

| Block I General details | |
|-------------------------------------|--|
| 1 | <p>Location of the PCB disposal facility:</p> <p>Name of Facility: Orion BV City: Drachten Country: The Netherlands <i>(Provide address information in Block IV)</i></p> |
| 2 | <p>Licence / authorization:</p> <p>Is this facility licensed or authorized to handle PCBs? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If "Yes": (i) Nature of licence / authorization: Full license for PCB-handling, PCB-materials decontamination and other halogenated materials. (ii) Please submit the licensing history <i>(please attach to this questionnaire)</i></p> <p>Issuing authority <i>(name)</i>: Provincie Friesland <input checked="" type="checkbox"/> National <input checked="" type="checkbox"/> Local or <input type="checkbox"/> Independent</p> |
| 3 | <p>Please provide information on storage at the facility including:</p> <p>Capacity for the various PCB waste and equipment types: 100 tonnes</p> <p>Method: In house storage</p> <p>Holding time: 180 days</p> |
| 4 | <p>Worker protection <i>(Please summarize protective measures applied during treatment of PCB wastes)</i></p> <ol style="list-style-type: none"> All workers are certified for CVA; This is the Dutch certificate for safe working. It is the Dutch standard. The work will be carried out by trained personnel. The truck driver must have a driving license for carriage of dangerous goods and be instructed in the risks of PCBs and in the correct way of dealing with calamities. Both the preparation of transport and the supervision of loading and unloading should be performed by specialists. ORION sends teams of specialists all over the world. All specialists will use personal protection gear during the work. <p>Does the facility have an accident book? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Most frequent cause(s) of incidents involving PCBs: None</p> |

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Opinion box - PCB Management issues *(Please describe briefly)*

What are your major concerns?

Orion's main concern for PCB-management is the execution of safe and environmentally sound working.

Can you identify research and development needs in PCB management that would be beneficial for your region and waste managers worldwide?

In our experience it is still possible that PCB's end up in the environment because PCB's can not always be identified with available analysis-techniques. Therefore we can see advantage in further spreading of local laboratories, with sufficient equipment for PCB-analysis.

Block II Types of PCB wastes

Part A: Treatment of PCB containing equipment/material

Part A1: Metallic Parts

| A1.1 | Types of metallic PCB equipment/material treated: | Limitation on waste accepted <i>(please specify, if appropriate)</i> | | |
|---|---|---|-----------|--|
| | | Concentration <i>(specify the unit)</i> unit: mg/kg | | Quantity <i>(specify the unit)</i> unit: tonnes/year |
| | | min | max | |
| | <input checked="" type="checkbox"/> Equipment containing 100 % PCB | - | 1 000 000 | 20 000 |
| | <input checked="" type="checkbox"/> Equipment containing mineral oil contaminated by PCB | 5 | 1 000 000 | 20 000 |
| | <input checked="" type="checkbox"/> Others: Equipment containing mercury | - | 150 000 | 3 000 |
| <p><i>Please specify any other limitation on waste accepted: No limitations</i></p> | | | | |
| A1.2 | <p>Presentation of metallic equipment/material</p> <p>In what form must the metallic PCB equipment/material be presented:</p> <p><input checked="" type="checkbox"/> Drums : UN approved</p> <p><input checked="" type="checkbox"/> Other packaging: UN-approved packaging materials or ship containers</p> <p><input type="checkbox"/> Other constraints:</p> | | | |

A1.3

Treatment of metallic PCB equipment/material

Immediate destruction of metallic equipment/material containing PCB? Yes No

If 'Yes', please specify the applied technology in Part III

Extraction of PCB? Yes No

If 'Yes':

- please specify the applied technology in Part III
- Is the decontaminated metallic equipment/material subjected to reuse/recycling? Yes No

If 'Yes', please specify in **Block II Part C** (Reuse and recycling)

