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INTERIM

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GENERIC SPECIFICATION FOR BATTERIES, NON RECHARGEABLE, PRIMARY

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Defence Standard
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dated 7 September 1990

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Revision Note

This Standard supersedes Defence Standard 61-3 (Part 1)/Issue 4 and has been revised to incorporate lithium batteries.

Historical Record

Def Stan 61-3 (Part 1)/Issue 1 - 19 March 1968
Def Stan 61-3 (Part 1)/Issue 2 - 4 July 1972
Def Stan 61-3 (Part 1)/Issue 3 - 2 March 1979
Def Stan 61-3 (Part 1)/Issue 4 - 7 September 1990

GENERIC SPECIFICATION

FOR BATTERIES, NON-RECHARGEABLE, PRIMARY

PREFACE

This Defence Standard supersedes
DEF STAN 61-3 (PART 1) ISSUE 4

i This Standard provides the generic specification for all types of primary batteries, (Leclanché, mercuric oxide, manganese dioxide and lithium) for Ministry of Defence use, together with related Supplements detailing particular requirements of individual batteries.

ii This Standard has been prepared by the Defence Electrical and Electronic Standardization Committee (DELSC) Subcommittee L1O: Batteries because there is no suitable National or other Standard acceptable to the Ministry of Defence available.

iii This Standard together with its related Supplements contains all the necessary technical information and it is the definitive specification for these items.

NOTE: The Supplement may call for changes to the tests given in this Standard to be carried out. Therefore the Supplement is to be read in conjunction with this Standard before any testing is carried out to ensure that all of the requirements of the Supplement are met.

iv This Defence Standard is being issued as an INTERIM Standard and is provisional in order to obtain information and experience of its application. This will then permit the submission of observations and comments from users, using D Stan Form No 22 enclosed.

v This Standard has been agreed by the authorities concerned with its use and shall be incorporated 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 the Defence Standard, the Directorate of Standardization shall be informed so that a remedy may be sought.

vi 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.

vii This Standard has been devised for the use of the Crown and of its contractors in the execution of contracts for the Crown. The Crown hereby excludes all liability (other than liability for death or personal injury) whatsoever and howsoever arising (including, but without limitation, negligence on the part of the Crown its servants or agents) for any loss or damage however caused where the Standard is used for any other purpose.

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Section One. General

1 Scope

This Standard specifies the technical requirements for qualification approval, manufacture, quality conformance and test procedures for batteries, non-rechargeable, primary.

This Standard is not intended as a guide to battery selection, for which purpose reference should be made to Def Stan 61-17.

2 WARNING

This Standard calls for the use of substances and/or procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and in no way absolves either the designer, the producer, the supplier or the user from statutory obligations relating to health and safety at any stage of manufacture or use.

Particular attention is drawn to the following hazards although the list is not necessarily exhaustive and the inclusion of such a list does not absolve the supplier or user from the obligations referred to in this WARNING.

(a) Lithium cells may rupture or explode under certain circumstances, ejecting lithium metal and irritant and/or noxious liquids and gases.

(b) Lithium metal will ignite spontaneously on contact with water or other aqueous fluid, including body fluid and is capable of causing serious burns.

3 MOD Procurement Policy

It is MOD policy to purchase batteries against procurement specifications, whenever possible. Two types of specification are used; Qualification Approval Supplements and Preferred Battery Supplements.

These Supplements, which are separate documents and must be read in conjunction with this Standard, contain the particular requirements for a specific battery. Their requirements shall take precedence should they differ from those given in this Standard.

To provide a focal point for expertise on batteries a Technical Authority has been established within each Controllerate, for further details refer to Def Stan 61-17.

4 Related Documents

4.1 Reference is made in this Standard to the following documents:

BS 89	Specification for Direct Acting Indicating Electrical Measuring Instruments and their Accessories
BS 397	Primary Cells and Batteries. (Parts 1, 2 and 3)
BS 2011	Basic Environmental Testing Procedures
BS 3G100	General Requirements for Equipment in Aircraft

4.1 (Contd)

BS 5750 Part 1	Quality Systems. Specification for Design Manufacture and Installation
BS 5750 Part 2	Quality Systems Specification for Manufacture and Installation
BS 6001	Sampling Procedures and Tables for Inspection by Attributes
BS 6002	Sampling Procedures and Charts for Inspection by Variables for Percent Defective
BS G239	Primary Active Lithium Batteries for Use in Aircraft
Def Stan 00-9	General Requirements for Qualification Approval, Capability Approval and Quality Assurance of Components for Ministry of Defence Use
Def Stan 00-10	General Design and Manufacturing Requirements for Service Electronic Equipment
Def Stan 00-35	Environmental Handbook for Defence Materiel
Def Stan 05-14	Mutual Acceptance of Qualification Approvals for Electronic Components within NATO Countries
Def Stan 05-34	Marking of Service Materiel
Def Stan 59-59	Electrical/Electronic Components for Defence Use Services Qualified Products List including Components of Assessed Quality
Def Stan 61-17	The Requirements for the Selection of Batteries for Service Equipment
Def Stan 61-19	Storage, Handling and Disposal of Lithium Batteries
Def Stan 93-42	Requirements for Thermoplastic Injection Mouldings
EN 29002	Quality Systems - Model for Quality Assurance in Production and Installation
ISO 9002	Quality System - Model for Quality Assurance in Production and Installation
STANAG 4093	Mutual Acceptance of Qualification Approvals for Electronic Parts

4.2 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.

4.3 The related documents are available from the address as shown below:

DOCUMENT	SOURCE
British Standards	BSI Sales Department Linford Wood MILTON KEYNES MK14 6LE
Defence Standards	Ministry of Defence Directorate of Standardization Kentigern House 65 Brown Street GLASGOW G2 8EX

4.3 (Contd)

DOCUMENT	SOURCE
STANAG	Ministry of Defence Directorate of Standardization Kentigern House 65 Brown Street GLASGOW G2 8EX

5 Definitions

For the purpose of this Standard the following definitions apply:

5.1 Approving Authority. The delegated Approving Authority (AA) is the Defence Electrical and Electronic Standardization Committee (DELSC) Subcommittee L10; Batteries. All correspondence should be addressed to:

Secretary DELSC Subcommittee L10
D Stan 8
Kentigern House
65 Brown Street
GLASGOW G2 8EX

5.2 Approving Authority Representative (AAR). The AAR is the authority nominated by DELSC L10 to oversee the qualification approval exercise and its maintenance, also to provide a general focal point for quality assurance aspects when invoked in the contract schedule. The details of the current AAR can be obtained from the Approving Authority.

5.3 Battery dimensions. These shall be in accordance with the relevant Supplement. For the purposes of this Standard once qualification approval has been granted (see Section Two) the dimensions shall not be changed without approval from the Approving Authority.

5.4 Discharge. Process by which a battery delivers current to an external circuit.

5.5 Duty discharge. The electrical load demands of the application for which the battery is intended expressed in terms either of resistance, current or power versus time.

5.6 Duty discharge duration (N_L, N, N_H). The duration for which the battery, at a temperature of T_L, 20°C or T_H respectively, is required to perform its duty discharge down to the end-point voltage V_E, as defined in the relevant Supplement.

5.7 End point voltage (V_E). The specified OLV at which the discharge is considered complete.

5.8 Frozen design. A frozen design is one which has successfully completed all phases of development.

5.9 Generic specification. The generic requirements are those that generally apply to all types of primary batteries produced to or purchased against this Standard.

5.10 Group A, B and C testing. These groups are the categories used for quality conformance testing. The test requirements are specified in the relevant supplement and the data obtained is used for establishing quality conformance and acceptance of the manufactured lot also maintenance of the qualification approval. The groups are as follows:

Group A: Non-destructive tests, normally applied to all samples in the lot, used for the inspection of the battery's principal visual, electrical and dimensional characteristics.

Group B: Tests which are carried out on a sample from the manufacturing lot selected in accordance with the supplement and BS 6001. Typical tests include short term storage at temperate and elevated temperatures followed by discharge, the results of which are used to provide batch release test data.

Group C: These are normally long term storage and environmental tests, data from which is used for the maintenance of qualification approval.

5.11 Hermetically sealed cell. A cell having a metallic case which is fully sealed by welding and where glass or ceramic-to-metal seals are used to insulate electrical feed-throughs.

5.12 Nominal voltage. A value, for descriptive purposes, that approximates to the OCV of the battery. Tables la and lb show typical nominal voltages for various electro-chemistries.

5.13 Non-hermetically sealed cell. A cell in a non-metallic case, or one in a metallic case wherein plastic or elastomeric seals or insulators are used.

5.14 On load voltage (OLV). The potential difference existing between the terminations of a battery when it is delivering a current.

5.15 Open circuit voltage (OCV). The potential difference existing between the terminations of a battery when no load has been applied.

5.16 Operational temperature limits (T_H, T_L). The maximum temperature T_H and the minimum temperature T_L between which the battery is designed to be used and to comply with this Standard as defined in the relevant Supplement.

5.17 Primary battery. A primary battery may contain one or more primary cells.

5.18 Primary cell. A source of electrical energy obtained by a direct conversion of chemical energy, designed to deliver its capacity once and be discarded. When ready for delivery, a primary battery includes terminals and may include a case.

5.19 Qualification approval. The process applied to a batch of samples which are representative of production standard batteries to demonstrate that the manufacturer is capable of meeting the requirements of the generic and supplement specifications.

5.20 Rated capacity (C_r). The product of the constant current equivalent to the mean of the duty cycle current and the discharge time at 20°C down to the end-point voltage V_E, as defined in the relevant Supplement.

5.21 Storage life. Duration of storage under specified conditions at the end of which the battery retains the ability to meet the specified performance requirements.

5.22 Supplements. These are specifications for an individual battery and define all of the requirements related to it. There are two types, Qualification Approval Supplements (QAS) and Preferred Battery Supplements (PBS). They are sequentially lettered and their unique identity is used to reference their appropriate sectional specification.

5.22.1 Preferred Battery Supplements. These are basic detail specifications which define the minimum technical requirements for a specific battery type. The requirements are based on commercially available battery specifications with minimal specific requirements for defence use.

5.22.2 Qualification Approval Supplements. These are detail specifications which define the technical requirements for a specific battery type which is used in a critical role and the design is subject to configuration management. The dimensional requirements are normally those that apply to commercially available batteries, but the performance requirements are more onerous and designed to match the wide range of applications of defence equipment.

5.22.3 Terminations. The parts to which the external circuit is connected.

5.23 Voltage delay time (D). The maximum time interval between the application of the Duty Discharge load and the terminal voltage reaching and sustaining a value not less than V_E, as defined in the relevant Supplement.

Table 1

Electrochemical Systems & Nominal Voltages

(a) Aqueous Systems with Zinc as Negative Electrode

Positive Electrode	Electrolyte Solution	Nominal Voltage
mercuric oxide	alkali/metal hydroxide	1.35
mercuric oxide/ manganese dioxide	alkali/metal hydroxide	1.4
oxygen	alkali/metal hydroxide	1.4
oxygen	ammonium chloride or zinc chloride	1.4
manganese dioxide	alkali/metal hydroxide	1.5
manganese dioxide	ammonium chloride or zinc chloride	1.5
silver oxide	alkali/metal hydroxide	1.55

(b) Non-Aqueous Electrolyte Systems with Lithium as Negative Electrode

Positive Electrode	Nominal Voltage
copper oxide	1.5*
iron disulphide	1.5
copper oxyphosphate	2.5
iodine	2.8
manganese dioxide	3.0
polycarbon monofluoride	3.0
sulphur dioxide	3.0
thionyl chloride	3.5
sulphuryl chloride	3.9

* NOTE: For OCV measurements a value of 2.3 V is used.

