

Status report of Batteries Management in the State of Goa



Report prepared by
Goa State Pollution Control Board

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Chapter 1 : Introduction

1 Introduction :

1.1 Lead Acid Batteries:

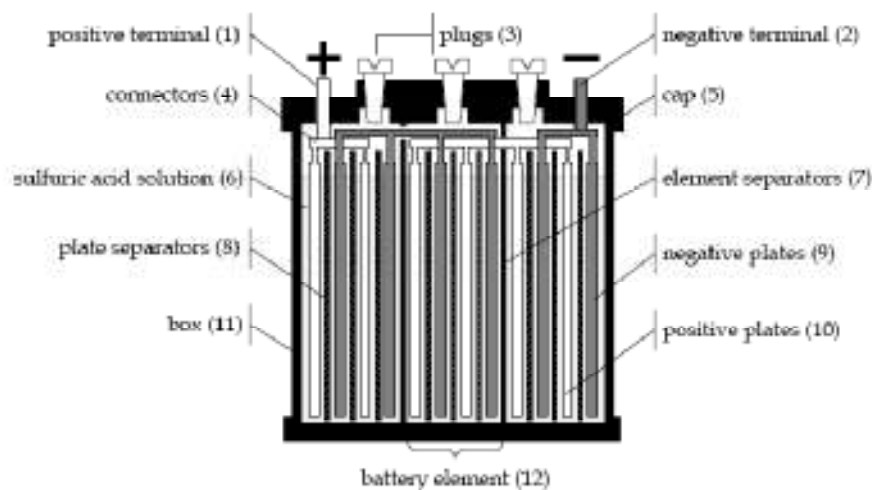
Lead acid battery is the one with lead as electrodes, and dilute sulfuric acid as electrolyte. The lead electrodes react with sulfuric acid to give lead sulfate on discharge. The reaction is reversed on recharge.

Batteries are constructed of lead grids, and individual cells are connected to form a battery in a plastic case.

Diagrammatic representation of lead-acid battery is given in **Figure 1.1**.

Figure 1.1

Diagrammatic representation - Lead Acid battery



These are used for automotive, commercial and industrial purposes.

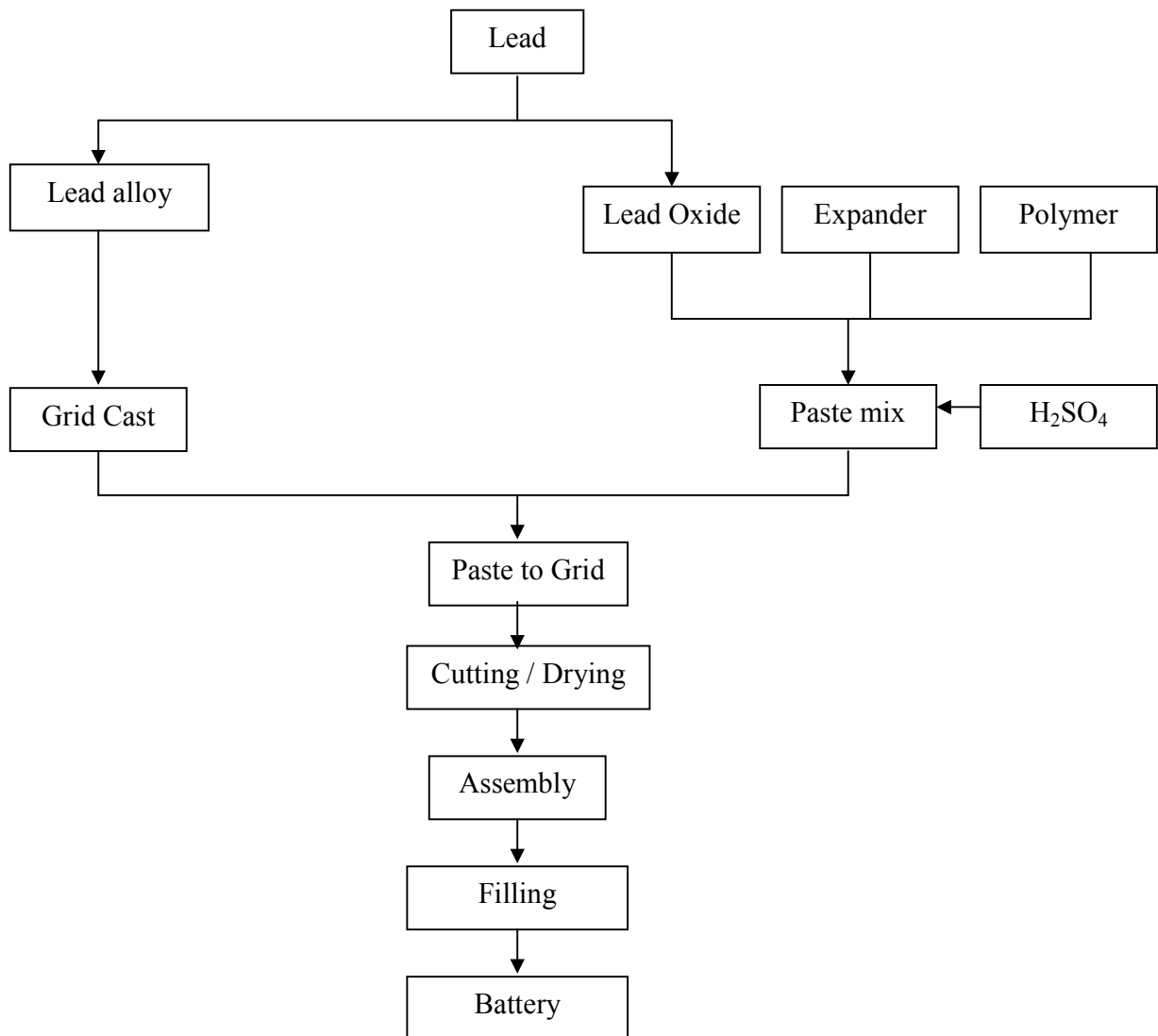
1.2 Battery Manufacturing :

A battery is an electrochemical apparatus which provides electrical energy, through controlled use of chemical reaction. Lead acid batteries use reversible chemical reaction, and hence can be recharged.

The main components of the lead acid battery, as mentioned above, are lead electrode, and sulfuric acid as electrolyte.

Important steps in the manufacturing of lead acid battery are as mentioned in **Figure 1.2**.

Figure 1.2
Manufacturing of Lead Acid Battery



A paste of lead oxide, expander (component of negative plate, increases surface area, stabilizes structure of negative active material) and polymer along with sulfuric acid, is coated on lead grid, which act as electrode.