Part A: Treatment of PCB containing equipment/material

Part A2: Non-metallic Parts

| A2.1 | Types of non-metallic PCB equipment/material treated: | Limitation on waste accepted <i>(please specify, if appropriate)</i> | | |
|---|---|---|--------------|--|
| | | Concentration <i>(specify the unit)</i> unit: mg/kg | | Quantity <i>(specify the unit)</i> unit: tonnes/year |
| | | min | max | |
| <input checked="" type="checkbox"/> | PCB-containing materials (clothes, cables, etc.) | 5 | 1 000 000 | 20 000 |
| <input type="checkbox"/> | PCB-contaminated residues, sludges | | | |
| <input type="checkbox"/> | PCB-contaminated soils and sediments | | | |
| <input checked="" type="checkbox"/> | Packaged / drummed waste | 5 | 1 000 000 | 20 000 |
| <input checked="" type="checkbox"/> | Other: PCB-contaminated concrete max dim 0,1 x 0,1 x 0,1 m | 5 | 1 000 000 | 20 000 |
| Please specify any other limitation on waste accepted: none | | | | |
| A2.2 | Presentation of non-metallic equipment/material In what form must the non-metallic PCB equipment/material be presented: <input checked="" type="checkbox"/> Drums : UN approved <input checked="" type="checkbox"/> Other packaging: UN approved packaging materials <input type="checkbox"/> Other constraints: | | | |

A2.3

Treatment of non-metallic PCB equipment/material

Immediate destruction of non-metallic equipment/material containing PCB? Yes No

If 'Yes', please specify the applied technology in Part III

Extraction of PCB? Yes No

If 'Yes':

- please specify the applied technology in Part III
- Is the decontaminated non-metallic equipment/material subjected to reuse/recycling? Yes No

If 'Yes', please specify in **Block II Part C** (Reuse and Recycling)

Part B: Treatment of PCB oils and PCB waste oils

| B1 | Types of PCB oils and PCB waste oils treated: | Limitation on waste accepted <i>(please specify, if appropriate)</i> | | |
|---|--|---|-----|---------------------------------------|
| | | Concentration <i>(specify the unit)</i> | | Quantity <i>(specify the unit)</i> |
| | | unit mg/kg | | unit: |
| | | min | max | tonnes/year |
| | <input type="checkbox"/> 100 % PCB oils | | | |
| | <input type="checkbox"/> Mineral oils contaminated by PCB | | | |
| | <input type="checkbox"/> Waste oils contaminated by PCB | | | |
| | <input type="checkbox"/> Other: | | | |
| <p><i>Please specify any other limitation on waste accepted: none</i></p> | | | | |
| B2 | <p>Presentation of PCB oils and PCB waste oils</p> <p>In what form must the PCB oils and PCB waste oils be presented:</p> <p><input type="checkbox"/> Drums :</p> <p><input type="checkbox"/> Other packaging:</p> <p><input type="checkbox"/> Other constraints:</p> | | | |
| B3 | <p>Treatment of PCB oils and PCB waste oils</p> <p>Please specify the applied technology for the destruction of PCB oils and PCB waste oils in Part III</p> | | | |



Part C: Reuse & Recycling of decontaminated PCB equipment/material

| | | |
|------------------|--|---|
| <p>C1</p> | <p>Types decontaminated PCB equipment/material treated:</p> | <p>Limitation on waste accepted <i>(please specify, if appropriate)</i></p> <p>Quantity <i>(specify the unit)</i></p> <p>unit: tonnes/ year</p> |
| | <p><input checked="" type="checkbox"/> Transformers</p> | <p>20 000</p> |
| | <p><input checked="" type="checkbox"/> Capacitors</p> | <p>20 000</p> |
| | <p><input checked="" type="checkbox"/> Materials (clothes, cables, etc.)</p> | <p>20 000</p> |
| | <p><input type="checkbox"/> Residues, sludges</p> | |
| | <p><input type="checkbox"/> Soils and sediments</p> | |
| | <p><input checked="" type="checkbox"/> Other: mercury rectifiers</p> | <p>3 000</p> |
| | <p><i>Please specify any other limitation on waste accepted: none</i></p> | |
| <p>C2</p> | <p>Presentation of decontaminated PCB equipment/material</p> <p>In what form must the decontaminated PCB equipment/material be presented:</p> <p><input checked="" type="checkbox"/> Drums UN approved</p> <p><input checked="" type="checkbox"/> Other packaging: UN approved packaging materials</p> <p><input type="checkbox"/> Other constraints:</p> | |

C3

Treatment of decontaminated PCB equipment/material

Reuse and Recycling of decontaminated PCB equipment/material? Yes No

If 'Yes', please specify the applied technology in Part III

Is the decontaminated PCB equipment/material disposed of? Yes No

If 'Yes', please specify:

Transport to the disposal site? Yes No

If 'Yes':

International transport

National transport

Location of disposal site: Europe and others

Please provide a short description of disposal site

Metals go to licensed scrap yards and ceramics go to road filling

| Block III Detailed information on applied technologies | | |
|--|--|---|
| 1 | The following description refers to Block II, Part: | Type of PCB waste or decontaminated equipment/material: |
| | <input checked="" type="checkbox"/> A1 (<i>Treatment of metallic PCB equipment/material</i>) | Transformers ; capacitors; hydraulic equipment; mercury rectifiers |
| | <input checked="" type="checkbox"/> A2 (<i>Treatment of non-metallic PCB equipment/material</i>) | Insulation materials; stone; concrete; ceramics; clothes; packaging materials |
| | <input type="checkbox"/> B (<i>Treatment of PCB oil and PCB waste oil</i>) | |
| | <input checked="" type="checkbox"/> C (<i>Reuse and recycling of decontaminated PCB equipment/material</i>) | Clean metals; stone; ceramics |

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Applied technologies (Please specify the technology used for disposal):

- Pyrolysis / gasifiers
- Gas Phase Chemical Reduction (GPCR)
- Base Catalysed Decomposition (BCD)
- Sodium Reduction
- Super-Critical Water Oxidation (SCWO)
- Plasma Arc
- Molten Salt Oxidation
- Solvated Electron Technology
- Retrofilling
- Other: cold-rinsing with solvents; autoclave; PCB-extraction

Type of technology (1-sentence description):

Orion BV is specialized in the decontamination of PCB-containing materials by using solvents to clean non-porous materials like metals, ceramics and PCB contaminated oils.

Description of the technology please provide additional information as appropriate (*summarize here and, if necessary, attach documentation*)

Orion's process of cleaning and decontamination of PCB materials provides one of the highest recycling rates in the world. PCB-transformers are drained and cleaned inside with solvents. After this cleaning process the transformer is opened and all the parts are dismantled. Coil material will be stripped from their insulation materials. wire and sheet metal will then be rinsed with fresh solvents to clean them for save scrapping. Solvents will be recycled by vacuum distillation and the PCB concentrate will be collected with the PCB oil from the transformer to be recycled by chemical processing to recover the Chlorine from it. This obtained Chloride will be used as base material for production of new products. The recycling rate for PCB transformers and the PCB oil is with Orion's process 95%.

Only the insulation materials that count for 5% of the total material are incinerated in a high temperature incinerator. PCB capacitors will be recycled in a similar way. PCB capacitors will be drained and opened up. The metal case and the isolators are decontaminated from PCB. Chemical processing recycles the Chloride out of the PCB oil. The recycling rate for PCB capacitors is 50%. The other 50% consist of insulation and metal sheets, which have to be incinerated. Lightly contaminated oil with PCB < 100 ppm PCB is incinerated without recycling the Chloride. This lightly contaminated oil has a high caloric value and therefore incineration results in energy production.

Commissioned? Yes No Year: 1992

Can the technology be used in a mobile facility? Yes No

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State of development

Does the technology exist as an industrial unit? Yes No

If "No", please indicate when it will become operational:

If "Yes", please indicate how many units exist: 1

In what countries: The Netherlands

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Pretreatment:

Does the technology require any pretreatment procedures? Yes No

If "Yes", please specify required pretreatment procedures:

- Thermal Desorption
 Dilution
 Low Temperature Rinsing
 Electro-osmosis
 Draining/Solvent washing
 Dismantling/Shredding
 Other:

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Byproducts

What byproducts does the technology produce? *(please specify below)*

| Byproduct | Kind | Amount |
|-----------|-------------------|--|
| Liquids: | none | L per tonnes of waste treated |
| Solids: | none | kg per tonnes of waste treated |
| Air: | Solvent emissions | 2 m ³ per tonnes of waste treated |

Does the technology allow all byproducts to be monitored for POPs*/PTS** before release? Yes No

If POPs*/PTS** are discovered, can the byproducts be returned to the process for further treatment? Yes No

Are any of the byproducts classified as other sorts of hazardous wastes? Yes No

If "Yes" please specify:

What volumes of such byproducts are generated by handling a unit volume of PCB wastes:

Can third party monitoring data be provided? Yes No

If "Yes", please attach to this questionnaire.