Section Two. Requirements for Qualification Approval

6 Qualification Approval Procedures

The qualification approval procedures defined below are based on those of Def Stan 00-9 and are incorporated to demonstrate that a manufacturer is capable of producing the type of battery that meets the requirements of this Standard and its appropriate Supplement.

A battery is eligible for qualification approval to this Standard provided the manufacturer can demonstrate, through his registered quality system, control over all stages of manufacture, either in its entirety, or commencing at a manufacturing operation which is called the “primary stage”.

The procedures of this section apply to both qualification approval and preferred battery supplements.

6.1 General requirements for qualification approval. For batteries whose primary stage of manufacture is the receipt of raw materials and for which the AAR can witness all stages of manufacture and qualification testing. The manufacturer is required to:

(a) Have an approved manufacturing scope which includes the type of battery for which qualification is sought.

(b) Be assessed and registered to BS 5750 Part 1 or 2, ISO 9002 or EN 29002 equivalent, by a third party certification body which itself is registered with the National Accreditation Council for Certification Bodies (NACCB). If not assessed and registered meet the requirements of Def Stan 00-9 Section B.

(c) Establish the complete manufacturing data package (build standard) of quality control specifications for materials, piece parts and processes for the battery for which approval is sought. The relevant documents and specifications shall be subject to the configuration controls of Def Stan 05-57 and referenced in the battery’s quality plan (see **19.2).**

(d) Provide the AAR with a full programme of the test schedule matrix and permit the AAR to witness any of the tests.

(e) On receipt of authorization from the AAR provide and test the batteries as directed by the Supplement, free of all charges unless otherwise contractually agreed.

(f) Complete a test report (see clause **8).**

(g) Prepare an application for a qualification approval certificate (see clause **9).**

(h) Maintain his qualification approval (see clause **11).**

6.2 Requirements for qualification approval of batteries manufactured within NATO. For batteries whose primary stage of manufacture is the receipt of raw materials, but, where the AAR may not be able to witness all stages of manufacture and qualification testing.

The general requirements of **6.1** shall apply. The qualification approval procedures shall be in accordance with STANAG 4093 and Def Stan 05-14.

6.3 Requirements for qualification approval of batteries manufactured outside NATO. For batteries whose primary stage of manufacture is the receipt of raw materials and where an inter-government agreement (Memorandum of Understanding) exists between the manufacturers country and the UK.

The general requirements of **6.1** shall apply. The qualification approval procedures shall follow the principles of STANAG 4093 and Def Stan 05-14 which shall be defined in an inter-government agreement.

NOTE: In exceptional circumstances the AAR may undertake surveillance of the qualification approval.

6.4 Requirements for qualification approval of batteries manufactured by a subcontractor. For batteries produced under a subcontract whose primary stage of manufacture is the finished cell. The finished cell may then be subjected to further stages of manufacture, by the prime manufacturer, and offered for qualification approval.

The procedures used for the qualification approval shall be referenced on the application for qualification approval and associated certification (see Annexes) and the quality plan (see **19.2).**

6.4.1 The prime manufacturer shall:

(a) Satisfy the general requirements of **6.1.**

(b) Establish a configuration control agreement with his subcontractor which is acceptable to the AAR.

(c) Be responsible for ensuring compliance with the requirements of this Standard, the Supplement and the quality assurance system including the surveillance of the subcontract manufacturer to the satisfaction of the AAR.

(d) Apply for qualification approval in accordance with **6.5** stating the procedure by which adequate control and compliance with the requirements of this Standard is to be achieved.

6.4.2 The Approving Authority shall:

(a) Acknowledge acceptance or define necessary modifications to the proposals given from **6.4.1** above. Modifications, as directed by the Approving Authority, shall be sufficient to ensure that confidence in the original build standard and associated qualification approval is maintained, which may entail either modified group A, B or C testing or additional maintenance of approval requirements.

(b) On successful completion of qualification approval raise an appropriate qualification approval certificate.

6.4.3 The AAR shall:

(a) Approve the sub-contract control and the configuration control procedures or identify any areas of risk which the prime manufacturer shall address.

6.4.3 (Contd)

(b) Arrange for the surveillance of the qualification approval using their own resources or delegate the activity in accordance with **6.2** or **6.3** above.

(c) Authorize commencement of qualification testing.

6.5 Sub-contracted work. The manufacturer may sub-contract work provided it is carried out in accordance with Def Stan 05-61 (Part 3). The rules for qualification approval of a battery, which is produced using critical sub-contracted components, such as cells, shall be applied in full and separately for each source of critical sub-contracted component, ie each approval programme, supporting documentation and associated approval certificate will be valid for the proven source of sub-contract cells and only that source.

6.6 Application for qualification approval. A manufacturer seeking qualification approval shall apply in writing to the Secretary of the Approving Authority. The manufacturer will complete three copies of annex A and forward them with the supporting information to the Secretary of the Approving Authority. The Approving Authority will complete the details at the bottom of the form, retain one copy and send a copy to the manufacturer and the AAR.

6.7 Notice of testing. The manufacturer shall give the AAR sufficient notice of their desire to start qualification approval testing. Testing may only start once the AAR has given agreement to the commencement of testing. The manufacturer shall then demonstrate that he is in a position to apply all of the processes, tests, measurements etc, which will result in an approved battery.

7 Qualification Approval Testing

Tests will be carried out by the manufacturer using his own approved testing facilities or by an independent test laboratory which is acceptable to the AAR. All qualification approval testing shall be carried out in accordance with the requirements of this Standard and the appropriate supplement, free of all charges to the MOD unless otherwise contractually agreed.

7.1 Qualification approval supplements. In the case of these the manufacturer is required to test the batteries to the full requirements and will only be permitted to provide supporting evidence where structural similarity can be claimed from an existing qualification approval.

7.2 Preferred battery supplements. In the case of these the requirements reflect those of commercial standards and not necessarily those of military requirements. In line with the manufacturer’s commercial activities he may well have carried out tests or be able to provide test evidence of conformance to the test requirements. The manufacturer is permitted to provide such test evidence to support his application for approval provided it is supported by a declaration of design performance (DDP).

The DDP is a formal document detailing the test requirements, test results and referencing the reports related to the tests. On completion it will be signed by the manufacturer’s senior technical manager confirming that the test requirements are achievable. The DDP will be countersigned by the AAR who are required to substantiate the test data. An example of a typical DDP is shown at annex G.

8 Qualification Approval Test Report

The manufacturer shall compile a test report in accordance with the requirements defined below.

8.1 Information to be included in the test report:

(a) Approval Authority reference number (from the returned annex A).

(b) Supplement number, issue and date.

(c) Manufacturer's name and address.

(d) Place of manufacture if different from (c).

(e) Manufacturer's part number and description.

(f) A complete record of all of the measurements taken with their corresponding measurement uncertainty and ambient conditions at the time of measurement.

(g) A tabulated list of the test equipment used, the serial number of the equipment and the calibration due date.

(h) The identification of any test carried out by an independent test laboratory.

(i) Reference to manufacturing data package including its build standard, construction terminations, labelling etc.

(j) Full details of any supporting test results for read across information, where appropriate.

(k) Copy of the countersigned DDP, in the case of preferred batteries.

NOTE 1: When the requirements of (f) and (g) prove too large to include in the test report the manufacturer shall retain the results for the life of the approval and shall provide a summary of the results in the report.

NOTE 2: When qualification approval tests have not been carried out at the same address, reports on the separately performed tests shall be submitted in their entirety as appendices to the main report.

8.2 Authentication of test report. Test reports shall be certified by the manufacturer's Quality Manager, or authorized representative, to certify the results and signifying that all of the tests for qualification approval have been carried out. The qualification approval report shall be countersigned by the AAR's representative to signify that the surveillance is complete, the results are confirmed and that the content of the report is agreed. If the report cannot be signed by the AAR, but the manufacturer considers he has fulfilled the requirements then the report shall be submitted, with a covering letter from the AAR, to the Approving Authority for their consideration.

8.3 Preparation and distribution of the test reports. Three copies of the test report shall be prepared and distributed as follows:

(a) One copy to the Approving Authority.

8.3 (Contd)

(b) One copy to the AAR.

(c) One copy shall be retained by the manufacturer.

9 Qualification Approval Certificate

9.1 Application for an approval certificate. At the appropriate point in the qualification approval programme, and on completion of a test report, the manufacture may apply for an approval certificate by completing the appropriate "application for a qualification approval certificate" (see annex B) and submitting it to the AAR for countersignature, who will forward it to the Approving Authority.

Depending upon the application and the progress of the test programme two levels of certification may be awarded:

9.1.1 Full qualification approval certificate. Full qualification approval may be applied for and granted on the successful completion of all specified tests once compliance with all of the specification requirements can be demonstrated.

9.1.2 Interim qualification approval certificate. Due to the relatively lengthy storage periods that may be involved in the approval programme a manufacturer may apply for and be granted an interim approval on the basis of satisfactory completion of the short term tests. The appropriate point for application will vary depending upon the Supplement requirements. Normally this will only be granted after completion of the mechanical, environmental and short term storage tests.

Should the remaining tests yield unsatisfactory results the interim approval may be withdrawn.

Interim approvals may be awarded where a performance limitation exists for a minor deviation from the Supplement's requirements. The certificate may only be uprated to a full certificate once it can be demonstrated that the limitation has been overcome.

A minor deviation is classified as a deviation from the specification which will not affect the required performance to an extent which cannot be tolerated in use for a particular application. Each case will be considered on its merits by the Approving Authority.

In terms of competitive procurement preference will normally be given to a manufacturer who is in receipt of a full qualification approval certificate.

9.2 Processing the certification application. The AAR shall examine the application and the supporting documentation. If acceptable, the AAR shall complete section B of annex B and forward it to the Secretary of the DELSC L10 committee which signifies a recommendation for the award of an approval certificate. If the application is unacceptable the application shall be returned to the manufacturer for appropriate action (see **8.2).**

Once an approval application is received by the DELSC L10 they shall consider it and if acceptable prepare and issue an approval certificate. If the application is not acceptable it shall be returned to the manufacturer, with a supporting letter which shall be copied to the AAR.

9.3 Preparation of an approval certificate. The Secretary to the Approving Authority shall prepare, register and number the certificate and arrange for its signature. A completed copy of the certificate (annex C) shall be forwarded to each of the Controllerate technical authorities, the Supply Management branches, the manufacturer and the AAR.

The Approving Authority shall ensure that the appropriate certificate and listing clearly identify whether a full or interim qualification approval has been granted.

9.4 Approval certificate reference list. The Secretary of the DELSC L10 committee shall retain an up to date list of the battery approval certificates.

