Policy
for

Equipment Decontamination

REVISION

Rev No.	DCN No.	Change Summary	Release Date	DCN Initiator	Document Owner
78	DCN3952	Email updates	September 2024	M. Kochan	K. Rydberg

Prior revision history, if applicable, is available from the Document Control Office.

1 PURPOSE AND SCOPE

The purpose of this policy is to provide instructions for the decontamination of all equipment and support systems in a manner consistent with applicable codes, regulations, manufacturer's instructions, and sound engineering practices.

This process ensures that equipment is decontaminated in a manner that will minimize risk to employees, operations, and the environment.

This policy applies to contaminated equipment and machinery used directly or indirectly in the testing, research, and development of products or in the operation of the facility or production support systems at all NY CREATES sites (Site) and includes but is not limited to:

- Diffusion Furnaces,
- Photoresist Spin Tracks and Developers,
- Etchers and Ashers,
- Chemical Vapor Deposition Systems,
- Ion Implanter,
- Sputters,
- Ovens,
- Wet Pumps,
- Dry Pumps,
- Acid Sinks,
- Stripper Sinks,
- Solvent Sinks,
- Lead Contaminated Equipment,
- Process Gas Lines,
- HIVAC Forelines
- Acid Drain Lines,
- Exhaust Ventilation Ducting,
- Floor, Walls, Trenches,
- Gas Cabinets,
- Spin Rinse Dryers (SRD),
- Tube Cleaners,
- Chemical Mechanical Polishing (CMP)
- Radioactive parts and assemblies.

By necessity, this document is limited in scope. The Facilities Engineer or Equipment Engineer (EE) shall apply professional judgment and knowledge above that which is included in this specification.

Semiconductor equipment and parts that were or may have been exposed to hazardous materials and are intended for further use (reuse, repair, resale, etc.) must comply with the **SEMI S12**- Environmental, Health, and Safety Guideline for Manufacturing Equipment Decontamination.

Any equipment that will be decommissioned and removed must comply with **EHS-00030 –** Policy for Equipment Decommissioning.

2 ASSOCIATED DOCUMENTS

2.1 **SEMI S12** - Guidelines for Equipment Decontamination

2.2 **EHS-00008** – Lockout / Tagout (LOTO) Program

2.3 **EHS-00015** - NY CREATES Respiratory Protection Program

2.4 **EHS-00030** - Equipment Decommissioning and Removal Procedure

EHS-00030-F1 - Equipment Decommissioning and Removal Sign-Off Checklist

2.5 **EHS-00037** - Policy for Equipment Decontamination

2.6 **EHS-00037-F1** - EHS Equipment Decontamination Certification

3 RESPONSIBILITIES

Site Employees, Tenant, Contract or Sub-Contract EE's are responsible for performing the appropriate decontamination procedure in a safe and timely manner, disposing of materials generated appropriately, and posting the Equipment Decontamination Certification form (**EHS-00037-F1**), at or near the subject equipment after decontamination is completed.

4 SAFETY

4.1 Safety Notices

NOTE: The following safety rules are to be followed when applicable to the specific operation being performed. Certain precautionary measures are highlighted in the procedures as CAUTIONS / WARNINGS / DANGERS should be strictly adhered to.

The signal words for safety are DANGER, WARNING, and CAUTION:

DANGER is the signal word used to indicate an immediate hazardous situation that, if not avoided, will result in severe injury or death. This signal word is limited to the most extreme situations.

WARNING is the signal word used to indicate a potentially hazardous situation which, if not avoided, could result in severe injury or death.

CAUTION is the signal word used to indicate a potentially hazardous situation which, if not avoided, could result in minor to moderate injury. It may also be used to alert against unsafe practices.

4.2 General Safety Information

Refer to the NY CREATES Environmental, Health, and Safety (EHS) website for Safety related procedures and precautions http://intranet.sunycnse.com/.

All hazardous energy source(s) must be locked out and tagged out, so the equipment is isolated from any hazardous energy source(s) (electrical, chemicals, pneumatic, pressurized pipes, etc.). The Lockout/Tagout Procedure (**EHS-00008-F1**) or equivalent procedure must be followed.

Safety Data Sheets (SDS) are available for all chemicals used at the Albany NanoTech Complexand other NY CREATES sites. Consult the applicable SDS before conducting decontamination to better understand the hazards and needed precautions for chemicals involved.

Proper personal protective equipment (PPE) must be worn at all times when decontaminating equipment. The following PPE may be required depending on the type and level of contamination:

- Chemical resistant gloves
- Safety glasses
- Face shield
- Arm guards
- Chemical apron
- Cartridge respirator – for solvent fumes, corrosive fumes, CMP particulates, dusts
- Airline respirator or Self-Contained Breathing Apparatus
- Tyvek Suit
- Shoe Covers

Decontamination work may require the use of a respirator. Any employee who wears a respirator must comply with the NY CREATES Respiratory Protection Program (**EHS-00015**) or their company's policy.

