PCB INFORMATION LEAFLET

What are PCBs?

PCBs (polychlorinated biphenyls) are chemical substances that have been commercially produced and sold as pure oil or in equivalent form from around 1929. They are extremely stable compounds with excellent electrical insulation and heat transfer properties. These characteristics have led to their widespread use in a variety of industrial, commercial and domestic applications. PCB applications are commonly categorised as either *open* or *closed* applications as follows:

- Open applications: use as heat exchange fluids, hydraulic oils, lubricating oils and as additives in paints, plastics, solvents, adhesives and cements.
- Closed applications: use as insulating fluid in electrical transformers, capacitors, power factor correction units, lighting ballasts, vacuum pumps and submersible pumps.

Why the need for Regulation?

PCB's have long been recognised as posing a threat to the environment because of their toxicity, persistence and tendency to bioaccumulate (i.e. to build up in the bodies of animals, particularly at the top of the food chain). Although the use of PCBs has been reduced greatly since the 1970s it is recognised that those still remaining in existing equipment pose a continuing environmental threat.

Your Legal Obligations

EC Directive 96/59/EC *(http://eur-lex.europa.eu/en/index.htm)* on the disposal of PCBs and polychlorinated terphenyls (PCTs) requires the preparation of national inventories and the labeling and disposal / treatment of all PCB holdings. **In Ireland the EPA are responsible for this national inventory**.

The *Waste Management (Hazardous Waste) Regulations 1998* (http://www.irishstatutebook.ie/1998/en/si/0163.html) implement provisions of the EC Directive (96/59/EC*)* and sets out the requirements in terms of disposing of PCBs and registering holdings of PCBs. A holder of PCBs, used PCBs or contaminated equipment must:

- Decontaminate or dispose of used PCBs, contaminated equipment and the PCBs contained in such equipment as soon as possible. For contaminated equipment containing more than 5dm^3 (5 litres) of PCBs:
  - By 31 December 2010, if the fluid content contains more than 0.05% by weight of PCBs. Transformers containing more than 0.05% by weight of PCBs must be decontaminated in accordance with a specific set of conditions;
  - At the end of its useful life if the fluid content contains between 0.005% and 0.05% by weight of PCBs.

- Label equipment containing more than 5 litres of PCBs and the doors of premises where such equipment is located. The labels must be indelible, easily visible and legible, stating that the equipment (or premises contain equipment) is "Contaminated by PCBs". Where it is reasonable to assume that the fluid content of the equipment contains between 0.005% and 0.05% by weight of PCBs label as "PCBs contaminated 0.05%".

- Separate such PCBs or equipment from flammable materials and take precautions to avoid any risk of fire.

- Operate a source separation programme for equipment that contains less than 5 litres of PCBs and is a component of another piece of equipment, i.e., remove and arrange for the separate collection of such components with a view to their recovery or disposal.

- Give Notice to the EPA for all PCBs, used PCBs or contaminated equipment containing more than 5 litres of PCBs no later than the 1 September each year. To include: the name and address of the holder; the location and quantity of the PCBs or used PCBs; the location and description of the equipment; the quantity of PCBs contained in such equipment; the measures taken or proposed to be taken for the decontamination or disposal; and the date of giving such notice.

- Respect the prohibition of certain uses of PCBs:
  - Importation, production or supply to another person of PCBs or contaminated equipment;
  - Holding or use of PCBs or contaminated equipment, unless notified to the EPA;
  - Separation of PCBs from other substances for the purpose of reusing the PCBs;
  - Addition of PCBs to transformers or other equipment; and
  - Maintenance of transformers containing PCBs, unless under certain circumstances.

European Communities (Dangerous Substances and Preparations)(Marketing and Use) Regulations 2003, (http://www.irishstatutebook.ie/2003/en/si/0220.html)
These regulations implement Council Directives 85/467/EEC and 89/677/EEC in relation to polychlorinated biphenyls (except mono and dichlorinated biphenyls), PCTs, and preparations, including waste oils, with a PCB or PCT weight content higher than 0.005%.

- These substances may not be used, except in designated applications that were in service prior to 30 June 1986. Equipment and plant containing PCBs or PCTs are required to display instructions concerning disposal and maintenance and use of equipment and plant containing them.

How to Identify PCBs and Contaminated Equipment

> "*Any equipment of a type which is likely to contain PCBs shall … be considered as containing PCBs unless it is reasonable to assume the contrary*." (Article 13(2), Waste Management (Hazardous Waste) Regulations, 1998)

PCBs were commercially manufactured for over 60 years by dozens of manufacturers using over 100 different trade names. The following information should be used as a guide in the identification of PCB oils and PCB-containing equipment, analytical testing is always recommended prior to disposal of equipment suspected of containing PCBs.

Oils (e.g. heat exchange fluids, hydraulic oils, lubricating oils)
A list of common trade names for the various mixtures of PCB oils is provided in Table 1 overleaf.

Transformers Electrical transformers are used to 'transform' voltage from one level to another, usually from a higher voltage to a lower voltage by applying the principle of magnetic induction between coils to convert voltage and/or current levels. Some of the high voltage electrical transformers contain oil, which acts as an insulator and coolant, which may contain PCBs.
A transformer is considered to be in scope-equipment if it:

1. Contains oil, and
2. Was manufactured prior to 1989 or manufacturing year is unknown.

A transformer is out of scope if:

1. Manufactured post 1989; or
2. Resin filled.

To determine if a transformer is in-scope:

- Review the manufacturer's nameplate to identify:
  - the manufacturer name;
  - the year of manufacture (transformers older than 1989 are considered in-scope unless there is evidence to prove their PCB-free status);
  - if the transformer is oil filled - oil filled transformers e.g. ON – oil natural cooling (indicates that transformer contains oil), ONAN – oil natural air natural cooling (indicates that transformer contains oil;
  - serial number;
  - volume of oil, and
  - if possible the PCB status e.g. some nameplates will have non-PCB labels.

