



## 1. SCOPE

The testing and certification of valve regulated sealed lead-acid (VRSLA) batteries by CSIRO is provided as a service to assist suppliers and maintainers of fire detection, alarm and warning system Control and Indicating Equipment (FDCIE) and Emergency Warning and Intercom Systems (EWCIE) to identify and source suitable VRSLA batteries as secondary (standby) power supplies.

With the publication of Australian Standard AS/NZS 62368.1:2018, which applies to this category of life safety equipment as referenced by national electrical safety regulations (Telecommunications (Customer Equipment Safety) Technical Standard 2018), the specified requirements of CSIRO (ActivFire) TS-001 Technical Specification have been superseded and replaced by this CSIRO TS-015 Technical Specification.

## 2. REFERENCED DOCUMENTS

The documents referenced by this technical specification are detailed in Table 1.

**Table 1. List of documents referenced by this technical specification.**

|                              |   |
|------------------------------|---|
| <b>AS/NZS 62368.1:2018</b>   | Audio/video, information and communication technology equipment, Part 1: Safety requirements (IEC 62368-1:2014 (ED. 2.0) MOD) |
| <b>IEC 60896-21:2004</b>     | Stationary lead-acid batteries - Part 21: Valve regulated types - Methods of test   |
| <b>IEC 60896-22:2004</b>     | Stationary lead-acid batteries - Part 22: Valve regulated types - Requirements  |
| <b>AS ISO/IEC 17025:2018</b> | General requirements for the competence of testing and calibration laboratories   |
| <a href="#">F2018L01725</a>  | Telecommunications (Customer Equipment Safety) Technical Standard 2018 (Telecommunications Act 1997)                          |

## 3. VERIFICATION PROCEDURE

Documentation, submitted as evidence of conformity with IEC 60896, shall be a relevant selection of records and reports from recognised testing agencies in accordance with suitable and relevant protocols, standards or specifications.

The following activities, as detailed in Table 2, are required for the purposes of verifying conformance of VRSLA batteries.

**Table 2. Activities required for the purposes of verifying conformance with the specified requirements of this technical specification.**

| Activity         | Description   | Support Documentation Required   |
|------------------|---|--|
| 1 <sup>(i)</sup> | Verification that battery tests have been conducted in accordance with specified Standard(s)  | Completed IEC 60896-22 Annex B form<br>Test report(s) from a laboratory accredited to IEC 60896-21 within the ILAC recognition framework.  |
| 2                | Verification that product designations (variants, series/models) of the tested batteries, are selected from and correlate with the designations of batteries included in the full schedule/tabulation of batteries submitted for purposes of certification. | Manufacturer's Declaration stating which product designations (variants, series/models) tested and designated in an IEC 60896-21 test report correlate with the product designations (variants, series/models) in the full schedule/tabulation of batteries submitted for purposes of certification.   |
| 3                | Review of design and installation manual(s)   | Manufacturer's Declaration and engineering justification/confirmation correlating the design of the tested batteries with the full schedule/tabulation of batteries submitted for purposes of certification. (ref. Section 5.1).<br>Product datasheets of VRSLA battery series and/or datasheets of each VRSLA battery product designations (variants, series/models). |
| 4                | Review of component quality assurance program   | ISO 9001 certificates of battery manufacturer.   |
| 5                | Identification of battery series limitations  | -  |
| 6                | Prescription of ongoing constancy of conformity activities required for certification.  | -  |

## Notes:

- i. For the purposes of Activity 1, evidence for conformity may be provided through validated external test reports from recognised external agencies and/or laboratories. The clauses relevant to VRSLA batteries intended to be used with FDCIE/EWCIE are detailed in Section 4 of this technical specification.

## 4. EVALUATION

### 4.1. Activity 1

Table 3 provides the required evaluation schedule of a battery series to IEC 60896, indicating the applicable clauses for which evidence of conformity is required to be provided. The schedule is drawn from

IEC 60896-22 (Section 5 and Annex A), with mandatory and optional tests nominated as appropriate for the performance and durability characteristics of batteries intended for use with FDCIE/EWCIE.

