



# Does Your Business Produce Hazardous Waste? Many Small Businesses Do

**UPDATED  
EDITION**

**TC  
REPLACES  
EP  
TOXICITY**

**WASTE  
MINIMIZATION**

Waste Minimization  
Should Be the Key  
Component of Your  
Company's Hazardous  
Waste Management  
Program



# Many small businesses produce hazardous waste.

If yours is one of them, this brochure will help you comply with new hazardous waste laws.

## Federal law requires many small businesses to meet requirements for handling hazardous wastes.

In 1976 the Congress of the United States passed a law called the Resource Conservation and Recovery Act (RCRA). Under RCRA, the United States Environmental Protection Agency (EPA) has developed specific requirements for handling hazardous waste in ways that protect human health and the environment. These requirements control hazardous waste from the moment it is generated until its ultimate disposal. Since 1980, EPA has been improving the hazardous waste program

to further protect public health and the environment. As a result, the requirements were expanded to include small businesses that handle specified quantities of hazardous waste, and the number of hazardous wastes has been increased.

## EPA's definition of hazardous waste was recently expanded to cover many additional toxic compounds, including some commonly used by small businesses.

Under these new regulations, many previously regulated businesses will be required to handle *additional* wastes as hazardous waste, and *many small businesses never before regulated under federal hazardous waste laws* must comply with hazardous waste requirements.

## Defining Hazardous Waste

A waste is a solid or liquid material that is no longer used. You either throw waste away or store it until you have enough to warrant disposal. EPA defines waste as hazardous if it has certain properties that could pose dangers to human health and the environment after it is discarded.

EPA considers a waste to be hazardous if it possesses certain characteristics (ignitability, corrosivity, reactivity, or toxicity) or if it is on a list of specific wastes determined by EPA to be hazardous. All "characteristic" and "listed" wastes must be handled according to federal hazardous waste regulations. You must check to see if your waste is on the EPA list. If it is not, you must determine whether it exhibits one of the characteristics. If you are not sure, you can have it tested in a laboratory to determine whether it is hazardous. (See "A New Test for Toxicity" below.) You will generally be able to tell if your waste might be hazardous by reviewing label information (i.e., if it says things like "flammable" or "poison").

RCRA regulations, found in the Code of Federal Regulations (CFR) Title 40, Part 261, present the "listed" hazardous wastes, describe hazardous waste characteristics, and specify test methods for determining whether waste is hazardous.

## Do Hazardous Waste Requirements Apply to You?

The following information will help you determine whether your business might be a small quantity

generator of hazardous waste. If you think your business is, contact your EPA Regional office or state hazardous waste management agency to see what you need to do to comply with the regulations. The EPA Regional contacts and state contacts are listed in this brochure.

## How to Determine Whether Your Business Produces Hazardous Waste

Your business is likely to produce hazardous waste if you:

- Use petroleum products
- Use dyes, paints, printing inks, thinners, solvents, or cleaning fluids
- Use pesticides or other related chemicals
- Use materials that dissolve metals, wood, paper, or clothing (acids and caustics)
- Use flammable materials
- Use materials that burn or itch upon contact with skin
- Use materials that bubble or fume upon contact with water
- Receive delivery of products accompanied by a shipping paper or label indicating that the product is hazardous.

Such businesses might include those that:

- repair and maintain motor vehicles
- do electroplating and other metal manufacturing and fabrication
- operate printing and reproduction equipment
- do drycleaning and laundering

- do photographic processing and printing
- operate laboratories
- do building, road, and other construction
- provide home or industrial pest control
- manufacture or process chemicals
- manufacture or formulate pesticides

- manufacture textiles (including fabric dyeing and finishing)
- make or refinish furniture
- manufacture or process cosmetics
- chemically treat lawns, yards, or gardens
- do wood preserving
- manufacture paper and paper products.

## A New Test for Toxicity

One property that determines whether a waste is hazardous is its toxicity. Toxic waste is harmful or fatal when it is swallowed or when it comes into contact with the skin. When toxic waste is disposed of on land, contaminated liquid might drain (leach) from the waste and pollute ground water.

Since 1980, toxicity has been determined using the "Extraction Procedure (EP) leach test," which tests whether a waste is likely to leach certain metals or pesticides into ground water. The EP test, however, only applied to a handful of toxic constituents. Other toxic constituents were not detected by the EP test.

In March of 1990, EPA issued a new "Toxicity Characteristic" rule which changes the test for toxicity. The new test is called the Toxicity Characteristic Leaching Procedure (TCLP). The TCLP is used to test for 25 organic chemicals (see list below) in addition to the metals and pesticides that had been tested for in the EP leach test. Small businesses are required to comply with the Toxicity Characteristic rule beginning March 29, 1991.

The changes in the regulation mean that many wastes that previously were not covered will now be subject to federal hazardous waste regulations. Contact your EPA Regional office to find out if these changes will affect you. Information in the industry-specific inserts included in this brochure can also help you determine how the new requirements apply to waste that your business might generate. Generally, if you use a product that contains one of these chemicals, your waste might well be hazardous.

## The Following Constituents Are Now Regulated under the TC Rule:

### Old EP Constituents

Arsenic  
Barium  
Cadmium  
Chromium  
Lead  
Mercury  
Selenium  
Silver  
Endrin  
Lindane  
Methoxychlor  
Toxaphene  
2,4-Dichlorophenoxy-  
cetic acid  
2,4-Dinitrotoluene  
2,4,5-Trichlorophenoxy-  
propionic acid

### New Organic Constituents

Benzene  
Carbon Tetrachloride  
Chlordane  
Chlorobenzene  
Chloroform  
m-Cresol  
o-Cresol  
p-Cresol  
Cresol  
1,4-Dichlorobenzene  
1,2-Dichloroethane  
1,1-Dichloroethylene  
2,4-Dinitrotoluene  
Heptachlor (and its  
hydroxide)  
Hexachloro-1,3-butadi-  
ene  
Hexachlorobenzene  
Hexachloroethane  
Methyl ethyl ketone  
Nitrobenzene  
Pentachlorophenol  
Pyridine  
Tetrachloroethylene  
Trichloroethylene  
2,4,5-Trichlorophenol  
2,4,6-Trichlorophenol  
Vinyl chloride

## If You're Not Sure, There's Help

If you are uncertain whether your business produces hazardous waste, contact EPA's RCRA/Superfund Hotline at (800) 424-9346, your EPA Regional office, or your state hazardous waste management agency. EPA Regional offices and state hazardous waste management agencies are listed below. These contacts can provide a list of all wastes identified by EPA as hazardous. They can also tell you about testing laboratories that can help you determine if your wastes are hazardous, even if they are not included on EPA's list.

## How Much Waste Must a Business Produce To Be Regulated under Federal Hazardous Waste Requirements?

EPA considers you a small quantity generator if your business produces more than 220 and less than 2,200 pounds (more than 100 and less than 1,000 kilograms) of hazardous waste in a calendar month. Small quantity generators are subject to the hazardous waste requirements described in this brochure. You should be aware that **your state may have additional or more restrictive requirements.** The state requirements that apply to you depend on where your plant or facility is located; this may be different from your corporate mailing address.

If you produce 1,000 kilograms or more of hazardous waste in any calendar month, or more than one kilogram of certain acutely hazardous wastes, you are subject to the more extensive regulations for large quantity generators. (Acutely hazardous waste is waste that is fatal to humans in low doses. See 40 CFR 261.11(a).)

If you never produce more than 100 kilograms (approximately one-half of a 55-gallon drum), and no more than one kilogram of acutely hazardous waste in a calendar month, then you are exempt from most of the federal hazardous waste requirements. However, you must determine whether your waste is hazardous and ensure that hazardous waste is delivered to a facility permitted, licensed, or authorized by EPA or the state to accept hazardous waste. It is important to be aware that some states do not recognize exemptions for this category of

hazardous waste generators. Check with your state hazardous waste agency to determine your obligations under state law.

## If Your Business Produces Hazardous Waste and Is Regulated Under the Federal Hazardous Waste Requirements, You Must:

- Obtain an EPA identification number for each site at which hazardous waste is generated. To obtain an EPA identification number, contact the EPA Regional office or your state hazardous waste management agency and ask for Form 8700-12.
- Properly handle your waste on your premises, following federal and state requirements. If you store, treat, or dispose of your hazardous waste on site, you might need a permit. Contact the RCRA/Superfund Hotline or your EPA Regional office for permit information.

### OR

Periodically ship your waste off your premises for treatment or disposal, following federal and state requirements.

## Storing Hazardous Waste at Your Facility

- You may store hazardous waste on site without a permit for up to 180 days (or 270 days if the waste is to be shipped more than 200 miles) as long as you never accumulate more than 6,000 kilograms (13,200 pounds) of hazardous waste on site.
- You must obtain a permit to store waste on site for longer than 180 days (270 days if the waste is to be shipped more than 200 miles). If you have questions, contact your EPA Regional office or your state agency.
- You may accumulate as much as 55 gallons of hazardous waste in a "satellite accumulation area"—an area at or near the point of generation. Once you accumulate more than 55 gallons in the satellite accumulation area, you must move the waste to your hazardous waste storage area within three days and follow the hazardous waste storage requirements described above.

## May Waste Be Managed at Your Facility Rather Than Being Shipped Away for Disposal?

Yes, you may manage your hazardous waste at your own plant, but **ONLY** if you are permitted, licensed, or authorized by EPA or the state to do so. The permit ensures that your facility meets the standards established by RCRA for proper waste management. Certain kinds of recycling and wastewater treatment can be conducted on site without a permit. Contact your Regional EPA office or state agency for information about whether you need a permit and how to obtain it.

## How to Ship Hazardous Waste Off Your Premises

Under federal law, you must:

- Use only authorized hazardous waste transporters with EPA identification numbers to transport hazardous waste.
- Send hazardous waste only to facilities permitted, licensed, or authorized by EPA or the state to accept hazardous waste.
- Use the Hazardous Waste Manifest. A generator of hazardous waste is legally responsible for the waste at all times. Therefore, you must make sure that your transporter complies with all applicable federal and state regulations governing hazardous waste transport. It is also your responsibility to ensure that the facility to which the hazardous waste is sent is permitted and meets RCRA requirements for treatment, storage, and disposal of hazardous waste.

Under RCRA, shipments of some hazardous wastes are exempted from most requirements if they are being sent to a recycling or reclamation establishment. For small businesses, these wastes include dead automobile batteries and used oil. You must make sure that the facility that takes these wastes is recycling them.

Your state hazardous waste management agency can help you locate authorized hazardous waste facilities and transporters. You can also contact the National Solid Waste Management Association (202-659-4613), Government Refuse Collection and Disposal Association (301-585-2898) or your own trade association.

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## EPA Regional Contacts

### EPA Region 1

*Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont*  
Frank Ciavattieri, Chief  
ME/VT Waste Management Branch  
HPL-CAN2  
JFK Federal Building  
Boston, MA 02203  
617-573-5770

Gerald M. Levy, Chief  
Waste Management Branch (HRW-CAN3)  
JFK Federal Building  
Boston, MA 02203  
617-573-5720

### EPA Region 2

*New Jersey, New York, Puerto Rico, Virgin Islands*  
Stanley Siegel, Chief  
Hazardous Waste Programs Branch  
Room 2343  
26 Federal Plaza  
New York, NY 10278  
212-264-3384

### EPA Region 3

*Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia*  
Robert Allen, Chief  
RCRA Programs Branch (3HW30)  
841 Chestnut Street  
Philadelphia, PA 19107  
215-597-0980

### EPA Region 4

*Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee*  
James H. Scarbrough, Chief  
RCRA and Federal Facilities Branch  
345 Courtland Street, N.E.  
Atlanta, GA 30365  
404-347-3016

### EPA Region 5

*Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin*  
Judith A. Kertcher, Chief  
RCRA Program  
Management Branch  
230 S. Dearborn Street  
Chicago, IL 60604  
312-353-8510

Karl Bremer, Chief  
RCRA Permitting Branch  
230 S. Dearborn Street  
Chicago, IL 60604  
312-353-0398

### EPA Region 6

*Arkansas, Louisiana, New Mexico, Oklahoma, Texas*  
Guanita Reiter, Chief  
RCRA Programs Branch (6H-H)  
First Interstate Bank Tower  
1445 Ross Avenue  
Dallas, TX 75270  
214-655-6655

Bill Honker, Chief  
RCRA Permits Branch (6H-P)  
First Interstate Bank Tower  
1445 Ross Avenue  
Dallas, TX 75270  
214-655-6770

### EPA Region 7

*Iowa, Kansas, Missouri, Nebraska*  
Mike Sanderson, Chief  
RCRA Branch  
726 Minnesota Avenue  
Kansas City, KS 66101  
913-551-7050

### EPA Region 8

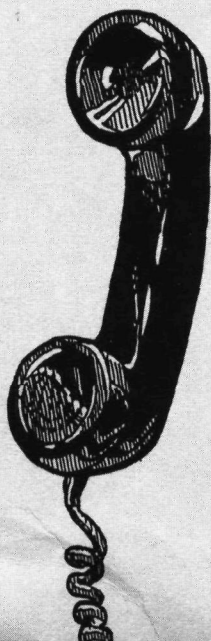
*Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming*  
Terry Anderson, Chief  
Implementation Branch  
Denver Place (8HWM-RI)  
999 18th Street, Suite 500  
Denver, CO 80202-2405  
303-293-1662

### EPA Region 9

*Arizona, California, Hawaii, Nevada, Guam, Marianas*  
Eve Levin  
State Programs Branch  
1235 Mission Street  
San Francisco, CA 94103  
415-744-1468

### EPA Region 10

*Alaska, Idaho, Oregon, Washington*  
Michael Gearheard, Chief  
Waste Management Branch (HW-112)  
1200 Sixth Avenue  
Seattle, WA 98101  
206-442-2782



## The RCRA/Superfund Hotline

Further information and publications on federal hazardous waste laws can be obtained by calling EPA's toll-free RCRA/Superfund Hotline: 800-424-9346 outside of Washington, D.C.; 202-382-3000 in Washington, D.C. For the hearing impaired, the number is TDD 800-553-7672 or 202-475-9652.

## Small Business Ombudsman Hotline

For more information specific to small businesses, call 800-368-5888, or 202-557-1938 in Washington, D.C.

Ask the RCRA/Superfund Hotline how you can access the  
**POLLUTION PREVENTION INFORMATION CLEARINGHOUSE (PPIC)**  
and the  
**ELECTRONIC INFORMATION EXCHANGE SYSTEM (EIES).**

# STATE AND TERRITORIAL HAZARDOUS WASTE MANAGEMENT AGENCIES

## Alabama

Land Division  
Alabama Department of  
Environmental Management  
1751 Federal Drive  
Montgomery, AL 36130  
205-271-7730

## Alaska

Alaska Department of  
Environmental Conservation  
Division of Environmental Quality  
P.O. Box #0  
Juneau, AK 99801  
907-465-2666

## American Samoa

Environmental Quality Commission  
Government of American Samoa  
Pago Pago, American Samoa 96799  
Overseas Operator: 663-2304

## Arizona

Office of Waste and  
Water Quality Management  
Arizona Department of  
Environmental Quality  
2005 N. Central Avenue, Room 304  
Phoenix, AZ 85004  
602-257-2211

## Arkansas

Hazardous Waste Division  
Arkansas Department of Pollution  
Control and Ecology  
P.O. Box 9583  
Little Rock, AR 72219  
501-562-7444 x 504

## California

Toxic Substances Control Division  
Department of Health Services  
P.O. Box 942732  
400 P Street  
Sacramento, CA 95814  
916-324-1826

## Colorado

Waste Management Division  
Colorado Department of Health  
4210 E. 11th Avenue  
Denver, CO 80220  
303-331-4830

## Commonwealth of Northern Mariana Islands

Division of Environmental Quality  
Department of Public Health and  
Environmental Services  
Commonwealth of the  
Northern Mariana Islands  
Office of the Governor  
Saipan, Mariana Islands 96950  
Overseas Operator: 6984  
Cable Address: Gov. NMI Saipan

## Connecticut

Hazardous Material Management Unit  
Department of Environmental Protection  
State Office Building  
165 Capitol Avenue  
Hartford, CT 06106  
203-566-4924

## Delaware

Hazardous Waste Management Section  
Division of Air and Waste Management  
Department of Natural Resources and  
Environmental Control  
P.O. Box 1401  
89 Kings Highway  
Dover, DE 19903  
302-736-3672

## District of Columbia

Pesticides and Hazardous  
Materials Division  
Department of Consumer and  
Regulatory Affairs  
5010 Overlook Avenue, S.W.  
Room 114  
Washington, DC 20032  
202-783-3194

## Florida

Division of Waste Management (UST)  
Department of Environmental  
Regulations  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32301  
904-488-0190

## Georgia

Land Protection Branch  
Industrial and Hazardous Waste  
Management Program  
Floyd Towers East/Room 1154  
205 Butler Street, S.E.  
Atlanta, GA 30334  
404-656-2833

## Guam

Hazardous Waste Management Program  
Guam Environmental Protection Agency  
P.O. Box 2999  
Agana, Guam 96910  
Overseas Operator: 671-646-8863

## Hawaii

Department of Health  
Hazardous Waste Program  
P.O. Box 3378  
Honolulu, HI 96801  
808-543-8226

## Idaho

Hazardous Materials Bureau  
Department of Health and Welfare  
Idaho State House  
450 W. State Street  
Boise, ID 83720  
208-334-5879

## Illinois

Division of Land Pollution Control  
Illinois Environmental Protection Agency  
2200 Churchill Road  
Springfield, IL 62706  
217-782-6760

## Indiana

Indiana Department of  
Environmental Management  
105 S. Meridian Street  
P.O. Box 6015  
Indianapolis, IN 46225  
317-232-3210

## Iowa

Air Quality and Solid Waste Protection  
Department of Water, Air, and  
Waste Management  
900 East Grand Ave.  
Henry A. Wallace Building  
Des Moines, IA 50319-0034

## Kansas

Bureau of Waste Management  
Department of Health and Environment  
Forbes Field, Building 321  
Topeka, KS 66620  
913-862-9360 x 290

## Kentucky

Division of Waste Management  
Department of Environmental  
Protection  
Cabinet for Natural Resources and  
Environmental Protection  
Fort Boone Plaza, Building #2  
18 Riley Road  
Frankfort, KY 40601  
564-6716 x 214

## Louisiana

Hazardous Waste Division  
Office of Solid and Hazardous Waste  
Louisiana Department of  
Environmental Quality  
P.O. Box 44307  
625 N. 4th Street  
Baton Rouge, LA 70804  
504-342-9079

## Maine

Bureau of Oil and Hazardous  
Materials Control  
Department of Environmental Protection  
State House Station #17  
Augusta, ME 04333  
207-289-2651

## Maryland

Hazardous and Solid  
Waste Management Administration  
Maryland Department of the  
Environment  
201 W. Preston Street, Room 212  
Baltimore, MD 21201  
301-225-5647

## Massachusetts

Division of Solid and Hazardous Waste  
Massachusetts Department of  
Environmental Protection  
One Winter Street, 5th Floor  
Boston, MA 02108  
617-292-5589

## Michigan

Waste Management Division  
Environmental Protection Bureau  
Department of Natural Resources  
Box 30038  
Lansing, MI 48909  
517-373-2730

## Minnesota

Solid and Hazardous Waste Division  
Minnesota Pollution Control Agency  
520 Lafayette Road, North  
St. Paul, MN 55155  
612-296-7282

## Mississippi

Division of Solid and Hazardous  
Waste Management  
Bureau of Pollution Control  
Department of Natural Resources  
P.O. Box 10385  
Jackson, MS 39209  
601-961-5062

## Missouri

Waste Management Program  
Department of Natural Resources  
Jefferson Building  
205 Jefferson St. (13/14 Floor)  
P.O. Box 176  
Jefferson City, MO 65102  
314-751-2176

## Montana

Solid and Hazardous Waste Bureau  
Department of Health and  
Environmental Sciences  
Cogswell Building, Room B-201  
Helena, MT 59620  
406-444-2821

## Nebraska

Hazardous Waste Management Section  
Department of Environmental Control  
State House Station  
P.O. Box 94877  
Lincoln, NE 68509  
402-471-2186

## Nevada

Waste Management Program  
Division of Environmental Protection  
Department of Conservation and  
Natural Resources  
Capitol Complex  
201 South Fall Street  
Carson City, NV 89710  
702-687-4670

## New Hampshire

Division of Public Health Services  
Office of Waste Management  
Department of Health and Welfare  
Health and Welfare Building  
6 Hazen Drive  
Concord, NH 03301  
603-271-4662

## New Jersey

Division of Waste Management  
Department of Environmental  
Protection  
401 East State St. (CN 028)  
Trenton, NJ 08625  
609-292-1250

## New Mexico

Hazardous Waste Section  
Groundwater and  
Hazardous Waste Bureau  
New Mexico Health and Environment  
Department  
P.O. Box 968  
Santa Fe, NM 87504-0968  
505-827-2924

## New York

Division of Solid and Hazardous Waste  
Department of Environmental  
Conservation  
50 Wolfe Road, Room 209  
Albany, NY 12233  
518-457-6603

## North Carolina

Solid and Hazardous  
Waste Management Branch  
Division of Health Services  
Department of Human Resources  
P.O. Box 2091  
Raleigh, NC 27602  
919-733-2178

## North Dakota

Division of Hazardous Waste  
Management  
Department of Health  
1200 Missouri Avenue, Room 302  
Box 5520  
Bismarck, ND 58502-5520  
701-224-2366

## Ohio

Division of Solid and Hazardous  
Waste Management  
Ohio Environmental Protection Agency  
1800 Watermark Drive  
P.O. Box 1049  
Columbus, OH 43266-0149  
614-466-7220

## Oklahoma

Waste Management Service  
Oklahoma State Department of Health  
P.O. Box 53551  
1000 Northeast 10th Street  
Oklahoma City, OK 73152  
405-271-5338

## Oregon

Hazardous and Solid Waste Division  
Department of Environmental Quality  
811 Southwest 6th Avenue  
Portland, OR 97204  
503-229-5356

## Pennsylvania

Bureau of Waste Management  
Pennsylvania Department of  
Environmental Resources  
P.O. Box 2063  
Fulton Building  
Harrisburg, PA 17120  
717-787-9870

## Puerto Rico

Environmental Quality Board  
Santurce, PR 00910-1488  
809-725-0439

## Rhode Island

Solid Waste Management Program  
Department of Environmental  
Management  
204 Cannon Building  
75 Davis Street  
Providence, RI 02908  
401-277-2797

## South Carolina

Bureau of Solid and  
Hazardous Waste Management  
Department of Health and  
Environmental Control  
2600 Bull Street  
Columbia, SC 29201  
803-758-5681

## South Dakota

Office of Air Quality and Solid Waste  
Department of Water and Natural  
Resources  
523 E. Capitol  
Foss Building, Room 416  
Pierre, SD 57501  
605-773-3153

## Tennessee

Division of Solid Waste Management  
Tennessee Department of Public Health  
701 Broadway  
Customs House, 4th Floor  
Nashville, TN 37219-5403  
615-741-3424

## Texas

Hazardous and Solid Waste Division  
Texas Water Commission  
P.O. Box 13087, Capitol Station  
Austin, TX 78711-3087  
512-463-7760

## Utah

Bureau of Solid and  
Hazardous Waste Management  
Department of Health  
P.O. Box 16700  
288 North 1460 West Street  
Salt Lake City, UT 84116-0700  
801-533-4145

## Vermont

Waste Management Division  
Agency of Environmental Conservation  
103 South Maine Street  
Waterbury, VT 05676  
802-244-8702

## Virgin Islands

Department of Conservation  
and Cultural Affairs  
P.O. Box 4399, Charlotte  
St. Thomas, VI 00801  
809-774-6420

## Virginia

Division of Technical Services  
Virginia Department of Waste  
Management  
Monroe Building, 11th Floor  
101 North 14th Street  
Richmond, VA 23219  
804-225-2667

## Washington

Solid and Hazardous  
Waste Management Division  
Department of Ecology  
Mail Stop PV-11  
Olympia, WA 98504  
206-459-6316

## West Virginia

Waste Management Division  
Department of West Virginia Natural  
Resources  
1260 Greenbrier Street  
Charleston, WV 25311  
304-348-5935

## Wisconsin

Bureau of Solid Waste Management  
Department of Natural Resources  
P.O. Box 7921  
Madison, WI 53707  
608-266-1327

## Wyoming

Solid Waste Management Program  
State of Wyoming  
Department of Environmental Quality  
122 West 25th Street  
Herschler Building  
Cheyenne, WY 82002  
307-777-7752

## How to Prepare Waste for Shipment

- **Package and label** your drums and containers as required by the U.S. Department of Transportation (DOT). Your state may have additional requirements for preparing hazardous waste for shipment. If you need assistance with these requirements, contact DOT (202-366-5580) or your state transportation agency.
- **Fill out a Uniform Hazardous Waste Manifest** to accompany each shipment.
- Your transporter can help you prepare the shipment. You still are responsible for the waste, however, and you must sign the Manifest.

## What Is a Manifest?

The Uniform Hazardous Waste Manifest is a special form—EPA Form 8700-22—that must accompany shipments of hazardous waste. A copy of the Manifest and instructions for completing it are included in this brochure.

Federal law requires that any firm that produces more than 100 kilograms (220 pounds or approximately one-half of a 55-gallon drum) of hazardous waste (or one kilogram of acutely toxic waste) in a calendar month use a fully completed Manifest when shipping its hazardous waste off-site. Some states print their own version of the Manifest, using the state name and logo. Contact your state hazardous waste agency to find out if your state does; if so, you must use the state form. If you are sending hazardous waste out of state, you must use the Manifest of the state to which you are sending the waste. (If that state does not have its own Manifest form, use the Manifest form of the state in which you generated the waste.)

The Manifest must accompany the waste wherever it travels. Each individual handler of the waste must sign the Manifest and keep one copy. When the waste reaches its destination, the owner of that facility returns a copy of the Manifest to you to confirm that the waste arrived. If the waste does not arrive as scheduled, you should try to find out what happened. If you are unable to deter-

mine what went wrong, notify EPA or your state agency so that they can investigate and take appropriate action. You must keep copies of the Manifest for three years after shipment. Remember, it is your waste and you remain responsible for it.

## How to Obtain Additional Copies of the Manifest

Contact your Regional EPA office or state agency for additional copies of the Manifest. Ask for EPA Form 8700-22. If your state (and, if you are shipping out of state, the receiving state) does not have its own version of the Manifest, you may purchase copies of the EPA Manifest from some commercial printers, or obtain copies from some hazardous waste treatment, storage, or disposal facilities.

## Filling Out the Manifest

Instructions for completing the Manifest are provided on the back of the sample Manifest included with this brochure. New industry-specific inserts, also included in this brochure, contain information that can help you complete the Manifest for some of the wastes you produce. Your EPA Regional office, state agency, or the RCRA/Superfund Hotline can also provide assistance.

## Waste Minimization: It's Good Business

Waste minimization means reducing the amount of waste your company generates. EPA strongly encourages the minimization of all wastes that pose risks to human health and the environment. Under RCRA, small quantity hazardous waste generators must certify that they have made a good faith effort to reduce the volume of hazardous waste they generate.

Many states have waste minimization programs that can help you identify cost-effective approaches to reducing the volume and toxicity of wastes. The EPA publication, *Waste Minimization: Environmental Quality with Economic Benefits* (EPA/530-SW-87-026) can also help you develop a waste minimization plan. The following is one industry-specific example of successful waste minimization practices.

# Cleaner Drycleaning

Drycleaners can minimize hazardous waste produced by their operations through simple process changes, maintenance procedures, and efficient operating practices. The environmental "culprit" in the drycleaning process is solvent waste. Solvent wastes are used solvents that cannot be extracted from filters, and solvent residues that remain in the system after recovery and treatment. Even though recovery/recycling processes are built into the drycleaning process, solvent loss is possible due to leaks, spills, and poor management practices. Eliminating these problems can result in less waste and reduced spending for "fresh" solvents.

The benefits of a waste minimization program can be impressive. Below are examples of steps that some drycleaning facilities have taken to reduce wastes.

