J. J. Keller®
COMPLIANCE NETWORK

WHITEPAPER

HAZARDOUS CHEMICALS 101:

Understanding the Difference Between Hazmat, HazCom, and Hazardous Waste

HAZARDOUS CHEMICALS 101:

Understanding the Difference Between Hazmat, HazCom, and Hazardous Waste

More than 900,000 chemical products are used in U.S. workplaces every day and millions of tons more are transported across the country each year. Many of these chemicals are considered to be hazardous.

Hazardous chemicals—from cleaning fluids to pharmaceuticals, pesticides, and paints—have the potential to cause adverse effects. These include:

- Health hazards, such as carcinogenicity and sensitization,
- Physical hazards, such as flammability or reactivity, or
- Environmental hazards, such as contaminating the air and/or ground water.

Hazardous chemicals are regulated by OSHA, EPA, and the DOT depending upon what is happening to the chemical; where it is; the types of containers, labels and markings; employee exposures; and what happens if a release occurs:

- **HAZARD COMMUNICATION** – 29 CFR 1910.1200: OSHA requires that employees receive training about the chemicals they use in their work.
- **HAZARDOUS WASTE** – 40 CFR 260 - 273 refers to waste with properties that make it dangerous or capable of having a harmful effect on human health and the environment. Under the Resource Conservation Recovery Act, hazardous wastes are specifically defined as wastes that meet a particular listing description or that exhibit a characteristic of hazardous waste.
- **HAZARDOUS MATERIAL** – 49 CFR Part 172: HAZMAT is often used when discussing the transport or cleanup of hazardous materials, but it can mean any aspect of hazardous materials production, transport, use, disposal, cleanup, or emergency response.

HAZARD COMMUNICATION – 29 CFR 1910.1200

OSHA's Hazard Communication (HazCom) Standard, says that workers have the right to know about the hazards of the chemicals they work with, and how they can protect themselves from those hazards. Hazardous chemical is defined in the standard to mean any chemical which is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, or hazard not otherwise classified.

Chemical manufacturers and importers must evaluate the hazards of the chemicals they produce or import, and provide hazard information through labels on shipped containers and safety data sheets (SDSs) to downstream users.

Employers with employees exposed to hazardous chemicals must:

- Identify and list hazardous chemicals in their workplaces, e.g., create and maintain a chemical inventory.
- Ensure containers of hazardous chemicals are appropriately labeled.
- Obtain safety data sheets (SDSs) for each hazardous chemical, if not provided by the manufacturer, importer, or distributor.
- Implement a written HazCom program, including provisions for proper container labeling, SDSs, and employee training.
- Communicate hazard information to employees through proper labels, SDSs, and formal training programs.

There are only two types of work operations where coverage of the rule is limited:

- Laboratories, and
- Operations where employees only handle chemicals sealed containers which are not opened under normal conditions of use (e.g., a warehouse).

Employers with these types of work operations need only:

- Keep labels on containers as they are received,
- Maintain SDSs that are received and give employees access to them, and
- Provide information and training for employees.

EMPLOYERS HAVE A RESPONSIBILITY TO COMMUNICATE INFORMATION TO EMPLOYEES ABOUT THE HAZARDS OF THE CHEMICALS THEY WORK WITH.

WRITTEN PROGRAM

Employers must have a written program that explains how the standard is being applied in the workplace. The program describes how the employer meets the requirements for labels and other forms of hazard warnings, SDSs, and employee training. The written program must include a chemical inventory, which is a list of the hazardous chemicals in the facility for which a safety data sheet is required.

SAFETY DATA SHEETS

The SDS provides the detailed information about hazardous chemicals. Employers must have an SDS available for all covered hazardous chemicals in the workplace.

CONTAINER LABELS

Labels on shipped containers of hazardous chemicals must contain a product identifier; signal word; hazard statement(s); pictogram(s); precautionary statement(s); and name, U.S. address, and U.S. telephone number of the chemical manufacturer, importer, or other responsible party.

Workplace labels may duplicate the label elements from the original container (minus the supplier information), or they can be labeled with the product identifer and words, pictures, symbols, or a combination of these that convey general information regarding the hazards of the chemicals. This option includes the use of NFPA or HMIS® III.

EMPLOYEE TRAINING

Employees must be trained on the hazardous chemicals they are exposed to before their initial assignment and when new hazards are introduced into the work area.

Employees must be informed of the location of the written HazCom program (including the chemical inventory) and SDSs. They must be trained on the hazards of the chemicals they are exposed to and how to protect themselves, and how to understand the information found on labels and SDSs.

