THE OFFICIAL
DIY print SHOP MANUAL

DO IT YOURSELF KITS AND PRESSES

COVERING:

- GETTING STARTED
- ARTWORK
- SCREEN EXPOSURE
- PRINT PREPARATION
- PRINTING
- CLEAN-UP/RECLAIMING SCREENS

EASY! DIY print SHOP &FUN!

GETTING STARTED

Welcome to screen printing. Screen printing is considered by many to be one of the oldest methods of printing. Today, screen printing is a multi-billion dollar industry. It integrates exciting industries like fashion, design, sports, music, education, corporate America and much more! The basic purpose of screen printing is to create a screen through which ink can form designs on numerous duplicates. Literally thousands of prints can be made from a single screen at a very economical price.

With this kit (and our numerous tutorials) you will be able to create art, a screen and a t-shirt with your unique design on it. This manual and the accompanying YouTube video (https://www.youtube.com/watch?v=eCZbmoWZlGE) will walk you through the process whether you are doing this as a hobby or starting a business.
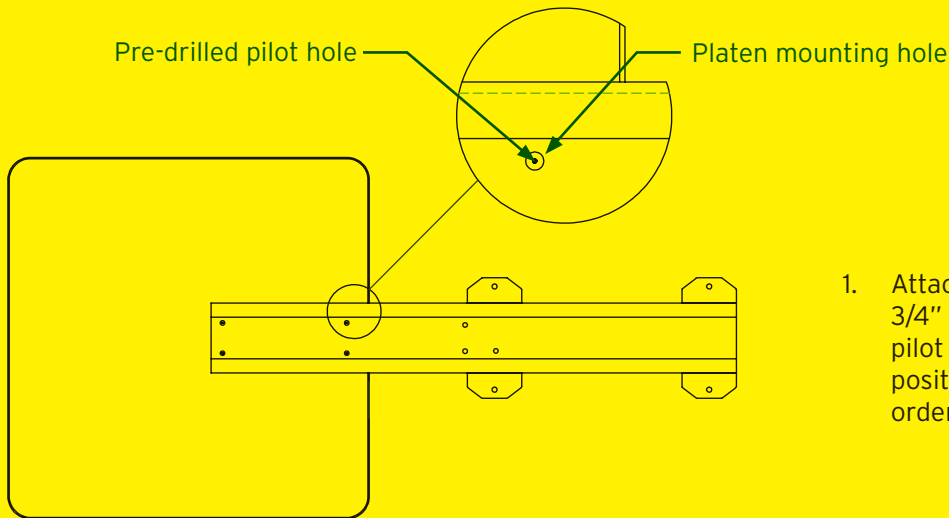
HOME PRODUCTS NEEDED:

• Water

• Pressure hose (sink hose or pressure washer)

• Open table top space

• Iron, heat gun or oven

• Screwdriver (electric or manual)

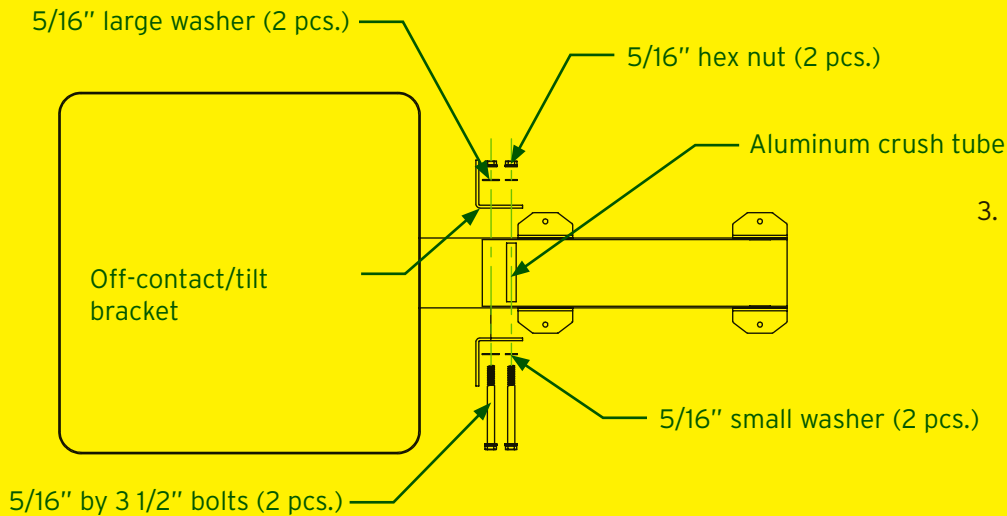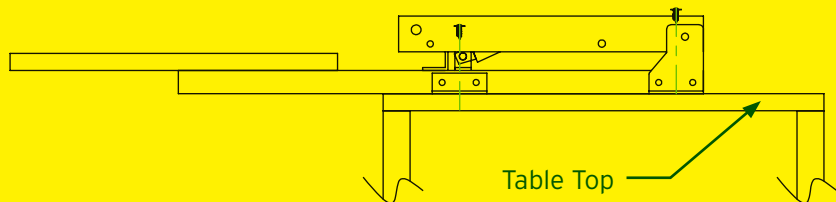• 1/2" wrench or crescent wrench (x2)