## Process Changes

One drycleaning operation reduced its solvent wastes to a level well below national industry standards by implementing regular checks for system leaks and installing a system to recover additional solvent. The system involved azeotropic conditioning (a process which maintains a constant composition in the solvent) and a carbon absorption unit. With this new setup, the plant cleans **four times as many clothes per drum of solvent**. This translates into real savings for the facility; waste disposal costs are cut, and less new solvent must be purchased. Increased solvent recovery also means a cleaner environment.

## Regular Maintenance

Leaks from worn equipment can easily go unnoticed unless routinely checked for signs of solvent loss. The following are a few of the areas that should be checked regularly for liquid leakage, and repaired if worn or damaged:

- hose connections, couplings, and valve machines
- filter head gasket and seating
- pumps and storage tanks
- cartridge filters

## Efficient Operating Practices

Improved operating practices can significantly reduce waste and save money. Drycleaners can eliminate unnecessary solvent loss by following simple procedures such as the following:

- Keep containers of solvent closed while not in use.
- Clean lint screens regularly to avoid clogging of the fans and condensers. The operation of the solvent recovery system is impeded if the condensers are caked with lint.
- Size the garment load correctly relative to the size of equipment. Overloading results in incomplete solvent extraction, while underloading increases the amount of solvent loss per garment.
- Consider purchasing newer, more efficient equipment.

Process-specific waste minimization options are continually being developed and tested. Simple, common-sense changes in facility operation can result in both substantial savings for generators and good news for the environment. For more information, contact your state agency or EPA Regional office, or access the Pollution Prevention Information Clearinghouse through the RCRA/Superfund Hotline.

# Vehicle Maintenance

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## Industry Overview

If your business is in the vehicle maintenance category, then the products you use on the vehicles and on your equipment, tools, hands, or floor might contain hazardous materials, and the waste generated by using these products might be hazardous waste. If you generate hazardous waste, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

Your business is classified under *vehicle maintenance* if you repair or maintain:

- Vans
- Trucks
- Vehicle Fleets
- Heavy equipment
- Farm equipment.

Vehicle maintenance operations that might generate hazardous waste include:

- Removing oil or grease
- Removing rust, dirt, or paint
- Repairing or rebuilding
- Refinishing or restoring
- Painting
- Replacing lead-acid batteries.

## Hazardous Wastes from Vehicle Maintenance

Everyday mechanics and body repair personnel use products containing hazardous materials. Products containing materials that are hazardous to human health and the environment include:

**Rust removers** that contain strong acid or alkaline solutions

**Carburetor cleaners** that contain flammable or combustible liquids

**Parts cleaners and degreasers** that contain toxic chemicals

**Paint thinners or reducers** that are ignitable or contain toxic constituents

**Motor oil and other petroleum products** that are ignitable or contain toxic chemicals

**Auto and truck batteries.**

Waste that is generated as a result of using these products might be RCRA-regulated hazardous waste.

Table 1 lists typical processes/operations that use products that might contain hazardous materials and that probably generate hazardous waste. If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. Table 2 lists proper DOT shipping descriptions for a number of wastes that might be generated during vehicle maintenance operations. Table 1 and Table 2 are not comprehensive lists. If you suspect any waste you generate is hazardous, check with your state hazardous waste management agency or Regional EPA office.

There are special provisions in the regulations for spent lead-acid batteries and used oil. You do not have to use a Manifest when you ship used lead batteries that are destined for recycling or used motor oil that is destined for recycling. If, however, you are disposing of used oil yourself or are sending it off-site for disposal, you generally should handle it as hazardous waste because it is likely to be ignitable or toxic. Special requirements apply if you are burning used oil as fuel. Your state might have its own requirements for lead-acid batteries or used oil; check with your state hazardous waste management agency.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.



**Table 1**  
**Typical Vehicle Maintenance Operations:**  
**Materials Used and Hazardous Wastes that Might be Generated**

Process/Operation	Materials Used	Typical Material Ingredient	General Types of Waste Generated
Degreasing	Degreasers (gunk), carburetor cleaners, engine cleaners, solvents, acids/alkalies, cleaning fluids	Petroleum distillates, aromatic hydrocarbons, mineral spirits, benzene, toluene, petroleum naphtha	Acid/alkaline wastes Spent Solvents Ignitable wastes Toxic wastes
Rust Removal	Naval jelly, strong acids, strong alkalies	Phosphoric acid, hydrochloric acid, hydrofluoric acid, sodium hydroxide	Acid/alkaline wastes
Paint Preparation	Paint thinners, enamel reducers, white spirits	Alcohols, petroleum distillates, oxygenated solvents, mineral spirits, ketones	Paint wastes Spent solvents Ignitable wastes Toxic wastes
Painting	Enamels, lacquers, epoxies, alkyds, acrylics, primers, solvents	Acetone, toluene, benzene, petroleum distillates, epoxy ester resins, methylene chloride, xylene, VM&P naphtha, aromatic hydrocarbons, methyl isobutyl, ketones	Paint wastes Spent solvents Ignitable wastes Toxic wastes
Spray Booth, Spray Guns, and Brush Cleaning	Paint thinners, enamel reducers, solvents, white spirits	Ketones, alcohols, toluene, acetone, isopropyl alcohol, petroleum distillates, mineral spirits	Paint wastes Spent solvents Toxic wastes
Paint Removal	Solvents, paint thinners, enamel reducers, white spirits	Acetone, toluene, petroleum distillates, methanol, methylene chloride, isopropyl alcohol, mineral spirits, alcohols, ketones, other oxygenated solvents	Paint wastes Spent solvents Toxic wastes
Tank Cleanout	Solvents or cleaners to wash out tanks, residues	Solvents, petroleum products in tanks	Tank draws containing toxic residues
Installing Lead-Acid Batteries	Used batteries of cars, trucks, boats, motorcycles, and other vehicles	Lead dross	Acid/alkaline wastes Batteries (lead-acid)



# Table 2

## Vehicle Maintenance Waste Descriptions<sup>1</sup>

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>STRONG ACID/ALKALINE WASTES</b>				
Ammonium Hydroxide	Ammonium Hydroxide, NH <sub>4</sub> OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		(containing less than 12% ammonia)	ORM-A	NA2672
Hydrobromic Acid	Hydrobromic Acid, HBr	Waste Hydrobromic Acid (not more than 49% strength)	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, HCl, Muriatic Acid	Waste Hydrochloric Acid	Corrosive Material	NA1789
Hydrofluoric Acid	Hydrofluoric Acid, HF, Fluorohydric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, HNO <sub>3</sub> , Aquafortis	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		(40% or less)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, H <sub>3</sub> PO <sub>4</sub> , Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, KOH, Potassium Hydrate, Caustic Potash, Potassa	Waste Potassium Hydroxide Solution Dry Solid, Flake, Bead, or Granular	Corrosive Material Corrosive Material	UN1814 UN1813
Sodium Hydroxide	Sodium Hydroxide NaOH, Caustic Soda, Soda Lye, Sodium Hydrate	Waste Sodium Hydroxide Solution Dry Solid, Flake, Bead, or Granular	Corrosive Material Corrosive Material	UN1824 UN1823
Sulfuric Acid	Sulfuric Acid, H <sub>2</sub> SO <sub>4</sub> , Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1830
Chromic Acid	Chromic Acid	Waste Chromic Acid Solution	Corrosive Material	UN1755
<b>SPENT SOLVENTS AND IGNITABLE OR TOXIC WASTES CONTAINING:</b>				
Ethylene Dichloride*	Ethylene Dichloride, 1,2-Dichloroethane	Waste Ethylene Dichloride	Flammable Liquid <sup>2</sup>	UN1184
Benzene*	Benzene	Waste Benzene (benzol)	Flammable Liquid	UN1114
Toluene	Toluene	Waste Toluene (toluol)	Flammable Liquid	UN1294
Ethyl Benzene	Ethyl Benzene	Waste Ethyl Benzene	Flammable Liquid	UN1175
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Cresols*	o-Cresol, m-Cresol, p-Cresol, (m,p)-Cresol, (o,m,p)- Cresol	Waste Cresol	Corrosive Material	UN2076
Trichloroethylene*	TCE, Gemalgene, Lanadin, Lethurin, Nialk, Perm-a-Chlor	Waste Trichloroethylene	ORM-A	UN1710
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, MEK, Methyl Acetone, Meetco, Butanone, Ethyl Methyl Ketone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane Tetraform, Carbona Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Hexachloroethane*	Hexachloroethane	Waste Hexachloroethane	ORM-A	NA9037
White Spirits, Varsol	White Spirits, Mineral Spirits, Naphtha	Waste Naphtha	Flammable Liquid	UN2553
1,1,1-Trichloroethane	Aerotherne TT, Chlorten, Chloroethane, Methyl Chloroform, Alpha T, Chlorotene	Waste 1,1,1-Trichloroethane	ORM-A	UN2831
Petroleum Distillates	Petroleum Distillates	Waste Petroleum Distillate	Flammable Liquid Combustible Liquid <sup>3</sup>	UN1268 UN1268

**Table 2** (continued)  
**Vehicle Maintenance Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>PAINT WASTES WITH HEAVY METALS</b>				
Heavy Metal paints or paint sludges with: Lead* Nickel* Chromium*	Heavy Metal Paints	Hazardous Waste, Liquid or Solid, NOS <sup>4</sup>	ORM-E	NA9189
<b>OTHER WASTES</b>				
Lead-Acid Batteries	Lead-Acid Batteries	Lead Dross (containing 3% or more free acid)	ORM-C	NA1794
Used Oil	Various petroleum products	Waste Petroleum Oil, NOS Waste Petroleum Oil, NOS	Combustible Liquid Flammable Liquid	NA1270 NA1270
Ignitable Wastes, NOS <sup>4</sup>	Ignitable wastes	Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS Waste Flammable Solid, NOS	Flammable Liquid Combustible Liquid Flammable Solid	UN1993 NA1993 UN1325
Hazardous Waste, NOS		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP leachate containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not necessarily correspond to RCRA hazardous waste categories.

2 A flammable liquid has a flash point below 100°F.

3 A combustible liquid has a flash point between 100°F and 200°F.

4 NOS - Not otherwise specified.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Drycleaning and Laundry Plants

## Industry Overview

While not all dry cleaning and laundry facilities produce hazardous waste, those facilities using hazardous solvents might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

The establishments covered under *drycleaning and laundry plants* include:

- Retail drycleaning stores
- Industrial and linen supply plants with drycleaning operations
- Leather and fur cleaning plants
- Self-service laundromats with drycleaning equipment
- Other establishments with drycleaning operations.

## Hazardous Wastes from Drycleaning and Laundry Plants

Potential hazardous wastes generated by drycleaning and laundry plants are primarily solvents. These solvents include:

**Perchloroethylene**, otherwise known as perc, PCE, or tetrachloroethylene

**Valclene**, also known as fluorocarbon 113 or trichlorotrifluoroethane

**Petroleum solvents**, such as Stoddard, quick-dry, low-odor, and other solvents.

Perchloroethylene plants potentially produce three types of hazardous wastes:

**Still residues from solvent distillation** (the entire weight)

**Spent filter cartridges** (total weight of the cartridge and remaining solvent after draining)

**Cooked powder residue** (the total weight of drained powder residues from diatomaceous or other powder filter systems after heating to remove excess solvent).

Valclene plants potentially produce two types of hazardous wastes:

**Still residues from solvent distillation** (the entire weight)

**Spent filter cartridges** (total weight of the cartridge and remaining solvent after draining).

Petroleum solvent plants potentially produce only one type of hazardous waste:

**Still residues from solvent distillation** (the entire weight).

To determine whether your plant qualifies as a regulated generator and to complete the Uniform Hazardous Waste Manifest, you

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must determine the weight of the hazardous waste your plant generates. Table 1 lists common types and average quantities of hazardous waste produced per 1,000 pounds of clothes cleaned.

If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. DOT description information is provided in Table 2 to aid in preparing the Manifest. Table 1 and Table 2 are not comprehensive lists. If you suspect you generate other hazardous wastes, contact your state hazardous waste agency or Regional EPA office for more information.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Quantities of Hazardous Waste From Dry Cleaning**  
**(Pounds of waste per 1,000 pounds of clothes cleaned)**

Waste Type	Cleaning Method		
	PERC	Valclene	Petroleum Solvents
Average Quantity of Hazardous Waste (pounds)			
Still Residues	25	10	20
Spent Cartridge Filters			
Standard (carbon core)	20	15	*
Adsorptive (split)	30	20	*
Cooked Powder Residue	40	NA	NA
Drained Filter Muck	NA	NA	*

\* Well-drained filter cartridges or drained filter muck are solids and are not likely to meet the criteria for classification as ignitable solids; therefore, they are usually not hazardous wastes. Be sure, however, that these wastes do not fail the Toxicity Characteristic Leaching Procedure; if they do, they are hazardous wastes.

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**Table 2**  
**Drycleaning and Laundry Plants Waste Descriptions<sup>1</sup>**

<b>Waste Type</b>	<b>Designations/Trade Names</b>	<b>DOT Shipping Name</b>	<b>Hazard Class</b>	<b>UN/NA ID Number</b>
Perc		Waste Perchloroethylene or Waste Tetrachloroethylene	ORM-A	UN1897
Valclene		Hazardous Waste, NOS <sup>2</sup>	ORM-E	UN9189
Petroleum Solvents		Waste Petroleum Distillate	Combustible Liquid <sup>3</sup>	UN1268
		Waste Petroleum Naphtha	Combustible Liquid	UN1255
Hazardous Waste, NOS		Hazardous Waste, Liquid or Solid, NOS	ORM-E	NA9189

1 In certain situations, other DOT descriptions may be applicable to the wastes listed.

2 NOS - not otherwise specified.

3 If the flash point of the solvent or residue as disposed of is less than 100°F, the hazard class is "flammable liquid." Although the flash point of petroleum drycleaning solvents is above 100°F, the presence of contaminants (such as printing inks) could lower the overall flash point to below 100°F.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Furniture/Wood Manufacturing and Refinishing

## Industry Overview

Not all furniture/wood manufacturing and refinishing operations produce hazardous waste. If, however, you use any solvents, flammable or combustible liquids, combustible solids, ignitable paints containing flammable solvents, or other materials containing toxic chemicals, the waste generated from using these materials might be hazardous, and you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

Your business is included in the *furniture/wood manufacturing and refinishing* category if you manufacture, refinish, reupholster, or repair:

- Wooden kitchen cabinets
- Hardwood veneer, softwood veneer, or plywood
- Particleboard
- Wooden household furniture or upholstered furniture
- Wooden office furniture, lockers, office and store fixtures.

## Hazardous Wastes from Furniture/Wood Manufacturing and Refinishing

The furniture/wood manufacturing and refinishing industry uses many solvents. Spent solvents and solvent still bottoms are usually hazardous wastes. In addition to solvent wastes, your facility might generate ignitable wastes or toxic wastes. Many wastes generated from the use of paints, wood treatments, stains, varnishes, polishes, and adhesives might be ignitable or might fail the Toxicity Characteristic Leaching Procedure (TCLP) test. Sawmills and planing mills can generate wastewaters that fail the TCLP test.

Table 1 lists general processes/operations that use hazardous materials and that can result in the generation of hazardous waste. If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship the hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. Table 2 lists proper DOT shipping descriptions for a number of wastes that might be generated during furniture and wood manufacturing and refinishing. Table 1 and Table 2 are not comprehensive lists. If you generate a waste that is not in these tables, consult your EPA Regional office or state hazardous waste management agency to determine if your waste is hazardous and to obtain the proper DOT information.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can

help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Furniture Manufacturing and Refinishing Operations:**  
**Materials Used and Hazardous Wastes that Might be**  
**Generated**

Process/ Operation	Materials Used	Typical Material Ingredient	General Types of Waste Generated
Wood Cleaning and Wax Removal	Petroleum distillates, white spirits	Petroleum distillates, mineral spirits	Ignitable wastes Toxic wastes Solvent wastes
Refinishing/ Stripping	Paint removers, varnish removers, enamel removers, shellac removers, paint solvents, turpentine	Acetone, toluene, petroleum distillates, methanol, methylene chloride, alcohols, ketones, oxygenated solvents	Ignitable wastes Toxic wastes Paint wastes Solvent wastes
Staining	Stains	Mineral spirits, alcohol, pigments	Ignitable wastes Toxic wastes Solvent wastes
Painting	Enamels, lacquers, epoxies, alkyds, acrylics	Toluene, pigments, titanium dioxide, epoxy-ester resins, aromatic hydrocar- bons, glycol ether, halogenated hydro- carbons, vinyl- acetate acrylic	Ignitable wastes Toxic wastes Paint wastes Solvent wastes
Finishing	Varnish, shellac, polyurethane, lacquers, wood treatments, polish	Denatured alcohols, resins, shellac, petroleum distillates, toluene diisocyanate	Ignitable wastes Toxic wastes Spent solvents Solvent still bottoms
Brush Cleaning and Spray Gun Cleaning	Paint thinners, enamel reducers, varnish removers, shellac removers, white spirits	Acetone, toluene, petroleum distillates, methanol, methylene chloride, isopropanol, mineral spirits, alcohols	Ignitable wastes Toxic wastes Spent solvents Solvent still bottoms

## Table 2

### Furniture/Wood Manufacturing and Refinishing Waste Descriptions<sup>1</sup>

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>SPENT SOLVENTS AND STILL BOTTOMS AND IGNITABLE OR TOXIC WASTES CONTAINING:</b>				
Ethylene Dichloride*	Ethylene Dichloride, 1,2-Dichloroethane	Waste Ethylene Dichloride	Flammable Liquid <sup>2</sup>	UN1184
Benzene*	Benzene	Waste Benzene (benzol)	Flammable Liquid	UN1114
Toluene	Toluene	Waste Toluene (toluol)	Flammable Liquid	UN1294
Ethyl Benzene	Ethyl Benzene	Waste Ethyl Benzene	Flammable Liquid	UN1175
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, MEK, Methyl Acetone, Meetco, Butanone, Ethyl Methyl Ketone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane, Tetraform, Carbona Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Hexachloroethane*	Hexachloroethane	Waste Hexachloroethane	ORM-A	NA9037
Cresols*	o-Cresol, m-Cresol, p-Cresol, (m,p)-Cresol, (o,m,p-Cresol)	Waste Cresol	Corrosive Material	UN2076
Pentachlorophenol*	Pentachlorophenol	Waste Pentachlorophenol, Liquid or Solid	ORM-E	NA2020
Acetone	Acetone	Waste Acetone	Flammable Liquid	UN1090
White Spirits, Varsol	White Spirits, Mineral Spirits, Naphtha	Waste Naphtha	Flammable Liquid	UN2553
Kerosene	Kerosene, Fuel Oil #1	Waste Kerosene	Combustible Liquid <sup>3</sup>	UN1223
Methylene Chloride	Dichloromethane, Methane Dichloride, Methylene Bichloride, NCI-C50102, Solaesthin, Aerothene, Narkotil, Solmethine	Waste Dichloromethane or Methylene Chloride	ORM-A	UN1593
Toluene	Toluene, Methacide, Methylbenzene, Methylbenzol, Phenylmethane, Toluol, Antisal 1A	Waste Toluene (Toluol)	Flammable Liquid	UN1294
Benzene*	Benzene, Benzol	Waste Benzene (Benzol)	Flammable Liquid	UN1114
Ethanol	Ethanol, Ethyl Alcohol	Waste Ethyl Alcohol	Flammable Liquid	UN1770
Phenol*	Phenol	Waste Phenol	Poison B	UN1671
<b>PAINT WASTES WITH HEAVY METALS</b>				
Heavy Metal paints with: Lead* Nickel* Chromium*		Hazardous Waste, Liquid or Solid, NOS <sup>4</sup>	ORM-E	NA9189
<b>OTHER WASTES</b>				
Ignitable Wastes, NOS	Ignitable Wastes NOS, Solvents	Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS Waste Flammable Solid, NOS Waste Petroleum Distillates	Flammable Liquid Combustible Liquid Flammable Solid Flammable Liquid	UN1993 NA1993 UN1325 UN1268
Hazardous Wastes, NOS		Hazardous Waste, Liquid or Solid, NOS	ORM-E	NA9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 A flammable liquid has a flash point below 100°F.

3 A combustible liquid has a flash point between 100°F and 200°F.

4 NOS - Not otherwise specified.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**



# Equipment Repair

## Industry Overview

Not all equipment repair operations produce hazardous waste. If, however, you use any solvents, petroleum products, paints, special parts cleaners and fluids, or lacquers, the waste generated from using these materials might be hazardous. If you generate hazardous waste, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

Your business is included in the *equipment repair* category if you operate a:

- Radio and/or television repair shop
- Refrigeration and air conditioning service or repair shop
- Miscellaneous equipment shop (e.g., electrical household appliances or industrial equipment)

or if you repair equipment used for:

- Pipelines (except natural gas)
- Communications
- Power generation transmission
- Automatic merchandising machines
- Amusement parks.

## Hazardous Wastes from Equipment Repair

Everyday mechanics and repair personnel use products containing hazardous materials. Products that contain materials that are hazardous to human health and the environment include:

**Rust removers** that contain strong acid or alkaline solutions

**Degreasers** that contain ignitable liquids and toxic chemicals

**Paint thinners or reducers** that are ignitable and/or contain toxic chemicals

**Paints and coatings** with heavy metals or toxic constituents.

Table 1 lists typical operations/processes that use products that might contain hazardous materials and that probably generate haz-

ardous waste. If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship hazardous waste off your property. The Manifest requires the Department of Transportation (DOT) description for each waste. Table 2 lists the proper DOT shipping descriptions for a number of wastes that might be generated during equipment repair operations. Table 1 and Table 2 are not comprehensive lists. If you suspect that any waste you are generating is hazardous, check with your state hazardous waste management agency or EPA Regional office.

There are special provisions in the regulations for used oil. You do not have to use a Manifest when you ship used motor oil that is destined for recycling. If, however, you are disposing of used oil yourself or are sending it offsite for disposal, you generally should handle it as hazardous waste because it is likely to be ignitable or toxic. There are special requirements that apply if you are burning used oil as fuel. Your state might have its own requirements for used oil; check with your state hazardous waste management agency.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Equipment Repair Operations:**  
**Materials Used and Hazardous Wastes that Might be Generated**

Process/Operation	Materials Used	Typical Material Ingredient	General Types of Waste Generated
Degreasing; Engine, Parts, and Equipment Cleaning	Degreasers (gunk), carburetor cleaners, engine cleaners, solvents, acids/alkalies, cleaning fluids	Petroleum distillates, aromatic hydrocarbons, mineral spirits, benzene, toluene, petroleum naphtha	Acid/alkaline wastes Toxic wastes Ignitable wastes Spent solvents
Rust Removal	Naval jelly, strong acids, strong alkalies	Phosphoric acid, hydrochloric acid, hydrofluoric acid, sodium hydroxide	Acid/alkaline wastes
Paint Preparation	Paint thinners, enamel reducers, white spirits, paint removers	Alcohols, petroleum distillates, oxygenated solvents, mineral spirits, ketones	Ignitable wastes Toxic wastes Paint wastes Spent solvents
Painting	Enamels, lacquers, epoxies, alkyds, acrylics, primers, solvents	Acetone, toluene, petroleum distillates, epoxy ester resins, methylene chloride, xylene, VM&P naphtha, aromatic hydrocarbons, methyl isobutyl, ketones	Ignitable wastes Toxic wastes Paint wastes Spent solvents
Spray Booth, Spray Guns, and Brush Cleaning	Paint thinners, enamel reducers, solvents, white spirits	Ketones, alcohols, toluene, acetone, isopropyl alcohol, petroleum distillates, mineral spirits	Ignitable wastes Toxic wastes Paint wastes
Paint Removal	Solvents, paint thinners, enamel reducers, white spirits	Acetone, toluene, petroleum distillates, methanol, methylene chloride, isopropyl alcohol, mineral spirits, alcohols, ketones, other oxygenated solvents	Paint wastes Spent solvents Toxic wastes

**Table 2**  
**Equipment Repair Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>STRONG ACID/ALKALINE WASTES</b>				
Ammonium Hydroxide	Ammonium Hydroxide, NH <sub>4</sub> OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		(containing less than 12% ammonia)	ORM-A	NA2672
Hydrobromic Acid	Hydrobromic Acid, HBr	Waste Hydrobromic Acid (not more than 49% strength)	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, HCl, Muriatic Acid	Waste Hydrochloric Acid	Corrosive Material	NA1789
Hydrofluoric Acid	Hydrofluoric Acid, HF, Fluorohydric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, HNO <sub>3</sub> , Aquafortis	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		(40% or less)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, H <sub>3</sub> PO <sub>4</sub> , Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, KOH, Potassium Hydrate, Caustic Potash, Potassa	Waste Potassium Hydroxide Solution Dry Solid, Flake, Bead, or Granular	Corrosive Material Corrosive Material	UN1814 UN1813
Sodium Hydroxide	Sodium Hydroxide NaOH, Caustic Soda, Soda Lye, Sodium Hydrate	Waste Sodium Hydroxide Solution Dry Solid, Flake, Bead, or Granular	Corrosive Material Corrosive Material	UN1824 UN1823
Sulfuric Acid	Sulfuric Acid, H <sub>2</sub> SO <sub>4</sub> , Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1832
Chromic Acid	Chromic Acid	Waste Chromic Acid Solution	Corrosive Material	UN1755
<b>SPENT SOLVENTS AND IGNITABLE OR TOXIC WASTES CONTAINING:</b>				
Ethylene Dichloride*	Ethylene Dichloride, 1,2-Dichloroethane	Waste Ethylene Dichloride	Flammable Liquid <sup>2</sup>	UN1184
Benzene*	Benzene	Waste Benzene (benzol)	Flammable Liquid	UN1114

**Table 2** (continued)  
**Equipment Repair Waste Descriptions<sup>1</sup>**

<b>Waste Type</b>	<b>Designations/Trade Names</b>	<b>DOT Shipping Name</b>	<b>Hazard Class</b>	<b>UN/NA ID Number</b>
Toluene	Toluene	Waste Toluene (tuluol)	Flammable Liquid	UN1294
Ethyl Benzene	Ethyl benzene	Waste Ethyl benzene	Flammable Liquid	UN1175
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Cresols*	o-Cresol, m-Cresol, p-Cresol, (m,p)-Cresol, (o,m,p)- Cresol	Waste Cresol	Corrosive Material	UN2076
Trichloroethylene*	TCE, Gemalgene, Lanadin, Lethurin, Nialk, Perm-a-Chlor	Waste Trichloroethylene	ORM-A	UN1710
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, MEK, Methyl Acetone, Meetco, Butanone, Ethyl Methyl Ketone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane Tetraform, Carbona Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Hexachloroethane*	Hexachloroethane	Waste Hexachloroethane	ORM-A	NA9037
White Spirits, Varsol	White Spirits, Mineral Spirits, Naphtha	Waste Naphtha	Flammable Liquid	UN2553
1,1,1-Trichloroethane	Aerothene TT, Chlorten, Chloroethane, Methyl Chloroform, Alpha T, Chlorotene	Waste 1,1,1-Trichloroethane	ORM-A	UN2831
Petroleum Distillates	Petroleum Distillates	Waste Petroleum Distillate	Flammable Liquid Combustible Liquid <sup>3</sup>	UN1268 UN1268
<b>PAINT WASTES WITH HEAVY METALS</b>				
Heavy Metal paints with: Lead* Nickel* Chromium*	Heavy Metal Paints	Hazardous Waste, Liquid or Solid, NOS <sup>4</sup>	ORM-E	NA9189
<b>OTHER WASTES</b>				
Used Oil	Various petroleum products	Waste Petroleum Oil, NOS Waste Petroleum Oil, NOS	Combustible Liquid Flammable Liquid	NA1270 NA1270
Ignitable Wastes, NOS	Ignitable Wastes	Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS Waste Flammable Solid, NOS	Flammable Liquid Combustible Liquid Flammable Solid	UN1993 NA1993 UN1325
Hazardous Waste, NOS		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a leachate containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

<sup>1</sup> These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

<sup>2</sup> A flammable liquid has a flash point below 100°F.

<sup>3</sup> A combustible liquid has a flash point between 100°F and 200°F.

<sup>4</sup> NOS - Not otherwise specified.