These are then cut, dried, and arranged and filled with electrolyte. The case/ box is then sealed, and finishing done.

1.3 Battery Hazards :

The active materials of lead acid battery is lead and sulfuric acid.

Lead :

Lead is naturally present in the lithosphere in small amounts. Along with being naturally present, anthropogenic sources too lead to magnification in the amount of lead.

As per OSHA standards, the TWA for lead is 0.05 mg/m^3 . It is a mutagen, and a probable carcinogen.

Mechanism of lead poisoning can be explained as :

- Lead competes with essential metabolic metals like zinc, calcium etc
- Sulphydril groups have strong affinity for lead, thus lead alters chemical composition of several proteins, thereby making it dysfunctional or altering the metabolic reactions
- It alters the transport of ions in the body.

Acute lead poisoning :

This is due to accidental ingestion of inorganic lead. It is a rare event even for people working in lead recycling plants. A sweet metallic taste in the mouth is quickly followed by symptoms of thirst, or burning abdominal pain and vomiting, followed by diarrhea or occasional constipation; death, if occurs, does so usually within the first two days. Most patients recover, however other signs of the poisoning process may persist for a while.

Chronic lead poisoning :

This occurs when the body is exposed to lead concentrations usually not so high as in the case of acute poisoning, but high enough to produce observable effects after some time. The earliest symptoms of poisoning in adults are not specific and would not by themselves suggest excessive exposure to lead. Therefore, the diagnosis must be based on a history of exposure, a general feeling of being unwell, and appropriate biochemical tests, since the clinical examination may reveal little of significance: headache, fatigue and lassitude are the most common complaints, and later on loss of appetite, facial pallor and muscular pains occur.

If the diagnosis is not made at this stage and treatment started, various body systems start to

function abnormally and the results of this gradually become obvious. As the anemia progresses, pallor and shortness of breath increase. Dyspepsia and abdominal colic are most often associated with constipation, but intermittent diarrhea may also occur. At this stage, loss of appetite will have occurred and there may be vomiting; a blue line on the gum margin may be seen and there may also be changes affecting the peripheral nerves and/or central nervous system. Chronic encephalopathy may be difficult to recognize, as in some patients it occurs as depression and other as a manic-depressive state, either of which may be mistaken for an intrinsic mental illness. Occasionally, as the patient may have fits, it is necessary to differentiate poisoning from epilepsy.

Sulfuric Acid :

As per OSHA standards, Time weighted average for sulfuric acid is 1 mg/m^3 . Exposure to strong inorganic mist containing sulfuric acid is carcinogenic. Inhalation of strong vapour causes serious lung damage. Contact with eyes results in total loss of vision, skin contact may produce severe necrosis.

1.4 Need for Proper Management :

A used battery (ie. Used damaged and old lead acid battery) needs to be properly managed and either disposed off or recycled to prevent any leakage of hazardous material of which the battery is composed of.

For the same, in exercise of the powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government notified the Batteries (Management and Handling) Rules, 2001 (16th May, 2001).

These rules are applicable to every manufacturer, importer, re-conditioner, assembler, dealer, recycler, auctioneer, consumer and bulk consumer involved in manufacture, processing, sale, purchase and use of batteries or components.

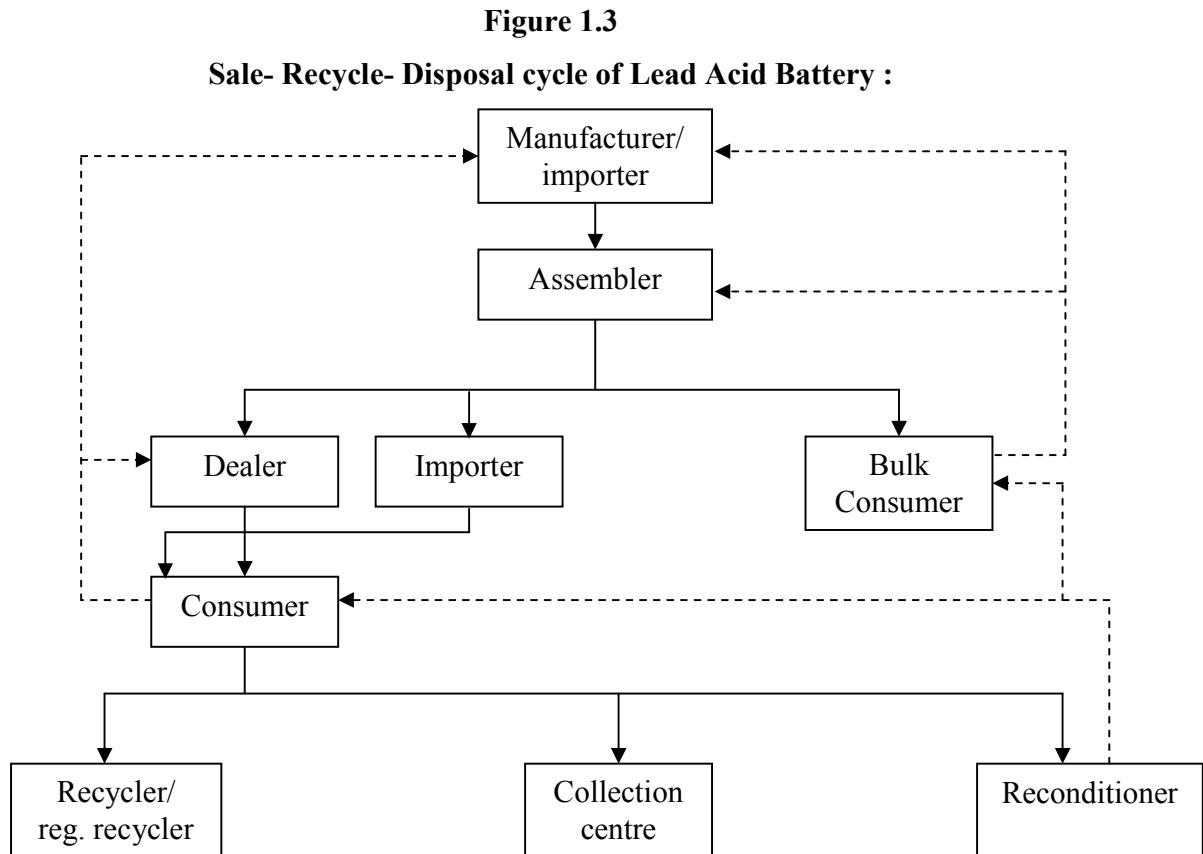
1.5 Batteries (Management & Handling) Rules, 2001

1.5.1 Introduction & Definitions :

Manufacturers, dealers, bulk consumers, recyclers, assemblers form important component in

the cradle to grave aspect of lead acid battery.