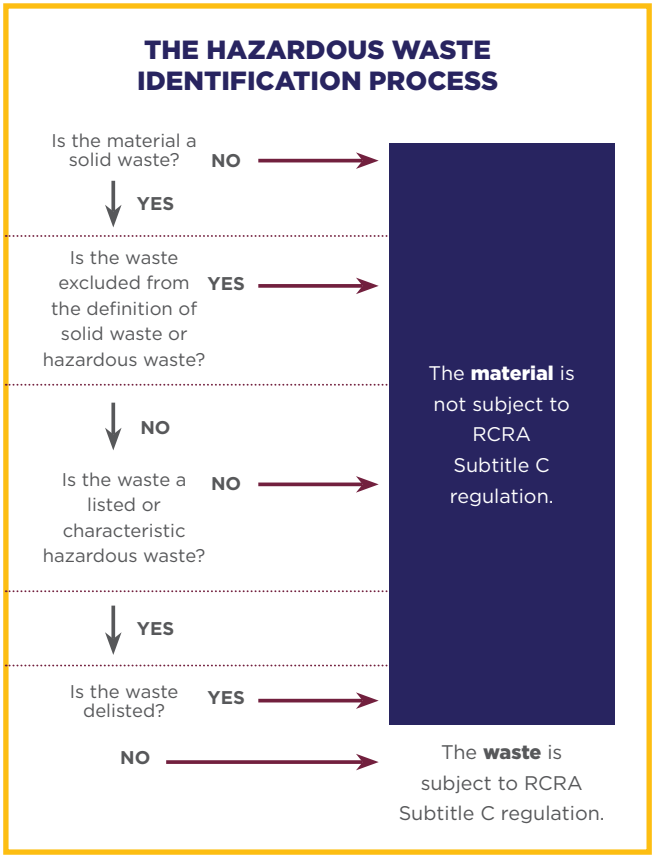
HAZARDOUS WASTE – 40 CFR 260 - 273

Hazardous wastes are substances that you may have used or produced at your facility or in your business and no longer need or want. They can cause serious problems if not properly handled and disposed of, and have the potential to:

- Cause injury or death, or
- Damage or pollute land, air, or water.

Simply defined, a hazardous waste is a waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment. EPA's hazardous waste rules focus on preventing waste from reaching the environment.

HAZARDOUS WASTE CAN CAUSE SERIOUS PROBLEMS IF NOT PROPERLY HANDLED AND DISPOSED OF.



HAZARDOUS WASTE GENERATION

Under the Resource Conservation and Recovery Act (RCRA), all generators must determine if their waste is hazardous and must oversee the fate of the waste. Generators must ensure and fully document that the hazardous waste that they produce is properly identified, managed, and treated prior to recycling or disposal. The degree of regulation that applies to each generator depends on the amount of waste that a generator produces.

If a waste meets the definition of a solid waste, the generator must investigate whether the waste is a listed or characteristic hazardous waste, or whether the waste is specifically excluded from regulation as a solid or hazardous waste.

LISTED HAZARDOUS WASTE

Listed hazardous waste is waste which:

- Is listed on any of the four lists of hazardous wastes contained in the RCRA regulations, or
- Exhibits one of the characteristics described below, or
- Contains any toxic constituents that have been shown to be harmful to health and the environment.

CHARACTERISTIC HAZARDOUS WASTE

Even if a waste does not appear on one of EPA's lists, it is considered hazardous if the waste possesses one or more of the following characteristics:

- **IGNITIBILITY:** easily combustible or flammable, such as paint wastes, degreasers, or other solvents;

- **CORROSIVITY:** dissolves metals, other materials, or burns the skin, such as waste rust removers, waste acid or alkaline cleaning fluids, and waste battery acids;
- **REACTIVITY:** unstable, undergoes rapid or violent reaction with water or other materials, such as cyanide plating wastes, waste bleaches, and other waste oxidizers; and
- **TOXICITY:** harmful or fatal when swallowed or in contact with skin, or which pollutes groundwater if it is improperly disposed of on land. Wastes are tested for toxicity using the Toxicity Characteristic Leachate Procedure (TCLP).

LARGE QUANTITY GENERATOR (LQG)

A large quantity generator (LQG) of hazardous waste is a generator that meets any one of the following criteria:

- Produces over 1000 kg of hazardous waste per month;
- Produces over 1 kg of acute hazardous waste per month;
- Produces over 100 kg of residue or contaminated soil from the cleanup of an acute hazardous waste spill; OR
- Accumulates more than 6000 kg of hazardous waste on-site.

SMALL QUANTITY GENERATOR (SQG)

A small quantity generator (SQG) of hazardous waste is a generator that:

- Produces at least 100 but no more than 1000 kg of hazardous waste per month;
- Produces no more than 1 kg of acute hazardous waste per month; AND
- Accumulates no more than 6000 kg of hazardous waste on-site.