9.5 Periodic review of approval certificates. Approval certificates will be issued for a three year period after which they shall be reviewed and retained provided the approval has been maintained in accordance with clause **12.** If they have not been maintained they will be withdrawn (see clause **13).**

10 Modification to Batteries Approved to a Qualification Approval Supplement

In the case of any proposed modifications to the battery, subsequent to the granting of qualification approval the manufacturer shall notify the Approving Authority through the AAR. Notification of the modification shall be accompanied by sufficient test evidence to demonstrate that no adverse effects will occur as a result of the change, also the existing standard will be maintained.

The AAR, after consultation with the Approving Authority, shall decide whether it is necessary to carry out any further qualification approval tests before the change is introduced and the battery can be offered for release.

Failure to comply with this requirement may result in the withdrawal of the qualification approval certificate which could lead to the cancellation of any associated Ministry contracts. It is in the manufacturer’s interest to retain his approval by introducing modifications in a controlled manner by establishing approval of the revised build standard before ceasing production of the qualification approved battery.

11 Modification to Batteries Approved to a Preferred Battery Supplement

Modifications may be made to an approved battery without the agreement of the approval authority provided the requirements of this Standard and the PBS are not prejudiced. Should there be any doubt that this will occur then the AAR shall be notified and the procedure of clause **10** shall apply.

Provided the specification can still be met then the manufacturer shall confirm in writing his modification to both the Approving Authority and the AAR so that the records can be maintained and certification amended.

Failure to comply with this requirement may result in the withdrawal of the qualification approval certificate which could lead to the cancellation of any associated contracts.

12 Maintenance of Qualification Approval

The manufacturer is responsible for demonstrating that the qualification approval has been maintained.

The manufacturer shall complete the Maintenance of Approval Notification (annex F) for countersignature by the AAR who will forward it to the Approving Authority. This shall be carried out three months before the expiry date of the qualification approval certificate. Failure to carry out this procedure may result in the withdrawal of the certificate.

Maintenance of approval is assured under the following circumstances:

(a) For those batteries continuously manufactured and successfully submitted to the procedure of quality conformance testing (section-four).

(b) When Group C testing has been satisfactorily completed (refer to **20.1).**

The Approving Authority shall acknowledge receipt of annex F. Provided the approval has been maintained the Approving Authority shall complete section C of annex F, retain one copy and forward one copy to the Controllerate technical authorities, the Supply Management Branches, the manufacturer and the AAR.

If the approval has not been maintained it will be withdrawn in accordance with clause **13.**

13 Withdrawal of Qualification Approval

13.1 Circumstances for withdrawal. Qualification approval may be withdrawn at the discretion of the Approving Authority under the following circumstances:

(a) At the request of the manufacturer, who shall give, except for circumstances beyond his control, at least six months notice to the Approving Authority of his intention to cease production and twelve months notice before ceasing the supply of a battery having qualification approval.

(b) When production of the battery is given up altogether or the manufacturer has not carried out the maintenance of approval (group C) test requirements.

(c) When the manufacturer’s Quality Assessment Registration is withdrawn.

(d) In the case of non-conformity with the requirements of this Standard or its associated Supplement.

13.2 Procedure for withdrawal. The Approving Authority shall:

(a) Complete and sign an approval withdrawal notification (see annex D).

(b) Delete the relevant entry in the approval register.

(c) retain one copy of the completed approval withdrawal notification and forward one copy to each of the Controllerate technical authorities, Supply Management Branches, the AAR and the manufacturer.

14 Lists of Qualification Approved Batteries

A reference list of all approved batteries for both the qualification approval Supplements and preferred battery Supplements will be retained by the Secretary of the DELSC L10 committee. Duplicates of the list will be held by the Controllerate technical authorities and the AAR.

To establish details of approved batteries the appropriate authority should be consulted.

Section Three. Preparation of Supplements

15 General Requirements

A Supplement is a specification for a specific battery type. It will be a separate document generated by the originator, who may be a MOD personnel or a defence contractor, and will define all the necessary technical requirements for a specific battery to meet a service requirement.

The procedures for the acceptance of a battery Supplement are defined in Def Stan 61-17. Once the Supplement has been accepted it will be formally issued and controlled by the Secretary of the Approval Authority.

The Controllerate Technical Authority shall arrange for each Supplement to be codified by the Defence Codification Authority such that each battery is related to its unique specification by reference to its NATO Stock Number (NSN) and application.

16 Requirements to be Incorporated in a Qualification Approval Supplement

A qualification approval Supplement (QAS) is a detail specification for a battery type which is used in a critical application and the test requirement shall define the worst case conditions (see **5.22.2).**

16.1 The qualification approval Supplement (QAS) shall contain the following details.

(a) A sequential letter and issue date, provided by the Approving Authority once the 'DRAFT' becomes approved and is published.

(b) A suitable heading which describes the battery type similar to the following format: Battery, Non-Rechargeable, Alkaline Manganese Dioxide, 1.5V, NATO Stock Number 6140-99-109-9428.

(c) A scope introducing the environmental and electrical use of the battery.

(d) Nominal voltage of the cell or battery.

(e) Rated capacity, in Ah.

(f) IEC reference of the battery.

(g) Details of the battery dimensions. Whenever possible these shall be the same as those given in the appropriate national or international standards (IEC, BS, EN, Mil etc). In the case of multicell batteries the dimensions given shall take account of the accumulative dimensions of individual cells. In addition to the battery dimensions an outline drawing shall be given which shows the full dimensions of the label including the size of the lettering.

(h) Mass of the battery.

(i) Marking of the battery.

(j) Construction of the battery, including details of its assembly, terminations, outer casing and associated requirements.

16.1 (Contd)

(k) Specific handling and disposal instructions either in detail or by reference to other procedures which satisfy the Health and Safety requirements.

(l) Storage and performance requirements. These must reflect the design requirements of the battery for the application and include conditions for environmental, mechanical, temperature, safety and electrical aspects. The envelope of these requirements shall reflect the worst case condition of the known applications.

The test requirements given shall be based upon those given in this Standard and its associated specifications or other nationally agreed criteria whilst reflecting the required performance of the battery for its defence application. Such environmental standards as Def Stan 00-35 and BS 2011 shall be used.

(m) Quality assurance and quality conformance requirements. Details of the requirements for group A, B and C testing and a sampling plan.

(n) Maintenance of approval requirements. The requirements shall be such as to provide sufficient confidence that the original approval has been maintained. Refer to clause **12.**

(o) A test schedule identifying the number of batteries to be tested and the quantity allocated to each subgroup.

16.2 Test schedule. A typical test schedule, detailing a comprehensive list of appropriate and possible tests, is detailed in table 2. The test schedule identifies the test groups.

In designing the test schedule it is important that each test-group enables the batteries to be tested to as many of the requirements it is likely to see in service as possible. The environmental tests should be kept together so that the test regime simulates the service application. Destructive tests will always be the last rests carried out in any test-group.

17 Requirements to be Incorporated in a Preferred Battery Supplement

A preferred battery Supplement (PBS) shall only be raised for non-critical application or where the specified requirements of nationally recognized specifications are adequate for the battery application (see **5.22.1).**

17.1 General. The rules of procedure will be the same as those for qualification approved Supplements, but the specified test requirements will be less onerous and reflect more closely those of 'commercial' applications. The test detail will be aligned with the requirements of a nationally recognized 'commercial standards' (such as BS, IEC, EN etc.)

Normally it is not possible for MOD to procure to commercial standards directly because in many instances the quality and performance requirements are not adequately defined also they are restricted, in the majority of instances, to single cells rather than batteries.

17.1 (Contd)

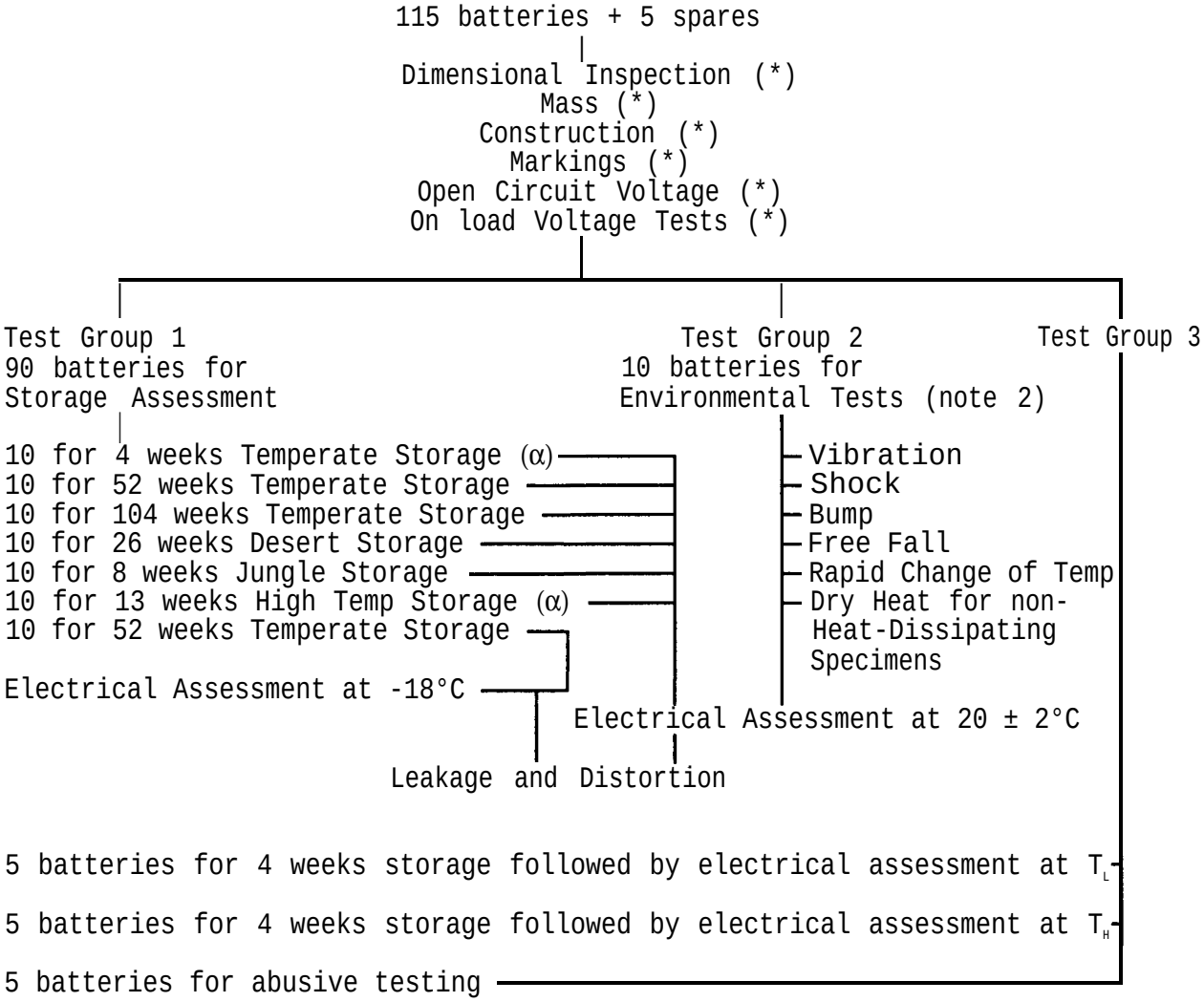
In some cases, where the application permits, it may be acceptable to make use of existing specification sheets, such as those of Part 2 of BS 397 (or its equivalent) and enter the additional data such as performance and quality related information which can be offered and supported by a DDP (refer to **7.2).**

17.2 Specific test requirements. The test requirements of the PBS shall make reference to those in an appropriate national specification. Additional test requirements may only be generated where no national tests are considered appropriate. The PBS shall contain appropriate quality assurance and conformance test requirements similar to those required for QASs.

