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Defence Standard

61-3 Supplement B/Issue 1

7 May 1993



GENERIC SPECIFICATION FOR BATTERIES, NON
RECHARGEABLE, PRIMARY

SUPPLEMENT B: SPECIFICATION FOR ALKALINE
MANGANESE DIOXIDE BATTERY, 7V, NSN 6135-
99-130-6823

This Supplement supersedes
Def Stan 61-3(Part 1)
Supplement 89/Issue 1- see
Historical Record

DEF STAN 61-3 B/1

AMENDMENTS ISSUED SINCE PUBLICATION

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Revision Note

This is the first issue of this Supplement.

Historical Record

This Supplement supersedes Def Stan 61-3 (Part 1) Supplement 89/1 (issued without formal publication to meet an urgent requirement).

GENERAL SPECIFICATION FOR BATTERIES, NON-RECHARGEABLE, PRIMARY

SUPPLEMENT B: SPECIFICATION FOR ALKALINE MANGANESE DIOXIDE

BATTERY, 7 V, NSN 6135-99-130-6823

PREFACE

This Supplement supersedes
Defence Standard 61-3 (Part 1)
Supplement 89/1 - see Historical
Record

- i** This Supplement shall be read in conjunction with Def Stan 61-3.
- ii** This Supplement provides a definitive specification for the design, construction, qualification approval and production release for a 7 V alkaline manganese dioxide battery.
- iii** This Supplement has been prepared by the Defence Electrical and Electronic Standardization Committee (DELSC), L10 Batteries, because there is no suitable national or other Standard available.
- iv** This Supplement 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.
- v** Any enquiries regarding this Supplement 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.
- vi** This Supplement has been devised for the use of the Crown and 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 Supplement is used for any other purpose.

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GENERIC SPECIFICATION FOR BATTERIES, NON-RECHARGEABLE, PRIMARY

SUPPLEMENT B: SPECIFICATION FOR ALKALINE MANGANESE DIOXIDE BATTERY, 7 V,
NSN 6135-99-130-6823

1 Scope

This Supplement provides a definitive specification for the design, construction, qualification approval and production release for a 7 V alkaline manganese dioxide battery.

2 Related Documents

For the purposes of this Supplement all related documents are listed in Defence Standard 61-3.

3 Electrical Characteristics

3.1 Nominal voltage. The nominal voltage of the battery shall be 7 V.

3.2 On-load voltage. The battery shall have a maximum on load voltage of 6.95 V, when a current of 30 +0 mA is delivered.
-2

3.3 End-point voltage. The end point voltage of the battery shall be 4.5 V.

4 Physical Characteristics

4.1 Dimensions. The overall dimensions of the battery will be in accordance with figure 2.

4.2 Mass. The mass of the battery shall not exceed 150 g.

5 Construction and Materials

5.1 Battery construction. Five LR6 cells shall be connected in series and rigidly bonded within an insulating sleeve of black PVC in accordance with the requirements of figure 2. Intercell connections shall be resistance welded. Internal electronic components may be used to satisfy the maximum on-load voltage requirement stated in 3.2.

5.2 Terminals. All terminals shall be in accordance with the requirements of figures 3 and 4.

5.3 Protective end cap. Each battery will be provided with two protective end caps constructed in accordance with the requirements of figure 5. Alternative end caps may be acceptable provided they fit securely to the battery and meet the functional requirements of this Supplement.

5.4 Cell details. The LR6 cells used in the battery construction shall have been qualified and released in accordance with the requirements of Def Stan 61-3, Supplement A.

6 Marking

All marking shall be in accordance with the requirements of Def Stan 61-3 and figure 6.

7 Qualification Approval

7.1 For qualification approval the manufacturer shall comply with the requirements of Def Stan 61-3 and this Supplement.

7.2 Qualification approval tests. Unless otherwise stated, information appertaining to these tests is contained in Def Stan 61-3.

The manufacturer shall produce 40 batteries for qualification approval testing in accordance with the test programme outlined in figure 1.

7.2.1 Spares shall be inserted into the appropriate test regime in the event of operator error or equipment malfunctions.

7.2.2 Batteries for jungle and desert storage shall be stored singly and with the end caps fitted.

7.2.3 Insulation resistance. The insulation resistance of the sample batteries subjected to jungle storage shall be measured after storage and shall be greater than 2 M Ω

7.2.4 Functional. The batteries shall be functionally tested by the application of a 112 Ω load, for a period of five seconds, during which time the voltage shall not fall below 4.5 V. The functional test shall be carried out on each battery at 20°C at the following intervals:

- (a) At the start of the qualification approval exercise.
- (b) Prior to battery discharge.
- (c) After periods of not more than 8 weeks storage.