- Verify the PCB-free status of an in-scope transformer by sampling the oil and analysing it for the presence of PCBs using a method conforming to standard IEC 61619.

Power factor correction (PFC) units and **Capacitors:** Power capacitors are used in a range of functions on industrial sites, most commonly power factor correction units. A power factor correction unit (PFCU) usually consists of a number of power capacitors and associated control circuitry. In some cases, capacitors can only be seen if the housing of the PFCU is opened. Most power capacitors are large rectangular boxes. However, a cylindrical design is also popular. PFCU can consist of a single power capacitor. A capacitor is considered to be in-scope equipment if it:

1. Contains oil, and
2. Was manufactured prior to 1989 or if the manufacturing year is unknown.

A capacitor is out of scope if:

- 'PCB free' or 'NON PCB' is displayed on the manufacturer's nameplate or label;
- The manufacturing year is after 1989; or
- If there is a 'dry design' label on the manufacturer's nameplate or label.

The stated standard to which the capacitor was built with the year when the standard was published can also be used to classify a capacitor as out-of-scope equipment. For example a Nokian capacitor labelled IEC 60831 1&2 (1996), means that this capacitor was built to the standard published in 1996, which means that the earliest this capacitor could have been built was 1996, i.e. it is out of scope.
Testing capacitors for PCB content is destructive, so once a sample of dielectric liquid is taken, the capacitor becomes waste. Therefore manufacturer's documentation can be used to verify PCB status.

Lighting ballasts (devices contained within a light fitting designed to maintain the electric current)
Lighting ballasts rarely display sufficient technical details to determine their PCB-status. Ballasts manufactured in the USA after 1979 will have 'PCB-free' labels attached. No such equivalent requirement in the EU is known to exist. All lighting ballasts manufactured before 1989 that do not contain a 'PCB-free' label should be considered in-scope.

Circuit Breakers (Oil filled circuit breakers (OFCBs), also called switches or switchgear, are designed to break an electrical circuit. OFCBs are equivalent of the light switch in homes and offices, but for high voltage. When a high voltage electrical circuit is broken, an electrical arcing may occur which can damage the circuit breaker, therefore, an oil bath is required to quench the electrical arc.
A circuit breaker is considered to be in scope-equipment if it:

1. Contains oil, and
2. Was manufactured prior to 1989 or manufacturing year is unknown.

A circuit breaker is out of scope if:

3. Manufactured post 1989; or
4. Air or SF6 insulated.

The same checks can be conducted for circuit breakers as for transformers identified above including analytical sampling.

Other equipment which may contain PCBs includes:

1. X-Ray machines;
2. Welding plant; and
3. Hydraulic equipment.

All holders of electrical equipment should systematically determine whether their equipment contains or potentially contains PCBs. Any PCB-containing equipment or suspect PCB containing equipment should be notified to the EPA,

Further information and guidance:

- Environment Protection Agency: www.pcbs.ie
- Identification of PCBs, United Nations: http://www.chem.unep.ch/pops/pdf/PCBident/pcbid1.pdf
- Identification of PCB-containing capacitors: Australian and New Zealand Environment and Conservation Council: http://www.environment.gov.au/settlements/publications/chemicals/scheduled-waste/pcbidentification.html

Table 1 Oils: List of common trade names for the various mixtures of PCB oils

Asbestol	Adkarel	Askeral	Auxol	Aceclor
Arochlor 1221, 1232/1248, 1254, 1260, 1268, 1270, 1342, 2565/4465/5460	Apirolio	Apirolia	Aroclor	Areclor (t)
Arubren	ASK	Bakola 131	Biclor (c)	Chorextol
Chlorextol	C(h)lophen A30	C(h)lophen A50	Clophen A60	Clophen Apirorlio
Chlorphen	Chloresil	Chlorintol	Chlorinol	Chlorinated Diphenyl
Clorphen (t)	Deler	Delor	Dialor (c)	Diaclor
Diachlor	Diaconal	Diconal	Disconon (c)	Dykanol
Duconal	DK	DP 3, 4, 5, 6.5	Educarel	EEC-18
Electrophenyl	Elaol	Elemex (t, c)	Elexem	Eucarel
Fenclor 42, 54, 64, 70	Hexol	Hivar (c)	Hydol	Hyvol
Inclor	Inclar	Inerteen 300, 400, 600	Kan(e)chlor (KC) 200-600	Kanechor
Kaneclor	Keneclor 400	Keneclor 500	Keneclor	Kennechlor
Leromoli	Leromoll	Magvar	MCS 1489	Montar
Nepolin	Niren	No-Famol	No-Flamol	NoFlamol
Non-Flamable Liquid	Phenoclar DP6	Phenoclor DP6	Plastivar	Pydraul
Pyroclar	Pyroclor	Pyrochlor	Pyranol	Pyranal
Pysanol	Physalen	Phyralene	Pyralene 1460	Pyralene 1500, 1501
Pyralene 3010, 3011	Pyralene T1	Pyralene T2	Pyralene T3	Safe-T-America
Safe-T-Kuhl	Saft-Kuhl	Sant(h)osafe	Santosol	Santvacki
Santovac	Santovac 1	Santovac 2	Santowax	Santothern FR
Santotherm	Sant(h)othern FR	Saut(h)otherm	Siclonyl (c)	Solvol
Sorol	Sovol	Therminol	Therminol FR	Terpenylchlore

This list should not be assumed to be exhaustive or all-inclusive. If there is any doubt about whether an item of equipment contains PCBs, assume that it does.