

# Battery testing



Telepower Australia has an extensive range of test equipment and offers a full range of battery testing services. Testing can range from laboratory-based, for the purposes of benchmark performance assessments and specifications conformance, through to field testing of in-service batteries.

## *Electrical testing of batteries*

Independent testing of the claimed electrical performance of batteries can become expensive, especially for conformance testing to a particular standard (normally quite a time consuming process). For End-users, we generally do not advocate conformance testing for testing sake. We usually advise “fit-for-purpose” testing more suited to the application intended for the battery. Telepower’s “fit-for-purpose” testing for applications involving deep cycling are generally different to the type of testing recommended for batteries to be used in stand-by or float service.

In general, the real-time float behaviour of new batteries designed for float applications cannot be meaningfully determined in much less than 6-9 months. Similarly, testing for lifetime characteristics using acceleration conditions also normally takes many months. Telepower’s approach is to use a suite of “shorter-term” tests designed to provide indicators that suggest the suitability of the battery for long-life float service in stand-by applications. These tests involve assessing discharge and charge performance, capacity retention and stability, recharge efficiency, and the end-of-charge characteristics. The time required for testing varies. However, a minimum of approximately 4 weeks is needed for initial charge/discharge performance characterisation, extending to another 4-5 weeks for capacity retention and stability work.

Long-life standby service depends on the relative similarity and consistency between the cells that make up the battery. The similarity in performance between different samples of a given battery type provides an indication of the level of quality of design and manufacture of the battery. A cornerstone to the “shorter-term” testing approach used by Telepower is to assess the electrical performance characteristics across a number of samples of the battery. Lack of similarity in behaviour is grounds for concern as to the suitability of the battery. For End-users, Telepower advises testing to be performed on random samples of normal production batteries. It is best if the samples submitted for testing are randomly selected from battery consignments destined for installation in the User’s end-application. This reduces any concern that the batteries may be subject to pre-treatment prior to testing, and the results of the testing better reflect the performance the User could expect.

Telepower’s battery testing capabilities include:-

- Fit for purpose testing or testing against battery standards over wide temperature ranges
- Fully computerised testing and highly time-resolved data logging.
- Highly accurate current ,voltage, temperature and ampere-hour measurements.
- Measurement with individual cell discrimination (if possible with battery construction).
- Optional impedance behaviour.
- Assessment of similarity in electrical performance between samples.
- Fully detailed reporting.

A schedule of some of the battery tests available from Telepower are listed over page. Discounts are offered for multiple tests. Call Telepower for a formal quotation.

<b>Test</b>	<b>Purpose of test</b>	<b>Price &amp; time</b> <i>(see Notes)</i>
<b>Rated capacity conformance</b> 4 cycle regime typically using C <sub>3</sub> - C <sub>3</sub> - C <sub>10</sub> - C <sub>3</sub> regime with float voltage recharge for 48hr	Benchmark claimed specifications. Comparison of performance between samples provides a measure of production consistency.	Test time <i>ca</i> : 14 days <b>\$350:</b> for batteries up to 300 Ah (C <sub>10</sub> ) + <b>\$110:</b> for each additional 300Ah (C <sub>10</sub> )
<b>Basic User capacity conformance</b> 4 cycle regime typically using capacities and recharge regime nominated by User.	Benchmark capacity performance relating to User application requirements. Comparison of performance between samples provides a measure of production consistency.	Test time <i>ca</i> : 14-16 days <b>\$350:</b> for batteries up to 300 Ah (C <sub>10</sub> ) + <b>\$110:</b> for each additional 300Ah (C <sub>10</sub> )
<b>Basic capacity rating</b> Capacity determined typically at C <sub>3</sub> , C <sub>5</sub> , C <sub>8</sub> , C <sub>10</sub> and C <sub>20</sub> , or similar with float voltage recharge for 48hr	Measure full capacity performance over a range of discharge rates. Indicates aspects of battery design. More important for Users with applications involving low rate discharges.	Test time <i>ca</i> : 22 days <b>\$430:</b> for batteries up to 300 Ah (C <sub>10</sub> ) + <b>\$205:</b> for each additional 300Ah (C <sub>10</sub> )
<b>Recharge time and efficiency</b> 5 cycle discharge-charge regime where total recharge time is limited to a specified amount (typically 24 hrs).	Measure recharge time and recharge efficiency needed to recharge battery to rated capacity after a discharge at nominated discharge rate. Useful for Users concerned with the time taken to recharge before a subsequent discharge can be sustained.	Test time <i>ca</i> : 14-16days <b>\$350:</b> for batteries up to 300 Ah (C <sub>10</sub> ) + <b>\$110:</b> for each additional 300Ah (C <sub>10</sub> )
<b>Capacity stability</b> 20 cycle discharge-charge at nominated rate(s) with constant (float) voltage recharge time and efficiency limits	Track capacity performance for stability and consistency. Useful for assessing the extent of any previous pre-treatment of the batteries prior to testing and for detecting signs of capacity collapse.	Test time <i>ca</i> : 50 days <b>\$820:</b> for batteries up to 300 Ah (C <sub>10</sub> ) + <b>\$450:</b> for each additional 300Ah (C <sub>10</sub> )
<b>Pre-float behaviour</b> 3-group discharge-recharge cycle regime at rated (C <sub>3</sub> or C <sub>10</sub> ) capacity with 96-148hr recharge at float voltage only.	Measure cell/battery response, particularly towards end of charge, and monitor response after completion of charge and establishment of float level voltage conditions. Useful when comparison is made between different samples as an indication of future float behaviour.	Test time <i>ca</i> : 6-8 weeks <b>\$700:</b> for batteries up to 300 Ah (C <sub>10</sub> ) + <b>\$450:</b> for each additional 300Ah (C <sub>10</sub> )
<b>Real time float performance</b>	Best estimate of service life performance and battery behaviour on float.	Test time varies. Price on application.
<b>Accelerated float tests</b>	Estimate expected service life on float by accelerated means. Provides a measure of likely float behaviour over time but may not mimic actual service life degradation in real time.	Test time varies. Price on application.
<b>Accelerated life tests</b>	Measure capacity degradation over time to end-of-life conditions by accelerated means. Useful approach if capacity is important in critical applications.	Test time varies. Price of application.
<b>Tests to any standards</b>	Determine level of conformance to claimed performance standard and specification.	Test time varies depending on standards testing. Price on application.

**Notes:**

1. Pricing is per single cell or single monoblock unit, and is based on testing three (3) samples of the same battery unit.
2. Pricing only applies where unit capacity < 1500 Ah, and terminal potential of battery unit 12V or less.
3. Pricing may vary without notice. Actual pricing provided at time of quotation.
4. Test time is indicative only.
5. All prices are exclusive of GST and any other taxes.

**Telepower Australia Pty Ltd**

(ACN 077 173 570)

Unit 2, 71 Rushdale St, Knoxfield

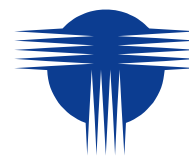
Victoria, 3180. Australia

ph: +61 3 9764 2001

fax: +61 3 9764 2611

email: telepower@telepower.com.au

web: www.telepower.com.au



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AUSTRALIA