Exhaust ducting from certain processes may contain a variety of hazards depending on the process chemistries such as liquid residuals, energetics, reactive byproducts, or toxic dusts. Ducting associated with tools using pump oil, solvents, or stripper may involve flammable or combustible vapors. Evaluation of potential hazards and appropriate controls must be established prior to work.

Any questions regarding decontamination procedures should be referred to the EE, Decontamination Service Provider, or NY CREATES EHS at ehs@ny-creates.org.

5 DECONTAMINATION GUIDELINES

Tool specific procedures must be followed for decontamination. General requirements in addition to the above requirements include:

All chemical / gas sources to the equipment must be removed prior to decontamination.

It may be necessary to disconnect internal lines to enable “gravity flow” drainage of residual liquids from pumps and lines. Chemical liquid lines must be flushed and decontaminated.

Gas lines must be cycle purged and disconnected. Cap off gas lines at the gas cylinder and the equipment end.

Local exhaust should be left in place until it is determined that chemical contamination is no longer present. If dust contamination is present, remove particles with a HEPA vacuum or wet wipe the area.

Surfaces must have a pH of between 5 and 9. If necessary, use liquid neutralizers. Fluoride surface contamination should be checked with SPILFYTER strips. Fluoride should be non-detectable.

Drain all oil and remove pumps equipped with oil filters and/or drains that will permit draining the oil with the pump in place. Dispose of it as hazardous waste.

WARNING: Filters can contain toxic process byproduct solids. Pump oils can contain absorbed process gases that can outgas.

Sinks (e.g., Corrosive, Solvent) must be cleaned while still connected to drains (if connected to appropriate waste drain lines) and exhaust. Depending on contamination, wash with high pressure, hot water to remove residues for corrosives. IPA or Acetone wipes can be used to remove any solvent residues. If necessary, use a scrapper (i.e., non-spark producing) to remove dried photoresist. Discoloration is allowed.

For disassembly of HPM drain lines, a low point in the line should be identified and a hole carefully drilled into the bottom portion to ensure all free liquids have been drained out. Any liquid collected must be tested for pH to determine the level of contamination remaining inside. Liquids should be disposed in the acid neutralization treatment system no matter the pH.

NOTE: Fluoride bearing liquids must go to the fluoride removal system.

If the piping cannot be adequately decontaminated or a conservative approach is needed, parts or lines may need to be containerized and sent off-site as hazardous waste. Smaller pieces should fit into a 55-gallon open top drum; larger jobs may need to go into a flex bin, cubic yard box or roll off can.

For exhaust ventilation ducts, ensure the entire length of affected ducting is inspected for the presence of free liquids prior to disturbing. If free liquids are identified, they must first be drained by carefully drilling a drain hole at a low spot. Collect the liquids and dispose of it as hazardous waste.

HIVAC Forelines must be properly removed, capped, bagged, and sent to the CUB for either decon/cleaning and or scrap.

After decontamination, all chemical identification labels and warning / danger signs must be removed from the outside of the tool before it is removed from site.

If the equipment will be reused at another location, wrap the components with shrink-wrap to maintain cleanliness and place in a yellow hazardous materials bag with legible and clear information at a minimum containing the following:

- An appropriate identification label,
- The source of the material (i.e., tool, system the material is from),
- A contact name and number and,
- The date on which the bag was created.

If the tool or contaminated components will be disposed, place in the appropriate container/bag, label, and seal. Dispose of it as hazardous waste. Non-contaminated components can be sent out as metal scrap.

All hazardous waste materials generated from decontamination must be properly handled, bagged, sealed, and labeled in accordance with Hazardous Waste Management Plan. Examples include decontamination wipes, residues removed from equipment, parts which cannot be cleaned, and used PPE.

Ensure floor and wall surfaces are wiped down in accordance with clean room protocols.

6 TRAINING

Site Employees, Tenant, Contract, or Sub-Contract employees can perform tool decontamination, as long as appropriate training courses have been completed and are up to date such as but not limited to:

- Cleanroom or Laboratory Safety,
- Hazardous Waste Handling,
- Respirator Safety (if a respirator must be used),
- Lock Out/Tag Out,
- Equipment/Task-specific training

7 RECORDS

The Site EE, Tenant, Contract or Sub-Contract EE is responsible for maintaining records of completed Equipment Decontamination Certification (**EHS-00037-F1**) for one year and forwarding a scanned copy to EHS.