SPECIAL WASTE REGULATIONS 1996
SPECIAL WASTE ADVISORY NOTE

ADHESIVES AND SEALANTS — Ref: SWAN/06

Background

This note deals with the classification and assessment of hazardous (special) adhesive and sealant wastes.

Summary

There are many formulations of adhesive and sealant products. Non-aqueous ones may contain a carrier solvent (e.g. toluene or chlorinated hydrocarbons) and be flammable or toxic. Others like wood glue and polyurethane (including laminates) may comprise urea formaldehyde resin or acid catalysts and also be carcinogenic and corrosive. Low VOC sealant, cured resins and epoxy hardeners may not be hazardous. Silicone rubber based supplies, superglues and acrylates may also not be hazardous. Some products have additives to assist their application, e.g. asbestos filler, lead drying agent or phthalate softener.

The hazardous description of the waste will usually be guided by the hazard data provided on the packaging and with the product. Assessment should be based on Material Safety Data Sheets (MSDS's) of the original formulation. Processing, use or contamination of the product may affect the classification.

Waste Classification

The wastes are classified under Chapter 08 of the EWC and include water-proofing products unless they arise amongst builder's waste (Chapter 17) or are separately collected (Chapter 20).

Wastes containing halogenated solvents

08 04 09* **Waste adhesives and sealants containing organic solvents or other dangerous substances**

There are other codes depending on the form in which they were supplied, their application or their removal (e.g. aqueous based solutions such as perspex solution in chloroform will be **08 04 15***):

08 04 11* **Adhesive and sealant sludges containing organic solvents or other dangerous subs.**

08 04 13* **Aqueous sludges containing adhesives or sealants containing organic solvents or other dangerous substances**

08 04 15* **Aqueous liquid waste containing adhesives or sealants containing organic solvents or other dangerous substances**

20 01 27* **Paint, inks, adhesives and resins containing dangerous substances**

Some formulations, particularly protective coatings may contain active ingredients other than solvents, which will be assessed as 'other dangerous substances' in the mirror entries above (for instance some are treated to resist stains or moulds, moths or micro-organisms). Some historic bitumastic adhesives and glazing compounds have asbestos fibres as the filler and would be hazardous at 0.1% asbestos. Vinyl flooring (PVC) may contain chlorinated paraffins and tributyl tin[1]. Others may have had reagents such as thinners added after manufacture.

Some specialist industrial preparations may contain toxic substances, e.g. in 'two-pack' supplies or reactive co-polymers. Urea formaldehyde resins[2] (e.g. in the wood adhesives in laminates) may be hazardous waste if they contain more than 1% of free formaldehyde. Further information on formaldehyde is given in WM2, App. B22.

Silane (trialkoxy isobutyl silane) modified polymers, e.g. those used in concrete proofing to prevent the ingress of chlorides may be hazardous as the ingredients can be highly damaging to the aquatic environment, i.e. **ecotoxic** (**H14**). Some silicones and silane polymers release toxic or corrosive substances, which could qualify them hazardous by **H12** for example acetic acid, methanol oxime or various amines as part of the curing process. Although the concentrations released are unlikely to achieve this, a precautionary assessment should be done.

Numerous examples of liquid formulations contain solvents (typically ketones) where the flash point is less than 21°C (hazardous by **H3-A**[first indent] – **highly flammable**) or between 21 and 55°C (hazardous by **H3-B - flammable**). Certain aerosol spray applications may be highly flammable due to solvent content and release.

Not all acrylics and epoxy resins are likely to be hazardous, but some may have risk phrases **R36**, **37** and **R38** (e.g. silicon tetrachloride) or **R41**[3] linking to **irritant** above 20% or 10% respectively. Some phenol resins may be **flammable** (**H3-B**) but also **carcinogenic**, e.g. by **R45**[3]. Bisphenol-A (epichlorohydrin) resin is given **R51/53**[3] (**ecotoxic**) on data sheets. This should take precedent if the classification is otherwise not given on the ASL.