* POPs: Persistent Organic Pollutants
 ** PTS: Persistent Toxic Substances

How are byproducts disposed of? *(please describe briefly)*

Solvent emissions are diluted with ambient air to environmental approved emission levels

| | |
|---|--|
| 6 | <p>Efficiency <i>(please specify, if appropriate)</i></p> <p>Destruction efficiencies (DEs): %</p> |
| 7 | <p>Monitoring & Control of releases</p> <p>What technologies are used to monitor releases: Air: sapling with calibrated test tubes Effluents: PCB-oils are analyzed by licensed independent laboratories Solids: wipetest</p> <p>Are all releases monitored for POPs/PTS before release? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If POPs*/PTS** are discovered, can the releases be returned to the process for further treatment? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are any of the releases classified as hazardous wastes? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If "Yes" please specify: PCB-oil; PCB-contaminated oil; PCB-contaminated porous materials like insulation.</p> <p>What technologies are used/ required to monitor and treat any such releases prior to release: Not applicable; Hazardous waste that can not be treated at Orion, will be properly packed and send for treatment with the best available PCB-disposal technology.</p> <p>What volumes of such releases are generated by handling a unit volume of PCB wastes: 5-40%</p> <p>Is third party monitoring data available? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><i>If "Yes", please attach to this questionnaire.</i></p> <p style="text-align: right;">* POPs: Persistent Organic Pollutants ** PTS: Persistent Toxic Substances</p> |
| | <p>How are releases disposed of? <i>(please describe briefly)</i></p> <p>They are send to licensed Hazardous waste disposal companies with the best available technologies.</p> |

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Disposal costs

What are the *approximate* costs for applying the technology per unit[‡], **including** costs for all technical pretreatment steps, **excluding** all costs **not** related to the technical application of the technology (transport costs, costs for disposal of decontaminated transformers/capacitors/materials, etc.)?

Please specify type of treated/disposed PCB equipment/material/oil below:

| | Costs per unit [‡] | Currency |
|---------------------|-----------------------------|----------|
| a) PCB-Transformers | 1500 | EURO |
| b) PCB-Capacitors | 1900 | EURO |
| c) PCB-oils | 1500 | EURO |
| d) PCB-solids | 1900 | EURO |
| e) | | |
| f) | | |
| g) | | |

[‡] Specify the unit for a) to g): tonnes

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Treatment capacities and scaling (*tonnes per year for main waste & equipment types*)

Capacity of existing facilities: 20 000 units[‡] per year

Can the technology be adapted to higher or lower capacities? Yes No

If "Yes":

- (i) What is the capacity of the smallest commercially viable facility: 2000 units[‡] per year
- (ii) What is the capacity of the largest commercially viable facility: 20 000 units[‡] per year

Does the adaptation will cause additional costs? Yes No

If "Yes" specify the increase in costs for the adaptation (%) of the initial costs:

- (i) For smaller plants: 100 %
- For larger plants: 20 %

[‡] Please specify the unit: Tonnes

Block IV**Facility: Address and Service Information****1**

Facility Name: Orion BV

Address: De Steven 25

City/Town: Drachten

P.O. Box:

District/State: Friesland

Country: The Netherlands

Telephone: +31 512 532515

Fax: +31 512 541130

Email: info@orionUN2315.nl

Web site: www.orionUN2315.nl

Person completing form

Name: Yvonne Hoogendoorn

Position: Marketing and Sales Manager

Parent Company (*if different*)

Address:

City/Town:

P.O. Box:

District/State:

Country:

Telephone:

Fax:

Email:

| | |
|----------|---|
| 2 | Other Services offered by the company <input type="checkbox"/> Laboratory analysis / testing <input checked="" type="checkbox"/> PCB waste packaging for shipment <input checked="" type="checkbox"/> PCB classification / labeling <input checked="" type="checkbox"/> Clean-up of PCB contaminated sites <input checked="" type="checkbox"/> PCB wastes transport <input checked="" type="checkbox"/> Other PCB-related services: training in PCB-management |
| 3 | Further information Identify any company information (brochures, notes etc...) provided separately and if you wish provide additional comments on your services in not more than 50 words: Orion may import PCB from all countries in the world in respect of the Basel convention. Brochure |