

Are Your Ion-Exchange Resins Hazardous Wastes?

This brochure is intended to assist metal finishing, electroplating, and other businesses in the classification of ion exchange resin in tanks as hazardous waste when used for treatment of process wastewaters for discharge or reuse. It is not intended to represent the EPA or other regulatory agency and should be used for information purpose only. Please consult with your local agency for final authority and direction.

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What is spent waste ion-exchange resin?

It is ion-exchange resin that has been exhausted with metals. Wastewater ion exchange (WWIX) is used to treat wastewater prior to discharge or reuse. When used to remove metals from metal finishing and electroplating wastewater, EPA has classified spent ion-exchange resin as sludge or “residual” from a waste treatment system.

What is a wastewater residual?

It is the sludge or remaining waste after a waste treatment process. In this case, the residual is metal absorbed onto the resin inside the ion-exchange tank. Under RCRA, the classification of a residual is tied to the type of unit in which the waste is generated, not the disposition of the treated effluent or intent of the processing unit.

What is RCRA?

RCRA is the Resource Conservation and Recovery Act, regulations adopted by Congress & administered by USEPA and State and Local regulatory agencies, defining what hazardous wastes are and how they must be legally stored, treated and disposed.

If I am treating a metal-bearing rinse or wastewater, are my discharge water and the residuals always regulated and possibly hazardous?

NO! Just because you’re treating a metal-bearing rinse or wastewater doesn’t necessarily mean the spent ion-exchange resins used in the treatment process are hazardous wastes. However, because you are working with metals the possibility exists that your residuals could be hazardous. If it is classified as hazardous, you want to make sure that you properly manage the hazardous waste. NOTE: There are significant legal liabilities to you and your company for not properly managing your residuals according to RCRA regulations.

How do I know whether my spent resin is hazardous?

There are two ways that a waste is classified as hazardous waste. It can be either classified as a LISTED or a CHARACTERISTIC hazardous waste. RCRA regulations provide guidance to assist the waste generator in determining whether the waste falls into either classification. See 40 CFR 261- Identification and Listing of Hazardous Waste

What is a LISTED hazardous waste?

The EPA has made a list of certain manufacturing processes. If you use one of those processes (see below), then waste residuals from that process are automatically considered LISTED Hazardous Wastes. This is true no matter what part of the process they come from.

What is a CHARACTERISTIC hazardous waste?

If you have your waste residuals analyzed, using the TCLP test, and they contain more than a specified level of specific metals (or organics), your waste is classified as a CHARACTERISTIC Hazardous Waste. TCLP is the Toxic Characteristics Leaching Procedure.

Do I have to ship my tanks using a Hazardous Waste manifest?

If you fall into one of the categories for regulated hazardous waste, either LISTED or CHARACTERISTIC, then you are required to manifest and ship them as hazardous waste.

What if my State Agency says that these resins are not hazardous?

Although many states have been given authority by the USEPA to enforce RCRA rules, as well as establish and enforce their own rules, the state can NEVER be more lenient than the Federal EPA. **PROCEED WITH CAUTION**

How do I determine if my manufacturing process is LISTED?

The EPA has classified the residuals from the following 6 manufacturing processes, also called Electroplating Processes, as LISTED Hazardous Wastes, and they must be dealt with as such. Residuals from these processes are assigned the F006 hazardous waste code. See 40 CFR 413

| | |
|---------------------|---|
| Electroplating | Coating (chromating, phosphating, coloring) |
| Electroless Plating | Chemical Etching & Milling |
| Anodizing | Printed Circuit Board Manufacturing |

What about the other metal finishing processes done in conjunction with the above 6 LISTED Electroplating processes?