PRESS/SETUP PARTS:

• Clamp head

• Pallet

• Screws (x4)

• Off contact adjustments

• Press

DIY PRESS ASSEMBLY INSTRUCTIONS

Pre-drilled pilot hole
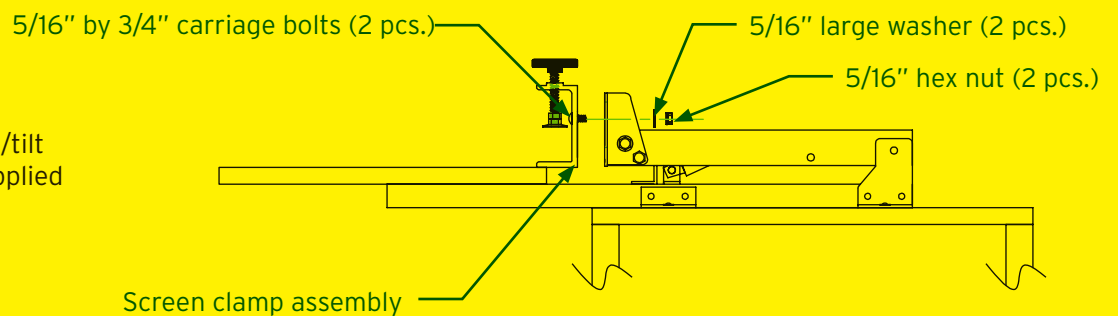
Platen mounting hole

1. Attach platen to press using supplied 3/4″ pan head screws. Line up pre-drilled pilot holes with press in the upside-down position. Insert the screws in a diagonal order for best alignment.

2. Mount base assembly to table top using supplied mounting screws.

Table Top

5/16″ large washer (2 pcs.)

5/16″ hex nut (2 pcs.)

Aluminum crush tube

Off-contact/tilt bracket

3. Attach off-contact/tilt brackets using supplied 5/16″ hardware.

5/16″ small washer (2 pcs.)

5/16″ by 3 1/2″ bolts (2 pcs.)

5/16″ by 3/4″ carriage bolts (2 pcs.)

5/16″ large washer (2 pcs.)

5/16″ hex nut (2 pcs.)

4. Attach off-contact/tilt brackets using supplied 5/16″ hardware.

Screen clamp assembly

1. Turn press over so bottom is facing up.
2. Set screen under press arm.
3. Place platen on screen to set up under the press.
4. Align the drill holes on the platen to the four holes on the press arm.
5. Use screws to attach platen to press arm.
6. Turn press over onto its base.

ALIGN OFF-CONTACT/TILT BRACKET TO PRESS ARM

1. Remove hardware already in place.
2. Place a bracket on each side.
3. Slide bolts back through holes to clamp in both side clamps.

BOTTOM BOLTS NEEDS TO SIDE THROUGH THE CENTER TUBE

1. Lower head into print position.
2. Take clamp head and remove nuts from bolts.
3. Align bolts to slots in the off-contact/tilt brackets.
4. Attach nuts to secure to press arm (finger tight, we will adjust these later).

