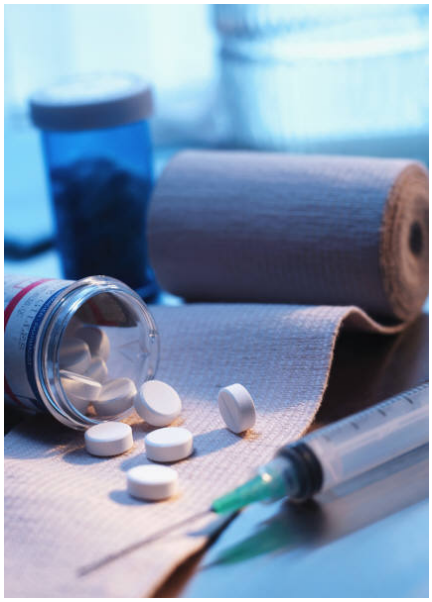
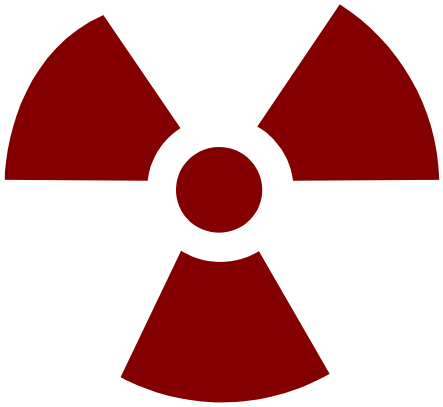
# Roger Williams University Lab Waste Management and Disposal Guide (MNS Version)

Roger Williams University
Department of Environmental Health and Safety
1 Old Ferry Road, Bristol, RI 02809
Last Updated: July 2019

# Table of Contents


## Administrative Information pgs 4-6

**Training**
- **Annual requirements**
- **Hazard-specific requirements**

**Program Assessments**
- **Satellite Accumulation Area Inspections**
- **Lab Audits**

**Contact Information**

## Waste Management and Disposal pgs 7-22

**Hazardous (Chemical) Waste Management**
- **Hazardous Wastes – Listed**
- **Hazardous Wastes – Characteristic**
- **Hazardous Wastes – State Regulated**
- **Satellite Accumulation Areas**
- **Pick Up / Disposal Procedures**
- **Empty Containers**
- **Obtaining Hazardous Waste Management Supplies**

**Broken Glass Management**
**Biological Waste Management**
**Radioactive Waste Management**
**Cylinders**
**Used Gloves Management (Universal Precautions)**
**Lab Plastics (Tips, Tubes, and Pipettes) Management**
**Sharps Management**
**Universal Waste Management**

## References pg 23

**References**

## Appendices pgs 24-64

**Appendix A:** **EPA: P-Listed Chemicals**
**Appendix B:** **EPA: U-Listed Chemicals**
**Appendix C:** **EPA: F-Listed Chemicals**
**Appendix D:** **EPA: D-Codes (Characteristic Wastes) and Definitions**
**Appendix E:** **RI: R-Codes**
**Appendix F:** **Chemical Compatibility Guidelines – EPA-600/2-80-076 April 1980: A Method for Determining the Compatibility of Chemical Mixtures**

# Administrative Information

## Training Requirements

### Annual Requirements

Any person who generates hazardous waste at Roger Williams University is required to take an annual hazardous waste management and lab safety seminar through the Department of Environmental Health and Safety (EHS). The training is a requirement per EPA and OSHA regulations and the RWU Chemical Hygiene Plan (CHP).

For faculty, staff, and students working in the Marine and Natural Sciences labs (MNS), the training session is one hour in length and offered online on the RWU Bridges site at: **http://bridges.rwu.edu**. Join the "EHS Lab and Shop Safety" group, and the trainings are available on the "Lessons" page. Instructions for submitting completion documentation are on the Bridges site.

### Hazard-Specific Requirements

Hazard-specific trainings for highly hazardous materials and OSHA Subpart Z regulated materials must be taken prior to using these materials. Please contact Environmental Health and Safety to set up a training session. Examples of these specific trainings include:

- Bloodborne Pathogens (BBP) (29 CFR 1910.1030)
- Formaldehyde (29 CFR 1910.1048)
- Peroxide Formers (Peroxidizable Compounds)
- Cyanide Handling

Hazard-specific training topics include safe handling and waste disposal procedures, as well as personal protective equipment (PPE) requirements.

## Program Assessments

### Satellite Accumulation Area (SAA) Inspections

**Satellite Accumulation Area (SAA) inspections** are conducted on a routine basis – usually bi-weekly. These inspections include the documentation of any hazardous waste SAA regulatory issues in the labs, and may also include documentation of other health and safety related issues (examples: HazComm violations, improper chemical storage, etc). More information on the **SAA regulations and requirements** can be found in the "SAA" section of this document.

- **Reporting** – any SAA regulatory violations will be documented and compiled into an inspection document. This document will be e-mailed to all concerned parties (MNS faculty, staff, and EHS staff).

- **Corrective Actions** – SAA corrective actions need to be completed as soon as possible. The inspector will remedy any situations that could prove to be immediately hazardous, including, but not limited to: closing open containers of hazardous waste, and correcting incorrect segregation of incompatible materials. Faculty and staff lab users are responsible for completing all other corrective actions.

- **Follow-up Procedures** – It is recommended (but not required) that lab users email or call EHS when the corrective actions have been completed. Corrective actions that have not been completed between inspections will be documented again on the next inspection report. Repeat/consistent/egregious safety concerns and/or violations will be brought to the MNS department chair.

## Lab Audits

**Full lab audits** are conducted once per semester. These inspections include: chemical storage and segregation, electrical safety, emergency and safety equipment, fume hoods, general housekeeping, hazard communication, hazardous waste, PPE, and miscellaneous items.

- **Reporting** – Lab audit reports are compiled and sent to the director of EHS, the MNS faculty/staff lab users, and any other pertinent personnel. The faculty/staff lab users should contact EHS to discuss any findings and corrective actions.

- **Corrective Actions** – Lab audit corrective actions should be completed as quickly as possible, particularly those that pose significant potential threats to health and safety.

- **Follow-up Procedures** – It is required that faculty/staff lab users email or call EHS when the corrective actions have been completed so that information may be entered into the spreadsheet to serve as documentation of completion. CAs that have not been addressed within one month of the report being issued (at least on a preliminary level) will be brought to the attention of the department chair.

# Contact Information

All contact information may be found on the RWU website directory.

**Environmental Health and Safety**
x3494 (Director)
x3781 (Coordinator)

**MNS Stockroom**
x3141 (all personnel)

**Public Safety**
x3333
401-254-3333 (off-campus phone)

**Facilities Management**
x3136 (M-F, 8AM – 4PM – call Public Safety after hours)

# Waste Management and Disposal

## Hazardous (Chemical) Waste Management

### Hazardous Waste – Listed Wastes

**Listed Wastes** are specific wastes designated as hazardous waste by the EPA. Any chemical that meets the definition of a listed waste is a regulated hazardous waste and must be managed as such.

Listed wastes appear on one of these lists:

- **P-listed (P00-) wastes:** These wastes are "acutely toxic" chemicals from any industry that are unused (have never been put through a process) (40 CFR 261.33). Roger Williams University generates P-listed waste at this time. See **Appendix A** for a complete list of P-listed wastes.
    - Example: Unused sodium azide for disposal receives the code P105.
    - Empty chemical containers that have previously held P-listed wastes are also P-listed wastes. These containers need to be managed as **hazardous waste**.
    - Materials used to clean up spills of P-listed chemicals or other materials that are contaminated with P-listed chemicals (weigh boats, etc) are P-listed wastes. These materials need to be managed as **hazardous waste**.

- **U-listed (U00-) wastes:** These wastes are toxic chemicals from any industry that are unused (have never been put through a process) (40 CFR 261.33). Roger Williams University generates U-listed waste at this time. See **Appendix B** for a complete list of U-listed wastes.
    - Example: Unused methanol for disposal receives the code U154.
    - Empty chemical containers that have previously held U-listed wastes are not considered U-listed wastes. These containers may be rinsed out and disposed of as clean glassware. However, the rinsate must be collected and managed as U-listed **hazardous waste**.
    - Materials used to clean up spills of U-listed chemicals or other materials that are contaminated with U-listed chemicals (weigh boats, etc) are U-listed wastes. These materials need to be managed as **hazardous waste**.

- **F-listed (F00-) wastes:** These wastes are non-specific source wastes that can be generated by a variety of industries and processes (40 CFR 261.31). With the exception of F039, these wastes are "spent," or have been put through a process. Roger Williams University generates F-listed waste at this time. See **Appendix C** for a complete list of F-listed wastes.

  - Example: Spent methanol is one of the solvents meeting the definition of a F003 waste. Spent pyridine is one of the solvents meeting the definition of a F005 waste.

- **K-listed (K00-) wastes:** These wastes are specific to certain industries and processes (40 CFR 261.32). Roger Williams University does not generate any K-wastes at this time. A complete list of K-code wastes may be found online on the **EPA website**.

## Hazardous Waste – Characteristic Wastes

**Characteristic Wastes** exhibit one or more of the four hazardous waste characteristics listed below, and must be managed as hazardous waste. Characteristic wastes receive one or more D-codes, which correspond to the hazardous characteristic. The full definition of each hazard characteristic and each D-code is listed in **Appendix D**.

The four characteristics are:

- **D001: Ignitability**
  - Example: Methanol is characteristic for ignitability (D001).
- **D002: Corrosivity**
  - Example: Sodium hydroxide is characteristic for corrosivity (D002).
- **D003: Reactivity**
  - Example: Sodium is characteristic for reactivity (D003).
- **D004 – D043: Toxicity**
  - Example: Mercury is characteristic for toxicity (D009).

The first eight chemicals characteristic for toxicity (D004 – D011) are colloquially known as the "RCRA 8 Metals." These metals are:

- Arsenic (D004)
- Barium (D005)
- Cadmium (D006)
- Chromium (D007)
- Lead (D008)
- Mercury (D009)
- Selenium (D010)
- Silver (D011)

Chemical compounds containing these metals (i.e., cadmium chloride, barium nitrate, potassium dichromate) are also considered to be toxicity characteristic wastes.

## Hazardous Waste – State Regulated Wastes

Rhode Island regulates additional chemicals as state regulated hazardous wastes. State regulated hazardous wastes must be managed in the same manner as federally regulated hazardous wastes. State regulated wastes are assigned R- codes. Some R- codes are used in conjunction with any applicable federal codes and some are only used if no federal code applies. Full definitions of the R-codes are listed in **Appendix E**.

## Satellite Accumulation Areas

A **satellite accumulation area** (SAA) is a designated area for hazardous waste storage within a lab or workspace. Both the EPA and RIDEM have regulations pertaining to SAA set up and management. The sections below list the requirements.


*SAA Set Up in the MNS Wet Lab*


*Gloves Collection SAA*

**SAA Signage and Set-Up**

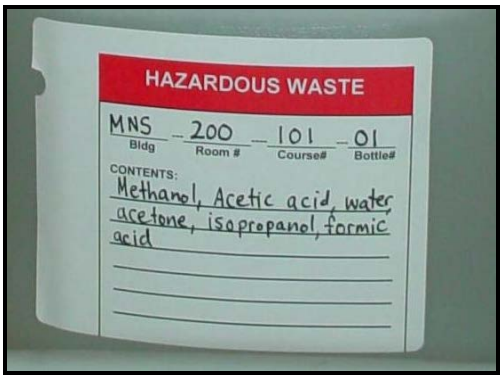
- All RWU SAAs must be set up and approved by RWU EHS. Contact EHS if your area needs an SAA set up or moved.
- RWU SAAs are designated with yellow signage and demarcated with yellow/black striped tape.
- SAAs must be set up:
  - At or near the point of waste generation
  - Under control of the waste generator
    - Waste may not be moved from one lab to another
    - Each lab generating waste must have its own SAAs
- SAAs may store up to 55 gallons of hazardous waste (or 1 quart of **acutely toxic (P-listed) waste**) at one time.
- Only hazardous waste may be stored within the SAA demarcation lines.
- Hazardous waste may not be stored outside of the SAA demarcation lines (i.e., fume hoods, bench tops, etc). Hazardous wastes that pose significant flammability risks or vapor release risks (e.g., chemicals that would require handling in a fume hood) should be stored in the intrinsically safe and vapor-proof 5-gallon metal "Justrite" cans, available from EHS.


*RWU SAA Signage (all SAAs)*

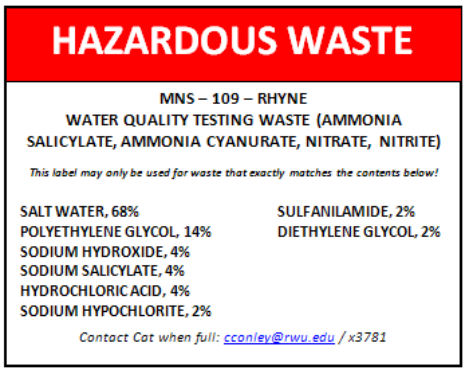
*Demarcation tape*

**Labels and Logs**

- Each hazardous waste container must be labeled with a hazardous waste label.
- Each hazardous waste label must state the words "Hazardous Waste" and a description of the contents of the container.
    - The label must be written legibly and in English.
    - The label must accurately list all chemicals added to that container.
    - The label must list only complete chemical names. The following labeling methods are **not** acceptable: chemical formulas ("NaOH"), abbreviations ("EDTA"), trade names ("Lysol") or generic chemical classes ("Organic Waste").
    - Pre-printed labels may be developed for consistent, large volume waste streams (i.e., ethidium bromide gels). These labels must only be used for the specific waste streams that they describe (i.e., a waste container of only nitric acid must not be labeled with a pre-printed label stating "Nitric Acid, Sulfuric Acid, Phosphoric Acid").

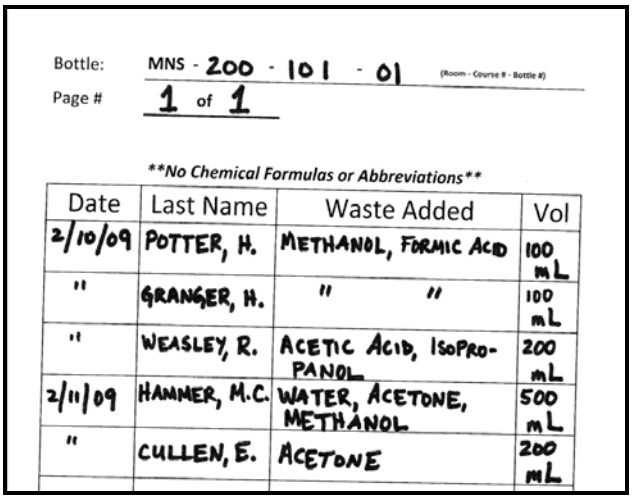



*Handwritten hazardous waste label*




*Pre-printed hazardous waste label*

- Each waste container should have an associated waste log. The waste log must be filled in each time waste is added to the container with the following information: date, user's name, type of waste added (chemical composition), and approximate amount. Waste streams that are always composed of the same chemical mixture (i.e., water quality testing waste) may have pre-printed waste logs with the "waste added" column already filled in.



