



**Ministry of Defence  
Defence Standard 61-21**

**Issue 1 Publication Date 5 July 2001**

**General Specification  
for  
Batteries  
Supplement 010  
Specification for Zinc  
Chloride Battery 1.5V, NSN  
6135-99-464-1938**



## AMENDMENT RECORD

Amd No	Date	Text Affected	Signature and Date

### REVISION NOTE

The content of this supplement has been aligned with the Defence Standard for batteries, Def Stan 61-21.

### HISTORICAL RECORD

This supplement supersedes Bat Spec 416 Issue 1 Amendment 1 dated 3<sup>rd</sup> October 1995.

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**PREFACE**

**Standards for Defence**

**Specification for**

**Zinc Chloride Battery**

**1.5V, NSN 6135-99-464-1938**

- a.** This supplement shall be read in conjunction with Def Stan 61-21.
- b.** This supplement provides a definitive specification for the electrical, physical, performance and nomenclature requirements for a 1.5V Zinc Chloride battery.
- c.** This supplement has been agreed by the authorities concerned with its use and is intended to be used whenever relevant in all future designs, contracts, orders etc. and whenever practicable by amendment to those already in existence. If any difficulty arises which prevents application of this Defence Standard and its associated supplements, the UK Defence Standardisation (DStan) shall be informed so that a remedy may be sought.
- d.** Any enquiries regarding this standard in relation to an invitation to tender or a contract in which it is incorporated are to be addressed to the responsible technical or supervising authority named in the invitation to tender or contract.
- e.** Compliance with this Defence Standard shall not in itself relieve any person from any legal obligations imposed upon them.
- f.** This standard has been devised solely for the use of the Ministry of Defence (MOD) and its contractors in the execution of contracts for the MOD. To the extent permitted by law, the MOD hereby excludes all liability whatsoever and howsoever arising (including, but without limitation, liability resulting from negligence) for any loss or damage however caused when the standard is used for any other purpose.

**TEXT**

**Standards for Defence**

**Specification for**

**Zinc Chloride Battery**

**1.5V, NSN 6135-99-464-1938**

**SECTION 1 GENERAL REQUIREMENTS**

**0 INTRODUCTION**

It is Ministry of Defence (MOD) policy to purchase batteries against performance specifications whenever possible. Defence Standard 61-21 and its series of supplements has been generated to address the current requirements for batteries. This supplement is applicable when invoked directly by a MOD invitation to tender, contract, or when referred to by other MOD battery specifications.

**1 SCOPE**

This supplement provides a definitive specification for the electrical, physical, performance and nomenclature requirements for a 1.5V Zinc Chloride battery, NSN 6135-99-464-1938, NBA 030, BS EN 60086-2 designation R20. This supplement invokes Product Conformity Certification.

**2 WARNING**

The Ministry of Defence (MOD), like its contractors, is subject to both United Kingdom and European laws regarding Health and Safety at Work, without exemption. All Defence Standards either directly or indirectly invoke the use of processes and procedures that could be injurious to health if adequate precautions are not taken. Defence Standards or their use in no way absolves users from complying with statutory and legal requirements relating to Health and Safety at Work.

**SECTION 1 GENERAL REQUIREMENTS**

**3 RELATED DOCUMENTS**

**3.1** For the purposes of this supplement all related documents are listed in Defence Standard 61-21.

**3.2** Reference in this standard to any related document means in any invitation to tender or contract the edition and all amendments current at the date of such tender or contract unless a specific edition is indicated.

**3.3** In consideration of **3.2** above, users shall be fully aware of the issue and amendment status of all related documents, particularly when forming part of an invitation to tender or contract. Responsibility for the correct application of standards rests with users.

**3.4** DStan can advise regarding where related documents are obtained from. Requests for such information can be made to the DStan Helpdesk. How to contact the helpdesk is shown on the outside rear cover of Def Stans.

**4 DEFINITIONS**

Def Stan 61-21 definitions shall apply.

**5 ABBREVIATIONS**

Def Stan 61-21 abbreviations shall apply.

**SECTION 2 ELECTRICAL CHARACTERISTICS**

**6 ELECTROCHEMICAL SYSTEM**

The electrochemical system shall be defined by BS EN 60086-1: system designation R.

**7 NOMINAL AND OFF-LOAD VOLTAGE**

The nominal and off-load voltage shall be defined by BS EN 60086-1: system designation R.

