



The UK trade body for the caravan, motorhome, caravan holiday and park home industry.

# **NCC Leisure Battery Verification Scheme**

## **Leisure Accommodation Vehicles**

## 1 Scope

The NCC Battery Verification Scheme (the Scheme) is applicable to auxiliary batteries used in touring caravans and motorhomes only. It covers auxiliary battery performance, capacity and testing.

The scheme is applicable to lead-acid batteries (of all types including AGM) and Gel batteries but does not cover batteries made from other materials.

### 1.1 Definitions

All definitions are as detailed BS EN 13878.

## 2 References

### 2.1 Directives and Regulations

2006/95/EC - The Low Voltage Directive, and subsequent amendments.

2006/66/EC - The Waste Batteries and Accumulators Directive, and subsequent amendments.

(EU) 1103/2010 - **rules as regards capacity labelling of portable secondary (rechargeable) and automotive batteries and accumulators**

### 2.2 Standards

BS EN 50342-1 - Lead-acid starter batteries. General requirements and methods of test

BS EN 13878 - Leisure accommodation vehicles – Terms and definitions

BS EN 1648 -1 - Leisure accommodation Vehicles - 12 V direct current extra low voltage electrical installations – Part 1: Caravans

BS EN 1648 -2 - Leisure Accommodation Vehicles - 12 V direct current extra low voltage electrical installations - Part 2: Motor caravans

## 3 Applying the regulations and standards

The basis for the marking requirements for batteries in the Scheme is European Directive 2006/66/EC and Commission Regulation (EU) 1103/2010. These regulations require that the capacity of lead-acid batteries, as supplied for use in our industry, be established by testing to BS EN 50342-1. The capacity is marked on the battery in ampere hours (Ah) according to simple rules.

EN 50342-1 defines the 20 hour nominal capacity ( $C_n$ ) as the charge (in Ah) that a battery can supply, until its voltage drops to the minimum discharge voltage, with a current  $I_n$ , where  $I_n = C_n/20$  (A). This is the so called C20 rating.

## 4 Requirements

### 4.1 General

- 4.1.1 Battery manufacturers that declare and can demonstrate compliance with the Scheme specification shall incorporate the NCC logo and blue 'tick' onto their product. The blue 'tick' logo is shown in Annex D
- 4.1.2 There are two methods of testing available to manufacturers to demonstrate compliance, these are shown in annex B.
- 4.1.3 Each member of the scheme shall declare the original manufacturer of each battery that they wish to list on the scheme and the original manufacturer's part number for this type of battery. This is to allow the NCC to check performance claims and test results against the specifications given by the battery manufacturer. **This information will not be published on the register.**
- 4.1.4 Model numbers that can be confused with capacity, i.e. 12V110, shall not be used.

### 4.2 Labelling

Battery manufacturers shall clearly label the battery stating (as a minimum) the following data:

- 4.2.1 The nominal battery supply voltage
- 4.2.2 Battery capacity (C20) in Ah, derived by testing as per method shown in Annex A or by calculation based on testing of other batteries from the same model range that share common architecture.
- 4.2.3 Expected life cycle of the battery at 50% depth of discharge C20 (i.e. 100 cycles) beyond which the battery would no longer hold enough charge to complete the test.
- 4.2.4 The mass of the battery (kg)
- 4.2.5 The NCC testing class that the battery meets to give an indication of its intended purpose
- 4.2.6 Link to NCC website of verified products

## 5 Additional NCC Verification

### 5.1 Scope of testing

Additional surveillance testing may be carried out by the NCC at random intervals on new units taken from the supply chain:

Initially the batteries shall be checked for compliance with the manufacturers' submitted documentation in the following areas:

- 5.1.1 Mass, in Kg - To meet the requirements of the scheme the capacity must be within 5% of that claimed by the manufacturer
- 5.1.2 Dimensions, in mm - To meet the requirements of the scheme the overall dimensions must be within 2mm of that claimed by the manufacturer
- 5.1.3 A visual comparison with the photographs included in the submitted documentation.

## 5.2 Further testing:

If the NCC inspector is not satisfied that the battery is within tolerance or of the same construction as that submitted during the verification process then the battery may be removed for further testing. These tests shall be:

- 5.2.1 Capacity (C20) in Ah, - To meet the requirements of the scheme the capacity must be no less than 95% of that claimed by the manufacturer within the submitted documentation
- 5.2.2 Life cycle test at 50% depth of discharge (C20 rate of discharge) - To meet the requirements of the scheme the life cycle must be no less than 95% of that claimed by the manufacturer within the submitted documentation

## 5.3 NCC Testing Class.

From the test data the manufacturer shall nominate a testing class for the battery to give an approximate guide to the intended purpose of the battery. The NCC testing class is intended to provide a starting point and not to be a substitute for expert advice based on the circumstances of an individual consumer. These classes shall equate to:

NCC Testing Class	Intended Purpose	Minimum Capacity (Ah)	Minimum Life Cycles at 50% Depth of Discharge (Cycles)
C	Motor Homes / Caravans with low power consumption used with an electrical hook-up	60	70
B	Motor Homes / Caravans with higher power consumption (for example with a motor mover) but still generally used with electrical hook-up	90	200
A	Motor Homes / Caravans frequently used without electrical hook-ups	90	350
For motor homes with higher power consumption (for example with a diesel heater) but still generally used without electrical hook-up it may be more practical to use multiple batteries from class A to provide the required storage capacity than to specify a single battery of the required capacity.			