MOUNT PRESS TO A STURDY TABLE OR BENCH FOR STABILITY

1. Place so platen hangs off over the edge of the table/bench.
2. Attach to board with screws provided.

ADJUST SCREEN CLAMP HEAD

1. Set screen onto platen.
2. Loosed clamp head screws.
3. Slide screen in, square up to platen and clamp down.
4. Tighten off contact bolts.
5. Tighten tilt bolts (bottom first then top bolt).
6. This keeps the screen flat and level with the platen.

NOW YOUR PRESS IS SET UP!

SETUP UP SCREEN EXPOSURE LIGHT:

1. Source a light fixture to power bulb.
2. In a light safe environment center bulb directly above the middle of the screen at a height of twelve to fifteen inches.
   Note: The higher your bulb is, the longer your exposure time, and more coverage to the screen. The lower your bulb is, the shorter your exposure time, but the more direct your light source is to the center of

the screen. For larger screens use a higher distance and increase exposure time.

3. Place opaque black transparency reverse onto shirt side of screen and tape to screen. If your transparency is not opaque your screen will not expose as well. We recommend using water proof Rite-Film and BlackMAX Ink made by Ryonet® powered by AccuRIP® for maximum density. Rite-Film will also work with standard Epson® printer ink. Use BEST QUALITY PHOTO and PREMIUM GLOSSY PHOTO PAPER settings in your print driver.
4. You can add a piece of thin optically clear glass on top of your screen to increase the positive pressure during exposure. This is optional but will increase the detail gained during exposure.
5. Expose for ten to eleven minutes in a light safe environment. *Note: Ensure your screen is bone dry before exposing, we recommend drying and exposing in a room under 40% humidity. The more emulsion your screen has, the longer your exposure times will be. Increase exposure for lower mesh counts.*
6. Washout your screen in a light safe environment.

SCREEN PREPARATION:

1. Find degreaser bottle. **FIG. 1**
2. Fill with water and place squirt cap onto bottle.
3. Wet the screen with water.
4. Spray on degreaser.
1. Scrub with scrub pad on both sides of screen. **FIG. 2**
2. Clean environment necessary to ensure a clean screen.
3. Rinse the soap thoroughly off of the screen and the frame.
4. Dry screen (either air dry with fan or blow dryer).

YOU'RE READY TO EXPOSE!

FIG. 1
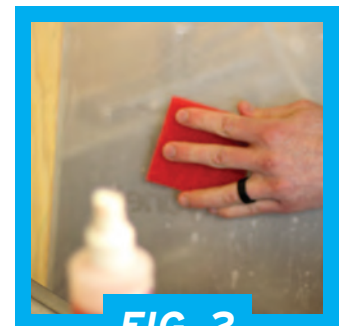
FIG. 2

ARTWORK

This kit is capable of doing single color designs. At your computer you need to have a design you want to print. This can be in Corel, Illustrator, Photoshop, etc.

PROGRAMS NEEDED

- Adobe® Photoshop® or Gimp for raster designs.
- Adobe® Illustrator® or CorelDRAW® for vector images.

RASTER IMAGES: JPEG, TIFF, BITMAP (INTERNET IMAGES)

- Definition: an image comprised of pixels. A finite bit of information making up a photographic image.

VECTOR ART, LINE WORK

- Definition: images comprised or line work calculated mathematically.
- Optimal images for screen printing are vector art. Nice clean lines.

SPOT COLOR ART

- Halftone artwork: a color or grayscale image that has been converted into a series of large and small dots, software required.
- Spot Color: color reproduced by an opaque, premixed, standard ink chosen from a color system such as the PANTONE Matching System®.

CLIP ART IMAGES VS. INTERNET

- Copyright laws

DOING SIMPLISTIC IMAGES IN ADOBE® PHOTOSHOP® (PHOTOGRAPHIC DESIGNS)

- Tips: use largest image available to get best resolution. Learn the text tool, magic wand and threshold commands to easily and quickly breakdown a one color image.
- Threshold tool: use to make multi-color images into a 1 color job.
- Using layers to get separations.
- Work in RGB (red, green and blue) mode and 300 DPI.
- Ready for film.