**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Textile Manufacturing

## Industry Overview

Not all textile manufacturing industries produce hazardous waste. If, however, you use hazardous solvents and materials containing toxic chemicals, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

The following *textile manufacturing industry* segments are covered by this summary:

- Broad woven fabric mills and wool mills, including dyeing and finishing
- Knitting mills and knit goods finishing
- Other dyeing and finishing textile mills
- Floor covering mills, including dyeing and finishing.

## Hazardous Wastes from Textile Manufacturing

Most of the hazardous waste generated by textile manufacturers results from the use of solvents. Solvents are used in the dry-cleaning of synthetic fiber knit fabrics and woven and wool fabrics; in specialty operations such as tricot and lace splitting or solvent scouring; in dyeing operations; and in some finishing operations for impregnation or coating of textile fibers. In addition, solvents are used to clean machinery such as rollers and spinning machines used in textile manufacturing. Spent solvents are listed hazardous wastes. In addition, tetrachloroethylene, trichloroethylene, benzene, and ethylene dichloride are included in the recently expanded Toxicity Characteristic. Insecticides and disinfectants also sometimes contain Toxicity Characteristic chemicals such as cresols, chloroform, and carbon tetrachloride. Wastewaters or other process wastes containing these chemicals are hazardous if they fail the Toxicity Characteristic Leaching Procedure (TCLP) test.

Table 1 lists general processes/operations that use hazardous materials and that might result in the generation of hazardous waste. If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship the hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. Table 2 lists proper DOT shipping descriptions for a number of wastes that are potentially generated during textile mill operations. Table 1 and Table 2 are not comprehensive lists. If

you suspect that you generate a waste that is not included in this summary, contact your state hazardous waste management agency or EPA Regional office for assistance.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification -
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Textile Manufacturing Operations:**  
**Materials Used and Hazardous Wastes that Might be Generated**

Process/ Operation	Materials Used	General Types of Waste Generated
Wool Scouring	Disinfectants, insecticides, solvents	Spent solvents Toxic wastes
Fabric and Floorcovering Finishing	Dyes, solvents, lacquers, bleaches, finishing agents, adhesives	Spent solvents Toxic wastes Wastewaters and wastewater treatment sludges with toxic constituents
Stock and Yarn Processing, Dyeing, and Finishing	Solvents, dyes	Spent solvents Toxic wastes

**Table 2**  
**Textile Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>WASTE SOLVENTS, SOLVENT STILL BOTTOMS AND OTHER TOXIC WASTES CONTAINING:</b>				
Tetrachloroethylene*		Waste Tetrachloroethylene or Perchloroethylene	ORM-A	UN1897
Trichloroethylene*		Waste Trichloroethylene	ORM-A	UN1710
Methylene Chloride		Waste Dichloromethane or Methylene chloride	ORM-A	UN1593
1,1,1-Trichloroethane		Waste 1,1,1-Trichloroethane	ORM-A	UN2831
Chlorobenzene*		Waste Chlorobenzene	Flammable Liquid <sup>2</sup>	UN1134
Toluene		Waste Toluene or Toluol	Flammable Liquid	UN1294
Benzene*		Waste Benzene or Benzol	Flammable Liquid	UN1115
Xylene		Waste Xylene (xylol)	Flammable Liquid	UN1307
Ethylene Dichloride*		Waste Ethylene Dichloride	Flammable Liquid	UN1184
Varsol		Waste Naphtha	Flammable Liquid <sup>3</sup>	UN1256
White Spirits			Combustible Liquid	UN1256
Mineral Spirits				
<b>OTHER WASTES</b>				
Ignitable Wastes, NOS <sup>4</sup>		Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Combustible Liquid, NOS	Combustible Liquid	NA1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
Hazardous Waste, NOS		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP leachate containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 A flammable liquid has a flash point less than 100°F.

3 A combustible liquid has a flash point between 100°F and 200°F.

4 NOS - not otherwise specified.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Wood Preserving

## Industry Overview

Not all wood preserving operations produce hazardous waste. If, however, you use arsenical compounds, pentachlorophenol, or creosote, you are probably subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

*Wood preservation* involves two general steps: pretreatment (reducing the moisture content of the wood) and preservation (permeating the wood with a preserving agent). A typical wood preserving operation uses any of the following processes: steaming, inorganic salt treatment, boultonizing, or kiln or air drying utilizing one or more of the three principal wood preserving agents:

- Creosote
- Pentachlorophenol (PCP)
- Inorganic arsenical compounds (CCA - Chromated Copper Arsenate or ACA -Ammoniacal Copper Arsenate).

## Hazardous Wastes from Wood Preserving

The wastewater treatment sludge generated from wood preserving processes that use creosote and/or pentachlorophenol is listed by EPA as a hazardous waste. EPA might list additional wood preserving wastes in the future. Waste from using inorganic arsenicals is frequently a hazardous waste if it contains either chromium or arsenic at levels high enough to fail the Toxicity Characteristic Leaching Procedure (TCLP). Other wastes from wood preserving operations might fail the TCLP test if they contain high levels of creosols, phenol, or pentachlorophenol.

Table 1 lists general operations/processes that use hazardous materials and that might generate hazardous waste. If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship the hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. Table 2 lists proper DOT shipping descriptions for a number of wastes that might be generated during wood preserving. Table 1 and Table 2 are not comprehensive lists. If you suspect you generate other hazardous wastes, contact your state hazardous waste management agency or EPA Regional office for assistance.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste

management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Wood Preserving Operations:**  
**Materials Used and Hazardous Wastes that Might be Generated**

Process/ Operation	Materials Used	Typical Material Ingredient	General Types of Waste Generated
Steam Preconditioning	Organic solvents, preservatives	Pentachlorophenol, xylol, stoddard solvent, arsenic, creosote	Wastewater treatment sludges Toxic heavy metal wastes Solvent wastes Toxic organic wastes
Boulton Precon- ditioning	Preservatives	Pentachlorophenol, arsenic, creosote	Wastewater treatment sludges Toxic heavy metal wastes Toxic organic wastes
Inorganic Salt Treatment	Inorganic salts, preservatives	Arsenic, borates, ammonium compounds	Wastewater treatment sludges Toxic heavy metal wastes
Non-pressure Treatment Preservation (with air or kiln drying)	Preservatives	Arsenic, chromium, chromated copper arsenate (CCA), creosote	Toxic heavy metal wastes Toxic organic wastes

**Table 2**  
**Wood Preserving Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>WOOD PRESERVING WASTES CONTAINING:</b>				
Creosote		Hazardous Waste, Liquid or Solid, NOS <sup>2</sup>	ORM-E	NA9189
Cresols*		Waste Cresol	Corrosive Material	UN2076
Pentachlorophenol*		Waste Pentachlorophenol, Liquid or Solid	ORM-E	NA2020
Chromated Copper Arsenate		Waste Arsenical Compounds, Solids Waste Arsenical Compounds, Liquids	Poison B Poison B	UN1557 UN1556
Ammoniacal Copper Arsenate		Waste Arsenical Compounds, Solids Waste Arsenical Compounds, Liquids	Poison B Poison B	UN1557 UN1556
Other Wood Preserving Wastes		Hazardous Waste, Liquid or Solid, NOS	ORM-E	NA9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

<sup>1</sup> These descriptions may change given variations in waste characteristics and conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

<sup>2</sup> NOS -- Not otherwise specified.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Printing and Allied Industries

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## Industry Overview

Not all printing and allied industry operations produce hazardous waste. If, however, you use solvents, strong acid or alkaline solutions, or paint or ink containing toxic organic chemicals or heavy metals, the waste you generate might be hazardous. If so, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

Many printing industries generate hazardous waste. Your firm is included in *printing and allied industries* if it is involved in:

### Preparation:

- Typesetting
- Lithography
- Letterpress
- Gravure
- Engraving (stationery)
- Photoengraving.

### Printing:

- Heatset lithography
- Non-heatset lithography
- Thermography
- Business form printing
- Sheetfed lithography
- Letterpress printing (including flexography)
- Gravure printing
- Screen press printing.

### Finishing Operations:

- Looseleaf binder manufacturing
- Trade binding operations
- Book binding operations
- In-house binding operations
- Magazine and catalog binding operations.

## Hazardous Wastes from Printing and Allied Industries

Printing generates waste ink and ink sludges that might contain solvents or heavy metals. The composition of inks used in printing and allied industries varies greatly depending on whether an ink is to be used for lithography, letterpress, gravure, flexography, or screen printing. Oil-based or paste inks are generally composed of colorant or pigments (carbon black, inorganic, and organic), varnish (drying oils, alkyd, resin-phenolic, resin-ester), drier (cobalt, manganese, or zirconium fatty acid compounds), and

sometimes an extender, solvents and modifiers (waxes, petroleum solvents, and magnesia). Fluid inks contain a vehicle made of resin and solvent or oil, and additives such as waxes, drier, and wetting agents. While not all waste inks and ink sludges are hazardous, those containing solvents or heavy metals generally are.

Photographic processes are used in all major printing operations for image conversion and plate making. Photographic wastes, including heavy metal solutions and spent solvents, make up a large portion of the hazardous waste generated in these industries. Photographic wastes such as processing solutions, developers, hardeners, plating chemicals, fountain solutions, and fixing baths, that are sent directly to publicly owned treatment works (POTWs) for disposal are exempt from RCRA requirements (as is any waste sent directly to a POTW). Silver-containing solutions that pass through electrolytic, chemical replacement, or ion exchange silver recovery units located on your premises are also exempt. If, however, you send your waste offsite for silver recycling or solvent recovery, the waste must be accompanied by a Uniform Hazardous Waste Manifest.

Table 1 lists typical processes/operations in the printing and allied industries that might produce hazardous waste. Table 2 provides the Department of Transportation (DOT) information needed for the Manifest for some wastes generated by printers. Table 1 and Table 2 are not comprehensive lists. If you do not find your waste here but suspect it is hazardous, contact your EPA Regional office or state hazardous waste management agency for additional information.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.



**Table 1**  
**Typical Printing and Allied Industries Operations:**  
**Materials Used and Hazardous Wastes that Might be Generated**

Process/Operation	Materials Used	Typical Material Ingredient	General Types of Waste Generated
<b>PLATE PREPARATION</b>			
*Counter-Etching to Remove Oxides	Phosphoric acid	Phosphoric acid	Acid/alkaline wastes
*Deep-Etch Coating of Plates	Deep-etch bath	Ammonium dichromate, ammonium hydroxide	Acid/alkaline wastes Heavy metal wastes
*Etch Baths	Multimetal plate and plate coating	Ferric chloride (copper), aluminum/zinc chloride/hydrochloric acid (chromium), nitric acid (zinc, magnesium), gum arabic	Acid/alkaline wastes Heavy metal wastes
Applying Light-sensitive Coating	Resins, binders, emulsifiers, photosensitizers, gelatin, photoinitiators	PVA/ammonium dichloromate, polyvinyl cinnamate, fish glue/albumin, silver halide, gelatin, emulsifiers, gum arabic/ammonium dichromate	Photographic processing wastes
Developing Plates	Developer	Lactic acid, zinc chloride, magnesium chloride, hydroquinone	Photographic processing wastes
*Applying lacquer	Resins, solvents, vinyl lacquer, lacquer developers	PVC, PVA, maleic acid, methyl ethyl ketone, cyclohexanone, isophorone	Solvent wastes
Using Ink (lithography, letterpress, screen printing, flexography)	Pigments, dyes, varnish, drier, extender, modifier, fountain solutions	Titanium oxide, iron blues, molybdated chrome orange, phthalocyanine pigments, oils, hydrocarbon solvents, waxes, cobalt/zinc/manganese oleates, plasticizers, barium-based pigments	Toxic waste ink with solvents/chromium/lead/barium. Ink sludges with chromium/lead/barium
Making Gravure Cylinders	Acid plating bath	Copper, chromic acid, chrome	Plating wastes
<b>STENCIL PREPARATION FOR SCREEN PRINTING</b>			
Lacquer Stencil Film	Solvents, polyester film, vinyl film, dyes	Aliphatic acetates, cellulose-based lacquer, plasticizers	Solvent wastes
Photographic Stencil Film	Organic acids, gelatin (pigmented), polyester film base	Acids, alkalis, peroxide-forming compounds, plasticizers, surfactants	Acid/alkaline wastes
Photoemulsion	Resins, binders, photosensitizers, dyes	PVA, PVAC, ammonium or potassium bichromate, diazonium compounds	Photographic processing wastes
Blockout (screen filler)	Pigmented polymers, solvents, acetates	Methylene chloride, methanol, methyl cellulose acetates	Solvent wastes
<b>PHOTOPROCESSING</b>			
Developing Negatives and Prints	Developer, cleaning agents, wetting agents, fixers, bleaches	Hydroquinone, ammonium thiosulfate, silver, lead, chromium, cadmium, phenol, toluene, chloroform, ethyl benzene, methylene chloride	Photographic processing wastes
<b>PRINTING</b>			
Using Ink (lithography, letterpress, screen printing, flexography)	Pigments, dyes, varnish, drier, extender, modifier, fountain solutions, inks, solvents, plates, shellacs	Titanium oxide, iron blues, molybdated chrome orange, phthalocyanide pigments, oils, hydrocarbon solvents, waxes, cobalt/zinc/manganese oleates, plasticizers, barium-based pigments, acrylic copolymers	Heavy metal wastes (dust and sludge) Ink — sludges with chromium or lead Ink — toxic wastes with metals or organic constituents Solvent wastes
<b>CLEAN UP</b>			
Wash/Clean Plates, Type, Die, Press Blankets and Rollers	Alcohols, solvents, rags, alkaline cleaners	Ethyl alcohol, benzene, toluene, xylene, isopropyl alcohol, methyl ethyl ketone, trichloroethylene, perchloroethylene, carbon tetrachloride, gasoline, naphtha, kerosene	Acid/alkaline wastes Ink — toxic wastes with metals or organic constituents Solvent wastes

\* Older technologies.

**Table 2**  
**Printing and Allied Industries Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>PHOTOGRAPHIC WASTES</b>				
Heavy Metal Solutions	Photographic processing waste containing heavy metals	Hazardous Waste Solution containing Cadmium, Chromium, Lead, and/or Cyanide	ORM-E	NA9189
<b>SPENT SOLVENTS AND OTHER WASTES CONTAINING:</b>				
Trichloroethylene*	Trichloroethylene, Trichloroethene, Ethinyl trichloride, Tri-Clene, Trielene, Tri	Waste Trichloroethylene	ORM-A	UN1710
Carbon Tetrachloride*	Carbon Tetrachloride, Perchloromethane, Necatorina, Benzinoform, CCl <sub>4</sub>	Waste Carbon Tetrachloride	ORM-A	UN1846
Ethanol	Ethanol, Ethyl alcohol	Waste Ethyl Alcohol	Flammable Liquid <sup>2</sup>	UN1170
Isopropanol	Isopropanol, Isopropyl alcohol	Waste Isopropanol	Flammable Liquid	UN1219
Ethyl Benzene	Ethyl Benzene	Waste Ethyl Benzene	Flammable Liquid	UN1175
1,1,1-Trichloroethane	Aerothene TT, Chlorten, Inhibisol, Trichloroethane, Chlorothen NU, NCI-C04626, Methylchloroform, Chlorothene VG, Chlorothane NU, Chlorotene	Waste 1,1,1-Trichloroethane	ORM-A	UN2831
Methylene Chloride	Dichloromethane, Methane dichloride, Methylene bichloride, NCI-CS0102, Methylene dichloride, Solaesthin, Aerothene MM, Narkotil, Solmethine	Waste Dichloromethane or Methylene Chloride	ORM-A	UN1593
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, MEK, Methyl Acetone, Meetco, Butanone, Ethyl Methyl Ketone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
<b>WASTE INK WITH SOLVENTS OR HEAVY METALS</b>				
Waste Ink	Various ingredients: Carbon tetrachloride, Chloroform, Methylene chloride, 1,1,1-Trichloroethane, 1,2-Dichloroethane, Benzene, Toluene, Ethyl benzene, Tetrachloroethylene, Trichloroethylene, Chromium, Copper, Lead, Zinc, Cyanide, Aluminum, Cadmium, Nickel, Cobalt	Waste Ink	Combustible Liquid <sup>3</sup> Flammable Liquid	UN2867 UN1210
<b>CORROSIVE WASTES</b>				
Ammonium Hydroxide	Ammonium Hydroxide, Aqua Ammonia, Ammonia Water, Spirit of Hartshorn, NH <sub>4</sub> OH	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		Waste Ammonium Hydroxide (containing less than 12% ammonia)	ORM-A	NA2672
Hydrochloric Acid	Hydrochloric Acid, Muriatic Acid	Waste Hydrochloric Acid Mixture	Corrosive Material	NA1789
		Waste Hydrochloric Acid Solution	Corrosive Material	UN1789
Nitric Acid	Nitric Acid, Aquafortis, HNO <sub>3</sub>	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		Waste Nitric Acid (40% or less nitric acid)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, Orthophosphoric Acid, H <sub>2</sub> SO <sub>4</sub>	Waste Phosphoric Acid	Corrosive Material	UN1805
Sodium Hydroxide	Sodium Hydroxide, Caustic Soda, Soda Lye, Sodium hydrate, NaOH	Waste Sodium Hydroxide Solution	Corrosive Material	UN1824
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1823

**Table 2** (continued)  
**Printing and Allied Industries Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Sulfuric Acid	Sulfuric Acid, Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1832
Chromic Acid	Chromic Acid	Waste Chromic Acid Solution	Corrosive Material	UN1755
<b>SPENT PLATING WASTES</b>				
Spent Plating Wastes	Spent etch baths, spent plating solutions and sludges, stripping and cleaning baths	Hazardous Waste, Liquid or Solid, NOS <sup>4</sup>	ORM-E	NA9189
<b>INK SLUDGE WITH CHROMIUM OR LEAD</b>				
Ink Sludge with Chromium or Lead	Ink sludge containing heavy metals	Hazardous Waste, Liquid or Solid, NOS	ORM-E	NA9189
<b>OTHER WASTES</b>				
Ignitable Wastes, NOS	Ignitable Wastes, NOS	Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS Waste Flammable Solid, NOS	Flammable Liquid Combustible Liquid Flammable Solid	UN1993 UN1993 UN1325
Hazardous Wastes, NOS		Hazardous Waste, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 A flammable liquid has a flash point below 100°F.

3 A combustible liquid has a flash point between 100°F and 200°F.

4 NOS - Not otherwise specified.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Chemical Manufacturers

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## Industry Overview

Chemical manufacturers produce a large variety of hazardous wastes that might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

Your business is included in the *chemical manufacturers* category if you manufacture:

- Industrial inorganic chemicals
- Industrial organic chemicals
- Pigments
- Plastics
- Pesticides
- Synthetic rubber
- Explosives
- Synthetic fibers
- Gum and wood chemicals.

## Hazardous Wastes from Chemical Manufacturing

The many different processes used in the chemical manufacturing industry result in a large number of specific wastes. Typical wastes from chemical manufacturing plants include spent solvents, distillation bottoms and side-cuts, off-specification or unused chemicals, wastewater, wastewater treatment sludge, emission control sludges, filter cake, spent catalysts, byproducts, reactor cleanout wastes, and container residues. Many wastes from chemical manufacturing (e.g., spent solvents and off-specification chemicals) are listed wastes. Toxicity Characteristic Leaching Procedure (TCLP) toxic constituents have been detected in many other chemical manufacturing wastes.

Table 1 provides a general description of chemical manufacturing waste types. If you generate more than 100 kilograms (220 pounds or about half of a 55-gallon drum) of hazardous waste per month, you must complete a Uniform Hazardous Waste Manifest when you ship your waste. The Manifest requires the DOT (Department of Transportation) description of the waste, including shipping name, hazard class, and UN/NA ID number. This information can be found in Table 2 for a number of wastes that chemical manufacturers might generate. Table 1 and Table 2 are not comprehensive lists. If you suspect that you generate a hazardous waste that is not on this list, contact your state hazardous waste management agency or EPA Regional office for assistance.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Chemical Manufacturing Operations:**  
**Materials Used and Hazardous Wastes that Might be**  
**Generated**

Process/ Operation	Materials Used	General Types of Waste Generated
Pigment Manufacturing	Acids/alkalies, heavy metals (catalysts and salts), solvents, petroleum distillates	Acid/alkaline wastes Heavy metal wastes (dust and sludge) Heavy metal wastes (solutions ) Solvent wastes Toxic organic liquids Toxic wastewaters and sludges
Pesticide Manufacturing	Pesticides, carriers, dispensing agents, solvents	Pesticide wastes Ignitable wastes Solvent wastes Toxic wastes
Synthetic Fiber Manufacturing: Cellulosic Fibers	Cellulose acetate/rayon pigments, solvents, bleaches, lubricants, dyeing assistants, stabilizers, delustrants, brighteners	Toxic heavy metal wastes Toxic wastewaters and sludges Other toxic wastes Solvent wastes Reactive wastes
Synthetic Fiber Manufacturing: Non-cellulosic (acrylic, nylon, polyester)	Pigments, solvents, bleaches, lubricants, dyeing assistants, stabilizers, delustrants, brighteners, polymeric materials	Still bottoms Solvent wastes Reactive wastes Toxic heavy metal wastes Toxic wastewaters and sludges Other toxic wastes

**Table 1** (continued)  
**Typical Chemical Manufacturing Operations:**  
**Materials Used and Hazardous Wastes that Might be**  
**Generated**

Process/ Operation	Materials Used	General Types of Waste Generated
Rubber Manufacturing	Monomers, solvents, paints, catalysts	Toxic heavy metal wastes Toxic or ignitable paint wastes Toxic wastewaters and sludges Other toxic wastes Oily wastes Solvent wastes Waste rubber solids
Other Chemical Manufacturing	Solvents, chemicals, catalysts, acids/alkalies, heavy metals	Acid/alkaline wastes Toxic heavy metal wastes (dust and sludge ) Other toxic wastes Ignitable wastes Reactive wastes (other) Solvent wastes Spent catalysts Emission control dusts and sludges

**Table 2**  
**Chemical Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>SPENT SOLVENTS, SOLVENT STILL BOTTOMS<sup>2</sup>, AND IGNITABLE OR TOXIC WASTES CONTAINING:</b>				
White Spirits	White Spirits, Mineral Spirits, Naphtha	Waste Naphtha Waste Naphtha Waste Naphtha, Solvent Waste Naphtha, Solvent	Combustible Liquid <sup>3</sup> Flammable Liquid <sup>4</sup> Combustible Liquid Flammable Liquid	UN2553 UN2553 UN1256 UN1256
Kerosene	Kerosene, Fuel Oil #1	Waste Kerosene	Combustible Liquid	UN1223
Benzene*	Benzene	Waste Benzene (Benzol)	Flammable Liquid	UN1114
Ethyl Benzene	Ethyl Benzene	Waste Ethyl Benzene	Flammable Liquid	UN1175
Toluene	Toluene, Methacide, Methylbenzene, Methylbenzol, Phenylmethane, Toluol, Antisal 1A	Waste Toluene (Toluol)	Flammable Liquid	UN1294
Toluene Diisocyanate	Toluene Diisocyanate	Waste Toluene Diisocyanate	Poison B	UN2078
Xylene	Xylene, Xylol	Waste Xylene	Flammable Liquid	UN1307
Ethanol	Ethanol, Ethyl Alcohol	Waste Ethyl Alcohol	Flammable Liquid	UN1170
Isopropanol	Isopropanol, Isopropyl Alcohol	Waste Isopropanol	Flammable Liquid	UN1219
Acetone	Acetone	Waste Acetone	Flammable Liquid	UN1090
Methyl Ethyl Ketone*	Methyl Ethyl Ketone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Tetrahydrofuran	Tetrahydrofuran, THF	Waste Tetrahydrofuran	Flammable Liquid	UN2056
Methylene Chloride	Dichloromethane, Methane Dichloride, Methylene Bichloride, NCI-C50102, Solaesthin, Aerothene, Narkotil, Solmethine	Waste Dichloromethane or Methylene Chloride	ORM-A	UN1593

**Table 2** (continued)  
**Chemical Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
1,1,1-Trichloroethane	1,1,1-Trichloroethane, Aerothene TT, Chlorten, Inhibisol, Trichloroethane, Chlorothene NU, NCI-C04626, Methylchloroform, Chlorothene VG, Chlorothane NU, Chlorotene	Waste 1,1,1-Trichloroethane	ORM-A	UN2831
Trichloroethylene*	Perm-A-Chlor, Trielin, Triline, Triol, Vestrol, Chlorylene, Dow-Tri, Vitran, TCE, Nialk, Philex	Waste Trichloroethylene	ORM-A	UN1710
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane Tetraform, Carbona Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Ethylene Dichloride*	Ethylene Dichloride, 1,2-Dichloroethane	Waste Ethylene Dichloride	Flammable Liquid	UN1184
Hexachloroethane*	Hexachloroethane	Waste Hexachloroethane	ORM-A	NA9037
Tetrachloroethylene	TCE, Gemalgene, Lanadin, Lethurin, Nialk, Perm-a-Chlor	Waste Trichloroethylene	ORM-A	UN1710
Phenol	Phenol	Waste Phenol	Poison B	UN1671
Cresols	o-Cresol, m-Cresol, p-Cresol, (m,p)-Cresol, (o,m,p)-Cresol	Waste Cresol	Corrosive Material	UN2076

#### OTHER IGNITABLE WASTES

Ignitable Wastes	Ignitable Wastes	Waste Flammable Liquid, NOS <sup>5</sup> Waste Combustible Liquid, NOS Waste Flammable Solid, NOS	Flammable Liquid Combustible Liquid Flammable Solid	UN1993 NA1993 UN1325
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#### OTHER TOXIC WASTES

Hazardous Waste		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189
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#### STRONG ACID/ALKALINE WASTES

Ammonium Hydroxide	Ammonium Hydroxide, NH <sub>4</sub> OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)  (containing less than 12% ammonia)	Corrosive Material  ORM-A	NA2672  NA2672
Hydrobromic Acid	Hydrobromic Acid, HBr	Waste Hydrobromic Acid	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, HCl, Muriatic Acid	Waste Hydrochloric Acid	Corrosive Material	NA1789
Hydrofluoric Acid	Hydrofluoric Acid, HF, Fluorohydric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, HNO <sub>3</sub> , Aquafortis	Waste Nitric Acid (over 40%)  (40% or less)	Oxidizer  Corrosive Material	UN2031  NA1760
Phosphoric Acid	Phosphoric Acid, H <sub>3</sub> PO <sub>4</sub> , Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, KOH, Potassium Hydrate, Caustic Potash, Potassa	Waste Potassium Hydroxide Solution Dry Solid, Flake, Bead, or Granular	Corrosive Material Corrosive Material	UN1814 UN1813
Sodium Hydroxide	Sodium Hydroxide NaOH, Caustic Soda, Soda Lye, Sodium Hydrate	Waste Sodium Hydroxide Solution Dry Solid, Flake, Bead, or Granular	Corrosive Material Corrosive Material	UN1824 UN1823
Sulfuric Acid	Sulfuric Acid, H <sub>2</sub> SO <sub>4</sub> , Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1832
Chromic Acid	Chromic Acid	Waste Chromic Acid Solution	Corrosive Material	UN1755



**Table 2** (continued)  
**Chemical Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>OTHER REACTIVE WASTES</b>				
Hypochlorite	Hypochlorite, Sodium Hypochlorite (or other salts), Hypochlorous Acid, Clorox	Waste Hypochlorite solution (containing not more than 7% available chlorine by weight)	ORM-B	UN1791
		Waste Hypochlorite solution (containing more than 7% available chlorine by weight)	Corrosive Material	NA1791
Organic Peroxides	Organic Peroxide	Waste Organic Peroxide, Liquid or Solution, NOS	Organic Peroxide	NA9183
Sodium Perchlorates	Sodium Perchlorate	Waste Sodium Perchlorate	Oxidizer	UN1502
Potassium Permanganate	Potassium Permanganate	Waste Potassium Permanganate	Oxidizer	UN1490
Sodium Permanganate	Sodium Permanganate	Waste Sodium Permanganate	Oxidizer	UN1503
Potassium Sulfide	Potassium Sulfide	Waste Potassium Sulfide	Flammable Solid	UN1382
Sodium Sulfide	Sodium Sulfide, Sodium Sulfuret	Waste Sodium Sulfide, Anhydrous	Flammable Solid	UN1385
<b>EMISSION CONTROL DUSTS AND SLUDGES</b>				
Flue Dusts from degassing agents used in glass production	Heavy metal dust containing Arsenic, Barium, Cadmium, Chromium, Mercury, Lead, Silver, and/or Selenium	Hazardous Waste, Solid, NOS	ORM-E	NA9189
<b>SPENT CATALYSTS</b>				
Waste heavy metal catalysts from plastic materials, synthetic spinning and polymerization	Heavy metal sludges with organics containing Antimony, Cadmium, Cobalt, Manganese, and/or Zinc	Hazardous Waste (Liquid or Solid), NOS	ORM-E	NA9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics and conditions. Note that the DOT shipping name, hazard class and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 Still bottoms may not be hazardous if the concentrations of the hazardous materials in the still bottom are sufficiently low.

