Screen Printing Walk-Through

Materials List:

- Screens
  - 10 x 14 Aluminum (100 mesh count - better for fabrics and large prints)
  - 18 x 20 Aluminum (200 mesh count - better for detailed prints)
- Squeegee
  - Speedball
  - Amazon* (speedball works fine, I just wanted a small one too)
- Acrylic paint for paper
- Emulsion
  - Diazo Photo Emulsion
  - Diazo Sensitizer - I found that this sensitizer was unreliable
  - Baselayr Emulsion/Sensitizer*
- Cleaning materials
  - Degreaser and Dehazer
  - Emulsion remover
- Transparencies
- Flood Light

Optional but recommended:

- Dark Room Lights
- Emulsion applicator - scoop coater
  - 8” should be good for a 10 x 14 Screen
- Glass top
- Hinges
- Scrub brush
- Small spatula for clean up of wet emulsion
- Pressure washer

*preference

Steps:

1. Degrease the screen[1] and let it dry.
2. Mix the Diazo emulsion and sensitizer[2] per the instructions on the bottles.
3. In a dark room[3], use a squeegee or scoop coater[4] to evenly coat both sides of the screen with a *thin* amount of emulsion.
4. Prop up the screens, screen side down, for 24hrs (or until dry) in a dark room. They should not have any excess emulsion and be level.
5. Once dry, tape the transparencies[5] (reversed) on the screen and put a glass top[6] to ensure the transparency is flush with the screen
6. Expose the screens. With the flood light in the materials list hovering above the screen at about a 2’ distance, 24-26 minutes (UPDATE: 27 min for thicker transparencies) is a good estimate[7] if using Baselayr emulsion.
7. After the exposure time, remove the glass and transparencies. Cover the screen with something opaque[8] until you wash it out.

8. Wet both sides of the screen with a shower head or hose nozzle. Keep washing out the screen side until your design appears.
9. Let the screen dry[9] and expose to harden the emulsion further[10].
10. Depending on the project use appropriate paints with a squeegee to print your design[11].
11. Once finished, clean the screen with an emulsion remover (do not let this dry on the screen) and the dehazer/degreaser. For tough cleans with dried paint, use a pressure washer.

Notes:

1. I tried to make my own screens but I don't think they will hold up for as long as the aluminum ones. I think buying quality screens is a good investment. The speedball wood screen started to fault after 3 attempts to expose (I didn't even use it to print yet).
2. The first time I mixed these two I did it incorrectly. I think the Diazo sensitizer I bought was old or something. When you put cold water into the sensitizer, make sure it's mixed thoroughly; mine was grainy. When mixed with the Diazo photo emulsion it should be a thick, dark green liquid (see video here for an example 6:10). Baselayr emulsion was much more user friendly
3. In the beginning I tried to do everything in the dark. Getting some dark room lights was a huge help to ensure my screens were evenly coated and my transparencies were accurate.
4. At first, I was coating the screens with a squeegee. I couldn't get a thin coat and I had so many drips, resulting in failed screens (fig. 1 and 2).
5. I print my transparencies at my local Office Depot and use 100% k graphics.
6. I use a piece of glass from an unused picture frame.
7. I've read that depending on mesh count and color of screen, this can fluctuate. Use the exposure calculator test sheet from this website to find your ideal time. ~ 22-26 minutes is a good estimate for the Baselayr. For Diazo emulsion, I was using around 18-19 minutes.
8. For this, I just use black trash bags.
9. I've used a hair dryer to speed up this process and it doesn't seem to harm the screen. Although it might have a negative impact on adhesive around the screen.
10. If you see small "pin-holes" just put a small amount of emulsion on them to avoid ink from unintentionally getting on your paper (see troubleshooting video below for details), this is a trick I learned from one of the videos -- much easier clean up than a ton of tape for tiny holes.
11. I used the hinges from the material list and a scrap piece of wood to easily print designs (see t-shirt printing video below for inspiration).

