Batrec’s Mercury Waste Management Technology –

safe, traceable & cost effective by central treatment

Dieter Offenthaler, Managing Director
# BATREC in brief

<table>
<thead>
<tr>
<th><strong>Year of foundation</strong></th>
<th>1989</th>
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<tbody>
<tr>
<td><strong>Turnover in 2018</strong></td>
<td>approx. 16 Mio. €</td>
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<td><strong>Employees</strong></td>
<td>77</td>
</tr>
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<td><strong>Certifications</strong></td>
<td>ISO 9001, ISO 14001 and OSHAS 18001</td>
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<td><strong>Shareholders</strong></td>
<td>100% VEOLIA, managed by SARP Industries</td>
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**Main activities**

- battery recycling
- AC reactivation
- Hg recycling
- adsorbent rec.
- Hg stabilization
Batrec & Veolia – a powerful network

Global network with local expertise and specialized central treatment units.

- **Veolia** is present in approx. 50 countries of the world

- **Veolia Field Services (VFS)** – a sister company of Batrec - has global expertise in hazardous wastes management and is able to provide the following tailor made services
  - Packaging
  - Conditioning
  - Transport
  - Regulatory administration
Typical Mercury Wastes
Mercury management at Batrec

Hazardous waste containing mercury

Removal of mercury, enabling the recovery of the other compounds

Stabilisation of mercury

Recycling of mercury

- audited clients
- restricted uses
  - dental amalgam
  - R&D and analytics
- export permit for Hg in compliance with Article 3 of the Minamata Convention

Wastes accompanied by movement form for hazardous wastes

Thermal treatment

Hg / sludge

Distillation process

Purification

Hg > 99,9999 %

Registered in our ERP

ERP

Final disposal

Stabilisation

Registered in our ERP (kg, analysis, batch no.)

Purification

Delivery

Monthly reporting to FOEN and local authority

End-user

Material flows

- - Material flows
- - Info IT
- - Info and audit

Presentation of Batrec Industrie AG
Treatment of Mercury wastes
Hg Distillation: Process Flow Diagram
Mercury Waste Recycling Plant
Stabilisation of mercury
Mercury stabilisation
Stabilisation process – capacity

Capacity
- 625 kg mercury / batch
- 3 reactors
- 1,200 t mercury / year

Process characteristics
- simple reactants
- low temperature
- wet process guarantees very low Hg emissions
- no gaseous Hg in the process
- short reaction times
The key aspects of BATREC's offer

- full transparency for customers & authorities
- external sampling, mass balancing & reporting
- full service from client site to final disposal including notification, transport, etc.
- supply of approved transportation containers for Hg
  → no investment costs for the client

Traceability chain for the stabilisation of Mercury

1. Transport of Mercury from customer site to Batrec under a notification using a “movement document for transboundary shipments of waste”
2. Transformation of Mercury into Mercury Sulphide (HgS) → Dt disposal operation
3. Sampling and inspection of Mercury Sulphide by an external laboratory
4. Transport of Mercury Sulphide from Batrec to the K+S salt mine of Herfa-Neurode (Germany) under a notification using a “movement document for transboundary shipments of waste”
5. Final disposal of Mercury Sulphide in the K+S salt mine of Herfa-Neurode (Germany) = Dt disposal operation
Our treatment philosophy

**safe, traceable & cost effective by central treatment**

- local collection
- support in packaging
- international shipment
  - ADR / IMDG rules minimize risks since 1968 and 1974
  - Basel Convention (1989, 186 member states)
- central treatment in Europe
  - cost effective
  - trained and monitored staff
  - close and strict monitoring by authorities
  - traceability and fate of recovered mercury is ensured
- stabilization of recovered mercury
Thank you for your attention!