

**COMMITTEE OF EXPERTS ON THE TRANSPORT OF
DANGEROUS GOODS AND ON THE GLOBALLY
HARMONIZED SYSTEM OF CLASSIFICATION
AND LABELLING OF CHEMICALS**

**Sub-Committee of Experts on the
Transport of Dangerous Goods**

**(Twenty-fourth session, 1-10 December 2003,
agenda item 13)**

OTHER BUSINESS

**Application for consultative status by the
European Battery Recycling Association (EBRA)**

1. The secretariat reproduces below information provided by the EBRA with respect to their application for consultative status (see document ST/SG/AC.10/C.3/2003/41).

Founded in 1998, EBRA acts for and on behalf of its members at the E. U. level to promote the development of collection, treatment, sorting and recycling of spent batteries.

Our objectives

- Encouraging the activities and the flow of information concerning the techniques of collection, sorting, treatment, and recycling;
- Developing a dialog with the Administrations at the European level, in each Member State, and with the battery industry.
- Establishing standards for the quality of treatment and recycling.

EBRA acts as intermediary between the manufacturers and the importers of batteries and accumulators and provide answers to the questions concerning the collection and recycling of spent batteries and accumulators, specifically:

- The specifications of batteries,
- The modalities for collection, transport, sorting and recycling,
- The hazardousness of used batteries (composition/European and International classifications),
- The battery chemistries and their evolution,
- The collection and recycling rates.

EBRA acts at the following levels:

International	<ul style="list-style-type: none">• Basel Convention (technical work group)• OECD (Ni-Cd batteries workshop)• Congress (International Congress for battery recycling)
European	<ul style="list-style-type: none">• Committee for Technical Adaptation of Hazardous Waste list (DG Environment - European Commission)• Recycling Forum (DG Industry and DG Environment - European Commission)
Member states	<ul style="list-style-type: none">• Supervisory function for batteries and accumulators ISPA (Instance de Suivi des Piles et Accumulateurs) France, ...• Contact with National Experts in charge of battery regulations in each European countries

Founding Members

• <i>Batrec Industrie AG (Switzerland)</i>	<i>Primary batteries</i>
• <i>Citron (France)*</i>	<i>Primary batteries</i>
• <i>Erachem Europe - Comilog/Eramet Group (Belgium)</i>	<i>Primary batteries, Lithium</i>
• <i>MBM (France)*</i>	<i>Button cells</i>
• <i>Metaleurop (France)</i>	<i>Lead-acid batteries</i>
• <i>Nife Recycling (Sweden)</i>	<i>Ni-Cd batteries, Ni-MH batteries</i>
• <i>SNAM (France)*</i>	<i>Ni-Cd, Ni-MH, Lithium batteries</i>

Other Members

• <i>Duclos Environnement (France)*</i>	<i>Primary batteries and button cells</i>
• <i>Euro Dieuze Industrie (France)*</i>	<i>Primary and secondary batteries</i>
• <i>Recupyl (France)*</i>	<i>Primary batteries, Lithium primary and secondary</i>
• <i>Revatech - Suez Group (Belgium)</i>	<i>Primary batteries</i>
• <i>Valdi (France)*</i>	<i>Primary batteries</i>
• <i>SFRAP (France)</i>	<i>French Association of Battery Recyclers</i>

(*) SFRAP members

The SFRAP is the french association of battery recyclers (Syndicat Français des Recycleurs d'Accumulateurs et de Piles) - contact: tel. +33 (0)1 34 97 24 85

The three process technologies and their respective operators

Hydrometallurgic

- Erachem Comilog
- Euro Dieuze Industrie
- Recupyl
- Revatech (Suez Group)

Pyrometallurgic

- Citron
- Valdi
- Batrec Industrie AG

Thermal treatment (distillation and pyrolyse)

- Duclos Environnement
- MBM
- Nife Recycling
- SNAM

Charter of battery and accumulator recycling

Any recycler joining the European Battery Recycling Association automatically agrees to comply with the principles defined in this charter.