7.2.5 Discharge. The sample batteries shall be discharged at the temperature specified for each storage condition in table A using a load resistance of 330 Ω . The time taken to reach an on-load end-point voltage of 4.5 V shall be not less than the minimum discharge life stated.

7.2.6 Weld integrity. The sample batteries submitted for weld integrity testing shall be destructively examined to demonstrate the integrity of cell to terminations and intercell connections. The criteria for acceptance shall be that when the weld connection is pulled apart, the material of either the interconnecting strip or the battery terminal shall be ruptured leaving the weld "nugget" intact, the weld itself shall not part at its interface.

8 Quality Conformance Testing

8.1 Quality conformance testing shall be in accordance with the requirements of Def Stan 61-3 and this Supplement.

8.2 Each batch of batteries manufactured in accordance with this Supplement shall be subjected to quality conformance testing in accordance with the test regime at 8.3.

8.3 Quality conformance tests. The batteries from each manufactured lot shall be subjected to the quality conformance tests, group A, B and C as follows:

8.3.1 Group A. Each battery manufactured shall be checked for compliance with the on-load voltage limit of section 3.2 and inspected to the marking and construction requirements.

8.3.2 Group B. A sample shall be selected from the batch in accordance with BS 6001 Inspection Level S3 to an AQL of 0.65%. The sample shall be subjected to the temperate (short term) storage period and shall meet the minimum discharge life stated in table A when discharged at 20°C.

8.3.3 Group C. Six batteries shall be selected from the batch and divided into three sub-groups. The sub-groups shall be subjected to the temperate (intermediate term), jungle and desert storage periods respectively and shall meet the minimum discharge life stated in table A. These results will be used for maintenance of approval in accordance with Def Stan 61-3.

Table A

Storage Conditions and Minimum Discharge Life for Qualification Approval Testing

Storage Condition	Storage Period (Weeks)	Minimum Discharge Life after Storage (Hours)		
		55°C ± 2°C	20°C ± 2°C	-37°C ± 2°C
Temperate (Short Term)	4	130	120	18
Temperate (Intermediate Term)	104	NA	113	NA
Temperate (Long Term)	208	NA	110	NA
Jungle	8	NA	125	NA
Desert	26	NA	115	NA
Temperate (Spare)	See 7.2.1			

NOTE: NA indicates not applicable.

