

**Note:** These instructions are reported for deposition of silicon monoxide (SiO, or “silicon oxide”) with Cooke Thermal Evaporator. See Cooke Thermal Evaporator manual. This procedure been tested successfully and does not represent an exclusive procedure.

### Typical Deposition Procedure

1. Use a long tungsten (W) boat.
2. Program the Sigma Film Thickness Monitor using the following parameters (See Sigma Film Thickness Monitor manual.):
  - density = **2.13** (g/cm<sup>3</sup>)
  - tooling = **126** (126%, for sample nearest crystal on platen)
  - z-ratio = **0.87**

**Note:** See Technical Data for Depositing Thin Films Under Vacuum table for additional information.
3. Fill boat with SiO fragments.

**Note:** AgAl-coated or Al-coated quartz crystals are recommended for SiO as they offer greater resistance to material stresses than Au-coated quartz crystals.
4. When ready for heating, slowly rotate power dial to ~15% or until W-boat begins to glow.

**Note:** Since SiO sublimes, it will not glow nor melt.
5. Remain at ~15% for about 2 minutes to allow for uniform boat heating.
6. Switch on heating unit.
7. Slowly increase dial to ~30%. Remain for 30 sec.
8. ZERO thickness monitor and open shutter fully.

**Note:** Deposition rate may be ~0.3-0.5Å/s.
9. Slowly increase dial to ~35-40%.

**Note:** Deposition rate may be ~1.3-1.5Å/s.  
**Note:** Though a high rate of deposition may be desired, the substrate and quartz crystal may overheat at higher boat currents. A deposition rate as high as 4Å has been successfully demonstrated at ~50%, but with considerable heating of top plate after a very short period of time.
10. Once desired thickness is obtained, close shutter and record final thickness after ~1 min.
11. Slowly reduce boat current to zero and switch off heating unit.