DOING SIMPLISTIC DESIGNS IN CORELDRAW®

- Tips: use largest images available to get best resolution.
- Trace images with the trace bitmap option
- Re-color image in PANTONE® colors.
- Use print function to separate the colors of the image.
- Print out the appropriate color required for the design.

WORKING IN COREL® PHOTO-PAINT®

- Edit bitmap to go to paint file.
- Threshold tool.
- Similar to Adobe® Photoshop®.

FILM OUTPUT

- 8.5 by 11 inches waterproof film.
- Coated on one side. This side will stick to your finger when wetted.
- Print out design to inkjet printer: Density is key. If you are using standard inks in a standard printer be sure to make sure it is dark enough. You do not want to see light through the image. You may need to double or triple up on the film.
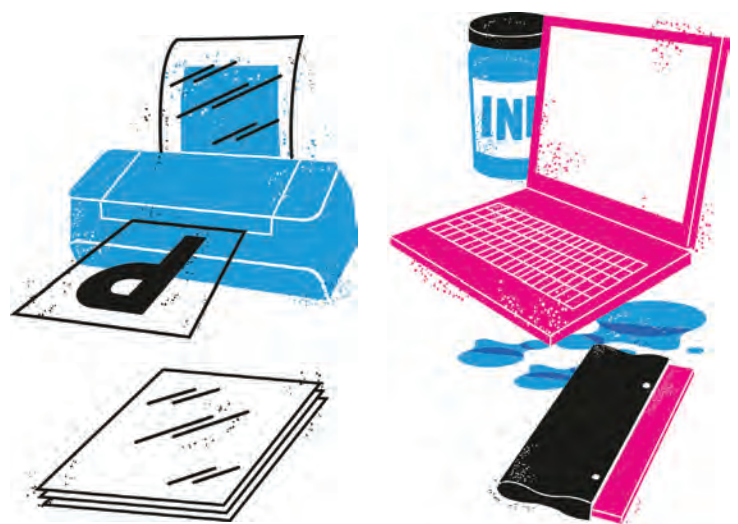
EXPOSURE

- Must be in a light safe environment!!!!
- Create a light safe environment with the yellow bulb provided. **FIG. 1**
  Tip: coat your screens at night with a yellow bulb in the room, use a bathroom with a curtain over the window and the yellow bug light.
- Open emulsion to add diazo.
- Fill small bottle with distilled water one half full.
- Shake vigorously and pour into large bucket of emulsion.
- Stir well and mix in thoroughly. Tip: clean up any spills with warm water immediately.
- Let sit for two hours to release any air bubbles in the mixture.
- Take scoop coater wipe out to take out any contaminants.
- Fill scoop coater one third full with emulsion. **FIG. 2**
- Set screen at an angle of about 80° F on a sturdy surface.
- Start on the "flat" shirt side of the screen
- Hold the scoop coater with both hands and press the sharp side of the coater against the base of screen. **FIG. 3**
- Press firmly until emulsion is touching screen and slide coater up to top of screen.
- At the top of the screen tilt it back to release emulsion from the screen. **FIG. 4**
- Repeat on the inside "ink" side of the screen.
- Should see a nice glassy and smooth surface.
- Lay screen flat with the "shirt" flat side facing down. **FIG. 5**
- Let screen dry for minimum of four to six hours with a fan blowing on the screen.
- Once dry, store in a light safe environment. This can be a dark trash bag to protect the screen.
- Clean out scoop coater by putting remaining emulsion back into bucket and rinsing out with water. **FIG. 6**

