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Safe Handling of Banknote Protection Chemicals

This report summarises the findings of an external review of contaminated banknote handling at the Bank of England, Leeds and the development of a specification for chemicals not to be used for banknote protection systems.

The principal risks are likely to arise from skin contact and inhalation of dust arising from the contaminated notes.

The attached specification consists of a list of hazardous chemical classifications which should result in such materials being excluded from banknote protection systems. The health risks of greatest concern are from the most toxic materials with the potential for long term effects, in particular those which are carcinogens, mutagens and toxic for reproduction (CMR). All such materials should be excluded from banknote protection systems.

Substances to be excluded in preparations used for Banknote Protection Systems

(A) Substances which are classified in accordance with the following table

Classifications are given in accordance with both the UK CHIP Regulations which are based on the Dangerous Substance Directive 67/548/EEC and Dangerous Preparations Directive 1999/45/EC, as well as the recent Classification Packaging and Labelling Directive 1272/2008.

R phrase under CHIP	Meaning	CLP Hazard Class	CLP Hazard Statement	Meaning
R23	Toxic by inhalation	Acute Tox. 2 Acute Tox. 3	H330 H331	Fatal if inhaled Toxic if inhaled
R24	Toxic in contact with skin	Acute Tox. 2 Acute Tox. 3	H331	Toxic in contact with skin
R25	Toxic if swallowed	Acute Tox. 3	H301	Toxic if swallowed
R26	Very toxic by inhalation	Acute Tox. 1 Acute Tox. 2	H330	Fatal if inhaled
R26/27	Very toxic by inhalation and in contact with skin			
R26/27/28	Very toxic, in contact with skin and if swallowed			
R26/28	Very toxic by inhalation and if swallowed			
R27	Very toxic in contact with skin	Acute Tox. 1	H310	Fatal in contact with skin
R27/28	Very toxic in contact with skin and if swallowed			
R28	Very toxic if swallowed	Acute Tox. 2	H300	Fatal if swallowed
R39	Danger of very serious irreversible effects	SLOT SE 1	H370	Causes damage to organs
R39 in combination with R23-R28	As above			As above
R42	May cause sensitisation by inhalation	Resp. Sens. 1	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
R43	May cause sensitisation by skin contact	Skin Sens. 1	H317	May cause an allergic skin reaction

R phrase under CHIP	Meaning	CLP Hazard Class	CLP Hazard Statement	Meaning
R42/43	May cause sensitisation by inhalation and skin contact			
R45	May cause cancer	Carc. Cat 1A Carc. Cat 1B	H350	May cause cancer
R46	May cause heritable genetic damage	Muta. 1B	H340	May cause genetic defects
R48	Danger of serious damage to health by prolonged exposure			
R48 in combination with R20, R21 and R22	Harmful: danger of serious damage to health by prolonged exposure through inhalation	SLOT RE 2	H373	May cause damage to organs
R48 in combination with R23, R24 and R25	Toxic: danger of serious damage to health by prolonged exposure through inhalation	SLOT RE 1	H372	Causes damage to organs
R49	May cause cancer by inhalation	Carc. Cat 1A Carc. Cat 1B	H350i	
R60	May impair fertility	Repr. 1A Repr. 1B	H360F	May damage fertility
R61	May cause harm to the unborn child	Repr. 1A Repr. 1B	H360D	May damage the unborn child
R62	Possible risk of impaired fertility	Repr. Cat 2	H361f	Suspected of damaging fertility
R63	Possible risk of harm to the unborn child	Repr. Cat 2	H361d	Suspected of damaging the unborn child
R64	May cause harm to breastfed babies	Repr.	H362	May cause harm to breast-fed children

Radioactive substances should also be excluded.

(A) Specific Substances

Pigment colorants based on Antimony, Arsenic, Cadmium, Chromium (VI), Lead, Mercury, Selenium.

Dye colorants: Auramine (Basic Yellow 2 - CI 41000), Chrysoidine (Basic Orange 2 - CI 11270), Fuchsine (Basic Violet 14 – CI 42510), Induline (Solvent Blue 7 CI - 50400), Cresylene Brown (Basic Brown 4 - CI 21010).

Other soluble azo dyes which can decompose in the body to bio-available carcinogenic aromatic amines of category 1 and 2 according to Directive 67/548/EEC: Chlorinated naphthalenes, chlorinated paraffins, monocresyl phosphate, tricresyl phosphate, monocresyl diphenyl phosphate, diaminostilbene and derivatives, 2,4-dimethyl-6-tertiary-butylphenol, 4,4-tetramethyldiaminobenzophenone (Michler's ketone), hexachlorocyclohexane.

Addendum - 2014

Following a review in April 2014 the Bank has included 3 additional risk phrases. Materials with these risk phrases associated to them should also be excluded from Banknote protection systems. These risk phrases relate to reproductive toxicants (R62, R63, R64).