17.3 Typical test schedule. A typical test schedule is shown in table 2a, in which the test clauses shall define those of the appropriate sectional specification or an appropriate national standard.

Table 2

Typical Test Schedule for a Qualification Approval Supplement



NOTES:

1. The above is given as an outline. Specific requirements shall be defined to meet the battery's application.

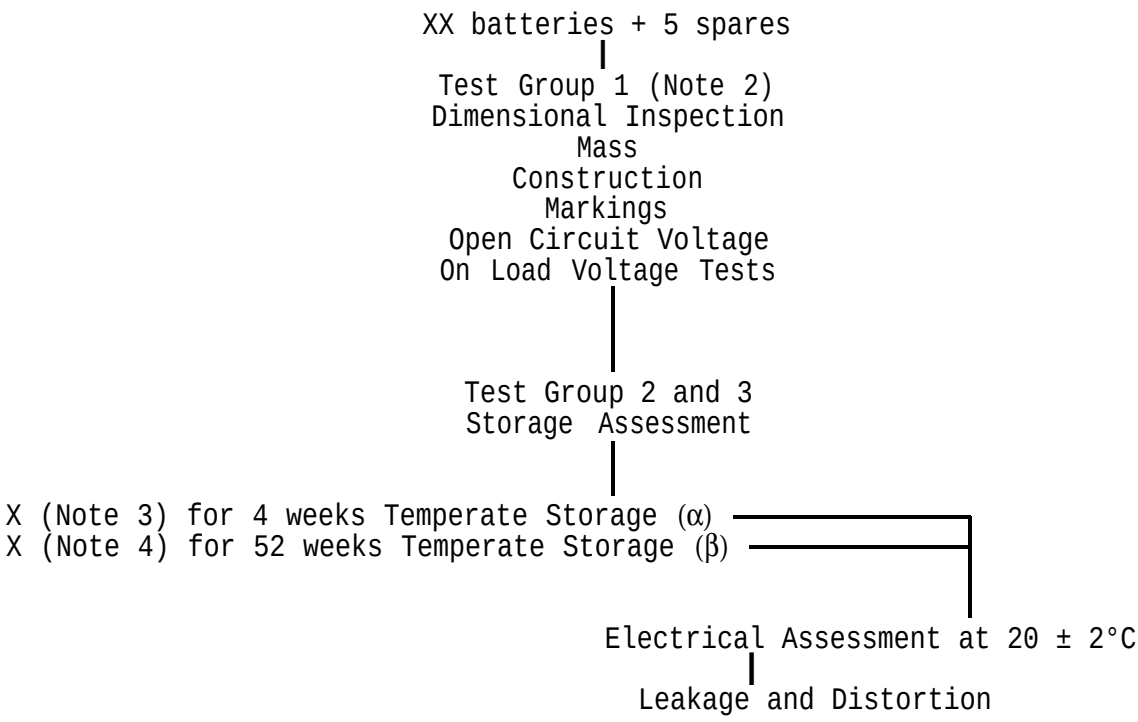
2. In addition to these requirements the manufacturer shall state, in the approval report, the storage life of the battery (refer to **5.19).** The conditions shall be 20 ± 5°C and the performance required is 80% of the battery's original capacity.

3. Tests marked (*) are normally group A tests with tests marked (α) being group B tests. Group C tests comprise all other tests. The manufacturer shall ensure that each test is repeated at some time during the certification period as agreed by the AAR and stated in the Quality Plan (refer to **20.1).**

4. For Electrical Assessment at least 9 batteries in any test group of 10 shall meet the minimum discharge requirements.

Table 2a

Typical Test Schedule for a Preferred Battery Supplement



NOTES:

1. The manufacturer is required to define the performance requirements of his battery, and retain the data in the form of a DDP, which shall be managed within the company's Quality System and made available to the AAR (refer to **7.2).**

2. Tests marked (*) are group A tests.

3. Tests marked (α) are group B tests. The quantity for batch release testing shall be selected in accordance with an agreed sampling plan conforming to BS 6001, the results of which shall be used to sentence each lot for release.

4. Tests marked (β) are group C tests. Samples shall be selected from each lot released and accumulated over a number of contracts sufficient to demonstrate maintenance of the approval in accordance with clause **12.** Specific details shall be incorporated into the Quality Plan **(19.2).**

5. The requirements for the electrical assessment will be taken from international or national standard requirements.

6. The quantity of batteries used for qualification testing will depend upon the application and shall be proposed by the manufacturer and agreed by the AAR in conjunction with the Approving Authority.

Section Four. Quality Conformance Testing

18 General Requirements

Quality conformance is achieved by the production of batteries within a total quality management system and is confirmed by carrying out group A, B and C tests, the results of which demonstrate whether or not the lot offered for release has achieved the prescribed quality. Under the responsibility of the Quality Manager and under the surveillance of the AAR the manufacturer shall carry out those tests or arrange for them to be carried out free of all charges to MOD unless otherwise contractually agreed.

The requirements for quality conformance inspection are defined in the relevant Supplement and shall be carried out in accordance with BS 6001.

A battery is only considered to be approved and may be released to a Supplement when an approval certificate has been issued and maintained in accordance with this Standard.

18.1 Specific requirements. The specific requirements are defined in the appropriate Supplement. The identified group A tests shall be applied to all of the samples in the lot, either at the end of manufacture or during the process of manufacture. The group B tests shall be carried out on the statistical sample selected from the manufacturing lot in accordance with BS 6001 and the results used for sentencing the lot for release and delivery. The group C samples shall be selected and tested in accordance with the Supplement and used for the maintenance of the approval.

Should any battery fail group A inspection it shall be rejected and not used for group B or C tests. Any additional batteries required for group B and C tests, ie due to equipment malfunction or operator error shall be drawn from the same manufacturing lot and shall have met the group A requirements.

18.2 Batch release procedure. Provided the test results of the manufacturing lot are acceptable then it may be released using the certificate of conformity shown in annex E. If the test results are not acceptable then the manufacturer shall take action as defined in **20.5.**

19 Acceptance Sampling Procedures

Where the Supplements include inspection levels and acceptable quality levels the statistical sampling procedures and tables to be used shall be those specified in BS 6001. Alternative sampling procedures shall only be used once agreed with the AAR.

20 Quality Conformance Tests

20.1 General. The conformance tests and requirements are defined in the relevant Supplement.

For group C, maintenance of approval tests, the sample size shall be randomly selected from each manufacturing lot and allocated, in sequence, to a test–group of the test schedule (see tables 2, 2a, 3 and 3a) and subjected to its requirements. The objective being to repeat the test requirements of the test-groups by the end of three contracts, but no later

20.1 (Contd)

than the three yearly certificate review dates. Specific proposals for Maintenance shall be contained in the Quality Plan. The requirements for environmental tests may be waived provided the manufacturer can demonstrate that no amendments have been made to the original qualification approval documentation related to the subject approval certificate.

20.2 Tolerances. The limits prescribed in the relevant Supplement are true values. When carrying out the specified tests the manufacturer shall employ sufficient inset from the specified limits to cover the uncertainty of his measurement. Where there is a technical difficulty in the assessment of measurement uncertainty the criteria for acceptance shall be agreed with the AAR.

20.3 Alternative test methods. The test and measurement methods given in this Standard and its associated specifications are intended to unify test and measurement procedures.

They are not necessarily the only methods which can be used. Should the manufacturer wish to use an alternative method he shall consult with and satisfy the AAR that the chosen method will provide results equivalent to or better than those obtained by the method specified.

20.4 Procedure in the case of defective test equipment or operator error. Any battery whose failure during testing can be attributed to a verified test equipment defect or test operator error shall, where possible, be replaced by another battery from the same manufacturing lot. The replacement battery shall be subjected to all of the tests to which the discarded battery was subjected to prior to its failure and to any remaining specified tests to which the discarded battery was not subjected.

20.5 Procedure in the event of failures. Failure of a battery in one or more of the prescribed tests shall be counted as a single defective.

The Quality Manager shall keep records of such defects in samples taken in the course of periodic tests. The records shall be made available to the AAR for examination.

When a sample fails to meet the requirements of a test the manufacturer shall:

(a) Suspend release of the lot from which the sample was drawn.

(b) Initiate an investigation to determine the reason for failure.

(c) Report the situation to the AAR.

The Quality Manager shall maintain this suspension until the investigation has been concluded and the AAR informed accordingly.

If the failure can be attributed to a test procedure error then the lot may be released and suitable corrective action taken accordingly.

If the failure is due to an identified manufacturing fault that can be immediately corrected, then once corrected and satisfactorily tested, the lot may be released.

20.5 (Contd)

If the failure is concluded to be due to an identified manufacturing fault which cannot be corrected immediately but defective batteries can be identified and rejected by a suitable screening method acceptable to the AAR, then the acceptable batteries from the lot may be released.

The Quality Manager shall determine, to the satisfaction of the AAR, if any deliveries have been made from lots affected by the manufacturing fault. In the event of any deliveries having been made the Quality Manager shall notify the recipients giving identities and sufficient details of the manufacturing faults to allow any necessary action to be taken.

21 Release for Delivery (Attestation of Conformity)

21.1 General. Each manufactured lot shall be unambiguously identified by a certificate of conformity, the affixing or issue of which is under the surveillance of the AAR. This certifies that the batteries have been released in accordance with the requirements of this Standard and the appropriate supplement. It shall allow reference to be made to the test documents against which the batteries have been released.

The authority to issue the certificate of conformity shall be suspended or withdrawn by the AAR if there is persistent non-conformity with this specification or its Supplements or if the provisions of this procedure are not complied with.

21.2 Certificate of conformity. An example of a certificate of conformity is shown at annex E which shall be used for each manufactured lot released against a Supplement.

22 Date of Manufacture

22.1 Date of manufacture on the battery. When marking the date of manufacture on the battery, the information may be given explicitly or by use of the four digit code, given below. The code indicates the year and the month of manufacture in which the first two digits indicate the year and the last two digits indicate the number of the month. The months earlier than the 10th month are a single digit, preceded by '0'.

Example. A battery, manufactured in March 1979, will bear the code 7903. A battery, manufactured in November 1982, will bear the code 8211.

22.2 Date of manufacture on the packaging. To provide an explicit date of manufacture the actual date of manufacture shall be clearly marked on the outside of the unit level packaging defined in the contract.

Section Five. Manufacturing and Test Requirements for Batteries Excluding Lithium

23 General Requirements

This section defines the various test methods that shall be used, as directed by the relevant Supplement, for qualification approval (section two) and quality conformance testing (section four). The manufacturer shall ensure that the requirements of the relevant section are met.

23.1 Qualification approval tests. The manufacturer shall provide and test the batteries, as directed by the relevant Supplement, free of all charges unless otherwise contractually agreed.