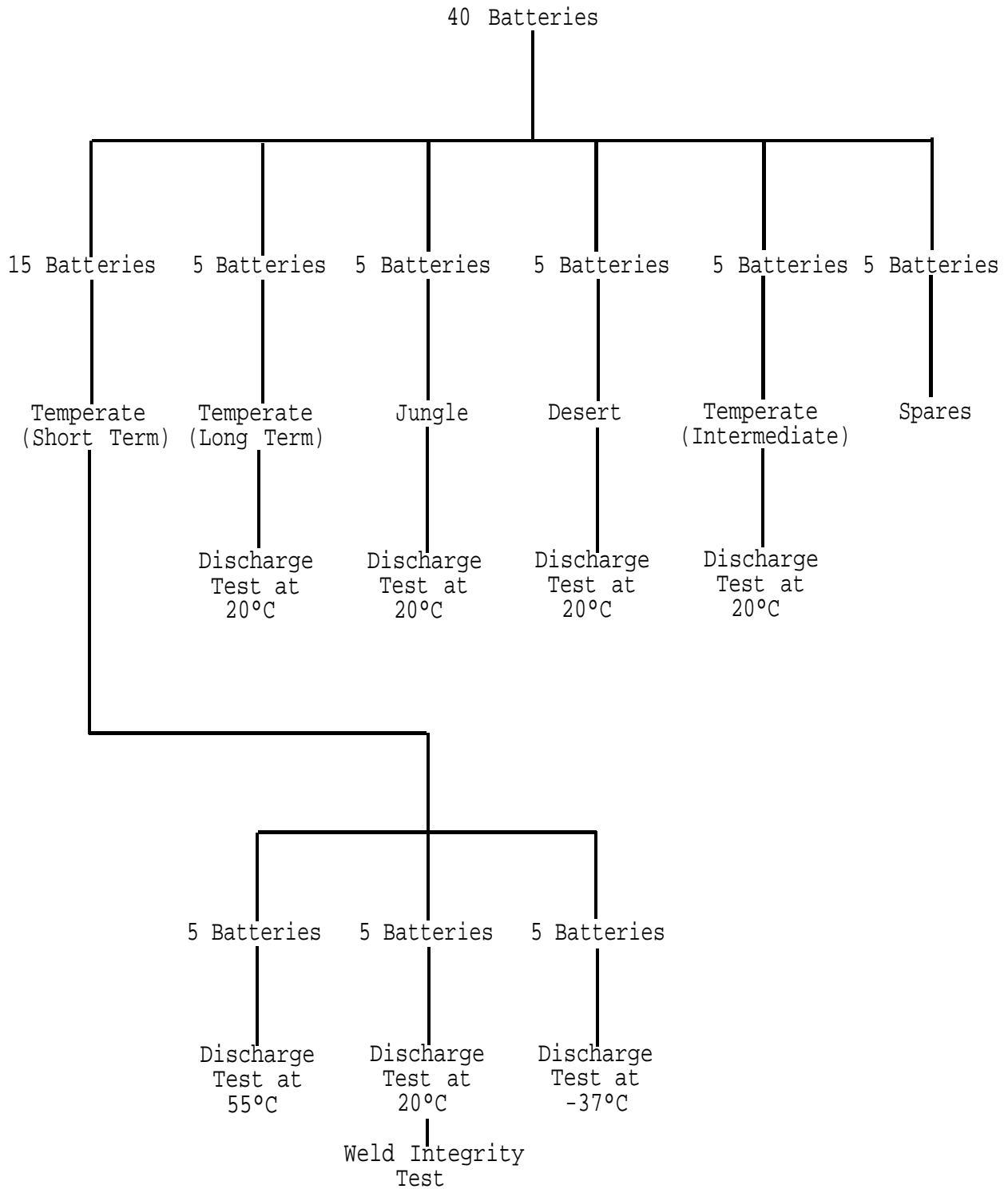
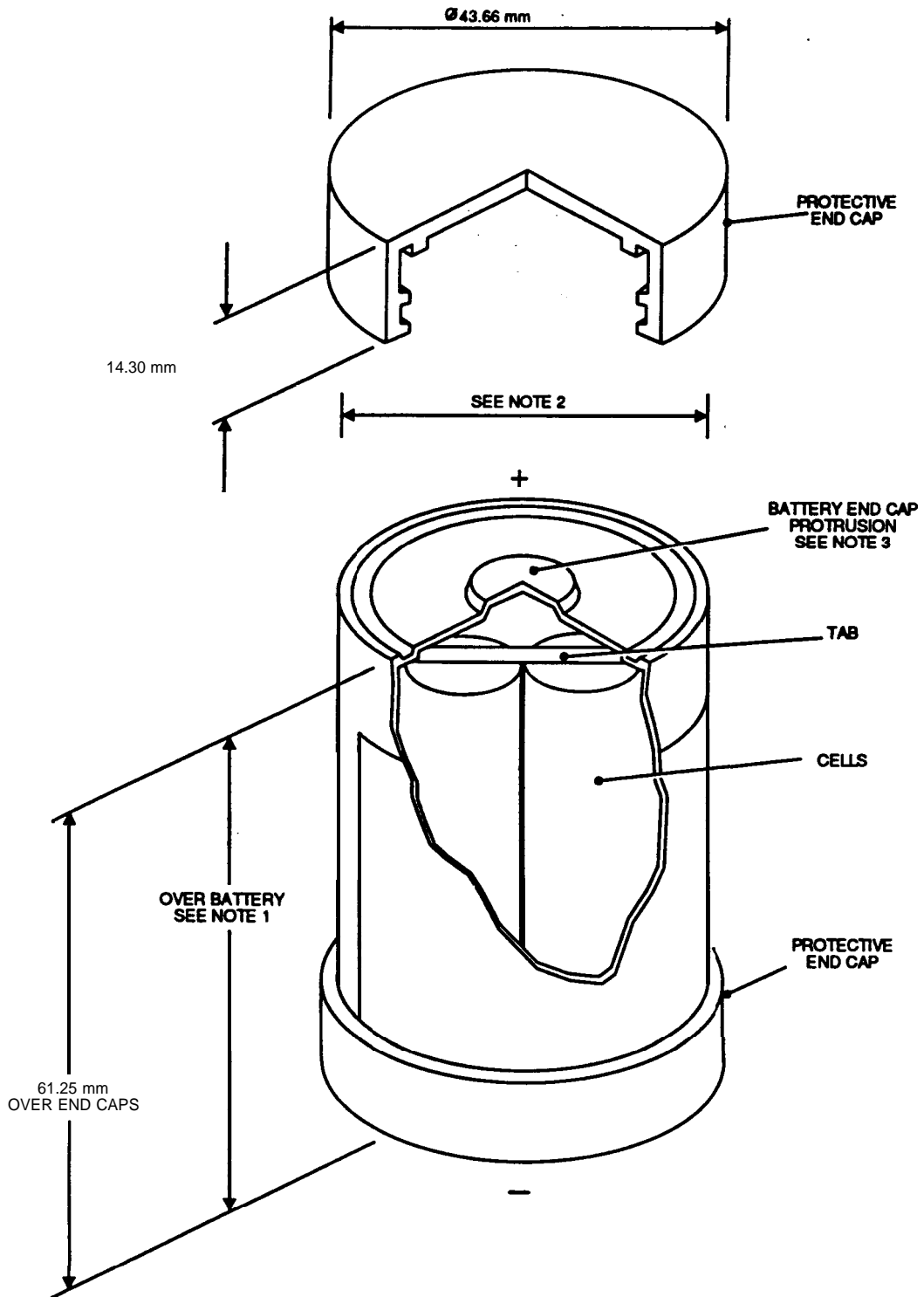