**Table 3. Evaluation schedule required to demonstrate conformity. All requirements are mandatory unless noted as optional.**

| IEC 60896-21<br>Clause                   | Title   | Conformity<br>information required<br>(Note 1)  | Comments  |
|--|---|---|---|
| <b>Product safe operation in-service</b> |   |   |   |
| 6.1                                      | Gas emission (at float voltage and at 2,40 Vpc)                     | Data  | Nil   |
| 6.2                                      | High current tolerance  | Pass  | Nil   |
| 6.3                                      | Short circuit current and d.c. internal resistance                  | Data  | Nil   |
| 6.4                                      | Internal ignition from external spark sources                       | Pass  | Nil   |
| 6.5                                      | Protection against ground short propensity                          | Pass  | Nil   |
| 6.6                                      | Content and durability of required markings                         | Pass  | Nil   |
| 6.7                                      | Material identification   | Pass  | Nil   |
| 6.8                                      | Valve operation   | Pass  | Nil   |
| 6.9                                      | Flammability rating of materials                                    | Data  | Nil   |
| 6.10                                     | Intercell connector performance                                     | Data  | Optional requirement  |
| <b>Product performance in-service</b>    |   |   |   |
| 6.11                                     | Discharge capacity  | Data for C <sub>10</sub> , C <sub>8</sub> , C <sub>3</sub> , C<br>and C <sub>0.25</sub> . | Data for C <sub>20</sub> may be optionally supplied as it is a common specification used for determining required battery capacity of FDCIE/EWCIE systems.  |
| 6.12                                     | Charge retention during storage                                     | Pass  | Optional requirement  |
| 6.13                                     | Float service with daily discharges                                 | Value   | Optional requirement  |
| 6.14                                     | Recharge behaviour  | Pass  | Nil   |
| <b>Product durability in-service</b>     |   |   |   |
| 6.15                                     | Service life at an operating temperature of 40°C                    | Value   | Optional requirement.<br><br>If this value is not provided then a nominal operating temperature not exceeding 40°C will be indicated with a statement that the service life for operation at 40°C is not specified. |
| 6.16                                     | Impact of a stress temperature of 55°C or 60°C                      | Value   | Optional requirement  |
| 6.17                                     | Abusive over-discharge  | Value   | Optional requirement  |
| 6.18                                     | Thermal runaway sensitivity   | Pass or Data  | Nil   |
| 6.19                                     | Low temperature sensitivity   | Value   | Optional requirement<br><br>If this value is not provided then an operating temperature limitation will be stated to ensure the prevention of electrolyte freezing.   |
| 6.20                                     | Dimensional stability at elevated internal pressure and temperature | Data  | Nil   |
| 6.21                                     | Stability against mechanical abuse of units during installation     | Pass  | Nil   |

*Normative notes:*

*Note 1: Evidence will be verified from external test report(s).*

## 4.2. Activity 2

Verification of supplied declaration, provided by the Registrant and/or Producer, stating which product designations (variants, series/models) tested and designated in an IEC 60896-21 test report correlate with the product designations (variants, series/models) in the full schedule/tabulation of batteries submitted for purposes of certification.

## 4.3. Activity 3

Verification of supplied declaration, provided by the Registrant and/or Producer, stating the product and engineering justification/confirmation correlating the design of the tested batteries with the full schedule/tabulation of batteries submitted for purposes of certification.

Product datasheets of the VRSLA battery series and/or datasheets of each VRSLA battery product designations (variants, series/models).

The datasheets shall be in English.

## 4.4. Activity 4

Verification of supplied evidence (in English) of ISO 9001 certification of the Producer.

## 4.5. Activity 5

Determination of the maintenance of ongoing constancy of conformity as established through a surveillance program as identified in the future by CSIRO's ActivFire® Scheme.