Bottle: MNS - 200 - 101 - 01 (Room - Course # - Bottle #)

Page # 1 of 1

**No Chemical Formulas or Abbreviations**

| Date | Last Name | Waste Added | Vol |
|---|---|---|---|
| 2/10/09 | POTTER, H. | METHANOL, FORMIC ACID | 100 mL |
| " | GRANGER, H. | " " | 100 mL |
| " | WEASLEY, R. | ACETIC ACID, ISOPRO-PANOL | 200 mL |
| 2/11/09 | HANNER, M.C. | WATER, ACETONE, METHANOL | 500 mL |
| " | CULLEN, E. | ACETONE | 200 mL |

*Handwritten waste log*

Bottle: MNS - 109 - RHYNE - WATER QUAL (Room - Course # - Bottle #)

Page # of

**No Chemical Formulas or Abbreviations**

| Date | Last Name | Waste Added | Vol |
|---|---|---|---|
| | | "WATER QUALITY TESTING WASTE" (Water, Polyethylene glycol, Sodium hydroxide, Sodium Salicylate, Hydrochloric Acid, Sodium Hypochlorite, Sulfanilamide, Diethylene Glycol) | |
| | | " | |
| | | " | |
| | | " | |
| | | " | |
| | | " | |

*Pre-printed waste log*

## Waste Containers

- If a hazardous waste container is compromised or begins to leak, the waste must be transferred to an intact, chemically compatible container immediately.
- Hazardous waste containers must be compatible with the wastes that they are storing.
- Hazardous waste containers must always be closed when not adding or removing waste.
- Transfer funnels should not be left in waste bottles as this prevents proper bottle closure.
- The cap should be intact, fit properly, and not compromised in anyway.
- The container must not be handled or stored in such a way that the container may leak or rupture.
- Example: Do not store hazardous waste bottles in direct sunlight as the sunlight can (a) cause the plastic to break down, or (b) cause the waste to react
- Example: Do not over pack a secondary containment tray with too many bottles as that may cause the bottles to crack.
- Wastes such as: multiple small vials all containing the same liquid or solid, contaminated debris, or solids such as gels, should be placed into overpack containers and managed as a single unit of hazardous waste. RWU provides plastic 1-gallon "mayo jar" over packs for this purpose. A single hazardous waste label may be placed on the mayo jar to indicate the contents of the container – there is no need to label each individual vial/gel/etc. within the container. This management method is safer, more efficient, and easier to manage in the satellite area.
- **Only fill waste containers to 80-90% capacity.**

## Compatibility

- Containers that have previously held materials or waste must not be used to store another waste until the container has been triple rinsed and purged of all potentially incompatible material.
- Incompatible wastes must not be placed in the same waste container.
  - For a list of general compatibility guidelines, see: **Appendix F: Chemical Compatibility Guidelines** or the compatibility section of the **RWU Chemical Hygiene Plan**
  - Consult the chemical's **Material Safety Data Sheet** for specific compatibility guidelines

- Outside references, such as Hawley's Condensed Chemical Dictionary or Wiley's Guide to Chemical Compatibilities are also good resources
- Incompatible wastes must not be stored in the same secondary containment tray.
- The same guidelines apply to waste containers and secondary containments – do not put waste bottles in the same secondary containment trays if they are incompatible and could not be placed in the same waste bottle without causing an adverse reaction

**If you are unsure about chemical compatibility, please consult with Environmental Health and Safety *before* adding waste to a container or containment tray!**

**It is better to start a new hazardous waste container than to unknowingly mix incompatibles in the same waste container!**

*Sample SAA set up with separate containment trays for incompatible chemicals*

**Secondary Containment Trays** are used to keep spilled wastes confined to a small area, away from the environment, personnel, and incompatibles.

- All liquid hazardous wastes must be stored in secondary containment.
    - Solid hazardous wastes should also be stored in secondary containment as a matter of good management practices
- The secondary containment must be able to contain 100% of the volume of the largest container in the containment, or 10% of the total volume of all the containers in the containment, whichever volume is larger.
- Incompatible wastes must not be stored in the same secondary containment trays.
- Spills in the secondary containments must be cleaned up immediately and the debris must be managed as hazardous waste if it meets the definition of hazardous waste.
- There are three sizes of secondary containment trays available for use. Trays may be stacked one inside another to segregate incompatibles without increasing the footprint of the SAA if necessary.


*Secondary containment trays*

**Pick Up / Disposal Procedures**

- Physically full hazardous waste containers (80-90% capacity) will be picked up.
- Containers that are ready for disposal but are not physically full should have a strip of tape placed across the cap with the word "FULL" written on it. Those containers will be picked up along with the full containers.
    - Please put in a work order request ("Health / Safety" button on the School Dude form) for any additional pickup requests or questions.
- Chemical clean-outs and other large-volume disposals should be coordinated through the EHS office to ensure proper disposal resources are onsite.
- The disposal of highly hazardous wastes, such as peroxide formers, poison inhalation hazards, acutely toxic wastes, etc., should be coordinated through the EHS office, as it is safer to collect those wastes immediately rather than leave them unattended in the SAA.

**Empty Containers**

- Empty containers of **P-listed chemicals** must be managed as P-listed hazardous wastes. They should not be cleaned, triple rinsed, or thrown away in the trash or the glass collection containers.
- Empty containers of peroxidizable compounds must be triple rinsed immediately and the threads on the neck and cap cleaned of all residues. The container must be listed as "empty - disposed" on the peroxidizable compounds inventory spreadsheet.
- Clean, empty containers of other compounds must be free of residual liquids or powders. Manage any residual powders or liquids as hazardous waste. Remove and/or completely deface chemical labels and dispose of in the regular trash.
- Grossly contaminated empty glass containers may be disposed of in the **chemically contaminated broken glass disposal containers**.

## Obtaining Hazardous Waste Management Supplies

Hazardous waste management supplies are available from the MNS stockroom. If the stockroom does not have the container type or size you need, please contact Environmental Health and Safety.

**Use the container size that best meets your needs (e.g., do not use a 5 gallon carboy to collect 50 mLs of waste).**

**AVAILABLE HAZARDOUS WASTE CONTAINER TYPES**

| Container Type | Notes on Use / Obtaining |
|---|---|
| Clear plastic 2 liter | Liquids only |
| Clear plastic 4 liter | Liquids only |
| Clear plastic 1 gallon "mayo jar" | Solids only – debris, gels, overpack for small vials, etc |
| White plastic 2.5 gallon carboy | Liquids only |
| Clear plastic 5 gallon carboy | Liquids only |
| Flammable liquids-rated 5 gallon carboy | For flammable liquids only – no corrosives. NFPA approved for waste flammable liquid storage in SAAs (NFPA 45). |
| Clear plastic 16 gallon drum | Liquids only. Please request in advance (2 – 4 weeks). |
| Clear plastic 30 gallon drum | Liquids only. Please request in advance (2 – 4 weeks. |
| Clear plastic 55 gallon drum | Liquids only. Please request in advance (2 – 4 weeks. |
| **Various sized glass containers** | **Contact EHS for authorization prior to use. Only to be used for materials that are incompatible with plastics.** |

**Grey secondary containment trays** are available in three sizes from the MNS Stockroom.

# Broken Glass Management

## Clean (non-contaminated) broken glass

Clean broken glass does not have any chemical residues or biological contamination. Examples include: broken glass stirring rods, broken glassware, etc.

These items should be gathered up using a dustpan and small hand broom (located in each lab) and placed into an appropriately sized corrugated cardboard box (available at the stockroom). The box should be securely taped closed, and "Clean Broken Glassware for Disposal in Trash" should be clearly written on the top of the box. The box should be placed into the regular trash.

## Chemically contaminated broken glass

Chemically contaminated broken glass contains chemical residues but is free of biological contamination. Examples include: glass pipettes, glass stirring rods, beakers, and other types of lab glassware.

Broken chemically contaminated glassware should be gathered up using a dustpan and small hand broom (located in each lab) and placed into the lab's blue 16 gallon "Chemically Contaminated Broken Glassware" container.

**P-listed chemical containers** and P-listed contaminated glassware need to be managed as P-listed **hazardous waste** – do NOT dispose of these materials in with other types of chemically contaminated glassware!


*Chemically contaminated glass bin*


*Glass bin signage*

## Biologically contaminated broken glass

Biologically contaminated broken glass should be gathered using a dustpan and small hand broom (available in the labs).

Small items, such as small cracked or broken test tubes, can be placed in autoclave bags with other contaminated items and sent for autoclaving.

Larger items that have the potential to break into more pieces upon heating, such as partially-cracked glassware items, should be placed into rigid plastic containers before being sent for autoclave. The outer plastic containers should be labeled as "FOR AUTOCLAVE ONLY."

Items that may present hazards if autoclaved, such as large pieces of partially broken glassware that could shatter upon heating, should be brought to the attention of the Chemical Hygiene and Safety Officer, who may use a chemical sterilization method prior to disposal.

Biologically contaminated broken glass should be managed as **clean broken glass** after it has been autoclaved.

# Biological Waste Management

## Specimens

Non-infectious specimens that have been removed from their storage solution for classroom use may be double-bagged in black plastic trash bags and placed in the regular trash. Please notify Facilities in advance via phone call or work order so that arrangements can be made for their timely collection.

Known infectious specimens, or wild-caught specimens of unknown infectious status, should be placed in red biohazardous bags and placed in the designated section of the freezers for pickup and disposal at the end of the semester.

Old or no longer in use specimens still in their storage solution and containers should be managed as-is as **hazardous waste** (i.e., do not pour off the storage solution into another container and throw the specimens away). Note the specimen type (example: Perch, Jellyfish, etc), the storage solution (example: Ethanol, Formalin), any other chemical constituents, and whether or not the specimen is infectious on the hazardous waste label. Please also note if there is a possibility that the storage solution could contain or does contain Bouin's Reagent (contains Picric Acid). Place the labeled specimens in the lab's SAA and manage as hazardous waste.

## Solid Biological Waste

Solid biological waste (contaminated disposables such as bench paper, plastic pipettes and tips, plates, etc.) should be placed into an autoclave bag and sent for autoclaving. Solid biological waste that doesn't fit into an autoclave bag / autoclave should be referred to EHS for further guidance.

*Orange wire holders for large autoclave bags*

*Side view of small benchtop autoclave bag*

**Gloves** used to handle biological items should be placed into a separate autoclave bag, autoclaved, and then collected in the gloves collection SAA with the other disposable gloves as part of the universal glove precautions program.

**Sharps** should be collected in the lab's biological sharps bin (red or yellow biological waste bin with snap cap). Items should never be removed from these bins once they have been placed inside. These bins are supplied by the stockroom.

From the RI DEM Medical Waste Regulations (updated 10/10/10)"

**Sharps:** Objects including, but not limited to, hypodermic needles, syringes with or without the attached needle, Pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, glass carpules, and glass culture dishes regardless of presence of infectious agents. Also included are other types of broken or unbroken glassware that have been used in animal or human patient care or treatment, such as used slides and cover slips. For the purpose of these regulations, disposable syringes and needles are considered regulated medical waste after one use. The following categories of wastes are considered sharps:

(1) **Medical and Veterinary Sharps:** Sharps that have been used in animal or human patient care or treatment, including sharps generated from the preparation of human and animal remains for burial or cremation, or in medical, research, or industrial laboratories,.
(2) **Unused Sharps:** Unused, discarded hypodermic needles or other sharps as described above with the exception that if the unused sharp is in its original sealed packaging, it not by definition a RMW.
(3) **Other sharp Waste:** This category of waste shall also include sharps used on human beings or animals for other than medical procedures, such as sharps used for cosmetic treatment, training purposes, circumcision or embalming procedures.
(4) **Body Art Waste:** any waste produced in the course of injecting or physically altering a human being or animal including tattooing, ear piercing or any other process where a foreign object is used to cut or pierce the skin. Waste generated in this manner meeting the definition of sharps must be handled accordingly.

*Top view of sharps disposal bin*

*Side view of sharps disposal bin, lid off*

### Liquid Biological Waste

Liquid biological waste (including human or animal bodily fluids) should be collected in an impervious container (plastic) with a secure screw cap-style lid and either sterilized in the autoclave, or managed as biological waste/chemical waste mixtures as indicated below.

## Biological Waste also containing Chemical Waste

Biological waste that is also mixed with chemical waste must be managed as chemical **hazardous waste**. Examples include: blood, tissues, or bodily fluids mixed with alcohols or biological stains. Note all biological components on the hazardous waste label in addition to any chemical components (e.g., “Methanol, Human Cheek Cells, Sodium Chloride”).

# Radioactive Waste Management

Roger Williams University does not generate any radioactive waste at this time. Contact the EHS for further guidance if you have potential radiological waste.

# Cylinders

Roger Williams University has a contract with Air Gas for the as-needed replacement of the large gas tanks in the labs. Contact Purchasing with any questions.

Smaller, non-refillable, cylinders (lecture bottles, spuds (thin walled cylinders e.g., the propane tanks for camping stoves), and refrigerant cylinders) should be managed as **hazardous waste**.

Cylinders need to be re-capped with any protective valve caps that they were originally shipped with and need to have the original manufacturer’s label / stenciling visible and legible. Attach the SDS to the cylinder. Secure and store all cylinders upright. Contact EHS for further guidance.