FIG. 1

FIG. 2

FIG. 3


FIG. 4

FIG. 5

FIG. 6

NOTICE:
LIGHT SAFE ENVIRONMENT

1. Draw a center line on pallet and screen to be exposed. You can do this with a t-square. **FIG. 7**
2. Lay film onto pallet using center marks on center line of pallet.
3. Remove exposure light from clamp.
4. Put tape on reverse side of film facing up. **FIG. 8**
5. Put screen in clamp and lower to film.
6. Press screen onto tape, picking up the film on the back of the screen. **FIG. 9**
7. Remove from clamp and secure film to the screen.
8. Hang exposure light directly over the center of the screen. **FIG. 10**
9. Turn screen so image lays on pallet image up, centered under the exposure light. *Use glass for better positive contact between the positive and emulsion.*
10. Turn on light to expose screen. **FIG. 11**
   - Be sure to set a timer to get the correct amount of time.
   - Time is approximately **11** minutes to expose with emulsion provided.
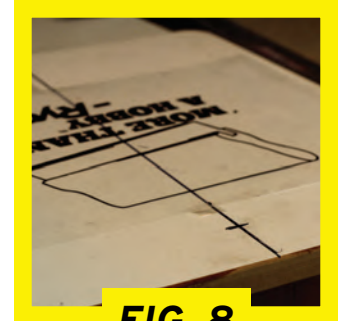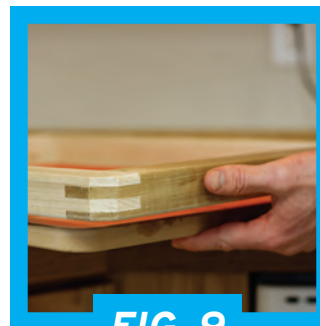
WASHING OUT IMAGE AFTER EXPOSURE:

1. Use cold water to rinse screen **FIG. 12**
2. Wet screen on both sides with sprayer.
3. Let sit for one to two minutes then continue to wash out from "flat" t-shirt side of the screen.
   - See videos for under exposure if your screen is slimy or has soap bubbles
   - See videos for over exposure if your screen image will not wash out.
4. Use paper towel or newspaper to lay on screen to soak up excess water. **FIG. 13**
5. Dry with either a fan or blow dryer. Make sure to lay flat with ink side facing down.
   - Make sure image is clear of any water to reduce the chance of "scum."

FIG. 7

FIG. 8

FIG. 9

FIG. 10

FIG. 11

FIG. 12

FIG. 13

TIP: YOU CAN STORE IN A FRIDGE TO AID IN EXTENDING THE LIFE OF THE EMULSION.

SCREEN PREP

1. Remove exposure light for future use.
2. Use tape to tape off the four sides of the interior of the screen.
   - Tape off areas where there is no emulsion. Putting half of it on the screen and half on the frame. Work it into the crease where the mesh and frame meet. **FIG. 1**
3. Tape off registration marks with scotch tape so ink will not pass through onto your shirt.
4. Put screen back into screen clamp. Do not tighten down.
5. Lower screen into print position and line up registration marks up to center line on press. **FIG. 2**
6. Hold screen in place and tighten screen clamp.
7. Set off-contact. To set off-contact, make sure there is one eighth inch between the screen in the print position and the pallet. This allows the screen to release from the shirt as the squeegee goes by leaving the ink on the shirt and not in the screen. You can make adjustment with the off contact bolts on the screen clamp head.
   - Place a board or cardboard one eighth inch thick on pallet. Set screen in down position and tighten bolts on screen clamp to set off contact. **FIG. 3**
   - You can place a washer on the edge of the frame to create an off-contact tab to control flexing. **FIG. 4**
8. Make sure screen is still aligned to center line. **FIG. 5**
9. Now take the pallet adhesive and spread it evenly over the pallet using the ink card provided.
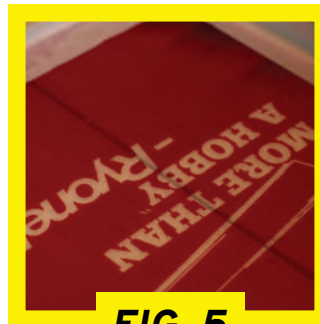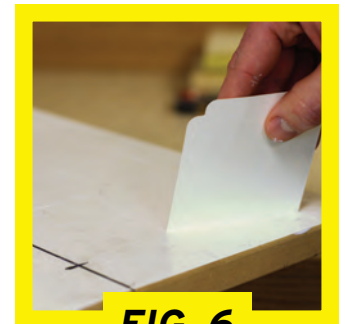10. Try to use a thin layer for good adhesion and fast drying. **FIG. 6**