## 6. Annex A – Test Methods

### 6.1 Capacity test method

- 6.1.1 Battery to be placed in a water bath and maintained at a temperature of  $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ . The terminal base of the battery shall be at least 15mm but no more than 25mm above the level of the water. If several batteries are tested concurrently in the same water bath then the distance between them and also the distance to the walls of the bath shall be at least 25mm. The battery shall be allowed to stand in the water at  $25^{\circ}\text{C}$  for a minimum of 4 hours prior to the start of the test sequence.
- 6.1.2 An initial charge in accordance with EN 50342 shall be applied for a period of 24 hours followed by a standing period of not less than 4 hours. In the absence of clear manufacturers' instructions, the following shall be used:
- 6.1.2.1
- 6.1.2.2 AGM:  $14.8\text{v} \pm 0.05\text{v}$  Max  $5\text{I}_{20}$
- 6.1.2.3 Calcium, Calcium:  $16.0\text{v} \pm 0.05\text{v}$  Max  $5\text{I}_{20}$
- 6.1.2.4 Hybrid:  $15.2\text{v} \pm 0.05\text{v}$  Max  $5\text{I}_{20}$
- 6.1.2.5 Gel Batteries – manufacturer's instructions should be followed
- 6.1.3 Manufacturers may specify a pre-test conditioning regime of up to 5 charge / discharge cycles prior to testing to allow batteries to reach optimum performance.
- 6.1.4 Battery capacity will be tested using a PWM controlled load at  $\text{C}_{20}$  for the battery capacity i.e.  $4.5\text{A} \pm 1\%$  for 90Ah and  $5.5\text{A} \pm 1\%$  for 110Ah.
- $I_n = \text{Cn}/20 \text{ (A)}$
- 6.1.5 Voltage, current and time will be sampled during the test at 5 minute intervals using a data logging technique. The test will be terminated when the battery voltage reaches the minimum discharge voltage ( $10.5\text{v} \pm 0.05\text{v}$  unless otherwise stated by the battery manufacturer). The information shall be presented as a graph and retained.
- 6.1.6 The readings including the time taken to reach the minimum discharge voltage shall then be converted into Ah to establish the battery capacity,
- $C_e = t \times I_n \text{ (Ah)}$ .
- 6.1.7 The testing shall then be repeated until a sequence of 6 cycles has been completed.
- 6.1.8 From the test sequence, the values measured during all 6 cycles shall be used to calculate the mean 20-hour capacity;
- 6.1.9 
$$\overline{C_e} = \frac{\sum_{i=1}^6 C_{e_i}}{6}$$
- 6.1.10 In order for a battery to be listed in the NCC register, the mean 20-hour capacity shall be no less than 95% of the labelled capacity  $C_n$ .

## 7 Annex B – Scheme Administration

### 7.1 Verification Process

Battery manufacturers/distributors will apply for their product to be registered with the NCC using the application form in Annex C.

Companies with their own testing facilities:

- 7.1.1 The NCC will undertake an audit of the test facility and witness at least 1 test being undertaken. Alternatively, the manufacturer will provide evidence of annual inspection and verification by a suitably recognised independent agency giving the test house an accreditation such as UKAS Approved to ISO / IEC 17025. Provided the audit is successful, the company may undertake their own testing and submit the results to the NCC along with the application document.
- 7.1.2 If a complaint is received the NCC reserves the right to undertake a surveillance visit to ensure the testing is maintained to a satisfactory standard.

Companies without their own testing facilities:

- 7.1.3 Supplier / manufacturer submits an application together with the results of testing from a recognised and suitably approved third-party testing institution such as a UKAS Approved ISO / IEC 17025 testing laboratory.

### 7.2 Approval procedure:

- 7.2.1 A single type of battery is submitted to the scheme: For example: NCCbatt (battery brand / manufacturer) Leisure+ (battery range) 100Ah (battery capacity)
- 7.2.2 The battery is tested by the laboratory using the process as defined in Annex A
- 7.2.3 Company undertaking the verification advises NCC and manufacturer of the result and provides appropriate test certification
- 7.2.4 If testing is successful, verified products are then added to database and published on the NCC website
- 7.2.5 The manufacturer is issued a licence from the NCC and incorporates the NCC 'Tick' logo and all required information onto the stickers / printing applied to verified models.
- 7.2.6 If changes are made to the battery specification the NCC must be notified in order to enable checks to be carried out to ensure that compliance is unaffected.
- 7.2.7 When a complaint is received the NCC reserves the right to require the manufacturer to undertake a further test of the product at a test house nominated by the NCC to confirm the validity of the original test data supplied by the manufacturer. The cost of such testing shall borne by the battery manufacturer.