23.2 Quality conformance tests. The manufacturer shall provide and test the required number of batteries, as directed by the relevant Supplement, free of all charges unless otherwise contractually agreed. Those batteries from which test groups were subjected to group A and B test, if acceptable may be subsequently released.

23.3 Test schedule. Unless otherwise specified, in the relevant Supplement, a test schedule shall be produced, similar to that shown in tables 2 and 2a, which may be modified to suit a particular requirement after consultation with the AAR and the Approval Authority and used for a test programme.

23.4 Test equipment. The range of test equipment used shall be appropiate for the magnitude of the parameter to be measured. It shall be regularly calibrated and shall be of sufficient accuracy and quality to permit performance of the required test.

24 Manufacturing Requirements

This clause defines the requirements that are specified for the cell and/or battery construction and are the minimum requirements to be met by the manufacturer.

24.1 Battery construction. The construction of the battery shall comply with the following:

(a) The requirements specified in the Supplement.

(b) Any electrical or electronic parts used in the battery construction shall be selected in accordance with the specified requirements of Def Stan 59-59.

(c) Any applied finishes shall comply with the requirements of Def Stan 00-10.

(d) If injection mouldings are to be used in a particular battery construction then the requirements of Def Stan 93-42 shall be complied with.

(e) The manufacturer shall not deviate from the approved build standard without the consent of the Approving Authority.

24.2 Quality plans. To satisfy the requirements of this Standard the manufacturer is required to generate a Quality Plan which shall be sufficiently definitive to cover all aspects of the manufacture of the battery concerned. It shall provide adequate reference to demonstrate that the requirements of this Standard and its associated specifications can be met.

It shall define any minor amendments to the specified requirements such as alternative test methods, sampling rates and associated test requirements as well as controls for sub-contract activities and maintenance of approval requirements.

The Quality Plan shall be produced in an acceptable format and approved by the AAR.

24.3 Component cells

(a) Conditioning. All unit cells shall be stored at 20° ± 5°C and 70% RH.

(b) Testing before assembly. All component cells (or cell stacks where individual cell testing is impracticable) shall be tested at 20°C ± 5°C immediately before assembly. The testing shall comprise determination of the OCV and OLV or short circuit current. The results shall be measured to 3 significant figures.

The minimum acceptance voltage or current shall be determined by a statistical quality control procedure applied to a representative sample taken from each batch and used for analysis.

The method of test and any statistical sampling procedure employed shall be acceptable to the AAR.

24.4 Terminations. The terminations shall be as shown in the appropriate Supplement.

The materials, processes and finishes selected for the terminations shall be corrosion resistant and maintain good electrical contact at all times when tests are carried out in accordance with this Standard or its Supplements.

The materials and finishes shall be in accordance with the specified requirements of Def Stan 00-10.

24.5 Leakage. When batteries are stored or discharged under the conditions given in this Standard and the appropriate Supplement, no electrolyte, sealing compound or other internal material shall appear on any of the external surfaces of the battery.

24.6 Dimensional stability. The dimensions of the battery shall conform with the specified dimensions at all times when tested to the requirements of this Standard or the appropriate Supplement.

24.7 Marking

24.7.1 Marking of the batteries. Each battery shall be indelibly marked or permanently labelled to conform to this specification and that of NATO and shall include:

24.7.1 (Contd)

- the NATO type designation (consisting of a symbol NBA, followed by a three or four digit number).
- the NATO Stock Number.
- the item name.
- nominal (rated) voltage.
- source of manufacture.
- date of manufacture or release (clause **22).**
- polarity.
- instructions for use (if appropriate).

24.7.2 Marking of the packaging. The marking on all stages of packaging of the batteries shall include the same marking as listed in **24.7.1** above with the exception of the polarity of the terminals and instructions for use. The latter, if appropriate, should be contained within the packaging.

For mercuric oxide and similar batteries that contain hazardous material an appropriate marking shall be securely fixed to the packaging, and where practical, to the battery. Def Stan 05-34 shall be used as a guide in respect of hazard marking.

Any special storage requirements shall be clearly marked on the outer packaging.

The proposed battery labels shall be submitted to the Approving Authority for acceptance.

25 Conformance Test Requirements

The inspection and test requirements are given, which should be read in conjunction with section three, and are used, as directed by the Supplement, to ensure that batteries released against the accompanying certificate of conformity are acceptable for use. The requirements define the extent of testing for qualification approval, maintenance of approval and production performance.

25.1 Test conditions. Unless otherwise specified the environmental conditions of 20° C ± 2°C, relative humidity of between 45 and 75% shall be used. However OCV and OLV measurements may be taken from batteries which have been allowed to stabilize at 20°C ± 5°C.

25.2 Test equiment. Unless otherwise specified the test equipment used shall have at least the following degree of accuracy and have a range appropriate to the measurement.

(a) Voltmeters shall comply with BS 89, class index 0.3.

(b) Ammeters shall comply with BS 89, class index 0.3.

(c) Temperature measurement devices shall have an accuracy of 1°C.

(d) Chronometers shall have an accuracy not exceeding 2% for periods less than 10 secs 0.5% for periods between 10 secs & 24 hrs, and 0.1% for periods greater than 24 hrs.

(e) Resistors shall have an accuracy of 0.5% up to 100 W dissipation and 0.1% above 100 W dissipation.

25.3 Conditions for storage tests

25.3.1 Temperate storage. Batteries shall be stored after manufacture, in an ambient temperature of 20°C ± 5°C. The periods of storage shall be calculated from the date of manufacture and shall be that required by the relevant Supplement.

25.3.2 Desert storage. Batteries shall be stored at 50°C ± 2°C for six hours per day for four days per week. During the intervening periods the batteries shall be stored in an ambient temperature of 20°C ± 5°C. Each cycle shall be substantially completed within one hour unless otherwise stated in the Supplement. Batteries shall be stored either singly or in unit cartons for the period specified in the Supplement.

25.3.3 Jungle storage. The packing shall be removed from the battery which shall then be stored for eight weeks at a temperature of 35°C ± 2°C for six hours per day for five days per week. The temperature during the intervening periods shall be 20°C ± 5°C. A relative humidity of not less than 95% shall be maintained during this test.

25.4 Examination and test during storage. Except in the case of jungle storage the batteries shall be examined at regular intervals of not more than eight weeks when this is not precluded by the nature of the packaging. For each storage regime, including jungle, the batteries shall be examined and the result recorded at the end of the storage period.

NOTE: All electrical measurements shall be carried out at 20°C ± 5°C. Prior to measurement the batteries shall be allowed to stabilize to the temperature.

25.5 Open circuit voltage tests. Batteries shall be subjected to OCV tests during and after storage, as directed by the relevant Supplement. The variation in voltage of each battery shall be not less than or greater than 15% of the nominal cell voltage(s) or as stated in the relevant Supplement.

25.6 On load voltage tests. Batteries shall be subjected to OLV during and after storage testing as directed by the relevant Supplement. Unless otherwise specified the value of the applied load and the time interval shall be agreed between the manufacturer and the AAR.

25.7 Insulation resistance after jungle storage. The batteries shall be removed from the chamber and the surface water blotted off. The insulation resistance shall be measured immediately at an applied potential of 500 V d.c. as follows:

(a) Cylindrical types - between the negative termination and a strip of copper 25 mm wide positioned centrally such that it encircles the insulating container.

(b) Rectangular block types - between the negative termination and a metal plate placed in contact with each face in turn.

(c) Metal jacketed types - as detailed in the relevant Supplement.

The minimum resistance value for each type shall be as stated in the relevant Supplement.

25.8 Discharge test conditions. Batteries shall be discharged after they have undergone the specified storage period. Before discharge testing, the batteries shall be allowed to stabilize at the relevant discharge temperature for not less than 24 hours. Unless otherwise specified, the discharge temperature shall be 20°C ± 2°C with a relative humidity of between 45 and 75%. The period of discharge shall be terminated and recorded once the voltage reaches the specified value.

25.9 Failure criterion. The batteries shall be examined for leakage and distortion (see **24.5** and **24.6)** also any faults in their operation or non compliance with the specified requirements will be regarded as a failure.

Section Six. Manufacturing and Test Requirements for Lithium Batteries

26 General Requirements

This section defines the various test methods that shall be used, as directed by the relevant Supplement, for qualification approval (section two) and quality conformance (section three). The manufacturer shall ensure that the requirements of the relevant section are met.

26.1 Qualification approval tests. The manufacturer shall provide and test the batteries, as directed by the relevant Supplement, free of all charge unless otherwise contractually agreed.

26.2 Quality conformance tests. The manufacturer shall provide and test the required number of batteries, as directed by the relevant Supplement, free of all charge unless otherwise contractually agreed. Those batteries from which test groups were subjected to group A and B testing, if acceptable, may be subsequently released.

26.3 Test schedule for qualification approval. Unless otherwise specified, in the relevant Supplement, the batteries shall be tested to the schedule shown in table 3a which may be modified to suit a particular requirement after consultation with the AAR and the Approval Authority.

