

## Classification of household hazardous waste in Ireland

This Annex provides a description of household hazardous waste and guidance on its classification, based on the Guidance — for the Management of Household Hazardous Waste at Civic Amenity Sites published by the Environmental Protection Agency of Ireland in 2017.

### Guidelines for Specific Hazardous Wastes

Aerosol Cans	
<p><b>LoW Code and Description</b></p> <p>16 05 04* gases in pressure containers (including halons) containing dangerous substances</p> <p>16 05 05 gases in pressure containers other than those mentioned in 16 05 04</p>	
<p><b>Description</b></p> <p>In the context of household hazardous waste, the term aerosol describes the various types of products packaged in non-refillable, self-dispensing pressurised containers. These include spray products and foam products used by household consumers. In addition, farms generate a significant amount of waste aerosol sprays, which are used for marking cattle and sheep.</p> <p><b>Associated Hazards</b></p> <p>Post-consumer aerosols may contain significant residual amounts of their original content that may be hazardous, flammable (e.g., automotive products, insecticides) or toxic (e.g. chlorinated solvent sprays or some cleaning products). Aerosols also contain a propellant gas, which may be flammable, such as butane. Even when notionally “empty”, aerosol cans still contain an amount of flammable propellant gas under pressure. Very old aerosols may contain chlorofluorocarbons (CFCs) or fluorinated greenhouse gas (F-gas) propellants, which are damaging to the ozone layer and contribute to climate change, respectively. When stored together, the cumulative volume of gas in aerosols may be significant and their gases can cause fires and explosions if released through mistreatment.</p>	
Asbestos	
<p><b>LoW Code and Description</b></p> <p>16 01 11* brake pads containing asbestos</p> <p>17 06 05* construction materials containing asbestos</p>	

### Description

Asbestos is a naturally occurring substance that originates from crystallisation of molten rock. It is classified into many different types; the six listed below are regulated, but the first three are the main types of asbestos that have any real significance or usage in Ireland.

- |  |                  |
|--|------------------|
| 1. Crocidolite, often referred to as blue asbestos | 4. Anthophyllite |
| 2. Amosite, often referred to as brown asbestos    | 5. Tremolite     |
| 3. Chrysotile, often referred to as white asbestos | 6. Actinolite    |

Chrysotile is the most widely used form of asbestos. The majority of buildings, including domestic buildings, built between 1940 and 1985 will contain some asbestos products. The list below is ranked from high-risk to lower risk asbestos-containing materials:

- insulation from around pipes and boilers, including sprayed coatings
- insulating board used for fire barriers in applications such as door panels, partitioning, ceiling panels, attic access insulation, and insulation to stoves, ovens and storage heaters
- rope insulation or compressed gaskets for pipework
- profiled cement roofing sheets and roof tiles
- cement pipes, flues, guttering and water tanks
- vinyl floor tiles and bitumen adhesive
- textured coatings and paints containing asbestos
- asbestos-backed linoleum
- moulded products such as cisterns and tanks
- asbestos bitumen roofing felts and damp-proof courses.

### Associated Hazards

Asbestos is a Category 1 carcinogen and all six types can cause cancer. Friable, damaged or disturbed asbestos is more likely to release fibres into the air that can lead to inhalation by exposed persons and contamination of clothing and skin. Examples of friable asbestos include sprayed fireproofing on structural steelwork or thermal insulation on pipe work. Non-friable asbestos means material containing asbestos that is resistant to mild abrasion and damage and less likely to release inhalable fibres. Examples of non-friable and therefore lower risk asbestos-containing materials include vinyl floor tiles and asbestos cement products such as roof sheets from sheds and garages, roof tiles, associated guttering, downpipes, cisterns, tanks and flue pipes.

## Batteries

### Description

All batteries contain substances that are harmful to the environment, so collecting and recycling batteries can prevent pollution and save resources. The Battery and Accumulator Regulations 2014 describe three types of batteries that are covered under these regulations:

1. **automotive batteries** (ignition/starter batteries in cars, vans, trucks and boats)
2. **industrial batteries** (including those used in forklift trucks, electric pallet trucks, electric vehicles and golf buggies)
3. **portable batteries** (including those found in blister packs used in household appliances, toys, mobile phones, remote controls, button cells used in cameras, watches, etc.).

Waste batteries must be separately collected for recycling and recovery of resources. They must not be disposed of in general refuse or mixed waste streams and free take-back must be provided to all end users. This applies to both household and non-household end users. A system for the free take-back of waste batteries from the household waste stream is well established through retail outlets and they can be brought to CA sites.

Waste industrial batteries are generally managed through specialist suppliers.

