

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?

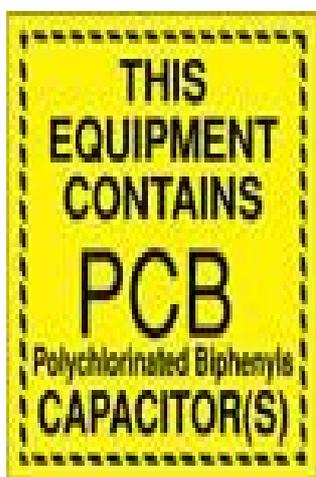
PCB's have long been recognised as posing a threat to the environment because of their toxicity, persistence and tendency to bioaccumulate (i.e. to build up in the bodies of animals, particularly at the top of the food chain). Although the use of PCBs has been reduced greatly since the 1970s it is recognised 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 5dm³ (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.

PCB INFORMATION LEAFLET

- 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 in writing 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 (Devices that transfer an alternating current from one circuit to one or more other circuits, usually with a change of voltage. The unit is generally filled with a dielectric fluid, which may contain PCBs, **see photograph below**).

- Review the manufacturer’s nameplate and compare against the names in Table 1 and Table 2 overleaf. If a match is found it should be assumed that it contains 600,000-700,000 parts per million (ppm) PCBs (approximately 70%).
- Where other data is not available, an estimate of the unit’s age should be made. Units manufactured in the USA after 1977 should contain a ‘PCB-free’ label. Otherwise, any transformer which was manufactured in 1986 or earlier (or if from the USSR or former USSR countries, 1993 or earlier) should be considered to potentially contain PCB oils until such time as analytical testing or other evidence may prove otherwise.

The volume of oil will vary greatly from unit to unit and may range from 0.2 to 4,000 litres. Where the volume is not specified on the equipment, an initial estimate may be made by measuring the outer dimensions of the transformer. Wet cell transformers typically contain 50-80% fluid by volume.



Industrial Transformer

PCB INFORMATION LEAFLET

Capacitors (A device for accumulating and holding an electric charge. A capacitor comprises two conducting surfaces separated by a dielectric fluid, which may contain PCBs. Also referred to as a condenser).

- Review the manufacturer's name plate and compare against [Table 1](#) and [Table 3](#). If a match is found the unit should be assumed to contain PCBs.
- Where such data is not available and in the absence of contrary information, any capacitor manufactured during or prior to 1989 should be assumed to contain PCBs until proven otherwise by analytical testing or other evidence.

Typically a capacitor containing PCBs will be a completely sealed unit with two electric contacts. Over 70% of all capacitors are used as power capacitors and will contain 10 to 20 litres of oil. Small capacitors, such as those associated with household appliances, generally contain 0.05 to 1.8 litres of oil.

Power factor correction (PFC) units (A specific form of large capacitor, generally located in close proximity to a site's transformer or power board):

Power factor correction units are typically comprised of several smaller capacitors, see capacitor section for identification guidance. Power factor correction units are generally of uniform size (approximately 60x30x15cm) and contain approximately 1.8 litres of oil.

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 to contain PCBs.
- Each lighting ballast typically contains 0.01 to 0.03 litres of PCB fluid and there is generally one ballast for every two fluorescent lighting tubes.

Circuit Breakers (A protective device that opens a circuit upon sensing a current overload. Unlike a fuse, it can be reset). Oil filled circuit breakers older than 1989 may contain PCBs. Carry out the same checks as for Transformers and Capacitors.

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: <http://www.epa.ie/whatwedo/resource/mgt/hazardous/pops/>
- Identification of PCBs, United Nations: <http://www.chem.unep.ch/pops/pdf/PCBident/pcb1.pdf>
- PCB reports in general, United Nations: <http://www.chem.unep.ch/pops/newlayout/repdocs.html>.

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>

For queries relating to PCBs please contact:

Environmental Protection Agency
Johnstown Castle Estate
Wexford
Ireland

Phone No.: 00353 - 53 - 9160600

Fax No: 00353 - 53 - 9160699

E-mail: info@epa.ie

Website: <http://www.epa.ie/whatwedo/resource/mgt/hazardous/pops/>

PCB INFORMATION LEAFLET

These lists 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.

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	Apiroliia	Aroclor	Areclor (t)
Arubren	ASK	Bakola 131	Biclor (c)	Chorextol
Chlorextol	C(h)lophen A30	C(h)lophen A50	Clophen A60	Clophen Apirorio
Chlorphen	Chloresil	Chlorintol	Chlorinol	Chlorinated Diphenyl
Clophen (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

Table 2 Transformers: List of transformer manufacturers reported to have used PCB oils in their equipment

US	Standard Transformer Co.	R.E. Uptegraff Mfg Co.	British Power
Westinghouse	Helena Corp.	H.K. Porter	Transunal
General Electric Company	Hevi-Duty Electric	Van Tran Electric Co.	Germany
Research-Cottrell	Kuhlman Electric Co.	Esco Manufacturing Co.	AEG (Divisions in Germany)
Niagara Transformer Corp.	Electro Engineering Works	UK	Trafo Union (TU)

Source: Guidelines for the Identification of PCBs and Materials Containing PCBs, United Nations EP

Table 3 Capacitors: List of capacitor manufacturers reported to have used PCBs in their equipment.

A.H. Hunt Ltd	BTH	ERO	Liljeholmen	N1CHICON	SCC	TEAPOL
ACEC	Capacitor Specialists	ESHA	LMT	NICH1CON Capacitor Co	SEI	The Capacitron Co
AEE	CDG	FAC	McGraw-Edison	Nippon	Seika Electrics Co Ltd	The Telegraphic Condenser Co
AEG	CCP	Ferguson	Mallory & Co	Nokia	Seiray	Tobe Deutschmann Labs
AEI Aerovox	Cine-Chrome Lab, Inc.	Firbourg	Marcon	Novea	Selenium	THORN
Alpha	CTS	Fluorseal	Mazdalux	NTK	SH	TMC
AME	Cornell Dubilier	Frako	ME	OMD	Shizuki	TOC
AME Dubilier	D	Fuji Ken	Mepco/Electra	Phillips	SIC-SAFCO	UCC
AME Hunts	Daly	General Electric	Metalect	Plessey	Sieverts	USHA
ANDREW ICAR	Danco	GEC	MF	Plessey Capacitors	Siemens	Universal Manufacturing Corp.
ASEA	Dawco	Glassmike	MF Phillips	Plessey Uk	Simplex	Watson
Associated Light'g	Dawson	Hydrowerk	Micro (Alelko)	Pye	Slimcap	Wego
ATE CO.	DICC	ICAR	MKL	RDE	Soltra	Wego Condenser Co
ATE	Dubilier	INCO	MKP	RF Interionics	SPA "Condensator"	Western Electric
AWA	Ducati	INTERCAP	Motor Start	RIC	Sprague	Westinghouse
Axel Electronic Inc.	Ducon	IRH	Motorola	RIC Capacitors Ltd	Stabilac Pty Ltd	Yesha
BAL-CO	Duconol	ITAL FARAD	MP	RIFA	Static	Yesha Electricals
BHC	Elna	ITT	MPW	Roederstein	STC	York Electronics
BICC	Endurance	Jard Corp.	MSP	RS	Stedepower	Yunchang
BICC-NEECO	Electric Utility Co.	Johnson & Phillips Ltd	National Industry	Samhwa Capacitor Co	SUDD	
Bosch	Ericsson/Rifa	KCC	NATRON 1C	Sangamo Electric Co.	TCC	

PCB INFORMATION LEAFLET

