

RECYCLING



NON FEROUS METAL RECYCLING

SPECIALIST

Background

Name: AKBAR KHOSHFEKR

EDUCATION:

1-Bachelor's Degree in Industrial Engineering (Industrial Technology Branch)2-Associate (master diploma) Degree in MetallurgyWORK DESCRIPTION:



Has worked:

- In a Battery Company/SABA battery for 20 years as a manager of Lead Production in recycling plant and Lead production.
- In research department for 2 years in SABA battery
- In copper production (copper refining)
- In UNIQE METAL TECHNOLOGIESE CO.(jabel-ali– UAE) ,Partnership with ENGITEC ITALY

Experience:

Nonferrous metal production & recycling specially:

- Lead acid battery recycling &lead smelting and refining
- Cooper production and recycling
- Zinc and its alloys
- Antimony production
- Designing , manufacturing , installing all machinery & equipment for nonferrous metals recycling plant(lead , cooper , zinc)







Lead Recycling Process

Lead Recycling Process includes these following steps:

- Lead Battery Breaking and Separation
- Lead Smelting
- Lead Refining and Alloying
- Lead Casting



BATTERY SEPERATION

The Lead acid scrap batteries received through container/trucks will be unloaded at the battery recycling plant, from where batteries will be processed through breaking and separation system.

The electrolyte drained from scrap batteries is conveyed to electrolyte sump through a suitable slope of the floor.

Electrolyte sump pump sends the collected acid to a filter to the electrolyte storage tank.

The stored sulfuric acid has an average concentration of 15 to 20% (freezing point around -10° C to -14° C) and can be either neutralized or sold as picking agent. The electrolyte pump delivers acid to the Neutralization tanks.



SMELTING

Lead Smelting is the process of separating the metal from impurities. It is placed into a furnace where it is heated by high temperature. It causes the metal to melt. Smelting the raw material produces a metal or a high-grade metallic mixture along with a solid waste product called lead dust and toxic slag.



Lead Refining and Alloying

The lead received from Rotary Furnace (smelting) is called hard lead /crude lead. The lead tapped from the furnace has to be cleaned from residual oxides and slag. After stirring for a while all the impurities settle at the surface and are skimmed off.

On the other hand, Lead required for battery manufacturing is either soft Lead with 99.97% purity or hard Lead of varying Antimony compositions. In order to make the quality of lead suitable for its different uses, different variations of pot melting processes are employed.

Lead is melted within the pot; components which include Sulphur, Wooden Powder & Coke Breeze are added and blended gently followed by dross removal. Thereafter, Tin & Antimony are added to the liquid metal to get the desired grade of Lead.

Elements	Composition in %	
Antimony (Sb)	0.001% (max)	
Arsenic (As)	0.001% (max)	
Tin (Sn)	0.001% (max)	
Copper (Cu)	0.001% (max)	
Bismuth (Bi)	0.025% (max)	
Iron (Fe)	0.001% (max)	-
Nickel (Ni)	0.001% (max)	1
Silver (Ag)	0.003% (max)	
Zinc (Zn)	0.001% (max)	
Calcium (Ca)	0.0005% (max)	
Sulphur (S)	0.0005% (max)	
Aluminum (Al)	0.0005% (max)	
Lead (Pb)	99.970% (min)	

Typical composition as per LME standards



Lead ingot casting

Lead Ingot Casting is done by Casting Machine. This machine is a combination of chain conveyor mechanism. The moulds are filled with pure lead with a lead pump or through flow regulating valves. The feeding system has load cell mounted, which controls the speed of the Lead pump and it regulates the flow of lead automatically.







Pollution control measures

The gases & fumes generated in the system are effectively controlled by the

Pollution control Equipment:

Our plants are specifically designed to meet and exceed the relevant country's environmental guidelines and standards. In addition, we provide suitable operating instructions and maintenance inputs. As a result, all our installations successfully meet the challenge of showing continuous environmental performance as per the design parameters





Laboratory & quality control

Laboratory quality control (QC) ensures that the lab processes and operations run efficiently and guarantees the production of accurate and reproducible results. In addition, the QC measures developed in a lab are the building blocks for the process of certification and accreditation.

The chemical composition of all raw materials is recorded. The quality of its products by performing sampling during casting and final product and accurate analysis of the chemical composition by an Optical Emission Spectrometer





Lead acid batteries must be recycled

Lead-acid batteries are by far the most fully recycled of all consumer products. Recycling centers can recover more than 97% of the lead and plastic in a lead-acid battery. Once those reclaimed materials reach a battery manufacturer, they can account for 60-80% of the lead and plastic in a "new" lead-acid battery. It's a closed-loop lifecycle that can continue indefinitely. It makes lead-acid battery recycling very green from both a cost and resource-saving perspective.

According to EUROBAT and Battery Council International (BCI), the lead-acid battery is the most recycled consumer product in the world.







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