## Batteries (Automotive)

### LoW Code and Description

16 06 01\* lead batteries

16 06 02\* Ni-Cd batteries

16 06 03\* mercury-containing batteries

20 01 33\* batteries and accumulators

20 01 34 batteries and accumulators not mentioned in 20 01 33\*



### Description

Automotive batteries are a type of rechargeable battery that supplies electric energy to a vehicle's starter motor, lights and ignition system. Automotive starter batteries are usually of lead–acid type.

Automotive batteries are included in the scope of the Batteries and Accumulators Regulations 2014. Therefore, householders can bring back waste batteries free of charge to the retailer selling batteries of a similar type, on a one-for-zero basis (i.e. no purchase is necessary), or, alternatively, take them to the local CA site.

### Associated Hazards

Automotive batteries are very toxic to aquatic life and are harmful to human health. Lead is persistent in soil and sediments and bioaccumulates in aquatic and terrestrial animals and plants.

Automotive batteries are also corrosive and can also produce high-energy sparks and heating if shorted-out by a metal item placed or dropped across the terminals. Shorting is often violent enough to “weld” a metal item (e.g. metal jewellery) to the battery and provide a source of ignition (it cannot be assumed that waste batteries have been discharged).

Lead–acid batteries can also produce highly flammable hydrogen. This, combined with potential ignition by sparks, should shorting occur, makes vehicle batteries very hazardous. Lead–acid batteries can also split and explode if maltreated.

## Batteries (Portable)

### LoW Code and Description

16 06 01\* lead batteries

16 06 02\* Ni-Cd batteries

16 06 03\* mercury-containing batteries

16 06 05 other batteries and accumulators (including lithium batteries)

20 01 33\* batteries and accumulators

20 01 34 batteries and accumulators not mentioned in 20 01 33\*



### Description

Portable batteries include alkaline and carbon–zinc (9-volt, D, C, AA, AAA), mercuric oxide (button, some cylindrical and rectangular), silver oxide and zinc–air (button), and lithium (9-volt, C, AA, coin, button, rechargeable). Portable batteries also include those found in blister packs used in household appliances, toys, mobile phones, remote controls, and button cells used in cameras, watches, etc.

These products are included in the scope of the Batteries and Accumulators Regulations 2014 and free take-back of batteries at the end of their useful life must be made available by retailers to householders and, in certain circumstances, commercial end users. They must not be disposed of in general refuse or mixed waste streams. Householders can bring back waste portable batteries free of charge to any retailer who is selling batteries of a similar type, on a one-for-zero basis (i.e. no purchase necessary), or alternatively to the local CA site.

### Associated Hazards

Portable batteries are generally smaller and lower risk than automotive batteries. However, they contribute many potentially hazardous compounds to the municipal solid waste stream, including zinc, lead, nickel, alkalines, manganese, cadmium, silver and mercury. If lithium batteries are exposed to water, there is a chemical reaction that releases hydrogen and significant amounts of heat. Contact with battery contents may cause irritation to skin and eyes. Inhalation of vapours or fumes released due to heat or a large number of leaking batteries may cause respiratory irritation.

### Fire Extinguishers

#### LoW Code and Description

16 05 04\* gases in pressure containers (including halons) containing dangerous substances

16 05 05 gases in pressure containers other than those mentioned in 16 05 04



### Description

There are two main types of fire extinguishers: stored pressure and cartridge-operated extinguishers. In stored pressure units, the propellant is stored in the same chamber as the fire-fighting agent itself. Depending on the agent used, different propellants are used. With dry chemical extinguishers, nitrogen is typically used; water and foam extinguishers typically use air. Stored pressure fire extinguishers are the most common type.

Cartridge-operated extinguishers contain the propellant gas in a separate cartridge that is punctured prior to discharge, exposing the propellant to the extinguishing agent. This type is not as common.

Halon fire extinguishers are usually green and marked "halon" or "BCF" (bromochlorodifluoromethane) and can be stored within the same secure area as other fire extinguishers. Halon was banned in 2003, under the Ozone-depleting Substances (ODS) Regulation (1005/2009/EC) because it damages the ozone layer. Halon must be recovered and destroyed by authorised processes. Newer extinguishers may contain F-gases, which are also widely used for refrigeration and air conditioning; these are climate change gases and should be brought to an authorised facility for disposal. Those cylinders are owned by the manufacturer/main supplier of the gas and therefore they may not be classified as waste.

### Associated Hazards

Fire extinguishers are usually under pressure and should be treated in the same manner as compressed gas cylinders. Halon is a potent ozone-depleting substance and F-gases are potent climate change gases.