FIG. 1

FIG. 2
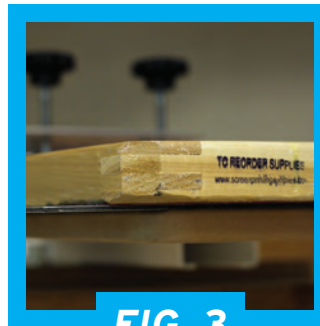
FIG. 3

FIG. 4

FIG. 5

FIG. 6

PRINTING

1. Warm up adhesive on platen with heat gun.
2. To reactivate the adhesive, use a little bit of warm water on pallet.
3. Load shirt from bottom over the platen. **FIG. 1**
4. Use the center line as a visual guide to center the shirt.
5. Use the neck line to know when to stop.

DARK GARMENTS:

- Load ink into the screen at the base of the screen. **FIG. 2**
- Load enough to pull the ink over the screen.
- Use the squeegee to flood ink over the image area. Use little pressure as to not push the ink through mesh just yet. **FIG. 3**
- Pull squeegee in an 80° angle with moderate pressure in an even stroke toward yourself. **FIG. 4**
- Shear the ink through the screen with the squeegee. You can do this pulling or pushing the squeegee.
- If you push have the squeegee in a 45° angle.
- You can stroke the ink one to two times.
- Flood the image between prints.
- To flood between strokes leave shirt in place.
- Place a carrier sheet on the image and iron over to dry the ink in place. This can be done with a heat gun as well. Just dry the ink to the touch, no need to cure at this point. **FIG. 5**
- Bring screen back down and print again. If you pull, pull every time. If you push, push every time.
- Now you are ready to cure the ink.
- When using an iron replace the carrier sheet and iron the ink for two minutes to get a full cure. Do this in sections to ensure a good cure. **FIG. 6**
- When using a heat gun pass over the image area for two to three minutes making sure to cover the entire image. The goal is to evaporate all the water out of the ink and heat set the pigment.
- Take shirt off the platen to do a final cure this way you do not over heat the platen as well. **FIG. 7**
- To remove shirt slide hand into the neck to break the adhesive hold on the garment and slide off the pallet. **FIG. 8**
- Testing cure with a stretch test—ultimate test is a wash test. **FIG. 9 (NEXT PAGE)**
  Tip: If ink dries in the screen use a little warm water to open up the mesh. Then dry with a dry rag and you will remove any excess water on the screen.

FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 6

FIG. 7

FIG. 8

PRINTING

LIGHT GARMENTS:

1. Put dark ink into screen.
2. Flood the screen with ink. Be sure not to press too hard at this juncture.
3. Load shirt onto platen.
 • Be sure to have image three inches lower than the neck line of the shirt.
4. Print image.
 • Darker colors print easier than lighter colors.
5. Remove shirt and place on top of pallet.
6. Pull by the shoulders–the ink is wet so don't let it fold over onto itself.
7. Use heat gun or iron to cure ink into shirt.
 • Dark ink on light shirts cures faster and can be seen curing. Color will change and look more matte. Wet you finger and rub image to test curing. No ink should come off on your hand if it is cured correctly.

INK CHANGE OUT:

 • To change colors in a press or re-initialize ink in screen. If ink has dried in screen use a squirt bottle to re-wet the ink. Do this at the base and mix together with the squeegee.
1. To change colors, remove ink from screen with an ink card and put back in the container. **FIG. 10**
2. Clean squeegee with warm water and a paper towel. **FIG. 11**
3. Use warm water in the screen using a paper towel to take ink out. Work water into the ink until it is loose from the mesh.
4. Wipe out with a dry rag.
5. Repeat until all ink is out of screen. **FIG. 12**
 Tip: you can use a screen opener or ink degrader to remove ink as well. If the emulsion starts to breakdown you are under exposed and need to expose for longer.
6. Re-ink with next color and start again!
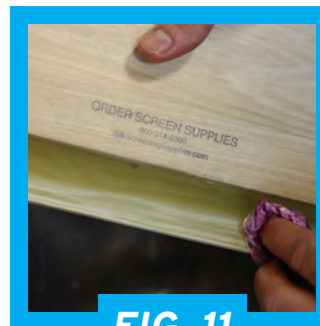

FIG. 9

FIG. 10

FIG. 11

FIG. 12

CLEAN-UP

CLEAN-UP:

- Pull ink off the image area to begin cleaning. **FIG. 1**
- This can be done on a scrap shirt or test pellon or newspaper.
- Scoop the remainder ink from squeegee and screen into the ink container for later use. **FIG. 2**
- Use warm water and paper towels to remove the reminder of ink residue from screen.
- Shop towels work best because they are more absorbent.
- Use degreaser or warm water to remove platen adhesive off platen.

