

POPs waste characterization and methods for disposal

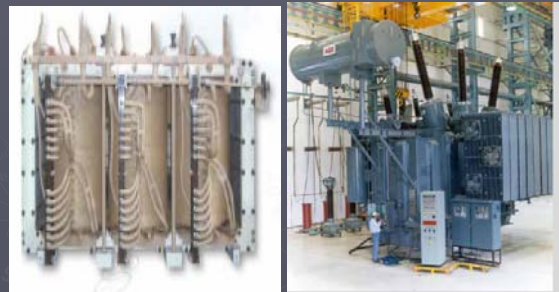
PCB waste can be:
Transformers filled with PCBs
Transformers contaminated with PCBs
Switch gear
Capacitors
Other waste textiles etc.
PCB contaminated soil
Waste from open applications

Different PCB waste consists of different materials that has to be taken into consideration in waste disposal :

Transformers consist of:

- ▶ an outer iron casing;
 - ▶ a magnetic steel core (flat platelets assembled together) ;
 - ▶ copper coils, which are covered by an insulating layer of either a resin or paper;
 - ▶ variously shaped wood struts (these are porous and can absorb the dielectric oil); and
 - ▶ the dielectric oil.
- There are variations in the type of structures of transformers and some other metals cansometimes also be found, for example aluminium.

Transformers



Capacitors consists of:

- ▶ Thin metal surfaces (foils) in two coils
- ▶ Di-electric fluid
- ▶ outer contacts
- ▶ Closed casing

Capacitors are not maintained either working or not, no oil changing or topping-up

Capacitors





Methods of disposal

World-wide a number of methodologies are used for PCB disposal.

- INCINERATION
- DECHLORINATION PROCESSES
- GAS PHASE CHEMICAL REDUCTION (GPCR), GPCR PROCESS
- BASE CATALYSED DECOMPOSITION (BCD)
- SODIUM REDUCTION
- SUPER-CRITICAL WATER OXIDATION (SCWO)
- PLASMA ARC
- PYROLYSIS
- MOLTEN SALT OXIDATION
- SOLVATED ELECTRON TECHNOLOGY

Methods of disposal

Non-incineration based commercial systems available in Europe:

Sodium Reduction

- Envio Germany GmbH & Co. KG

Advanced Oxidation Process (electro-oxidation)

- Envio Germany GmbH & Co. KG
- Solvent Decontamination (for PCB contaminated oils, transformers)
- GEP (Générale d'Extraction du Pyralène)
- ORION BV
- SEA Marconi Technologies SAS

Methods of disposal

High-temperature incineration based commercial systems available in Europe:

- AKZO-NOBEL - Incinerator of AKZO-NOBEL (CKI)
- AVG Abfall-Verwertungs-Gesellschaft mbH
- AVR Nutsbedrijf Gevaarlijk Afval B.V.
- Bayer Industry Services GmbH & Co OHG
- Ekokem Oy Ab
- EMS-Dottikon AG
- Envio Germany GmbH & Co. KG
- GSB Sonderabfall-Ersorgung Bayern
- HIM GmbH, Hazardous waste incineration plant
- RWE Umwelt Sonderabfallwirtschaft GmbH - Betriebsstätte Bramsche
- RZR Herten
- SAKAB, Sweden
- SAVA Sonderabfallverbrennungsanlagen GmbH
- Shanks
- Tredi Saint Vulbas
- TRV Thermische Rückstandsverwertung GmbH & Co. KG
- Valorec Services AG, Regionale Sondermüllverbrennungsanlage (RSMVA)

Domestic Methods

Hazardous waste incinerator in Olaine.

Points to consider

Environmental permit?

Size of equipment?

Areas of handling?

Safety procedures for workers protection and environmental control?

Endproduct and metal parts disposal/re-use possibilities/feasibility?