

### Step 3: Printing a T-Shirt

Objectives: Upon completion of the shirt printing step, you should be able to successfully print a two-color design on a t-shirt and cure the ink.

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#### Tasks

- \* Apply the ink to the screen
- \* Print the ink through a screen to a t-shirt
- \* Cure the ink

#### Vocabulary

- \* off contact
- \* spot color
- \* plastisol
- \* wet-on-wet
- \* print-flash-print
- \* curing
- \* flash heating
- \* gel

#### Materials & Supplies

- Exposed screens
- Plastisol Inks
- Stir sticks
- Squeegees
- Tape
- Flash heater
- Curing oven

#### Video:

- \* Watch the “Emulsion” segment of the Exposure DVD.
- \* Write down the definitions of the vocabulary terms.

**Plastisol** ink is the most common for printing t-shirts. It provides bright colors and is durable. It is viscous, or thick when you first open the container. Stirring the ink thins it out.

1. Apply the ink to the screen.

\* Stir the ink to thin it out.

When the ink is thin or plyable, it is ready to use.



\* Apply ink to the screen.

Use a spatula to put load the ink a few inches below the bottom of the image. With experience, you will learn how much ink to use for a given job. You can always add more while you're working, if you need to, and scoop any extra back into the container when you're finished.



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The first print or two will be test prints. They will have registration marks on them, and may not be perfectly lined up, so its a good idea to use a reject shirt or scrap for testing.

2. Make a test print

\* Mount the test shirt on the shirt board.

- Slide the t-shirt onto the shirt board so that the bottom of the sleeves are centered.
- Smooth out any wrinkles.



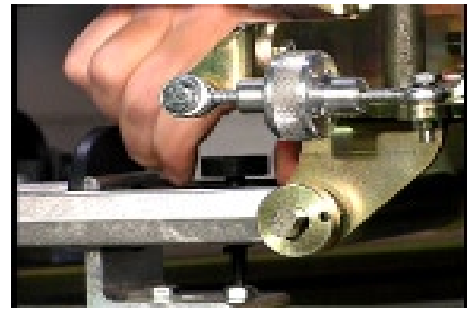
When printing, the screen needs to be about 1/16" above the fabric. This is called the "off contact".

3. Set a 1/16" off-contact

\* Lower the frame onto the t-shirt.

\* Use the off-contact adjuster to lift the frame up 1/16" above the t-shirt.

You can use a penny to gage the distance.



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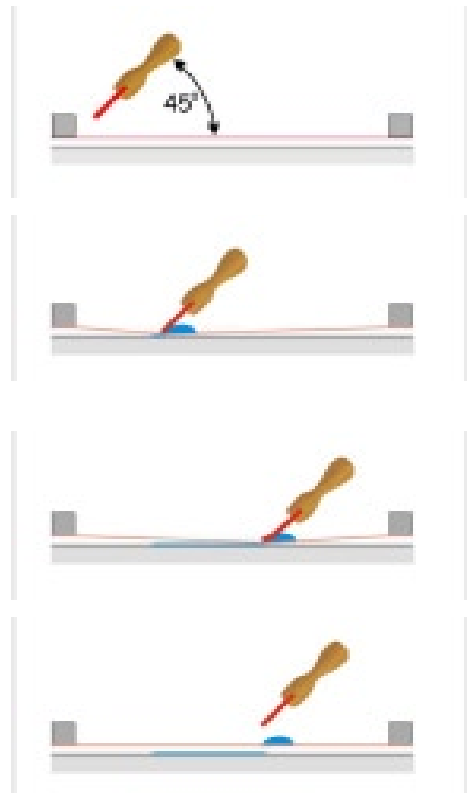
**Before printing, review these diagrams of the process.**

First, hold the squeegee at about a 45 degree angle to the screen.

Bring the squeegee to the ink, and press down. Since the screen is slightly above the fabric, you need to push down hard enough to press it to the shirt.

Pull the ink across the image. (Notice the "snap off" of the screen behind the squeegee.)

