

Technical documentation

Technical documentation according to **Batteries Regulation 2023/1542, Article 17, Annex VIII, Part A, Module A - “Internal production control”, Clause 2:**

1. GENERAL DESCRIPTION AND INTENDED USAGE

Lead-Acid rechargeable battery, consisting in lead as anode and lead dioxide as cathode, with a diluted sulphuric acid as electrolyte. It is designed to supply the intended electric power in motor vehicles for SLI (Starting, Lightning or ignition) functions and can be used for auxiliary or backup purposes in vehicles, other means of transport or machinery.

Voltage/Chemistry/Application/Technology : 12V Lead-Acid truck GEL-VRLA

2. CONCEPTUAL DESIGN, MANUFACTURING DRAWINGS AND SCHEMES OF COMPONENTS

1. Positive electrode
2. Positive grid
3. Negative electrode
4. Separator sheet
5. Plates stack and enveloped separators. Cell stacks are connected in series and/or in parallel
6. Positive and negative electrode connectors
7. Casing
8. Closing Lid

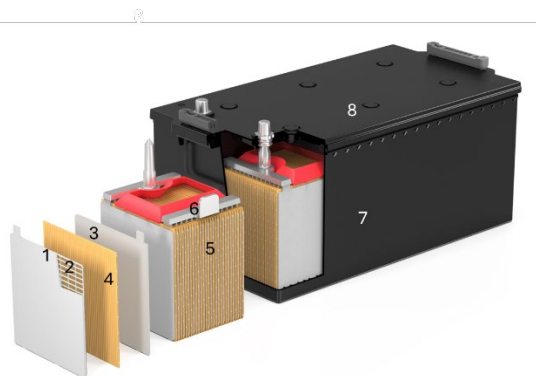


Figure 1 – Conceptual design of a CV GEL-VRLA lead acid battery

3. DESCRIPTIONS AND EXPLANATIONS

No further documentation is needed to understand drawings and schemes. For any details concerning operation of the battery refer to safety instructions and user manual.

4. MARKING SPECIMEN (acc. to Article 13)

For a transition period (see Article 95 of the Battery Regulation), requirements from both - the Directive and the Regulation - apply in parallel.

The eco marking requirements – the crossed out dustbin, the recycling loop and the symbol to indicate the heavy metal content - and the restriction on mercury, cadmium had been transferred from the Directive into the Regulation.

The marking requirements are derived from

- Article 4, Article 21 and Annex 2 of the EU Battery Directive 2006/66 and
- Article 6, Article 13 and Annex 6 of the EU Battery Regulation 2023/1542



Figure 2 – Example of marking with symbol for separate collection according to Annex VI Part B and with the chemical symbol "Pb" for the heavy metal Pb content according to Articles 13.4 & 13.5

5. List of harmonised standards and common specification and other relevant technical specifications used for measurement or calculation purposes

No harmonized standards are available. Article 6 (restriction on substances) and Article 13 (labelling and marking of batteries) compliance requirements don't need specific measurements or calculations.

6. Description of the solutions adopted to meet the applicable requirements

- Restrictions on substances as per **Article 6 and Annex I**

- Mercury and Cadmium content limits compliance is ensured by suppliers certifications and by EXIDE material internal specifications¹ (RM/ETS-RM):

ETS	Material	Cd - Limit ²	Hg - Limit ³
RM-020	Cellulosic pasting paper	5 ppm	5 ppm
RM-024a-b	Acid-resistant PP components	5 ppm	5 ppm
RM-031/032	AGM Separators	<1 ppm	<1 ppm
ETS-RM-016a-b	Plate paste fibers	1-5 ppm	1-5 ppm
ETS-RM-012	Aluminum Sulfate	2 ppm	1 ppm
RM-011-a/b/c	Sulfuric acid - different concentrations	1 ppm	1 ppm
ETS-RM-004/005x	Carbon and Conductive Carbons	5 ppm	5 ppm
ETS-RM-013xx	Various % Sn, Ca, Al, Sb Alloys	5-10 ppm	5 ppm
ETS-RM-029xx	Various % Sn, Ca, Sb Alloys	5-10 ppm	5 ppm

- For Mercury and Cadmium content limits compliance, in case of battery suppliers, reference requirements are stated in suppliers PPAP and Certificates of Compliance
- ¹ ETS (Exide Technical Standards) are regulated inside EXIDE Quality system (BMS) in terms of requirements to suppliers, change management and maintenance (regularly updated according to products specifications).
 - ² Mercury content limit in ppm is 5
 - ³ Cadmium content limit in ppm is 20
- Labelling and marking of batteries as per **Article 13**
 - Sample of marking compliant to Articles 13.4 & 13.5 requirement is shown on section 4

7. Results of design calculations made and examinations carried out, and the technical or documentary evidence used

Article 6 (restriction on substances) and Article 13 (labelling and marking of batteries) compliance requirements don't require specific design calculations.
Restricted substances examinations according to Article 6 are handled by incoming goods inspections

8. Test reports

- Article 6 compliance: Mercury and Cadmium content limits compliance is ensured by suppliers certifications and by EXIDE material internal specifications
- Article 13 compliance: no testing is required to ensure compliance to requirements according to Article 13 (labelling and marking of batteries)

NOTES:

1. EXIDE Technologies decision making processes, innovation, development, industrialization and products quality are managed following risk management principles and procedures in accordance with EXIDE's certified compliance to ISO 9001 (clause 6.1) and to IATF 16949 (clause 6.2.1.1).
2. Batteries placed on the market or put into service by EXIDE, provided proper product handling and usage as intended/specified, do not present risks to human health, safety of persons, properties or environment