

# THE ENGITEC CX<sup>®</sup> PROCESS FOR THE COMPLETE RECYCLING OF LEAD-ACID BATTERIES

The main peculiarities of the Engitec CX<sup>®</sup> Process, are :

- . The absolute fulfilment of the process capacity
- . The quality of separated products
- . The environment respect in term of emissions.
- . The environment in the working Place
- . The absence of waste waters discharged from the system.

The CX<sup>®</sup> systems for processing lead-acid batteries are in principle sized as per the following capacities:

<b>2-3 Ton/hour</b>	of batteries, for a total amount of	<b>8.000-15.000</b> t/year approx
<b>5-7 Ton/hour</b>	of batteries, for a total amount of	<b>12.000-30.000</b> t/year approx
<b>10-12 Ton/hour</b>	of batteries, for a total amount of	<b>30.000-50.000</b> t/year approx.
<b>15-18 Ton/hour</b>	of batteries, for a total amount of	<b>60.000-90.000</b> t/year approx
<b>20-25 Ton/hour</b>	of batteries, for a total amount of	<b>80.000-150.000</b> t/year approx.

and other on request.

The production of lead is usually around **54% - 56%** of inlet batteries full of electrolyte.

**The recycling system can be composed as follows:**

## **SECTION 1 :**

BATTERY BREAKER (basic plant):

- unit 100:** electrolyte collection and filtration: the electrolyte escaped during scrap entering to the storage area and during handling, is collected and pumped trough a filter press in a storage vessel for further neutralization or sale as it is as pickling agent or other industrial purposes, when not properly neutralized.
- unit 200:** battery crushing and separation of the fractions: polypropylene (commercial), heavy plastics (to dump), paste and grid metal (for sale to outside lead smelters or for smelting inside the factory).
- unit 500:** Gas scrubber system, to process all the gases and acidic mist captured during the phases of the process.

## **SECTION 2 :**

SMELTING, REFINERY AND INGOTS CASTING:

The cycle of lead production is completed with:

- unit 700:** lead foundry (rotary furnace and filter baghouse. Product: raw lead)
- unit 800:** lead refinery (kettles and casting machine. Product: ingots of refined lead and lead alloys)

## **SECTION 3 (can be a postponed installation):**

DESULPHURIZATION OF PASTE AND PROCESSING OF OBTAINED SOLUTION:

- unit 300:** Lead paste desulphurization (by making it reacted with Sodium Carbonate or Sodium Hydroxide) in order to have better results during smelting operation (less additives, less slag (**-70%!**), more productivity, lowest sulphur emissions).

The electrolyte from unit 100 is re-used in this section.

- unit 400:** production of salt Na<sub>2</sub>SO<sub>4</sub>: the solution of Na<sub>2</sub>SO<sub>4</sub> obtained from the reaction in the unit 300 is processed in a Crystallization section to produce a commercial pure salt used e.g. in detergent industry.