Some states have different generator and accumulation categories, and many states allow storage for shorter periods of time and smaller quantities of hazardous waste. An SQG may accumulate hazardous waste on-site for up to 180 days, or 270 days if the waste is to be shipped over 200 miles away for treatment, storage, or disposal.

SATELLITE ACCUMULATION

A hazardous waste generator may accumulate up to 55 gallons of hazardous waste or 1 kg of solid acute hazardous waste in a satellite accumulation area (SAA) that is:

- At or near the point of hazardous waste generation, and
- Under the control of the operator of the process generating the waste.

The advantage to using an SAA is that the waste generated there does not have an accumulation time limit.

During accumulation in the SAA, containers must be marked with the words “Hazardous Waste” and include an indication of why the waste is hazardous (e.g., ignitable, corrosive, reactive, toxic). Once the generator accumulates more 55 gallons of hazardous waste or 1 kilogram of solid acute hazardous waste, the generator must mark the container with the date the excess began accumulating. Within three days, the generator must move the excess waste from the SAA to a central accumulation area or send it offsite for treatment or disposal.

MANIFEST

The hazardous waste manifest system is a set of forms, reports, and procedures that track hazardous waste from the time it leaves the generating facility until it reaches the off-site waste management facility that will store, treat, or dispose of the hazardous waste.

AUTHORIZED HAZMAT PACKAGING

- Intermediate Bulk Containers
- Drums
- Boxes
- Cargo Tanks
- Portable Tanks
- Cylinders

The manifest is required by both DOT and EPA and contains:

- Information on the type and quantity of the waste being transported,
- Instructions for handling the waste, and
- Signature lines for all parties involved in the disposal process.

Each party that handles the waste signs the manifest and retains a copy for themselves. This ensures accountability in the transportation and disposal processes. Once the waste reaches its destination, the receiving facility returns a signed copy of the manifest to the generator, confirming that the waste has been received by the designated facility. Shippers may use paper forms or may opt in to EPA's electronic manifest system (e-Manifest).

HAZARDOUS MATERIAL – 49 CFR PART 172

Hazmat is a term used by the DOT, and it is short for "hazardous materials." As defined by DOT for shipping purposes, hazardous material means any substance or material that has been determined to pose an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated.

The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous under the Hazardous Materials Regulations (HMR) 49 CFR 172.101 and materials that meet the defining criteria for hazard classes and divisions in 49 CFR 173.

BEFORE TRANSPORTING A MATERIAL, THE SHIPPER MUST DETERMINE IF THE MATERIAL IS CONSIDERED "HAZARDOUS."

The Pipeline and Hazardous Materials Safety Administration (PHMSA) is responsible for regulating and ensuring the safe and secure movement of hazardous materials by developing and enforcing regulations, promoting transportation emergency preparedness, and providing safety training.

The HMR contains all the information needed to properly classify, package, label, placard, create shipping papers or hazmat bill of lading (BOL), and more, for hazardous materials. This responsibility, in most cases, rests with the individual preparing the hazardous material for transport.

PACKAGING

A packaging can be any container authorized by the regulations to contain a hazardous material. The HMR have very specific requirements for all hazmat packagings. These requirements are designed to ensure that the packaging is appropriate for the material and that it can withstand the conditions normally encountered in transport.

Once the material has been identified from the Hazardous Materials Table (HMT), the appropriate packaging can be selected by referencing column 8 from the HMT. In addition to the packaging requirements from the HMT, all packagings must be in compliance with the general packaging requirements found in 173.24, 173.24a, and 173.24b of the HMR.

SHIPPING PAPERS/SHIPPER'S CERTIFICATION/RETENTION

Although there are a few exceptions, shipping papers are required for each hazardous material shipment. A hazardous waste manifest must accompany a hazardous waste shipment. Typically, this requirement can be met using a waybill, manifest, or bill of lading.

Each person who offers a hazardous material for transportation must describe the material on a shipping paper according to the requirements of Subpart C of Part 172 - Shipping Papers.

In most cases, a person who offers a hazardous material for transportation is required to certify that the material is offered for transportation in accordance with the HMR.

The certification required must be legible, signed by a principal, officer, partner, or employee of the shipper or his agent and may be signed manually, by typewriter, or by other mechanical means.

Shipping papers must be retained by the carrier for one year after the material has been accepted and by the shipper for two years after the material is accepted by the initial carrier. Hazardous waste manifests must be retained for three years after the material has been accepted by the initial carrier.

TRAINING

The HMR require that all hazmat employers train their hazmat employees to make sure that every hazmat employee is familiar with the HMR, can recognize and identify hazardous materials, understands the specific HMR requirements applicable to the functions they perform, and is knowledgeable about emergency response, self-protection measures, and accident prevention methods.

