

SCIF Cleanroom

User Expectations for Photolithography Training and Microfabrication

1. General Expectations

Users are expected to follow standard cleanroom practices and adhere to photolithography processes based on manufacturer specifications for photoresists, chemicals, and equipment. Any process variation must remain within safe and approved operating conditions.

2. Process Expectations

Users are expected to understand and correctly perform the full photolithography workflow, including:

- Substrate cleaning and dehydration
- Photoresist spin coating
- Soft bake
- Mask alignment and UV exposure
- Post-exposure bake (if applicable)
- Development
- Inspection and optional curing

All steps must follow approved protocols, safety requirements, and operating procedures.

3. Protocol Adherence

Users are expected to follow approved photolithography protocols, which include both process steps and specific parameters such as:

- Resist type and thickness
- Spin conditions
- Bake conditions

- Exposure settings
- Development process

Unapproved deviations from established protocols are not permitted.

4. Process Improvement Expectations

Users may refine process parameters only in a controlled and informed manner to improve:

- Safety
- Reproducibility
- Pattern quality
- Workflow efficiency

All refinements must remain aligned with manufacturer guidance and facility-approved practices.

5. Photoresist Handling

Users are expected to:

- Follow manufacturer datasheets
- Use correct resist selection and parameters
- Maintain strict control over bake, exposure, and development conditions

Improper handling or deviation from protocol may lead to inconsistent or failed results.

6. Training Expectations

Users must complete required training before independent tool use.

Training includes:

- Cleanroom safety and PPE
- Chemical handling and waste procedures
- Tool operation (spinner, hotplates, wet bench, mask aligner)

- Standard photolithography process (~4 hours)
- Positive and negative photoresist comparison
- Hands-on participation and competency demonstration

Users are expected to actively participate and demonstrate understanding.

Independent access is granted **only after demonstrated competency and user request.**

There is **no limit on additional training sessions.**

7. Qualification Expectations

Users are expected to achieve qualification through demonstrated competency, not attendance.

Typical expectations:

- Initial training: ~4 hours
- Additional practice: ~8–20 hours
- Working proficiency: ~15–40 hours over 2–6 weeks
- **Proficient and confident independent operation: typically developed over ~3–6 months of regular use**

Advanced proficiency and strong process judgment may require continued experience beyond this period, depending on usage frequency and process complexity.

8. User Responsibility

Users are responsible for:

- Their research objectives and experimental design
- Process planning and execution
- Data interpretation and outcomes

Core facility staff provide training and guidance but are **not responsible for running user research projects.**

9. Communication Expectations (PI Inclusion)

For transparency, users are encouraged to include their Principal Investigator (PI) in communications related to:

- Training
- Troubleshooting
- Process discussions
- Equipment use

This supports alignment with research goals and proper oversight.

10. Independent Use Expectations

Independent users are expected to:

- Operate safely and follow all protocols
- Use tools correctly
- Complete full processes without supervision
- Perform proper cleanup and waste handling

Independent access does not imply full process expertise or optimization capability.

11. Collaboration Expectations

Collaboration is recognized when staff contribute beyond routine support, including:

- Experimental design
- Method development
- Data interpretation
- Significant troubleshooting
- Contribution to publications

Routine training and standard support are not considered collaboration.

12. Fabrication Expectations

Users are expected to understand that:

- Device fabrication is iterative
- Optimization requires multiple trials
- Outcomes depend on user-driven process development

The facility provides tools, training, and guidance—not guaranteed fabrication outcomes.

13. General Understanding

Users are expected to recognize that process results may vary due to:

- Substrate condition
- Design complexity
- Resist selection and thickness
- Environmental and tool conditions

Consistent results require adherence to protocol and continued practice.

14. Summary

Users are expected to:

- Follow approved protocols and safety practices
- Demonstrate competency before independent use
- Take responsibility for their research
- Use training and support effectively
- Develop skills through practice and iteration