



Water Talk

Understanding EPA Hazardous Waste Codes

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INTRODUCTION

As regulatory requirements become more stringent, and the public awareness increases, we are finding that the folks who staff the Environmental Health and Safety (EHS) Department (EH&S) are becoming more of a presence at end-user facilities. More and more, the EH&S Department has the final word on which chemical products can be brought on site.

While environmental safety is a tremendous priority, it isn't the only consideration to take into account when making product selections. Many processes demand that certain chemical characteristics are unavoidable. For example, in cleaning a new construction piping system, a product with a high pH, and packed with surfactants, polymers and corrosion inhibitors is needed. New construction piping will often have oils (cutting oils, thread lubricants) applied while the system piping is fitted up. These oils must be removed before the system is placed into operation, or very serious microbiological fouling could occur. Removing these oils is impossible without detergents, surfactants and sufficient alkalinity (high pH). Yet more and more we get panicked calls from customers who have read the cleaner SDS, and discovered that it is considered a

hazardous waste. How you deal with this problem could very well dictate the new system longevity, and the success of your water treatment program. This Water Talk is designed to provide you with some helpful information that can be used to help inform your customers and assist them in making correct treatment decisions.

HAZARDOUS WASTE IDENTIFICATION

In almost every case where a product is deemed as too hazardous to bring on site, it is as a result of the information found in section 13 of the SDS. Section 13 contains disposal considerations for the product. All EH&S personnel will review this section especially closely. The two SDS excerpts below show both a non-hazardous waste product and a hazardous waste product.

13. DISPOSAL CONSIDERATIONS

US EPA RCRA Status: *This product is not considered to be a hazardous waste.*
US EPA RCRA Hazardous waste code: *NA*

Follow all general good housekeeping rules when handling this or any other chemical formulation. Do not dump undiluted product into any sewers, on the ground or into any body of water. This product, when used in accordance with use instructions is not considered to be a hazardous waste. Rinse containers before disposal. Emptied containers may contain product residue, therefore, follow label warnings

after container is emptied. Dispose of container in accordance with all applicable federal, state, and local laws and regulations.

13. DISPOSAL CONSIDERATIONS

US EPA RCRA Status: *This*

product is considered to be a hazardous waste.

US EPA RCRA Hazardous waste code: **D002**

Do NOT dump into any sewers, on the ground or into any body of water. Rinse containers before disposal. Since emptied containers contain product residue, follow label warnings even after container is emptied. Dispose in accordance with all applicable federal, state and local laws and regulations.

The second excerpt above is taken from a SDS for a material that would be considered a hazardous waste. The EPA has assigned a hazardous waste code of D002. This code can be used to reference the regulations to determine the nature of the hazard and the chemical that it represents.

EPA HAZARDOUS WASTE CLASSIFICATION & IDENTIFICATION, 40 CFR 261

Title 40, Section 261 of the Code of Federal Regulations (40 CFR 261) has a detailed listing of all of the materials that the Federal Government considers a hazardous waste. There are four broad classifications that hazardous wastes can fall into. These are LISTED WASTES, CHARACTERISTIC WASTES, UNIVERSAL WASTES and MIXED WASTES.

We will discuss all the different types of wastes in this Water Talk, but let's start with the particular type that causes all of the problems for water treaters, Characteristic Wastes

CHARACTERISTIC WASTES

Characteristic wastes are those wastes that have a characteristic that makes them hazardous. The materials are not intrinsically hazardous. Rather, they have a particular characteristic, like pH, that makes them hazardous. If you could change the characteristic, then the material could be de-listed.

40 CFR 261, subpart C (Sections 261.20 through 261.24) list physical characteristics that the material would exceed and thus be considered as hazardous waste. These are Ignitable Wastes, Corrosive Wastes, Reactive Wastes and a short list of contaminants which MIGHT make a material hazardous.

These could also be called the D-List Wastes, because their designation begins with the letter D. They are broken down into 4 broad categories of IGNITABILITY, CORROSIVITY, REACTIVITY and TOXICITY.

40 CFR 261.21 – IGNITABILITY, Hazardous Waste Code D001.

Any waste that exhibits the characteristic of ignitability is considered a hazardous waste and will be designated by the Hazardous Waste Code of D001. The CFR spells out the definitions for liquids, gasses and solids.

A typical liquid classification would be that the material, ... "has less than 24% alcohol, and has a flash point of less than 140°F" ...

40 CFR 261.22 – CORROSIVITY, Hazardous Waste Code D002.

Any waste that exhibits the characteristic of corrosivity is considered a hazardous waste and will be designated by the Hazardous Waste Code of D002 (as in our example SDS).

Materials are considered corrosive if their pH is ≤ 2.0 or ≥ 12.5 . Thus any material with a pH between 2.1 and 12.4 would not be considered corrosive, and therefore would not be considered a hazardous waste due to corrosivity.