The sale, recycle disposal cycle of lead acid battery is represented in **Figure 1.3**.



The manufacturer either manufactures entire battery or component. An assembler manufactures battery by assembling components of the battery, which are further bought by bulk consumer, or dealer / importer for sale to consumer/ other dealers.

The consumer/ bulk consumer after usage are expected to dispose off the battery by sending it to registered recycler, collection centre, or reconditioner.

The consumer may also send the battery back/ in exchange of new battery to dealers. For this, the dealer may give certain discounts to the consumer. The used battery is further sent back to the manufacturer/ registered recycler who recycle the lead and dispose off other components properly.

1.5.2 Definitions:

As per the Battery Manufacturers and Handling Rules (2001), following are the definitions of the same.

1.5.2.1 Dealer :

A dealer is a person who sells and receives lead acid batteries or components to and from the consumers or other dealers or retailers on behalf of the manufacturers, importers, assemblers and re-conditioners.

1.5.2.2 Manufacturer :

A manufacturer (in relation to any factory manufacturing lead acid batteries or components) is a person or Chief Executive Officer (CEO) of the company who has control over the affairs of the factory or the premises for sale and collection of lead acid batteries or components.

1.5.2.3 Importer :

An importer is a person who imports new lead acid batteries or components containing lead for the purpose of sale.

1.5.2.4 Assembler :

An assembler is a person who manufactures lead acid batteries by assembling various components.

1.5.2.5 Reconditioner :

A reconditioner is a person involved in repairing of lead acid batteries for selling the same in the market.

1.5.2.6 Recycler :

A recycler is an occupier who processes used lead acid batteries or components for recovering lead.

1.5.2.7 Registered recycler :

A registered recycler is a recycler registered with the ;'Ministry of Environment and Forests'' for reprocessing used lead acid batteries or components.

1.5.2.8 Auctioneer :

An Auctioneer means a person who auctions used lead acid batteries or components.

1.5.2.9 Consumer :

A consumer is a person using lead acid batteries excluding bulk consumers.

1.5.2.10 Bulk Consumer :

A bulk consumer is a consumer such as Central or State Government Departments of Railways, Defense, Telecom, Posts & Telegraph, State Road Transport Undertakings, State Electricity Boards and others who purchase batteries through central 'rate' or running contract centrally placed on behalf of individual departments or user units under their jurisdiction.

1.5.3 Responsibilities allotted as per the Rules:

For proper use and disposal/ recycling of lead acid batteries and its components, and avoid any hazards due to improper disposal, the responsibility of each *component* is specified.

1.5.3.1 Dealer :

The responsibilities of the dealer include:

1. to ensure that the used batteries are collected back as per the Schedule against new batteries sold
2. to give appropriate discount for every used battery returned by the consumer
3. to ensure that used batteries collected back are of similar type and specifications as that of the new batteries sold
4. to file half-yearly returns of the sale of new batteries and buy-back of old batteries to the manufacturer in Form V by 31st May and 30th November of every year
5. ensure safe transportation of collected batteries to the designated collection centers or to the registered recyclers
6. to ensure that no damage is caused to the environment during storage and transportation of used batteries

1.5.3.2 Manufacturer, importer, assembler and re-conditioner :

The responsibilities of manufacturer, importer, assembler and re-conditioner are :

1. to ensure that the used batteries are collected back as per the Schedule against new batteries sold, excluding those sold to original equipment manufacturer and bulk consumer
2. to ensure that used batteries collected back are of similar type and specifications as

that of the new batteries sold

3. to file a half-yearly return of their sales and buy-back to the State Board in Form- I latest by 30 June and 30 December of every year
4. to set up collection centers either individually or jointly -at various places for collection of used batteries from consumers or dealers
5. to ensure that used batteries collected are sent only to the registered recyclers
6. to ensure that necessary arrangements are made with dealers for safe transportation from collection centers to the premises of registered recyclers
7. to ensure that no damage to the environment occurs during transportation
8. to create public awareness through advertisements, publications, posters or by other means with regard to the following :
 - hazards of lead
 - responsibility of consumers to return their used batteries only to the dealers or deliver at designated collection centre
 - addresses of dealers and designated collection centers
9. to use the international recycling sign on the Batteries
10. to buy recycled lead only from registered recyclers
11. to bring to the notice of the State Board or the Ministry of Environment and Forests any violation by the dealers.

Chapter 2: Present Status

2.1 Classification :

Batteries sold have been classified as per the Batteries Management and handling rules, under 3 main categories:

- Automotive
- Industrial
- Others

These have been further classified as :

Automotive	Industrial	Others
<ul style="list-style-type: none"> • 4 wheeler • 2 wheeler 	<ul style="list-style-type: none"> • UPS • Motive • Stand-by 	<ul style="list-style-type: none"> • Inverters etc.

Data was collected from the dealers, assemblers, bulk consumers. Data received from GSPCB, on the battery returns was also included. Questionnaires were sent to 123 battery dealers, 10 assemblers, 5 bulk consumers. Data for others was obtained from GSPCB. Data obtained is given in **Annexure III**.

Table 2.1
No. Of Dealers, Assemblers, Bulk Consumers

	Total questionnaires sent (A)	Additional Data from GSPCB (B)	Closed (C)	Not responded (D)	Total Estimated Figure (Operating) [A x (B+C)]/ B
Dealers	123	2	17	26	108
Assemblers	11	11	4	2	18
Bulk Consumers	7	18	1	8	24

Some of these dealt with automotive batteries, while some with industrial ones. However, most of them deal with all three specified type of batteries.