The EPA has determined that wastewater from the following processes are regulated (when performed in conjunction with the one or more of the 6 Electroplating processes) and any residuals from these processes are also considered F006 hazardous wastes: See 40 CFR 433

| | | | |
|------------|----------------------|------------------------|------------------------|
| Cleaning | Grinding | Tumbling | Electrostatic Painting |
| Machining | Impact Deformation | Shearing | Vacuum Metalizing |
| Brazing | Flame Spraying | Calibration | Salt Bath Descaling |
| Polishing | Ultrasonic Machining | Laminating | Mechanical Plating |
| Sputtering | Thermal Infusion | Sintering | Solvent Degreasing |
| Painting | Electroplating | Assembly | Hot Dip Coating |
| Testing | Laser Beam Machining | EDM | Thermal Cutting |
| Burnishing | Pressure Deformation | Heat Treating | Vapor Plating |
| Welding | Paint Stripping | Sand Blasting | |
| Soldering | Plasma Arc Machining | Abrasive Jet Machining | |

If my process is not listed above, how do I determine if my spent ion-exchange resin is a CHARACTERISTIC Hazardous Waste?

If any part of your finishing process includes (even if incidental) the following metals and ion-exchange is used to treat your rinse/wastewater discharge, the spent resin must be evaluated using TCLP. If the results of the TCLP are equal to or above the limits below, then the resin is a Characteristic Hazardous Waste:

| | | | | | |
|---------|----------------|----------|----------------|----------|----------------|
| Arsenic | 5 ppm | Chromium | 5 ppm | Mercury | 0.2 ppm |
| Barium | 100 ppm | Cyanides | 250 ppm | Selenium | 1 ppm |
| Cadmium | 1 ppm | Lead | 5 ppm | Silver | 5 ppm |

How does the USEPA Clean Water Act affect my discharge of rinse or wastewater streams?

According to the Clean Water Act, industrial process wastewater must be treated prior discharge into Publicly Owned Treatment Works (POTW) or surface water. Spent ion exchange resins, when used to comply with discharge regulations, are considered wastes regulated under RCRA.

What is a POTW?

Publicly Owned Treatment Works. It is the local authority that monitors and treats industrial and sanitary waste discharged into the sewer system.

What metals and limits might be regulated under the Clean Water Act?

As an example, the following metals and limits apply to manufacturers classified as Electroplaters (see above) under the Clean Water Act discharging to a POTW. Note: Your company’s actual discharge limits may be more stringent.

| | | | | | |
|---------|---------|----------|---------|--------|---------|
| Cadmium | 0.7 ppm | Chromium | 4.0 ppm | Copper | 2.7 ppm |
| Lead | 0.4 ppm | Nickel | 2.6 ppm | Silver | 0.7 ppm |
| Zinc | 2.6 ppm | Cyanides | 1.0 ppm | | |

If I have any questions about RCRA or my local POTW regulations how can I find out more concerning the regulation of hazardous waste?

Call your local regulator to request information concerning the RCRA regulations. To learn about POTW regulations simply call your local community public works office and asks them for the necessary information. You may also call Siemens Water Technologies for assistance at 888-927-8349.

What is a RCRA Part B Permit and what does it have to do with Hazardous Waste?

RCRA deals specifically with hazardous waste treatment, storage, and disposal. There are nearly 400 RCRA Part B permitted facilities in the USA but only one that regenerates ion-exchange resins. Siemens Water Technologies is that facility.

Can Siemens Water Technologies regenerate and handle my spent ion-exchange resin, if it is determined to be hazardous?

YES, we are a RCRA Part B permitted facility and our specialty is treatment of inorganic waste streams.

As a manufacturer we use solvents, oil, or other organics that enter the rinse water stream.

Can Siemens Water Technologies still regenerate my spent ion-exchange canisters?

Minor amounts of these substances can be dealt with; however, an excessive amount will dictate the use of a system other than ion-exchange. These chemicals may also require other LISTED and CHARACTERISTIC hazardous waste codes to be applied to the spent resin. Even if Siemens Water Technologies cannot provide a WWIX system, the company provides the world’s broadest range of water and wastewater treatment technologies and can provide you with the best fit for your specific applications.