3 Formulations with a flash point less than 200°F and greater than or equal to 100°F.

4 Formulations with a flash point less than 100°F.

5 NOS — Not otherwise specified.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Pesticide End-Users/Application Services

## Industry Overview

Not all pesticide use generates hazardous waste. If, however, you dispose of pesticides or pesticide containers, clean pesticide application equipment, or contaminate soils with pesticides, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste. Farmers using pesticides are exempt from most RCRA provisions, including preparation of a Manifest, provided that pesticide containers are triple rinsed and the rinse solution is either used or disposed of on their own farms in accordance with the pesticide label instructions.

Several industries are included in the *pesticide end-users/application services* category:

- Agricultural pesticide application services
- Lawn, garden, and tree services
- Disinfecting and structural pest control services
- Arboreta, botanical, and zoological gardens and forestry operations
- Public golf courses and other facilities regularly using pesticides.

## Hazardous Wastes Generated by Pesticide End-Users and Applications

Many pesticides are commonly used in applications ranging from protection of food and structures to pest and disease control in home gardens. Pesticides can be harmful if not mixed and disposed of in accordance with EPA-approved pesticide label instructions. Several types of wastes from pesticide end-users and applicators are common:

**Rinsewater** - Solutions used to rinse application equipment and product containers

**Empty Containers** Containers that retain pesticide residues (unless triple rinsed)

**Unused Pesticides** Unusable or unidentifiable material

**Contaminated Soil** Soil or other material contaminated from spills.

Some very dilute rinsewater or soils contaminated with very low pesticide concentrations might not be hazardous, but should be treated as hazardous waste unless known to be nonhazardous from label information, chemical analysis, or another reliable

source. Pesticide containers that are triple rinsed are not hazardous waste, although the rinse solution might be hazardous. Some pesticide formulations contain solvents or other material that make the pesticide solution an ignitable or toxic hazardous waste.

Table 1 summarizes possible waste types from pesticide application. If you generate more than 100 kilograms (220 pounds or about half of a 55-gallon drum) of hazardous waste per month, you must complete a Uniform Hazardous Waste Manifest when shipping your wastes. The Manifest requires the DOT (Department of Transportation) description of the waste including shipping name, hazard class, and UN/NA ID number. This information can be found in Table 2 for some wastes associated with pesticide use.

To assess whether RCRA requirements are applicable, the entire weight of each waste (e.g., the weight of any contaminated soil), not just the weight of the pesticide, is considered. Regardless of the quantity generated, pesticide waste should be disposed of according to EPA-approved pesticide container label instructions. Table 1 and Table 2 are not comprehensive lists. If you suspect that you generate a hazardous waste that is not listed, contact your state hazardous waste management agency or EPA Regional office for assistance.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Pesticide End Users/Application Services Operations:**  
**Materials Used and Hazardous Wastes that Might be Generated**

Process/ Operation	Materials Used	Typical Material Ingredient	General Types of Waste Generated
Pesticide Application	Pesticides, solvents	Arsenic, carbamates, mercury, nicotine, nitrophenols, strychnine, triazine, thallium sulfate, phenoxy, organochlorides, others (see Table 2)	Used/unused pesticides Solvent wastes Ignitable wastes Contaminated soil (from spills)
Cleanup	Rinses, solvents, rags	Alcohols, toluene, benzene, xylene, solvent mixtures	Contaminated rinsewater Empty containers Solvent wastes

**Table 2**  
**Pesticide End-Users/Application Services Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>PESTICIDES CONTAINING ARSENIC*</b>				
Arsenic pentoxide	Arsenic Acid Anhydride, Arsenic (v) Oxide	Waste Arsenic Pentoxide, Solid	Poison B	UN1559
Arsenic trioxide	Arsenic Sesquioxide, Arsenic (III) Oxide, Arsenous Acid (anhydride), White Arsenic	Waste Arsenic Trioxide, Solid	Poison B	UN1561
Cacodylic acid	Hydroxydimethylarsine Oxide, Dimethylarsinic Acid, Phytar	Waste Arsenical Pesticide, Solid, NOS <sup>2</sup> Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid <sup>3</sup>	UN2759 UN2759 UN2760
Monosodium methanearsonate	MSMA, Ansar 170 H.C. and 529 H.C., Arsanote Liquid, Bueno 6, Daconate 6, Dal-E-Rad, Herb-All, Merge 823, Mesamate, Monate, Tans-Vert, Weed-E-Rad, Weed-Hoe	Waste Arsenical Pesticide, Solid, NOS Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2759 UN2759 UN2760
Disodium monomethanearsonate	DSMA, Ansar 8100, Arrhenal, Arsinyl, Dinat, Di-Tac, DMA, Methar 30, Sodar, Versar DSMA-LQ, Weed-E-Rad 360	Waste Arsenical Pesticide, Solid, NOS Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2759 UN2759 UN2760
<b>PESTICIDES CONTAINING CARBAMATES</b>				
Temik	Aldicarb, OMS 771, UC 21149	Waste Carbamate Pesticide, Solid, NOS Waste Carbamate Pesticide, Liquid, NOS Waste Carbamate Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2757 UN2757 UN2758
<b>PESTICIDES CONTAINING MERCURY*</b>				
2-Methoxyethylmercuric chloride	MEMC, Agallol, Cekusil Universal-C, Ceresan-Universal-Nassbeize, Emisan 6	Waste Mercury Based Pesticide, Solid, NOS Waste Mercury Based Pesticide, Liquid, NOS Waste Mercury Based Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2777 UN2777 UN2778
Phenylmercuric acetate	PMA, PMAS, Agrosan, Cekusil, Celmer, Gallotox, Hong Nien, Liquiphene, Mersolite, Pamisan, Phix, Seedtox, Shimmer-ex. Tag HL 331	Waste Mercury Based Pesticide, Solid, NOS Waste Mercury Based Pesticide, Liquid, NOS Waste Mercury Based Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2777 UN2777 UN2778
<b>PESTICIDES CONTAINING NICOTINE</b>				
Nicotine	Black Leaf 40	Waste Poison B, Solid, NOS Waste Poison B, Liquid, NOS Waste Flammable Liquid, Poisonous, NOS	Poison B Poison B Flammable Liquid	UN2811 UN2810 UN1992
<b>PESTICIDES CONTAINING SUBSTITUTED NITROPHENOLS</b>				
Dinitrocresol	DNC, DNOC, Chemsect, Detal, Elgetol 30, Nitador, Selinin, Sinox, Trifocide, Trifrina	Waste Substituted Nitrophenol Pesticide, Solid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2779 UN2779 UN2780

**Table 2** (continued)

**Pesticide End-Users/Application Services Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Dinoseb	DNBP, Basanite, Caldon, Chemox General, Chemox PE, Dinitro, Dinitro General, Dynamite, Elgetol 318, Gebutox, Hel-Fire, Nitropone C, Premerge 3, Sinox General, Subitex, Vertac General Weed Killer, Vertac Selective Weed Killer	Waste Substituted Nitrophenol Pesticide, Solid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Flammable Liquid	UN2780
<b>ORGANOPHOSPHATE PESTICIDES</b>				
Dimethoate	AC-12880, Bi 58 EC, Cekuthoate, Cygon, Daphene, De-Fend, Demos-L40, Devigon, Dimet, Dimethogen, Perfekthion, Rebelate, Rogodial, Rogor, Roxion, Trimetion	Waste Organophosphorus Pesticide, Solid, NOS Waste Organophosphorus Pesticide, Liquid, NOS Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2783 UN2783 UN2784
Disulfoton	BAY 19639 and S276, Dithiodemeton, Dithiosystox, Di-Syston, Ethylthiodemeton, Frumin AL, M-74, Solvirex, Thiodemeton	Waste Disulfoton Waste Disulfoton Mixture, Dry Waste Disulfoton Mixture, Liquid Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Poison B Flammable Liquid	NA2783 NA2783 NA2783 UN2784
Famphur	Bash, Bo-Ana, Dovip, Famfos, Warbex	Waste Organophosphorus Pesticide, Solid, NOS Waste Organophosphorus Pesticide, Liquid, NOS Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2783 UN2783 UN2784
Methyl Parathion	Cekumethion, E-601, Devithion, Folidol M, Fosferno M50, Gearphos, Metacide, Metaphos, Nitrox 80, Parataf, Paratox, Partron M, Penncap-M, Wofatox	Waste Methyl Parathion, Liquid Waste Methyl Parathion Mixture, Dry Waste Methyl Parathion Mixture, Liquid (containing 25% or less methyl parathion) Waste Methyl Parathion Mixture, Liquid (containing more than 25% methyl parathion) Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Poison B Poison B Flammable Liquid	NA2783 NA2783 NA2783 NA2783 UN2784
Parathion	AC-3422, Alkron, Alleron, Aphamite, Bladan, Corothion, E-605, ENT 15108, Ethyl Parathion, Etilon, Folidol E-605, Fosterno 50, Niran, Orthophos, Panthion, Paramar, Paraphos, Parathene, Parawet, Phoskil, Rhodiattox, Soprathion, Station, Thiophos	Waste Parathion, Liquid Waste Parathion Mixture, Dry Waste Parathion Mixture, Liquid Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Poison B Flammable Liquid	NA2783 NA2783 NA2783 UN2784
<b>STRYCHNINE PESTICIDES</b>				
Strychnine	Strychnine Salts	Waste Strychnine, Solid Waste Strychnine Salt, Solid	Poison B Poison B	UN1692 UN1692
<b>THALLIUM SULFATE PESTICIDES</b>				
Thallium Sulfate	Thallous Sulfate, Ratox, Zelio	Waste Thallium Sulfate, Solid Waste Flammable Liquid, Poisonous, NOS	Poison B Flammable Liquid	NA1707 UN1992
<b>TRIAZINE PESTICIDES</b>				
Amitrole	Amerol, Amino Triazol Weedkiller 90, Amizol, AT-90, AT Liquid, Azolan, Azole, Cytrol, Diurol, Farmco, Herbizole, Simazol, Weedazol, Weedazol TL	Waste Triazine Pesticide, Solid, NOS Waste Triazine Pesticide, Liquid, NOS Waste Triazine Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2763 UN2763 UN2764
<b>PHENOXY PESTICIDES</b>				
2,4-D*	Amoxone, Brush Killer, Brush Rhap, Chloroxone, Crop Rider, D50, DMA 4, Dacamine, Ded-Weed, Desormone, Dinoxol, Emulsamine BK and E3, Envert DT and 171, Hedonal, Miracle, Pennamine D, Rhodia, Salvo, Super D-Weedone, Verton, Visko-Rhap, Weed Tox, Wee-B-Gone, Weed-Rhap, Weedar, Weedone, Weedtrol	Waste 2,4-Dichlorophenoxyacetic Acid Waste 2,4-Dichlorophenoxyacetic Ester Waste Phenoxy Pesticide, Liquid, NOS	ORM-A ORM-E Flammable Liquid	NA2765 NA2765 UN2766
2,4,5-T	Brush-Rhap, Dacamine, Ded-Weedon, Esteron, Farmco Fence Rider, Forron, Inverton 245, Line Rider, Super D Weedone, Tormona, Transamine, U 46, Veon 245, Weedar, Weedone	Waste 2,4,5-Trichlorophenoxyacetic Acid Waste 2,4,5-Trichlorophenoxyacetic Acid (amine, ester, or salt) Waste Phenoxy Pesticide, Liquid, NOS	ORM-A ORM-E Flammable Liquid	NA2765 NA2765 UN2766

**Table 2** (continued)  
**Pesticide End-Users/Application Services Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Silvex*	2,4,5-Fenoprop, AquaVex, Double Strength, Fruitone T, Kuron, Kurosai, Silvi-Rhap, Weed-B-Gone	Waste 2-(2,4,5-Trichlorophenoxy) propionic Acid	ORM-A	NA2765
		Waste 2-(2,4,5-Trichlorophenoxy) propionic Acid Ester	ORM-E	NA2765
		Waste Phenoxy Pesticide, Liquid, NOS	Flammable Liquid	UN2766
ORGANOCHLORINE PESTICIDES				
Aldrin	HHDN, Aldrex 30, Aldrite, Aldrosol, Altos, Drinox, Octalene, Seedrin Liquid	Waste Aldrin	Poison B	NA2761
		Waste Aldrin Mixture, Dry (with more than 65% Aldrin)	Poison B	NA2761
		Waste Aldrin Mixture, Dry (with 65% or less Aldrin)	ORM-A	NA2761
		Waste Aldrin Mixture, Liquid (with more than 60% Aldrin)	Poison B	NA2762
		Waste Aldrin Mixture, Liquid (with 60% or less Aldrin)	ORM-A	NA2762
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Chlordane*	Belt, Chlordan, ChlorKil, Chlortox, Corodane, Gold Crest C-100, Kypchlor, Vesicol 1068, Topiclor 20, Nixan, Octachlor, Octa-Klor, Orhto-Klor, Synklor, Termini-Ded	Waste Chlordane, Liquid	Flammable Liquid	NA2762
		Waste Chlordane, Liquid	Combustible Liquid <sup>4</sup>	NA2762
DDT	Dedelo, Didimic, Digmar, Genitox, Gyron, Hildit, Kopsol, Neocid, Pentachlorin, Rukseam, Zerdane	Waste DDT	ORM-A	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Dichloropropene	1,3-Dichloropropene, Telone II Soil Fumigant	Waste Dichloropropene	Flammable Liquid	UN2047
Dieldrin	Dieldrex, Dieldrite, Octalox, Panoram D-31	Waste Dieldrin	ORM-A	NA2761
		Waste Organochloride Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Endrin*	Endrex, Hexadrin	Waste Endrin	Poison B	NA2761
		Waste Endrin Mixture, Liquid	Poison B	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Endosulfan	Beosit, Chlorthiepin, Crisulfan, Cycloclan, Endocel, EnSure, FMC 5462, Hildan, Hoe 2671, Malix, Thifor, Thimul, Thiodan, Thiofor, Thionex, Thiovel	Waste Endosulfan	Poison B	NA2761
		Waste Endosulfan Mixture, Liquid	Poison B	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Heptachlor*	Gold Crest H-60, Drinox H-34, Heptamul, Heptox	Waste Heptachlor	ORM-E	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Kepone	Chlordecone, GC 1189	Waste Kepone	ORM-E	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Lindane*	Exgama, Forlin, Gallogama, Gamaphex, Gammex, Inexit, Isotox, Lindafor, Lindagam, Lindagrain, Lindagranox, Lindalo, Lindamul, Lindapoudre, Lindaterra, Novigam, Silvanol	Waste Lindane	ORM-A	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Methoxychlor	Flo Pro MeSeed Protectant, Marlate	Waste Methoxychlor	ORM-E	NA2761
		Waste Organochlorine Pesticide, Solid, NOS	Poison B	UN2701
		Waste Organochlorine Pesticide, Liquid, NOS	Poison B	UN2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Propylene Dichloride	1,2-Dichloropropane	Waste Propylene Dichloride	Flammable Liquid	UN1279
Toxaphene*	Attac 4-2, 4-4, 6, 6-3, 8, Camphochlor, Motox, Phenacide, Phenatox, Strobane T-90, Toxakil, Toxon 63	Waste Toxaphene	ORM-A	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762

**Table 2** (continued)  
**Pesticide End-Users/Application Services Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>OTHER PESTICIDES</b>				
Thiram	TMTD, AAtack, Arasan, Aules, Evershield T Seed Protectant, Fermide 850, Fernasan, Flo Pro T Seed Protectant, Hexathir, Mercuram, Nomersan, Pomarsolforte, Polyram-Ultra, Spotrete-F, Tetrapom, Thimer, Thioknock, Thiotex, Thiramad, Thirasan, Thiuramin, Tirampa, Trametan, Tripomol, Thylate, Tuads, Vancide TM	Waste Thiram Waste Flammable Liquid, Poisonous, NOS	ORM-A Flammable Liquid	NA2771 UN1992
Warfarin	Co-Rax, Cov-R-Tox, Kypfarin, Liqua-Tox, RAX, Rodex, Rodex Blox, Tox-Hid	Hazardous Waste, Solid NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
Pentachlorophenol*	PCP, Penta, Penchlorol, Pentacon, Penwar, Sinituho, Santophen	Waste Pentachlorophenol Waste Flammable Liquid Waste Combustible Liquid	ORM-E Flammable Liquid Combustible Liquid	NA2020 UN1993 NA1993
Pentachloronitrobenzene	PCNB, Avicol, Botrilex, Brassicol, Earthcide, Folosan, Kobu, Pentagen, Saniclor 30, Terraclor, Tilcarex, Tritisan	Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
Hexachlorobenzene*	Perchlorobenzene, Anticarie, Ceku C.B., HCB, No Bunt	Hazardous Waste, Solid NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
1,2-Dibromo 3-chloropropane	DBCP, Nemaforme, Nemanox, Nemaset, Nematocide	Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
<b>IGNITABLE AND/OR TOXIC SOLVENTS USED IN PESTICIDES</b>				
Methyl Alcohol	Methanol	Waste Methyl Alcohol	Flammable Liquid	UN1230
Ethyl Alcohol	Ethanol, Alcohol	Waste Ethyl Alcohol	Flammable Liquid	UN1170
Isopropyl Alcohol	Isopropanol	Waste Isopropanol	Flammable Liquid	UN1219
Toluene	Methyl benzene, Toluol	Waste Toluene, (toluol)	Flammable Liquid	UN1294
Xylene	Dimethylbenzene, Xylol	Waste Xylene (xylol)	Flammable Liquid	UN1307
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane, Tetraform, Carbona Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Benzene*	Benzol	Waste Benzene (Benzol)	Flammable Liquid	UN1114
Tetrachloroethylene*	Perc, Perclene, Tetralex, Nema, Tetracap, Persec, Antisal 1, Perawin, Didakene	Waste Tetrachloroethylene	ORM-A	UN1897
Solvent Mixtures		Waste Combustible Liquid, NOS (flash point between 100°F and 200°F) Waste Flammable Liquid, NOS (flash point less than 100°F)	Combustible Liquid Flammable Liquid	NA1993 UN1993



**Table 2** (continued)  
**Pesticide End-Users/Application Services Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>OTHER WASTES</b>				
Ignitable Wastes, NOS		Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
		Waste Combustible Liquid, NOS	Combustible Solid	NA1993
Hazardous Waste		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 NOS—Not otherwise specified.

3 A flammable liquid has a flash point below 100°F.

4 A combustible liquid has a flash point between 100°F and 200°F.

# Construction

## Industry Overview

If your operation is involved in the construction industry you might be subject to Resource Conservation and Recovery Act (RCRA) regulations covering the generation, transportation, and management of hazardous waste. Not all construction industry operations produce hazardous waste, but if you use materials such as strong acid or alkaline solutions, paints, solvents, or petroleum products, the waste generated during their use might be hazardous.

You are included in the *construction industry* if you provide services in the following areas:

- Heavy construction
- Plumbing, heating, and air conditioning
- Painting, paper hanging, and decorating
- Mobile home construction
- Prefabricated wood buildings and components
- Masonry, stonework, tile work, and plastering
- Carpentering and floorwork
- Concrete work
- Roofing and sheet metal work
- Glass and glazing work
- Wrecking and demolition.

## Hazardous Wastes From Construction

Hazardous wastes that might be generated during construction fall into several major categories:

**Ignitable paint wastes** generated by painting and other associated processes, including paint preparation and brush and spray gun cleaning

**Other ignitable wastes** containing paint and varnish removers, paint brush cleaners, and epoxy resins and adhesives used during processes such as painting, cleaning, and degreasing

**Spent solvents** from many processes, including painting, cleaning, degreasing, air conditioner maintenance, and fluxing

**Wastes containing toxic chemicals.** Many products such as adhesives, paints, coatings, polishes, varnishes, thinners, and treated woods contain toxic chemicals. Wastes generated during the use of such products are hazardous wastes if they contain certain levels of toxic chemicals.

**Strong acid/alkaline wastes** used in cleaning, degreasing, and plumbing operations.

Some businesses generate spent heat transfer boxes that contain PCBs. PCBs are not regulated under RCRA; they are, however, regulated under the Toxic Control Substances Act (TSCA).

If you have spent heat transfer boxes, contact your state hazardous waste management agency to determine your responsibilities.

In addition to these wastes, your operations might generate used oil. There are special provisions in the regulations for used oil. Currently most used oil is exempt from EPA hazardous waste regulations if it is recycled. If you recycle your oil, you are not required to use a Uniform Hazardous Waste Manifest, and you do not need to include used oil when determining your monthly hazardous waste generation rate. If, however, you are disposing of used oil yourself or are sending it offsite for disposal, you generally should handle it as hazardous waste because it is likely to be ignitable or toxic. Special requirements apply if you are burning used oil as fuel. EPA is currently developing new regulations for used oil. Some states regulate used oil differently than does EPA; contact your state hazardous waste agency for more information.

Table 1 lists typical processes/operations that use products that might contain hazardous materials and that probably generate hazardous waste. If you produce 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. Table 2 lists the proper DOT shipping description for a number of wastes that might be generated during equipment repair operations. Table 1 and Table 2 are not comprehensive lists. If you suspect that any waste you generate is hazardous, check with your state hazardous waste agency or EPA Regional office for more information.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Construction Operations: Materials Used and**  
**Hazardous Wastes that Might be Generated**

Process/ Operation	Materials Used	General Types of Waste Generated
Paint Preparation and Painting	Paint thinners, enamel reducers, paints, enamels, lacquers, epoxies, acrylics, primers, solvents	Ignitable wastes Toxic wastes Spent solvents Paint wastes
Carpentering and Floorwork	Adhesives, solvents, polishes and varnishes, treated wood	Spent solvents Toxic wastes
Other Specialty Contracting Activities	Adhesives, paints, coatings, polishes, varnishes, solvents, petroleum products	Ignitable wastes Toxic wastes Spent solvents
Heavy Construction	Motor oil and other petroleum products, asphalt	Used oil Asphalt wastes
Wrecking and Demolition		Wreckage and debris that may contain ignitable or toxic substances Used oil
Vehicle and Equipment Maintenance for Construction Activities	Degreasers and cleaners, motor oil and other petroleum products, solvents, rust removers	Spent solvents Acid/alkaline wastes Ignitable wastes Toxic wastes Used oil

**Table 2**  
**Construction Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>SPENT SOLVENTS AND IGNITABLE OR TOXIC WASTES CONTAINING:</b>				
Ethylene Dichloride*	Ethylene Dichloride, 1,2-Dichloroethane	Waste Ethylene Dichloride	Flammable Liquid <sup>2</sup>	UN1184
Benzene*	Benzene	Waste Benzene (benzol)	Flammable Liquid	UN1114
Ethyl Benzene	Ethyl Benzene	Waste Ethyl Benzene	Flammable Liquid	UN1175
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, MEK, Methyl Acetone, Meetco, Butanone, Ethyl Methyl Ketone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Methyl Isobutyl Ketone	Shell MIBK	Waste Flammable Liquid NOS	Flammable Liquid	UN1993
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane, Tetraform, Carbona, Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Hexachloroethane*	Hexachloroethane	Waste Hexachloroethane	ORM-A	NA9037
Methylene Chloride	Aerothene MM, Narkotil	Waste Dichloromethane or Methylene Chloride	ORM-A	UN1593
Trichlorotrifluoroethane	Fluorocarbon 113, Freon 113, Ucon 113, Freon TF, Frigen 113 113TR-T, Areton 63	Hazardous Waste, Liquid, NOS	ORM-E	NA9189
Toluene	Toluol, Methercid, Methyl Benzene, Methylbenzol, Phenylmethane, Antisol IA	Waste Toluene (toluol)	Flammable Liquid	UN1294
Xylene	Xylene, Xylol	Waste Xylene (xylol)	Flammable Liquid	UN1307

**Table 2** (continued)  
**Construction Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Kerosene	Kerosene, Fuel Oil #1	Waste Kerosene	Combustible Liquid <sup>3</sup>	UN1223
Cresols*	o-Cresol, m-Cresol, p-Cresol, (m,p)-Cresol, (o,m,p)-Cresol	Waste Cresol	Corrosive Material	UN2076
Trichloroethylene*	TCE, Gemalgene, Lanadin, Lethurin, Nialk, Perm-a-Chlor	Waste Trichloroethylene	ORM-A	UN1710
Mineral Spirits	White Spirits, Naphtha	Waste Naphtha	Flammable Liquid	UN2553
Acetone	Acetone	Waste Acetone	Flammable Liquid	UN1090
<b>STRONG ACID/ALKALINE WASTES</b>				
Ammonium Hydroxide	Ammonium Hydroxide, NH <sub>4</sub> OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		(containing less than 12% ammonia)	ORM-A	NA2672
Hydrobromic Acid	Hydrobromic Acid, HBr	Waste Hydrobromic Acid	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, HCl, Muriatic Acid	Waste Hydrochloric Acid	Corrosive Material	NA1789
Hydrofluoric Acid	Hydrofluoric Acid, HF, Fluorohydric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, HNO <sub>3</sub> , Aquafortis	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		(40% or less)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, H <sub>3</sub> PO <sub>4</sub> , Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, KOH, Potassium Hydrate, Caustic Potash, Potassa	Waste Potassium Hydroxide Solution	Corrosive Material	UN1814
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1813
Sodium Hydroxide	Sodium Hydroxide, NaOH, Caustic Soda, Soda Lye, Sodium Hydrate	Waste Sodium Hydroxide Solution	Corrosive Material	UN1824
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1823
Sulfuric Acid	Sulfuric Acid, H <sub>2</sub> SO <sub>4</sub> , Oil of Vitriol	Waste Sulfuric Acid, Spent	Corrosive Material	UN1832
<b>OTHER WASTES</b>				
Ignitable Wastes, NOS	Ignitable Wastes, NOS <sup>4</sup>	Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Combustible Liquid, NOS	Combustible Liquid	NA1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
Used Oil	Various petroleum products	Waste Petroleum Oil, NOS	Combustible Liquid	NA1270
		Waste Petroleum Oil, NOS	Flammable Liquid	NA1270
Asphalt	Asphalt	Waste Asphalt, at or above its flashpoint	ORM-C	NA1999
		Waste Asphalt, cut back	Flammable Liquid Combustible Liquid	NA1999 NA1999
Hazardous Waste, NOS		Hazardous Waste, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 A flammable liquid has a flash point below 100°F.

3 A combustible liquid has a flash point between 100°F and 200°F.

4 NOS - Not otherwise specified.

# Motor Freight Terminals/Railroad Transportation

## Industry Overview

If your business is in the motor freight terminals/railroad transportation category, the products you use or transport might contain hazardous materials and the waste you generate might be hazardous waste. If you generate hazardous waste, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

Your industry is classified under *motor freight terminals/railroad transportation* if you are primarily engaged in:

- The operation of terminal facilities used by highway vehicles
- The maintenance and service of trucks and other highway vehicles
- Line haul railroad operations
- The furnishing of terminal facilities for rail passenger or freight traffic for line haul service
- The movement of railroad cars between terminal yards.

## Hazardous Wastes from Motor Freight Terminals/Railroad Transportation

Motor freight terminals perform a variety of activities, including loading and unloading packaged goods, cleaning offloaded tank trucks, cleaning and painting trucks, and maintaining highway vehicles. Most of the hazardous wastes included in this summary are generated during maintenance activities; motor freight terminals not equipped with maintenance facilities might not generate some or any of these wastes. Operations that involve cleaning the inside of offloaded tank trucks generate waste that contains small amounts of the substance that was shipped. This waste might also be hazardous.