# Used Gloves Management (Universal Precautions)

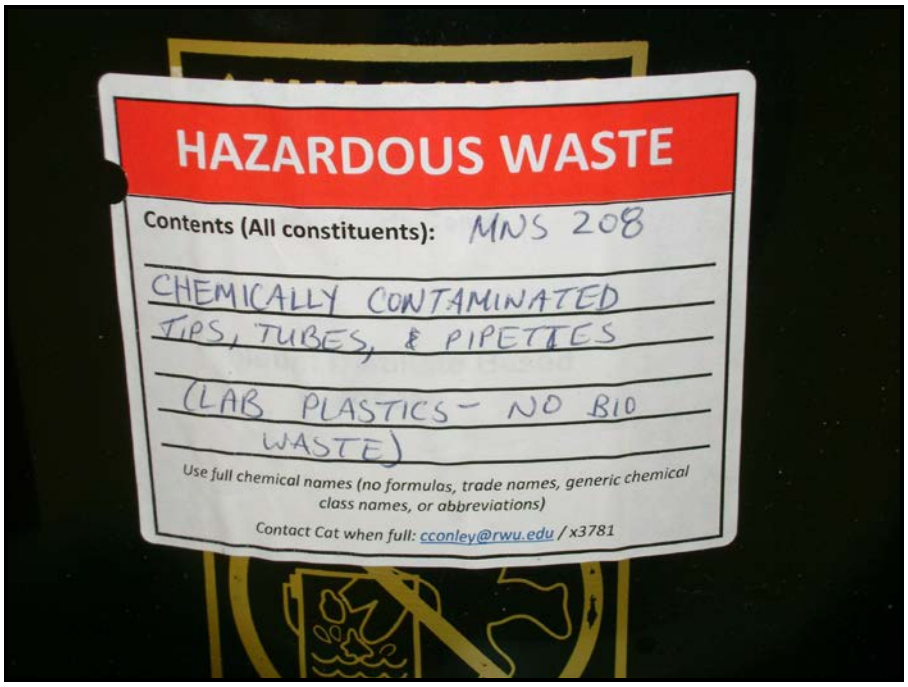
Roger Williams University collects **all** disposable gloves for disposal as state regulated hazardous waste as a matter of universal precautions. No gloves should ever be thrown in the trash, even autoclaved gloves or unused gloves. All gloves should be put into the gloves collection step can located in each lab. **Biologically contaminated gloves** should be autoclaved and then placed into the collection container. EHS collects the gloves from these containers once per week.


*Gloves Collection Container*

# Lab Plastics (Tips, Tubes, and Pipettes)

Chemically contaminated lab plastics (tips, tubes, and pipettes) should be collected and managed as **hazardous waste**. Lab plastics contaminated with P-listed materials must be managed as P-listed hazardous waste.

Biologically contaminated lab plastics (tips, tubes, and pipettes) should be collected and managed as **biologically contaminated solid waste**.




*Label on 5 gallon pail being used for lab plastics collection*

# Chemical Sharps

Chemically contaminated sharps should be collected and managed as **hazardous waste**. Chemical sharps must be labeled with a hazardous waste label stating the chemical composition and the type of sharp (needle, razor). Chemical sharps need to be packaged in puncture proof containers, such as the **1 gallon mayo jars**. DO NOT use the red biological waste sharps containers or any other container with a biological waste symbol to hold chemical wastes.

Biologically contaminated sharps (needles, razors, glass slides and slide covers, glass plates) should be collected and managed as **biologically contaminated sharps**.

# Universal Waste Management

Universal waste can be colloquially defined as common items that contain hazardous components that the EPA and DEM regulate less strictly to enable businesses to easily and correctly manage these items. Rhode Island has six types of universal waste:

- Mercury containing light bulbs
- Mercury containing devices (thermometers, barometers, etc)
- Mercury containing thermostats
- Pesticides
- CRTs and Used Electronics
- Batteries

## Mercury containing light bulbs

Mercury containing light bulbs include 2' and 4' fluorescent bulbs, U-Tubes, CFLs (compact fluorescent bulbs), halogen bulbs, and sodium and metal halide bulbs. Facilities Management changes out the campus light bulbs on a regular basis. **Regular incandescent bulbs may be thrown in the trash.** Small mercury-containing lamps from specialized equipment may be placed in a small sturdy container, labeled as "Universal Waste – Mercury Containing Lamps," and placed in the SAA for pickup.

## Mercury containing devices and mercury containing thermostats

Common mercury containing devices include thermometers, barometers, and thermostats. These items tend to be very fragile, so careful handling is essential. If the device is mounted in or on another device, contact EHS to remove the device. Otherwise, carefully wrap the device in a plastic bag (ziplock is best) and seal and tape the seam closed. Overpack the wrapped device into a 1 gallon mayo jar or 5 gallon pail. Place in SAA for pickup.

## Pesticides

Roger Williams University chooses to manage pesticides as **hazardous waste**.

## CRTs and Used Electronics

The IT Department arranges for the routine recycling and disposal of these items. Contact IT to be placed on the contact list for the next pickup date, and follow the instructions received from IT. Contact Facilities Management if needed to arrange transportation of the item to IT.

## Batteries

***Alkaline batteries are to be thrown away in the regular trash***

The MNS battery collection container is located outside the stockroom. These containers are for rechargeable battery types only. Follow the Battery Recycling Protocol requirements.

Batteries must be individually bagged in ziplock bags before placing into the container. No batteries may be connected in circuit. Leaking, corroded, damaged, or hot/warm batteries may NOT be

**If the batteries are leaking, corroded, or do not fit in the container, contact EHS.**

**Leaking and corroded batteries can cause very dangerous reactions, including fires and explosions!**

# References

Rhode Island Department of Environmental Management. “RIDEM Universal Waste Rule Fact Sheet .” Last Updated: January 2003.
**http://www.dem.ri.gov/programs/benviron/assist/pdf/univrule.pdf**

Rhode Island Department of Environmental Management. “Rules and Regulations for Hazardous Waste Management.” Last Updated: 17 January 2014.
**http://www.dem.ri.gov/pubs/regs/regs/waste/hwregs07.pdf**

Rhode Island Department of Environmental Management. “Medical Waste Regulations.” Last Updated: 10 October 2010.
**http://www.dem.ri.gov/pubs/regs/regs/waste/medwaste10.pdf**

United States Environmental Protection Agency. “Characteristic Wastes.”
**http://www.epa.gov/osw/hazard/wastetypes/characteristic.htm**

United States Environmental Protection Agency. “Frequent Questions about Satellite Accumulation Areas.” **http://www.epa.gov/waste/hazard/generation/labwaste/memo-saa.htm**

United States Environmental Protection Agency. “Listed Wastes**.”**
**http://www.epa.gov/osw/hazard/wastetypes/listed.htm**

United States Environmental Protection Agency. “Subpart I – Use and Management of Containers.” 40 CFR 265.
**http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=5d5a7e916829e818e5cfedd7b2662c69&rgn=div6&view=text&node=40:25.0.1.1.6.9&idno=40**

# Appendices

## Appendix A – EPA P-Codes List (Alphabetical)

*As taken from 40 CFR 261.33*

| Hazardous Waste No. | Chemical Abstracts No. | Chemical Substance |
|---|---|---|
| P023 | 107-20-0 | Acetaldehyde, chloro- |
| P002 | 591-08-2 | Acetamide, N-(aminothioxomethyl)- |
| P057 | 640-19-7 | Acetamide, 2-fluoro- |
| P058 | 62-74-8 | Acetic acid, fluoro-, sodium salt |
| P002 | 591-08-2 | 1-Acetyl-2-thiourea |
| P003 | 107-02-8 | Acrolein |
| P070 | 116-06-3 | Aldicarb |
| P203 | 1646-88-4 | Aldicarb sulfone |
| P004 | 309-00-2 | Aldrin |
| P005 | 107-18-6 | Allyl alcohol |
| P006 | 20859-73-8 | Aluminum phosphide |
| P007 | 2763-96-4 | 5-(Aminomethyl)-3-isoxazolol |
| P008 | 504-24-5 | 4-Aminopyridine |
| P009 | 131-74-8 | Ammonium picrate |
| P119 | 7803-55-6 | Ammonium vanadate |
| P099 | 506-61-6 | Argentate(1-), bis(cyano-C)-, potassium |
| P010 | 7778-39-4 | Arsenic acid H3 AsO4 |
| P012 | 1327-53-3 | Arsenic oxide As2 O3 |
| P011 | 1303-28-2 | Arsenic oxide As2 O5 |
| P011 | 1303-28-2 | Arsenic pentoxide |
| P012 | 1327-53-3 | Arsenic trioxide |
| P038 | 692-42-2 | Arsine, diethyl- |
| P036 | 696-28-6 | Arsonous dichloride, phenyl- |
| P054 | 151-56-4 | Aziridine |

| | | |
|---|---|---|
| P067 | 75-55-8 | Aziridine, 2-methyl- |
| P013 | 542-62-1 | Barium cyanide |
| P024 | 106-47-8 | Benzenamine, 4-chloro- |
| P077 | 100-01-6 | Benzenamine, 4-nitro- |
| P028 | 100-44-7 | Benzene, (chloromethyl)- |
| P042 | 51-43-4 | 1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, |
| P046 | 122-09-8 | Benzeneethanamine, alpha, alpha-dimethyl- |
| P014 | 108-98-5 | Benzenethiol |
| P127 | 1563-66-2 | 7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate. |
| P188 | 57-64-7 | Benzoic acid, 2-hydroxy-, compd. w/ (3aS-cis)-1,2,3a,8,8a-hexahydro-1,3a,8- trimethylpyrrolo[2,3-b]indol-5-yl methylcarbamate ester (1:1) |
| P001 | 81-81-2 2H-1- | Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts,when present at concentrations greater than 0.3% |
| P028 | 100-44-7 | Benzyl chloride |
| P015 | 7440-41-7 | Beryllium Powder |
| P017 | 598-31-2 | Bromoacetone |
| P018 | 357-57-3 | Brucine |
| P045 | 39196-18-4 | 2-Butanone, 3,3-dimethyl- 1-(methylthio)-, O-[(methylamino)carbonyl] oxime |
| P021 | 592-01-8 | Calcium cyanide |
| P021 | 592-01-8 | Calcium cyanide Ca(CN)2 |
| P189 | 55285-14-8 | Carbamic acid, [(dibutylamino)-thio]methyl-, 2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester |
| P191 | 644-64-4 | Carbamic acid, dimethyl-, 1-[(dimethyl-amino)carbonyl]-5-methyl-1H- pyrazol-3-yl ester |
| P192 | 119-38-0 | Carbamic acid, dimethyl-, 3-methyl-1(1-methylethyl)-1H- pyrazol-5-yl ester. |
| P190 | 1129-41-5 | Carbamic acid, methyl-, 3-methylphenyl ester |
| P127 | 1563-66-2 | Carbofuran |
| P022 | 75-15-0 | Carbon disulfide |
| P095 | 75-44-5 | Carbonic dichloride |
| P189 | 55285-14-8 | Carbosulfan |
| P023 | 107-20-0 | Chloroacetaldehyde |
| P024 | 106-47-8 | p-Chloroaniline |
| P026 | 5344-82-1 | 1-(o-Chlorophenyl)thiourea |
| P027 | 542-76-7 | 3-Chloropropionitrile |
| P029 | 544-92-3 | Copper cyanide |

| | | |
|---|---|---|
| P029 | 544-92-3 | Copper cyanide Cu(CN) |
| P202 | 64-00-6 | m-Cumenyl methylcarbamate |
| P030 | | |
| P031 | 460-19-5 | Cyanogen |
| P033 | 506-77-4 | Cyanogen chloride |
| P033 | 506-77-4 | Cyanogen chloride (CN)Cl |
| P034 | 131-89-5 | 2-Cyclohexyl-4,6-dinitrophenol |
| P016 | 542-88-1 | Dichloromethyl ether |
| P036 | 696-28-6 | Dichlorophenylarsine |
| P037 | 60-57-1 | Dieldrin |
| P038 | 692-42-2 | Diethylarsine |
| P041 | 311-45-5 | Diethyl-p-nitrophenyl phosphate |
| P040 | 297-97-2 | O,O-Diethyl O-pyrazinyl phosphorothioate |
| P043 | 55-91-4 | Diisopropylfluorophosphate (DFP) |
| P004 | 309-00-2 | 1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa-chloro-1,4,4a,5,8,8a,-hexahydro-,(1alpha, 4alpha,4abeta, 5alpha,8alpha,8abeta)- |
| P060 | 465-73-6 | 1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa-chloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha, 4abeta,5beta,8beta,8abeta)- |
| P037 | 60-57-1 | 2,7:3,6-Dimethanonaphth[2,3-b]oxirene 3,4,5,6,9,9- hexachloro-1a,2,2a,3,6,6a,7,7a- octahydro-, (1aalpha, 2beta,2aalpha,3beta,6beta,6aalpha,7beta, 7aalpha)- |
| P051 | 72-20-8 | 2,7:3,6-Dimethanonaphth [2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2abeta,3alpha,6alpha,6abeta,7beta, 7aalpha)-, & metabolites |
| P044 | 60-51-5 | Dimethoate |
| P046 | 122-09-8 | alpha,alpha-Dimethylphenethylamine |
| P191 | 644-64-4 | Dimetilan |
| P047 | 534-52-1 | 4,6-Dinitro-o-cresol, & salts |
| P048 | 51-28-5 | 2,4-Dinitrophenol |
| P020 | 88-85-7 | Dinoseb |
| P085 | 152-16-9 | Diphosphoramide, octamethyl- |
| P111 | 107-49-3 | Diphosphoric acid, tetraethyl ester |
| P039 | 298-04-4 | Disulfoton |
| P049 | 541-53-7 | Dithiobiuret |
| P185 | 26419-73-8 | 1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O- |
| | | [(methylamino)-carbonyl]oxime |

| | | |
|---|---|---|
| P050 | 115-29-7 | Endosulfan |
| P088 | 145-73-3 | Endothall |
| P051 | 72-20-8 | Endrin |
| P051 | 72-20-8 | Endrin, & metabolites |
| P042 | 51-43-4 | Epinephrine |
| P031 | 460-19-5 | Ethanedinitrile |
| P194 | 23135-22-0 | Ethanimidothioc acid, 2-(dimethylamino)-N-[[(methylamino)carbonyl]oxy]-2-oxo-, methyl ester. |
| P066 | 16752-77-5 | Ethanimidothioic acid, N-[[(methylamino) carbonyl]oxy]-, methyl ester |
| P101 | 107-12-0 | Ethyl cyanide |
| P054 | 151-56-4 | Ethyleneimine |
| P097 | 52-85-7 | Famphur |
| P056 | 7782-41-4 | Fluorine |
| P057 | 640-19-7 | Fluoroacetamide |
| P058 | 62-74-8 | Fluoroacetic acid, sodium salt |
| P198 | 23422-53-9 | Formetanate hydrochloride |
| P197 | 17702-57-7 | Formparanate |
| P065 | 628-86-4 | Fulminic acid, mercury(2+) salt |
| P059 | 76-44-8 | Heptachlor |
| P062 | 757-58-4 | Hexaethyl tetraphosphate |
| P116 | 79-19-6 | Hydrazinecarbothioamide |
| P068 | 60-34-4 | Hydrazine, methyl- |
| P063 | 74-90-8 | Hydrocyanic acid |
| P063 | 74-90-8 | Hydrogen cyanide |
| P096 | 7803-51-2 | Hydrogen phosphide |
| P060 | 465-73-6 | Isodrin |
| P192 | 119-38-0 | Isolan |
| P202 | 64-00-6 | 3-Isopropylphenyl N-methylcarbamate |
| P007 | 2763-96-4 | 3(2H)-Isoxazolone, 5-(aminomethyl)- |
| P196 | 15339-36-3 | Manganese, bis(dimethylcarbamodithioato-S,S')-, |
| P196 | 15339-36-3 | Manganese dimethyldithiocarbamate |
| P092 | 62-38-4 | Mercury, (acetato-O)phenyl- |
| P065 | 628-86-4 | Mercury fulminate |
| P198 | 23422-53-9 | Methanimidamide, N,N-dimethyl-N'-[3-[[(methyl amino)-carbonyl]oxy]phenyl]-, monohydrochloride |
| P197 | 17702-57-7 | Methanimidamide, N,N-dimethyl-N'-[2-methyl-4- |

