PHOTO EMULSION
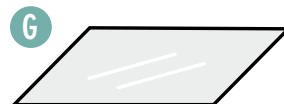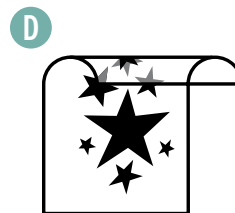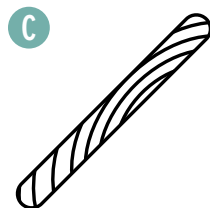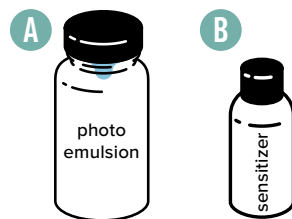
A photo emulsion
B photo emulsion sensitizer
C stir stick
D black and white
   transparent film positive
E strong light source
   - shop light (a photoflood
     bulb is included in the
     Speedball Light Kit or
     Advanced All-In-One Kit)
   - direct sun
F black paper/fabric
G glass or plexiglass

A photo emulsion

B sensitizer

1

If you can imagine that making a cut paper stencil is as easy as making toast, and creating a drawing fluid stencil is like making pancakes, then photo emulsion stencils are like making a gourmet omelet. There are numerous ways to experiment with tools, techniques, and exposures to fulfill your specific print needs or limitations. Be patient with your process. This is the most magic-filled of the three stencil-making techniques.

notes on photo emulsion

Speedball's Diazo Photo Emulsion is a 2-step process where the photo emulsion needs to be "activated." To activate the emulsion, sensitizer must be added. The sensitizer is a very thick oil and needs water to create the right consistency for adding it to the photo emulsion. The big advantage of Speedball's' Diazo Photo Emulsion is there is no need for a light safe environment. Simply working under normal light will keep the emulsion from premature exposure.

mixing emulsion

- Locate your bottle of photo emulsion (A) and little bottle of sensitizer (B). (The sensitizer bottle is not empty!)
- Fill the sensitizer bottle approximately ½ full with water (tap or distilled water works just fine.)
- Recap sensitizer bottle and shake vigorously! A craft stick can be used to scrape at the bottom to ensure all the material is stirred and dissolved.
- Open your bottle of photo emulsion – it will be bright blue.

- Carefully pour your mixed bottle of sensitizer into the bottle of photo emulsion. (Fig. 1)
- Stir well with a stir stick (C) until all the sensitizer is thoroughly mixed into the photo emulsion and it turns a grassy green. (If you're worried you did not get all the sensitizer out of the bottle, it is ok to add a small amount more water to the bottle, shake again, and add it to the emulsion.)
- Store any unused emulsion in a cool, dark place. The shelf life, if refrigerated, is approximately 4 months.

coating the screen

This is your first task of skillful craft. The fundamental goal of coating a screen is to thoroughly permeate the mesh with emulsion without overly saturating it and leaving emulsion dripping off your screen as it dries.

coating with a squeegee:
- Lay your screen horizontally over a sink, tub, etc.
- Pour a generous bead of your mixed emulsion along one end of your frame.
- Place your squeegee behind the mixed emulsion and in a nice easy motion, draw it across the screen, coating the screen with emulsion as you go. (Fig. 2)
- Continue this step with the squeegee to ensure the one side is fully coated.
- Repeat this same step so you coat one side (length-wise) and then rotate and flip your screen to coat the other side (width-wise.)
- To remove excess emulsion run your squeegee over your screen lightly. The extra emulsion can be collected back into the bottle.

(See **advanced section** [**Pg. 15**] for coating with a scoop coater.)

drying the screen

When your emulsion dries it becomes light sensitive and requires your screen to be kept in a dark place. Cupboards, closets, empty drawers, etc. are all great places.
- Lay your screen horizontally to dry for a minimum of 4 hours. (Putting a fan on the screen will help speed up the drying time.)
- Keep your screen out of light until you are ready to expose. (If you need to move it, you can store it in a black trash bag or a box.)
- You can leave a coated screen unexposed (in a dark place out of direct light and heat) for 1-2 weeks.

creating your artwork

The most effective image for use with photo emulsion is any artwork with a clear distinction between the black image and the white background. If creating handmade imagery, this would include hard-edged drawings done with black inks on transparent acetate, glass, or plexiglass. (Watercolor washes and light drawings will not expose well.) Another popular and effective way to create an image is to send a high-contrast, opaque image through a black and white laser or ink jet printer on a transparency sheet (D). (Speedball transparency sheets provided in some kits are for use with ink jet printers only.) The more opaque the artwork, the better. (Fig. 3) Taping two printed transparencies together can be an effective way to increase the opacity of your image. If using an actual photographic image, you may need to explore how to digitally create a black and white "halftone" of the image before you print it. Images with gray tones will not expose well. (Fig. 4)