### Gas Cylinders

#### LoW Code and Description

16 05 04\* gases in pressure containers (including halons) containing dangerous substances

16 05 05 gases in pressure containers other than those mentioned in 16 05 04



### Description

Gas bottles/cylinders for heating, refrigeration, industrial uses, etc. are often brought to CA sites. These can contain residual amounts of fuels such as propane or butane, which are flammable, refrigerant gas such as F-gases or ODS, which are climate change gases and ozone layer-depleting gases, respectively, or industrial gases such as carbon dioxide, acetylene and oxygen, etc.

CA site staff should examine all cylinders on receipt at the CA site and should consider the condition of the cylinder including any valve damage and the type of gas contained. Any damaged cylinders should be isolated.

All gas cylinders are required to be labelled to indicate the contents and this should be the primary means of identifying the contents, the hazard(s) and the owner of the cylinder.

Gas cylinders are owned by the manufacturer/main supplier of the gas and therefore they may not be classified as waste. The simplest and best way for CA site staff to deal with cylinders is to contact the supplier and request that they be collected. The supplier's name should be on the cylinder. Householders should be encouraged to return unwanted heating fuel cylinders to a local dealer. If the owner of a cylinder is unidentifiable, some gas distribution companies may collect "orphaned" gas cylinders for reuse. If a cylinder needs to go for disposal by specialist companies, a hazardous waste contractor can advise on this.

### Associated Hazards

Gas cylinders, including LPG cylinders and other gas cylinders, may contain significant amounts of their original gas. The hazards associated with these gases include flammability, explosion hazards, toxic effects of leaks and the physical hazards of a ruptured cylinder. The release of gas in a confined space can displace oxygen and cause asphyxiation, and contact with cold gas as it escapes can damage the skin. Gas cylinders are under pressure and may explode if heated.

The variety of gas cylinders present may have multiple hazards and a decision must be made as to which is the most important by talking to the waste holder, assessing the product label, the Safety Data Sheet or checking with the site's DGSA if necessary.

## Household and Garden Chemicals

### LoW Code and Description

20 01 14\* acids, e.g. corrosive floor cleaners

20 01 15\* alkalines, e.g. bleach

20 01 19\* pesticides

20 01 29\* detergents containing dangerous substances

20 01 31\* cytotoxic and cytostatic medicines

20 01 32 medicines other than those mentioned in 20 01 31



### Description

This category includes a range of household and garden chemicals that can be presented in full or partly empty containers.

**Toxic** waste types include pesticides (herbicides, insecticides and fungicides), weed killers, old medicines, old thermometers containing mercury and chemicals for lawn treatment. Less toxic household hazardous waste types include detergents, disinfectants and surface cleaners.

**Corrosive** wastes include chlorine bleaches, peroxides, hypochlorites and some fertilisers (presenting a fire hazard by yielding oxygen).

**Flammable** wastes include solvents such as acetone (in nail polish remover), some drain cleaners, some floor and furniture polishes, and alcohols such as surgical spirits or methylated spirits.

### Associated Hazards

Household chemicals can be split into low-risk substances, such as detergents and washing powders, and more high-risk hazardous substances, such as chlorine bleaches and peroxides, which are toxic and corrosive.

**Garden chemicals** are normally non-reactive, but may be toxic or oxidising. **Pesticides** (herbicides, insecticides, fungicides) are often toxic. **Fertilisers** are oxidising agents and can be explosive if exposed to a heat source. Skin and eye contact and inhalation of toxic fumes due to uncontrolled reactions of these chemicals are toxic.

Household and garden chemicals may have multiple hazards and a decision must be made as to which is the most important by talking to the waste holder, assessing the product label or the safety data sheet or checking with the site's DGSA if necessary.

Householders should be aware that wastes with different characteristics such as oxidising, flammable, corrosive and toxic should be stored separately prior to bringing them to the CA site.

## Motoring Products

### LoW Code and Description

13 07 01\* fuel oil and diesel

13 07 02\* petrol

16 01 13\* brake fluids

16 01 14\* antifreeze fluids containing dangerous substances

16 01 15 antifreeze fluids other than those mentioned in 16 01 14



### Description

Motoring products that may be presented at a CA site include flammable and toxic substances such as petrol, diesel, brake fluid, transmission fluid, antifreeze and rust remover.

### Associated Hazards

Antifreeze is highly toxic; it has a sweet taste and smell that make it attractive to children and pets. Rust remover is corrosive. The hazards associated with these motoring products include fire/ explosion hazards and toxic effects. Inhalation of fumes can result in headaches, dizziness, nausea or drowsiness.



## Oils and Oil Filters

### LoW Code and Description

16 01 07\* oil filters  
20 01 26\* oil and fat other than edible  
oil and fat



### Description

Waste oils and oil filters, typically from home car servicing. The CA site's acceptance criteria should be set to encourage commercial garages that generate oil and oil filters to use the services of one of the many companies that operate collection and recycling services.

