the flood stroke but sparingly. For more detailed images avoid the flood stroke, and (3) maintain adequate and even pressure on the squeegee during print stroke.

### Step D – Clean –up

After you have made your prints, remove any remaining ink in the screen. This ink can be saved if you wish. Detach the frame from the base (*don't lose the hinge pins*). SEE SECTION ON CLEAN-UP.



## PRINTING WITH FABRIC INKS

For the most part, screen-printing on fabric is the same as printing on paper. Use only fabrics that can be subjected to temperatures of at least 275° - 375° F. Do not use on non-porous fabrics such as nylon. Pre-test all fabrics. Fabrics with sizing must be washed prior to printing. This will assure proper adhesion of the fabric ink to the fabric.

### Five important differences are:

1. The screen frame is usually detached from the base and used alone. Usually two (2) people should work on the printing process – one holding the screen frame tightly against the fabric, and the other doing the printing.
2. On articles like T-shirts, a piece of foamboard or paper must be put inside each garment to act as a barrier.
3. To improve the lubricity (*slipperiness*) of the ink, you may add the Transparent Base. To slow drying or to prevent screen clogging, add the Retarder Base (1-2 Tbs of 8 oz. of ink).
4. Wash-up of screens and tools must be done immediately after use. If they are allowed to dry on your screen or tools, they are difficult or impossible to remove.
5. After the fabric ink dries on the fabric, set a household iron at the highest dry heat (*no steam*) that will not scorch the fabric and with a cloth or paper between the iron and printed material, iron on each side for 3 to 5 minutes. This will make the ink withstand repeated washings.

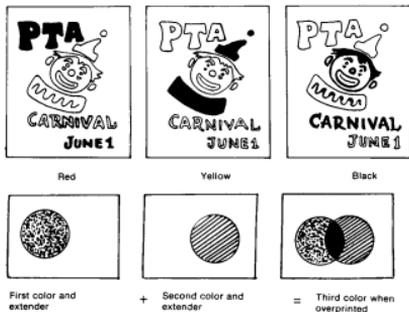
**IMPORTANT: PRE-TEST SAMPLES PRIOR TO ALL PRODUCTION RUNS.** If inadequate wash fastness occurs, the print needs to be heat set longer.

## MULTI-COLOR PRINTING

Multi-color signs can be achieved easily by making one screen with the entire message on it. Prepare the screen by any method you prefer. Once the screen is ready, simply block the words you do not want to print with your first color by putting masking tape or paper on the bottom side of the screen fabric.

After you have made your first run of prints, wash the ink from the screen and let it dry. Follow this by blocking-out the words you just printed and unblocking words you want to print with your second run of color.

After you have made this second run, again wash the screen and let it dry.



Repeat the blocking and unblocking process and screen washing for as many colors as you wish to run.

Making multi-color prints of detailed artwork requires the making of a screen for each color to be printed. (*Some books on the subject are listed later.*) One way is to have these screens prepared before you start to print. Additional Speedball® frames are available. Another way is to remake or revise the original screen for each color to be printed.

One interesting effect can be made by having two (2) color print on overlapping areas. These "overlaps" can add a third (*darker*) value to the print. Speedball® Transparent or Extender Bases are formulated to enable Screen Printers to achieve this.

Registration guides are very important when printing with more than one color. Details on registration guides are given in step A on the "Making Prints" section.

## SCREEN CLEAN-UP

An organized work area will make clean up easy. Here are the recommended procedures:

### Water Soluble Inks

Use warm water and a soft brush. These inks will remain water-soluble even after thorough drying.

### Fabric and Acrylic Inks

**WASH IMMEDIATELY AFTER THE LAST PRINT IS PULLED.** Use warm water and a soft brush.

Should ink dry in the screen, spray with Windex, or a similar window cleaner. Rub with a lint-free cloth. When ink is removed, wash with a mix of warm water and dishwasher detergent (*Cascade, etc.*) using a soft brush. Rinse with warm water.

### Drawing Fluid

Wash with cool water.

### Screen Filler

Greased Lightening or Comet cleanser is preferable for removing screen filler. One (1) cup of Arm & Hammer's Washing Soda dissolved in one (1) gallon of water is also suitable. Instructions are:

- Apply to both sides with a paintbrush. Scrub with a nylon bristle brush.
- Apply again to both sides. Let stand in a horizontal position for three to five minutes.
- Scrub with a nylon bristle brush while spraying with a forceful stream of hot water.