The recycling companies belonging to the EBRA, operating in the European Economic Area (EU + EFTA) and in Switzerland, undertake to:

- **Promote** the collection and recycling of batteries and accumulators in Europe,
- **Conduct** their businesses according to environmental and commercial ethics,
- **Optimise**, from both the technical and economic viewpoints and in an environmentally friendly manner, the recycling operations by improving the use of components or materials originating from recycled batteries and accumulators,
- **Supply**, if necessary, the operating statistics (incoming/outgoing), including accurate figures on the percentage of components or materials actually reused, after recycling, to manufacture batteries, accumulators or any other product. Other pieces of information shall also be communicated in order to show that the recycling operations have been carried out properly and in an environmentally friendly manner.

The purpose of this charter is to assure all stakeholders in the sector (manufacturers of batteries and accumulators, manufacturers of appliances incorporating batteries and accumulators, local authorities, retailers, etc.) that spent batteries and accumulators will be treated under satisfactory conditions in terms of protection of the environment.

Contacts: H. Klammer / A. Krebs – **Acceptance criteria:** all primary and secondary batteries, lithium batteries, button cells and mercury contaminated waste

Process technology: pyrometallurgy, a Batrec process based on a Sumitomo Technology – **Capacity:** 5,000 tons/year

Plant:

Postfach 20, CH-3752 Wimmis

Tel: +41 (0)33 657 85 00 - Fax: +41 (0)33 657 85 01

www.batrec.ch - e-mail: batrec@batrec.ch

Process description: In the pyrolysis water and mercury is evaporated and organics are transferred to coke. The off-gases are washed and metallic mercury is recovered.

The pyrolysed material is feeded to a melting-reduction furnace where the metals are reduced and molten in ferromanganese, zinc and slag. Now waste remain at the end of this process. Several distillation units are in use for the treatment of mercury contaminated waste.

(SFRAP member)

CITRON

Contacts: Adrien Antenen / Bertrand Schutz – **Acceptance criteria:** all primary & secondary batteries, light sources, other mercury-containing scrap, industrial sludge & scrap, containing heavy metals...

Process technology: pyrometallurgy – **Capacity:** 130,000 tons/year

Plant:

Route des Gabions - P.O. Box 51 - 76700 Rogerville (France)

Tel: +33 (0)2 35 927 227 - Fax: +33 (0)2 32 927 272

www.citron.ch - e-mail: bschutz@citron.ch

Citron Holding AG

Dufourstrasse 7, CH-8008 Zürich

Tel: +41 (0)1 386 44 88

Fax: +41 (0)1 386 44 89

Process description: pyrometallurgic process that recovers metallic components and valorizes organic elements for their calorific content and potential reduction. Metals that have a low vaporization temperature (zinc, cadmium, lead) are recovered in a gas scrubbing process. A special furnace is used for the recuperation of mercury.

(SFRAP member)

DUCLOS ENVIRONNEMENT

Contact: Gérard Parodi – **Acceptance criteria:** primary batteries and button cells (including mercury scrap)

Process technology: vacuum distillation – **Capacity:** 4,500 tons/year

Plant:

86, avenue du 8 mai 1945 - 13240 Septèmes-les-Vallons (France)

Tel: +33 (0)4 91 963 000 - Fax: +33 (0)4 91 962 527 - www.duclos-sa.com - e-mail: gparodi@duclos-sa.com

Process description: sorting by category, dissection to recover the steel mantle and the plastic joints and grinding. Thermal treatment: vaporization and condensation of mercury in a vacuum. Recuperation of zinc as powder. For primary batteries: hydrometallurgical treatment in cooperation with Erachem.

ERACHEM COMILOG

Contacts Belgium: S. Pietro Amico / Alain Vassart - **Contact France:** Georges de Watrigant

Acceptance criteria: all types of primary batteries (with or without mercury)

Process technology: hydrometallurgy – **Capacity:** 6,500 tons/year (could be extended)

Plant:

Rue de la Carbo - BP 9

B-7333 Tertre (Belgium)

Tel: +32 65 764 559

Fax: +32 65 764 692

e-mail: avassart@erachem-eur.com

Erachem Comilog

Headquarter: Avenue Louise 534

1050 Bruxelles (Belgium)

Tel: +32 2 627 54 04

Fax: +32 2 627 53 90

www.erachem-eur.com - e-mail: pamico@erachem-eur.com

CDMA

133, rue de Versailles

92140 Ville d'Avray (France)

Tel: +33 (0)1 47 093 838

Fax: +33 (0)1 47 090 550

e-mail: cdmadzst@aol.com

Process description: mechanical treatment: separation and valorization of the metallic part and plastics followed by an acidic leaching of the remaining Black-Mass (subcontracted). The manganese and zinc solution is purified by extracting nickel, cadmium, mercury and other impurities. Valorization of manganese and zinc under the form of salts and oxides for international markets. Erachem Europe has a licence from Recupyl and has concluded a collaboration agreement with Revatech since 1998 and Duclos Environnement.

