**Lamination Protocol using SKY 335R6 Laminator**

**April 2018**

**SUEX Packaging:**

*SUEX sheets come in vacuum sealed packages consisting of an outer clear pouch and an inner black pouch. Only open them in the CLEANROOM.*

1.When cutting open the outer pouch, cut just below the vacuum seal line, and do NOT cut the black pouch or you will break the films.

2.Carefully, remove the films from the package and choose one. ALWAYS use your fingers when handling the films as wafer tweezers and tongs will put too much stress in one location and will crack or deform the film.

3.Save the black pouch, and backing block to use while storing the extra films. Place the extra films back in the black pouch, and place the backing block behind the films to support them. **Always store films flat, never on their edge!**

**Setting up the Laminator:**

1.Remove laminator from box. Place on the table by the furnace. Place a 3” high platform in front and in back of the laminator so the carrier sheet can go in at a horizontal angle.

2. Remove heat shield and turn on rollers, but DO NOT HEAT.

3. Clean front and back rollers with a cleanroom wipe with acetone on it.

4. Set the temperature and wait 10 minutes.

5. Feed the thermocouple wire tip into the rollers and press stop.

6. Wait for the temperature to stabilize and set the temperature to the calibration temperature (thermocouple)

7. Remove thermocouple and inspect the carrier sheet, top, bottom and spacer transparencies. Clean any and all particulate off the sheets using an acetone soaked cleanroom wipe.

8. Feed a piece of paper through the rollers and check for speed. The target speed for the SKY335R6 is 3 feet per minute. (A 12” long sheet of paper should take 20 seconds). Adjust roller speed until it is correct.

9. Settings: for laminating SUEX, the temperature should be between 65-70°C. Speed is 3 ft/min

**Wafer Preparation:**

**Virgin Si wafers** can be cleaned per normal: Acetone, IPA, DI water 10 minutes each rinsing in between next step. Dehydrate bake for minimum 30 minutes in oven.

**Used Silicon wafers** should be cleaned using hot piranha solution in the fume hood, put through an acid neutralization step, then O2 plasma cleaned.

**Glass wafers (no metal)** should be cleaned using hot piranha solution in the fume hood, put through an acid neutralization step and then O2 plasma cleaned.

**Glass wafers (with metallization)** should be triple cleaned using Acetone, IPA, DI water and dehydrated for a minimum of 30 minutes. 24 hours would be better to get good adhesion.

**To laminate your substrate:**

1. Make sure your carrier sheet, top, bottom and spacer sheets are all particulate free. If not clean them with a cleanroom wipe soaked with acetone.

2. Place the carrier sheet in front of the laminator. Fold the top sheet of the pocket over the rollers.

3. Place your substrate on the bottom sheet of the lamination pocket. Position it about 2 inches from the top of the sheet (closer to the rollers).

4. Remove the shiny side cover of the SUEX film.

5. Place the spacer sheet about 1 cm from the edge of the wafers, so that most of the wafer is covered.

5. Center the SUEX film on the substrate. The hazy side should be face up now.

6. Gently press the leading edge of the film onto the wafer for 5-10 seconds. It should look like there is a wet mark when your finger is removed.

*Note: If you are working with glass substrates, you will need to use shims or spacers around the edge to minimize the stress on the edges as it is rolling through the laminator. They should be as close to the height of the wafer as possible, without being over the height.*

7. Readjust spacer sheet as needed.

8. Start the rollers and heater. Let the rollers gently grab the leading edge of the substrate.

9. As soon as the rollers grab the leading edge of the substrate, HOLD THE SPACER SHEET BACK!! You do NOT want to laminate the spacer to the top of the SUEX.

10. The carrier sheet, lamination pocket, shims and substrate will come out the other side.

11. Fold back the top sheet and inspect your laminated substrate. If there are bubbles or divots in the film, place the wafer in a 50-65 °C oven and back for 10 minutes with the hazy film STILL ON.

12. Cool on a stack of clean wipes. Do not force cool.

13. The top protector can be left on for exposure, but must be removed before PEB and development.