Minnesota Pollution Control Agency

Characteristic Wastes

Waste/Hazardous Waste #2.04, rev. July 2004

This fact sheet discusses the six characteristics that make a waste hazardous.

Inside

Environmental Concerns

"Characteristic" hazardous wastes are those wastes that are not listed as hazardous wastes on the F, K, P or U lists found in Minnesota Rules pt. 7045.0135, but that exhibit one or more of these characteristics:

- ignitability or is an oxidizer;
- corrosivity;
- reactivity;
- lethality; or
- toxicity.

Descriptions of each characteristic and the appropriate hazardous wastes code for each are given in the following pages. This information is taken from Minnesota Rules pt. 7045.0131.

Ignitability

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

A. It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume, and has a flash point less than 60 degrees Celsius (140 degrees Fahrenheit), as determined by a Pensky-Martens Closed Cup Tester using the test method specified in standard D-93-79 or D-93-80 in the Annual Book of ASTM Standards, issued by the American Society for Testing and Materials (Philadelphia 1982); or a Setaflash Closed Cup Tester using the test method specified in standard D-3278-78 in the Annual Book of ASTM Standards, issued by the American Society for Testing and Materials (Philadelphia 1982); or as determined by an equivalent test method approved by the commissioner under the procedures set forth in Minn. R. pt. 7045.0075, subp. 1.

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

C. It is an ignitable compressed gas as defined in Code of Federal Regulations (CFR), title 49, section 173.300 (1983) and as determined by the test methods described in that regulation or equivalent test methods approved by the commissioner under Minn R. pt. 7045.0075, subp. 1.

A waste that exhibits the characteristic of ignitability, but is not listed as a hazardous waste in Minn. R. pt. 7045.0135, has the hazardous waste code of **D001.**

Oxidizers

A waste exhibits the characteristics of an oxidizer if a representative sample of the waste has the following properties:

A. It is an oxidizer as defined in CFR, title 49, section 173.127 (1983).

B. It readily supplies oxygen to a reaction in the absence of air. Oxidative materials include, but are not limited to: oxides, organic and inorganic peroxides, permanganates, perrhenates, chlorates, perchlorates, persulfates, nitric acid, organic and inorganic nitrates, iodates, periodates, bromates, perselenates, per-bromates, chromates, dichromates, ozone, and perborates. Bromine, chlorine,

Minnesota Pollution Control Agency, 520 Lafayette Rd. N., Saint Paul, MN 55155-4194
(651) 296-6300. toll-free (800) 657-3864, TDD (651) 282-5332 or (800) 657-3864

fluorine, and iodine react similarly to oxygen under some conditions and are therefore also oxidative materials.

A waste that exhibits the characteristics of an oxidizer, but is not listed as a hazardous waste in Minn. R. pt. 7045.0135, has the hazardous waste number of **D001**.

Corrosivity

A waste exhibits the characteristics of corrosivity if a representative sample of the waste has any of the following properties:

A. It is aqueous and has a pH less than or equal to 2.0 or greater than or equal to 12.5, as determined by a pH meter using either the test method in the Test Methods for Evaluating Solid Waste, Physical/Chemical Methods issued by the U. S. Environmental Protection Agency (EPA), publication number SW 846 (First Edition, 1980 as updated by Revisions A (August 1980), B (July 1981), and C (February 1982 or Second Edition, 1982) also described in Methods for Chemical Analysis of Water and Waste Issued by the Environmental Monitoring and Support Laboratory, publication number 600/7-79-020 (March 1979), or an equivalent test method approved by the commissioner under the procedures set forth in Minn. R. pt. 7045.0075, subp. 1.

B. It is liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55 degrees Celsius (130 degrees Fahrenheit) as determined by the test method specified in National Association of Corrosion Engineers Standard TM-01-69 as standardized in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, issued by the EPA, publication number SW 846 (First Edition, 1980 as updated by Revisions A (August 1980), B (July 1981), and C (February 1982 or Second Edition, 1982) or an equivalent test method approved by the commissioner under the procedures set forth in Minn. R. pt. 7045.0075, subp. 1.

A waste that exhibits the characteristic of corrosivity, but is not listed as a hazardous waste in Minn. R. pt. 7045.0135, has the hazardous waste number of **D002**.

Reactivity

A waste exhibits the characteristics of reactivity if a representative sample of the waste has any of the following properties:

A. It is normally unstable and readily undergoes violent change without detonating.

B. It reacts violently with water.

C. It forms potentially explosive mixtures with water.

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

E. It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2.0 and 12.5 can generate toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment.

F. It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.G. It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

H. It is a forbidden explosive as defined in CFR, title 49, section 173.51 (1983), a Class A explosive as defined in CFR, title 49, section 173.53 (1983), or a Class B explosive as defined in CFR, title 49, Section 173.88 (1983).

A waste that exhibits the characteristic of reactivity, but is not listed as a hazardous waste in Minn. R. pt. 7045.0135, has the hazardous waste number of **D003**.

Lethality

Lethality is determined as follows:

A. A waste exhibits the characteristic of lethality as determined in item B, if a representative sample of the waste has any one of the following properties:

1. An oral median lethal dose less than 500 milligrams of material per kilogram of body weight of test animal.
2. A dermal median lethal dose less than 1,000 milligrams of material per kilogram of body weight of test animal.
3. An inhalation median lethal concentration of less than 2,000 milligrams of material per cubic meter of air, if the material or a component is in a form that may be inhaled as a dust or mist.
4. An inhalation median lethal concentration of less than 1,000 parts per million of material per million parts of air, if the material or component may be inhaled as gas or vapor.