Videos used:

- Screen Printing on a budget // DIY
    - Good example of a low budget DIY - although this looks much easier than what I experienced
    - Shows mixing diazo emulsion appropriately
- How to make a screen for screen printing

    - Great visual for the scoop emulsion application
    - Quick tutorial that uses a flood light
- T-Shirt Printing Machine for $30
    - Example of the hinges used for printing
- Step by step exposure unit for super cheap
    - Another example of a DIY low budget version
- 4 troubleshooting tips for burning and exposing screens
    - Walks through the exposure calculator
    - Great tips if you're having issues with screens

Images:

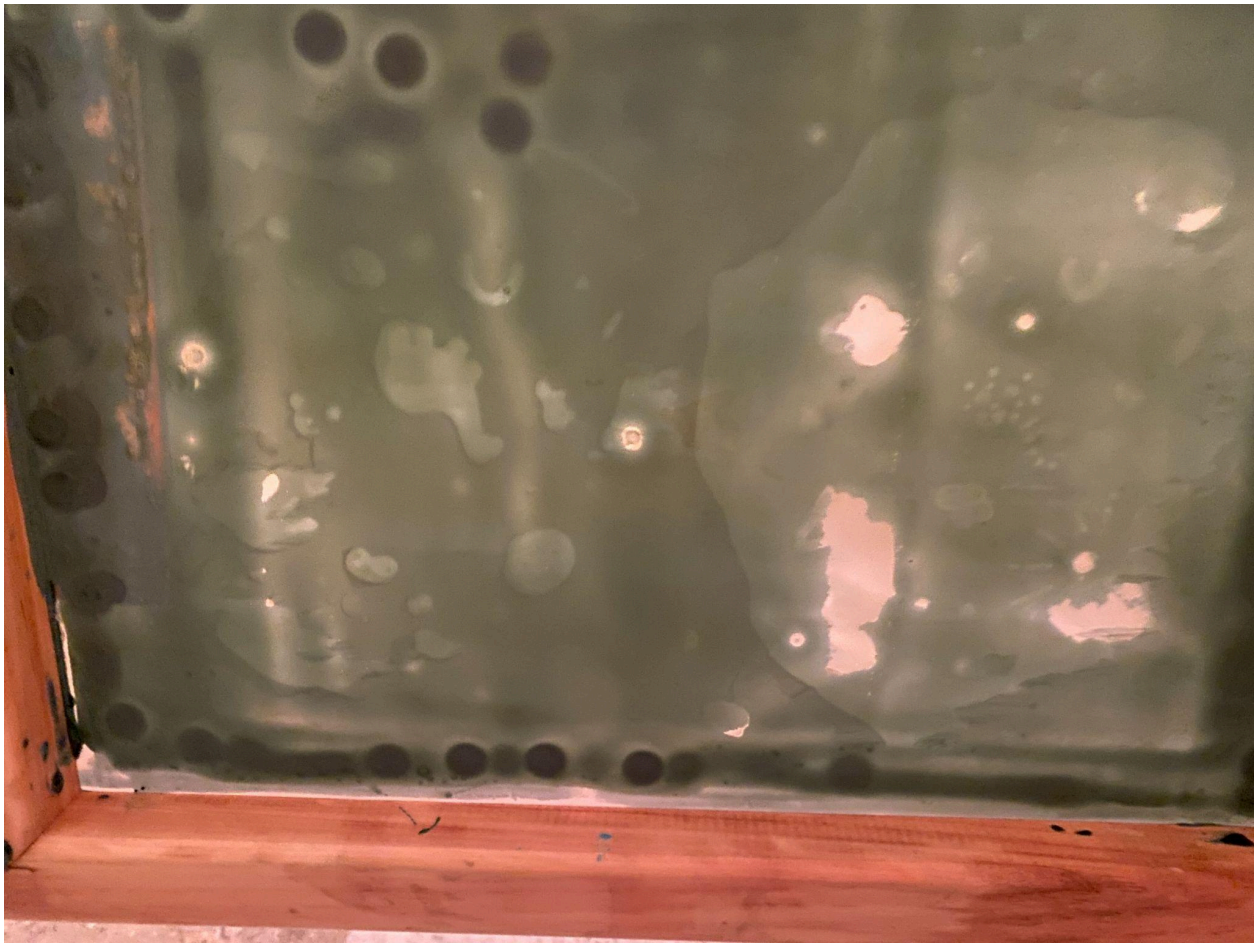

Fig. 1: Possible over exposure, or emulsion coating was too thick

Fig 2. Emulsion coating was way too thick, resulting in drip marks making an uneven surface that was impossible to evenly expose