### Photo Emulsion

**PHOTO EMULSION SHOULD BE WASHED OUT OF YOUR SCREEN AS SOON AS YOUR PRINT RUN IS COMPLETED - UNLESS YOU WANT A PERMANENT STENCIL.**

**ADULT SUPERVISION IS RECOMMENDED FOR THIS PROCEDURE. WEAR RUBBER GLOVES AND SMOCK.**

### Photo Emulsion Remover Method:

Be certain all of the ink has been removed from the screen fabric. Apply SPEEDBALL® Photo Emulsion Remover liberally to both sides of the stencil using a paintbrush. Immediately scrub both sides of the stencil with a dry nylon bristle brush. Again, apply SPEEDBALL® Photo Emulsion Remover liberally to both sides of the stencil. Keep the screen in a horizontal position for three (3) minutes. Scrub both sides with the nylon bristle brush and flush with a hard spray of hot water. Once you have started removing Photo Emulsion you must not let the screen dry until completely clean.

## OCCASIONAL PROBLEMS POSSIBLE REASONS / SOLUTIONS

### SCREEN STENCILS

**Problem:** Drawing Fluid, Screen Filler or Photo Emulsion won't adhere to screen.

**Possibilities:**

- A. Screen fabric dirty.
- B. Screen may have been used with solvent-based materials or the sizing may not have completely washed out of the screen fabric.
- C. Scrub with a soft bristle brush and a dishwasher powder / water solution. Rinse well.

**Problem:** Photo Emulsion will not wash out to create a stencil.

**Possibilities:**

- A. Artwork not prepared with a visually or photographically opaque material.
- B. Heat as well as light will "set" the photo emulsion. There must not be any heat build-up (*above 105 F*) on the stencil during exposure.
- C. More than 12 hours (*at 70 F*) exposed before the sensitized screen was exposed (*Speedball® Bichromate System*).
- D. The sensitized screen was exposed to too much light or heat before exposure to artwork.
- E. Overexposure. The instructions list exposure times and heights for a "disposable foil pie tin" reflector. More efficient reflectors will require a higher bulb height and/or less exposure time.
- F. Artwork did not make proper contact with screen.
- G. Incomplete washout.

**Problem:** Too much or all Photo Emulsion washed out of screen after exposure.

**Possibilities:**

- A. Improper mixing of emulsion and sensitizer.
- B. Underexposure.
- C. Tracing paper or film not sufficiently transparent.
- D. Washout temperature was too high.
- E. Screen not dry before coating.
- F. Screen not dry before exposure.

**Problem:** Some small details on Photo Emulsion screen did not wash out completely.

**Possibilities:**

- A. See relevant "Possibilities" under "Photo Emulsion will not wash out to create a stencil."
- B. Failure to use a black, non-reflective background under the screen during exposure.
- C. Using a more intense light source, such as a BBA No. 1 Photoflood, will reduce the required exposure time and resultant light bounce-back. This will improve detail washout.

**Problem:** Inks drying in screen.

**Possibilities:**

- A. Use the flood stroke technique given in the instructions.
- B. Keep squeegees sharpened.
- C. For the Acrylic Screen Inks and Fabric Inks, mix with 5-10% Retarder Base.
- D. Use a couple of humidifiers or "sick-room" vaporizers in the printing area.

**Problem:** Textile ink prints not opaque enough.

**Possibilities:**

- A. Use a coarser screen fabric.
- B. Make multiple passes.
- C. Use a rounded squeegee.
- D. Use a soft base under the fabric to be printed.
- E. Use a hair dryer to flush dry the print immediately after printing and then reprint overtop in exact register.

## SPEEDBALL®, RECOMMENDED READING

Ross, John, Romano Clare, Ross Tim., *The Complete Printmaker, Techniques, Traditions, Innovations*, MacMillan Publishers, New York, 1990.

## SPEEDBALL®, SCREEN PRINTING PRODUCTS

### SPEEDBALL® NON TOXIC WATER SOLUBLE INK

- AP non toxic and non flammable
- Contains no solvents; easy clean up with water
- Dry to a smooth, matte finish
- Great for paper and cardboard stocks
- Brilliant colors with excellent opacity

### WATER SOLUBLE

Color	8 oz. Product No.	32 oz. Product No.
Black	4540	4580
Red	4541	4581
Blue	4542	4582
White	4543	4583
Green	4544	4584
Yellow	4545	4585
Brown	4546	4586
Orange	4547	4587
Violet	4548	4588
Magenta	4549	4589
Transparent Extender Base	4532	4572

## SPEEDBALL® NON TOXIC FABRIC INKS

- AP non toxic and non flammable
- Contain no solvents.
- Easy clean up with water
- Excellent wash fastness when properly heat set
- Opaque and light fast
- Great for cotton, polyester, blends, linen, rayon, and other synthetic fibers.
- Four color process inks for creative mixing