Oftimes closed loop treatments or new construction cleaners have a high pH. They typically have a pH above 12.5, and therefore would be considered a hazardous waste. Their SDS would indicate they have the Hazardous Waste Code: D002. Of course the SDS is written for the

material in its undiluted form. The simple act of neutralizing the pH would be sufficient to remove its hazardous characteristic, thus rendering it no longer a hazardous waste. This could be done by diluting the product enough to bring the pH to within the limits (pH between 2.2 and 12.4).

40 CFR 261.23 – REACTIVITY, Hazardous Waste Code D003.

Any waste that exhibits the characteristic of reactivity is considered a hazardous waste and will be designated by the Hazardous Waste Code of D003.

Materials are considered reactive if they exhibit one or more of the following properties:

1. Solids
 - a. Normally unstable and can undergoes violent change without detonating.
 - b. Reacts violently with water
 - c. Forms potentially explosive mixtures with water
 - d. When mixed with water, forms enough toxic gasses, vapors or fumes so as to present a hazard to the environment or to humans
 - e. It is a cyanide or sulfide compound that when mixed with water will generate toxic gasses vapors or fumes that present a danger to the environment or to humans.
 - f. It can detonate or explode when heated or confined or when subjected to an initiating source
 - g. Readily capable of explosive detonation at Standard Temperature and Pressure.
 - h. It is a forbidden explosive as defined in 49 CFR 173.50, 173.53 or 173.54

40 CFR 261.24 – TOXICITY, Hazardous Waste Code D004.

Any waste that exhibits the characteristic of toxicity is considered a hazardous waste and will be designated by the Hazardous Waste Code of D003.

Materials are considered toxic if an extract from them contains sufficient concentration of any of the contaminants found in Table 1 of the CFR. Table 1 lists 40 specific contaminants like Silver, Cadmium, Mercury Lead, etc, along with their individual “Regulatory Level”. This Regulatory level is the concentration above which the item is considered as hazardous. Simply diluting the material so that the component is below the Regulatory Level, by definition makes the material a non-hazardous waste. These 40 contaminants are given their own unique hazardous waste code from D004 (Arsenic, ≥ 5 ppm) to D043 (Vinyl Chloride, ≥ 0.2 ppm).

LISTED WASTES

These are wastes that the EPA has determined are intrinsically hazardous, when found in even low concentrations. These wastes may not bio-degrade, or rather they may persist in the environment indefinitely. Or they may be so toxic as to require special handling and regulating. Fortunately for water treaters, these are typically not sold or handled by our industry. The list of hazardous wastes includes the F-List (wastes from common manufacturing and industrial processes), K-List (wastes from specific industries) and the P- and U-Lists (wastes from commercial chemical products).

F-LIST WASTES

Materials found on this list are not typically found in the water treatment world. These are typically cleaning solvents that can be generated in a variety

of industrial sectors, and therefore are from non-specific sources. A couple of common examples would include:

F-001: Various spent halogen solvents used in degreasing.

F-012: Quenching waste water treatment sludges from metal heat treating operations that might include cyanide.

K-LIST WASTES

Materials found on this list are also not typically found in the water treatment world. These are wastes from specific industries like petroleum refining and pesticide manufacturing. A typical example is:

K-106: Wastewater treatment sludge from the mercury cell process in chlorine production.

P-List and U-LIST WASTES

Materials found on this list are also not typically found in the water treatment world. These are most often discarded pharmaceutical wastes, or unused chemical wastes. A couple of common examples would include:

P-011: Arsenic Pentoxide.

U-032: Calcium Chromate.

UNIVERSAL WASTES

These are wastes that are present throughout society, and could be generated by a wide variety of sources including households, retail and commercial industries, office complexes etc. These would include batteries, pesticides and mercury-containing equipment (like thermostats and fluorescent bulbs).

MIXED WASTES

These are wastes that contain a mix of both radioactive waste and hazardous waste components. These materials will almost never be encountered by a water treatment professional.

DISPOSAL OF EMPTY CONTAINERS

Oftimes the proper disposal of empty containers can become a troublesome issue. Customers will sometimes want to treat the empty containers as hazardous waste. Per 40 CFR 261.7, any hazardous waste remaining in either an empty container or an inner liner from a container is not subject to the regulation under this CFR so long as it is empty:

- a. All wastes have been removed that can be removed using practices commonly employed to remove contents from the container (pumping, pouring, aspirating, etc.).
- b. No more than 1 inch of residue remain in the container.
- c. If the container contained an acute hazardous waste, it is empty if it has been triple rinsed.

LOCAL REGULATIONS

Local regulations could be more stringent. Be sure to check for local disposal methods and acceptable practices.