**8 ON-LOAD VOLTAGE**

The on-load voltage shall exceed 1.0V during the application of a  $1.0\Omega \pm 0.5\%$  load for 2 seconds.

**SECTION 3 PHYSICAL CHARACTERISTICS**

**9 DIMENSIONS**

The dimensions of the battery will be in accordance with BS EN 60086-2 designation R20.

**10 MASS**

The mass of the battery shall not exceed 113g.

**11 MARKING**

Marking shall be in accordance with figure 2 of this supplement.

**SECTION 4 PERFORMANCE REQUIREMENTS**

**12 DISCHARGE REQUIREMENTS**

When subjected to a continuous discharge load of  $10\Omega \pm 0.5\%$  (for 4 hours/day) to an end-point of 0.9V the batteries shall meet the duration requirements given in Table 1

Prior to undertaking a discharge test, the batteries shall be pre-conditioned at the test temperature for a minimum of 24 hours.

<b>Table 1 Discharge Duration Requirements</b>		
Pre-Discharge Test (and discharge regime)	Supplement Clause Reference	Minimum Discharge Duration (Hours)
		Discharge Temperature
		$+20 \pm 2^{\circ}\text{C}$
Immediate Discharge	12	42
8 Weeks Jungle Storage	13.3	35
26 Weeks Desert Storage	13.4	36
52 Weeks Temperate Storage	13.2	39
104 Weeks Temperate Storage	13.2	36

## SECTION 4 PERFORMANCE REQUIREMENTS

### 13 STORAGE REQUIREMENTS

#### 13.1 Examination During Storage

At the start, and on completion of each storage test, the off-load and on-load voltage tests (clauses 7 and 8) shall be carried out, and the batteries examined. Any battery showing signs of leakage, corrosion or distortion shall be deemed to have failed.

#### 13.2 Temperate Storage

Batteries shall be stored in an ambient temperature of  $20 \pm 5^{\circ}\text{C}$  and a relative humidity between 45% and 75% for the specified duration.

#### 13.3 Jungle Storage

Batteries shall be stored for eight weeks at a temperature of  $35^{\circ}\text{C} \pm 2^{\circ}\text{C}$ , for six hours per day, five days per week. The temperature in the intervening period shall be  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ . A relative humidity of not less than 95% shall be maintained during this test. Batteries shall be stored singly without packaging.

**13.3.1** Insulation Resistance (IR) after jungle storage. The batteries shall be removed from the chamber and the surface water blotted off. The IR shall be measured immediately at an applied potential of 500V d.c. as follows:

Cardboard jackets – between the negative termination and a strip of copper 25mm wide positioned centrally such that it encircles the insulation container.

Painted metal jackets – between the negative terminal and the bare metal jacket.

The measured IR shall be greater than 0.1 Megohms.

#### 13.4 Desert Storage

Batteries shall be stored for twenty-six weeks at a temperature of  $50^{\circ}\text{C} \pm 2^{\circ}\text{C}$ , for six hours per day, four days per week. The temperature in the intervening period shall be  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ . Each cycle shall be substantially completed within one hour. Batteries shall be stored in manufacturer's packaging as supplied.