B. Lethality shall be determined by applying knowledge of materials and processes used, including reasonably available information on the lethality of the components of the waste. If available information and knowledge

are insufficient to reasonably determine lethality, the generator must notify the commissioner. The commissioner may order additional evaluation as specified in Minn. R. pt. 7045.0217. Additional evaluation may include testing according to the specifications of item C.

C. Lethality shall be determined as described in subitems (1) to (3):

1. Oral median lethal dose shall be determined by a test in which the specified time is 14 days, the group of test animals is at least ten white laboratory rats of 200 to 300 grams each, half of which are male and half of which are female, and the route of administration is a single oral dose.
2. Dermal median lethal dose shall be determined by a test in which the specified time is 14 days and the group of test animals is ten or more white rabbits, half of which are male and half of which are female, and the route of administration is a 24-hour exposure with continuous contact on bare skin.
3. Inhalation median lethal concentration shall be determined by a test in which the specified time is 14 days, the group of the test animals is at least ten white laboratory rats of 200 to 300 grams each, half of which are male and half of which are female, and the route of administration is continuous respiratory exposure for a period of one hour.

A waste that exhibits the characteristics of lethality, but is not listed as a hazardous waste in Minn. R. pt. 7045.0135, has the hazardous waste number **MN01**.

Toxicity

Toxicity is determined as follows:

A. A waste exhibits the characteristic of toxicity if, using the test methods described in CFR, title 40, part 261, appendix II, as amended, or equivalent methods approved by the commissioner under the procedures in Minn. R. pt. 7045.0075, subp. 1, the extract from a representative sample of the waste contains any of the contaminants listed in Table 1, page 4,at a concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering, is considered to be the extract. [This is the Toxicity Characteristic Leaching Procedure - (TCLP)].

A waste that exhibits the characteristic of toxicity, but is not listed as a hazardous waste in Minn. R. pt. 7045.0135, has the hazardous waste number specified in Table 1 (see page 4) which corresponds to the toxic contaminant causing it to be hazardous.

If the concentration of a constituent in a waste is known and that constituent is listed in Table 1, the maximum possible concentration in the extract can be calculated on the assumption that 100 percent of the constituent will be extracted. If the calculated maximum possible concentration in the extract is less than the limit listed in Table 1, the waste is not a hazardous waste because of the subject constituent.

Maximum concentration of contaminants for the toxicity characteristic are given in Table 1 on page 4.

More Information

Your metropolitan county and the MPCA have staff available to answer questions. For more information, contact your metropolitan county hazardous waste office or the MPCA office closest to your county.

Metro County Hazardous Waste Offices

Anoka County	(763) 422-7093
Carver County	(952) 361-1800
Dakota County	(952) 891-7557
Hennepin County	(612) 348-3777
Ramsey County	(651) 773-4466
Scott County	(952) 496-8177
Washington County	(651) 430-6655

Minnesota Pollution Control Agency

Toll free	(800) 657-3864
Brainerd	(218) 828-2492
Detroit Lakes	(218) 847-1519
Duluth	(218) 723-4660
Mankato	(507) 389-5977
Marshall	(507) 537-7146
Rochester	(507) 285-7343
St. Paul	(651) 297-2274
Willmar	(320) 214-3786
Web Site	*http://www.pca.state.mn.us*

Table 1: Maximum Allowable Concentration for Toxicity Characteristic Contaminants

Hazardous Waste Number	Contaminant	CAS Number	Concentration (milligrams per liter)
D004	Arsenic	7440-38-2	5.0
D005	Barium	7440-39-3	100.0
D018	Benzene	71-43-2	0.5
D006	Cadmium	7440-43-9	1.0
D019	Carbon tetrachloride	56-23-5	0.5
D020	Chlordane	57-74-9	0.03
D021	Chlorobenzene	108-90-7	100.0
D022	Chloroform	67-66-3	6.0
D007	Chromium	7440-47-3	5.0
D023	*o*-Cresol	95-48-7	*200.0
D024	*m*-Cresol	108-39-4	*200.0
D025	*p*-Cresol	106-44-5	*200.0
D026	Cresol		*200.0
D016	2,4-D	94-75-7	10.0
D027	1,4-Dichlorobenzene	106.46-7	7.5
D028	1,2-Dichloroethane	107-06-2	0.5
D029	1,1-Dichloroethylene	75-35-4	0.7
D030	2,4-Dinitrotoluene	1221-14-2	0.13
D012	Endrin	72-20-8	0.02
D031	Heptachlor (and its epoxide)	76-44-8	0.008
D032	Hexachlorobenzene	118-74-1	0.13
D033	Hexachlorobutadiene	87-68-3	0.5
D034	Hexachloroethane	67-72-1	3.0
D008	Lead	7439-92-1	5.0
D013	Lindane	58-89-9	0.4
D009	Mercury	7439-97-6	0.2
D014	Methoxychlor	72-43-5	10.0
D035	Methyl ethyl ketone	78-93-3	200.0
D036	Nitrobenzene	98-95-3	2.0
D037	Pentachlorophenol	87-86-5	100.0
D038	Pyridine	110-86-1	5.0
D010	Selenium	7782-49-2	1.0
D011	Silver	7440-22-4	5.0
D039	Tetrachloroethylene	127-18-4	0.7
D015	Toxaphene	8001-35-2	0.5
D040	Trichloroethylene	79-01-6	0.5
D041	2,4,5-Trichlorophenol	95-95-4	400.0
D042	2,4,6-Trichlorophenol	88-06-2	2.0
D017	2,4,5-TP (Silvex)	93-72-1	1.0
D043	Vinyl chloride	75-01-4	0.2

**Laboratory analyses which show any individual cresol above the 200.0 mg/L threshold are hazardous for that reason. For analyses where o-, m- and p- cresol concentrations cannot be differentiated, the total cresol concentration is used.*