Waste from the railroad transportation industry predominantly comes from maintenance operations in which trains are cleaned and repaired. Routine operations similar to those carried out by motor freight terminals might generate waste, including strong acid or alkaline materials, spent cleaning and degreasing solvents, ignitable paint wastes, used oil, and lead-acid batteries. In addition, older freight cars with plane bearings might generate lead-contaminated lubricating pads which might also be hazardous.

Table 1 lists typical processes/operations that use products that might contain hazardous materials, and that probably generate

hazardous waste. If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship hazardous waste off your property. The Manifest requires the Department of Transportation (DOT) description for each waste. Table 2 lists the DOT shipping descriptions for a number of wastes that might be generated by motor freight terminals and railroad transportation facilities. Table 1 and Table 2 are not comprehensive lists. If you suspect any of your other wastes is hazardous, contact your state hazardous waste management agency or EPA Regional office for assistance.

RCRA has special provisions for spent lead-acid batteries and used oil. You do not have to use a Manifest when you ship used lead batteries that are destined for recycling or used oil that is destined for recycling. If, however, you are disposing of used oil yourself or are sending it offsite for disposal, you generally should handle it as hazardous waste because it is likely to be ignitable or toxic. Special requirements apply if you are burning used oil as fuel. Your state might have its own requirements for lead-acid batteries or used oil; check with your state hazardous waste management agency.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Motor Freight Terminals/Railroad Transportation Operations:**  
**Materials Used and Hazardous Wastes that Might be Generated**

Process/ Operation	Materials Used	Typical Material Ingredient	General Types of Waste Generated
Unloading and Cleaning Tank Trucks or Cars	Solvents, alkaline cleaners	(see Product Shipping Papers)	Acid/alkaline wastes Toxic wastes Solvent wastes (Residual tank contents)
Degreasing; Engine Parts and Equipment Cleaning	Degreasers (gunk), carburetor cleaners, engine cleaners, solvents, acids/alkalies, cleaning fluids	Petroleum distillates, aromatic hydrocarbons, mineral spirits, benzene, toluene, petroleum naphtha	Acid/alkaline wastes Toxic wastes Ignitable wastes Solvent wastes
Rust Removal	Naval jelly, strong acids, strong alkalies	Phosphoric acid, hydrochloric acid, hydrofluoric acid, sodium hydroxide	Acid/alkaline wastes
Paint Preparation	Paint thinners, enamel reducers, white spirits	Alcohols, petroleum distillates, oxygenated solvents, mineral spirits, ketones	Ignitable wastes Toxic wastes Paint wastes Solvent wastes
Painting	Enamels, lacquers, epoxies, alkyds, acrylics, primers, solvents	Acetone, toluene, petroleum distillates, epoxy ester resins, methylene chloride, xylene, VM&P naphtha, aromatic hydrocarbons, methyl isobutylketones	Ignitable wastes Toxic wastes Paint wastes Solvent wastes
Spray Booth, Spray Guns, and Brush Cleaning	Paint thinners, enamel reducers, solvents, white spirits	Ketones, alcohols, toluene, acetone, isopropyl alcohol, petroleum distillates, mineral spirits	Paint wastes Solvent wastes Toxic wastes
Paint Removal	Solvents, paint thinners, enamel reducers, white spirits	Acetone, toluene, petroleum distillates, methanol, methylene chloride, isopropyl alcohol, mineral spirits, alcohols, ketones, other oxygenated solvents	Paint wastes Solvent wastes Toxic wastes
Changing Lead-Acid Batteries	Batteries of motor freight vehicles	Lead dross	Acid/alkaline wastes Batteries (lead-acid)



**Table 2**  
**Motor Freight Terminals/Railroad Transportation Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>STRONG ACID/ALKALINE WASTES</b>				
Ammonium Hydroxide	Ammonium Hydroxide, NH <sub>4</sub> OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		(containing less than 12% ammonia)	ORM-A	NA2672
Hydrobromic Acid	Hydrobromic Acid, HBr	Waste Hydrobromic Acid	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, HCl, Muriatic Acid	Waste Hydrochloric Acid	Corrosive Material	NA1789
Hydrofluoric Acid	Hydrofluoric Acid, HF, Fluorohydric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, HNO <sub>3</sub> , Aquafortis	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		(40% or less)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, H <sub>3</sub> PO <sub>4</sub> , Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, KOH, Potassium Hydrate, Caustic Potash, Potassa	Waste Potassium Hydroxide Solution Dry Solid, Flake, Bead or Granular	Corrosive Material	UN1814
			Corrosive Material	UN1813
Sodium Hydroxide	Sodium Hydroxide NaOH, Caustic Soda, Soda Lye, Sodium Hydrate	Waste Sodium Hydroxide Solution Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1824
			Corrosive Material	UN1823
Sulfuric Acid	Sulfuric Acid, H <sub>2</sub> SO <sub>4</sub> , Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1832
Chromic Acid	Chromic Acid	Waste Chromic Acid Solution	Corrosive Material	UN1755
<b>SPENT SOLVENTS AND IGNITABLE OR TOXIC WASTES CONTAINING:</b>				
Ethylene Dichloride*	Ethylene Dichloride, 1,2-Dichloroethane	Waste Ethylene Dichloride	Flammable Liquid <sup>2</sup>	UN1184
Benzene*	Benzene	Waste Benzene (benzol)	Flammable Liquid	UN1114
Toluene	Toluene	Waste Toluene (toluol)	Flammable Liquid	UN1294
Ethyl Benzene	Ethyl Benzene	Waste Ethyl Benzene	Flammable Liquid	UN1175
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, MEK, Methyl Acetone, Meetco, Butanone, Ethyl Methyl Ketone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane Tetraform, Carbona Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Hexachloroethane*	Hexachloroethane	Waste Hexachloroethane	ORM-A	NA9037
White Spirits, Varsol	White Spirits, Mineral Spirits, Naphtha	Waste Naphtha	Flammable Liquid	UN2553
1,1,1-Trichloroethane	Aerothene TT, Chlorten, Chloroethane, Methyl Chloroform, Alpha T, Chlorotene	Waste 1,1,1-Trichloroethane	ORM-A	UN2831
Petroleum Distillates	Petroleum Distillates	Petroleum Distillate	Flammable Liquid Combustible Liquid <sup>3</sup>	UN1268 UN1268
<b>PAINT WASTES WITH HEAVY METALS</b>				
Heavy Metal paints with: Lead* Nickel* Chromium*	Heavy Metal Paints	Hazardous Waste, Liquid or Solid, NOS <sup>4</sup>	ORM-E	NA9189

**Table 2** (continued)  
**Motor Freight Terminals/Railroad Transportation Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>OTHER WASTES</b>				
Lead-Acid Batteries	Lead-Acid Batteries	Lead Dross (containing 3% or more free acid)	ORM-C	NA1794
Used Oil	Various petroleum products	Waste Petroleum Oil, NOS	Combustible Liquid	NA1270
		Waste Petroleum Oil, NOS	Flammable Liquid	NA1270
Ignitable Wastes, NOS	Ignitable wastes	Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Combustible Liquid, NOS	Combustible Liquid	NA1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
Hazardous Waste, NOS		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 A flammable liquid has a flash point below 100°F.

3 A combustible liquid has a flash point between 100°F and 200°F.

4 NOS - Not otherwise specified.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Educational and Vocational Shops

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## Industry Overview

Many educational and vocational institutions do not produce hazardous waste. If, however, you use ignitable solvents, strong acid alkaline solutions, heavy metals, or toxic organic chemicals, the waste you generate might be hazardous. If you generate hazardous waste, you might be subject to Resource Conservation Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

*Educational and vocational institutions* include shops conducting:

- Automotive and small engine repair
- Automobile body repair
- Metalworking
- Graphic arts production (e.g., printing and photography)
- Woodworking.

Waste generated by laboratories is not addressed in this pamphlet; a separate pamphlet on laboratory waste is available.

## Hazardous Wastes from Educational and Vocational Shops

The majority of hazardous waste from educational and vocational shops are:

**Solvents** (e.g., paint removers, thinners, and cleaning solvents)

**Paint waste**

**Strong acid or alkaline solutions** (e.g., cleaning solutions).

Automobile body repair and woodworking operations generate waste solvents and paints. The solvents might be flammable or toxic, and paints might contain heavy metal pigments or hazardous solvents. Metalworking and automotive repair generate waste solvents and acid or alkaline solutions used to clean metal and remove rust.

Graphic arts production can generate several types of waste, depending on the activities. Printing wastes include strong acid solutions used to clean, etch, and coat plates, and solvents used to clean plates, to apply light-sensitive coatings, and to develop plates. The use of inks generates waste containing solvents and/or heavy metals. Photographic wastes include processing solutions, developers, hardeners, and fixing baths. Photographic processing waste might be toxic, ignitable, or corrosive.

RCRA regulations contain special provisions for spent lead-acid batteries and used oil, which might be generated in automotive shops and other shops with heavy machinery. You do not have to use a Manifest when you ship used lead batteries that are destined for recycling or used motor oil that is destined for recycling. If, however, you are disposing of used oil yourself or are sending it offsite for disposal, you generally should handle it as hazardous waste because it is likely to be ignitable or toxic. Special requirements apply if you are burning used oil as fuel. Your state might have its own requirements for lead-acid batteries or used oil; check with your state hazardous waste management agency.

Table 1 lists general operations/processes that use hazardous materials and that might result in the generation of hazardous waste. If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship the hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. Table 2 lists proper DOT shipping descriptions for a number of wastes that might be generated by educational and vocational shops. Table 1 and Table 2 are not comprehensive lists. If you do not find your waste here but suspect it is hazardous, contact your EPA Regional office or state hazardous waste management agency for additional information.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Educational and Vocational Shops Operations:**  
**Materials Used and Hazardous Wastes that Might be Generated**

Process/Operation	Materials Used	Typical Material Ingredient	General Types of Waste Generated
<b>AUTOMOBILE ENGINE AND BODY REPAIR, METALWORKING</b>			
Oil and grease removal; metal/tool cleaning; engine, parts, and equipment cleaning	Solvents, carburetor cleaners, degreasers, cleaning fluids, acids/alkalies, engine cleaners	Petroleum distillates, aromatic hydrocarbons, mineral spirits, benzene, toluene, petroleum naphtha	Ignitable waste Solvent waste Combustible solids Waste acid/alkaline solutions
Rust removal	Naval jelly, strong acid/alkaline solutions	Phosphoric acid, hydrochloric acid, hydrofluoric acid, sodium hydroxide	Waste acid/alkaline solutions
Painting	Enamels, lacquers, epoxies, alkyds, acrylics, primers	Acetone, toluene, petroleum distillates, epoxy ester resins, methylene chloride, xylene, VM&P naphtha, aromatic hydrocarbons, methyl isobutyl ketones	Ignitable paint waste Solvent waste Paint waste with heavy metals Ignitable waste
Spray Booth, Spray Guns, Brush Cleaning; Paint Removal/Paint Preparation	Solvents, paint thinners, enamel reducers, white spirits	Acetone, toluene, petroleum distillates, methanol, methylene chloride, isopropanol, mineral spirits, alcohols, ketones, other oxygenated solvents	Ignitable paint waste Heavy metal paint waste Solvent waste
Changing Lead-Acid Batteries	Car, truck, boat, motorcycle, and other vehicle batteries	Lead dross, less than 3% free acids	Lead-acid batteries Strong acid/alkaline solutions
Changing Oil, Lubricating Machinery	Petroleum products	Motor oil, gasoline, lubricants	Used oil
<b>GRAPHIC ARTS - Plate Preparation</b>			
Counter-etching to Remove Oxide	Phosphoric acid	Phosphoric acid	Acid/alkaline waste
Deep-etch Coating of Plates	Deep etch bath	Ammonium dichromate, ammonium hydroxide	Acid/alkaline waste Heavy metal waste
Applying Light Sensitive Coating	Resins, binders, emulsion, photo-sensitizers, gelatin, photo-initiators	PVA/ammonium dichromate, polyvinyl cinnamate, fish glue/albumin, silver halide/gelatin emulsion, gum arabic/ammonium dichromate	Photographic processing waste
Developing Plates	Developer	Lactic acid, zinc chloride, magnesium chloride	Photographic processing waste
Washing/Cleaning Plates	Alcohols, solvents	Ethyl alcohol, isopropyl alcohol, methyl ethyl ketone, trichloroethylene, perchloroethylene	Solvent waste
Applying Lacquer	Resins, solvents, vinyl lacquer	PVC, PVA, maleic acid, methyl ethyl ketone	Solvent waste
Ink Use	Pigments, dyes, varnish, drier, extender, modifier	Titanium oxide, iron blues, molybdated chrome orange, phthalocyanide pigments, oils, hydrocarbon solvents, waxes, cobalt/zinc manganese oleates, plasticizers	Waste ink and ink sludges with chromium or lead
Making Gravure Cylinders	Acid plating bath	Copper, hydrochloric acid	Plating waste
Painting	Solvents, paint with solvents, heavy metals	Ethylene dichloride, benzene, toluene, ethylbenzene, chlorobenzene, methyl ethyl ketone	Ignitable waste Toxic waste Paint waste
<b>WOODWORKING</b>			
Wood Cleaning and Wax Removal	Petroleum distillates, white spirits	Petroleum distillates, mineral spirits	Ignitable waste Solvent waste
Refinishing/Stripping; Brush Cleaning and Spray Gun Cleaning	Paint removers, varnish removers, enamel removers, shellac removers, paint solvents, turpentine	Acetone, toluene, petroleum distillates, mineral spirits, methanol, methylene chloride, alcohols, ketone, oxygenated solvents	Ignitable waste Toxic waste Paint waste Solvent waste
Staining	Stains	Mineral spirits, alcohols, pigments	Ignitable waste Solvent waste
Painting	Enamels, lacquers, epoxies, alkyds, acrylics, primers, solvents	Toluene, pigments, titanium dioxide, epoxy-ester resins, aromatic hydrocarbons, glycol ether, halogenated hydrocarbons, vinyl acetate acrylic	Ignitable waste Toxic waste Paint waste Solvent waste
Finishing	Varnish, shellac, polyurethane, lacquers	Denatured alcohols, resins, shellac, petroleum distillates, toluene diisocyanate	Ignitable waste Toxic waste Solvent waste

**Table 2**  
**Educational and Vocational Shops Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>PHOTOGRAPHIC WASTES</b>				
Carbon Tetrachloride*	Carbon Tetrachloride, Perchloromethane, Necatorina, Benzinoform, CCl <sub>4</sub>	Waste Carbon Tetrachloride	ORM-A	UN1846
Heavy Metal Solutions	Photographic processing waste containing heavy metals	Hazardous Waste Solution containing Cadmium, Chromium, Lead, and/or Cyanide	ORM-E	NA9189
<b>SPENT SOLVENTS AND OTHER TOXIC OR IGNITABLE WASTES CONTAINING:</b>				
Acetone	Acetone	Waste Acetone	Flammable Liquid <sup>2</sup>	UN1090
White Spirits	White Spirits, Mineral Spirits, Naphtha	Waste Naphtha Waste Naphtha, Solvent Waste Naphtha, Solvent	Combustible Liquid <sup>3</sup> Flammable Liquid Combustible Liquid Flammable Liquid	UN2553 UN2553 UN1256 UN1256
Petroleum Distillate	Petroleum Distillates	Waste Petroleum Distillate	Combustible Liquid Flammable Liquid	UN1268 UN1268
Kerosene	Kerosene, Fuel Oil #1	Waste Kerosene	Combustible Liquid	UN1223
Methylene Chloride	Dichloromethane, Methane Dichloride, Methylene Bichloride, NCI-C50102, Solaesthin, Aerothene, Narkotil, Solmethine	Waste Dichloromethane or Methylene Chloride	ORM-A	UN1593
Toluene	Toluene, Methacide, Methylbenzene, Methylbenzol, Phenylmethane, Toluol, Antisal 1A	Waste Toluene (Toluol)	Flammable Liquid	UN1294
Benzene*	Benzene, Benzol	Waste Benzene (Benzol)	Flammable Liquid	UN1114
Ethanol	Ethanol, Ethyl Alcohol	Waste Ethyl Alcohol	Flammable Liquid	UN1770
Xylene	Xylene, Xylol	Waste Xylene	Flammable Liquid	UN1307
Tetrahydrofuran	Tetrahydrofuran, THF	Waste Tetrahydrofuran	Flammable Liquid	UN2056
Isopropanol	Isopropanol, Isopropyl Alcohol	Waste Isopropanol	Flammable Liquid	UN1219
Ethyl Benzene	Ethyl Benzene	Waste Ethyl Benzene	Flammable Liquid	UN1175
1,1,1-Trichloroethane	1,1,1-Trichloroethane, Aerothene TT, Chlorten, Inhibisol, Trichloroethane, Chloroethene NU, NCI-C04626, Methylchloroform, Chloroethene VG, Chlorothane NU, Chlorotene	Waste 1,1,1-Trichloroethane	ORM-A	UN2831
Trichloroethylene*	Perm-A-Chlor, Trielin, Triline, Trioil, Vestrol, Chlorylene, Dow-Tri, Vitran, TCE, Nialk, Philex	Waste Trichloroethylene	ORM-A	UN1710
Ethylene Dichloride*	Ethylene Dichloride, 1,2-Dichloroethane	Waste Ethylene Dichloride	Flammable Liquid	UN1184
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenyl Chloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, Methyl Acetone, Meetco, Butanone, Ethyl Methyl Ketone, MEK, 2-Butanone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
<b>WASTE INK WITH SOLVENTS OR HEAVY METALS</b>				
Waste Ink	Various ingredients: Carbon Tetrachloride, Chloroform, Methylene Chloride, 1,1,1-Trichloroethane, 1,2-Dichloroethane, Benzene, Toluene, Ethyl Benzene, Tetrachloroethylene, Trichloroethylene, Chromium, Copper, Lead, Zinc, Cyanide, Aluminum, Cadmium, Nickel, Cobalt	Waste Ink	Combustible Liquid Flammable Liquid	UN2867 UN1210
<b>INK SLUDGE WITH CHROMIUM OR LEAD</b>				
Ink sludge with Chromium or Lead	Ink sludge containing heavy metals	Hazardous Waste, Liquid, NOS <sup>4</sup> Hazardous Waste, Solid, NOS	ORM-E ORM-E	NA9189 NA9189

**Table 2** (continued)  
**Educational and Vocational Shops Waste Descriptions<sup>1</sup>**

Educational and Vocational Shops Waste Descriptions				UN/NA ID Number
Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	
STRONG ACID/ALKALINE WASTES				
Ammonium Hydroxide	Ammonium Hydroxide, NH <sub>4</sub> OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		Waste Ammonium Hydroxide (containing less than 12% ammonia)	ORM-A	NA2672
Hydrobromic Acid	Hydrobromic Acid, HBr	Waste Hydrobromic Acid	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, HCl, Muriatic Acid	Waste Hydrochloric Acid	Corrosive Material	NA1789
Hydrofluoric Acid	Hydrofluoric Acid, HF, Fluorohydric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, HNO <sub>3</sub> , Auafortis	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		Waste Nitric Acid (40% or less)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, H <sub>3</sub> PO <sub>4</sub> , Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, KOH, Potassium Hydrate, Caustic Potash, Potassa	Waste Potassium Hydroxide Solution	Corrosive Material	UN1814
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1813
Sodium Hydroxide	Sodium Hydroxide, NaOH, Caustic Soda, Soda Lye, Sodium Hydrate	Waste Sodium Hydroxide Solution	Corrosive Material	UN1824
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1823
Sulfuric Acid	Sulfuric Acid, H <sub>2</sub> SO <sub>4</sub> , Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1832
Chromic Acid	Chromic Acid	Waste Chromic Acid Solution	Corrosive Material	UN1755
Lacquer, Paint, or Varnish Removing Liquid	Lacquer, Paint, or Varnish Removing Liquid	Waste Compound, Lacquer, Paint, or Varnish Removing Liquid	Corrosive Material	NA1760
SPENT PLATING WASTES				
Spent Plating Wastes	Spent etch baths, spent plating solutions and sludges, stripping and cleaning baths	Hazardous Waste, Liquid, NOS	ORM-E	NA9189
		Hazardous Waste, Solid, NOS	ORM-E	NA9189
OTHER IGNITABLE AND/OR TOXIC WASTES				
Paint Dryer	Paint Dryer	Waste Paint Dryer, Liquid	Combustible Liquid Flammable Liquid	UN1168 UN1168
Paint, Enamel, Lacquer, Stain, Shellac, or Varnish; Aluminum, Bronze, Gold, Wood Filler, Liquid or Lacquer Base, Liquid	Paint, Enamel, Lacquer, Stain, Shellac, or Varnish; Aluminum, Bronze, Gold, Wood Filler, Liquid or Lacquer Base, Liquid	Waste Paint, Enamel, Lacquer, Stain, Shellac, or Varnish; Aluminum, Bronze, Gold, Wood Filler, Liquid or Lacquer Base, Liquid	Combustible Liquid Flammable Liquid	UN1263 UN1263
Enamel	Enamel	Waste Compound, Enamel	Flammable Liquid	NA1263
Lacquer, Paint, or Varnish Removing, Reducing, or Thinning Liquid	Lacquer, Paint, or Varnish Removing, Reducing, or Thinning Liquid	Waste Compound, Lacquer, Paint, or Varnish, Removing, Reducing, or Thinning Liquid	Combustible Liquid Flammable Liquid	NA1142 NA1142
PAINT WASTES WITH HEAVY METALS				
Paint Waste	Paint Waste with Heavy Metals	Hazardous Waste, Liquid, NOS	ORM-E ORM-E	NA9189 NA9189
IGNITABLE WASTES NOT OTHERWISE SPECIFIED (NOS)				
Ignitable Wastes, NOS	Ignitable Wastes, NOS	Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Combustible Liquid, NOS	Combustible Liquid	NA1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
Hazardous Wastes, NOS		Hazardous Wastes, Liquid, Solid, NOS	ORM-E	NA9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA categories of hazardous waste. 3 A combustible liquid has a flash point between 100°F and 200°F.

2 A flammable liquid has a flash point below 100°F.

4 NOS - not otherwise specified.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Laboratories

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## Industry Overview

Not all laboratories produce hazardous waste. If, however, you use ignitable compounds, strong acid or alkaline solutions, solvents, heavy metals, or toxic organic constituents, the waste you generate might be hazardous. If you generate hazardous waste, you might be subject to Resource Conservation Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

*Laboratories* that use chemicals are likely to generate hazardous waste. These laboratories include:

- Research and development laboratories, such as government labs (e.g., National Institutes of Health, Food and Drug Administration) and industrial labs (e.g., chemicals, pharmaceuticals)
- Commercial testing laboratories, including labs that analyze hazardous waste samples
- Academic laboratories, such as university and high school labs, and labs of educational or scientific organizations
- Medical laboratories, including hospital and dental labs.

## Hazardous Wastes from Laboratories

A large variety of wastes are generated by laboratories. The following wastes are commonly generated:

**Spent solvents** used in cleaning, extraction, or other processes

**Unused reagents** that are no longer needed, do not meet specifications, are contaminated, have exceeded their storage life, or are otherwise unusable in the lab

**Reaction products** of known or unknown composition, which are often produced by research and academic labs. (To facilitate disposal, labs should try to identify or characterize reaction products to the extent possible and label them with this information.)

**Testing samples** that are not entirely consumed by the test procedure

**Contaminated materials** such as glassware, paper, and plastic products.

If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. Table 1 lists DOT shipping descriptions for some wastes generated by laboratories. Table 1 is not a comprehensive list. If you do not find your waste here but suspect it is hazardous, contact your EPA Regional office or state hazardous waste management agency for additional information.

Radioactive waste, which is generated by some laboratories, is generally regulated under the Atomic Energy Act and in many cases is excluded from RCRA regulation. Nuclear Regulatory Commission and DOT regulations might apply. Contact the Nuclear Regulatory Commission, the DOT Materials Transport Bureau, or your state transportation agency for more information concerning proper transport and disposal of radioactive waste.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Laboratories Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>SOLVENTS</b>				
Acetone		Waste Acetone	Flammable Liquid <sup>2</sup>	UN1090
Benzene*		Waste Benzene	Flammable Liquid	UN1114
Chloroform* Trichloromethane		Waste Chloroform	ORM-A	UN1888
1,4-Dioxane Diethylene Ether 1,4-Diethylene Oxide Diethylene Oxide Dixyethylene Ether		Waste Dioxane	Flammable Liquid	UN1165
Ethanol Ethyl Alcohol Grain Alcohol		Waste Ethyl Alcohol	Flammable Liquid	UN1170
Ethyl Ether Ether Diethyl Ether Diethyl Oxide		Waste Ethyl Ether	Flammable Liquid	UN1155
Formalin Formaldehyde Solution (1) flash point greater than 141°F		Waste Formaldehyde Solution	ORM-A (or Combustible Liquid if shipped in containers larger than 110 gallons)	UN2209
(2) flash point less than or equal to 141°F		Waste Formaldehyde Solution	ORM-A (or Combustible Liquid if shipped in containers larger than 110 gallons)	UN1198
Hexane n-Hexane		Waste Hexane	Flammable Liquid	UN1208
Isopropanol Isopropyl Alcohol TPA Dimethyl Carbinol 2-Propanol		Waste Isopropanol	Flammable Liquid	UN1219
Methanol Methyl Alcohol Wood Alcohol		Waste Methyl Alcohol	Flammable Liquid	UN1230
Methyl Ethyl Ketone* MEK 2-Butanone		Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Methylene Chloride Dichloromethane		Waste Dichloromethane (or Waste Methylene Chloride)	ORM-A	UN1593
Pentane		Waste Pentane	Flammable Liquid	UN1265
Petroleum Ether		Waste Petroleum Ether	Flammable Liquid	UN1271
Tetrahydrofuran THF		Waste Tetrahydrofuran	Flammable Liquid	UN2056
Toluene Toluol Methyl Benzene		Waste Toluene	Flammable Liquid	UN1294
Xylene Xylol Dimethyl Benzene		Waste Xylene	Flammable Liquid	UN1307



**Table 1** (continued)  
**Laboratories Waste Descriptions<sup>1</sup>**

<b>Waste Type</b>	<b>Designations/Trade Names</b>	<b>DOT Shipping Name</b>	<b>Hazard Class</b>	<b>UN/NA ID Number</b>
Carbon Tetrachloride* Carbon Tet Tetrachloromethane Perchloromethane		Waste Carbon Tetrachloride	ORM-A	UN1846
Ignitable Liquids		Waste Flammable Liquids, NOS <sup>3</sup> Waste Combustible Liquids, NOS	Flammable Liquid Combustible Liquid	UN1993 NA1993
<b>ACIDS/BASES</b>				
Acetic Acid		Waste Acetic Acid, Glacial Waste Acetic Acid, Solution	Corrosive Material Corrosive Material	UN2789 UN2790
Hydrochloric Acid		Waste Hydrochloric Acid	Corrosive Material	UN1789
Nitric Acid		Waste Nitric Acid, over 40% Waste Nitric Acid, 40% or less Waste Nitric Acid, Fuming	Oxidizer Corrosive Material Oxidizer	UN2031 NA1760 UN2032
Perchloric Acid		Waste Perchloric Acid, not over 50% acid Waste Perchloric Acid, exceeding 50% but not exceeding 72% acid Waste Perchloric Acid, exceeding 72% acid	Oxidizer Oxidizer Forbidden <sup>4</sup>	UN1802 UN1873
Sulfuric Acid		Waste Sulfuric Acid Waste Sulfuric Acid, Spent	Corrosive Material Corrosive Material	UN1830 UN1832
Oleum Fuming Sulfuric Acid		Waste Oleum	Corrosive Material	NA1831
Ammonium Hydroxide Ammonia Solution Aqueous Ammonia		Waste Ammonium Hydroxide, containing less than 12% ammonia Waste Ammonium Hydroxide, containing not less than 12% but not more than 44% ammonia	ORM-A Corrosive Material	NA2672 NA2672
Potassium Hydroxide Caustic Potash		Waste Potassium Hydroxide, Solid Waste Potassium Hydroxide, Liquid	Corrosive Material Corrosive Material	UN1813 UN1814
Sodium Hydroxide Caustic Soda Lye		Waste Sodium Hydroxide, Solid Waste Sodium Hydroxide, Liquid	Corrosive Material Corrosive Material	UN1823 UN1824
<b>NON-SPECIFIC WASTES</b>				
Corrosive Liquids		Waste Corrosive Liquids, NOS	Corrosive Material	UN1760
Corrosive Solids		Waste Corrosive Solid, NOS	Corrosive Material	UN1759
Oxidizer, Corrosive, Liquid		Waste Oxidizer, Corrosive, Liquid, NOS	Oxidizer	NA9193
Oxidizer, Corrosive, Solid		Waste Oxidizer, Corrosive, Solid, NOS	Oxidizer	NA9194
Oxidizer		Waste Oxidizer, NOS	Oxidizer	UN1479
Poisonous Liquid <sup>5</sup>		Waste Poison B, Liquid, NOS	Poison B	UN2810
Poisonous Solid		Waste Poison B, Solid, NOS	Poison B	UN2811
Corrosive, Poisonous Liquid		Waste Corrosive Liquid, Poisonous, NOS	Corrosive Material	UN2922

**Table 1** (continued)  
**Laboratories Waste Descriptions<sup>1</sup>**

<b>Waste Type</b>	<b>Designations/Trade Names</b>	<b>DOT Shipping Name</b>	<b>Hazard Class</b>	<b>UN/NA ID Number</b>
Poisonous, Corrosive Solid		Waste Poisonous Solid, Corrosive, NOS	Poison B	UN2928
Poisonous, Oxidizing Liquid		Waste Oxidizer, Poisonous, Liquid, NOS	Oxidizer	NA9199
Poisonous, Oxidizing Solid		Waste Oxidizer, Poisonous, Solid, NOS	Oxidizer	NA9200
Hazardous Waste Liquid <sup>6</sup>		Hazardous Waste, Liquid, NOS	ORM-E	NA9189
Hazardous Waste Solid		Hazardous Waste, Solid, NOS	ORM-E	NA9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics, conditions or process modifications. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA categories of hazardous waste.