| | | |
|---|---|---|
| | | [(methylamino)carbonyl]oxy]phenyl]- |
| P082 | 62-75-9 | Methanamine, N-methyl-N-nitroso- |
| P064 | 624-83-9 | Methane, isocyanato- |
| P016 | 542-88-1 | Methane, oxybis[chloro- |
| P112 | 509-14-8 | Methane, tetranitro- (R) |
| P118 | 75-70-7 | Methanethiol, trichloro- |
| P050 | 115-29-7 | 6,9-Methano-2,4, 3-benzodioxathiepin,6,7,8,9,10,10- hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide |
| P059 | 76-44-8 | 4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro- 3a,4,7,7a-tetrahydro- |
| P199 | 2032-65-7 | Methiocarb |
| P066 | 16752-77-5 | Methomyl |
| P068 | 60-34-4 | Methyl hydrazine |
| P064 | 624-83-9 | Methyl isocyanate |
| P069 | 75-86-5 | 2-Methyllactonitrile |
| P071 | 298-00-0 | Methyl parathion |
| P190 | 1129-41-5 | Metolcarb |
| P128 | 315-8-4 | Mexacarbate |
| P072 | 86-88-4 | alpha-Naphthylthiourea |
| P073 | 13463-39-3 | Nickel carbonyl |
| P073 | 13463-39-3 | Nickel carbonyl Ni(CO) 4 , (T-4)- |
| P074 | 557-19-7 | Nickel cyanide |
| P074 | 557-19-7 | Nickel cynaide Ni(CN) 2 |
| P075 | 54-11-5 | Nicotine, & salts |
| P076 | 10102-43-9 | Nitric oxide |
| P077 | 100-01-6 | p-Nitroaniline |
| P078 | 10102-44-0 | Nitrogen dioxide |
| P076 | 10102-43-9 | Nitrogen oxide NO |
| P078 | 10102-44-0 | Nitrogen oxide NO2 |
| P081 | 55-63-0 | Nitroglycerine |
| P082 | 62-75-9 | N-Nitrosodimethylamine |
| P084 | 4549-40-0 | N-Nitrosomethylvinylamine |
| P085 | 152-16-9 | Octamethylpyrophosphoramide |
| P087 | 20816-12-0 | Osmium oxide OsO4 , (T-4)- |
| P087 | 20816-12-0 | Osmium tetroxide |
| P088 | 145-73-3 | 7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid |
| P194 | 23135-22-0 | Oxamyl |

| | | |
|---|---|---|
| P089 | 56-38-2 | Parathion |
| P034 | 131-89-5 | Phenol, 2-cyclohexyl-4,6-dinitro- |
| P128 | 315-18-4 | Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester). |
| P199 | 2032-65-7 | Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate |
| P202 | 64-00-6 | Phenol, 3-(1-methylethyl)-, methyl carbamate |
| P201 | 2631-37-0 | Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate. |
| P048 | 51-28-5 | Phenol, 2,4-dinitro- |
| P047 | 534-52-1 | Phenol, 2-methyl-4,6-dinitro-, & salts |
| P020 | 88-85-7 | Phenol, 2-(1-methylpropyl)-4,6-dinitro- |
| P009 | 131-74-8 | Phenol, 2,4,6-trinitro-, ammonium salt |
| P092 | 62-38-4 | Phenylmercury acetate |
| P093 | 103-85-5 | Phenylthiourea |
| P094 | 298-02-2 | Phorate |
| P095 | 75-44-5 | Phosgene |
| P096 | 7803-51-2 | Phosphine |
| P041 | 311-45-5 | Phosphoric acid, diethyl 4-nitrophenyl ester |
| P039 | 298-04-4 | Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl]ester |
| P094 | 298-02-2 | Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester |
| P044 | 60-51-5 | Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester |
| P043 | 55-91-4 | Phosphorofluoridic acid, bis(1-methylethyl) ester |
| P089 | 56-38-2 | Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester |
| P040 | 297-97-2 | Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester |
| P097 | 52-85-7 | Phosphorothioic acid, O-[4-[(dimethylamino) sulfonyl]phenyl] O,O-dimethyl ester |
| P071 | 298-00-0 | Phosphorothioic acid, O,O,-dimethyl O-(4-nitrophenyl) ester |
| P204 | 57-47-6 | Physostigmine |
| P188 | 57-64-7 | Physostigmine salicylate |
| P110 | 78-00-2 | Plumbane, tetraethyl- |
| P098 | 151-50-8 | Potassium cyanide |
| P098 | 151-50-8 | Potassium cyanide K(CN) |
| P099 | 506-61-6 | Potassium silver cyanide |
| P201 | 2631-37-0 | Promecarb |
| P070 | 116-06-3 | Propanal, 2-methyl-2- (methylthio)-, O-[(methylamino) carbonyl]oxime |
| P203 | 1646-88-4 | Propanal, 2-methyl-2-(methyl-sulfonyl)-, O-[(methylamino) carbonyl] oxime. |

| | | |
|---|---|---|
| P101 | 107-12-0 | Propanenitrile |
| P027 | 542-76-7 | Propanenitrile, 3-chloro- |
| P069 | 75-86-5 | Propanenitrile, 2-hydroxy-2-methyl- |
| P081 | 55-63-0 | 1,2,3-Propanetriol, trinitrate |
| P017 | 598-31-2 | 2-Propanone, 1-bromo- |
| P102 | 107-19-7 | Propargyl alcohol |
| P003 | 107-02-8 | 2-Propenal |
| P005 | 107-18-6 | 2-Propen-1-ol |
| P067 | 75-55-8 | 1,2-Propylenimine |
| P102 | 107-19-7 | 2-Propyn-1-ol |
| P008 | 504-24-5 | 4-Pyridinamine |
| P075 | 54-11-5 | Pyridine, 3-(1-methyl- 2-pyrrolidinyl)-, (S)-, & salts |
| P204 | 57-47-6 | Pyrrolo[2,3-b]indol-5-ol, 1,2,3,3a,8,8a-hexahydro-1,3a, 8-trimethyl-,methylcarbamate (ester), (3aS-cis)-. |
| P114 | 12039-52-0 | Selenious acid, dithallium(1+) salt |
| P103 | 630-10-4 | Selenourea |
| P104 | 506-64-9 | Silver cyanide |
| P104 | 506-64-9 | Silver cyanide Ag(CN) |
| P105 | 26628-22-8 | Sodium azide |
| P106 | 143-33-9 | Sodium cyanide |
| P106 | 143-33-9 | Sodium cyanide Na(CN) |
| P108 | 1 57-24-9 | Strychnidin-10-one, & salts |
| P018 | 357-57-3 | Strychnidin-10-one, 2,3-dimethoxy- |
| P108 | 57-24-9 | Strychnine, & salts |
| P115 | 7446-18-6 | Sulfuric acid, dithallium(1+) salt |
| P109 | 3689-24-5 | Tetraethyldithio pyrophosphate |
| P110 | 78-00-2 | Tetraethyl lead |
| P111 | 107-49-3 | Tetraethyl pyrophosphate |
| P112 | 509-14-8 | Tetranitromethane |
| P062 | 757-58-4 | Tetraphosphoric acid, hexaethyl ester |
| P113 | 1314-32-5 | Thallic oxide |
| P113 | 1314-32-5 | Thallium oxide Tl2 O3 |
| P114 | 2039-52-0 | Thallium(I) selenite |
| P115 | 7446-18-6 | Thallium(I) sulfate |
| P109 | 3689-24-5 | Thiodiphosphoric acid, tetraethyl ester |
| P045 | 39196-18-4 | Thiofanox |
| P049 | 541-53-7 | Thioimidodicarbonic diamide [(H2 N)C(S)]2 NH |

| | | |
|---|---|---|
| P014 | 108-98-5 | Thiophenol |
| P116 | 79-19-6 | Thiosemicarbazide |
| P026 | 5344-82-1 | Thiourea, (2-chlorophenyl)- |
| P072 | 86-88-4 | Thiourea, 1-naphthalenyl- |
| P093 | 103-85-5 | Thiourea, phenyl- |
| P185 | 26419-73-8 | Tirpate |
| P123 | 8001-35-2 | Toxaphene |
| P118 | 75-70-7 | Trichloromethanethiol |
| P119 | 7803-55-6 | Vanadic acid, ammonium salt |
| P120 | 314-62-1 | Vanadium oxide V2 O5 |
| P120 | 1314-62-1 | Vanadium pentoxide |
| P084 | 4549-40-0 | Vinylamine, N-methyl-N-nitroso- |
| P001 | 1 81-81-2 | Warfarin, & salts, when present at concentrations greater than 0.3% |
| P121 | 557-21-1 | Zinc cyanide |
| P121 | 557-21-1 | Zinc cyanide Zn(CN)2 |
| P205 | 137-30-4 | Zinc, bis(dimethylcarbamodithioato-S,S')-, |
| P122 | 1314-84-7 | Zinc phosphide Zn3 P2 , when present at concentrations greater than 10% |
| P205 | 137-30-4 | Ziram |

# Appendix B – EPA U-Codes List (Alphabetical)

*As taken from 40 CFR 261.33*

| Hazardous Waste No. | Chemical Abstracts No. | Chemical Substance |
|---|---|---|
| U394 | 30558-43-1 | A2213 |
| U001 | 75-07-0 | Acetaldehyde |
| U034 | 75-87-6 | Acetaldehyde, trichloro- |
| U187 | 62-44-2 | Acetamide, N-(4-ethoxyphenyl)- |
| U005 | 53-96-3 | Acetamide, N-9H-fluoren-2-yl- |
| U240 | 94-75-7 | Acetic acid, (2,4-dichlorophenoxy)-, salts & esters |
| U112 | 141-78-6 | Acetic acid ethyl ester |
| U144 | 301-04-2 | Acetic acid, lead(2+) salt |
| U214 | 563-68-8 | Acetic acid, thallium(1+) salt |
| see F027 | 93-76-5 | Acetic acid, (2,4,5-trichlorophenoxy)- |
| U002 | 67-64-1 | Acetone |
| U003 | 75-05-8 | Acetonitrile |
| U004 | 98-86-2 | Acetophenone |
| U005 | 53-96-3 | 2-Acetylaminofluorene |
| U006 | 75-36-5 | Acetyl chloride |
| U007 | 79-06-1 | Acrylamide |
| U008 | 79-10-7 | Acrylic acid |
| U009 | 107-13-1 | Acrylonitrile |
| U011 | 61-82-5 | Amitrole |
| U012 | 62-53-3 | Aniline |
| U136 | 75-60-5 | Arsinic acid, dimethyl- |
| U014 | 492-80-8 | Auramine |
| U015 | 115-02-6 | Azaserine |
| U010 | 50-07-7 | Azirino[2',3':3,4] pyrrolo[1,2-a]indole-4,7-dione, 6-amino- 8-[[(aminocarbonyl) oxy]methyl]-1,1a,2,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha, 8beta, 8aalpha, 8balpha)]- |
| U280 | 101-27-9 | Barban |

| | | |
|---|---|---|
| U278 | 22781-23-3 | Bendiocarb |
| U364 | 22961-82-6 | Bendiocarb phenol |
| U271 | 17804-35-2 | Benomyl |
| U157 | 56-49-5 | Benz[j]aceanthrylene, 1,2-dihydro-3-methyl- |
| U016 | 225-51-4 | Benz[c]acridine |
| U017 | 98-87-3 | Benzal chloride |
| U192 | 23950-58-5 | Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)- |
| U018 | 56-55-3 | Benz[a]anthracene |
| U094 | 57-97-6 | Benz[a]anthracene, 7,12-dimethyl- |
| U012 | 62-53-3 | Benzenamine |
| U014 | 492-80-8 | Benzenamine, 4,4' -carbonimidoylbis[N,N-dimethyl- |
| U049 | 3165-93-3 | Benzenamine, 4-chloro- 2-methyl-, hydrochloride |
| U093 | 60-11-7 | Benzenamine, N,N-dimethyl-4- (phenylazo)- |
| U328 | 95-53-4 | Benzenamine, 2-methyl- |
| U353 | 106-49-0 | Benzenamine, 4-methyl- |
| U158 | 101-14-4 | Benzenamine, 4,4' -methylenebis[2-chloro- |
| U222 | 636-21-5 | Benzenamine, 2-methyl-, hydrochloride |
| U181 | 99-55-8 | Benzenamine, 2-methyl-5-nitro- |
| U019 | 71-43-2 | Benzene |
| U038 | 510-15-6 | Benzeneacetic acid, 4-chloro- alpha-(4-chlorophenyl)- |
| U030 | 101-55-3 | Benzene, 1-bromo-4-phenoxy- |
| U035 | 305-03-3 | Benzenebutanoic acid, 4-[bis (2-chloroethyl)amino]- |
| U037 | 108-90-7 | Benzene, chloro- |
| U221 | 25376-45-8 | Benzenediamine, ar-methyl- |
| U028 | 117-81-7 1,2- | Benzenedicarboxylic acid, bis(2-ethylhexyl) ester |
| U069 | 84-74-2 1,2- | Benzenedicarboxylic acid, dibutyl ester |
| U088 | 84-66-2 1,2- | Benzenedicarboxylic acid, diethyl ester |
| U102 | 131-11-3 1,2- | Benzenedicarboxylic acid, dimethyl ester |
| U107 | 117-84-0 1,2- | Benzenedicarboxylic acid, dioctyl ester |
| U070 | 95-50-1 | Benzene, 1,2-dichloro- |
| U071 | 541-73-1 | Benzene, 1,3-dichloro- |
| U072 | 106-46-7 | Benzene, 1,4-dichloro- |
| U060 | 72-54-8 | Benzene, 1,1'-(2,2- dichloroethylidene) bis[4-chloro- |
| U017 | 98-87-3 | Benzene, (dichloromethyl)- |
| U223 | 26471-62-5 | Benzene, 1,3-diisocyanatomethyl- |
| U239 | 1330-20-7 | Benzene, dimethyl- |