**SECTION 5 PRODUCT CONFORMITY CERTIFICATION**

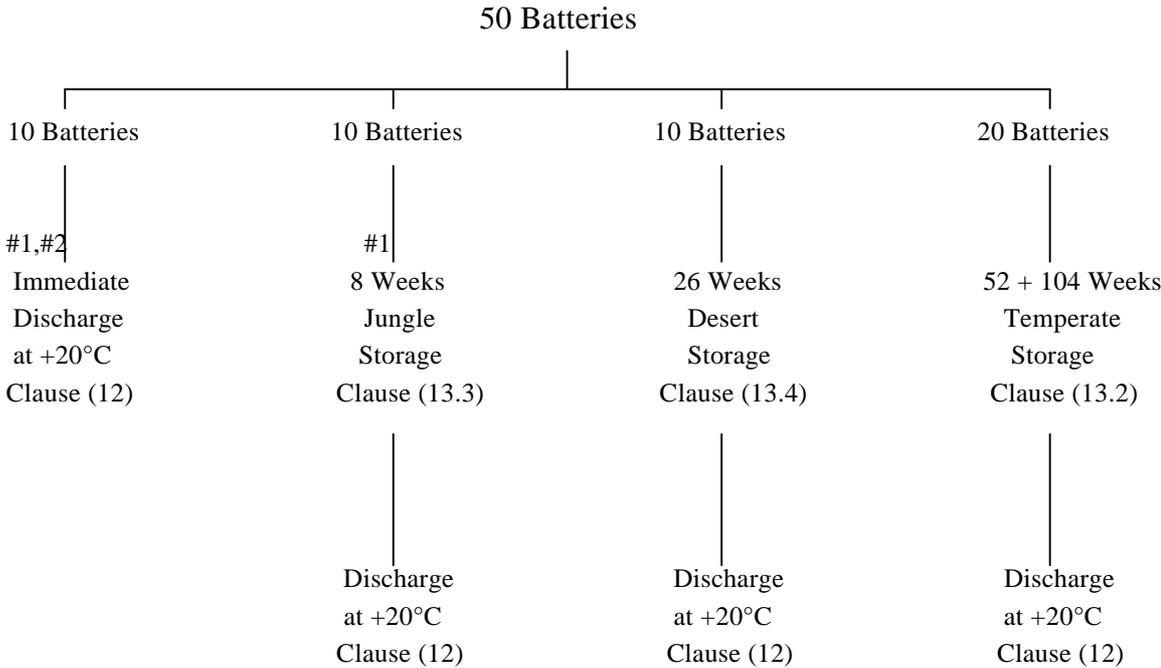
**14 GENERAL REQUIREMENTS**

The Product Conformity Certification requirements defined in Section 2 of Def Stan 61-21 are applicable to this supplement.

**14.1 Product Conformity Test Requirements**

The test schedule shown in figure 1 shall apply for product conformity certification. All of the tests shall be carried out in the stated order. The number of samples for each test shall be in accordance with the suppliers quality procedures, but shall be not less than the minimum quantities shown in figure 1.

Fig 1 Product Conformity Test Schedule



Note

#1 Indicates the tests to be carried out for interim certification (see clause 14.2).

#2 Indicates the tests to be carried out for periodic verification (see clause 14.3).

**SECTION 5 PRODUCT CONFORMITY CERTIFICATION**

**14.2 Interim Certification**

Interim certification may be considered after the satisfactory completion of the tests marked '#1' in the schedule shown in figure 1.

**14.3 Periodic Verification of Critical Performance**

All tests marked '#2' in the schedule shown in figure 1, shall be carried out in accordance with the contractor's quality procedures. Alternative tests may be adopted by the contractor, with the prior agreement of the Authority.

**SECTION 6 MARKING REQUIREMENTS**

**15 GENERAL REQUIREMENTS**

Product shall be marked in accordance with figure 2.

Figure 2. Battery Marking



Notes:

The text shall be black on an olive green background.

Alternative methods of identifying the DOM may be submitted to the Authority for their consideration.

**SECTION 7 PACKAGING AND LABELLING REQUIREMENTS**

**16 GENERAL REQUIREMENTS**

In addition to the packaging requirements stated in the contract, all levels of packaging shall include:

- a.** The battery NATO Stock number.
- b.** The date of manufacture.
- c.** The battery shelf life in the format “NOT TO BE STORED BEYOND *MM,YY*” which shall be 24 months from the date of cell/battery manufacture.

The product shall be packed to enable transportation by all modes (land, sea and air).

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*Outside Rear Cover*

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**File Reference**

The DStan file reference relating to work on this standard is D/DStan/61/21/10.

**Contract Requirements**

When Defence Standards are incorporated into contracts users are responsible for their correct application and for complying with contractual and statutory requirements. Compliance with a Defence Standard does not in itself confer immunity from legal obligations.

**Revision of Defence Standards**

Defence Standards are revised as necessary by up issue or amendment. It is important that users of Defence Standards should ascertain that they are in possession of the latest issue or amendment. Information on all Defence Standards is contained in Def Stan 00-00 Standards for Defence Part 3 , Index of Standards for Defence Procurement Section 4 'Index of Defence Standards and Defence Specifications' published annually and supplemented regularly by Standards in Defence News (SID News). Any person who, when making use of a Defence Standard encounters an inaccuracy or ambiguity is requested to notify the Directorate of Standardization (DStan) without delay in order that the matter may be investigated and appropriate action taken.