RECLAIMING:

- Take off tape from screen on both sides. **FIG. 3**
- Use water to remove any additional ink. **FIG. 4**
- Add water to emulsion remover bottle. Fill to top and replace spray cap.
- Spray emulsion remover on both sides of the screen.
- Use second scrub brush to work into the mesh on both sides of screen. **FIG. 5**
- Never let emulsion remover dry in the screen. This will "lock" the image into the screen and render it useless.
- Rinse off with water. The more pressure you have access to the better. **FIG. 6**
  If emulsion "sticks" in the screen you can take it to a local car wash and use the pressure hoses there to clear the screen.
- Now degrease the screen and dry to prepare for re-coating with emulsion.
- Rinse out your scrub brushes with warm water and label which chemical they go with. **FIG. 7**

FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 6

FIG. 7

GLOSSARY

ARTWORK: Common term for an image or text that will be used for printing.

BURN: To expose an emulsion coated screen to a light source to create a stencil.

COATING: The process of applying direct emulsion to a screen.

CURE: The process of using heat to completely fuse plastisol ink. Technically incorrect term for "drying" ink.

DARK GARMENT: Shirts darker in color such as black, royal, green, red, etc.

DARKROOM: A room devoid of light used for the purpose of drying screens coated with emulsion or capillary film.

DEGREASE: The process of washing a screen with a cleaning solution to remove all traces of dirt and oils prior to coating with emulsion.

EMULSION: Photosensitive chemical in either liquid, roll or sheet form that is applied to a screen and used for the purpose of making a stencil.

EXPOSURE: Exposing an emulsion coated screen to light to create a stencil. Also known as "burning" a screen.

FILM: Common term used for a film positive.

FLASH CURE UNIT: An infrared heating element that is typically attached to a rotary turntable, positioned above the platen and used for the purpose of bringing a print to a partially cured state so a second print stroke can be applied to achieve desired opacity. A flash cure unit can also be used to completely cure a print.

INK: Common term used to describe the printable substance that is used to make a print. In the textile printing business, the most widely used ink is plastisol.

LIGHT GARMENT: White or pastel colored garments.

LINE ART: Black and White artwork consisting of no halftones or color.

MANUAL PRESS: Press used for transferring ink to a substrate manually.

MESH COUNT: The number of threads in one square inch of screen fabric, measured in both directions. The lower the number, the coarser the mesh and the larger the screen opening.

OFF-CONTACT: A method of screen printing of having a slight gap between the screen and the substrate for improved printability.

OPACITY: An ink's ability to cover the underlying color of the substrate.

OVEREXPOSED: Exposing a screen for too long of a period of time resulting in a screen that will be difficult or impossible wash out.

PLATEN ADHESIVE: Adhesive in either spray or liquid form that is used to hold down garment on shirt board when printing.

PLASTISOL INK: A screen printing ink primarily for textile printing composed of the following components: PVC (polyvinyl chloride), color pigments and plasticizers.

PRINT SIDE: The side of the screen that touches the substrate being printed on.

RECLAIM: To remove old emulsion from a screen so the screen can be reused.

SAFELIGHT: A light that should be used when working with photosensitive materials like emulsion or capillary films to prevent accidental exposure to ultraviolet light. A yellow "bug light" works well for this purpose.

SCOOP COATER: A metal trough used to dispense emulsion for the purpose of coating screens.

SCREEN: A wooden or metal frame with mesh tightly attached to it.