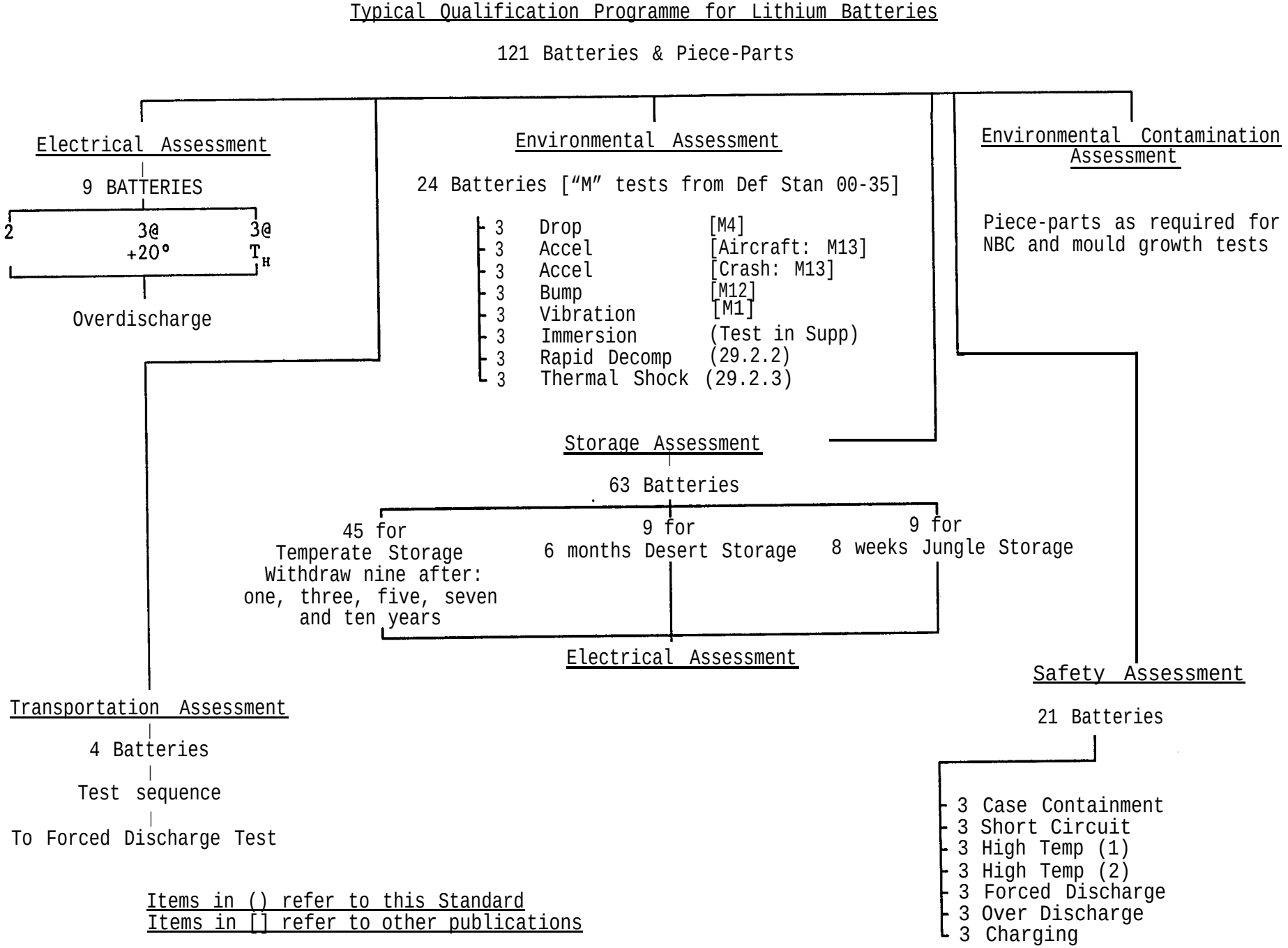
Table 3

Schedule of Tests

TEST	LOCATION
Case containment	Clause 24.6.2
Desert storage	Clause 23.4.3
Electrical assessment	Clause 24.1
Environmental assessment	Clause 24.2
Environmental contamination assessment	Clause 24.3
Forced discharge	Clause 24.6.6
High temperature (1)	Clause 24.6.4
High temperature (2)	Clause 24.6.5
Jungle storage	Clause 23.4.4
Overdischarge	Clause 24.6.7
Safety assessment	Clause 24.6
Short circuit	Clause 24.6.3
Supplementary tests	Supplement
Temperate storage	Clause 23.4.1
Transportation assessment	Clause 24.5

Table 3a

Typical Qualification Programme for Lithium Batteries



Items in () refer to this Standard
Items in [] refer to other publications

27 Manufacturing Requirements

This clause defines the requirements for cell and/or battery construction and are the minimum requirements to be met by the manufacturer.

27.1 Battery construction. The construction of the battery shall comply with the following:

(a) The requirements specified in the Supplement.

(b) Whenever possible, all electrical or electronic parts used in the battery construction shall be selected in accordance with the requirements of Def Stan 59-59.

(c) If injection mouldings are to be used in a particular battery construction, then the requirements of Def Stan 93-42 shall be complied with.

(d) The manufacturer shall not deviate from the approved build standard without the consent of the Approving Authority.

(e) Batteries shall be so designed that they do not present a safety hazard under normal and electrically abusive conditions of use. To meet this requirement it may be necessary to provide the following protective devices:

(1) Short circuit protection. An electrical fuse link, a thermal switch or a positive temperature co-efficient device may be used to protect the battery from accidental, external, short-circuit.

(2) Charge protection. Where the possibility of external charging exists, the battery shall be provided with a series diode or other protective device. Parallel-connected series strings of cells in a battery shall be protected from internal charging by the inclusion of a series diode or other device in each string.

(3) Reverse polarity. To comply with the forced discharge and overdischarge requirements **(29.6.6** to **29.6.7)** the inclusion of a shunt diode or other device across each cell may be needed.

The above devices shall:

i. form an integral part of the battery;
ii. not be susceptible to any failure which will allow them to be by-passed;
iii. not be replaceable by the user;
iv. be rated such that the reliable operation of the battery over the full range of operating and environmental conditions is not inhibited.

27.2 Quality plans. To satisfy the requirements of this Standard the manufacturer is required to generate a Quality Plan which shall be sufficiently definitive to cover all aspects of the manufacture of the battery concerned. It shall provide adequate reference to demonstrate that the requirements of this Standard and its associated specifications can be met.

27.2 (Contd)

It shall define any minor amendments to the specified requirements such as alternative test methods, sampling rates and associated test requirements as well as controls for sub-contract activities and maintenance of approval requirements.

The Quality Plan shall be produced in an acceptable format and approved by the AAR.

27.3 Component cells. All component cells (or cell stacks where individual cell testing is impracticable) shall be tested at 20°C ± 5°C immediately before assembly.

The minimum acceptable voltage or current shall be determined by a statistical quality control procedure applied to a representative sample taken from each batch and used for analysis.

The method of test and any statistical sampling procedure employed shall be acceptable by the AAR.

27.4 Terminations. The terminations shall be as shown in the appropriate Supplement.

The materials, processes and finishes selected for the terminations shall be corrosion resistant and maintain good electrical contact at all times when tests are carried out in accordance with this Standard or its Supplements.

The materials and finishes shall be in accordance with the specified requirements of Def Stan 00-10.

27.5 Dimensional stability. The dimensions of the battery shall conform with the specified dimensions at all times when tested to the requirements of this Standard.

27.6 Marking. The marking of all batteries and their packaging shall be in accordance with Def Stan 61-19.

28 Conformance Test Requirements

These inspection and test requirements should be read in conjunction with section three to ensure that batteries released against the accompanying certificate of conformity are acceptable for use. The requirements define the extent of testing for qualification approval, maintenance of approval and production performance.

28.1 Test conditions and quantities. Unless stated otherwise in the relevant Supplement, the tests shall be conducted at +20 ±2°C, in a relative humidity between 45% and 75%. However, OCV and OLV stabilize at 20 ±5°C. Unless stated otherwise, a sample size of three shall be used for all tests.

28.2 Leakage. When batteries are stored or discharged under the conditions given in this Standard and/or Supplement, no electrolyte, sealing compound or other internal materiel shall appear on any of the external surfaces of the battery except where tests permit leakage.

28.3 Test equipment. Unless otherwise specified the test equipment used shall have at least the following degree of accuracy and have a range appropriate to the measurement.

(a) Voltmeters shall comply with BS 89, class index 0.3.

(b) Ammeters shall comply with BS 89, class index 0.3.

(c) Temperature measurement devices shall have an accuracy of 1°C.

(d) Timing devices shall have an accuracy not exceeding 2% for periods less than 10 secs 0.5% for periods between 10 secs & 24 hrs, and 0.1% for periods greater than 24 hrs.

(e) Resistors shall have an accuracy of 0.5% up to 100 W dissipation and 0.1% above 100 W dissipation.

28.4 Conditions for storage tests. The following conditions for storage are to comply with the requirements of BS 2011 Part 1.1.

28.4.1 Temperate storage. For normal storage batteries shall be stored after manufacture, in an ambient temperature of 20°C ± 5°C.

28.4.2 High temperature storage. For accelerated storage at elevated temperatures the batteries shall be tested in accordance with BS 2011 Part 2.1b. The period and temperature of storage shall be as defined in the relevant Supplement.

28.4.3 Desert storage. Batteries shall be stored at 50°C ± 5°C for six hours per day for four days per week. During the intervening periods the batteries shall be stored at 20°C ± 5°C. Each cycle shall be substantially completed within one hour unless otherwise stated in the relevant Supplement. Batteries shall be stored either singly or in unit cartons for the period specified in the relevant Supplement.

28.4.4 Jungle storage. The packaging shall be removed from the battery, which shall then be stored for eight weeks at a temperature of 35°C ± 2°C for six hours per day for five days per week. The temperature in the intervening period shall be 20°C ± 5°C. A relative humidity of not less than 95% shall be maintained during this test.

28.4.5 Examination and test during storage. Except in the case of jungle storage the batteries shall be examined at regular intervals of not more than eight weeks, or as directed in the relevant Supplement, when this is not precluded by the nature of the packaging. For each storage regime, including jungle, the batteries shall be examined and the result recorded at the end of the storage period.

28.4.6 Open circuit voltage tests. Batteries shall be subjected to OCV tests during and after storage, as directed by the relevant Supplement. The variation in voltage of each battery shall be not less than or greater than 15% of the nominal cell voltage(s) or as stated in the relevant Supplement.

28.4.7 On load voltage tests. Batteries shall be subjected to OLV during and after storage testing as directed by the relevant Supplement. Unless otherwise specified the value of the applied load and the time interval shall be agreed between the manufacturer and the AAR.

28.4.8 Insulation resistance after jungle storage. The batteries shall be removed from the chamber and the surface water blotted off. The insulation resistance shall be measured immediately at an applied potential of 500 V d.c. as follows:

(a) Cylindrical types - between the negative termination and a strip of copper 25 mm wide positioned centrally such that it encircles the insulating container.

(b) Rectangular block types - between the negative termination and a metal plate placed in contact with each face in turn.

(c) Metal jacketed types - as detailed in the relevant Supplement.

The minimum resistance value for each type shall be as stated in the relevant Supplement.

28.4.9 Discharge test conditions. Batteries shall be discharged after they have undergone the specified storage period. Before discharge testing, the batteries shall be allowed to stabilize at the relevant discharge temperature for not less than 24 hours. Unless otherwise specified, the discharge temperature shall be 20°C ± 2°C with a relative humidity of between 45 and 75%. The period of discharge shall be terminated and recorded once the voltage reaches the specified value.

28.4.10 Failure criterion. The batteries shall be examined for leakage and distortion (see **24.5** and **24.6)** also any faults in their operation or non compliance with the specified requirements will be regarded as a failure.

29 Schedule of Conformance Tests

29.1 Electrical assessment. The electrical load shall be specified in the Supplement and shall be either the rated capacity load, the duty cycle or an appropriate simulation thereof. Before discharge testing the batteries shall be allowed to stabilize at the relevant discharge temperature for not less than 24 hours. Unless otherwise specified three batteries shall be tested at each of three temperatures T_H +20°C, T_L. The period of discharge shall be terminated and recorded once the voltage reaches the specified value. When required by the Supplement the voltage delay time **(5.23)** shall be measured. The requirements given in the Supplement shall be met.

29.2 Environmental assessment. A typical schedule, involving 18 batteries is given in table 3a. Whenever possible, alternative tests shall be taken from Def Stan 00-35.

Normally, three batteries shall be allocated to each test. They shall be discharged at +20°C to the requirements of **29.1,** either during or after the test. Details shall be given in the Supplement.

29.2.1 Mechanical tests. Where applicable the Supplement shall define any mechanical tests, such as bump, acceleration, water immersion also vibration and shock requirements not covered by the tests in **29.5.5.**

29.2.2 Rapid decompression. This test is to be applied to batteries that will be used or carried in the pressurized container of an aircraft. It is based on the requirements of BS 3G100, Part 2, Section 3, Subsection 3.4 for equipment grade A and aircraft class IV.

(a) Throughout the following sequence, discharge the batteries through the load given in the Supplement.

(b) Thirty minutes from the start of discharge, reduce the ambient pressure to 80.5 kPa in not more than 10 minutes and maintain this pressure for one hour.

(c) Reduce the ambient pressure to 4.5 kPa within one minute ±20 seconds and maintain this pressure for one hour.

(d) Return the pressure to the laboratory ambient within 10 minutes and continue the discharge to the end voltage given in the Supplement.