When you reach the end of the design, lift the squeegee off the screen.



#### 4. Print the test shirt

- \* Determine the printing order.

The normal printing order is to start with the lighter color and work toward the darker ones for white garments. The reverse is true for printing on dark garments. Dark to light is the color order for printing dark garments.

- \* Print the first color.

- Angle the squeegee 45° toward you.
- Press down the squeegee with even pressure so that the screen is in firm contact with the t-shirt.
- Pull the ink across the stencil.

It may take a second squeegee pull to work the ink onto the fabric.

When you raise the screen, you should see the design on the test fabric.

- \* Print the next color.

- Bring the next screen into position, and lower it onto the test fabric.
- Use the same motion to print the next color.

Its important that you get ink coverage over the entire image, and that you use an even pressure, and a smooth motion.



- \* Examine the print.

Examine the print, the colors should be bright, and the images in the right place. The registration marks should be printed on top of each other, appearing to make one clean registration mark.



This type of printing is called “**spot color**” because each color is solid and opaque. This is the most common method of screen printing.

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When you’re satisfied that the design is printing the way it should, you are ready to print t-shirts.

5. Print a t-shirt.

- \* Cover the registration marks on all of the screens with tape.

This will keep the registration marks from printing. If the frames get knocked out of registration, you can remove the tape and re-register the screen.



- \* Load the shirt on the shirt board with the arms square, and about half way across the shirt board.



- \* Use the same procedure you used on the test print.

Experiment with different pressures and squeegee angles until you find the combination that works best for you.



This kind of printing is called “**wet on wet**”, because you are printing the different colors while the ink is wet with no flash curing in between. This is the fastest way to print, and gives good results, as long as you are careful not to smear the ink.

**Curing** hardens the ink, and bonds it to the fabric. Different inks have different curing processes. Plastisol ink typically cures at a temperature of 320 degrees Fahrenheit for one minute. (Always follow ink manufacturer's guidelines for proper cure temperature for the product you are using.)

Step 6. Cure the ink.

\* Read the instructions that came with your ink for the best combination of time and temperature.

\* Turn on the power switch to the curing oven.



\* Set the temperature according to the instructions for the ink.



\* Set the belt speed so that the t-shirt goes through the oven in the time recommended for the ink.



You may need to adjust the temperature of the dryer to get a proper cure. Room temperature, humidity, and the thickness of the ink all affect curing.

\* Test oven temperature with temperature strips, or check ink deposit with a ray gun, or to check ink film temperature out of the oven.

Printing a dark color onto a light fabric may require two layers of ink. The first layer will look dull. Flash heating the ink to the “Gel” state and adding a second layer of ink to the fabric will make the color brighter. This is called the “**print- flash- print**” technique.



7. Print a t-shirt, using the “print- flash- print” technique.

\* Print the first layer of ink on a dark t-shirt.



Simply “Gel” the surface of the ink. **Do not** “cure” the ink deposit at this stage.

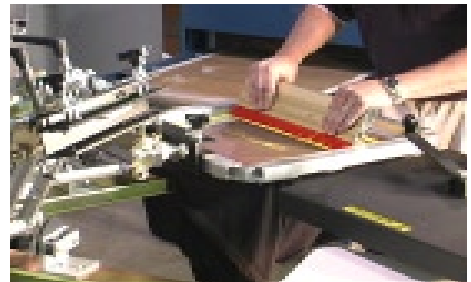
\* Use the flash heater to heat the ink for six seconds to the “gel” stage.



The gelled ink is just hard enough to keep from smearing, but soft enough for the next layer of ink to stick to it.

\* Print the image again.

The second layer of ink gives a good, bright image on the fabric.



NOTE: Gelation for plastisol is between 190°F and 230°F. Curing inks completely during the flash stage will result in delamination of inks that are subsequently printed on top of this “cured” ink deposit.

 [Click to Play Video](#)  
**2 Color Print Job**

 [Click to Play Video](#)  
**4 Color Print Job**