

## Classification of electronic display devices

**This document sets out the process for deciding whether monitors and other electronic display equipment such as Liquid Crystal Display (LCDs) and Plasma televisions should be classified as hazardous waste. The conclusions on LCDs displays in the report produced for Defra (WEEE and hazardous waste Part 2) is superseded by this document.**

Once the decision is made that an item is waste an assessment process needs to be followed to determine if that waste is hazardous. Our guidance, WM2, can be found at: [www.environment-agency.gov.uk/hazwaste](http://www.environment-agency.gov.uk/hazwaste). Hazardous waste is defined as entries in the European Waste Catalogue (EWC) that are marked by an asterisk (\*).

The following codes are applicable to waste electrical equipment such as televisions or monitors:

- 16 02 13\* discarded electrical and electronic equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12
- 16 02 14 discarded equipment other than those mentioned in 16 02 09 to 16 02 13
  
- 20 01 35\* discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components
- 20 01 36 discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35

There is a footnote associated with entries 16 02 13\* and 20 01 35\* that states:

"Hazardous components from electrical and electronic equipment may include accumulators and batteries mentioned in 16 06 and marked as hazardous; mercury switches, glass from cathode ray tubes and other activated glass, etc."

The components specifically listed as hazardous in the footnote above should be regarded as hazardous components and no further consideration of the determination of whether they are hazardous needs to be made. Waste electrical equipment containing any hazardous components will also be hazardous as the waste will then fulfil the criteria set out in the entries 16 02 13\* and 20 01 35\* ("containing hazardous components") and no further assessment needs to be made. The list in the footnote is not exclusive and other hazardous components would also make the waste electrical equipment hazardous.

### Liquid Crystal and Plasma Displays

Liquid Crystal Displays consist of liquid crystal substances embedded between thin layers of polarised glass and electrical control elements. On current evidence we consider that the liquid crystal substances themselves will not make waste LCDs hazardous waste.

## Backlighting

This will be applicable to flat screen displays. Most LCDs (including thin film transistor screens -TFT) have fluorescent tube backlights, but some small devices such as calculators don't have these backlights. The fluorescent tube backlights will contain mercury and are identified as hazardous components in the EWC:

- 20 01 21\* fluorescent tubes and other mercury-containing waste.

Where a waste monitor contains a fluorescent tube backlight, it will be a hazardous waste.

Note that new technology is emerging using Light Emitting Diode backlights. These are currently very limited in use and unless evidence is presented to the contrary, it should be assumed that any backlight present in LCD screens is a fluorescent tube:

- There is very limited information regarding the liquid crystal display substances themselves. At present, and pending any further information, we do not regard these substances as hazardous.
- Plasma and Organic Light Emitting Diode (OLED) monitors work in a different way and do not require a backlight and again, pending further information, we do not consider these hazardous.

## Cathode ray tubes

As Cathode ray tubes (CRTs) are hazardous waste, any piece of waste equipment containing a cathode ray tube is also hazardous waste. CRTs are components of electronic equipment that convert electronic signals into visual displays. They are found in computer monitors, televisions and industrial equipment such as oscilloscopes and medical imaging equipment. They largely comprise a sealed evacuated tube made up of differing glass types. The screen consists of glass containing heavy metals such as lead and barium and phosphor coatings, usually three but monochrome screens have one, onto which a beam of electrons is projected to form the image. The sides of the tube have a conductive coating to absorb excess electrons.

## Summary

On the evidence we currently have, all electrical equipment containing cathode ray tubes and most LCD televisions should be classified as hazardous once they have been designated waste. Waste Plasma displays and televisions do not appear to contain hazardous components and at the present time we do not consider these hazardous.

If the hazardous components referenced above are removed from the waste electric or electronic equipment, and there are no other hazardous components present, the equipment will not be classified as hazardous.

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