| | | |
|---|---|---|
| U201 | 108-46-3 | 1,3-Benzenediol |
| U127 | 118-74-1 | Benzene, hexachloro- |
| U056 | 110-82-7 | Benzene, hexahydro- |
| U220 | 108-88-3 | Benzene, methyl- |
| U105 | 121-14-2 | Benzene, 1-methyl-2,4-dinitro- |
| U106 | 606-20-2 | Benzene, 2-methyl-1,3-dinitro- |
| U055 | 98-82-8 | Benzene, (1-methylethyl)- |
| U169 | 98-95-3 | Benzene, nitro- |
| U183 | 608-93-5 | Benzene, pentachloro- |
| U185 | 82-68-8 | Benzene, pentachloronitro- |
| U020 | 98-09-9 | Benzenesulfonic acid chloride |
| U020 | 98-09-9 | Benzenesulfonyl chloride |
| U207 | 95-94-3 | Benzene, 1,2,4,5-tetrachloro- |
| U061 | 50-29-3 | Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-chloro- |
| U247 | 72-43-5 | Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4- methoxy- |
| U023 | 98-07-7 | Benzene, (trichloromethyl)- |
| U234 | 99-35-4 | Benzene, 1,3,5-trinitro- |
| U021 | 92-87-5 | Benzidine |
| U202 | 81-07-2 | 1,2-Benzisothiazol- 3(2H)-one, 1,1-dioxide, & salts |
| U203 | 94-59-7 | 1,3-Benzodioxole, 5-(2-propenyl)- |
| U141 | 120-58-1 | 1,3-Benzodioxole, 5-(1-propenyl)- |
| U090 | 94-58-6 | 1,3-Benzodioxole, 5-propyl- |
| U278 | 22781-23-3 | 1,3-Benzodioxol-4-ol, 2,2-dimethyl-, methyl carbamate |
| U364 | 22961-82-6 | 1,3-Benzodioxol-4-ol, 2,2-dimethyl-, |
| U367 | 1563-38-8 | 7-Benzofuranol, 2,3-dihydro-2,2-dimethyl- |
| U064 | 189-55-9 | Benzo[rst]pentaphene |
| U248 | 181-81-2 | 2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1- phenyl-butyl)- |
| U022 | 50-32-8 | Benzo[a]pyrene |
| U197 | 106-51-4 | p-Benzoquinone |
| U023 | 98-07-7 | Benzotrichloride (C,R,T) |
| U085 | 1464-53-5 | 2,2'-Bioxirane |
| U021 | 92-87-5 | [1,1'-Biphenyl]-4,4'-diamine |
| U073 | 91-94-1 | [1,1'-Biphenyl]-4,4'- diamine, 3,3'-dichloro- |
| U091 | 119-90-4 | [1,1'-Biphenyl]-4,4'- diamine, 3,3'-dimethoxy- |
| U095 | 119-93-7 | [1,1'-Biphenyl]-4,4'- diamine, 3,3'-dimethyl- |
| U225 | 75-25-2 | Bromoform |

| | | |
|---|---|---|
| U030 | 101-55-3 | 4-Bromophenyl phenyl ether |
| U128 | 87-68-3 | 1,3-Butadiene, 1,1,2, 3,4,4-hexachloro- |
| U172 | 924-16-3 | 1-Butanamine, N-butyl- N-nitroso- |
| U031 | 71-36-3 | 1-Butanol |
| U159 | 78-93-3 | 2-Butanone |
| U160 | 1338-23-4 | 2-Butanone, peroxide |
| U053 | 4170-30-3 | 2-Butenal |
| U074 | 764-41-0 | 2-Butene, 1,4-dichloro- |
| U143 | 303-34-4 | 2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy- 2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H- pyrrolizin-1-yl ester,[1S-[1alpha(Z), 7(2S*,3R*),7aalpha]]- |
| U031 | 71-36-3 | n-Butyl alcohol |
| U136 | 75-60-5 | Cacodylic acid |
| U032 | 13765-19-0 | Calcium chromate |
| U238 | 51-79-6 | Carbamic acid, ethyl ester |
| U372 | 10605-21-7 | Carbamic acid, 1H-benzimidazol-2-yl, methyl ester |
| U271 | 17804-35-2 | Carbamic acid, [1-[(butylamino)carbonyl]-1H-benzimidazol-2-yl]-,methyl ester |
| U280 | 101-27-9 | Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester |
| U409 | 23564-05-8 | Carbamic acid, [1,2-phenylenebis (iminocarbonothioyl)]bis-,dimethyl ester. |
| U373 | 122-42-9 | Carbamic acid, phenyl-, 1-methylethyl ester |
| U178 | 615-53-2 | Carbamic acid, methylnitroso-, ethyl ester |
| U097 | 79-44-7 | Carbamic chloride, dimethyl- |
| U114 | 111-54-6 | Carbamodithioic acid, 1,2-ethanediylbis-, salts & esters |
| U062 | 2303-16-4 | Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester |
| U279 | 63-25-2 | Carbaryl |
| U372 | 10605-21-7 | Carbendazim |
| U367 | 1563-38-8 | Carbofuran phenol |
| U215 | 6533-73-9 | Carbonic acid, dithallium(1+) salt |
| U033 | 353-50-4 | Carbonic difluoride |
| U156 | 79-22-1 | Carbonochloridic acid, methyl ester |
| U033 | 353-50-4 | Carbon oxyfluoride |
| U211 | 56-23-5 | Carbon tetrachloride |
| U034 | 75-87-6 | Chloral |
| U035 | 305-03-3 | Chlorambucil |
| U036 | 57-74-9 | Chlordane, alpha & gamma isomers |

| | | |
|---|---|---|
| U026 | 494-03-1 | Chlornaphazin |
| U037 | 108-90-7 | Chlorobenzene |
| U038 | 510-15-6 | Chlorobenzilate |
| U039 | 59-50-7 | p-Chloro-m-cresol |
| U042 | 110-75-8 | 2-Chloroethyl vinyl ether |
| U044 | 67-66-3 | Chloroform |
| U046 | 107-30-2 | Chloromethyl methyl ether |
| U047 | 91-58-7 | beta-Chloronaphthalene |
| U048 | 95-57-8 | o-Chlorophenol |
| U049 | 3165-93-3 | 4-Chloro-o-toluidine, hydrochloride |
| U032 | 13765-19-0 | Chromic acid H2CrO4, calcium salt |
| U050 | 218-01-9 | Chrysene |
| U051 | | Creosote |
| U052 | 1319-77-3 | Cresol (Cresylic acid) |
| U053 | 4170-30-3 | Crotonaldehyde |
| U055 | 98-82-8 | Cumene (I) |
| U246 | 506-68-3 | Cyanogen bromide (CN)Br |
| U197 | 106-51-4 | 2,5-Cyclohexadiene- 1,4-dione |
| U056 | 110-82-7 | Cyclohexane (I) |
| U129 | 58-89-9 | Cyclohexane, 1,2,3,4, 5,6-hexachloro-, (1alpha,2alpha,3beta, 4alpha,5alpha,6beta)- |
| U057 | 108-94-1 | Cyclohexanone (I) |
| U130 | 77-47-4 | 1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro- |
| U058 | 50-18-0 | Cyclophosphamide |
| U240 | 94-75-7 | 2,4-D, salts & esters |
| U059 | 20830-81-3 | Daunomycin |
| U060 | 72-54-8 | DDD |
| U061 | 50-29-3 | DDT |
| U062 | 2303-16-4 | Diallate |
| U063 | 53-70-3 | Dibenz[a,h]anthracene |
| U064 | 189-55-9 | Dibenzo[a,i]pyrene |
| U066 | 96-12-8 | 1,2-Dibromo- 3-chloropropane |
| U069 | 84-74-2 | Dibutyl phthalate |
| U070 | 95-50-1 | o-Dichlorobenzene |
| U071 | 541-73-1 | m-Dichlorobenzene |
| U072 | 106-46-7 | p-Dichlorobenzene |
| U073 | 91-94-1 | 3,3'-Dichlorobenzidine |

| | | |
|---|---|---|
| U074 | 764-41-0 | 1,4-Dichloro-2-butene |
| U075 | 75-71-8 | Dichlorodifluoromethane |
| U078 | 75-35-4 | 1,1-Dichloroethylene |
| U079 | 156-60-5 | 1,2-Dichloroethylene |
| U025 | 111-44-4 | Dichloroethyl ether |
| U027 | 108-60-1 | Dichloroisopropyl ether |
| U024 | 111-91-1 | Dichloromethoxy ethane |
| U081 | 120-83-2 | 2,4-Dichlorophenol |
| U082 | 87-65-0 | 2,6-Dichlorophenol |
| U084 | 542-75-6 | 1,3-Dichloropropene |
| U085 | 1464-53-5 | 1,2:3,4-Diepoxybutane |
| U395 | 5952-26-1 | Diethylene glycol, dicarbamate |
| U108 | 123-91-1 | 1,4-Diethyleneoxide |
| U028 | 117-81-7 | Diethylhexyl phthalate |
| U086 | 1615-80-1 | N,N'-Diethylhydrazine |
| U087 | 3288-58-2 | O,O-Diethyl S-methyl dithiophosphate |
| U088 | 84-66-2 | Diethyl phthalate |
| U089 | 56-53-1 | Diethylstilbesterol |
| U090 | 94-58-6 | Dihydrosafrole |
| U091 | 119-90-4 | 3,3'-Dimethoxybenzidine |
| U092 | 124-40-3 | Dimethylamine |
| U093 | 60-11-7 | p-Dimethylaminoazobenzene |
| U094 | 57-97-6 | 7,12-Dimethylbenz[a]anthracene |
| U095 | 119-93-7 | 3,3'-Dimethylbenzidine |
| U096 | 80-15-9 | alpha,alpha- Dimethylbenzylhydroperoxide |
| U097 | 79-44-7 | Dimethylcarbamoyl chloride |
| U098 | 57-14-7 | 1,1-Dimethylhydrazine |
| U099 | 540-73-8 | 1,2-Dimethylhydrazine |
| U101 | 105-67-9 | 2,4-Dimethylphenol |
| U102 | 131-11-3 | Dimethyl phthalate |
| U103 | 77-78-1 | Dimethyl sulfate |
| U105 | 121-14-2 | 2,4-Dinitrotoluene |
| U106 | 606-20-2 | 2,6-Dinitrotoluene |
| U107 | 117-84-0 | Di-n-octyl phthalate |
| U108 | 123-91-1 | 1,4-Dioxane |
| U109 | 122-66-7 | 1,2-Diphenylhydrazine |

| | | |
|---|---|---|
| U110 | 142-84-7 | Dipropylamine |
| U111 | 621-64-7 | Di-n-propylnitrosamine |
| U041 | 106-89-8 | Epichlorohydrin |
| U001 | 75-07-0 | Ethanal |
| U174 | 55-18-5 | Ethanamine, N-ethyl-N-nitroso- |
| U404 | 121-44-8 | Ethanamine, N,N-diethyl- |
| U394 | 30558-43-1 | Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-, methyl ester. |
| U410 | 59669-26-0 | Ethanimidothioic acid, N,N'-[thiobis[(methylimino) carbonyloxy]]bis-, dimethyl ester |
| U155 | 91-80-5 | 1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'- (2-thienylmethyl)- |
| U067 | 106-93-4 | Ethane, 1,2-dibromo- |
| U076 | 75-34-3 | Ethane, 1,1-dichloro- |
| U077 | 107-06-2 | Ethane, 1,2-dichloro- |
| U131 | 67-72-1 | Ethane, hexachloro- |
| U024 | 111-91-1 | Ethane, 1,1'- [methylenebis(oxy)]bis[2-chloro- |
| U117 | 60-29-7 | Ethane, 1,1'-oxybis- |
| U025 | 111-44-4 | Ethane, 1,1'-oxybis[2-chloro- |
| U184 | 76-01-7 | Ethane, pentachloro- |
| U208 | 630-20-6 | Ethane, 1,1,1,2- tetrachloro- |
| U209 | 79-34-5 | Ethane, 1,1,2,2- tetrachloro- |
| U218 | 62-55-5 | Ethanethioamide |
| U226 | 71-55-6 | Ethane, 1,1,1-trichloro- |
| U227 | 79-00-5 | Ethane, 1,1,2-trichloro- |
| U359 | 110-80-5 | Ethanol, 2-ethoxy- |
| U173 | 1116-54-7 | Ethanol, 2,2'- (nitrosoimino)bis- |
| U395 | 5952-26-1 | Ethanol, 2,2'-oxybis-, dicarbamate |
| U004 | 98-86-2 | Ethanone, 1-phenyl- |
| U043 | 75-01-4 | Ethene, chloro- |
| U042 | 110-75-8 | Ethene, (2-chloroethoxy)- |
| U078 | 75-35-4 | Ethene, 1,1-dichloro- |
| U079 | 156-60-5 | Ethene, 1,2-dichloro-, |
| U210 | 127-18-4 | Ethene, tetrachloro- |
| U228 | 79-01-6 | Ethene, trichloro- |
| U112 | 141-78-6 | Ethyl acetate |
| U113 | 140-88-5 | Ethyl acrylate |