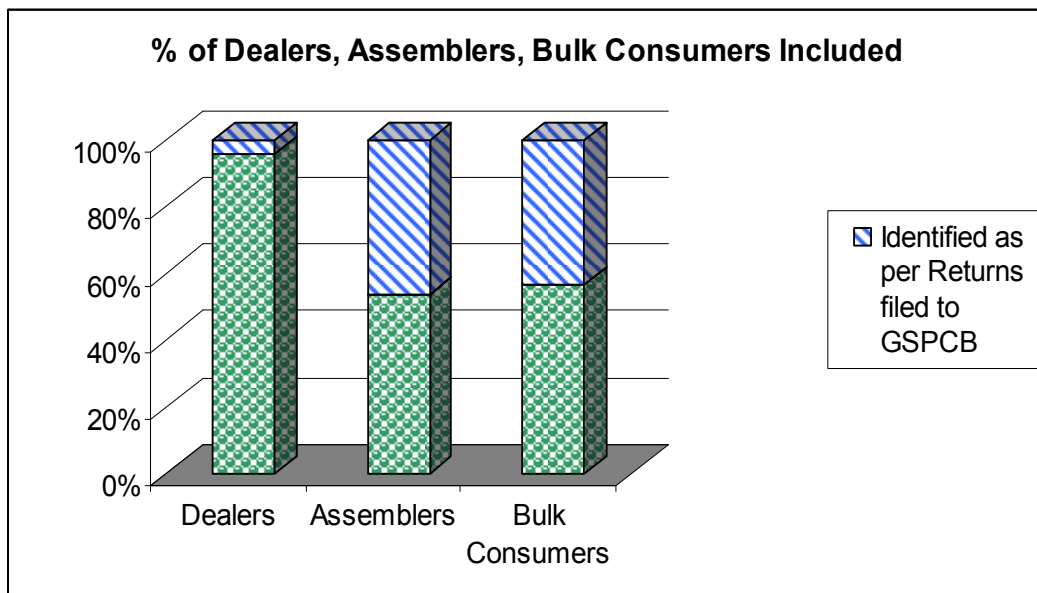
2.2 Data From GSPCB/ Returns Filed :

6 monthly/ annual returns are filed to GSPCB as per the Batteries Management & Handling Rules, 2001; this data was also included in the inventory, to give a more comprehensive status of the batteries management in the state.

Table 2.2
Battery dealers, Assemblers, Bulk Consumers included in Inventory

	Identified and included in inventory by AESPL	Identified as per Returns filed to GSPCB
Dealers	125	5
Assemblers/ Manufacturers	22	19
Bulk Consumers	25	19

Figure 2.1
Battery dealers, Assemblers, Bulk Consumers included in Inventory



Thus, of the 125 dealers, only 5 file battery returns with GSPCB. Of the 22 assemblers, 19

filed returns, and of 25 bulk consumers, 19 filed returns with the pollution control board.

2.3 Estimate of Batteries Sold :

To get an overall estimate of the number of batteries sold and recycled in the state, the total numbers responded was clubbed with the numbers that did not respond, to get a total (estimated/ approximate) figure. Thus a total estimate of batteries sold, is as given in **Table 2.3, Table 2.4, Table 2.5.**

No of batteries were classified under 3 main categories, and further under sub-categories, as mentioned earlier. However majority of the pro-formas filled, did not give specifications of the batteries sold. Hence, these were then included under the main category, without further classification.

Table 2.3
Estimate of Total batteries sold by Dealers – Annually

	No. of Batteries (A)	No of Dealers responded (B)	Not responded (C)	Total (estimated) no of Batteries [A x (B+C)]/ B
1) Automotive	4907	66	26	6,840
1a) 4 Wheeler	11230			15,654
1b) 2 Wheeler	15252			21,260
Total (Automotive)				43754
2) Industrial	29914	24		62,321
2a) UPS	4345			9,052
2b) Motive	0			0
2c) Stand-by	1024			2,133
Total (Industrial)				73506
3) Others	1175	7		5,539
TOTAL				1,22,799

Table 2.4**Estimate of Total batteries sold by Assemblers - Annually**

	No. of Batteries (A)	No of Assemblers (B)	Not responded (C)	Total (estimated) no of Batteries [A x (B+C)]/ B
1) Automotive	91	12	2	106
1a) 4 Wheeler	6787			7,918
1b) 2 Wheeler	26031			30,370
Total (Automotive)				38394
2) Industrial	0	3		0
2a) UPS	379			662
2b) Motive	0			0
2c) Stand-by	50			83
Total (Industrial)				745
3) Others	1258	4		1,887
TOTAL				41,026

Table 2.5
Estimate of Total batteries sold to Bulk Consumers - Annually

	No. of Batteries (A)	No of Assemblers (B)	No data found (C)	Total (estimated) no of Batteries [A x (B+C)]/ B
1) Automotive	0	10	8	0
1a) 4 Wheeler	930			1674
1b) 2 Wheeler	8			14
Total (Automotive)				1688
2) Industrial	0	9		0
2a) UPS	229			433
2b) Motive	2			4
2c) Stand-by	2			4
Total (Industrial)				441
3) Others	3	2		15
TOTAL				2144

2.4 Disposal of Lead Acid Batteries :

The preferred disposal alternative for hazardous batteries is recycling. Although many components of batteries may be recycled, the primary focus has been on metals recovery.

The user is expected to return the used battery to the dealer/ assembler from whom the battery is bought. They in turn return these used batteries to either the manufacturers/ assemblers/ to registered recyclers.

However, in majority of the cases, it has been observed, that there is no proper management of used batteries. These are either sold off to local scrap dealers, who are not competent enough to handle this hazardous waste.

Of the data collected, most of the dealers/ bulk consumers/ assemblers did not provide any details about their mode of disposal of the used batteries/ of the number of used batteries collected back.

An estimate of the total number of batteries/ battery waste that was managed in a proper manner and sent back to the registered recyclers/ designated collection centers/ manufacturers are given in **Table 2.6, Table 2.7 & Table 2.8.**

Table 2.6
Estimate of Total batteries taken back and sent to recyclers/ scrap dealers/ manufacturers/ assemblers by Dealers – Annually

	No. of Batteries (A)	No of Dealers responded (B)	Not responded (C)	Total (estimated) no of Batteries [A x (B+C)]/ B
1) Automotive	4379	40	26	7225
1a) 4 Wheeler	1927			3180
1b) 2 Wheeler	2097			3460
Total (Automotive)				13865
2) Industrial	501	8		2129
2a) UPS	297			1262
2b) Motive	0			0
2c) Stand-by	215			914
Total (Industrial)				4305
3) Others	0	0		0
TOTAL				18,170

Table 2.7**Estimate of Total batteries taken back Assemblers – Annually**

	No. of Batteries (A)	No of Assemblers (B)	Not responded (C)	Total (estimated) no of Batteries [A x (B+C)]/ B
1) Automotive	0	2	2	0
1a) 4 Wheeler	331			662
1b) 2 Wheeler	105			210
Total (Automotive)				872
2) Industrial	0	3		0
2a) UPS	0			0
2b) Motive	0			0
2c) Stand-by	0			0
Total (Industrial)				0
3) Others	63	1		189
TOTAL				1061

Table 2.8

**Estimate of Total batteries sent by Bulk Consumers to registered recyclers/ /
designated collection centers/ manufacturers**

	No. of Batteries (A)	No of Assemblers (B)	No data Found (C)	Total (estimated) no of Batteries [A x (B+C)]/ B
1) Automotive	179	5	8	465
1a) 4 Wheeler	646			1680
1b) 2 Wheeler	0			0
Total (Automotive)				2145
2) Industrial	0	2		0
2a) UPS	82			410
2b) Motive	0			0
2c) Stand-by	0			0
Total (Industrial)				410
3) Others	136	3		499
TOTAL				3054

Thus, comparing Table 2.3 to Table 2.8, we get an estimate of the no of batteries of each major category, sold as well as disposed off properly by sending these to registered recyclers/ given back to dealers/ manufacturers.