(e) Inspect the batteries for leakages or distortion.

(f) Repeat (a) to (d), but at 45°C or as required by the Supplement.

(g) The discharges shall meet the requirements in the Supplement.

29.2.3 Thermal shock. This test has been devised to give a sequence that can be done with 'normal' environmental chambers. It gives a choice of severities, as listed in table 4 and designated in the relevant Supplement.

(a) Place the batteries in a test chamber and raise the temperature to the specified upper value in not more than 30 minutes.

(b) Maintain the chamber at the upper temperature for four hours.

(c) Reduce the temperature of the test chamber to 20°C ±5°C in not more than 30 minutes.

(d) Maintain at 20 ±5°C for two hours.

(e) Reduce the temperature of the chamber to the lower specified value in not more than 30 minutes.

(f) Maintain at the lower specified value whilst completing a 24 hour cycle.

(g) After the fourth cycle, return the batteries to 20°C ±5°C and store for 7-10 days.

(h) Discharge the batteries through the load given in the Supplement.

(i) The discharges shall meet the requirement of the Supplement.

Table 4

Thermal Shock Test Levels

Test Level	Upper Temperature	Lower Temperature
A	90	-40
B	70	-40
C	55	-40
D	55	-32
E	45	-20

or as specified in the Supplement

29.3 Environmental contamination assessment. The Supplement shall define the tests required. Corrosion, mould growth and the reaction of case materials and other external components to nuclear, biological and chemical (NBC) environments may be required.

With the agreement of the Approval Authority, some or all of these tests may be conducted on piece-parts.

29.4 Storage assessments. Storage conditions shall be selected from those listed in **28.4.** Table 3a gives a typical programme, involving 63 batteries. The Supplement shall define the tests to be done during and after storage and the minimum performance required after storage.

29.5 Transportation assessment

29.5.1 Hazardous goods numbers. Batteries that contain more than a declared amount of lithium metal are classified as “Hazardous Goods” by the United Nations and the International Civil Airline Organization (ICAO).

The following identity numbers apply:

	UN	ICAO
Lithium batteries contained in equipment:	3091	8033
Lithium batteries, liquid cathode:	3090	8025
Lithium batteries, solid cathode:	3090	8034

29.5.2 Non-hazardous batteries. ICAO regulations are more strict than UN. In practice, the "Non-hazardous" category of the ICAO regulations includes most button cells and cylindrical cells up to the R6 size.

29.5.3 Lithium batteries and land/sea transport. Any battery cleared for transport by air is also cleared for land or sea transport.

29.5.4 Lithium batteries and air transport. As any battery used by the UK Defence Forces may need to be transported by air, ALL LITHIUM BATTERIES (except those classified as non-hazardous by ICAO regulations) shall be tested to the following schedule.

The tests must be completed successfully before the battery will be allowed to be transported in a UK military aircraft.

29.5.4 (Contd)

Only with the agreement of the Approving Authority and of the Dangerous Air Cargo Committee may these tests be relaxed or waived.

29.5.5 Test sequence. Subject four batteries to all of the following tests, in the order laid out below:

(a) Altitude. Store batteries for six hours at an absolute pressure of 11.6 kPa. Return to ambient pressure.

(b) High temperature. Store the batteries for 48 hours at 75°C ±2°C. Allow the batteries to stand for at least 24 hours at 20°C ±°C. Examine of leakage and distortion.

(c) Vibration. Secure each battery to a vibration table by a rigid mounting. Vibrate at ±2 g_n peak acceleration or ±6 mm displacement, whichever is the lesser, swept over the frequency range 5 Hz to 350 Hz for two hours in each of the three mutually perpendicular axis, at a logarithmic sweep rate that is not greater than one octave per minute.

(d) Shock. Secure each battery to a shock machine by means of a rigid mounting. Subject to three shocks, one along each of the three mutually perpendicular axis. During the first three milliseconds of shock the average minimum acceleration experienced by the battery shall be 75 g_n. The peak acceleration shall be between 125 g_n and 175 g_n. Then:

(e) Discharge. Discharge the batteries at +20°C to the electrical requirements of **29.1.**

(f) No battery shall leak or distort. The requirements of the discharge test shall be met.

(g) If the batteries have met the requirements, they may be used for the forced discharge test **(29.6.6).**

29.6 Safety Assessment

29.6.1 Applicability of safety tests

(a) Forced discharge test. This test shall not be undertaken unless an external power source can be connected in series with the battery when it is in its equipment, or if a single circuit fault may cause such a connection.

(b) Charging test. This test shall not be undertaken unless it is referred to in the Supplement and then only if an alternative secondary battery is available for use in the equipment or if a single fault in the equipment may connect a power source in parallel with the battery.

(c) High temperature (2). If the battery is composed of button cells, this test may be omitted, given the agreement of the Approval Authority,

29.6.2 Case containment. This test is to demonstrate that should a cell in an encased battery vent, then the event will not be a major physical hazard to adjacent personnel or equipment. It is to be applied to batteries where there is evidence that a cell can be forced to vent should it be subject to electrical abuse, other than charging, or an internal/manufacturing defect.

NOTE: See WARNING at clause **2** above.

It may need additional electrical connections to one cell in the battery, or the manufacture of special batteries.

(a) Remove or bypass all electrical protective devices.

(b) Cause at least one cell in a battery to vent, or to discharge its contents.

(c) EITHER by applying a short-circuit of 50 m Ω ±10 m Ω to one cell for at least 24 hours.

(d) OR by force discharging the complete battery to the electrical requirements of **29.6.6.**

(e) OR by undertaking any other test as agreed by the Approving Authority.

(f) The case of the battery shall remain essentially intact. There shall be no fragmentation or break-up. Distortion of the case, as well as splitting, is permitted as is the attack of plastics and other case materials by battery fluids. The escape of fluids or gases is also permitted.

29.6.3 Short circuit. Condition the batteries at T_H for at least six hours. Connect for at least 24 hours to a resistance of 50 m Ω ±10 m Ω of a rating capable of taking the expected short circuit current. No cell in the battery shall leak, vent or explode.

29.6.4 High temperature (1)

NOTE: This test, and the related on in **29.6.5,** is done on individual cells, whether used singly or as components in multi-cell batteries.

(a) Place five cells in an ambient temperature of 70°C for two hours.

(b) Examine every cell. None shall have leaked, vented or exploded.

(c) Place the cells in an ambient temperature of 160°C for two hours or as defined in the relevant Supplement.

(d) Examine:

(1) For hermetically sealed cells, every cell shall have vented through the designated vent area. Failure to vent, venting other than through the designated areas or tearing of the cell case in the vicinity of the vent by more than 5 mm, shall be classed as a failure.

29.6.4 (Contd)

(2) For non-hermetically sealed cells, it is not a pass/fail criterion that all cells must have vented. However, any venting must have occurred through or around the seal. No tearing of metallic parts is permissible, but distortion of the cell may occur. All cells shall remain substantially intact, no cell component being ejected.

29.6.5 High temperature (2)

NOTE: See WARNING at clause **2** above.

(a) At 20°C, discharge two cells to 75% of their nominal capacity, at the rated capacity load.

(b) Support the test cell vertically. The recommended method for cylindrical and rectangular cells is to support the cell in a wire cage constructed of nichrome wire (0.5 mm). Make two loops around the circumference of the cell towards the top and bottom, avoiding the vent area. Make a third loop around the length of the cell, to retain it without forming a short circuit, linking the two circumferential loops. Support the cage by wire from the top and bottom to prevent it moving out of the flame in the event of cell venting (see figure 2). Methods of support for cells of other shapes (eg button or coin cells) shall be agreed with the approval authority.

(c) Using a suitable gas torch, heat the centre of each cell with a flame of such intensity that it will cause the cell to vent within 3 mins without burning through or melting the case. The gas torch shall be capable of heating an aluminium block of equivalent dimensions to the test cell to at least 200°C.

(d) Keep the flame applied for 10 mins or until all activity ceases. If the cell has not remained within the flame throughout the test and has not suffered damage given in **29.6.4(d),** repeat the test.

(e) Examine:

(1) The cases of the cells shall remain in one piece. All cells shall remain substantially intact with no solid component being ejected.

(2) For hermetically sealed cells, every cell shall have vented through the designated vent area. Failure to vent, venting other than through the designated areas or tearing of the cell case in the vicinity of the vent by more than 5 mm, shall be classed as a failure.

(3) For non-hermetically sealed cells, it is not a pass/fail criterion that all cells must have vented. However, any venting shall have occurred through or around the seal. No tearing of metallic parts is permitted, but distortion of the cell is acceptable.

NOTE: If during the course of this test it is found that solid articles are released, a declaration should be made to the approval authority.

29.6.6 Forced discharge. Carry out this test at an ambient temperature as defined in the Supplement on both undischarged batteries and batteries which have previously been discharged to the end point voltage V_E at the n hr discharge rate. Discharge the battery in series with an external constant power supply derived from a 28 V d.c. source at the maximum value of continuous current at which the protection device will not operate or where such protection is not fitted, at a value of current to be declared by the manufacturer. Where the operating current of the overload protection device is temperature dependent, take the highest value within the temperature range of the battery. Continue the test for a period equal to the normal rated capacity of the battery C_r in Ah divided by the discharge current in amperes. Then let the batteries remain on open circuit for 24 hours.

The condition of the batteries shall be monitored throughout the test and there should be no signs of physical distress or leakage.

Providing they met the test requirements, those batteries used for the transportation assessment **(29.5)** may be used for this test.

NOTE 1: This test may require the overload protection device to be by-passed (see **27.1).**

NOTE 2: See WARNING at clause **2** above.

29.6.7 Over discharge. Within 24 hours of completing the electrical assessment **(29. 1),** continue the discharges by using for the electrical load fixed resistors of adequate wattage that have a value of V_E divided by the maximum current used during the duty discharge. Leave the resistors connected at the test temperature for 48 hours after the battery voltages have fallen below V_E.

The condition of the batteries shall be monitored throughout the test and there should be no signs of physical distress or leakage.

29.6.8 Charging. Using a constant voltage power supply with an output voltage set at twice the nominal voltage of the battery, attempt to pass a charging current through undischarged and also through discharged batteries that have been subjected to the over discharge test (see **29.6.7).**

The maximum output current from the charger shall be either:

(a) One-tenth of the nominal Ah capacity of the battery.

(b) If higher than (a) the maximum continuous current rating at 20°C of either the charge–blocking diode or the thermal protection device, if fitted.

Apply the charge for one hour, then leave the battery on open circuit for 24 hours ±5 hours.

At the end of this period, the battery shall show no signs of physical distortion or electrolyte leakage.