| | | |
|---|---|---|
| U238 | 51-79-6 | Ethyl carbamate (urethane) |
| U117 | 60-29-7 | Ethyl ether |
| U114 | 111-54-6 | Ethylenebisdithiocarbamic acid, salts & esters |
| U067 | 106-93-4 | Ethylene dibromide |
| U077 | 107-06-2 | Ethylene dichloride |
| U359 | 110-80-5 | Ethylene glycol monoethyl ether |
| U115 | 75-21-8 | Ethylene oxide |
| U116 | 96-45-7 | Ethylenethiourea |
| U076 | 75-34-3 | Ethylidene dichloride |
| U118 | 97-63-2 | Ethyl methacrylate |
| U119 | 62-50-0 | Ethyl methanesulfonate |
| U120 | 206-44-0 | Fluoranthene |
| U122 | 50-00-0 | Formaldehyde |
| U123 | 64-18-6 | Formic acid |
| U124 | 110-00-9 | Furan |
| U125 | 98-01-1 | 2-Furancarboxaldehyde |
| U147 | 108-31-6 | 2,5-Furandione |
| U213 | 109-99-9 | Furan, tetrahydro- |
| U125 | 98-01-1 | Furfural |
| U124 | 110-00-9 | Furfuran |
| U206 | 18883-66-4 | Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D- |
| U206 | 18883-66-4 | D-Glucose, 2-deoxy-2- [[(methylnitrosoamino)- carbonyl]amino]- |
| U126 | 765-34-4 | Glycidylaldehyde |
| U163 | 70-25-7 | Guanidine, N-methyl- N'-nitro-N-nitroso- |
| U127 | 118-74-1 | Hexachlorobenzene |
| U128 | 87-68-3 | Hexachlorobutadiene |
| U130 | 77-47-4 | Hexachlorocyclopentadiene |
| U131 | 67-72-1 | Hexachloroethane |
| U132 | 70-30-4 | Hexachlorophene |
| U243 | 1888-71-7 | Hexachloropropene |
| U133 | 302-01-2 | Hydrazine |
| U086 | 1615-80-1 | Hydrazine, 1,2-diethyl- |
| U098 | 57-14-7 | Hydrazine, 1,1-dimethyl- |
| U099 | 540-73-8 | Hydrazine, 1,2-dimethyl- |
| U109 | 122-66-7 | Hydrazine, 1,2-diphenyl- |
| U134 | 7664-39-3 | Hydrofluoric acid |

| | | |
|---|---|---|
| U134 | 7664-39-3 | Hydrogen fluoride |
| U135 | 7783-06-4 | Hydrogen sulfide |
| U135 | 7783-06-4 | Hydrogen sulfide H2S |
| U096 | 80-15-9 | Hydroperoxide, 1-methyl-1-phenylethyl- |
| U116 | 96-45-7 | 2-Imidazolidinethione |
| U137 | 193-39-5 | Indeno[1,2,3-cd]pyrene |
| U190 | 85-44-9 | 1, 3-Isobenzofurandione |
| U140 | 78-83-1 | Isobutyl alcohol |
| U141 | 120-58-1 | Isosafrole |
| U142 | 143-50-0 | Kepone |
| U143 | 303-34-4 | Lasiocarpine |
| U144 | 301-04-2 | Lead acetate |
| U146 | 1335-32-6 | Lead, bis(acetato-O)tetrahydroxytri- |
| U145 | 7446-27-7 | Lead phosphate |
| U146 | 1335-32-6 | Lead subacetate |
| U129 | 58-89-9 | Lindane |
| U163 | 70-25-7 | MNNG |
| U147 | 108-31-6 | Maleic anhydride |
| U148 | 123-33-1 | Maleic hydrazide |
| U149 | 109-77-3 | Malononitrile |
| U150 | 148-82-3 | Melphalan |
| U151 | 7439-97-6 | Mercury |
| U152 | 126-98-7 | Methacrylonitrile |
| U092 | 124-40-3 | Methanamine, N-methyl- |
| U029 | 74-83-9 | Methane, bromo- |
| U045 | 74-87-3 | Methane, chloro- |
| U046 | 107-30-2 | Methane, chloromethoxy- |
| U068 | 74-95-3 | Methane, dibromo- |
| U080 | 75-09-2 | Methane, dichloro- |
| U075 | 75-71-8 | Methane, dichlorodifluoro- |
| U138 | 74-88-4 | Methane, iodo- |
| U119 | 62-50-0 | Methanesulfonic acid, ethyl ester |
| U211 | 56-23-5 | Methane, tetrachloro- |
| U153 | 74-93-1 | Methanethiol |
| U225 | 75-25-2 | Methane, tribromo- |
| U044 | 67-66-3 | Methane, trichloro- |

| | | |
|---|---|---|
| U121 | 75-69-4 | Methane, trichlorofluoro- |
| U036 | 57-74-9 | 4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8 -octachloro-2,3,3a,4,7, 7a-hexahydro- |
| U154 | 67-56-1 | Methanol |
| U155 | 91-80-5 | Methapyrilene |
| U142 | 143-50-0 | 1,3,4-Metheno- 2H-cyclobuta[cd]pentalen-2-one,1,1a,3,3a,4, |
| U247 | 72-43-5 | Methoxychlor |
| U154 | 67-56-1 | Methyl alcohol |
| U029 | 74-83-9 | Methyl bromide |
| U186 | 504-60-9 | 1-Methylbutadiene |
| U045 | 74-87-3 | Methyl chloride |
| U156 | 79-22-1 | Methyl chlorocarbonate |
| U226 | 71-55-6 | Methyl chloroform |
| U157 | 56-49-5 | 3-Methylcholanthrene |
| U158 | 101-14-4 | 4,4'-Methylenebis (2-chloroaniline) |
| U068 | 74-95-3 | Methylene bromide |
| U080 | 75-09-2 | Methylene chloride |
| U159 | 78-93-3 | Methyl ethyl ketone (MEK) |
| U160 | 1338-23-4 | Methyl ethyl ketone peroxide |
| U138 | 74-88-4 | Methyl iodide |
| U161 | 108-10-1 | Methyl isobutyl ketone |
| U162 | 80-62-6 | Methyl methacrylate |
| U161 | 108-10-1 | 4-Methyl-2-pentanone |
| U164 | 56-04-2 | Mitomycin C |
| U059 | 20830-81-3 | 5,12-Naphthacenedione, 8-acetyl-10- [(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl)oxy]- 7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)- |
| U167 | 134-32-7 | 1-Naphthalenamine |
| U168 | 91-59-8 | 2-Naphthalenamine |
| U026 | 494-03-1 | Naphthalenamine, N,N'-bis(2-chloroethyl)- |
| U165 | 91-20-3 | Naphthalene |
| U047 | 91-58-7 | Naphthalene, 2-chloro- |
| U166 | 130-15-4 | 1,4-Naphthalenedione |
| U236 | 72-57-1 | 2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'- dimethyl[1,1'-biphenyl]-4,4'- diyl)bis(azo)bis [5-amino-4-hydroxy]-, tetrasodium salt |
| U279 | 63-25-2 | 1-Naphthalenol, methylcarbamate |
| U166 | 130-15-4 | 1,4-Naphthoquinone |

| | | |
|---|---|---|
| U167 | 134-32-7 | alpha-Naphthylamine |
| U168 | 91-59-8 | beta-Naphthylamine |
| U217 | 10102-45-1 | Nitric acid, thallium(1+) salt |
| U169 | 98-95-3 | Nitrobenzene |
| U170 | 100-02-7 | p-Nitrophenol |
| U171 | 79-46-9 | 2-Nitropropane |
| U172 | 924-16-3 | N-Nitrosodi-n-butylamine |
| U173 | 116-54-7 | N-Nitrosodiethanolamine |
| U174 | 55-18-5 | N-Nitrosodiethylamine |
| U176 | 759-73-9 | N-Nitroso-N-ethylurea |
| U177 | 684-93-5 | N-Nitroso-N-methylurea |
| U178 | 615-53-2 | N-Nitroso- N-methylurethane |
| U179 | 100-75-4 | N-Nitrosopiperidine |
| U180 | 930-55-2 | N-Nitrosopyrrolidine |
| U181 | 99-55-8 | 5-Nitro-o-toluidine |
| U193 | 1120-71-4 | 1,2-Oxathiolane, 2,2-dioxide |
| U058 | 50-18-0 | 2H-1,3,2-Oxazaphosphorin- 2-amine, N,N-bis (2-chloroethyl)tetrahydro-,2-oxide |
| U115 | 75-21-8 | Oxirane |
| U126 | 765-34-4 | Oxiranecarboxyaldehyde |
| U041 | 106-89-8 | Oxirane, (chloromethyl)- |
| U182 | 123-63-7 | Paraldehyde |
| U183 | 608-93-5 | Pentachlorobenzene |
| U184 | 76-01-7 | Pentachloroethane |
| U185 | 82-68-8 | Pentachloronitrobenzene (PCNB) |
| See F027 | 87-86-5 | Pentachlorophenol |
| U161 | 108-10-1 | Pentanol, 4-methyl- |
| U186 | 504-60-9 | 1,3-Pentadiene |
| U187 | 62-44-2 | Phenacetin |
| U188 | 108-95-2 | Phenol |
| U048 | 95-57-8 | Phenol, 2-chloro- |
| U039 | 59-50-7 | Phenol, 4-chloro-3-methyl- |
| U081 | 120-83-2 | Phenol, 2,4-dichloro- |
| U082 | 87-65-0 | Phenol, 2,6-dichloro- |
| U089 | 56-53-1 | Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, |
| U101 | 105-67-9 | Phenol, 2,4-dimethyl- |
| U052 | 1319-77-3 | Phenol, methyl- |

| | | |
|---|---|---|
| U132 | 70-30-4 | Phenol, 2,2'-methylenebis [3,4,6-trichloro- |
| U411 | 114-26-1 | Phenol, 2-(1-methylethoxy)-, methylcarbamate |
| U170 | 100-02-7 | Phenol, 4-nitro- |
| See F027 | 87-86-5 | Phenol, pentachloro- |
| See F027 | 58-90-2 | Phenol, 2,3,4,6 -tetrachloro- |
| See F027 | 95-95-4 | Phenol, 2,4,5-trichloro- |
| See F027 | 88-06-2 | Phenol, 2,4,6-trichloro- |
| U150 | 148-82-3 | L-Phenylalanine, 4-[bis(2-chloroethyl)amino]- |
| U145 | 7446-27-7 | Phosphoric acid, lead(2+) salt (2:3) |
| U087 | 3288-58-2 | Phosphorodithioic acid, O,O-diethyl S-methylester |
| U189 | 1314-80-3 | Phosphorus sulfide |
| U190 | 85-44-9 | Phthalic anhydride |
| U191 | 109-06-8 | 2-Picoline |
| U179 | 100-75-4 | Piperidine, 1-nitroso- |
| U192 | 23950-58-5 | Pronamide |
| U194 | 107-10-8 | 1-Propanamine |
| U111 | 621-64-7 | 1-Propanamine, N-nitroso-N-propyl- |
| U110 | 142-84-7 | 1-Propanamine, N-propyl- |
| U066 | 96-12-8 | Propane, 1,2-dibromo- 3-chloro- |
| U083 | 78-87-5 | Propane, 1,2-dichloro- |
| U149 | 109-77-3 | Propanedinitrile |
| U171 | 79-46-9 | Propane, 2-nitro- |
| U027 | 108-60-1 | Propane, 2,2'-oxybis[2-chloro- |
| U193 | 1120-71-4 | 1,3-Propane sultone |
| See F027 | 93-72-1 | Propanoic acid, 2- (2,4,5-trichlorophenoxy)- |
| U235 | 126-72-7 | 1-Propanol, 2,3-dibromo-, phosphate (3:1) |
| U140 | 78-83-1 | 1-Propanol, 2-methyl- |
| U002 | 67-64-1 | 2-Propanone |
| U007 | 79-06-1 | 2-Propenamide |
| U084 | 542-75-6 | 1-Propene, 1,3-dichloro- |
| U243 | 1888-71-7 | 1-Propene, 1,1,2,3,3,3 -hexachloro- |
| U009 | 107-13-1 | 2-Propenenitrile |
| U152 | 126-98-7 | 2-Propenenitrile, 2-methyl- |
| U008 | 79-10-7 | 2-Propenoic acid |
| U113 | 140-88-5 | 2-Propenoic acid, ethyl ester |
| U118 | 97-63-2 | 2-Propenoic acid, 2-methyl-, ethyl ester |

| | | |
|---|---|---|
| U162 | 80-62-6 | 2-Propenoic acid, 2-methyl-, methyl ester |
| U373 | 122-42-9 | Propham |
| U411 | 114-26-1 | Propoxur |
| U194 | 107-10-8 | n-Propylamine |
| U083 | 78-87-5 | Propylene dichloride |
| U387 | 52888-80-9 | Prosulfocarb |
| U148 | 123-33-1 | 3,6-Pyridazinedione, 1,2-dihydro- |
| U196 | 110-86-1 | Pyridine |
| U191 | 109-06-8 | Pyridine, 2-methyl- |
| U237 | 66-75-1 | 2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2- chloroethyl)amino]- |
| U164 | 56-04-2 | 4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo- |
| U180 | 930-55-2 | Pyrrolidine, 1-nitroso- |
| U200 | 50-55-5 | Reserpine |
| U201 | 108-46-3 | Resorcinol |
| U202 | 1 81-07-2 | Saccharin, & salts |
| U203 | 94-59-7 | Safrole |
| U204 | 7783-00-8 | Selenious acid |
| U204 | 7783-00-8 | Selenium dioxide |
| U205 | 7488-56-4 | Selenium sulfide |
| U205 | 7488-56-4 | Selenium sulfide SeS2 |
| U015 | 115-02-6 | L-Serine, diazoacetate (ester) |
| See F027 | 93-72-1 | Silvex (2,4,5-TP) |
| U206 | 18883-66-4 | Streptozotocin |
| U103 | 77-78-1 | Sulfuric acid, dimethyl ester |
| U189 | 1314-80-3 | Sulfur phosphide |
| See F027 | 93-76-5 | 2,4,5-T |
| U207 | 95-94-3 | 1,2,4,5- Tetrachlorobenzene |
| U208 | 630-20-6 | 1,1,1,2- Tetrachloroethane |
| U209 | 79-34-5 | 1,1,2,2- Tetrachloroethane |
| U210 | 127-18-4 | Tetrachloroethylene |
| See F027 | 58-90-2 | 2,3,4,6-Tetrachlorophenol |
| U213 | 109-99-9 | Tetrahydrofuran |
| U214 | 563-68-8 | Thallium(I) acetate |
| U215 | 6533-73-9 | Thallium(I) carbonate |
| U216 | 7791-12-0 | Thallium(I) chloride |
| U216 | 7791-12-0 | Thallium chloride TlCl |

| | | |
|---|---|---|
| U217 | 10102-45-1 | Thallium(I) nitrate |
| U218 | 62-55-5 | Thioacetamide |
| U410 | 59669-26-0 | Thiodicarb |
| U153 | 74-93-1 | Thiomethanol |
| U244 | 137-26-8 | Thioperoxydicarbonic diamide [(H2N)C(S)]2S2, tetramethyl- |
| U409 | 23564-05-8 | Thiophanate-methyl |
| U219 | 62-56-6 | Thiourea |
| U244 | 137-26-8 | Thiram |
| U220 | 108-88-3 | Toluene |
| U221 | 25376-45-8 | Toluenediamine |
| U223 | 26471-62-5 | Toluene diisocyanate |
| U328 | 95-53-4 | o-Toluidine |
| U353 | 106-49-0 | p-Toluidine |
| U222 | 636-21-5 | o-Toluidine hydrochloride |
| U389 | 2303-17-5 | Triallate |
| U011 | 61-82-5 | 1H-1,2,4-Triazol-3-amine |
| U227 | 79-00-5 | 1,1,2-Trichloroethane |
| U228 | 79-01-6 | Trichloroethylene |
| U121 | 75-69-4 | Trichloromonofluoromethane |
| See F027 | 95-95-4 | 2,4,5-Trichlorophenol |
| See F027 | 88-06-2 | 2,4,6-Trichlorophenol |
| U404 | 121-44-8 | Triethylamine |
| U234 | 99-35-4 | 1,3,5-Trinitrobenzene |
| U182 | 123-63-7 | 1,3,5-Trioxane, 2,4,6-trimethyl- |
| U235 | 126-72-7 | Tris(2,3-dibromopropyl) phosphate |
| U236 | 72-57-1 | Trypan blue |
| U237 | 66-75-1 | Uracil mustard |
| U176 | 759-73-9 | Urea, N-ethyl-N-nitroso- |
| U177 | 684-93-5 | Urea, N-methyl-N-nitroso- |
| U043 | 75-01-4 | Vinyl chloride |
| U248 | 81-81-2 | Warfarin, & salts, when present at concentrations of 0.3% or |
| U239 | 1330-20-7 | Xylene |
| U200 | 50-55-5 | Yohimban-16- carboxylic acid, 11,17-dimethoxy- 18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester, (3beta,16beta,17alpha,18beta,20alpha)- |
| U249 | 1314-84-7 | Zinc phosphide Zn3P2, when present at concentrations of 10% or less |