Table 2.9, 2.10, 2.11 & Figure 2.1, 2.2, 2.3 gives an overview of the same.

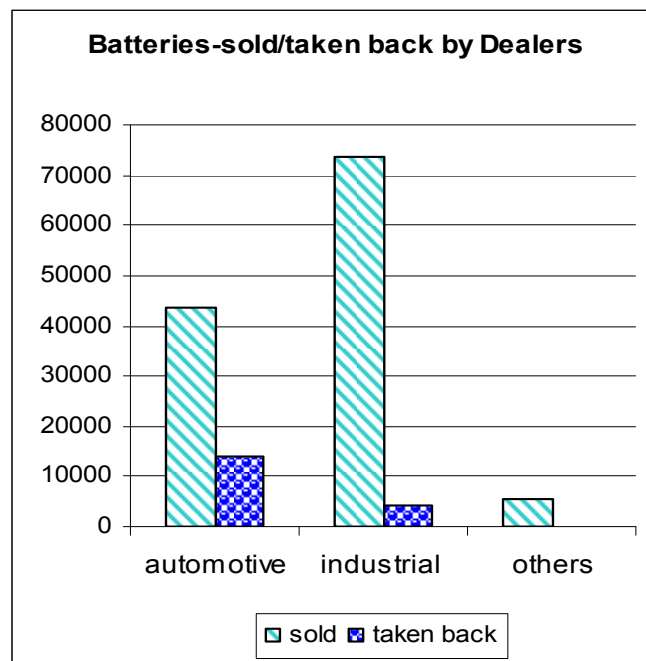
2.4.1 Dealers :

An estimated number of batteries sold by dealers annually and taken back and sent to recyclers/ other means of disposal is given in **Table 2.9** & compared in **Figure 2.2**.

Table 2.9
Batteries sold & taken back by dealers (Annually)

	Sold	Taken back
automotive	43754	13865
industrial	73506	4305
others	5,539	0
TOTAL	122799	18170

Figure 2.2



As can be seen from **Table 2.9** & **Figure 2.2** :

Automotive batteries:

- Of the total automotive batteries taken back and disposed off by sending them to registered recyclers/ other means is only **2%** of the batteries sold annually.

Industrial Batteries :

- Of the total industrial batteries taken back and disposed off by sending them to registered recyclers/ other means is only **6%** of the batteries sold annually.

Others:

- None of the batteries not included in the above two categories are taken back by the respective dealers. Hence either their mode of disposal/ recycling is not as per the given standards/ no information was given about the same by the respective dealers.

Of the ones that are taken back, **42 dealers send it to either the assemblers/ reg. recyclers/ other dealers; 5 dealers** (viz. Devi Batteries, Sanvordem; Excel Batteries, Margao; Lexus Batteries, Margao; Escort Enterprises, Margao; Sai Prasad Batteries, Margao) **dispose it off to local scrap dealers**, whereas for others the mode of disposal is not known.

2.4.2 Assemblers :

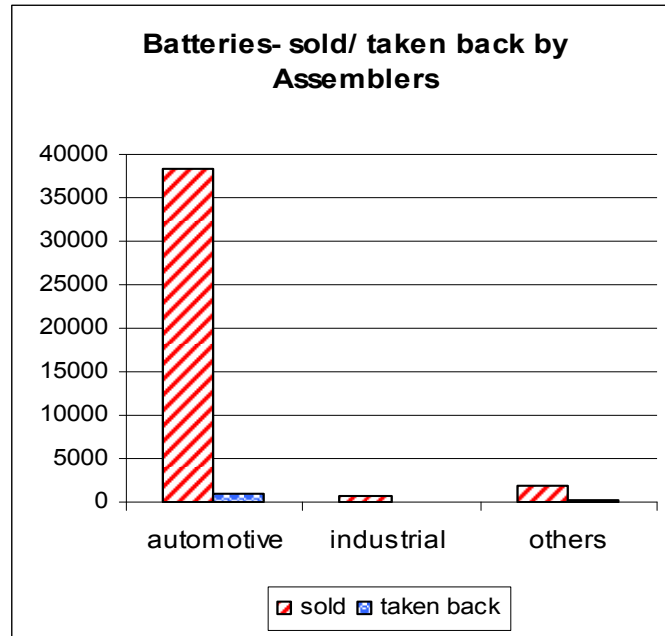
An estimated number of batteries sold by assemblers annually and taken back and sent to recyclers/ other means of disposal is given in **Table 2.10** & compared in **Figure 2.3**.

Figure 2.10

Batteries sold/ taken back by Assemblers (Annually)

	Sold	Taken back
automotive	38394	872
industrial	745	0
others	1,887	189
TOTAL	41026	1061

Figure 2.3



As can be seen from **Table 2.10 & Figure 2.3** :

Automotive batteries:

- Of the total automotive batteries taken back and disposed off by sending them to registered recyclers/ other means is only **2%** of the batteries sold annually.

Industrial Batteries :

- None of the batteries included under this category are taken back by the respective assemblers. Hence either their mode of disposal/ recycling is not as per the given standards/ no information was given about the same by the respective assemblers.

Others:

- Of the total batteries included under this category, batteries taken back and disposed off by sending them to registered recyclers/ other means is **10%** of the batteries sold annually.

Of the ones that are taken back, **10 assemblers send it either to the reg. recyclers/ other assemblers/ manufacturers; 1 (viz. Enco Batteries, Ponda) disposes it off to local scrap dealers**, whereas for others the mode of disposal is not known.

2.4.3 Bulk Consumers :

The scenario for management of battery hazardous waste is on a positive sense. Most of the batteries bought are disposed off by sending it to registered recyclers/ sending them back to respective dealers/ assemblers/ manufacturers. These mainly comprise of mines in the state, the power and electricity department, other government institutions etc. They buy these batteries on a larger number, and usually return them back from where these are bought.