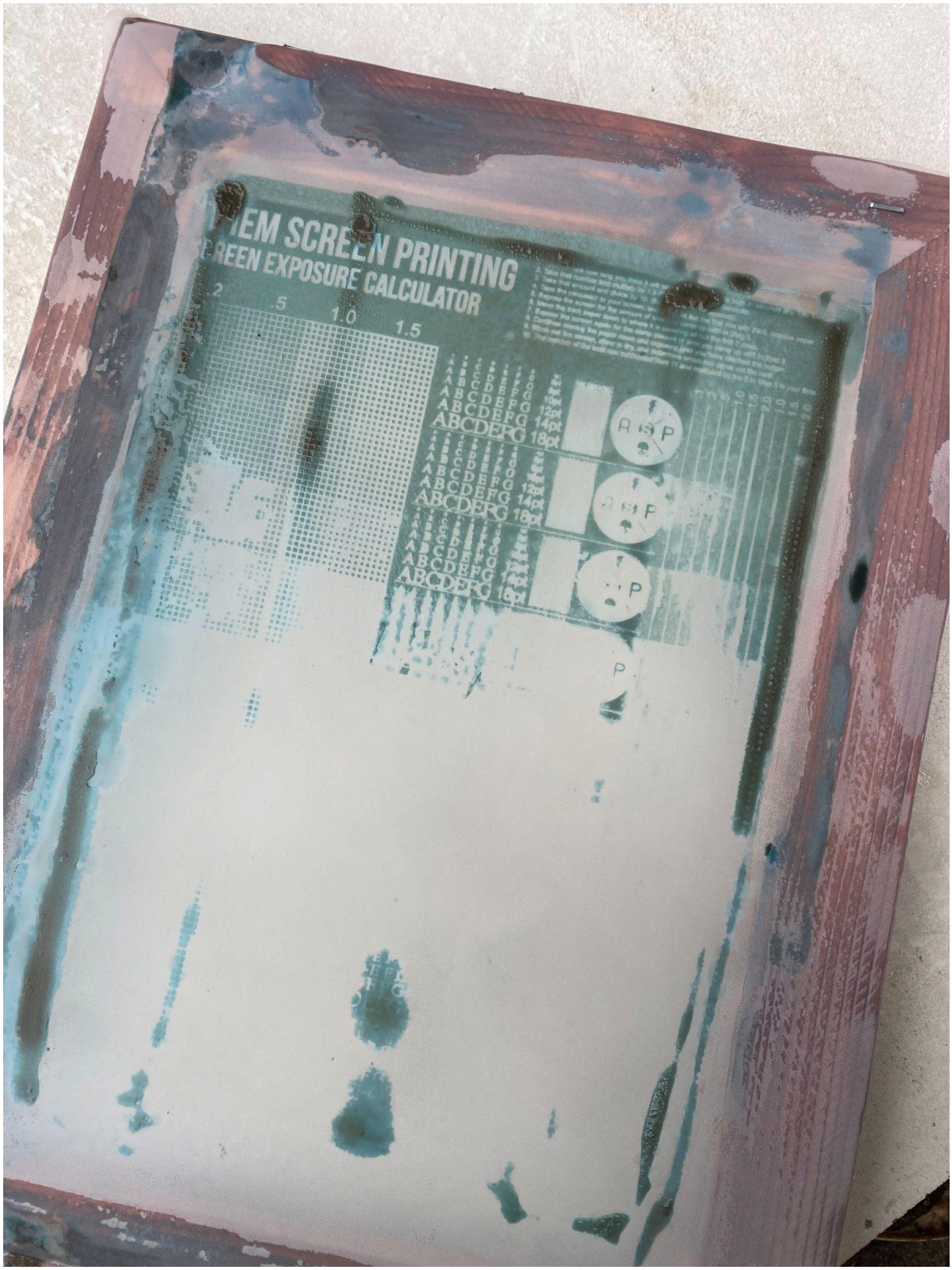

Fig. 3: First attempt at the exposure calculator using the sun. From 2 min (bottom) - 16 min (top).

Fig. 5: First successful round of prints.