### 7.3 Monitoring

Surveillance testing will be carried out on random samples taken from the supply chain. When a battery is found which does not comply with the NCC specification, the NCC reserves the right to withdraw the approval and notify the manufacturer/distributor and the main user clubs.

Verified batteries may remain on the NCC register for 3 years without re-submission of the test data by the manufacturer unless any change is made to the battery specification.

#### 7.4 Advertising

The verified battery register will be made available to the 2 main user clubs (The Caravan Club and the Camping and Caravanning Club). Publicity and information on the scheme will be circulated via the Club magazines. The list of verified products will also appear on the NCC website.

**Note:** Where a manufacturer/distributor markets a range of the same battery under different branding, it will be sufficient to test one sample of each capacity variant.



## Application for Leisure Battery Verification

Please complete all fields and email to [productapproval@thencc.org.uk](mailto:productapproval@thencc.org.uk)

### SECTION 1: GENERAL INFORMATION

Company Name:
Address:
Contact Name:
Telephone:
Email address:
Purchase order number:

### SECTION 2: BATTERY DETAILS (One application form per battery type & capacity)

Battery brand name: (As seen by the consumer)	
Model name or number: (As seen by the consumer)	
Original battery manufacturer name: (The factory / company of origin)	
Original battery manufacturer model reference: (The part number / model name used by the original manufacturer)	
Cell Chemistry:	
Voltage:	
Capacity (C20 rating) (Ah):	



Dimensions (mm): (Nominal + 2mm)	Length	Width	Height
Actual Mass (kg) (Nominal $\pm$ 5%)			
Test Class (A, B or C)			
Cell Construction (i.e. Number of plates per cell)			
Number of Cycles at 50% Depth of Discharge			
Discharge current (A)	Average	Peak	Min
Environmental limitations ( $^{\circ}$ C)	Test temperature (At which battery gives best performance)	Max design operating temperature	Min design operating temperature

### Section 3: Supporting documentation

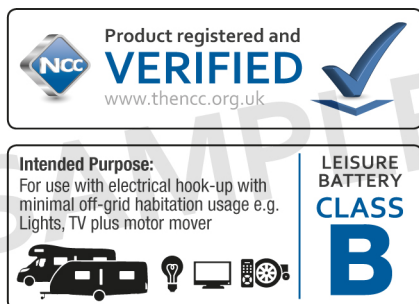
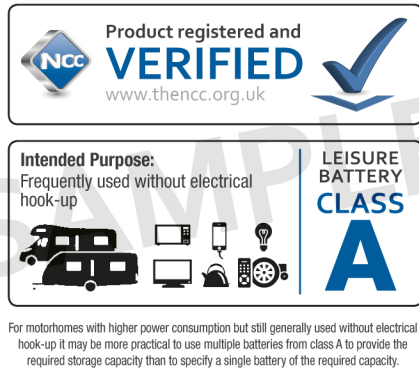
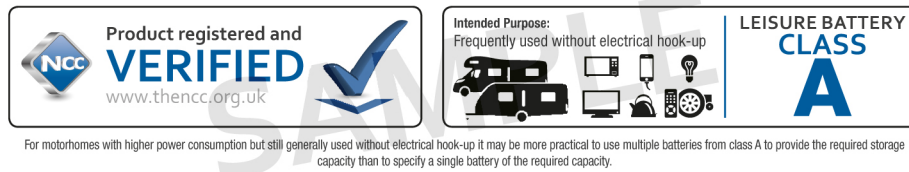
The time to complete the verification process will be reduced when a complete set of valid documentation is provided at the same time as the battery is submitted for testing.

Data sheets	Yes/No		
Sales literature	Yes/No		
Product photographs	Photographs allowing NCC inspectors to identify the battery (including casing design details) must be submitted – Please detail photographs submitted below:		
Copies of test reports submitted with the application (Required) –  Test report must include graphs showing results from 6 cycle test  Details of test reports that are required are shown in section (7.1.)	Please detail document references:		
Date:		Name:	
Job Title/Role:		Signature:	

## 9 Annex D – Scheme Logos

Banner style logos to be 125mm(w) x 20.5mm(h) (B & C) and 125mm(w) x 25mm(h) (A)

Box style logos to be 59mm(w) x 45mm(h) (B & C) and 59mm(w) x 52mm(h) (A)





Product registered and  
**VERIFIED**  
[www.thencc.org.uk](http://www.thencc.org.uk)



**Intended Purpose:**  
For use with electrical hook-up with  
minimal off-grid usage e.g. Lights



LEISURE  
BATTERY  
CLASS  
**C**