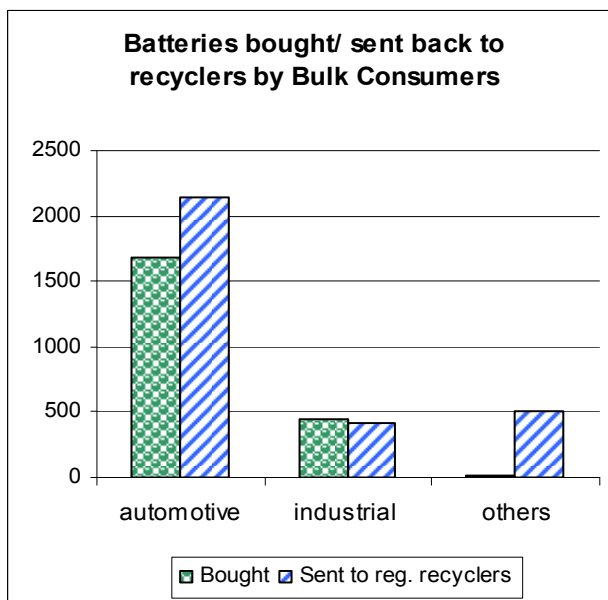
They are the ones who do file returns on a regular basis with the pollution control board.

Table 2.11

Batteries bought/ sent back to recyclers by Bulk consumers (Annually) :

	Bought	Sent to reg. recyclers
automotive	1688	2145
industrial	441	410
others	15	499
TOTAL	2144	3054

Figure 2.4



As can be seen from **Table 2.11 & Figure 2.4 :**

- The batteries sent (of the previous year) to the recyclers by the bulk consumers, were almost equal to or more than the ones bought by them.
- Of the ones that are taken back, **9 bulk consumers send it to either the reg. recyclers/ dealers/ assemblers/ manufacturers**; whereas for others the mode of disposal is not known.

Chapter 3: Survey Conducted

3.1 Scope of Work :

The scope of work as identified by GSPCB involved :

- Status of battery waste in Goa State
- Batteries waste handling as per Batteries Waste Management & Handling Rules (2001).

3.2 Purpose :

Lead acid batteries uses lead as a main component. Recycling of batteries is essential for sustainable development. There are set rules and regulations for proper recycling and disposal of battery. Besides the statutory requirements, it has a range of advantages viz.:

- Reuse of scarce natural resources
- Reduces monetary requirements due to reduction in cost of metal recovery
- Lead exposure can have drastic effects on humans and other living beings. Hence unsound disposal can lead to hazardous consequences.
- Besides lead, these batteries also contain other components, including sulfuric acid, which requires proper disposal.

The main objective of the study was to get a clear picture of the status of battery management in Goa State. This included battery usage, and methods of disposal/ recycle of used battery.

Thus, the study looked into the extent of implementation of Battery (Management and Handling) Rules, 2001, in Goa State.

3.3 Sources of Information :

Main sources of information for the report included :

- Goa State Pollution Control Board
- Battery Manufacturers

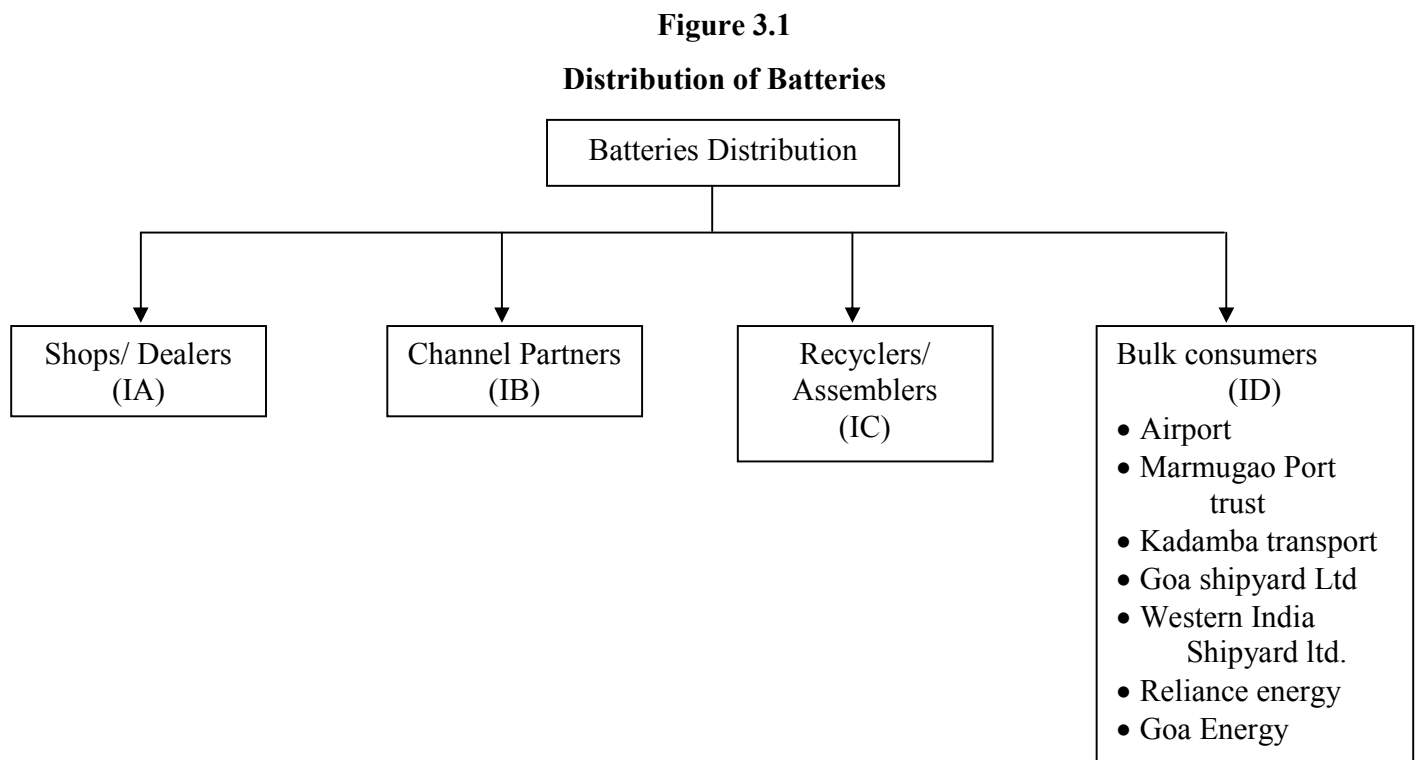
- Battery Assemblers
- Battery Dealers
- Bulk Consumers
 - Kadamba Transport Corporation
 - Goa Shipyard Limited
 - Reliance Infrastructure Ltd.
 - V.M. Salgaonkar & Bro. Pvt. Ltd.
- Municipal Councils in Goa State

Main source of information was the physical survey carried out by Aditya Environmental Services Pvt. Ltd.

