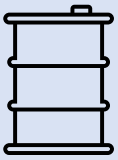
PERSISTENT ORGANIC POLLUTANTS - PCB INFORMATION LEAFLET

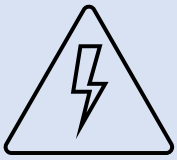
What are PCBs?

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

Heat exchange fluids, hydraulic oils, lubricating oils and as additives in paints, plastics, solvents, adhesives and cements.



Closed applications

Insulating fluid in electrical transformers, capacitors, power factor correction units, lighting ballasts, vacuum pumps and submersible pumps.

Why the need for Regulation?

PCBs 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 remaining in existing equipment pose a continuing environmental threat.

Listing of PCBs as Persistent Organic Pollutants (POPs)

PCBs were one of the twelve chemicals initially listed as a Persistent Organic Pollutant (POP) under the Stockholm convention[1]. This global treaty was created to protect human health and the environment from dangerous chemicals. The inclusion of PCBs to the treaty means that they must be restricted and eventually removed from production and use. In Ireland the convention is implemented through the Regulation (EU) 2019/1021 on Persistent Organic Pollutants, and the European Union (Persistent Organic Pollutants) Regulations 2020 (S.I. No. 146 of 2020).

Your Legal Obligations

Legislation requires the appropriate disposal of PCBs and polychlorinated terphenyls (PCTs) as soon as possible. EU countries must establish the preparation of national inventories and the labelling and safe disposal/treatment of all PCB holdings. In Ireland the EPA are responsible for this national inventory.

[1] Stockholm Convention - Home page

The 2025 Deadline

Regulation (EU) 2019/1021 on Persistent Organic Pollutants (Annex 1, Part A) requires that holders of PCBs should remove from use equipment containing more than 0.005% by weight PCBs and volumes greater than 0.05dm^3 (0.05 litres) **by 31st December 2025.**

The 2010 Deadline

Prior to the **31st of December 2010** EU countries were required to decontaminate or dispose of used PCBs, contaminated equipment and PCBs contained in such equipment as soon as possible. This covered equipment containing more than 5 litres of PCBs. Legislation covering PCBs stems from EC Directive 96/59/EC.

The Waste Management (Hazardous Waste) Regulations 1998 *(S.I. No. 163/1988)* 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. Part VI, 14 of the Waste Management regulations outline the requirements for all holders of PCBs.

Holders of PCBs, used PCBs or contaminated equipment containing more than 5 litres of PCBs must also give notice to the EPA no later than the 1st September each year (Part VI 15 of the Waste Management Regulations 1998). The online notification system EDEN is available to notify the EPA of PCB holdings. Guidance for first time users of the system is available on the EPA website – EDEN first time user.

European Communities (Dangerous Substances and Preparations) (Marketing and Use) Regulations 2003 – S.I. No 220/2003

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*.

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. To help manage the heat generated during this conversion it uses liquid coolant (e.g. oil), which may contain PCBs.

A transformer is out of scope if it was manufactured post 1989 or resin filled. A transformer is in scope-equipment if it contains oil and was manufactured prior to 1989 or manufacturing year is unknown. To determine if a transformer is in scope:

- Review the manufacturers 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 e.g. ON – Oil Natural cooling (indicates that the transformer contains oil), ONAN – Oil Natural Air Natural cooling (indicates that transformer contains oil).
  - Serial number.
  - Volume of oil.
  - 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 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 several 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 in scope equipment if it contains oil and 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 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 standards 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, manufacturers 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 switcher 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, therefor, an oil bath is required to quench the electrical arc.

A circuit breaker is in scope equipment if it contains oil and was manufactured prior to 1980 or manufacturing year is unknown. A circuit breaker is out of scope if it was manufactured post 1989 or is 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:

- X-Ray machines
- Welding plant
- 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

PCB information

- Environment Protection Agency: www.pcbs.ie
- Stockholm Convention on PCBs: PCBs - Overview (pops.int)
- UNEP PCBs: PCBs - a forgotten legacy? | UNEP - UN Environment Programme

PCB reporting

- PCB Online Notification System (EDEN): First-time User Guidance
- PCB Online Notification System (EDEN): Registered User Guidance

Relevant Regulations

- S.I. No. 163/1998 - Waste Management (Hazardous Waste) Regulations, 1998
- Council Directive 96/59/EC - Disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT)
- Regulation (EU) 2019/1021 - Regulation (EU) 2019/1021 of the European Parliament and of the council of 20 June 2019 on persistent organic pollutants
- S.I.146 of 2020 - European Union (Persistent Organic Pollutants) Regulations 2020
- The Stockholm Convention - Stockholm convention on persistent organic pollutants

PCB Oils

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.

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