2 Substances with a flash point less than 100°F are classified as "Flammable Liquid"; substances with a flash point greater than or equal to 100°F and less than 200°F are classified as "Combustible Liquid."

3 NOS - Not Otherwise Specified.

4 Forbidden materials are prohibited from being offered or accepted for transportation.

5 Certain gases and volatile liquids (e.g., cyanogen, phosgene) are classed as Poison A. The gases and liquids have a different UN/NA ID; NA 1953 for poisonous liquid or gas, flammable, NOS; or NA 1955 or poisonous liquid or gas, NOS.

6 Materials (e.g., disposable labware) contaminated with small quantities of a variety of hazardous substances generally can be classified as Hazardous Waste, NOS, unless a more specific DOT shipping name applies. The entire weight of the contaminated materials, not just the weight of the substance(s) making it hazardous, is considered when determining quantity.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Metal Manufacturing

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## Industry Overview

Most metal manufacturing operations produce some hazardous waste. If you use any solvents, strong acid or alkaline solutions, plating solutions, paints, cyanide solutions, or any solutions containing heavy metals, it is likely that your operation generates hazardous waste. Facilities that generate hazardous waste might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

Your business is classified under *metal manufacturing* if you manufacture:

- Metal furniture, shelves, lockers, cabinets and fixtures
- Primary metal products
- Fabricated metal products
- Machinery, including electrical and electronic machinery, equipment, and supplies
- Storage or primary batteries
- Motor vehicle parts and accessories
- Measuring, analyzing, or controlling instruments (for example, photographic, medical, or optical equipment)
- Other metal items such as clocks and watches; costume and precious metal jewelry; needles, pins, and similar notions; signs and advertising displays; burial caskets; silverware or stainless steel flatware.

*Metal manufacturing* also includes facilities that are involved in metalworking activities such as:

- Rolling, drawing, and extruding of non-ferrous metals
- Heat treating
- Coating, engraving, and allied services.

## Hazardous Wastes from Metal Manufacturing

Metal manufacturing businesses perform many different processes, including machining, grinding, buffing, polishing, tumbling, sand casting, forming, rolling, extruding, forging, ironing, lettering, enameling, cleaning, welding, finishing, die sinking, pickling, coining, degreasing, electrogalvanizing, electroplating, and painting. The wastes associated with these processes fall into several major categories:

**Spent solvent and solvent still bottoms** result from cleaning and degreasing operations. The types of solvents used include chlorinated solvents (e.g., methylene chloride, dichlorobenzene, carbon tetrachloride, trichloroethylene) or hydrocarbons (e.g.,

xylene, toluene, benzene). Other solvents are kerosene or mineral spirits ("Stoddard" solvents).

**Strong acid wastes** are generated in considerable quantity wherever any type of metal is formed or processed. Many pickling solutions are highly acidic; the acid, if not neutralized, might be carried to subsequent manufacturing operations. Subsequent operations can include drawing, rolling, pressing, electroplating, hot dip galvanizing or hot tinning, anodizing, phosphating, metal coloring, and many others.

**Strong alkaline wastes** are generated from the use of pickled aluminum and sometimes zinc.

**Plating wastes** are generated from electroplating operations. These wastes can be acidic or alkaline and contain significant concentrations of heavy metals. Acid plating solutions generally contain free acids and heavy metals such as copper, nickel, zinc, and possibly tin or cadmium. Alkaline plating solutions include zinc baths and sometimes tin baths. The waste products from plating can include spent plating solutions or sludges and stripping and cleaning bath solutions.

**Heavy metal wastewater sludges** are generated from wastewater treatment. Depending on the operation, these sludges can contain arsenic, barium, chromium, cadmium, lead, mercury, silver, or selenium. High concentrations of lead are found in the sludges from battery manufacturing plants. Other sludges can come from grinding, tank clean-outs, dust collectors, and lead pots.

**Paint and coating wastes** are generated by several segments of the industry. Generally, hazardous paint wastes contain cadmium, chromium, lead and/or mercury. Paints, lacquers, adhesives, and varnishes might contain toxic organic chemicals as well.

**Cyanide wastes** are generated from cyanide plating solutions and simple cyanide solutions. Cyanide plating solutions are used in metal plating operations. Simple cyanide solutions are used mainly for hardening and metal cleaning. Cyanide baths are commonly used in metal finishing and heat treating operations.

**Other ignitable or toxic wastes** are generated by the metal manufacturing industry. It is important to determine if your business generates any waste containing chemicals on the Toxicity Characteristic list.

**Other reactive wastes** are generated primarily by the photographic equipment and supplies industry, although other metal manufacturing industries can also generate reactive wastes. These wastes can include strong oxidizing agents such as chromic acid, perchlorates, and permanganates used in metal finishing, and other reactive compounds such as hypochlorites, peroxides, sulfides, nitrates, and sodium hydroxide.

In addition to these wastes, most metal manufacturing industry operations will generate used oil. Oils can come from cutting, lubricating, and/or quenching. RCRA regulations contain special provisions for used oil. You do not have to use a Manifest when shipping used oil that is destined for recycling. If, however, you are disposing of used oil yourself or are sending it offsite for disposal, it generally should be handled as hazardous waste because it is likely to be ignitable or toxic. Special requirements apply if you are burning used oil as fuel. Some states have rules that apply to used oil, and EPA is currently developing new regulations for used oil.

Most metal manufacturers also generate scrap metal. At present, any metal destined for reclamation is not regulated by EPA. Questions concerning used oils, scrap metal and other wastes should be referred to your state hazardous waste management agency or EPA Regional office.

Table 1 lists general operations/processes that use hazardous materials and that might result in the generation of hazardous waste. If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship the hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. Table 2 lists proper DOT shipping descriptions for a number of wastes that might be generated by metal manufacturers. Table 1 and Table 2 are not comprehensive lists. If you suspect any waste you generate is hazardous, check with your state hazardous waste management agency or EPA Regional office.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can

help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Metal Manufacturing Operations:**  
**Materials Used and Hazardous Wastes that Might be Generated**

Process/Operation	Materials Used	General Types of Waste Generated
Metal Cutting/Machining	Oils, solvents, lime, metal cuttings	Acid/alkaline wastes Toxic heavy metal wastes (dust and sludge) Solvent wastes Other toxic wastes
Degreasing	Solvents, alkaline wastes, rags	Acid/alkaline wastes Ignitable wastes Solvent wastes Toxic wastes
Pickling	Pickling acids	Acid/alkaline wastes
Heat Treating	Quenching oils, cyanide salts, barium salts, alkaline wastes	Acid/alkaline wastes Cyanide wastes Toxic heavy metal wastes
Metal Finishing and Painting	Paints, coatings, cleaning solvents, alkaline cleaning solutions, lacquers	Acid/alkaline wastes Paint wastes Solvent wastes Toxic wastes
Facility Cleanup	Solvents, rags, absorbents	Solvent wastes
Electroplating	Heavy metals, cyanide solutions, acid and alkaline solutions, plating solutions	Acid/alkaline wastes Cyanide wastes Toxic heavy metal wastes Plating wastes Reactive wastes

**Table 2**  
**Metal Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>SPENT SOLVENTS, SOLVENT STILL BOTTOMS, AND OTHER TOXIC WASTES CONTAINING:</b>				
Tetrachloroethylene*	Perchloroethylene, Perc, Tetralox, Perawin, Perelene, Terlen, Didakene, TetraCap, Antisal 1, Fedad-UN, Neme Gemalgene, Perma-A-Chlor, TCE, Benzinol, Dow-Tri, Nialk, Vestrol, Trielin	Waste Tetrachloroethylene or Perchloroethylene	ORM-A	UN1897
Trichloroethylene*	Tri-Clene, Trielene, Tri	Waste Trichloroethylene	ORM-A	UN1710
Methylene Chloride	Aerothene MM, Narkotil	Waste Dichloromethane or Methylene Chloride	ORM-A	UN1593

**Table 2** (continued)  
**Metal Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
1,1,1-Trichloroethane	Aerotherne TT, Chlorten, Inhibisol, Chlorothen NU, Alpha-T	Waste 1,1,1-Trichloroethane	ORM-A	UN2831
Carbon Tetrachloride*	Perchloromethane, Tetraform, Carbona, Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Trichlorotrifluoroethane	Fluorocarbon 113, Freon 113, Ucon 113, Freon TF, Frigen 113 113TR-T, Arcton 63	Hazardous Waste, Liquid, NOS <sup>2</sup>	ORM-E	NA9189
Trichlorotrifluoromethane	Eskimon 11, Ucon 11, Isotron 11, Freon 11, Freon MF, Fluorochloroform, Arcton 9	Hazardous Waste, Liquid, NOS	ORM-E	NA9189
Toluene	Toluol, Methercid, Methyl Benzene, Methylbenzol, Phenylmethane, Antisol 1A	Waste Toluene (toluol)	Flammable Liquid <sup>3</sup>	UN1294
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, MEK, Methyl Acetone, Meetco, Butanone, Ethyl Methyl Ketone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Benzene*	Benzene	Waste Benzene (benzol)	Flammable Liquid	UN1114
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
o-Dichlorobenzene*	o-Dichlorobenzene	Waste Dichlorobenzene, ortho, Liquid	ORM-A	UN1591
p-Dichlorobenzene*	p-Dichlorobenzene	Waste Dichlorobenzene, para	ORM-A	UN1592
Acetone	Acetone	Waste Acetone	Flammable Liquid	UN1090
Xylene	Xylene, Xylol	Waste Xylene (xylol)	Flammable Liquid	UN1307
White Spirits	Mineral Spirits, Naphtha, Stoddard Solvent	Waste Naphtha	Flammable Liquid	UN2553
Kerosene	Kerosene, Fuel Oil #1	Waste Kerosene	Combustible Liquid <sup>4</sup>	UN1223
Butyl Alcohol	n-Butyl Alcohol, sec-Butyl Alcohol, tert-Butyl Alcohol	Waste Butyl Alcohol	Flammable Liquid	NA1120
<b>STRONG ACID/ALKALINE WASTES</b>				
Ammonium Hydroxide	Ammonium Hydroxide, NH <sub>4</sub> OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		(containing less than 12% ammonia)	ORM-A	NA2672
Hydrobromic Acid	Hydrobromic Acid, HBr	Waste Hydrobromic Acid	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, HCl, Muriatic Acid	Waste Hydrochloric Acid	Corrosive Material	NA1789
Hydrofluoric Acid	Hydrofluoric Acid, HF, Fluorohydric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, HNO <sub>3</sub> , Aquafortis	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		(40% or less)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, H <sub>3</sub> PO <sub>4</sub> , Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, KOH, Potassium Hydrate, Caustic Potash, Potassa	Waste Potassium Hydroxide Solution	Corrosive Material	UN1814
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1813
Sodium Hydroxide	Sodium Hydroxide NaOH, Caustic Soda, Soda Lye, Sodium Hydrate	Waste Sodium Hydroxide Solution	Corrosive Material	UN1824
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1823
Sulfuric Acid	Sulfuric Acid, H <sub>2</sub> SO <sub>4</sub> , Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1832
Perchloric Acid	Perchloric Acid	Waste Perchloric Acid (Over 50%-72%)	Oxidizer	UN1873
		Waste Perchloric Acid (50% or less)	Oxidizer	UN1802

**Table 2** (continued)  
**Metal Manufacturing Waste Descriptions<sup>1</sup>**

Metal Manufacturing Waste Descriptions				
Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Acetic Acid	Acetic Acid	Waste Acetic Acid (Aqueous Solution)	Corrosive Material	UN2790
Nitrates	Nitrate	Waste Nitrate, NOS	Oxidizer	NA1477
SPENT PLATING WASTES				
Spent Plating Wastes	Spent Acid, Alkaline and Cyanide Plating Solutions and Sludges	Hazardous Waste, Liquid or Solid, NOS	ORM-E	NA9189
HEAVY METAL WASTEWATER SLUDGES				
Heavy Metal Wastewater Sludges	Sludges from wastewater treatment, grinding, tank clean outs, dust collectors, and lead pots	Hazardous Waste, Liquid or Solid, NOS	ORM-E	NA9189
CYANIDE WASTES				
Cyanide Waste	Spent cyanide, hardening and cleaning solutions, sludge from quench and wash tank	Waste Cyanide Solution, NOS	Poison B	UN1935
		Waste Cyanide Mixture, Dry	Poison B	UN1588
OTHER REACTIVE WASTES				
Acetyl Chloride	Acetyl Chloride	Waste Acetyl Chloride	Flammable Liquid	UN1717
Chromic Acid	Chromic Acid	Waste Chromic Acid Solution	Corrosive Material	UN1755
Hypochlorites	Hypochlorous Acid, Eau de Labarraque, Clorox, Dazzle	Hypochlorite solution (7% chlorine by weight)	Corrosive Material	UN1791
		Hypochlorite solution (7% chlorine by weight)	ORM-B	NA1791
Organic Peroxides	Organic Peroxide	Waste Organic Peroxide, Liquid or Solution, NOS	Organic Peroxide	NA9183
Perchlorates	Sodium or Potassium Perchlorate, Irenat, Periodin, Perchlorocap	Waste Sodium Perchlorate	Oxidizer	UN1502
		Waste Potassium Perchlorate	Oxidizer	UN1489
Permanganates	Sodium or Potassium Permanganate, Permanganic Acid, Chameleon Mineral	Waste Sodium Permanganate	Oxidizer	UN1503
		Waste Potassium Permanganate	Oxidizer	UN1490
Sulfides	Sodium or Potassium Sulfide, Sodium or Potassium Monosulfide, Sodium Sulfuret	Waste Sodium Sulfide	Flammable Solid	UN1385
		Waste Potassium Sulfide	Flammable Solid	UN1382
OTHER WASTES				
Used Oil	Dodge Combo MP8, Texaco Cleartex-D, Mobil Omicron, Shell Tellus, Welbube A-307, Eppert 204, Sunvis 931, Solene, Mobilmet Omieron	Waste Petroleum Oil, NOS	Combustible Liquid	NA1270
		Waste Petroleum Oil, NOS	Flammable Liquid	NA1270
Ignitable Wastes, NOS	Ignitable Wastes, NOS	Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Combustible Liquid, NOS	Combustible Liquid	NA1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
Hazardous Waste, NOS		Hazardous Waste, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA categories of hazardous waste.

2 NOS - Not otherwise specified.

3 A flammable liquid has a flash point below 100°F.

4 A combustible liquid has a flash point between 100°F and 200°F; only those materials with flash points below 140°F, however, are considered hazardous under EPA regulations.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Paper Industry

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## Industry Overview

Not all pulp and paper mills or converting operations generate hazardous waste. If, however, your facility uses strong acids and bases, toxic organic chemicals, paints and adhesives, ink, or solvents, the waste associated with using these materials might be hazardous waste. If you generate hazardous waste, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

The *paper industry* is composed of several sectors, including:

- Pulp and paper mills, which produce mechanical, thermomechanical, and chemical pulps and process these pulps to form paper, paperboard, or building papers
- Converting operations, which manufacture boxes, tablets, and other finished paper products.

## Hazardous Wastes from the Paper Industry

Pulp is made by mechanically or chemically separating the fibers in wood or other cellulose materials from nonfibrous material. In the kraft pulping process, used to make most chemical pulp, a solution of sodium hydroxide and sodium sulfide dissolves the nonfibrous materials. The pulp is then bleached if white paper is being produced. Several chemicals can be used for bleaching, including chlorine gas, sodium hydroxide, calcium hypochlorite, chlorine dioxide, hydrogen peroxide, and sodium peroxide. After any fillers and coloring materials are added, the pulp slurry is made into paper. Certain coatings can also be applied to the paper.

The large-volume wastes produced by the paper industry are not often classified as hazardous under RCRA. Some wastewaters and wastewater treatment sludges might fail the Toxicity Characteristic Leaching Procedure (TCLP) test due to the presence of organic constituents such as chloroform or trichloroethylene. Several lower volume hazardous wastes are generated, including:

**Spent halogenated solvents** used in degreasing

**Corrosive waste** generated from the use of strong acids and bases

**Paint waste** containing solvents and paint waste with heavy metals

**Ink waste**, which can include solvents, metals, or ignitable materials

**Petroleum distillates** from cleanup operations.

Spills of hazardous substances might also generate RCRA-regulated hazardous waste. Certain paper manufacturing facilities have associated research laboratories, which might produce a variety of hazardous wastes. Table 1 lists some typical processes/operations that might produce hazardous waste. Table 2 lists Department of Transportation (DOT) shipping descriptions (required on the Uniform Hazardous Waste Manifest) for a number of wastes that might be generated by the paper industry. Table 1 and Table 2 are not comprehensive lists. If you do not find your waste here but suspect it is hazardous, contact your EPA Regional office or state hazardous waste management agency for additional information.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Paper Industry Operations:**  
**Materials Used and Hazardous Wastes that Might be**  
**Generated**

Process/ Operation	Materials Used	General Types of Waste Generated
Chemical Pulping	Acids/alkalies, lime, sulfurous acid, sodium hydroxide, sodium sulfide	Acid/alkaline waste
Bleaching	Chlorine bleaches, sulfate bleaches, chloroform, solvents	Toxic wastewater and wastewater treatment sludge Acid/alkaline waste
Papermaking	Pigments	Wastewater treatment sludge
Sizing and Starching	Waxes, glues, synthetic resins, hydrocarbons	Toxic waste, including wastewaters and sludges
Coating, Coloring, and Dyeing	Inks, paints, solvents, rubbers, dyes	Solvent waste Ink waste Paint waste Ignitable waste Toxic waste
Cleaning and Degreasing	Tetrachloroethylene, trichloroethylene, methylene chloride, trichloroethane, carbon tetrachloride	Solvent waste Toxic rinse water

**Table 2**  
**Paper Industry Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>SPENT SOLVENTS AND OTHER TOXIC OR IGNITABLE WASTES CONTAINING:</b>				
Carbon Tetrachloride*	Carbon Tetrachloride, Carbon Tet, Tetrachloromethane	Waste Carbon Tetrachloride	ORM-A	UN1846
Methylene Chloride	Methylene Chloride, Dichloromethane	Waste Dichloromethane	ORM-A	UN1593
Tetrachloroethylene*	Tetrachloroethylene, Perchloroethylene, PCE	Waste Tetrachloroethylene	ORM-A	UN1897
1,1,1-Trichloroethane	1,1,1-Trichloroethane, 1,1,1-TCA	Waste 1,1,1-Trichloroethane	ORM-A	UN2831
Trichloroethylene*	Trichloroethylene, TCE	Waste Trichloroethylene	ORM-A	UN1710
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Benzene*	Benzene	Waste Benzene (Benzol)	Flammable Liquid <sup>2</sup>	UN1114
Ethylene Dichloride*	Ethylene Dichloride, 1,2-Dichloroethane	Waste Ethylene Dichloride	Flammable Liquid	UN1184
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenyl Chloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, Methyl Acetone, Meeto, Butanone, Ethyl Methyl Ketone, MEK, 2-Butanone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Mixed Spent Halogenated Solvents <sup>e</sup>		Hazardous Waste, Liquid, NOS <sup>3</sup>	ORM-E	NA9189
Petroleum Distillates	Petroleum Distillates	Waste Petroleum Distillate	Flammable Liquid Combustible Liquid <sup>4</sup>	UN1268 UN1268



**Table 2** (continued)  
**Paper Industry Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>CORROSIVE WASTES</b>				
Ammonium Hydroxide	Ammonium Hydroxide, Aqueous Ammonia, Ammonia Water, Spirit of Hartshorn	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		Waste Ammonium Hydroxide (containing less than 12% ammonia)	ORM-A	NA2672
Hydrobromic Acid	Hydrobromic Acid	Waste Hydrobromic Acid	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, Muriatic Acid	Waste Hydrochloric Acid Mixture	Corrosive Material	NA1789
		Waste Hydrochloric Acid Solution	Corrosive Material	UN1789
Hydrofluoric Acid	Hydrofluoric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, Aquafortis	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		Waste Nitric Acid (40% or less nitric acid)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, Caustic Potash	Waste Potassium Hydroxide Solution	Corrosive Material	UN1814
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1813
Sodium Hydroxide	Sodium Hydroxide	Waste Sodium Hydroxide Solution	Corrosive Material	UN1824
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1823
Sulfuric Acid	Sulfuric Acid, Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1832
<b>OTHER WASTES AND GENERAL CLASSIFICATIONS</b>				
Paint Waste with Heavy Metals	Paint Waste with Heavy Metals	Hazardous Waste, Liquid or Solid, NOS	ORM-E	NA9189
Corrosive Liquid	Corrosive Liquids	Waste Corrosive Liquid, NOS	Corrosive Material	UN1760
Corrosive Solid	Corrosive Solids	Waste Corrosive Solid, NOS	Corrosive Material	UN1759
Ignitable Wastes, NOS	Ignitable Wastes, NOS	Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Combustible Liquid, NOS	Combustible Liquid	UN1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
Hazardous Wastes, NOS		Hazardous Waste, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT name, hazard class, and UN/NA shipping ID number do not directly correspond to RCRA categories of hazardous waste.

2 A flammable liquid has a flash point below 100°F.

3 NOS -Not otherwise specified.

4 A combustible liquid has a flash point between 100°F and 200°F.

# Formulators

## Industry Overview

If your operation is in the chemical formulating industry category and you use solvents, pesticides, strong acids or bases, ignitable chemicals, reactive chemicals, or solutions or sludges containing metals or toxic organic chemicals, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

The following *chemical formulating industry* groups are covered by this summary:

- Printing ink
- Pesticides and agricultural chemicals
- Pharmaceutical preparations
- Paint and coatings
- Chemical product formulation not elsewhere classified under chemical manufacturing.

## Hazardous Wastes From Formulators

While the specific chemical constituents of your waste can vary depending on the type of chemicals you formulate, most formulators will have wastes that fall under one of the following categories:

**Spent or unusable materials** such as chemicals and solvents

**Rinsing solutions** from cleaning of containers, mixing vats, and tools

**Rags and other cleaning implements.**

In addition, specific formulators generate wastes such as used pesticide and pesticide containers, spent catalysts, wastes containing heavy metals, ink wastes, ignitable wastes, and reactive wastes.

**Printing ink** formulation involves the combination of basic constituents in proportions that depend on the desired properties of the ink. In general, inks are made from coloring materials that can include flushed colors, color concentrates, toners, and pigments; resins and varnishes; and solvents. Pigments might contain heavy metals or other toxic constituents. Resins and varnishes might contain toxic organic constituents. Many spent solvents are listed wastes. In addition to these basic ingredients, other ingredients that contain hazardous materials are sometimes added to adjust the ink's properties. These include driers, waxes, antioxidants, thickeners and gellants, defoamers, wetting agents, and surfactants. The main categories of wastes generated from the formulation of printing ink include alkaline wastes, spent solvents and solvent still bottoms, heavy metal solutions, ink sludges containing chromium or lead, and other wastes that might contain toxic organic constituents.

**Pesticide and agricultural chemical** formulators mix concentrated pesticides with carriers and dispersing agents for use

by pesticide applicators. The formulations can include a number of compounds that enhance the properties of the pesticide product. The carriers, dispersing agents, and other compounds might contain hazardous constituents. In general, the wastes from pesticide and agricultural formulators are pesticide-contaminated rinse solutions generated from washing and rinsing the drums, vats, and assorted instruments used to mix the formulation.

Formulators of **pharmaceutical preparations** generate spent solvents and solvent still bottoms, ignitable wastes, and possibly toxic wastewaters and sludges. The formulation of **paints and coatings** (e.g., varnishes, lacquers, enamels) usually involves the use of solvents, driers, plastic resins, alcohols, phthalates, and inorganic pigments. Potentially hazardous wastes from the formulation of paints and coatings are solvent wastes, sludges, cleaning wastes, spills, and spoiled batches. Formulators of **other miscellaneous chemical products** often generate hazardous wastes including strong acid/alkaline wastes, spent solvents and still bottoms, reactive wastes, ignitable wastes, and toxic wastes.