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◆ *If transparent acetate is not available, you can print your image on regular white paper, rub the paper with a towel and any household oil (vegetable, olive, canola, baby), wipe off excess oil, and let dry. Although, the slight opacity of the oiled paper may require a slightly longer exposure time.*

Keep in mind, every screen fabric also has a resolution limit of its own, dictated by the mesh count of the screen fabric (see "basic tools" in the "screen" section at the beginning for further insight.) If you are losing detail when you expose your image, you may have too much detail for the mesh count to hold — attempt to create an even more graphic/less detailed image. This problem will arise most often with a halftone photograph image with dots too small to expose on a screen.

exposing your image

The amount of time it will require to properly expose your image will depend mostly on your light source. A larger, brighter light source will require less time for a good exposure. A smaller, dimmer, light source will require more time. A clean and crisp exposure also requires even and accurate pressure between the screen and your artwork.

◆ **NOTE: You will now be working with an unexposed screen out in the open, so take care to work quickly and outside of direct light until the point that you are exposing your screen.**

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- glass/plexiglass
- transparency
- frame
- black fabric/paper
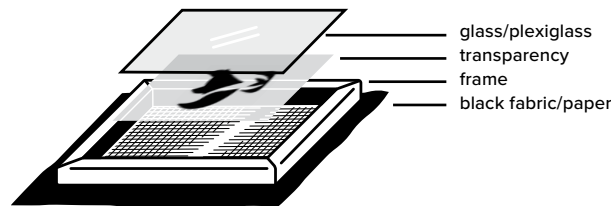
- Place your screen directly underneath your light source (E), with the light source placed approximately as far from your screen as the diagonal measurement of the screen to ensure that the light source is far enough away to evenly expose your entire image. (Fig. 5)
- Place something black (F) (black shirt, black piece of paper, black foam-core, etc.) under your screen, your black and white artwork on top, and a piece of glass or plexiglass (G) in the screen on top of your artwork to press it into tight contact against your screen. Without this pressure, any warps or bends in your transparent sheet will lead to a blurry stencil.

◆ *If you do not have plexiglass or glass, you can tape or glue your transparency to your screen to temporarily adhere it. If your plexiglass or glass is too big to fit inside the screen frame, you can flip your screen over and place the plexiglass or glass on top.*

- Simultaneously, set a timer corresponding to the suggested exposure times, and turn on your light source.

4

semi-opaque black   fully-opaque black

photographic image   "halftone" image
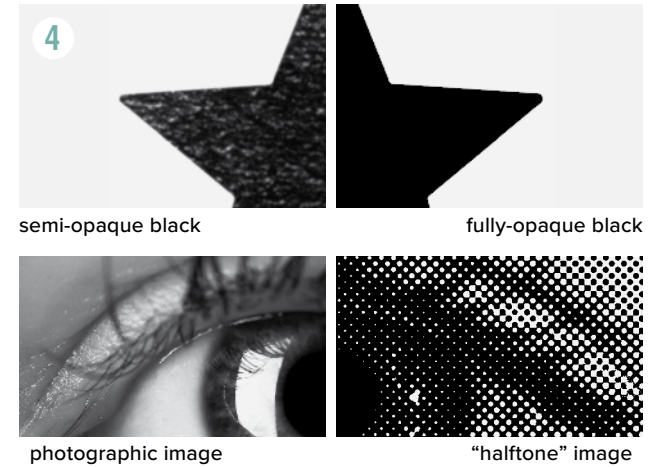
Below are some rough estimations for exposure time.

Light Source: 250W BBA No. 1 Photoflood Bulb

frame size	lamp height	exposure time
8x10 inches	16 inches	7 minutes
10x14 inches	16 inches	8 minutes
12x18 inches	18 inches	10 minutes
16x20 inches	20 inches	2 minutes
any	sunlight	45 seconds

washing out your stencil

- Using a spray nozzle or hose, apply a forceful spray of water to both sides of your screen. (Fig. 6) (Do not use hot water.)
- Concentrate the water on your artwork as the water slowly reveals your stencil.
- Continue spraying until all unwanted emulsion is gone and you can easily see your stencil. You can check by holding your screen up to a light and confirm there is no green emulsion in your stencil.
- If your stencil is a bit "stubborn" light scrubbing with a soft bristle brush over the screen can expedite the washout process.

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◆ *If your emulsion washes out too easily, taking your image with it, your exposure time was most likely too short and you have underexposed your emulsion. If your emulsion is extremely stubborn and difficult to spray out of the screen, your exposure time was too long and you have overexposed the emulsion.*

But hopefully you have...

EXPOSED YOUR FIRST SCREEN PRINTING PHOTO STENCIL!

Dab your screen dry with newspaper or towel (Do not rub! The emulsion is still wet), and leave it to dry fully.