## FABRIC INKS

Color	8 oz. Product No.	32 oz. Product No.	1 Gallon Product No.
Process Cyanine	45650	45750	
Process Magenta	45651	45751	
Process Yellow	45652	45752	
Black	4560	4600	
Red	4561	4601	
Blue	4562	4602	
White	4563	4603	
Green	4564	4604	
Yellow	4565	4605	
Violet	4550	4575	
Peacock Blue	4551	4576	
Blue Denim	4566	4606	
Brown	4567	4607	
Orange	4569	4609	
Burgundy	4684	4686	
Fluorescent Hot Pink	4687	4693	
Fluorescent			
Lime Green	4690	4695	
Fluorescent Orange	4691	4696	
Fluorescent Magenta	4692	4697	
Night Glo Blue	47520		
Night Glo Yellow	47521		
Night Glo Green	47522		
Night Glo White	47523		
<i>(Note: Night Glo inks work best on pastel color fabrics)</i>			
Fabric			
Transparent Base	4552	4577	4682
Retarder Base	4639		

## SPEEDBALL®, NON-TOXIC PERMANENT ACRYLIC INK

- AP non toxic and non flammable
- Contains no solvents
- Wash up with water
- Dry to a brilliant, water-resistant matte finish
- Ideal for paper, cardboard, wood, certain vinyl
- Beautiful colors with excellent light fastness
- Four color process inks for creative mixing

Color	8 oz. Product No.	32 oz. Product No.	1 Gallon Product No.
Process Cyanine	46210	46410	46610
Process Magenta	46211	46411	46611
Process Yellow	46212	46412	46612
White	4620	4640	4660
Primrose Yellow	4621	4641	4661
Medium Yellow	4623	4643	4663
Orange	4624	4644	4664
Fire Red	4625	4645	4665
Medium Red	4626	4646	4666
Dark Red	4627	4647	4667
Gold	4628	4648	4668
Silver	4629	4669	4689
Violet	4630	4650	4670
Ultra Blue	4631	4651	4671
Dark Blue	4632	4652	4672
Peacock Blue	4633	4653	4673
Emerald Green	4634	4654	4674
Brown	4636	4656	4676
Black	4637	4657	4677
Gloss Overprint			
Varnish	46420	46620	
Extender Base	46219	46419	46619
Transparent Base	4552	4577	4682
Retarder Base	4639		



**SPEEDBALL®, ACCESSORY ITEMS:**

Besides inks, Speedball® provides all the necessary accessory items including screen filler, drawing fluid, extender and retarder bases, squeegees, frames and screen fabrics.

**Accessory Items and Kits**

Number	Size	Description
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**GRAPHIC SQUEEGEES**

4508	9"	Red Plastic Handle Craft Squeegee
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**WOODEN HANDLES**

4480	6"	75 Durometer Urethane Sharp Edge
4481	8"	75 Durometer Urethane Sharp Edge
4482	10"	75 Durometer Urethane Sharp Edge
4483	12"	75 Durometer Urethane Sharp Edge
4484	14"	75 Durometer Urethane Sharp Edge
4539	6"	70 Durometer Pro Wood
4535	8"	70 Durometer Pro Wood
4536	10"	70 Durometer Pro Wood
4537	12"	70 Durometer Pro Wood
4538	14"	70 Durometer Pro Wood

**FABRIC SQUEEGEES**

4534	9"	Beige Plastic Handle Craft Squeegee
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**WOODEN HANDLES**

4490	6"	50 Durometer Fabric
4491	8"	50 Durometer Fabric
4492	10"	50 Durometer Fabric
4493	12"	50 Durometer Fabric
4494	14"	50 Durometer Fabric

**STENCIL MAKING MEDIUMS**

4530	8 oz.	Screen Filler
4570	32 oz.	Screen Filler
4531	8 oz.	Screen Drawing Fluid
4571	32 oz.	Screen Drawing Fluid
4558		Diazo Emulsion Kit
4573	32 oz.	Photo Emulsion
4574	8 oz.	Sensitizer

**Accessory Items and Kits**

Number	Size	Description
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**SCREEN AND HINGES**

4505	10" x 14"	Screen Printing Unit
4506	10" x 14"	Frame with 12 xx Fabric
4509	8" x 10"	Frame with 12 xx Fabric
4515	12" x 16"	Frame with 12 xx Fabric
4516	16" x 20"	Frame with 12 xx Fabric
4507		Screen Printing Hinge Pack
4513		Hinge/Clamp Pair

**SCREEN PRINTING FABRICS**

4512		12 xx Screen Fabric (for 10" x 14" frame)
4514	5 yard roll	12 xx Multifilament
4698	5 yard roll	8 xx Multi-Danitex
4699	5 yard roll	12 xx Multi-Danitex
4700	5 yard roll	14 xx Multi-Danitex

**SCREEN PRINTING KITS/BOOKS/VIDEOS**

4511		Speedball® Screen Printing Textbook
4520		Glo'N Dark Screen Printing Kit
4526		Super Value Fabric Printing Kit
4521		Screen Printing Kit
4523		Deluxe Screen Printing Kit
4522		Ultimate Screen Printing Kit
4524		Screen Printing Tool Kit
45410		Screen Printing Instructional Video





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