Table 1 summarizes some of the general waste types generated during formulation. If you generate more than 100 kilograms (220 pounds or one-half of a 55-gallon drum) of hazardous waste per month, you must complete a Uniform Hazardous Waste Manifest when you ship your waste off your property. The Manifest requires the DOT (Department of Transportation) description of the waste including shipping name, hazard class, and UN/NA ID number. This information is present in Tables 2 through 5 for some wastes generated by formulators. These tables are not comprehensive lists. If you suspect that you generate a hazardous waste that is not on this list, contact your state hazardous waste management agency or EPA Regional office for assistance.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Formulators Operations: Materials Used and Hazardous Wastes that Might be Generated**

Process/ Operation	Materials Used	General Types of Waste Generated
Printing Ink Formulation	Coloring materials, resins, varnishes, solvents, driers, antioxidants, thickeners, gellants, waxes, defoamers, wetting agents, surfactants	Acid/alkaline wastes Toxic heavy metal wastes (dust and sludge) Ink — sludges with chromium or lead Solvent wastes Other toxic wastes
Pesticide and Agricultural Chemical Formulation	Pesticides, solvents, organic chemicals, heavy metals	Pesticide wastes Empty containers Rinsewater Solvent wastes Toxic wastes
Pharmaceutical Preparations Formulation	Solvents, resins, lubricants, gelatins	Solvent wastes Ignitable wastes Toxic wastewaters and wastewater treatment sludges
Paint and Coatings Formulation	Paints, solvents, heavy metals, acids/alkalies, driers, plastic resins, plasticizers	Acid/alkaline wastes Toxic heavy metal wastes (dust and sludge) Other toxic wastes Paint wastes Solvent wastes Spoiled batches
Chemical Product Formulation not Classified Elsewhere	Solvents, chemicals, catalysts, acids/alkalies, heavy metals	Acid/alkaline wastes Toxic heavy metal wastes (dust and sludge) Other toxic wastes Ignitable wastes Reactive wastes Solvent wastes Spent catalysts Emission control dusts and sludges

**Table 2**  
**Printing Ink Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
STRONG ALKALINE WASTES				
Ammonium Hydroxide	Ammonium Hydroxide, NH <sub>4</sub> OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		(containing less than 12% ammonia	ORM-A	NA2672
SPENT SOLVENTS, SOLVENT STILL BOTTOMS, AND IGNITABLE TOXIC WASTES CONTAINING:				
Benzene*	Benzene	Waste Benzene (Benzol)	Flammable Liquid <sup>2</sup>	UN1114
Acetone	Acetone	Waste Acetone	Flammable Liquid	UN1090
Toluene	Toluene, Methacide, Methylbenzene, Methylbenzol, Phenylmethane, Toluol, Antisal 1A	Waste Toluene (Toluol)	Flammable Liquid	UN1294
Methyl Ethyl Ketone*	Methyl acetone, Meetco, Butanone, MEK, 2-butanone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Xylene	Xylene, Xylol	Waste Xylene (Xylol)	Flammable Liquid	UN1307
Ethyl Acetate	Ethyl Acetate	Waste Ethyl Acetate	Flammable Liquid	UN1173
n-Butyl Acetate	Butyl Acetate	Waste n-Butyl Acetate	Flammable Liquid	UN1123
Isopropyl Acetate	Isopropyl Acetate	Waste Isopropyl Acetate	Flammable Liquid	UN1220

**Table 2** (continued)  
**Printing Ink Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Glycol Ethers	May include numerous compounds including diethylene glycol and hexylene glycol	Waste Combustible Liquid, NOS <sup>3</sup>	Combustible Liquid <sup>4</sup>	NA1993
Ethyl Alcohol	Ethanol	Waste Ethyl Alcohol	Flammable Liquid	NA1170
Isopropyl Alcohol	Isopropanol	Waste Isopropanol	Flammable Liquid	UN1219
Propyl Alcohol	Propanol	Waste Propyl Alcohol	Flammable Liquid	UN1274
Hexane	Hexane	Waste Hexane	Flammable Liquid	UN1208
Heptane	Heptane	Waste Heptane	Flammable Liquid	UN1206
Naphtha	Mineral Spirits, VM&P Naphtha, White Spirits	Waste Naphtha	Combustible Liquid	UN2553
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Cresols*	o-Cresol, m-Cresol, p-Cresol, (m,p)-Cresol, (o,m,p)-Cresol	Waste Cresol	Corrosive Material	UN2076

### HEAVY METAL SOLUTIONS

Heavy Metal Solutions	Aqueous washing solutions from ink formulation, ink tub washwater	Hazardous Waste, Liquid, NOS	ORM-E	NA9189
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### INK SLUDGE

Ink Sludge Containing Chromium or Lead	Organic Heavy Metal Sludges	Hazardous Waste, Liquid, NOS	ORM-E	NA9189
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### OTHER WASTES

Ignitable Wastes, NOS	Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
	Waste Flammable Solid, NOS	Flammable Solid	UN1325
	Waste Combustible Liquid, NOS	Combustible Liquid	NA1993
Hazardous Waste	Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA categories of hazardous waste.

2 A flammable liquid has a flash point below 100°F.

3 NOS - Not otherwise specified.

4 A combustible liquid has a flash point between 100°F and 200°F.

**Table 3**  
**Pesticide and Agricultural Chemical Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>PESTICIDES CONTAINING ARSENIC*</b>				
Arsenic pentoxide	Arsenic Acid Anhydride, Arsenic (v) Oxide	Waste Arsenic Pentoxide, Solid	Poison B	UN1559
Arsenic trioxide	Arsenic Sesquioxide, Arsenic (III) Oxide, Arsenous Acid (anhydride), White Arsenic	Waste Arsenic Trioxide, Solid	Poison B	UN1561
Cacodylic acid	Hydroxydimethylarsine Oxide, Dimethylarsinic Acid, Phytar	Waste Arsenical Pesticide, Solid, NOS <sup>2</sup>	Poison B	UN2759
		Waste Arsenical Pesticide, Liquid, NOS	Poison B	UN2759
		Waste Arsenical Pesticide, Liquid, NOS	Flammable Liquid <sup>3</sup>	UN2760
Monosodium methanearsonate	MSMA, Ansar 170 H.C. and 529 H.C., Arsanote Liquid, Bueno 6, Daconate 6, Dal-E-Rad, Herb-All, Merge 823, Mesamate, Monate, Tans-Vert, Weed-E-Rad, Weed-Hoe	Waste Arsenical Pesticide, Solid, NOS	Poison B	UN2759
		Waste Arsenical Pesticide, Liquid, NOS	Poison B	UN2759
		Waste Arsenical Pesticide, Liquid, NOS	Flammable Liquid	UN2760

**Table 3** (continued)  
**Pesticide and Agricultural Chemical Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Disodium monomethanearsonate	DSMA, Ansar 8100, Arrhenal, Arsinyl, Dinat, Di-Tac, DMA, Methar 30, Sodar, Versar DSMA-LQ, Weed-E-RAD 360	Waste Arsenical Pesticide, Solid, NOS Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2759 UN2759 UN2760
<b>PESTICIDES CONTAINING CARBAMATES</b>				
Temik	Aldicarb, OMS 771, UC 21149	Waste Carbamate Pesticide, Solid, NOS Waste Carbamate Pesticide, Liquid, NOS Waste Carbamate Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2757 UN2757 UN2758
<b>PESTICIDES CONTAINING MERCURY*</b>				
2-Methoxyethylmercuric chloride	MEMC, Agallol, Cekusil Universal-C, Ceresan-Universal-Nassbeize, Emisan 6	Waste Mercury Based Pesticide, Solid, NOS Waste Mercury Based Pesticide, Liquid, NOS Waste Mercury Based Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2777 UN2777 UN2778
Phenylmercuric acetate	PMA, PMAS, Agrosan, Cekusil, Celmer, Gallotox, Hong Nien, Liquiphene, Mersolite, Pamisan, Phix, Seedtox, Shimmer-ex, Tag HL 331	Waste Mercury Based Pesticide, Solid, NOS Waste Mercury Based Pesticide, Liquid, NOS Waste Mercury Based Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2777 UN2777 UN2778
<b>PESTICIDES CONTAINING NICOTINE</b>				
Nicotine	Black Leaf 40	Waste Poison B, Solid, NOS Waste Poison B, Liquid, NOS Waste Flammable Liquid, Poisonous, NOS	Poison B Poison B Flammable Liquid	UN2811 UN2810 UN1992
<b>PESTICIDES CONTAINING SUBSTITUTED NITROPHENOLS</b>				
Dinitrocresol	DNC, DNOC, Chemsect, Detal, Elgetol 30, Nitador, Selinin, Sinox, Trifocide, Trifrina	Waste Substituted Nitrophenol Pesticide, Solid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2779 UN2779 UN2780
Dinoseb	DNBP, Basanite, Caldon, Chemox General, Chemox PE, Dinitro, Dinitro General, Dynamite, Elgetol 318, Gebutox, Hel-Fire, Nitropone C, Premerge 3, Sinox General, Subitex, Vertac General Weed Killer, Vertac Selective Weed Killer	Waste Substituted Nitrophenol Pesticide, Solid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Flammable Liquid	UN2780
<b>ORGANOPHOSPHATE PESTICIDES</b>				
Dimethoate	AC-12880, Bi 58 EC, Cekuthoate, Cygon, Daphene, De-Fend, Demos-L40, Devigon, Dimet, Dimethogen, Perfekthion, Rebelate, Rogodial, Rogor, Roxion, Trimetion	Waste Organophosphorus Pesticide, Solid, NOS Waste Organophosphorus Pesticide, Liquid, NOS Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2783 UN2783 UN2784
Disulfoton	BAY 19639 and S276, Dithiodemeton, Dithiosystox, Di-Syston, Ethylthiodemeton, Frumin AL, M-74, Solvirex, Thiodemeton	Waste Disulfoton Waste Disulfoton Mixture, Dry Waste Disulfoton Mixture, Liquid Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Poison B Flammable Liquid	NA2783 NA2783 NA2783 UN2784
Famphur	Bash, Bo-Ana, Dovip, Famfos, Warbex	Waste Organophosphorus Pesticide, Solid, NOS Waste Organophosphorus Pesticide, Liquid, NOS Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2783 UN2783 UN2784
Methyl Parathion	Cekumethion, E-601, Devithion, Folidol M, Fosfermo M50, Gearphos, Metacide, Metaphos, Nitrox 80, Parataf, Paratox, Partron M, Penncap-M, Wofatox	Waste Methyl Parathion, Liquid Waste Methyl Parathion Mixture, Dry Waste Methyl Parathion Mixture, Liquid (containing 25% or less methyl parathion) Waste Methyl Parathion Mixture, Liquid (containing more than 25% methyl parathion) Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Poison B Poison B Flammable Liquid	NA 2783 NA2783 NA2783 NA2783 UN2784
Parathion	AC-3422, Alkron, Alleron, Aphamite, Bladan, Corothion, E-605, ENT 15108, Ethyl Parathion, Etilon, Folidol E-605, Fostermo 50, Niran, Orthophos, Panthion, Paramar, Paraphos, Parathene, Parawet, Phoskil, Rhodiattox, Soprathion, Station, Thiophos	Waste Parathion, Liquid Waste Parathion Mixture, Dry Waste Parathion Mixture, Liquid Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Poison B Flammable Liquid	NA2783 NA2783 NA2783 UN2784

# Table 3 (continued)

## Pesticide and Agricultural Chemical Formulators Waste Descriptions<sup>1</sup>

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
STRYCHNINE PESTICIDES				
Strychnine	Strychnine Salts	Waste Strychnine, Solid	Poison B	UN1692
		Waste Strychnine Salt, Solid	Poison B	UN1692
THALLIUM SULFATE PESTICIDES				
Thallium Sulfate	Thallous Sulfate, Ratox, Zelio	Waste Thallium Sulfate, Solid Waste Flammable Liquid, Poisonous, NOS	Poison B Flammable Liquid	NA1707 UN1992
TRIAZINE PESTICIDES				
Amitrole	Amerol, Amino Triazol Weedkiller 90, Amizol, AT-90, AT Liquid, Azolan, Azole, Cytrol, Diurol, Farmco, Herbizole, Simazol, Weedazol, Weedazol TL	Waste Triazine Pesticide, Solid, NOS	Poison B	UN2763
		Waste Triazine Pesticide, Liquid, NOS	Poison B	UN2763
		Waste Triazine Pesticide, Liquid, NOS	Flammable Liquid	UN2764
PHENOXY PESTICIDES				
2,4-D*	Amoxone, Brush Killer, Brush Rhap, Chloroxone, Crop Rider, D50, DMA 4, Dacamine, Ded- Weed, Desormone, Dinoxol, Emulsamine BK and E3, Envert DT and 171, Hedonal, Miracle, Pennamine D, Rhodia, Salvo, Super D- Weedone, Verton, Visko-Rhap, Weed Tox, Wee-B-Gone, Weed-Rhap, Weedar, Weedone, Weedtrol	Waste 2,4-Dichlorophenoxyacetic Acid Waste 2,4-Dichlorophenoxyacetic Ester Waste Phenoxy Pesticide, Liquid, NOS	ORM-A ORM-E Flammable Liquid	NA2765 NA2765 UN2766
2,4,5-T	Brush-Rhap, Dacamine, Ded-Weedon, Esteron, Farmco Fence Rider, Forron, Inverton 245, Line Rider, Super D Weedone, Tormona, Transamine, U 46, Veon 245, Weedar, Weedone	Waste 2,4,5-Trichlorophenoxyacetic Acid Waste 2,4,5-Trichlorophenoxyacetic Acid (amine, ester, or salt) Waste Phenoxy Pesticide, Liquid, NOS	ORM-A ORM-E Flammable Liquid	NA2765 NA2765 UN2766
Silvex*	2,4,5-Fenoprop, AquaVex, Double Strength, Fruitone T, Kuron, Kurosai, Silvi-Rhap, Weed-B-Gone	Waste 2-(2,4,5-Trichlorophenoxy) propionic Acid	ORM-A	NA2765
		Waste 2-(2,4,5-Trichlorophenoxy) propionic Acid Ester	ORM-E	NA2765
		Waste Phenoxy Pesticide, Liquid, NOS	Flammable Liquid	UN2766
ORGANOCHLORINE PESTICIDES				
Aldrin	HHDN, Aldrex 30, Aldrite, Aldrosol, Altox, Drinox, Octalene, Seedrin Liquid	Waste Aldrin	Poison B	NA2761
		Waste Aldrin Mixture, Dry (with more than 65% Aldrin)	Poison B	NA2761
		Waste Aldrin Mixture, Dry (with 65% or less Aldrin)	ORM-A	NA2761
		Waste Aldrin Mixture, Liquid (with more than 60% Aldrin)	Poison B	NA2762
		Waste Aldrin Mixture, Liquid (with 60% or less Aldrin)	ORM-A	NA2762
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Chlordane*	Belt, Chlordan, ChlorKil, Chlortox, Corodane, Gold Crest C-100, Kypchlor, Vesicol 1068, Topiclor 20, Niran, Octachlor, Octa-Klor, Ortho-Klor, Synklor, Termi-Ded	Waste Chlordane, Liquid	Flammable Liquid	NA2762
		Waste Chlordane, Liquid	Combustible Liquid <sup>4</sup>	NA2762
DDT	Dedelo, Didimic, Digmar, Genitox, Gyron, Hildit, Kopsol, Neocid, Pentachlorin, Rukseam, Zerdane	Waste DDT Waste Organochlorine Pesticide, Liquid, NOS	ORM-A Flammable Liquid	NA2761 UN2762
Dichloropropene	1,3-Dichloropropene, Telone II Soil Fumigant	Waste Dichloropropene	Flammable Liquid	UN2047
Dieldrin	Dieldrex, Dieldrite, Octalox, Panoram D-31	Waste Dieldrin Waste Organochloride Pesticide, Liquid, NOS	ORM-A Flammable Liquid	NA2761 UN2762
Endrin*	Endrex, Hexadrin	Waste Endrin	Poison B	NA2761
		Waste Endrin Mixture, Liquid	Poison B	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Endosulfan	Beosit, Chlorthiepin, Crisulfan, Cycloclan, Endocel, EnSure, FMC 5462, Hildan, Hoe 2671, Malix, Thifor, Thimul, Thiodan, Thiofor, Thionex, Thiovel	Waste Endosulfan	Poison B	NA2761
		Waste Endosulfan Mixture, Liquid	Poison B	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762

**Table 3** (continued)  
**Pesticide and Agricultural Chemical Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Heptachlor*	Gold Crest H-60, Drinox H-34, Heptamul, Heptox	Waste Heptachlor Waste Organochlorine Pesticide, Liquid, NOS	ORM-E Flammable Liquid	NA2761 UN2762
Kepone	Chlordecone, GC 1189	Waste Kepone Waste Organochlorine Pesticide, Liquid, NOS	ORM-E Flammable Liquid	NA2761 UN2762
Lindane*	Exgama, Forlin, Gallogama, Gamaphex, Gammex, Inexit, Isotox, Lindafor, Lindagam, Lindagrain, Lindagranox, Lindalo, Lindamul, Lindapoudre, Lindaterra, Novigam, Silvanol	Waste Lindane Waste Organochlorine Pesticide, Liquid, NOS	ORM-A Flammable Liquid	NA2761 UN2762
Methoxychlor	Flo Pro MeSeed Protectant, Marlate	Waste Methoxychlor Waste Organochlorine Pesticide, Solid, NOS Waste Organochlorine Pesticide, Liquid, NOS Waste Organochlorine Pesticide, Liquid, NOS	ORM-E Poison B Poison B Flammable Liquid	NA2761 UN2701 UN2761 UN2762
Propylene Dichloride	1,2-Dichloropropane	Waste Propylene Dichloride	Flammable Liquid	UN1279
Toxaphene*	Attac 4-2, 4-4, 6, 6-3, 8, Camphochlor, Motox, Phenacide, Phenatox, Strobane T-90, Toxakil, Toxon 63	Waste Toxaphene Waste Organochlorine Pesticide, Liquid, NOS	ORM-A Flammable Liquid	NA2761 UN2762
<b>OTHER PESTICIDES</b>				
Thiram	TMTD, AAtack, Arasan, Aules, Evershield T Seed Protectant, Fermide 850, Fernasan, Flo Pro T Seed Protectant, Hexathir, Mercuram, Nomersan, Pomarsolforte, Polyram-Ultra, Spotrete-F, Tetrapom, Thimer, Thioknock, Thiotex, Thiramad, Thirasan, Thiuramin, Tirampa, Trametan, Tripomol, Thylate, Tuads, Vancide TM	Waste Thiram Waste Flammable Liquid, Poisonous, NOS	ORM-A Flammable Liquid	NA2771 UN1992
Warfarin	Co-Rax, Cov-R-Tox, Kypfarin, Liqua-Tox, RAX, Rodex, Rodex Blox, Tox-Hid	Hazardous Waste, Solid NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
Pentachlorophenol*	PCP, Penta, Penchlorol, Pentacon, Penwar, Sinituho, Santophen	Waste Pentachlorophenol Waste Flammable Liquid Waste Combustible Liquid	ORM-E Flammable Liquid Combustible Liquid	NA2020 UN1993 NA1993
Pentachloronitrobenzene	PCNB, Avicol, Botrilex, Brassicol, Earthcide, Folosan, Kobu, Pentagon, Saniclor 30, Terraclor, Tilcarex, Tritisan	Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
Hexachlorobenzene*	Perchlorobenzene, Anticarie, Ceku C.B., HCB, No Bunt	Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
1,2-Dibromo 3-chloropropane	DBCP, Nemaflume, Nemanox, Nemaset, Nematocide	Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
<b>IGNITABLE AND/OR TOXIC SOLVENTS USED IN PESTICIDES</b>				
Methyl Alcohol	Methanol	Waste Methyl Alcohol	Flammable Liquid	UN1230
Ethyl Alcohol	Ethanol, Alcohol	Waste Ethyl Alcohol	Flammable Liquid	UN1170
Isopropyl Alcohol	Isopropanol	Waste Isopropanol	Flammable Liquid	UN1219
Toluene	Methyl Benzene, Toluol	Waste Toluene, (toluol)	Flammable Liquid	UN1294
Xylene	Dimethylbenzene, Xylol	Waste Xylene (xylol)	Flammable Liquid	UN1307
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane, Tetraform, Carbona Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Benzene*	Benzol	Waste Benzene (Benzol)	Flammable Liquid	UN1114

**Table 3** (continued)  
**Pesticide and Agricultural Chemical Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Tetrachloroethylene*	Perc, Perclene, Tetralex, Nema, Tetracap, Persec, Antisal 1, Perawin, Didakene	Waste Tetrachloroethylene	ORM-A	UN1897
Solvent Mixtures		Waste Combustible Liquid, NOS (flash point between 100°F and 200°F)	Combustible Liquid	NA1993
		Waste Flammable Liquid, NOS (flash point less than 100°F)	Flammable Liquid	UN1993
<b>OTHER WASTES</b>				
Ignitable Wastes, NOS		Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
		Waste Combustible Liquid, NOS	Combustible Liquid	NA1993
Hazardous Waste		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 NOS - Not otherwise specified.

3 A flammable liquid has a flash point below 100°F.

4 A combustible liquid has a flash point between 100°F and 200°F.

**Table 4**  
**Pharmaceutical Preparations Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>SPENT SOLVENTS, STILL BOTTOMS, AND OTHER IGNITABLE TOXIC WASTES CONTAINING:</b>				
Acetone	Acetone	Waste Acetone	Flammable Liquid <sup>2</sup>	UN1090
Benzene*	Benzene	Waste Benzene (Benzol)	Flammable Liquid	UN1114
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane, Tetraform, Carbona, Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Phenol*	Phenol	Waste Phenol	Poison B	UN1671
Toluene				
<b>OTHER WASTES</b>				
Ignitable Waste, NOS <sup>3</sup>	Ignitable Wastes, NOS	Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Combustible Liquid, NOS	Combustible Liquid <sup>4</sup>	NA1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
Hazardous Waste		Hazardous Waste, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 A flammable liquid has a flash point below 100°F.

3 NOS - Not otherwise specified.

4 A combustible liquid has a flash point between 100°F and 200°F.

**Table 5**  
**Other Chemical Product Formulators Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>STRONG ACID/ALKALINE WASTES</b>				
Ammonium Hydroxide	Ammonium Hydroxide, NH <sub>4</sub> OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		(containing less than 12% ammonia)	ORM-A	NA2672
Hydrobromic Acid	Hydrobromic Acid, HBr	Waste Hydrobromic Acid	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, HCl, Muriatic Acid	Waste Hydrochloric Acid	Corrosive Material	NA1789



# Table 5 (continued)

## Other Chemical Product Formulators Waste Descriptions<sup>1</sup>

Other Chemical Product Formulators Waste Descriptions				UN/NA ID Number
Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	
Hydrofluoric Acid	Hydrofluoric Acid, HF, Fluorohydric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, HNO <sub>2</sub> , Aquafortis	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		(40% or less)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, H <sub>3</sub> PO <sub>4</sub> , Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, KOH, Potassium Hydrate, Caustic Potash, Potassa	Waste Potassium Hydroxide Solution	Corrosive Material	UN1814
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1813
Sodium Hydroxide	Sodium Hydroxide NaOH, Caustic Soda, Soda Lye, Sodium Hydrate	Waste Sodium Hydroxide Solution	Corrosive Material	UN1824
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1823
Sulfuric Acid	Sulfuric Acid, H <sub>2</sub> SO <sub>4</sub> , Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1832
Chromic Acid	Chromic Acid	Waste Chromic Acid Solution	Corrosive Material	UN1755
SPENT SOLVENTS, STILL BOTTOMS, AND OTHER IGNITABLE OR TOXIC WASTES CONTAINING:				
Acetone	Acetone	Waste Acetone	Flammable Liquid <sup>2</sup>	UN1090
Benzene*	Benzene	Waste Benzene (Benzol)	Flammable Liquid	UN1114
Methylene Chloride*	Dichloromethane, Methane Dichloride, Methylene Bichloride, NCI-C50102, Solaesthin, Aerothene, Narkotil, Solmethine	Waste Dichloromethane or Methylene Chloride	ORM-A	UN1593
Toluene	Toluene, Methacide, Methylbenzene, Methylbenzol, Phenylmethane, Toluol, Antisal 1A	Waste Toluene (Toluol)	Flammable Liquid	UN1294
Trichloroethylene*	TCE, Perm-A-Clor, Landain, Lethurin, Nialk, Triklene, Algylen, Trielin, Chlorylene, Dow-Tri	Waste Trichloroethylene	ORM-A	UN1710
Xylene	Xylene, Xylol	Waste Xylene (Xylol)	Flammable Liquid	UN1307
OTHER REACTIVE WASTES				
Hypochlorites	Sodium Hypochlorite, NaOCl Hypochlorous Acid, Cloros, Dazzle, Antiformin	Waste Hypochlorite Solution (more than 7% chlorine)	Corrosive Material	UN1791
		Waste Hypochlorite Solution (not more than 7% chlorine)	ORM-B	NA1791
Organic Peroxides	Organic Peroxide	Waste Organic Peroxide, Liquid or Solution, NOS <sup>3</sup>	Organic Peroxide Flammable Liquid	NA9183 NA1993
Perchlorates	Irenat, Periodin, Perchlorocap	Waste Sodium Perchlorate	Oxidizer	UN1502
		Waste Potassium Perchlorate	Oxidizer	UN1498
		Waste Perchlorate, NOS	Oxidizer	NA1481
Permanganates	Permanganic Acid, Potassium Salt, Chameleon Mineral	Waste Potassium Permanganate	Oxidizer	UN1490
		Waste Sodium Permanganate		UN1503
		Waste Permanganate, NOS		NA1482
Sulfides	Potassium Monosulfide, K <sub>2</sub> S, Sodium Sulfuret, Na <sub>2</sub> S	Waste Potassium Sulfide	Flammable Solid	UN1382
		Waste Sodium Sulfide, Anhydrous	Flammable Solid	UN1385
OTHER IGNITABLE OR TOXIC WASTES				
Ignitable Wastes NOS	Ignitable Wastes	Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Combustible Liquid, NOS	Combustible Liquid <sup>4</sup>	NA1993
Hazardous Wastes NOS	Hazardous Wastes	Waste Flammable Solid, NOS	Flammable Solid	UN1325
		Hazardous Waste, Solid, NOS	ORM-E	NA9189
		Hazardous Waste, Liquid, NOS	ORM-E	NA9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 A flammable liquid has a flash point below 100°F.

3 NOS - Not otherwise specified.

4 A combustible liquid has a flash point between 100°F and 200°F.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Cleaning Agents and Cosmetics Manufacturers

## Industry Overview

Not all businesses in the cleaning agents and cosmetic manufacturing category use hazardous substances. If, however, you use solvents, ignitable liquids, strong acids or bases, heavy metals, toxic organic constituents, or pesticides, you might generate hazardous waste. If you generate hazardous waste, you might be subject to the Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

Your business is included in the *cleaning agents and cosmetics manufacturing* category if you formulate or manufacture:

- Soaps, detergents or specialty cleaners
- Polishing or sanitizing compounds
- Surfactants, finishing agents, or sulfonated oils and other assistants
- Perfumes
- Cosmetics
- Toilet preparations or sundries.

## Hazardous Wastes from Cleaning Agents and Cosmetics Manufacturing

Manufacturers of cleaning agents and cosmetics use a wide range of processes and products, and many types of waste are generated. Table 1 summarizes the major hazardous waste types generated by manufacturers of cleaning agents and cosmetics, and Table 2 provides information about specific hazardous wastes. Generally, hazardous wastes from cleaning agents and chemical manufacturing are solvent wastes, pesticide wastes, acid/alkaline wastes, and heavy metal wastes. Wastewaters and sludges from cleaning equipment used in the formulation of soaps and stabilizers containing chromium and lead are listed hazardous wastes.