(SFRAP member)

EURO DIEUZE INDUSTRIE

Contact: Patrick de Metz – **Acceptance criteria:** all primary and secondary batteries

Process technology: hydrometallurgy

Plants:

Parc d'activités - 57260 Dieuze (France)

Tel: +33 (0)3 87 86 81 77 - Fax: +33 (0)3 87 86 81 65

www.sarpindustries.fr

Marketing: Patrick de Metz

Sarp Industries/Onyx - 422 route du Hazay - 78520 Limay (France)

Tel: +33 (0)1 34 97 24 85 - Fax: +33 (0)1 34 97 26 96

Process description: Euro Dieuze Industrie is able to organize the picking up of the used batteries anywhere in France. Once received in the plant, Euro Dieuze Industrie sorts the batteries by chemical composition. The batteries are then crushed and the material is separated in three basic components: steel mantle, paper and plastic, black mass. Item one and two are then recycled for their steel and/or calorific content. The black mass goes through an acidic leaching process whereby manganese and zinc are solubilized. The solution is then purified by extracting heavy metals and impurities. The manganese and zinc are then valorized as salts or oxides in the international markets.

(SFRAP member)

MBM (MERCURE BOYS MANUFACTURE)

Contact: Franck Desgranges – **Acceptance criteria:** button cells (including other mercury scrap)

Process technology: criogenic pulverization and distillation – **Capacity:** 30 tons/year

Plant: Zone d'activité des Randonnays - 72210 Voivres-lès-Le Mans (France)

Tel: +33 (0)2 43 885 215 - Fax: +33 (0)2 43 885 215 - e-mail: Mercure.Boys.Manufacture@wanadoo.fr

Process description

Criogenic pulverization to obtain the different elements by granular size: mercury/zinc amalgam, polymer joints and steel mantles. The mercury in the amalgam is distilled to be resold together with the zinc and steel powder.

NIFE RECYCLING

Contact: Anders Engström (Recycling Plant)- Anders Olsson Fogelberg (MD Saft AB) – **Acceptance criteria:** industrial and portable nickel-cadmium batteries, nickel-metal-hybrid cells

Process technology: thermal treatment (distillation and pyrolyse) – **Capacity:** 1,500 tons/year

Plant: Jungnergatan - P.O. Box 709, S-572 28 Oskarshamn (Sweden)

Tel: +46 491 68000 - Fax: +46 491 68165 - www.saftbatteries.com - e-mail: anders.olsson.fogelberg@saft.alcatel.se

Process description: dismantling of industrial cells, pyrolysis of portable cells, distillation of cadmium-containing materials.

(SFRAP member)

RECUPYL

Contact: Farouk Tedjar – **Acceptance criteria:** all primary and secondary batteries, including all lithium cells

Process technology: hydrometallurgy / electro-chemical – **Capacity:** 500 to 2,000 tons/year

Plant: Route de la Métallurgie - 38420 Domene (France)

Tel: +33 (0)4 76 774 397 - Fax: +33 (0)4 76 574 597 - www.recupyl.com - e-mail: farouk.tedjar@INPG.fr

Process description: mechanical treatment, separation and grinding. Hydrometallurgy with acid route and complementary electro-chemical process. This technique privileges the separation and valorization of non-ferrous metals in batteries.

REVATECH (SUEZ GROUP)

Contacts: Daniel Gillot - Michel Bauduin - Edwin Pagnin – **Acceptance criteria:** primary sorted or non-sorted batteries (with or without mercury), silver oxide primary batteries.