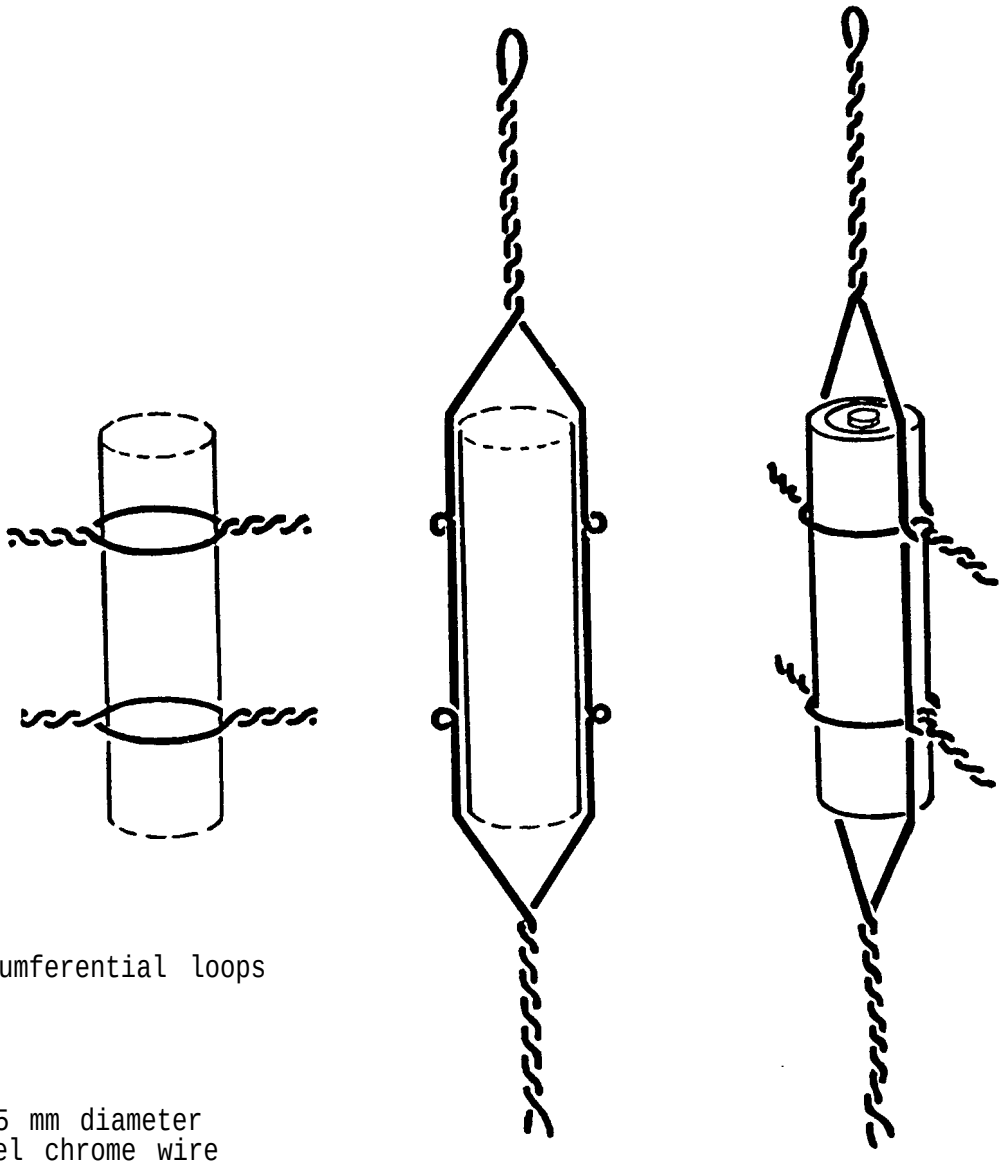


Fig 1 Recommended Means of Cell Support for High Temperature (2) Test

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APPLICATION FOR QUALIFICATION APPROVAL

This form should be completed in accordance with **6.6.**

Please write ‘none’ or ‘Not Applicable’ in the sections which do not apply.

Manufacturer’s Name:

Place of Manufacture:

Telephone Number:

PARTICULARS OF ITEMS TO BE SUBMITTED TO QUALIFICATION APPROVAL

Supplement Details:

Battery Type:

NATO Stock Number:

NATO Type Designation:

Manufacturer’s Drawing Number, issue and Date:

(Two copies of General Arrangement drawing to accompany this form).

Additional Comments:

This section is for MOD use

Reference Number:

Date Received:

Date Copy Forwarded to AAR:

APPLICATION FOR FULL/INTERIM* QUALIFICATION APPROVAL CERTIFICATE

This application is forwarded through the AAR to the Secretary of DELSC L10.

(*Delete as appropriate)

Section A (To be Completed by the Manufacturer).

Supplement Number:

Issue Number: Date:

Manufacturer's Name:

Place of Manufacture:

Name and Address of
Test Laboratory:
(if applicable)

Test Report Number and Date:

L10 Reference Number:
(allocated by Approving Authority)

Quality Manager's signature: Date:

SECTION B (To be completed by AAR)

Tests satisfactorily completed in accordance with specified procedures.

Signed: Date:

SECTION C (Approval Authority use)

Qualification Approval Expiry Date:

Signed: Date:

FULL QUALIFICATION APPROVAL CERTIFICATE

DATE OF ISSUE: CERTIFICATE NUMBER:

DATE OF EXPIRY: ISSUE NUMBER:

REFERENCE NUMBER:

This certificate is issued after examination of the detailed test results which indicate that the batteries detailed below comply with the Supplement quoted. It is issued by the Ministry of Defence under the conditions specified in DEF STAN 61-3 and is subject to withdrawal at the discretion of the Approving Authority.

Manufacturer's Name:

Place of Manufacture:

Test Report Number:

Description of Battery:

Manufacturers Drawing Reference:

(Master Record Index/Issue)

Approved on behalf of the DELSC Subcommittee L10.

Signed: Date:

INTERM QUALIFICATION APPROVAL CERTIFICATE

DATE OF ISSUE: CERTIFICATE NUMBER:

DATE OF EXPIRY: ISSUE NUMBER:

REFERENCE NUMBER :

This certificate is issued after examination of the detailed test results which indicate that the batteries detailed below comply with the Supplement quoted. It is issued by the Ministry of Defence under the conditions specified in DEF STAN 61-3 and is subject to withdrawal at the discretion of the Approving Authority.

Manufacturer's Name:

Place of Manufacture:

Test Report Number:

Description of Battery:

Manufacturers Drawing Reference:

(Master Record Index/Issue)

Approved on behalf of the DELSC Subcommittee L10.

Signed: Date:

APPROVAL WITHDRAWAL NOTIFICATION

REFERENCE NUMBER:

This notice is issued by the Approval Authority to give notice to the manufacturer that the Full/Interim* Qualification Approval has been withdrawn.

Manufacturer's Name:

Place of Manufacture:

Supplement Details:

Description of Batteries:

Reason for Withdrawal of Approval:
(either of the following a-f)

*a. At manufacturer's request.
*b. Failure to meet Standard/Supplement requirements.
*c. Confirmed failure of batteries in service.
*d. Significant changes to products or processes without prior notification.
*e. Qualification approval not reviewed by/on review/expiry date.
*f. When the manufacturer's quality system approval is withdrawn.
*g. Other reasons.

Comments:

Issued on behalf of the DELSC Subcommittee L10.

Signed: Date:

*Delete as appropriate

CERTIFICATE OF CONFORMITY

Serial Number:

Manufacturer's Name:

Battery Name:

Supplement Number:

Inspection Batch Identification Number:

The batteries detailed above have been manufactured, inspected and tested in conformity with DEF STAN 61-3 and the relevant Supplement quoted and are released with my authority under Qualification Approval Certificate Number:

Signed: Quality Manager:

Date:

MAINTENANCE OF APPROVAL NOTIFICATION

Section A (to be completed by the Manufacturer)

This notice is issued by the manufacturer, in accordance with clause **12** to demonstrate that the Qualification Approval related to the undermentioned battery has been maintained.

Qualification Approval Certificate Number:

Certificate Expiry Date:

Manufacturer:

Battery Description:

Supplement Number:

Details of contracts against which the Approved battery has been supplied.

Group C report Reference numbers (a summary of results is to be attached).

We certify that the requirements of DEF STAN 61-3 and the relevant Supplement are satisfied and that we can comply with the requirements under which the original certificate was issued.

Quality Manager’s Signature: Date:

Section B (to be completed by the AAR)

We confirm that the certificate has been maintained and should be revalidated:

Signed: Date:

Section C (to be completed by the Approval Authority)

Qualification Approval Certificate revalidated.

New Expiry Date:

Signed: Date:

DECLARATION OF DESIGN PERFORMANCE

Section A (to be completed by the Manufacturer)

This DDP is issued by the manufacturer, and certified by the AAR, to confirm that the information provided in the undermentioned Preferred Battery Supplement can be met.

DDP Reference Number..... Issue Number .....

NSN .....

DELSC L10 Reference .....

Preferred Battery Supplement Number and Issue .....

(Name and Address of Manufacturer)

.....

.....

.....

.....

Declaration of Design Performance

Battery Description .....

Design Specification Reference.....

Drawing Schedule Reference.....

Quality Plan Reference .....

Test Report Reference .....

.....

The above information confirms that the requirements specified in the PBS can be satisfied. Any subsequent changes which may be made to the battery will be notified to the Approving Authority.

Technical Manager .....Date .....
(Signed by the Senior Technical Manager)

Section B (to be completed by the AAR)

We confirm that the above information is correct.

Signed: Date:

Copies of the completed form shall be retained by the approval authority and copied to the Controllerate Technical Authorities, Supply Managers and Procurement Authorities.

Published by and obtainable from:
Ministry of Defence
Directorate of Standardization
Kentigern House
65 Brown Street
GLASGOW G2 8EX

Tel No: 041-248 7890

The following Defence Standard file reference relates to the work on this Standard - D/D Stan/371/03/10.

Contract Requirements

When Defence Standards are incorporated into contracts users are responsible for their correct application and for complying with contract requirements.

Revision of Defence Standards

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

Procurement Executive, Ministry of Defence

Directorate of Standardization
Room 1138, Kentigern House, 65 Brown Street, GLASGOW, G2 8EX

Telephone: 0141-224 2595 (Direct Dialling) Fax: 0141-224 2503
0141-248 7890 (Switchboard)
Internet e-mail address: t.leaver@dstan.mod.uk

Your Reference :

Our Reference : D/DStan/11/2

Date : 9 November 1998

Removal of Product Qualification Approval

IMPORTANT ANNOUNCEMENT

1. This Standard contains a Product Qualification Approval (PQA) scheme. [i]MOD policy requires that all PQA schemes are removed from Defence Standards called up in contracts placed after 1st January 1998.

2. Users of this Standard are to contact the Project Manager (PM), Equipment Support Manager (ESM) or Technical Service Authority (TSA) named in the contract or order, to identify whether there is a continuing need for an approvals scheme.

3. [ii]Product Conformity Certification (PCC) is a risk based process that replaces PQA. Once a risk has been identified PCC can be included as a contract clause. In exceptional circumstances agreement can be sought from AD/Stan for PCC to be included in a Defence Standard.

4. At the next revision of this Standard the PQA scheme will be removed.

T R Leaver
Head of Standards Programme Management
Tel: 0141 224 2595 FAX: 0141 224 2503

[i] Defence Council Instruction (General) 197/97; Quality Temporary Memorandum 5/98; Chief of Defence Procurement Instruction CDPI/TECH/250 (draft)

[ii] PCC is certification that a product meets its specification. When PC is required by the contract, the contractor is responsible for obtaining the necessary PCC. Certification shall be provided from a NAMAS accredited laboratory when appropriate. PCC shall apply where a Risk Assessment has been identified by the PM; ESM or TSA.