3.4 Methodology :

3.4.1 Classification/ Distribution :

Distribution of batteries channel was done as given in **Figure 3.1** :



3.4.1.1 IA, IB, IC :

A list of dealers, assemblers, manufacturers in Goa state was prepared based on some information available in directories. This formed the basis for information to be collected.

To make the list more exhaustive, the companies were contacted for their specific dealers in Goa state. The companies included :

- TATA Green
- Exide
- Addo
- Okaya
- Amaron

The company representatives were sent letters for information required on behalf of Goa State Pollution Control Board, along with the authorization letter of GSPCB, granted to AESPL for the survey (**Annexure I- Authorization Letter**).

3.4.1.2 ID :

Letters were sent to Bulk Consumers (Transport, Electricity department, Airport Authority, Ports, Goa Energy, Reliance Energy) for the no. of batteries purchased, and no and mode of disposal.

Information was also asked from municipal councils, Goa State, for licensed shops selling lead acid batteries in their jurisdiction.

3.4.2 Physical Survey :

The survey in the above given fashion had following drawbacks :

- Very long response time taken by the companies
- Except the Municipal council of Bicholim, no information was obtained from other municipal councils.
- Delay/ No response from bulk consumes that were contacted.

Thus to have a more clear and apt picture of the status of battery usage and disposal, it was decided to engage researchers, to carry out physical survey. These researchers visited the

dealers whose information was available in the directories, and also others in the same taluka. These were asked to submit a filled proforma, prepared for dealers, manufacturers, assemblers, bulk consumers, and submit it either to AESPL office, or GSPCB within the stipulated time period.

The sample pro-forma for data collection are given as **Annexure II**.

3.4.3 Data From GSPCB:

As per the Batteries Waste (Management & Handling) Rules, 2001, the dealers, manufacturers, assemblers, bulk consumers are expected to file half yearly/ annual returns to MoEF or an agency designated by it.

Thus the data of returns filed with GSPCB was provided by the Board. This data further helped to elaborate the list.

Chapter 4

Action Proposed :

4.1 Recommendations :

Immediate implementation of these rules would be an ideal situation, which would not be entirely possible on an immediate basis, however, steps can and should be taken for achieving the same, as soon as possible.

First major step proposed is to streamline proper disposal of used batteries. Buy back price of these batteries is about :

- small batteries approx 1000/-
- medium size approx 1700 /-
- Large size 2500/-

Thus it is recommended that :

- An inventory is a dynamic document. Hence, it needs to be continuously updated. Regular updating & data collection and maintenance should be carried out.
- Notice to be issued to Local bodies to collect data regarding the proponents dealing with sale of batteries under their jurisdiction.
- Necessary powers to be given to GSPCB, to ensure proper compliance & strict regulatory control on sale & management of batteries and.
- Proponents submitting returns should be asked to provide complete information regarding the manufacturers, from whom the batteries have been bought, and most important, the mode of disposal.
- Public notices should be put up asking units to follow norms as per the rules.
- Major companies in Goa, should have collection centers in Panaji & Margao.

Chapter 5

Conclusion:

5.1 Conclusion :

It has been observed that despite strict norms and regulations set up for proper management of lead acid batteries, proper disposal of used batteries is still a major issue in the state.

It can be clearly seen that most of the proponents dealing with sale of lead acid batteries are not filing returns as per the rules with the pollution control board.

Also, the main issue of concern is the mode of disposal of the used batteries. These are to be ideally returned back to the proponents from whom they are being bought. They in-turn send it to authorized recyclers (authorized by Central Pollution Control Board), who recycle the metal components, and other hazardous components, thus preventing its release into the environment. However, as observed a miniscule percentage of the proponents do receive back the batteries, and managed in a proper way. Some of these also send it to local scrap dealers, who are not technically equipped with handling/ recycling these hazardous materials.

Thus it can be inferred that statutory measures are present for batteries management, however its implementation is what is required.

4	5	6	8	9	10	11	
Details	Details	Details	Details	Details	Details	Details	Details
United Lead Acid Products Private Ltd. 216, Kundaim Ind. Est, Kundaim	Premanand Auto Electrical works		M/s. Super Life Battery Agencies, '1', Shanta Bldg, 18th June Road, St Inez, Panaji-Goa	M/s. Super Life Battery Service, '1', Shanta Bldg, 18th June Road, St Inez, Panaji-Goa	M/s. Agam Batteries (P) Ltd.,5, Dr. Tarquiro Henriques Apt., Vasco-da- Gama,Goa	M/s. Dayal Accumulator s, Gala No 6, Sancoale Industrial Estate,Sanco ale-Goa	M/ En Batter , Panc at BL Usgr Pon Go
Kalidas P. Shirodkar (Managing Director) 371034198 contact@ cobatteryindia .com	Premanand B. Naik Tisk - Sanvordem	Chandrashekar Nair 0832-2215212 9422451856	Mr. Ismail Khan Ph 2225017, Fax 2226714	Mr. Noor Mohamed Khan Ph 2225017, Fax 2226714	Prakash Gupta	Prakash Gupta	Mr. Balk na N Re 2344 , O 2344
Manufacturer	Assembler	Assembler					
1981	2003	06-10-1984					
Yes	No	No	Yes	Yes	Yes		Ye
Attached							

262				50	67			
				50				
				25	250			
	NIL							
				102	150		19	
40084								
224								
No. of batteries collected in last 1 year	No. of batteries collected in last 1 year	No. of batteries collected in last 1 year	No. of batteries collected in last 1 year	No. of batteries collected in last 1 year	No. of batteries collected in last 1 year	No. of batteries collected in last 1 year	No. of batteries collected in last 1 year	
	NIL	1 ton						
					271			
					105			