# Appendix C – EPA F-Codes List

*As taken from 40 CFR 261.31*

| Industry and EPA hazardous waste No. | Hazardous waste |
|---|---|
| Generic: | |
| F001 | The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures |
| F002 | The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures |
| F003 | The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures |

| | |
|---|---|
| F004 | The following spent non-halogenated solvents: Cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures |
| F005 | The following spent non-halogenated solvents: Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures |
| F006 | Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum |
| F007 | Spent cyanide plating bath solutions from electroplating operations |
| F008 | Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process |
| F009 | Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process |
| F010 | Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process |
| F011 | Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations |
| F012 | Quenching waste water treatment sludges from metal heat treating operations where cyanides are used in the process |
| F019 | Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process. Wastewater treatment sludges from the manufacturing of motor vehicles using a zinc phosphating process will not be subject to this listing at the point of generation if the wastes are not placed outside on the land prior to shipment to a landfill for disposal and are either: disposed in a Subtitle D municipal or industrial landfill unit that is equipped with a single clay liner and is permitted, licensed or otherwise authorized by the state; or disposed in a landfill unit subject to, or otherwise meeting, the landfill requirements in §258.40, §264.301 or §265.301. For the purposes of this listing, motor vehicle manufacturing is defined in paragraph (b)(4)(i) of this section and (b)(4)(ii) of this section describes the recordkeeping requirements for motor vehicle manufacturing facilities |
| F020 | Wastes (except wastewater and spent carbon from hydrogen chloride |

| | |
|---|---|
| | purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.) |
| F021 | Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives |
| F022 | Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions |
| F023 | Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of Hexachlorophene from highly purified 2,4,5-trichlorophenol.) |
| F024 | Process wastes, including but not limited to, distillation residues, heavy ends, tars, and reactor clean-out wastes, from the production of certain chlorinated aliphatic hydrocarbons by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution. (This listing does not include wastewaters, wastewater treatment sludges, spent catalysts, and wastes listed in §261.31 or §261.32.) |
| F025 | Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution |
| F026 | Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions |
| F027 | Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing Hexachlorophene sythesized from prepurified 2,4,5-trichlorophenol as the sole component.) |
| F028 | Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027 |

| | |
|---|---|
| F032 | Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that currently use or have previously used chlorophenolic formulations (except potentially cross-contaminated wastes that have had the F032 waste code deleted in accordance with §261.35 of this chapter or potentially cross-contaminated wastes that are otherwise currently regulated as hazardous wastes (i.e., F034 or F035), and where the generator does not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol |
| F034 | Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol |
| F035 | Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol |
| F037 | Petroleum refinery primary oil/water/solids separation sludge—Any sludge generated from the gravitational separation of oil/water/solids during the storage or treatment of process wastewaters and oil cooling wastewaters from petroleum refineries. Such sludges include, but are not limited to, those generated in oil/water/solids separators; tanks and impoundments; ditches and other conveyances; sumps; and stormwater units receiving dry weather flow. Sludge generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges generated in aggressive biological treatment units as defined in §261.31(b)(2) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and K051 wastes are not included in this listing. This listing does include residuals generated from processing or recycling oil-bearing hazardous secondary materials excluded under §261.4(a)(12)(i), if those residuals are to be disposed of. |
| F038 | Petroleum refinery secondary (emulsified) oil/water/solids separation sludge—Any sludge and/or float generated from the physical and/or chemical separation of oil/water/solids in process wastewaters and oily cooling wastewaters from petroleum refineries. Such wastes include, but are not limited to, all sludges and floats generated in: induced air flotation (IAF) units, tanks and impoundments, and all sludges generated in DAF units. Sludges generated in stormwater units that do not receive dry weather flow, sludges generated from |

| | |
|---|---|
| | non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges and floats generated in aggressive biological treatment units as defined in §261.31(b)(2) (including sludges and floats generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and F037, K048, and K051 wastes are not included in this listing |
| F039 | Leachate (liquids that have percolated through land disposed wastes) resulting from the disposal of more than one restricted waste classified as hazardous under subpart D of this part. (Leachate resulting from the disposal of one or more of the following EPA Hazardous Wastes and no other Hazardous Wastes retains its EPA Hazardous Waste Number(s): F020, F021, F022, F026, F027, and/or F028.) |

# Appendix D – EPA D-Codes List and Definitions

## D001 – Ignitability

*As taken from 40 CFR 261.21*

### *§ 261.21 Characteristic of ignitability.*

(a) A solid waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:

(1) It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume and has flash point less than 60 °C (140 °F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D 93–79 or D 93–80 (incorporated by reference, see §260.11), or a Setaflash Closed Cup Tester, using the test method specified in ASTM Standard D 3278–78 (incorporated by reference, see §260.11).

(2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.

(3) It is an ignitable compressed gas.

(i) The term “compressed gas” shall designate any material or mixture having in the container an absolute pressure exceeding 40 p.s.i. at 70 °F or, regardless of the pressure at 70 °F, having an absolute pressure exceeding 104 p.s.i. at 130 °F; or any liquid flammable material having a vapor pressure exceeding 40 p.s.i. absolute at 100 °F as determined by ASTM Test D–323.

(ii) A compressed gas shall be characterized as ignitable if any one of the following occurs:

(A) Either a mixture of 13 percent or less (by volume) with air forms a flammable mixture or the flammable range with air is wider than 12 percent regardless of the lower limit. These limits shall be determined at atmospheric temperature and pressure. The method of sampling and test procedure shall be acceptable to the Bureau of Explosives and approved

by the director, Pipeline and Hazardous Materials Technology, U.S. Department of Transportation (see Note 2).

(B) Using the Bureau of Explosives' Flame Projection Apparatus (see Note 1), the flame projects more than 18 inches beyond the ignition source with valve opened fully, or, the flame flashes back and burns at the valve with any degree of valve opening.

(C) Using the Bureau of Explosives' Open Drum Apparatus (see Note 1), there is any significant propagation of flame away from the ignition source.

(D) Using the Bureau of Explosives' Closed Drum Apparatus (see Note 1), there is any explosion of the vapor-air mixture in the drum.

(4) It is an oxidizer. An oxidizer for the purpose of this subchapter is a substance such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter (see Note 4).

(i) An organic compound containing the bivalent -O-O- structure and which may be considered a derivative of hydrogen peroxide where one or more of the hydrogen atoms have been replaced by organic radicals must be classed as an organic peroxide unless:

(A) The material meets the definition of a Class A explosive or a Class B explosive, as defined in §261.23(a)(8), in which case it must be classed as an explosive,

(B) The material is forbidden to be offered for transportation according to 49 CFR 172.101 and 49 CFR 173.21,

(C) It is determined that the predominant hazard of the material containing an organic peroxide is other than that of an organic peroxide, or

(D) According to data on file with the Pipeline and Hazardous Materials Safety Administration in the U.S. Department of Transportation (see Note 3), it has been determined that the material does not present a hazard in transportation.

(b) A solid waste that exhibits the characteristic of ignitability has the EPA Hazardous Waste Number of D001.

Note 1: A description of the Bureau of Explosives' Flame Projection Apparatus, Open Drum Apparatus, Closed Drum Apparatus, and method of tests may be procured from the Bureau of Explosives.

Note 2: As part of a U.S. Department of Transportation (DOT) reorganization, the Office of Hazardous Materials Technology (OHMT), which was the office listed in the 1980 publication of

49 CFR 173.300 for the purposes of approving sampling and test procedures for a flammable gas, ceased operations on February 20, 2005. OHMT programs have moved to the Pipeline and Hazardous Materials Safety Administration (PHMSA) in the DOT.

Note 3: As part of a U.S. Department of Transportation (DOT) reorganization, the Research and Special Programs Administration (RSPA), which was the office listed in the 1980 publication of 49 CFR 173.151a for the purposes of determining that a material does not present a hazard in transport, ceased operations on February 20, 2005. RSPA programs have moved to the Pipeline and Hazardous Materials Safety Administration (PHMSA) in the DOT.

Note 4: The DOT regulatory definition of an oxidizer was contained in §173.151 of 49 CFR, and the definition of an organic peroxide was contained in paragraph 173.151a. An organic peroxide is a type of oxidizer.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990; 70 FR 34561, June 14, 2005; 71 FR 40259, July 14, 2006]

# D002 – Corrosivity

*As taken from 40 CFR 261.22*

## *§ 261.22 Characteristic of corrosivity.*

(a) A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

> (1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using Method 9040C in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW–846, as incorporated by reference in §260.11 of this chapter.
>
> (2) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55 °C (130 °F) as determined by Method 1110A in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW–846, and as incorporated by reference in §260.11 of this chapter.

(b) A solid waste that exhibits the characteristic of corrosivity has the EPA Hazardous Waste Number of D002.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990; 58 FR 46049, Aug. 31, 1993; 70 FR 34561, June 14, 2005]

# D003 – Reactivity

*As taken from 40 CFR 261.23*

### *§ 261.23 Characteristic of reactivity.*

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties:

(1) It is normally unstable and readily undergoes violent change without detonating.

(2) It reacts violently with water.

(3) It forms potentially explosive mixtures with water.

(4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

(7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

(8) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

(b) A solid waste that exhibits the characteristic of reactivity has the EPA Hazardous Waste Number of D003.

[45 FR 33119, May 19, 1980, as amended at 55 FR 22684, June 1, 1990]

# D004 – D043 – Toxicity (listed alphabetically)

*As taken from 40 CFR 261.24*

### *261.24 Toxicity characteristic.*

(a) A solid waste (except manufactured gas plant waste) exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW–846, as incorporated by reference in §260.11 of this chapter, the extract from a representative sample of the waste contains any of the contaminants listed in table 1 at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract for the purpose of this section.

(b) A solid waste that exhibits the characteristic of toxicity has the EPA Hazardous Waste Number specified in Table 1 which corresponds to the toxic contaminant causing it to be hazardous.

Table 1 —Maximum Concentration of Contaminants for the Toxicity Characteristic

| EPA HW No.1 | Contaminant | CAS No.2 | Regulatory Level (mg/L) |
|---|---|---|---|
| D004 | Arsenic | 7440–38–2 | 5.0 |
| D005 | Barium | 7440–39–3 | 100.0 |
| D018 | Benzene | 71–43–2 | 0.5 |
| D006 | Cadmium | 7440–43–9 | 1.0 |
| D019 | Carbon tetrachloride | 56–23–5 | 0.5 |
| D020 | Chlordane | 57–74–9 | 0.03 |
| D021 | Chlorobenzene | 108–90–7 | 100.0 |
| D022 | Chloroform | 67–66–3 | 6.0 |
| D007 | Chromium | 7440–47–3 | 5.0 |
| D023 | o-Cresol | 95–48–7 | 4200.0 |
| D024 | m-Cresol | 108–39–4 | 4200.0 |
| D025 | p-Cresol | 106–44–5 | 4200.0 |
| D026 | Cresol | | 4200.0 |
| D016 | 2,4-D | 94–75–7 | 10.0 |

| | | | |
|---|---|---|---|
| D027 | 1,4-Dichlorobenzene | 106–46–7 | 7.5 |
| D028 | 1,2-Dichloroethane | 107–06–2 | 0.5 |
| D029 | 1,1-Dichloroethylene | 75–35–4 | 0.7 |
| D030 | 2,4-Dinitrotoluene | 121–14–2 | 30.13 |
| D012 | Endrin | 72–20–8 | 0.02 |
| D031 | Heptachlor (and its epoxide) | 76–44–8 | 0.008 |
| D032 | Hexachlorobenzene | 118–74–1 | 30.13 |
| D033 | Hexachlorobutadiene | 87–68–3 | 0.5 |
| D034 | Hexachloroethane | 67–72–1 | 3.0 |
| D008 | Lead | 7439–92–1 | 5.0 |
| D013 | Lindane | 58–89–9 | 0.4 |
| D009 | Mercury | 7439–97–6 | 0.2 |
| D014 | Methoxychlor | 72–43–5 | 10.0 |
| D035 | Methyl ethyl ketone | 78–93–3 | 200.0 |
| D036 | Nitrobenzene | 98–95–3 | 2.0 |
| D037 | Pentrachlorophenol | 87–86–5 | 100.0 |
| D038 | Pyridine | 110–86–1 | 35.0 |
| D010 | Selenium | 7782–49–2 | 1.0 |

| | | | |
|---|---|---|---|
| D011 | Silver | 7440–22–4 | 5.0 |
| D039 | Tetrachloroethylene | 127–18–4 | 0.7 |
| D015 | Toxaphene | 8001–35–2 | 0.5 |
| D040 | Trichloroethylene | 79–01–6 | 0.5 |
| D041 | 2,4,5-Trichlorophenol | 95–95–4 | 400.0 |
| D042 | 2,4,6-Trichlorophenol | 88–06–2 | 2.0 |
| D017 | 2,4,5-TP (Silvex) | 93–72–1 | 1.0 |
| D043 | Vinyl chloride | 75–01–4 | 0.2 |

1Hazardous waste number.