If you generate more than 100 kilograms (220 pounds or about one-half of a 55-gallon drum) of hazardous waste per month, you must complete a Uniform Hazardous Waste Manifest when shipping your waste. The Manifest requires the DOT (Department of Transportation) description of the waste, including the shipping name, hazard class, and UN/NA ID number. This information is provided in Table 2 for some wastes generated by manufacturers of cleaning agents and cosmetics. Table 1 and Table 2 are not comprehensive lists. If you suspect that you generate a hazardous

waste that is not on this list, contact your state hazardous waste management agency or EPA Regional office for assistance.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Cleaning Agents and Cosmetics Manufacturing Operations: Materials Used and Hazardous Wastes that Might be Generated**

Process/ Operation	Materials Used	General Types of Waste Generated
Cleaning Agent Manufacturing	Solvents, heavy metals, pesticides, organic chemicals, metals, strong acids and bases	Solvent wastes Toxic wastes Pesticide wastes Ignitable wastes Toxic heavy metal sludges and dusts Acid/alkaline wastes
Cosmetic Manufacturing	Solvents, organic chemicals, metals	Solvent wastes Toxic wastes Toxic heavy metal sludges

**Table 2**  
**Cleaning Agents and Cosmetics Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>STRONG ACID/ALKALINE WASTES</b>				
Ammonium Hydroxide	Ammonium Hydroxide, NH <sub>4</sub> OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		(containing less than 12% ammonia)	ORM-A	NA2672
Hydrobromic Acid	Hydrobromic Acid, HBr	Waste Hydrobromic Acid	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, HCl, Muriatic Acid	Waste Hydrochloric Acid	Corrosive Material	NA1789
Hydrofluoric Acid	Hydrofluoric Acid, HF, Fluorohydric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, HNO <sub>3</sub> , Aquafortis	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		(40% or less)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, H <sub>3</sub> PO <sub>4</sub> , Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, KOH, Potassium Hydrate, Caustic Potash, Potassa	Waste Potassium Hydroxide Solution	Corrosive Material	UN1814
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1813
Sodium Hydroxide	Sodium Hydroxide NaOH, Caustic Soda, Soda Lye, Sodium Hydrate	Waste Sodium Hydroxide Solution	Corrosive Material	UN1824
		Dry Solid, Flake, Bead, or Granular	Corrosive Material	UN1823
Sulfuric Acid	Sulfuric Acid, H <sub>2</sub> SO <sub>4</sub> , Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1832
Chromic Acid	Chromic Acid	Waste Chromic Acid Solution	Corrosive Material	UN1755
<b>SPENT SOLVENTS, AND IGNITABLE WASTES AND/OR TOXIC WASTES CONTAINING:</b>				
Ignitable Alcohol	Alcohol	Waste Alcohol, NOS <sup>2</sup>	Flammable Liquid <sup>3</sup> Combustible Liquid <sup>4</sup>	UN1987 UN1987
Aromatic Hydrocarbons	Aromatic Hydrocarbons	Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	Flammable Liquid Combustible Liquid	UN1993 NA1993
Methyl Alcohol	Methanol	Waste Methyl Alcohol	Flammable Liquid	UN1230
Ethyl Alcohol	Ethanol, Alcohol	Waste Ethyl Alcohol	Flammable Liquid	UN1170
Isopropyl Alcohol	Isopropanol	Waste Isopropanol	Flammable Liquid	UN1219
Toluene	Methyl Benzene, Toluol	Waste Toluene	Flammable Liquid	UN1294
Xylene	Dimethyl Benzene, Xylol	Waste Xylene	Flammable Liquid	UN1307
Solvent Mixtures		Waste Combustible Liquid, NOS Waste Flammable Liquid, NOS	Combustible Liquid Flammable Liquid	NA1993 UN1993
White Spirits, Varsol	White Spirits, Mineral Spirits, Naphtha	Waste Naphtha, Solvent	Flammable Liquid	UN1256
1,1,1-Trichloroethane	Aerotherene TT, Chlorten, Chloroethene, Methyl-Chloroform, Alpha T, Chlorotene	Waste 1,1,1-Trichloroethane	ORM-A	UN2831
Petroleum Distillates	Petroleum Distillates	Waste Petroleum Distillates	Flammable Liquid Combustible Liquid	UN1268 UN1268
Ethylene Dichloride*	Ethylene Dichloride, 1,2-Dichloroethane	Waste Ethylene Dichloride	Flammable Liquid	UN1184
Benzene*	Benzene	Waste Benzene (benzol)	Flammable Liquid	UN1114
Ethyl Benzene	Ethyl Benzene	Waste Ethyl Benzene	Flammable Liquid	UN1175
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134

**Table 2** (continued)  
**Cleaning Agents and Cosmetics Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, MEK, Methyl Acetone, Butanone, Ethyl Methyl Ketone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Cresols*	o-Cresol, m-Cresol, p-Cresol, (m,p)-Cresol, (o,m,p)-Cresol	Waste Cresol	Corrosive Material	UN2076
Phenol*	Phenol	Waste Phenol	Poison B	UN1671
<b>HEAVY METAL DUSTS</b>				
Heavy Metal Dusts	Heavy Metal Soaps containing: Silver, Calcium Chromate, Selenium, Barium, Cadmium, Mercury, Lead, Chromium, Nickel	Hazardous Waste, Solid or Liquid, NOS	ORM-E	NA9189
<b>PESTICIDES CONTAINING ARSENIC</b>				
Arsenic pentoxide	Arsenic (V) Oxide	Waste Arsenic Pentoxide, Solid	Poison B	UN1559
Arsenic trioxide	Arsenic (III) Oxide	Waste Arsenic Trioxide, Solid	Poison B	UN1561
Cacodylic acid	Hydroxydimethylarsine Oxide, Dimethylarsinic Acid, Phytar	Waste Arsenical Pesticide, Solid, NOS Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2759 UN2759 UN2760
Monosodium methanearsonate	MSMA, Arsanote Liquid, Herb-All, Weed-Hoe	Waste Arsenical Pesticide, Solid, NOS Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2759 UN2759 UN2760
Disodium monomethanearsonate	DSMA, Ansar 8100, DMA, Sodar	Waste Arsenical Pesticide, Solid, NOS Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2759 UN2759 UN2760
<b>OTHER PESTICIDES</b>				
Thiram	TMTD, Thiruamin, Vanacide TM	Waste Thiram Waste Flammable Liquid, Poisonous, NOS	ORM-A Flammable Liquid	NA2771 UN1992
Warfarin	Co-Rax, Kypfarin, Rax, Rodex	Hazardous Waste, Liquid or Solid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E Flammable Liquid Combustible Liquid	NA9189 UN1993 NA1993
Pentachlorophenol*	PCP, Pentachlor, Santophen	Waste Pentachlorophenol Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E Flammable Liquid Combustible Liquid	NA2020 UN1993 NA1993
Pentachloronitrobenzene	PCNB, Earthcide, Folosan, Tritisan	Hazardous Waste, Liquid or Solid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E Flammable Liquid Combustible Liquid	NA9189 UN1993 NA1993
Hexachlorobenzene*	Perchlorobenzene, HCB, Anticaric, No Bunt	Hazardous Waste, Liquid or Solid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E Flammable Liquid Combustible Liquid	NA9189 UN1993 NA1993
1,2-Dibromo 3-chloropropane	DBCP, Nemaflume, Nemanox, Nematocide	Hazardous Waste, Liquid or Solid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E Flammable Liquid Combustible Liquid	NA9189 UN1993 NA1993
<b>PESTICIDES CONTAINING CARBAMATES</b>				
Temik	Aldicarb, OMS 771, UC 21149	Waste Carbamate Pesticide, Solid, NOS Waste Carbamate Pesticide, Liquid, NOS Waste Carbamate Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2757 UN2757 UN2758
<b>PESTICIDES CONTAINING MERCURY*</b>				
2-Methoxyethylmercuric chloride	MEMC, Agallol, Cekusil Universal-C, Emisan 6	Waste Mercury Based Pesticide, Solid, NOS Waste Mercury Based Pesticide, Liquid, NOS Waste Mercury Based Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2777 UN2777 UN2778
Phenylmercuric acetate	PMA, PMAS, Agrosan, Celmer, Seedtox, Tag HL 331	Waste Mercury Based Pesticide, Solid, NOS Waste Mercury Based Pesticide, Liquid, NOS Waste Mercury Based Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2777 UN2777 UN2778

**Table 2** (continued)  
**Cleaning Agents and Cosmetics Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
PESTICIDES CONTAINING SUBSTITUTED NITROPHENOLS				
Dinitrocresol	Dinitrocresol, DNC, DNOC, Sinox, Trifocide	Waste Substituted Nitrophenol Pesticide, Solid, NOS	Poison B	UN2779
		Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Poison B	UN2779
		Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Flammable Liquid	UN2780
Dinoseb	Dinoseb, DNBP, Basanite, Caldon, Dinitro General, Hel-Fire, Nitropone C.	Waste Substituted Nitrophenol Pesticide, Solid, NOS	Poison B	UN2779
		Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Poison B	UN2779
		Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Flammable Liquid	UN2780
ORGANOPHOSPHATE PESTICIDES				
Dimethoate	Dimethoate, Cygon, Daphene, De-Fend, Roxion, Trimetion	Waste Organophosphorous Pesticide, Solid, NOS	Poison B	UN2783
		Waste Organophosphorous Pesticide, Liquid, NOS	Poison B	UN2783
		Waste Organophosphorous Pesticide, Liquid, NOS	Flammable Liquid	UN2784
Disulfoton	Disulfoton, BAY 19639 and S276, Dithiodemeton, Ethylthiodemeton, M-74, Solvirex	Waste Disulfoton	Poison B	NA2783
		Waste Disulfoton Mixture, Dry	Poison B	NA2783
		Waste Disulfoton Mixture, Liquid	Poison B	NA2783
		Waste Organophosphorus Pesticide, Liquid, NOS	Flammable Liquid	UN2784
Famphur	Famphur, Famfos, Bash, Bo-Ana, Warbet	Waste Organophosphorus Pesticide, Solid, NOS	Poison B	UN2783
		Waste Organophosphorus Pesticide, Liquid, NOS	Poison B	UN2783
		Waste Organophosphorus Pesticide, Liquid, NOS	Flammable Liquid	UN2784
Methyl Parathion	Methyl Parathion, Cekumethion, E-601, Devithion, Metacide, Nitrox 80, Paratox, Wofatox	Waste Methyl Parathion, Liquid	Poison B	NA2783
		Waste Methyl Parathion Mixture, Dry	Poison B	NA2783
		Waste Methyl Parathion Mixture, Liquid (containing 25% or less methyl parathion)	Poison B	NA2783
		Waste Methyl Parathion Mixture, Liquid (containing more than 25% methyl parathion)	Poison B	NA2783
		Waste Organophosphorous Pesticide, Liquid, NOS	Flammable Liquid	UN2784
Parathion	Parathion, Ethyl Parathion, AC-3422, Alkron, Bladan, Etilon, Folidol E-605, Phoskil	Waste Parathion, Liquid	Poison B	NA2783
		Waste Parathion Mixutre, Dry	Poison B	NA2783
		Waste Parathion Mixture, Liquid	Poison B	NA2783
		Waste Organophosphorous Pesticide, Liquid, NOS	Flammable Liquid	UN2784
STRYCHNINE PESTICIDES				
Strychnine	Strychnine Salts	Waste Strychnine, Solid	Poison B	UN1692
		Waste Strychnine, Solid	Poison B	UN1692
THALLIUM SULFATE PESTICIDES				
Thallium Sulfate	Thallous Sulfate, Rafox, Zelio	Waste Thallium Sulfate, Solid	Poison B	NA1707
		Waste Flammable Liquid, Poisonous, NOS	Flammable Liquid	UN1992
TRIAZINE PESTICIDES				
Amitrole	Amitrole, Amerol, Herbizole, Simazol, Weed 9701	Waste Triazine Pesticide, Solid, NOS	Poison B	UN2763
		Waste Triazine Pesticide, Liquid, NOS	Poison B	UN2763
		Waste Triazine Pesticide, Liquid, NOS	Flammable Liquid	UN2764
PHENOXY PESTICIDES				
2,4-D*	2,4-Dichlorophenoxyacetic Acid, Brush Killer, Crop Rider, Ded-Weed, Salvo, Weedone	Waste 2,4-Dichlorophenoxyacetic Acid	ORM-A	NA2765
		Waste 2,4-Dichlorophenoxyacetic Ester	ORM-E	NA2765
		Waste Phenoxy Pesticide, Liquid, NOS	Flammable Liquid	UN2766

**Table 2** (continued)  
**Cleaning Agents and Cosmetics Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
2,4,5-T	2,4,5-Trichlorophenoxy Acetic Acid, Brush-Rap, Farmers Fence Rider, Weedone	Waste 2,4,5-Trichlorophenoxyacetic Acid Waste 2,4,5-Trichlorophenoxyacetic Acid (amine, ester, or salt) Waste Phenoxy Pesticide, Liquid, NOS	ORM-A ORM-E Flammable Liquid	NA2765 NA2765 UN2766
Silvex*	2,4,5-Fenoprop, Fruitone T, Kuron, Weed-B-Gone	Waste 2-(2,4,5-Trichlorophenoxy) propionic Acid Waste 2-(2,4,5-Trichlorophenoxy) propionic Acid Ester Waste Phenoxy Pesticide, Liquid, NOS Waste Phenoxy Pesticide, Liquid, NOS	ORM-A ORM-E Flammable Liquid Poison B	NA2765 NA2765 UN2766 UN2765
<b>ORGANOCHLORINE PESTICIDES</b>				
Aldrin	HHDN, Aldrex 30, Alttox, Drinox, Octalene, Seedrin Liquid	Waste Aldrin Waste Aldrin Mixture, Dry (with more than 65% Aldrin) Waste Aldrin Mixture, Dry (with 65% or less Aldrin) Waste Organochlorine Pesticide, Liquid, NOS	Poison B Poison B ORM-A Flammable Liquid	NA2761 NA2761 NA2761 UN2762
Chlordane*	Chlorkil, Corodane, Octachlor	Waste Chlordane, Liquid Waste Chlordane, Liquid	Flammable Liquid Combustible Liquid	NA2762 NA2762
DDT	DDT	Waste DDT	ORM-A	NA2761
Dichloropropene	1,3-Dichloropropene	Waste Dichloropropene	Flammable Liquid	UN2047
Dieldrin	Dieldrin, Dieldrex, Dieldrite	Waste Dieldrin	ORM-A	NA2761
Endrin*	Endrin, Endrex, Hexadrin	Waste Endrin, Liquid Waste Endrin Mixture	Poison B Poison B	NA2761 NA2761
Endosulfan	Crisulfan, Malix	Waste Endosulfan Waste Endosulfan Mixture, Liquid	Poison B Poison B	NA2761 NA2761
Heptachlor*	Gold Crest H-60, Drinox H-34, Heptamul, Heptox	Waste Heptachlor Waste Organochlorine Pesticide, Liquid, NOS	ORM-E Flammable Liquid	NA2761 UN2762
Kepone	Chlordecone, GC 1189	Waste Kepone Waste Organochlorine Pesticide, Liquid, NOS	ORM-E Flammable Liquid	NA2761 UN2762
Lindane*	Exgama, Forlin, Gallogama, Gamaphex, Gammex, Inexit, Isotox, Lindafor, Lindagam, Lindagrain, Lindagranox, Lindalo, Lindamul, Lindapoudre, Lindaterra, Novigam, Silvanol	Waste Lindane Waste Organochlorine Pesticide, Liquid, NOS	ORM-A Flammable Liquid	NA2761 UN2762
Methoxychlor*	Flo Pro MeSeed Protectant, Marlate	Waste Methoxychlor Waste Organochlorine Pesticide, Solid, NOS Waste Organochlorine Pesticide, Liquid, NOS Waste Organochlorine Pesticide, Liquid, NOS	ORM-E Poison B Poison B Flammable Liquid	NA2761 UN2701 UN2761 UN2762
Propylene Dichloride	1,2-Dichloropropane	Waste Propylene Dichloride	Flammable Liquid	UN1279
Toxaphene*	Attac 4-2, 4-4, 6, 6-3, 8, Camphochlor, Motox, Phenacide, Phenatox, Strobane T-90, Toxakil, Toxon 63	Waste Toxaphene Waste Organochlorine Pesticide, Liquid, NOS	ORM-A Flammable Liquid	NA2761 UN2762
<b>OTHER WASTES</b>				
Ignitable Wastes, NOS		Waste Flammable Liquid, NOS Waste Flammable Solid, NOS Waste Combustible Liquid, NOS	Flammable Liquid Flammable Solid Combustible Liquid	UN1993 UN1325 NA1993
Hazardous Waste		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 NOS - Not otherwise specified.

3 A flammable liquid has a flash point below 100°F.

4 A combustible liquid has a flash point between 100°F and 200°F.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Leather Products Manufacturing

## Industry Overview

Not all facilities that manufacture leather goods produce hazardous waste. If you do produce hazardous waste, however, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

Your business is included in the *leather products manufacturing* industry category if you:

- Tan or finish leather

or if you manufacture:

- Boot and shoe cut stock and findings
- Non-rubber footwear
- Leather gloves and mittens
- Luggage
- Handbags and other leather goods.

## Hazardous Wastes from Leather Products Manufacturing

Manufacturers of leather products are likely to produce spent solvent wastes and wastes from the use of lacquers, materials containing lead, dyes, or materials that produce hydrogen sulfide.

Table 1 lists general processes/operations that use hazardous materials and that might result in the generation of hazardous waste. If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship the hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. Table 2 lists proper DOT shipping descriptions for a number of wastes that might be generated by the leather products manufacturing industry. Table 1 and Table 2 are not comprehensive lists. If a particular chemical you use is not included in these tables and you suspect it is hazardous, contact your state hazardous waste management agency or EPA Regional office for assistance.

## Waste Minimization

An effective waste minimization program can reduce the costs liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
**Typical Leather Manufacturing Operations:**  
**Materials Used and Hazardous Wastes that Might be Generated**

Process/ Operation	Materials Used	General Types of Waste Generated
Beamhouse/ Tanhouse	Lime, acids, chromium, salts	Acid/Alkaline wastes Toxic heavy metal wastes (dust and sludge) Other toxic wastes
Finishing/ Trimming	Chromium, solvents, dyes, lacquers	Toxic heavy metal wastes (dust and sludge) Other toxic wastes Spent solvent wastes



**Table 2**  
**Leather Products Manufacturing Waste Descriptions<sup>1</sup>**

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
<b>SPENT SOLVENTS, SOLVENT STILL BOTTOMS, AND OTHER IGNITABLE OR TOXIC WASTES CONTAINING:</b>				
Trichloroethylene*	Tri-Clene, Trielene, Tri	Waste Trichloroethylene	ORM-A	UN1710
Carbon Tetrachloride*	Perchloromethane, Tetraform, Carbona, Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Toluene	Toluol, Methercid, Methyl Benzene, Methylbenzol, Phenylmethane, Antisol 1A	Waste Toluene (toluol)	Flammable Liquid <sup>2</sup>	UN1294
Methyl Ethyl Ketone*	Methyl Ethyl Ketone, MEK, Methyl Acetone, Meetco, Butanone, Ethyl Methyl Ketone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Benzene*	Benzene	Waste Benzene (benzol)	Flammable Liquid	UN1114
White Spirits	Mineral Spirits, Naphtha, Stoddard Solvent	Waste Naphtha	Flammable Liquid	UN2553
Kerosene	Kerosene, Fuel Oil #1	Waste Kerosene	Combustible Liquid <sup>3</sup>	UN1223
Hexachloroethane*	Hexachloroethane	Waste Hexachloroethane	ORM-A	NA9037
Ethyl Benzene	Ethyl Benzene	Waste Ethyl Benzene	Flammable Liquid	UN1175
Chlorobenzene*	Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Trichloroethylene*	Trichloroethylene, Ethinyl trichloride, Tri-Clene, Trielene, Tri	Waste Trichloroethylene	ORM-A	UN1710
<b>OTHER HAZARDOUS WASTE</b>				
Hazardous Waste, NOS <sup>4</sup>	Hazardous Waste	Hazardous Wastes, Liquid or Solid, NOS	ORM-E	NA9189

\* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA categories of hazardous waste.

2 A flammable liquid has a flash point below 100°F.

3 A combustible liquid has a flash point between 100°F and 200°F.

4 NOS - Not otherwise specified.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**

# Uniform Hazardous Waste Manifest

Federal law requires that any facility that generates more than 100 kilograms (220 pounds or approximately one-half of a 55-gallon drum) of hazardous waste (or 1 kilogram of acutely hazardous waste) in a calendar month use the completed Uniform Hazardous Waste Manifest when shipping its hazardous waste off-site.

Remember—you must use the Manifest of the state to which you are sending the waste. If that state does not have its own version of the Manifest, use the Manifest form of the state in which you generated the waste.

If neither the state to which you are sending your waste nor the state in which your waste was generated has its own Manifest form, you may order Manifest forms from commer-

cial companies that produce the federal version of the Manifest, or obtain copies from some hazardous waste treatment, storage, or disposal firms.

Items 1 through 20 (and 21 through 35 on the continuation sheet) constitute the federal portion of the Manifest form. Items A through K comprise the state portion of the form. When using a state form, follow the instructions provided with that form. If you are not using a state form, ask your state hazardous waste agency whether you must fill in items A through K. Contact your state hazardous waste agency, your hauler, and the facility that is to receive your waste shipment to be sure you complete all the necessary items on the Manifest.

## Instructions

### ITEM 1.

*Generator's U.S. EPA ID Number - Manifest Document Number*

Enter the generator's U.S. EPA 12-digit identification number and the unique 5-digit you assign to this Manifest (e.g., 00001).

### ITEM 2.

*Page 1 of \_\_\_\_\_*

Enter the total number of pages used to complete this Manifest, i.e., the first page (EPA Form 8700-22) plus the number of Continuation Sheets (EPA Form 8700-22A), if any.

### ITEM 3.

*Generator's Name and Mailing Address*

Enter the name and address of your business.

### ITEM 4.

*Generator's Phone Number*

Enter a telephone number where an authorized agent of your company may be reached in the event of an emergency.

### ITEM 5.

*Transporter 1 Company Name*

Enter the company name of the first transporter who will transport the waste.

### ITEM 6.

*U.S. EPA ID Number*

Enter the U.S. EPA 12-digit identification number of the first transporter identified in Item 5.

### ITEM 7.

*Transporter 2 Company Name*

If applicable, enter the company name of the second transporter who will transport the waste. If more than two transporters are used to transport the waste, use a Continuation Sheet(s) (EPA Form

8700-22A) and list the transporters in the order they will be transporting the waste.

### ITEM 8.

*U.S. EPA ID Number*

If applicable, enter the U.S. EPA 12-digit identification number of the second transporter identified in Item 7. NOTE: If more than two transporters are used, enter each additional transporter's company and U.S. EPA 12-digit identification number in items 24-27 on the Continuation Sheet (EPA Form 8700-22A). Each Continuation Sheet has space to record two additional transporters. Every transporter used between the generator and the designated facility must be listed.

### ITEM 9.

*Designated Facility Name and Site Address*

Enter the company name and site address of the facility to which you are shipping the waste listed on this Manifest. The address must be the site address, which may be different from the company mailing address.

### ITEM 10.

*U.S. EPA ID Number*

Enter the U.S. EPA 12-digit identification number of the designated facility identified in Item 9.

### ITEM 11.

*U.S. DOT Description (including Proper Shipping Name, Hazard Class, and ID Number [UN/NA])*

Enter the U.S. Department of Transportation (DOT) Proper Shipping Name, Hazard Class, and ID Number (UN/NA) for each waste as identified in 49 CFR 171

through 177. Your hauler or the facility to which you are shipping the waste may be able to help you determine this information. You may also be able to obtain information and assistance from the U.S. Department of Transportation (DOT) at 202-366-5580, Materials Transport Bureau, your state transportation agency, your state hazardous waste management agency, or your trade association.

### ITEM 12.

*Containers (No. and Type)*

Enter the number of containers for each waste and the appropriate abbreviation for the type of container:

**DM** = Metal drums, barrels, kegs

**DW** = Wooden drums, barrels, kegs

**DF** = Fiberboard or plastic drums, barrels, kegs

**TP** = Tanks portable

**TT** = Cargo tanks (tank trucks)

**TC** = Tank cars

**DT** = Dump truck

**CY** = Cylinders

**CM** = Metal boxes, cartons, cases (including roll-offs)

**CW** = Wooden boxes, cartons, cases

**CF** = Fiber or plastic boxes, cartons, cases

**BA** = Burlap, cloth, paper or plastic bags

### ITEM 13.

*Total Quantity*

Enter the total quantity of waste described on each line. Your measurement must include the weight of the container when the waste

container is to be discarded (example: a drum containing waste). Do not use fractions or decimals.

### ITEM 14.

*Unit (Wt./Vol.)*

Enter the appropriate abbreviation for the unit of measure for each quantity entered under Item 13, as follows:

**G** = Gallons

**P** = Pounds

**T** = Tons (2,000 pounds)

**Y** = Cubic yards

**L** = Liters

**K** = Kilograms

**M** = Metric tons (1,000 kilograms)

**N** = Cubic meters

### ITEM 15.

*Special Handling Instructions and Additional Information*

Use this space to indicate special transportation, treatment, storage, or disposal information or Bill of Lading information.

### ITEM 16.

*Generator's Certification*

You must sign and date the Uniform Hazardous Waste Manifest after you have filled it out. You must certify that you have made a good faith effort to minimize your waste generation and to select the best waste management method that is available to you and that you can afford.

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No.		Manifest Document No		2. Page 1 of		Information in the shaded areas is not required by Federal law.						
3. Generator's Name and Mailing Address						A. State Manifest Document Number								
						B. State Generator's ID								
4. Generator's Phone ( )						C. State Transporter's ID								
5. Transporter 1 Company Name						D. Transporter's Phone								
6. US EPA ID Number						E. State Transporter's ID								
7. Transporter 2 Company Name						F. Transporter's Phone								
8. US EPA ID Number						G. State Facility's ID								
9. Designated Facility Name and Site Address						H. Facility's Phone								
10. US EPA ID Number														
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.		
						No.	Type							
						a.								
						b.								
						c.								
J. Additional Descriptions for Materials Listed Above						K. Handling Codes for Wastes Listed Above								
15. Special Handling Instructions and Additional Information														
<p><b>16. GENERATOR'S CERTIFICATION:</b> I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.</p> <p>If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.</p>														
Printed/Typed Name					Signature					Month Day Year				
17. Transporter 1 Acknowledgement of Receipt of Materials														
Printed/Typed Name					Signature					Month Day Year				
18. Transporter 2 Acknowledgement of Receipt of Materials														
Printed/Typed Name					Signature					Month Day Year				
19. Discrepancy Indication Space														
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.														
Printed/Typed Name					Signature					Month Day Year				

# Drycleaning and Laundry Plants

## Industry Overview

While not all dry cleaning and laundry facilities produce hazardous waste, those facilities using hazardous solvents might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

The establishments covered under *drycleaning and laundry plants* include:

- Retail drycleaning stores
- Industrial and linen supply plants with drycleaning operations
- Leather and fur cleaning plants
- Self-service laundromats with drycleaning equipment
- Other establishments with drycleaning operations.

## Hazardous Wastes from Drycleaning and Laundry Plants

Potential hazardous wastes generated by drycleaning and laundry plants are primarily solvents. These solvents include:

**Perchloroethylene**, otherwise known as perc, PCE, or tetrachloroethylene

**Valclene**, also known as fluorocarbon 113 or trichlorotrifluoroethane

**Petroleum solvents**, such as Stoddard, quick-dry, low-odor, and other solvents.

Perchloroethylene plants potentially produce three types of hazardous wastes:

**Still residues from solvent distillation** (the entire weight)

**Spent filter cartridges** (total weight of the cartridge and remaining solvent after draining)

**Cooked powder residue** (the total weight of drained powder residues from diatomaceous or other powder filter systems after heating to remove excess solvent).

Valclene plants potentially produce two types of hazardous wastes:

**Still residues from solvent distillation** (the entire weight)

**Spent filter cartridges** (total weight of the cartridge and remaining solvent after draining).

Petroleum solvent plants potentially produce only one type of hazardous waste:

**Still residues from solvent distillation** (the entire weight).

To determine whether your plant qualifies as a regulated generator and to complete the Uniform Hazardous Waste Manifest, you EPA/530-SW-90-027b

must determine the weight of the hazardous waste your plant generates. Table 1 lists common types and average quantities of hazardous waste produced per 1,000 pounds of clothes cleaned.

If you generate 100 kilograms (220 pounds or about half of a 55-gallon drum) or more of hazardous waste per month, you must fill out a Uniform Hazardous Waste Manifest when you ship hazardous waste off your property. The Manifest requires the proper Department of Transportation (DOT) description for each waste. DOT description information is provided in Table 2 to aid in preparing the Manifest. Table 1 and Table 2 are not comprehensive lists. If you suspect you generate other hazardous wastes, contact your state hazardous waste agency or Regional EPA office for more information.

## Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

**Table 1**  
Typical Quantities of Hazardous Waste From Dry Cleaning  
(Pounds of waste per 1,000 pounds of clothes cleaned)

Waste Type	Cleaning Method		
	PERC	Valclene	Petroleum Solvents
Average Quantity of Hazardous Waste (pounds)			
Still Residues	25	10	20
Spent Cartridge Filters			
Standard (carbon core)	20	15	*
Adsorptive (split)	30	20	*
Cooked Powder Residue	40	NA	NA
Drained Filter Muck	NA	NA	*

\* Well-drained filter cartridges or drained filter muck are solids and are not likely to meet the criteria for classification as ignitable solids; therefore, they are usually not hazardous wastes. Be sure, however, that these wastes do not fail the Toxicity Characteristic Leaching Procedure; if they do, they are hazardous wastes.

**Table 2**  
**Drycleaning and Laundry Plants Waste Descriptions<sup>1</sup>**

<b>Waste Type</b>	<b>Designations/Trade Names</b>	<b>DOT Shipping Name</b>	<b>Hazard Class</b>	<b>UN/NA ID Number</b>
Perc		Waste Perchloroethylene or Waste Tetrachloroethylene	ORM-A	UN1897
Valclene		Hazardous Waste, NOS <sup>2</sup>	ORM-E	UN9189
Petroleum Solvents		Waste Petroleum Distillate	Combustible Liquid <sup>3</sup>	UN1268
		Waste Petroleum Naphtha	Combustible Liquid	UN1255
Hazardous Waste, NOS		Hazardous Waste, Liquid or Solid, NOS	ORM-E	NA9189

1 In certain situations, other DOT descriptions may be applicable to the wastes listed.

2 NOS - not otherwise specified.

3 If the flash point of the solvent or residue as disposed of is less than 100°F, the hazard class is "flammable liquid." Although the flash point of petroleum drycleaning solvents is above 100°F, the presence of contaminants (such as printing inks) could lower the overall flash point to below 100°F.

**For further information call the RCRA/Superfund Hotline 1-800-424-9346**