

Mask Aligner SOP

Safety Information and Overview.....	1
Section 1 – Process or Experiment Description.....	1
Section 2 – Hazardous Substances.....	2
Section 3 – Potential Hazards.....	2
Section 4 – Routes of Exposure.....	3
Section 5 – Personal Protective Equipment.....	4
Section 6 – Waste Disposal.....	4
Tool Operation.....	4
Common Errors and Troubleshooting-.....	4

Safety Information and Overview

Advanced Science Research Center	Graduate Center CUNY
Date	6/10/2025
SOP Title	Mask Aligner SOP
Principal Investigator	Samantha Roberts
Department	NanoFabrication Facility
Room and Building	ASRC G.263
Primary Phone Number	2124133399

Section 1 – Process or Experiment Description

This SOP is only for the general use of transferring microscale patterns from a photomask, onto a photoresist-coated wafer or substrate using ultraviolet (UV) light. Only approved users are allowed to use the equipment, after passing a qualification with the tool manager. Any maintenance will be done by trained staff members. Some maintenance creates additional hazards which will be described in the Instrument Manual.





*Note: Any sample preparation is to be done by the user, and this document does not cover any information related to sample preparation. Any materials listed outside of the approved list, must be discussed with the tool manager.






Section 2 – Hazardous Substances

Substance Name: Mercury

Abbreviation: Hg

Section 3 – Potential Hazards

Hazard	Hazard Sign	Hazard Description
Bright light	 A yellow triangular warning sign with a black border. Inside the triangle is a black lightbulb with several short lines radiating from it, representing light.	Serious eye damage may occur if viewed directly at light during use
UV Radiation	 A rectangular warning sign. The top half has an orange background with the word "WARNING" in black. The bottom half has a white background with a black sun-like symbol (a circle with rays) and the text "UV light hazard" and "Avoid looking directly at light".	UV radiation can cause eye damage .
Thermal	 A yellow triangular warning sign with a black border. Inside the triangle is a black silhouette of a hand reaching towards a horizontal line with wavy lines underneath, representing a hot surface.	Hg lamp can get hot to touch .
Electrical	 A yellow triangular warning sign with a black border. Inside the triangle is a black lightning bolt.	Operate on high-voltage systems for light sources and alignment mechanisms.

Chemical		Photoresists and developers used before and after exposure. Many are toxic, flammable, or skin/eye irritants .
Pinching or Crushing		Moving parts such as wafer stage and mask holder.
Mercury	  	<p>Mercury vapor and liquid are highly toxic.</p> <p>If the lamp breaks or leaks, it can release elemental mercury, which is:</p> <p>A neurotoxin when inhaled.</p> <p>Harmful to kidneys and other organs.</p> <p>Dangerous to the environment if not properly disposed of.</p>

Section 4 – Routes of Exposure

Eye damage can occur if looking at an exposed area, and not wearing the appropriate protective eyewear.

Thermal hazard is present if did not wait until the lamp has sufficiently cooled down.

Electrical hazard is present whenever servicing the equipment.

Chemical exposure is present before and after equipment use.

Do not place your hands near any moving parts while the tool is in use.

Section 5 – Personal Protective Equipment

All trained staff members are instructed to use welding goggles whenever doing routine lamp maintenance or inspection.

All personnel are instructed to not look at exposed areas while in use.

Section 6 – Waste Disposal

Hazardous compound, element, or chemical name	State (L,G,S)	Hazardous	Non-hazardous	Which hazards?	How is waste managed?
Hg Lamp	S	x		Solid waste is toxic to environment, aquatic, and human health	Must be collected and disposed of as Hazardous waste

Tool Operation

Common Errors and Troubleshooting

Prepared by: Salam Elhalabi

Date: June 10, 2025

Reviewed/Revised:

Salam Elhalabi