### Associated Hazards

Oil is toxic, corrosive and hazardous to health. Short-term overexposure to petroleum products may lead to dizziness, drowsiness, headache and nausea. Irritation to eyes, skin and throat may also occur. The most common types of accident caused by oils at CA sites are slips and falls from spills. Oil is a commonly reported cause of water pollution. Even a small quantity can cause a lot of damage to the environment. Oils are also combustible and pose a fire risk. Dense smoke may be generated while burning.

## Paints and DIY Products

### LoW Code and Description

20 01 27\* paint, inks, adhesives  
and resins containing  
dangerous substances  
20 01 28 paint, inks, adhesives and  
resins other than those mentioned in  
20 01 27  
20 01 13\* solvents





### Description

Paint and varnish formulations have changed significantly over the past few years with elimination/reduction in the heavy metals used and a move towards water-based paints that contain lower concentrations of volatile organic compounds (VOCs).

Although much of the paint etc. received on site may be non-hazardous, it still has the potential to cause mess, contamination or nuisance. Hazardous paints and solvents are generally specialist, industrial, commercial or older paints that are marked as hazardous products and may have been hoarded. Many solvent-based paint strippers, paint thinners (such as turpentine) and wood preservatives are also flammable and toxic.

### Associated Hazards

Most domestic paints are now non-hazardous, but they should be collected separately for disposal or reuse because of their potential to cause contamination of other wastes or collection vehicles. Paint spills may cause long-term adverse effects in the aquatic environment and cause mess leading to staining, slips, trips and falls. Paint tins can expand in heat, leading to leaks or even explosion. Paints, solvents and thinners are toxic if swallowed.

The main hazards arise from older paints and varnishes that may contain any of a range of flammable, harmful, toxic and carcinogenic organic solvents.

## Smoke Alarms

### LoW Code and Description

20 01 35\* discarded electrical and electronic equipment (other than those mentioned in 20 01 21\* and 20 01 23\*) containing hazardous components



### Description

There are two types of smoke alarms in general use: photoelectric detectors, which present no environmental risk, and ionisation chamber detectors (ICSDs), which present little risk in normal use. However, if damaged by fire, americium may be released, resulting in low-level radiation.

These products are included in the scope of the WEEE and Batteries Regulations and free take-back must be made available by retailers to householders and, in certain circumstances, commercial end users at the end of their useful life. They must not be disposed of in general refuse or mixed waste streams.

Householders can bring back waste smoke alarms free of charge to the retailer when they are purchasing a new one, on a one-for-one basis, or alternatively take them to the local CA site. Retailers can arrange collection through their WEEE compliance schemes.

### Associated Hazards

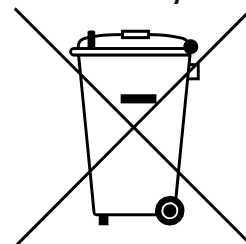
Smoke detectors contain americium, a radioactive material that, if ingested, increases the risk of developing cancer. The annual dose to a user of an ICSD is approximately 0.1 microsievert in comparison with an average annual dose of 4037 microsieverts in Ireland. Approximately 86% of this dose is from natural sources. Man-made sources contribute approximately 14% and are dominated by the beneficial use of radiation in medicine.

The potential dose estimated in the event of mechanical damage to a smoke detector is 80 microsieverts per year, which is very low. However, an accumulation of smoke detectors could result in exposure to much higher dosages.

## WEEE

End-of-life electrical and electronic equipment is included in the scope of the European Union (WEEE) Regulations (S.I. No. 149 of 2014). Under these regulations, free take- back must be made available by retailers to householders when returning WEEE at the end of its useful life.

**The WEEE symbol.**



### Description

For the purposes of handling and storage at CA sites, WEEE should be segregated into the following five categories. The storage requirements of each are discussed separately below.

1. WEEE Fluorescent Tubes and CFLs
2. WEEE Fridges and Freezers
3. WEEE Large Household Appliances
4. WEEE Mixed (Small) Household Appliances
5. WEEE Televisions and Monitors.

It should be noted that not all WEEE is hazardous; e.g., cookers and washing machines are non- hazardous, while fridges and freezers are hazardous because of the refrigerant gases contained in them. Other examples of non-hazardous WEEE are household appliances such as kettles, toasters, etc., and these are catered for by LoW Code 20 01 36. However, WEEE must never be disposed of in general refuse or mixed waste streams, and this is indicated by the crossed- out wheeled bin symbol shown above. The WEEE Directive is designed to encourage and regulate the collection, reuse, recycling and recovery of waste electrical and electronic equipment.