6	7	8	9	10	11	12	13	14
Details	Details	Details	Details	Details	Details	Details	Details	Details
M/s. Material Organisation, Dabolim-Goa	M/s. Power Grid Corporation of India Limited, 400/220KV Substation, Village Chikalim, Gomantak Nagar, Colvale, Bardez-Goa	M/s. Chowgule and Co Ltd., Mining Division, Khandepar Tisk, Usgao-Goa	M/s. Sesa Goa Ltd., Mining Division, Codli Mines, P.O. Kirlapale, Dabal, Sanguem-Goa	M/s. Duraline India P. Ltd., L/24 & 25, Verna Electronic City, Phase II A, Verna, Salcete-Goa	M/s. Dempo Mining Corp. Pvt. Ltd., Bicholim Mines	M/s. Dempo Mining Corp. Pvt. Ltd., (Surla Mines), Dempo House, Campal, Panaji-Goa	M/s. Goa Carbon Ltd.	M/s. Dempo Shipbuilding & Engineering Pvt. Ltd.,
The Flag Officer Commanding Goa Area, Head Quarters Goa Naval Area, Vasco da Gama	Add. General Manager, Power Grid Corporation of India Limited, Mapusa-Chiklim Road, Colvale, Bardez-Goa	Mr. R. P. P. Alvenkar, Mining Division, Khandepar	Mr. B. R. Rao, G.M. Maintenance, M/s. Sesa Goa Ltd	Mr. A. Mukherjee, Sr. Vice President, M/s. Duraline India P. Ltd.	Mr. P. K. Joshi	Mr. P. K. Joshi	Mr. K. M. Kamath	Mr. S.A. Kanekar-G.M., M/s. Dempo Shipbuilding & Engineering Pvt. Ltd.
		Tel-2345363, 2345364, Fax-2344390	Ph. 2617222, Fax-2618280	Ph. No-2783155/2783866/2783867-Fax-2887156	Ph. No-2783155/2783866/2783867-Fax-2887156	Ph:2441412, Fax:2225098/2228588	Fax 2860364	
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
79	0	22	419		4		1	1
4					4			
				30			6	32

Annexure: 3b

Dealers:

No data given
Raibow Electronics, 17, Patto Centre,Nr. KTC Bus Stand, Panaji
Sao Jose De Areal, Nispabhat, Salcete
Citizen Batteries, Khorlim, Mapusa
Mapusa Electronics, Shop No.. 12, Chandrakant Aptt., Opp. Police Stn, Mapusa
Shivraj Accumulators, Shed No. D-46, Bicholim
Powertrac Corporation, 3, Sita Smriti, St. Inez, Panaji
Galaxy Battery
K. K. Garage , Vasco Da Gama
Solar Batteries Nr Tilak Maidan, Nr State Bank of India, Vasco
G.R.K. Enterprises, 11, Old Market, Margao
Powertrac, Margao
Teracom Ltd. Plot No. 102, Kundaim Ind Est
Parvati Shiva Parab/ PSP Batteries, H.No.2/757/E (5) & (6), Opp. Holy Cross Chapel, Aysha Appt, New Vaddem, Vasco Da Gama
Sanyo Batteries, Nr Vishant Theatre, Margao
R.K. Batteries, Nr Saraswat Higher Secondary School , Mapusa
Durga Batteries, Shop No. 5, Kansa Board, Tivim, Mapusa
Genesis, Cavelosim, (Not giving proper address)
Kay Electronics, Colva
R. K. Batteries , Sweeta Residency Khorlim, Mapusa
R. K. Batteries , Shop No.24/2, Old Municipal Market, Opp. Abrew Lobo InstituteRauji Kolwalkar
Jos Battery Industry, Opp. Solar Battery Vasco
Amzel Automotive Ltd ,Govardhan Power ,Nr. St. Joseph's Institute Asquem, Alto, Power House Rd. Margao
Kamat Auto Care, Baina, UN Road, Vasco Da Gama
Powertrac Corporation,Shop No. 9, Nr. Santosh Garage Aquem, Babu Naik Rd, Margao
Sanyo Batteries, 5, Sundew Apts, Nr. Cine Vishant, Margao
Dukle Auto Care Centre (Apex Marketing),Phoenix Estate, G-24/25 ,Gogol, Margao
Roshan Batteries Kurtarkar Nest ,Aquem, Margao
Compac Batteries,Agnis Apts, Pontemol, Curchorem
M/s. Advanced Oral Care Products Pvt. Ltd., Kundaim Industrial Estate
M/s. Super Life Battery Service, ' 1 ', Shanta Bldg, 18th June Road, St Inez, Panaji-Goa
Kalpna Auto Electric Ware Behind Police Station, Margao

Devi Batteries, Belgaum Rd, Tisk - Sanvordem
National Batteries, Vasco da Gama
R.K. Batteries, Opp. Shetye Sales, Duler, Karaswada, Mapusa
R.K. Batteries, Shop No. 3, Vaman Smruti, Opp. Lami Narayan Mandir, Mapusa
Laxmi Batteries, Honda, Tisk, Satterri
Rolex Batteries, Sorautowado, Anjuna Bardez

Only sale & Charging of batteries
Manoj Batteries, Nr. HP Petrol Pump, Sanquelim
Zam Zam Batteries, Opp. Kisan Bhavan, Satterri Bazar, Valpoi

No sale of batteries

Mapusa Electronics, Shop No.. 12, Chandrakant Aptt., Opp. Police Stn, Mapusa
Bharat Batteries, Bandarwada, Bicholim
Shree Guru Krupa, Autoworld, P-76, Bicholim Ind. Est.
Mapusa Electronics, Mapusa
Appa Service Centre
Margao Electronics, Margao
Galaxy Battery, Nr Golden Charate Hotel Gogol, Margao

Assemblers:

Closed
Sameer Nair, Bicholim
Auto Care, Vasco Da Gama
Auto Spares & Ameya Auto Parts Distributors Shop No. G-6/7, Venkatesh Chambers, Nr Central Bank, Curchorem
Auto Care Sales Corporation, 5, Happy Apts, Nr Shilpa Glass, Vasco Da Gama
Mangesh Motors Vasco, S V Singbal Bldg, Nr Sanman Hotel, Vasco Da Gama
Sumesh Nair, Bicholim
Citizen Batteries, Shop No. D-8, Sattadhar Complex, Karaswada, Mapusa
Maruti Service Centre, Nr Fatorda Stadium, Fatorda, Margao
Damodar Acid & Chemicals H.No. 340, Station Rd, Margao

Closed:

Closed

M/s. PCS Technology Ltd., Plot No 44-45, Mapusa Industrial Estate, Mapusa-Goa

No Data

Western India Shipyard

Marmagoa Port Trust, Materials Department, MPT, Sada, Vasco-da-Gama, Goa.

Goa Airport, Airport Authority of India Dabolim, Goa.
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Goa Ind Energy Pvt. Ltd. Top Floor, Navelcar Trade Center, Azad Maidan, Panjim, Goa-403001.