HAZMAT EMPLOYEES MUST RECEIVE RECURRENT TRAINING AT LEAST ONCE EVERY THREE YEARS.

Before a hazmat employee performs any job function subject to the HMR they must be trained, tested, and certified. Until training is finished, hazmat employees cannot perform any hazmat function, unless they are directly supervised by a trained hazmat employee and training is completed in 90 days. Further, each hazmat employee must be provided with recurrent training at least once every three years.

Hazmat employees must be tested upon completion of training.

J. J. Keller®
COMPLIANCE NETWORK

CONNECT WITH THE COMPLIANCE COMMUNITY

Reach out to fellow safety and compliance professionals from around the country in the J. J. Keller® **COMPLIANCE NETWORK**'s member-only forums.

JOIN THE CONVERSATION

WHAT IT ALL MEANS

As you can see, there are a variety of chemical rules and responsibilities that fall upon the employer. And although it may seem confusing at first, you can help keep things straight by remembering who enforces each of the hazs – HazCom, hazardous waste, and hazmat – and at what point that enforcement applies: in transport, in use, or in disposal.

The bottom line is that you want employees to go home at the end of the day in the same condition as they arrived to work. By complying with these hazardous chemical regulations, you're protecting not only your employees, but your facility, your community, and the good name of your company.

HOW CAN WE HELP?

CLICK BELOW TO WATCH A VIDEO!

GET FREE RESOURCES

J. J. Keller®
COMPLIANCE
NETWORK

Join an Entire **NETWORK** of Safety & Compliance Expertise

Become a member of **COMPLIANCE NETWORK** and gain access to J. J. Keller's industry-leading safety and compliance content – custom-tailored to your exact regulatory needs.

MEMBERS ENJOY THESE VALUABLE BENEFITS:

- **PERSONALIZED REGULATORY CONTENT** for workplace safety, transportation, environment, HR, and other markets.
- **NEWS & TRENDING ISSUES** relevant to your industry, area(s) of operation, and more.
- **J. J. KELLER INSTITUTE**, an expansive collection of articles, videos, and interactive exercises spanning 120+ compliance topics.
- **UNPRECEDENTED ACCESS TO EXPERTS** through question submissions, one-on-one phone or video consultations, and in-depth research requests.
- **AND MORE**

ABOUT THE AUTHORS FROM J. KELLER & ASSOCIATES, INC.

RACHEL KRUBSACK

Rachel Krubsack joined J. J. Keller & Associates, Inc. in 2010 with a background in library and information science. She is an Editor on the Environmental, Health, and Safety (EHS) team. Rachel edits two manuals – OSHA Rules for General Industry and Hazard Communication Compliance. She also contributes content to Safety Management Suite and Compliance Network and various trade publications. Her topics of expertise include hazard communication, OSHA general industry training requirements, and laboratory safety. In 2023, she completed OSHA 30 training for general industry.

MICHAEL ATKINSON

Michael Atkinson has been an Editor at J. J. Keller & Associates, Inc. since 2016, brings over two decades of military logistics experience, covering operations, management, hazmat preparation, inspection, logistics, and material handling. He supports PHMSA hazmat regulations for highway, air, and water, and is knowledgeable in international dangerous goods regulations. Michael plays a crucial role in developing and updating hazmat-focused manuals, online services, forms, and handbooks, and contributes to innovative products like online hazmat training. His strong work ethic and commitment to exceeding customer expectations make him an invaluable asset to the company.

MISHKA BINNS

Mishka Binns joined J. J. Keller & Associates, Inc. in 2022 as an Environmental Industry Business Advisor on the Environmental, Health & Safety (EHS) Publishing Team. With 8 years of experience in the environmental compliance field, Mishka specializes in The National Environmental Policy Act, Clean Water Act, National Pollutant Discharge Elimination Systems Program and Spill Prevention Plans. She has significant experience in the areas of project management, determining permitting mechanisms and coordination with regulatory agencies. Mishka holds a Bachelor of Science (BS) from Florida International University and is working toward her Master of Science degree in Environmental Resource Management.

ABOUT J. J. KELLER & ASSOCIATES, INC.

Since we began as a family-owned company in 1953, our purpose at J. J. Keller & Associates, Inc. has been to protect people and the businesses they run. Today, serving 500,000+ companies across North America, our associates are making a larger impact than ever. Transportation, construction, utility, healthcare, education and industrial organizations of all sizes rely on our expert insights to help create safe work environments and simplify complex government regulations. They trust in our comprehensive portfolio of solutions, including cloud-based management tools, training, consulting, professional services, publications, forms, PPE and safety supplies.

Safety professionals rely on J. J. Keller's experts, products and services to reduce risk and improve regulatory compliance, performance management, and operational efficiency. Learn more at JJKeller.com, and follow us on LinkedIn, X, Facebook, and Instagram.