

DUAL LAYER LIFT-OFF PROCESS

Purpose:

Lift-off process is designed for the patterning of a thin layer metal film on various substrates. The process described here is a dual-layer lift-off process, which allows a clean “lift-off” and provides a smoother line edge.

Equipment:

1. Solitec Spinner and Hot Plate and/or SVG Track Coater
2. Karl-Suss MA4 or EVG 420
3. CHA E-Beam Evaporator

Materials:

1. LOL2000: An inert non-UV-sensitive polymer that can be “etched” with most standard developers
2. SPR 955 CM 0.7: A high-resolution positive tone photoresist
3. CD 26: A standard photoresist developer
4. Metal: Al, Cr, and Ti available on CHA E-Beam system, one can use his/her own metal with dedicated crucible for other metals

Process:

Figure 1 shows the process flow of lift-off. Process steps are as follows:

1. Vacuum bake the wafer at 110°C for 3 minutes in Solitec oven.
2. Spin coat LOL2000 using Solitec Spinner, spread 500 rpm for 15 seconds, spin cast 2500 rpm for 45 seconds and bake 200°C for 3 minutes. This will give you a 220 nm LOL layer
3. Spin coat 0.7 um SPR 955CM 0.7 using Solitec Spinner, spread 600 rpm, spin cast 3500 rpm and bake 90°C for 90 seconds or using program 1 in SVG coater. Alternatively, you can use a resist of your choice.
4. Expose using Karl-Suss aligner or EVG 420 with exposure energy of 66 mJ. If you are using different photoresist, use standard exposure times for the particular photoresist.

5. Perform post exposure (PEB) bake for SPR 955 CM resist at 110°C for 90 Seconds. If you are using different photoresist, please refer to the specification of that resist.
6. Develop for 60 seconds in CD 26 or use the SVG developer track.
7. Use CHA E-Beam evaporator to deposit desired metal. The metal layer thickness should be less than that of LOL layer thickness.
8. Lift-off in MNP at 80°C for 5 minutes or PRS 3000 bath dedicated for lift-off.

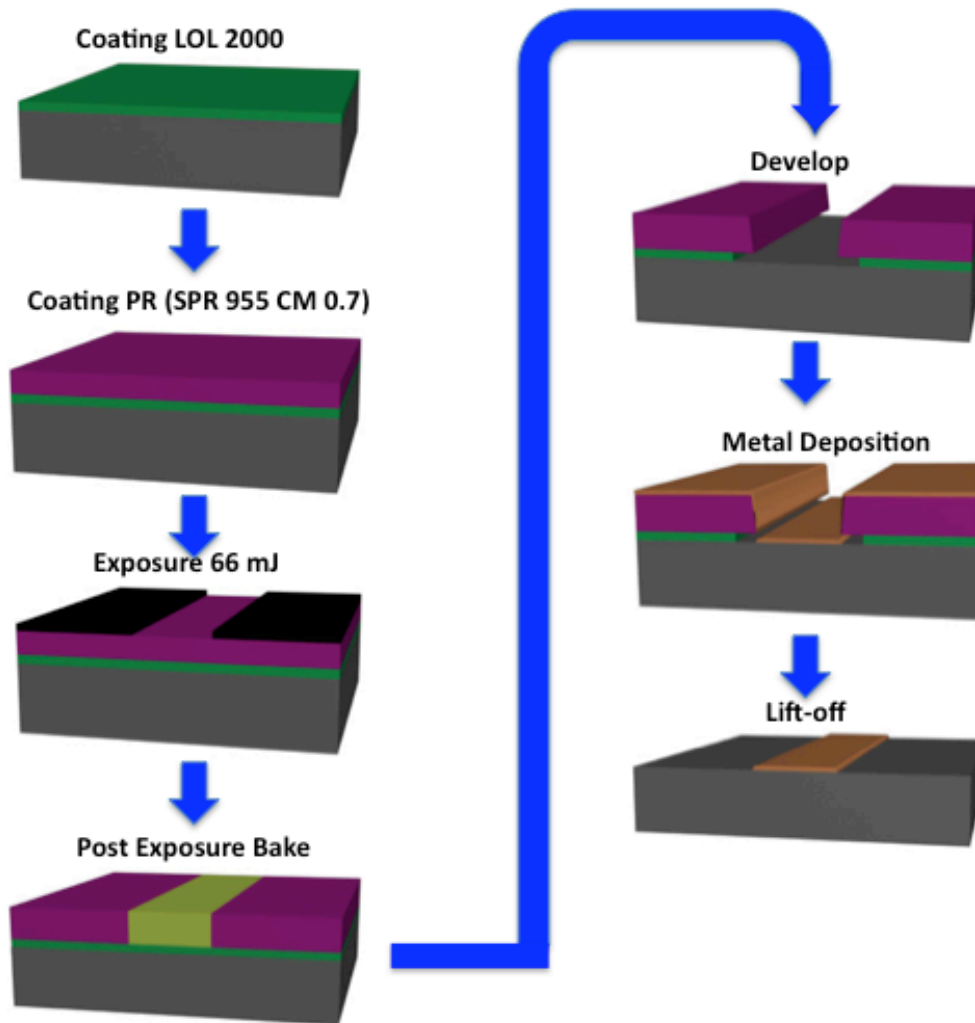


Figure 1: Lift-off process flow