SQUEEGEE: Wooden or metal handled tool with a rubber blade used to drive ink through a stencil by pulling the squeegee across the screen.
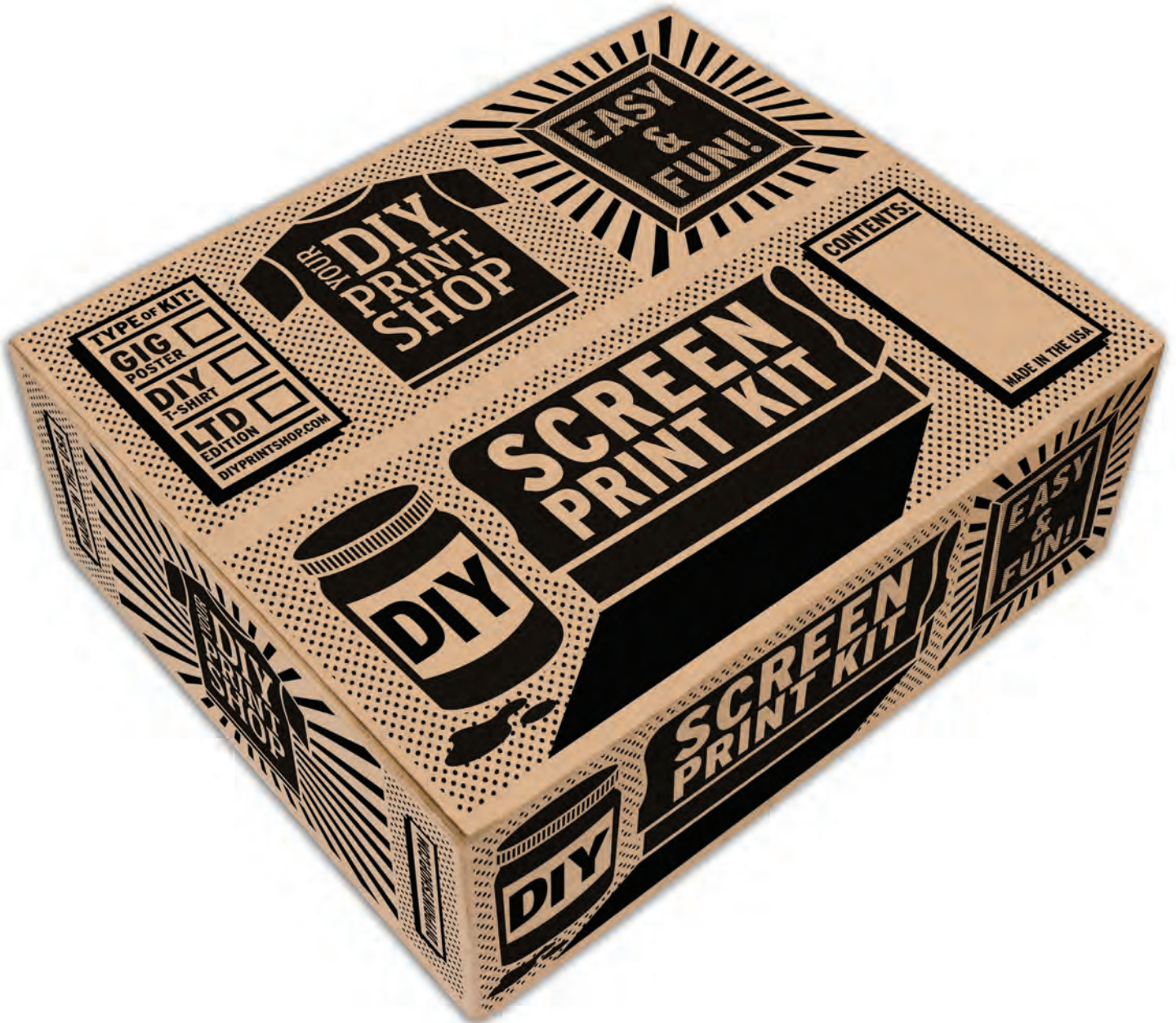
DIY*print*SHOP™

On a mission to find a better screen printing ink we searched from the depths of earth to the edge of the milky way until we finally found it: a new Green Galaxy. Sustainable, printer and planet and economically priced. Green Galaxy inks are taking the universe by storm. Too see the complete line of Green Galaxy ink check them out at:

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