# 5. REQUIREMENTS FOR VALIDATION OF PRODUCT VARIANTS (MODEL RANGE)

## 5.1. Capacity range

All or part of the full schedule/tabulation of VRSLA battery variants (model range) in a series of designated batteries, submitted for purposes of certification, will be validated based upon the capacity (in Ah) of the variants/models tested and detailed in the submitted IEC 60896-22 report(s). The principles applied to establish the validated variants (model range) are specified in Table 4.

**Table 4. Principles for establishing the extent of variants (model range) in a series, validated for purposes of certification, from the full schedule/tabulation of batteries submitted.**

$C_{n, \text{tested}}$  is the nominal capacity (in Ah) of variant (model) tested in accordance with IEC 60896-21.

| Series Extent | Capacity (Ah)                      | Note   |
|---------------|------------------------------------|--|
| Minimum       | $C_{n, \text{tested}} \div 12.5$   | Rounded to 0.1 Ah, down to 4 Ah. Smaller capacity variants (models) are unlikely to be useful for the purposes of standby power supplies to FDCIE/EWCIE.                     |
| Maximum       | $C_{n, \text{tested}} \times 12.5$ | Rounded to 1 Ah, up to 300 Ah. Larger capacity variants (models) require separate application to establish special considerations that may include additional test evidence. |

For example, if the nominal capacity of the battery variant (model) tested to IEC 60896-21 was 65 Ah, then the extent of the certified series may include variants (models) which span, at most, nominal capacities of between 5.2 and 300 Ah. Alternatively, if a variant (model) with a capacity of 7 Ah was tested, then certified range may include variants (models) which span, at most, nominal capacities of between 4 and 88 Ah.

Further extensions to the extent of the variants (model range) may be validated where engineering justification can be provided and as agreed by CSIRO's ActivFire® Scheme.

## 5.2. Physical properties (mass)

The mass of each battery variant (model), validated for purposes of certification, must be detailed in the associated product literature (e.g. Datasheet(s)) such that it may be physically verified.

## 6. SUITABILITY OF EXTERNAL EVIDENCE

### 6.1. Physical testing and reports

Assessment of the suitability of external agencies (laboratory) evidence shall be conducted in accordance with the CSIRO Recognition Framework, which requires that, at least, external test evidence (i.e. reports) are produced by a laboratory accredited under the ILAC recognition framework.

Evidence of conformity, in the form of endorsed test reports written in English, are required to be submitted in full. Where test reports were originally produced in a language other than English, suitable translations may be supplied in addition. Submitted external test reports must provide sufficient detail to describe the product being evaluated in full and in detail and establish that an evaluation schedule was designed and applied to each component submitted to the external agency.

### 6.2. Certificates of Conformity

Certificates, such as those published by a Conformity Assessment Body, *do not* provide direct and sufficient detail for the purposes of evaluation for conformity in accordance with this technical specification.

## 7. REPORTING

The evidence of conformity to the relevant clauses of the referenced documents, details product designations and documentation reviewed, product limitations and any requirements for a constancy of conformity program, are to be detailed in a Technical Verification of Conformity report.

## 8. REVISION HISTORY

Version: 3  
 Issued date: 19-Jun-2024  
 Authorised by: Executive Officer, CSIRO Verification Services - ActivFire® Scheme

| Document version no: | Issued date: | Change description  |
|----------------------|--------------|---|
| 3                    | 19-Jun-2024  | <ul style="list-style-type: none"> <li>Updated to provide Clause 6.10 as an optional requirement.</li> <li>Updated to include extended range of batteries based on engineering justification.</li> <li>Updated to include evaluation activities.</li> </ul> |
| 2                    | 10-Feb-2023  | <ul style="list-style-type: none"> <li>Typographical error update for Activity 2 in Table 1.</li> </ul>   |
| 1                    | 7-Nov-2022   | <ul style="list-style-type: none"> <li>New Document</li> </ul>  |
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