2Chemical abstracts service number.

3Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

4If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/l.

[55 FR 11862, Mar. 29, 1990, as amended at 55 FR 22684, June 1, 1990; 55 FR 26987, June 29, 1990; 58 FR 46049, Aug. 31, 1993; 67 FR 11254, Mar. 13, 2002; 71 FR 40259, July 14, 2006]

# Appendix E – RIDEM R-Codes List and Definitions

*Appendix E has been copied from Rhode Island Department of Environmental Management's "Rules and Regulations for Hazardous Waste Management," last updated 01/17/14*
**http://www.dem.ri.gov/pubs/regs/regs/waste/hwregs14.pdf**

***Rhode Island Hazardous Wastes*** shall mean any waste meeting the below-listed definitions:

Waste codes R001 through R010 are only to be used if the waste meets the definition associated with these codes and does not meet any of the federal definitions of a hazardous waste.

1. **Reserved:** The following waste codes are reserved: R001, R002, R003, R004, R005 and R008.

2. **Extremely *Hazardous Waste (R006)*** shall mean any waste that:

   a. contains any KNOWN CARCINOGEN as designated in regulatory rule-making by any of the federal agencies (OSHA, FDA, EPA,CPSC or DHHS-NTP) in concentrations or amounts at or above the federally regulated level or at 1/10 of 1% (0.1%) by weight, whichever is more stringent, of any solid or liquid mixture. (This rule does not apply to asbestos waste or PCB waste.) or
   b. contains any SUSPECT HUMAN CARCINOGEN as designated in regulatory rule-making by any of the federal agencies (OSHA, FDA, EPA, CPSC or DHHS-NTP) in concentrations or amounts at or above the federally regulated level or at 1% by weight whichever is more stringent, of any solid or liquid mixture. This rule does not apply to asbestos waste, or
   c. contains any U. S. Department of Transportation Class 2, Division 2.3 hazardous material (gas poisonous by inhalation), per 49 CFR 173.115 or Class 6, Division 6.1 hazardous material (poisonous materials), per 49 CFR 173.132 other than pharmaceuticals in finished dosage forms (i.e. inhalers, capsules, tablets, syrups, injectables and ointments), or
   d. contains chemotherapy agents that are antineoplastic or cytotoxic, including but not limited to drugs listed in the NIOSH list of Antineoplastic and Other Hazardous Drugs (http://www.cdc.gov/niosh/docs/2012-150/pdfs/2012-150.pdf).

3. **Polychlorinated *Biphenyls (PCB) Waste (R007)*** shall mean any waste that:
   Contains polychlorinated biphenyls at a concentration of fifty parts per million (50 ppm) or greater. Wastes containing PCBs at a concentration of 50 ppm or greater are also subject to additional regulations under TSCA (Toxic Substances Control Act) in 40 CFR 761.

4. ***Mercury Containing Wastes (R009)*** shall mean any waste that:
   Contains any mercury-added products that are disposed of as waste but do not meet the federal definition of D009 in 40 CFR 261.24. These wastes may also be managed as mercury containing equipment as per Rule 13.

5. ***Used Oil (R010)*** shall mean:
   Any used oil that meets the definition of a characteristic hazardous waste that is subject to disposal and not sent for recycling or any used oil that is designated by the generator as hazardous waste and not sent for recycling and that does not meet

any of the criteria for characteristic or listed hazardous wastes in 40 C.F.R. 261 Subparts C and D or Rhode Island state-regulated hazardous wastes.

The following codes indicate the waste is exempt from the Hazardous Waste Generation Fee described in Rules 5 and 6 and are to be used **in addition** to other applicable federal and state hazardous waste codes.

These waste codes are to be used in addition to applicable state and federal waste codes:

1. Secondary Waste: Waste generated by a hazardous waste management facility as a result of treatment, repackaging or storage of wastes received by the facility shall be designated as an **R011** waste. This waste code shall be used in addition to other required waste codes.
2. Precious metal bearing waste meeting the definition of a precious metal bearing waste as defined by Rule 3 of these Regulations shall be designated as an R012 waste. This waste code shall be used in addition to other required waste codes.
3. Household hazardous waste meeting the definition of a household hazardous waste as defined by Rule 3 shall be designated as an R013 waste. This waste code shall be used in addition to other required waste codes. This exemption shall also apply to architectural paints collected by Paint Collection Centers or Community Collection Centers from CESQGs.
4. Used oil or related materials that are managed in accordance with the requirements of Rule 15 shall be designated as an R014 waste.
5. Waste not meeting the definition of a hazardous waste that is transported using a manifest shall be designated as an R015 waste. This waste code shall be used in addition to other waste codes required by the destination state.
6. Removal Action Waste generated (as listed on item 5 of the Manifest) by the Department or the United States Environmental Protection Agency in the course of emergency response or environmental remediation activities. This exemption shall only apply if the applicable government agency generating the waste while performing the remediation is not considered a Responsible Party as defined herein or pursuant to R.I. General Laws § 23.19.14-3. Such waste shall bear a State waste code of **R016** code in addition to other waste codes required by the destination state.

Use of the **R016** waste code by the generating agency shall not prohibit the Department from collecting the Hazardous Waste Generation Fee as part of a cost recovery action from any other generator determined to be a responsible party associated with the removal action.

# Appendix F – Chemical Compatibility Guidelines

No single matrix of chemical compatibility guidelines can provide absolute answers to every scenario or combination of chemicals. This matrix has been developed by the EPA is meant to serve as a supplemental guide along with information from the chemical manufacturer's **MSDS** (available from the RWU-specific page at MSDSOnline), the **RWU Chemical Hygiene Plan**, guidance from RWU staff, and other industry recognized resources.

It is necessary to be prudent when combining chemicals at any point during the cycle of chemical use. The hazardous waste management stage of the cycle warrants special attention, as the chemicals have gone through any number of changes since they were manufactured and shipped – they may have been combined with other chemicals during an experiment, they may have undergone a concentration or dilution process, they may have undergone changes during storage (including the formation of peroxides), etc. It is important to recognize that chemicals that may have been compatible in their original states may no longer be compatible once they have undergone one of these processes or a period of storage. The careful, well-planned, and thoughtful addition of hazardous waste to hazardous waste containers is essential for a successful and safe hazardous waste management program, as is thorough labeling and safe container handling and management.

If there is **any** confusion or uncertainty as to whether wastes are compatible, remember: **it is always better to place waste into a new hazardous waste bottle than to risk mixing incompatible wastes and causing an adverse reaction.** Also remember that chemicals that are being disposed of unused (virgin materials, in the original container or a secondary transfer container – often leftover chemicals from a completed experiment, or older chemicals no longer being used) should be left in their original container and labeled and managed as is. Finally, remember that if chemicals are not compatible and cannot be combined in the same waste container, then they cannot not share a secondary containment, either.

The Environmental Health and Safety Department is always available to help with questions about chemical compatibility. Please do not hesitate to call:

Coordinator, Chemical Hygiene and Safety
Office Phone: (x3781)
Cell Phone: (774-955-4406)

# EPA's Chemical Compatibility Chart

**EPA-600/2-80-076 April 1980**

**A METHOD FOR DETERMINING THE COMPATIBILITY OF CHEMICAL MIXTURES**

*Please Note:* This chart is intended as an indication of some of the hazards that can be expected on mixing chemical wastes. Because of the differing activities of the thousands of compounds that may be encountered, it is not possible to make any chart definitive and all inclusive. It cannot be assumed to ensure compatibility of wastes because wastes are not classified as hazardous on the chart, nor do any blanks necessarily mean that the mixture cannot result in a hazard occurring. Detailed instructions as to hazards involved in handling and disposing of any given waste should be obtained from the originator of the waste.

| CODE | CONSEQUENCE |
|---|---|
| H | Heat Generation |
| F | Fire |
| G | Innocuous and non-flammable gas generation |
| GT | Toxic Gas formation |
| GF | Flammable Gas formation |
| E | Explosion |
| P | Violent Polymerization |
| S | Solubilization of toxic substance |
| U | May be hazardous, but Unknown |

| # | REACTIVITY GROUP NAME | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 101 | 102 | 103 | 104 | 105 | 106 | 107 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Acids, Mineral, Non-oxidizing | | G H | H F | H P | H | | H | G H | H G | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Acids, Mineral, Oxidizing | G H | | H F | H P | H | | H | G H | H G | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Acids, Organic | H F | H F | | H P | H | | H | G H | H G | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Alcohols and Glycols | H P | H F | H P | | H | | H | G H | H G | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Aldehydes | H | H GT | | | | H | | G H | H G | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Amides | H | H GT | H | | H | | H | G H | H G | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Amines, Aliphatic and Aromatic | H | H GT | H G | H G | H | | | G H | H G | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Azo Compounds, Diazo Compounds and Hydrazines | H G | H GT | H G | H G | H | | | G H | H G | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Carbamates | H G | H GT | | | | | | G H | H G | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Caustics | H | H | H | | H | | | | H G | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Cyanides | GT GF | GT GF | GT GF | | | | | G | | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Dithiocarbamates | H,F GF | H,F GF | H,GT GF | | GF GT | | U | H G | | | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Esters | H | H F | | | | | | H G | | H | | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Ethers | H | H F | | | | | | | | | | | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Fluorides, Inorganic | GT | GT | GT | | | | | | | | | | | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Hydrocarbons, Aromatic | | H F | | | | | | | | | | | | | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Halogenated Organics | H GT | H,F GT | | | | | H GT | H G | | H GF | H | | | | | | GT GF | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Isocyanates | H G | H,F GT | H G | H P | | | H P | H G | | H,P G | H G | U | | | | | | GT GF | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Ketones | H | H F | | | | | | H G | | H | H | | | | | | | | GT GF | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Mercaptans and Other Organic Sulfides | GT GF | H,F GT | | | | | | H G | | | | | | | | | H | H | H | GT GF | | | | | | | | | | | | | | | | | | | | |
| 21 | Metals, Alkali and Alkaline Earth, Elemental | H,F GF | H,F GF | H,F GF | H,F GF | H,F GF | GF H | GF H | GF H | GF H | GF H | GF H | GF,H | GT | GF H | | | | H E | GF H | GF H | GF H | | | | | | | | | | | | | | | | | | | |
| 22 | Metals, Other Elemental & Alloys as Powders, Vapors, or Sponges | H,F GF | H,F GF | G F | | | | | H,F GT | U | GF H | | | | | | | | H E | GF H | | H,F GF | | | | | | | | | | | | | | | | | | | |
| 23 | Metals, Other Elemental & Alloys as Sheets, Rods, Drops, etc. | H,F GF | H,F GF | | | | | | H,F G | | | | | | | | | | H F | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Metals and Metal Compounds, Toxic | S | S | S | | | S | S | | | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Nitrides | GF HF | H,F E | H GF | H,E GF | GF H | | | U | H G | U | GF H | GF | H | GF H | | | | GF H | U | GF H | GF H | E | | | | | | | | | | | | | | | | | | |
| 26 | Nitriles | H,GT GF | H,F GT | H | | | | | U | | U | | | | | | | | | | | | H P | | | $ | GF H | H | | | | | | | | | | | | | |
| 27 | Nitro Compounds, Organic | | H,F GT | | | H | | | | | H E | | | | | | | | | | | | H,E GF | | | | H,E GF | | H | | | | | | | | | | | |
| 28 | Hydrocarbons, Aliphatic, Unsaturated | H | H F | | | H | | | | | | | | | | | | | | | | | | H E | | | | | H | | | | | | | | | | | |
| 29 | Hydrocarbons, Aliphatic, Saturated | | H F | | | | | | | | | | | | | | | | | | | | | | | | | | | H | | | | | | | | | | |
| 30 | Peroxides and Hydroperoxides, Organic | H G | H E | | H F | H G | | H GT | H,F E | H,F GT | | H,E GT | H,F | GT | | | | H E | H | E | H,F GT | H E | H G | | H G | H,E GF | H,P GT | | H P | | H | | | | | | | | | |
| 31 | Phenols and Cresols | H | H F | | | | | | H G | | | | | | | | | | H P | | | | GF H | | | | GF H | | | | | H | H | | | | | | | |
| 32 | Organophosphates, Phosphothioates, Phosphodithioates | H GT | H GT | | | | | | U | | H E | | | | | | | | | | | | H | | | | | | | | | U | | H | | | | | | |
| 33 | Sulfides, Inorganic | GT GF | HF GF | GT | | H | | | E | | | | | | | | | | H | | | | | | | | | | | | | | GT | | | H | | | | |
| 34 | Epoxides | H P | H P | H P | H P | U | | H P | H P | | H P | H P | U | | | | | | | | H P | H P | H P | | H P | H P | | | | | | H P | H P | U | H P | | | | |
| 101 | Combustible and Flammable Materials, Miscellaneous | H G | H,F GT | | | | | | H | | H | | | | H | | | | | | | | H,F G | H | H | | H,F GF | | | | | | H,F GT | | | | H | | | |
| 102 | Explosives | H E | H E | H E | | | | | H E | | H E | | | | H E | | | | | | | | H E | H E | H E | E | E | | | | | | H E | H E | H E | H E | | | | |
| 103 | Polymerizable Compounds | P H | P H | P H | | | | | P H | | P H | P H | U | | | | | | | | | | P H | P H | P H | P H | H | | | | | | P H | H | | P H | | | | |
| 104 | Oxidizing Agents, Strong | H GT | | H GT | H F | H F | H,F GT | H,F GT | H E | H,F GT | | H,E GT | H,F | GT | H F | H F | | H F | H GT | H,F GT | H F | H,F GT | H,F E | H,F E | H F | | H E | H,F GT | H E | H F | H F | H G | H F | H,F GT | H,F GT | H G | H E | H,F GT | | |
| 105 | Reducing Agents, Strong | H GF | H,F GT | H GF | H,F GF | H,F GF | H GF | H G | | | | H GT | H | F | | | H E | H E | H GF | H GF | H GF | | | | | | H GF | H E | | | | H E | H GF | H,GT GF | | H | H GF | H E | H,F GF | H,F E | GF GT | |
| 106 | Water and Mixtures Containing Water | H | H | | | | | | G | | | | | | | | | | H G | | | | H GF | H GF | | $ | H GF | | | | | | | GT GF | | | | | | | |
| 107 | Water Reactive Substances | <---EXTREMELY REACTIVE! DO NOT MIX WITH ANY CHEMICAL OR WASTE MATERIAL! EXTREMELY REACTIVE!---> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 107 |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 101 | 102 | 103 | 104 | 105 | 106 | 107 |