Adhesives can be corrosive or harmful (generally at 25% depending on the R phrase), for instance the resin hardeners (usually organic amines) and acrylic formulations containing substances such as methacrylic acid with **R21/22** and **R35**[3]. Some products may contain PCBs, where mixed in builder's waste these are classified:

17 09 02* **Construction and demolition wastes containing PCB (for example PCB-containing sealants, PCB-containing resin-based floorings, etc.**

PCBs have risk phrase **R50-53**[3] which is **H14 - eco-toxic** over 0.25% (the substances being additive). However, PCBs are persistent in the environment and able to move into the food chain. **50 mg/kg** (**0.005%**) is the threshold such waste should be considered against in line with international/UK legislation and guidance.

On individual assessment, the family chemical name, or isomer group should be referred to verify the risk phrase if the substance itself is not verified in sources such as the ASL[4] when linking the data sheets to waste hazards. Table 3.1 in WM2 should be consulted when linking the R phrase to a hazardous property. Where a classification relates to sensitisation (e.g. of the skin) this is not applicable to hazardous waste classification.

Solvent free products

There are aqueous emulsions such as wood glues (organic esters) which are non-hazardous. Many other water based products which are free of organic solvents will have no inherent hazards and risk phrases, including:

- Natural starch/casein based products, e.g. wall-paper adhesive
- UV curing adhesives, e.g. araldite and permabond formulations
- Rubber based adhesives and silicones, e.g. glue gun based
- Cellulose derivatives, e.g. methyl cellulose and cryanoacrylates such as superglue[5]
- Cured resins (unless residues of reagent such as formaldehyde) and ready mixed tile adhesives

These will be classified under any of the following (powders and hardened wastes will be included in **08 04 10**):

08 04 10 **Waste adhesives and sealants other than those mentioned in 08 04 09**

08 04 12 **Adhesive and sealant sludges other than those mentioned in 08 04 11**

08 04 14 **Aqueous sludges containing adhesives or sealants other than .. 08 04 13**

08 04 16 **Aqueous liquid waste containing adhesives or sealants other than .. 08 04 15**

20 01 28 **Paint, inks, adhesives and resins other than those mentioned in 20 01 27**

Hot melt adhesives where there is only a physical phase change brought about by the action of heat and no inherent hazards are non-hazardous. Linoleum is made from non-hazardous linseed oil and tree resin mixed with inorganic fillers such as clay and chalk. Silicone rubber based products, typically polymeric siloxanes also contain inert fillers and pigments and are self curing, i.e. set in air. Only under certain conditions such as high temperature may they release formaldehyde, under normal usage and disposal this should not be a problem.

Notes

[1] Tributyltin compounds are classified **with R phrases R25-48, R21, R36/38 and R50-53 (see below)**

[2] Formaldehyde is classified with R phrases R40, R23/24/25 and R34 (see below)

[3] **Risk phrases and hazard codes**

R21: Harmful in contact with skin
R22: Harmful if swallowed
R23: Toxic by inhalation
R24: Toxic in contact with skin
R25: Toxic if swallowed
R34: Causes burns
R35: Causes severe burns
R36: Irritating to the eyes
R37: Irritating to the respiratory system
R38: Irritating to the skin
R41: Risk of serious damage to the eyes
R45: May cause cancer
R48: Danger of serious damage to health by prolonged exposure
R50-53 - Very toxic to aquatic organisms and may cause long term effects in the aquatic environment
R51-53 – Toxic to aquatic organisms and may cause long term-effects in the aquatic environment
H12: Substances and preparations which release toxic or very toxic gases in contact with water, air or an acid.

[4] ASL (provides simple information for the labelling of products with chemicals that could be dangerous to human health or the environment) can be found online on the NCEC website at: http://www.the-ncec.com/cselite/index.html WM2 uses the most recent version of the ASL to ensure that classification of waste reflects current understanding on dangerous substances

[5] Some superglues may be labelled 'irritant' and will require assessment