All sizes & corroded batteries are accepted

Process technology: mechanical and hydrometallurgic. The process named REVABAT and the associated patent are registered

Capacity: 4,000 tons/year (possible extension to 10,000 tons/year)

Plant: Zoning Industriel d'Ehein - 4480 Engis (Belgium)

Tel: +32 (0)4 275 00 93 - Fax: +32 (0)4 275 69 93

e-mail: michel.bauduin@revatech.be

Process description: mechanical pre-treatment (grinding, separation, sifting) to recover the metallic parts (magnetic and non-magnetic) as well as plastics after physico-chemical scrubbing. Acidic leaching of the remaining Black-Mass with the production of zinc and manganese sulfate solution. In accordance to a cooperation agreement (since 1998), these solutions are processed by Erachem Europe for purification and the production of manganese and zinc salts and oxides for international markets. New developments are going on such as collaborations with subcontractors for the production of zinc oxide always by hydrometallurgical way and the valorisation of the manganese fraction by thermal treatment. The production by own means of zinc and manganese salts is being studied.

(SFRAP member)

SNAM

Contact: Jacques David – **Acceptance criteria:** Ni-Cd, Ni-MH, lithium-ion batteries sorted or non-sorted, cadmium-containing scrap

Process technology: distillation – **Capacity:** Saint Quentin Fallavier: 1,400 tons/year - Viviez: 4,000 tons/year

Plants: Rue de la Garenne - P.O. Box 733 - 38287 Saint Quentin Fallavier (France)

Avenue Jean-Jaurès - 12110 Viviez (France)

Tel: +33 (0)4 74 945 985 - Fax: +33 (0)4 74 941 318

Tel: +33 (0)5 65 437 730 - Fax: +33 (0)5 65 430 395

www.snam.com - e-mail: info@snam.com

Process description: Ni-Cd batteries - 3 main stages: pre-treatment or preparation, cadmium distillation, finishing and refining. Distillation of cadmium contents in accumulators: the negative plates that contain the cadmium are put into cylindrical dishes that are placed into the distillation furnace for a cycle of 24 hours under controlled atmospheric conditions to extract the cadmium from the electrodes. The crude cadmium metal from this process is distilled again to give it a purity of at least 99.9%.

Ni-MH batteries are oxyded to disactivate the negative alloy containing hydrogen.

Lithium-ion batteries are disactivated, crushed, ground. Powders are treated by hydrometallurgical process to separate lithium and cobalt.

(SFRAP member)

VALDI

Contact: Marion Nicolet – **Acceptance criteria:** all alkaline, zinc carbon and zinc air batteries containing less 500 ppm mercury

Process technology: pyrometallurgy in a dedicated and enclosed electric arc furnace – **Capacity:** 10,000 tons/year (can be extended)

Plants: Boulevard de la Boissonnette - 42110 Feurs (France)

Tel: +33 (0)477 274 051 - Fax: +33 (0)477 265 149

www.afe.fr - e-mail: m.nicolet@valdi-feurs.fr

Process description: Through the melting process, a thermal separation of volatile metals (zinc, mercury, cadmium, lead) from the ferrous ones is carried out. Fumes are treated and filtered, and the zinc is recovered into a powder of zinc oxide used in the zinc metallurgy. The steel, the manganese, the nickel and the copper are melted, yielded and recovered as a ferroalloy used in the stainless steel industry. Mineral part called the slag is tapped separately, vitrified, and used as an embankment product.

How to join the European Battery Recycling Association?

EBRA status guarantees that all stakeholders involved in the field of battery recycling can join the association, specifically:

- battery manufacturers,
- retailers,
- local or regional authorities,
- sorting companies,
- waste transportation companies,
- companies using batteries (other than consumers),
- national collection and recycling associations (in each Member-State)...

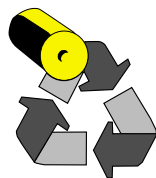
In joining EBRA, you will be informed, in a permanent way, on:

- technical matters (classification of used batteries as waste, storage, transportation, treatment processes...),
- regulations in force or under preparation (in each European Member State, at the level of the European Authorities, at the international level),
- general information (contacts...).

Any individual stakeholder or association can join EBRA as a member.

**To join EBRA or obtain more information,
please send us an e-mail: ebra@ebrarecycling.org
or contact our secretariat in Brussels**

Visit our web site www.ebrarecycling.org



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