◆ *You can expose your screen to light again (by itself without the black and white film) to cure your emulsion even more.*

creating your print

See "**creating your workspace**" (**Pg. 2**) for tool and workspace descriptions.

off-contact
To create a cleaner and crisper printed image, it helps to have the mesh slightly up off your print surface until the moment you press it down onto the surface with your print stroke. This is called "off-contact." A coin taped under each bottom corner of your screen can be an effective way to provide enough "off-contact" for the mesh before you print.

paper
One of the keys to a successful print is making sure your paper is in the right place every time. This is especially true when printing a multi-color image, which requires the art to be lined up, or "in registration."

With your screen frame secured (if necessary — see "frame base/hinge clamps" in "creating your workspace"), place your sheet of paper underneath your screen and adjust your sheet so that it is placed accurately in relation to your image stencil. You may need to lift and lower your screen a few times to check placement.
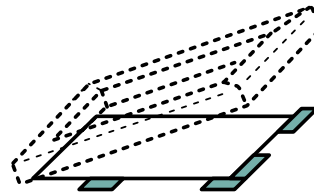
Once your print paper is placed correctly, carefully lift up your screen, making sure to not move your paper, and stick two pieces of thick tape or thin cardboard against the bottom edge of your paper, and two on the left or right edge. These registration tabs will stay on the table and act as a "jig" to keep all paper placed in the same area under your print.

fabric
If printing shirts or bags, cut a piece of thick paper, cardboard, or foam board to slide inside the shirt to keep ink from bleeding onto the other side when printing. (Fig. 7)

If your goal is printing a single color image on a shirt, rule of thumb for printing shirts is to try and print the artwork three fingers width down from the collar.

◆ *Given its tendency to bend and stretch, printing multicolor artwork on fabric can be a bit more of a challenge than printing on paper, but it is not impossible. As long as your additional imagery does not need to line up too closely, you can easily eyeball additional screens over the top of previously printed images and print additional color to great success. Any tighter registration on fabric may require more elaborate screen printing set-ups than provided.*

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printing your image

Oh boy, oh boy, now we get to print!
Pulling your squeegee is the heart of the craft of screen printing. The speed of your pull, squeegee angle, pressure, and "ink-wrangling" are some of the core skills for a good print.

The full print stroke is comprised of pulling the ink toward you on the "print stroke," then lightly pushing the ink back up to the top of the screen as a "flood stroke" to re-ink the screen and print again.

print stroke   flood stroke
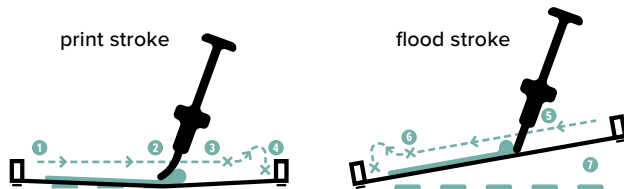
test printing

Before printing, it is always wise to print some "test prints" on scrap paper or fabric. This will help you recognize and remedy any issues before any legitimate printing. You can test print on anything you have laying around.

printing steps

additional materials:
• spray bottle of water (optional)

The following steps will guide your through the mechanics of a how to print. Good luck! See you on the print side:

1 Scoop out and add a few tablespoons of ink along the top of the screen (farthest from you).
   Do not lay any ink on your design or open mesh.
2 Place your squeegee behind the ink, tilted approximately 60 degrees in order to create a sharp print edge. Pull the squeegee toward you and across your image, evenly applying as much pressure as it might require to open a heavy door. (Fig. 8)
3 Stop your pull BEFORE you reach the bottom of the screen, and lift your screen slightly to separate the screen from your print surface.
4 Lift your squeegee, and place it in FRONT of the bead of ink.
5 Applying light to no pressure at all, "flood" the ink back over your screen and image, towards the top of the screen.
6 Finish your flood stroke BEFORE you reach the top of the screen, lift your squeegee, and lean it against the back of the screen, behind the ink.
7 Lift your screen (Fig. 9) and...

experience the miracle of screen printing

Congratulations, you just produced your first screen print using the photo emulsion method! (Fig. 10)

clean up

ink

Using a spatula, squeegee, or hand-held scraper, collect any excess ink and return it to the original jar or any other airtight container — a yogurt container with a removable lid works well. You can easily store any excess ink at room temperature for a few weeks, or even months.

All Speedball inks are water-based, and safe to wash down the drain. Soap and water will easily wash up any excess ink. Ink which has dried into the screen may need to be scrubbed or removed. It is natural that some inks may permanently stain a screen, but this will not affect print quality at all.

work area, tools and supplies

Make sure to pick up and wipe down your work area.

Using Speedball Pink Soap or dish soap, and a scrub brush, remove any excess ink from the blade and edges of the squeegee. Let dry. Remove tape from your screen frame and wash away excess ink with warm water before continuing on to removing the stencil.

removing emulsion

See the "advanced" section (Page 15) for reclaiming a screen and emulsion removal.

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