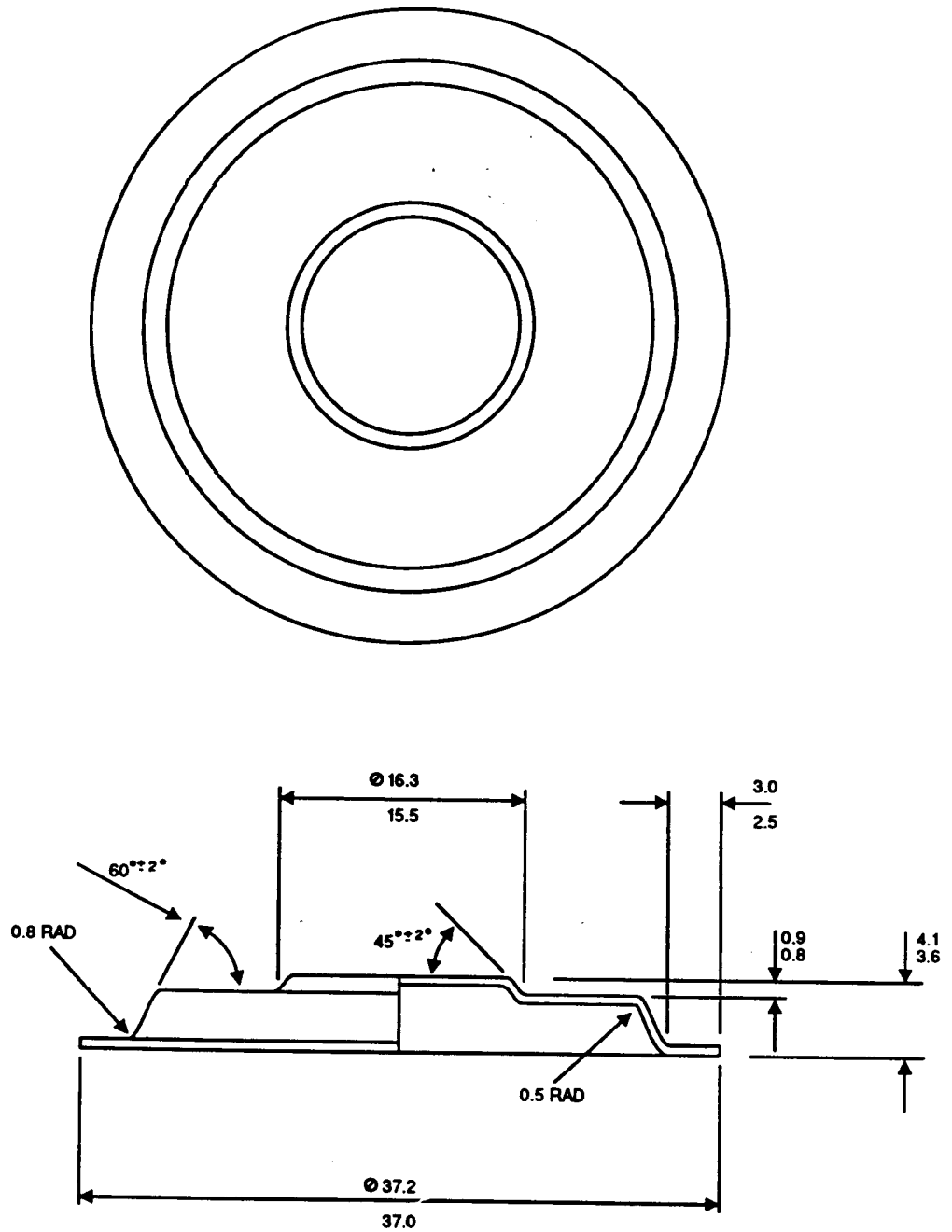
Fig 1 Qualification Approval Test Programme



NOTES:

1. Battery overall length to be between 57.9 and 59.5 mm.
2. Battery diameter to be between 37.3 and 38.9 mm.
3. The end caps of the battery shall protrude above the crimped end of the insulating sleeving between 0.38 and 1.00 mm.

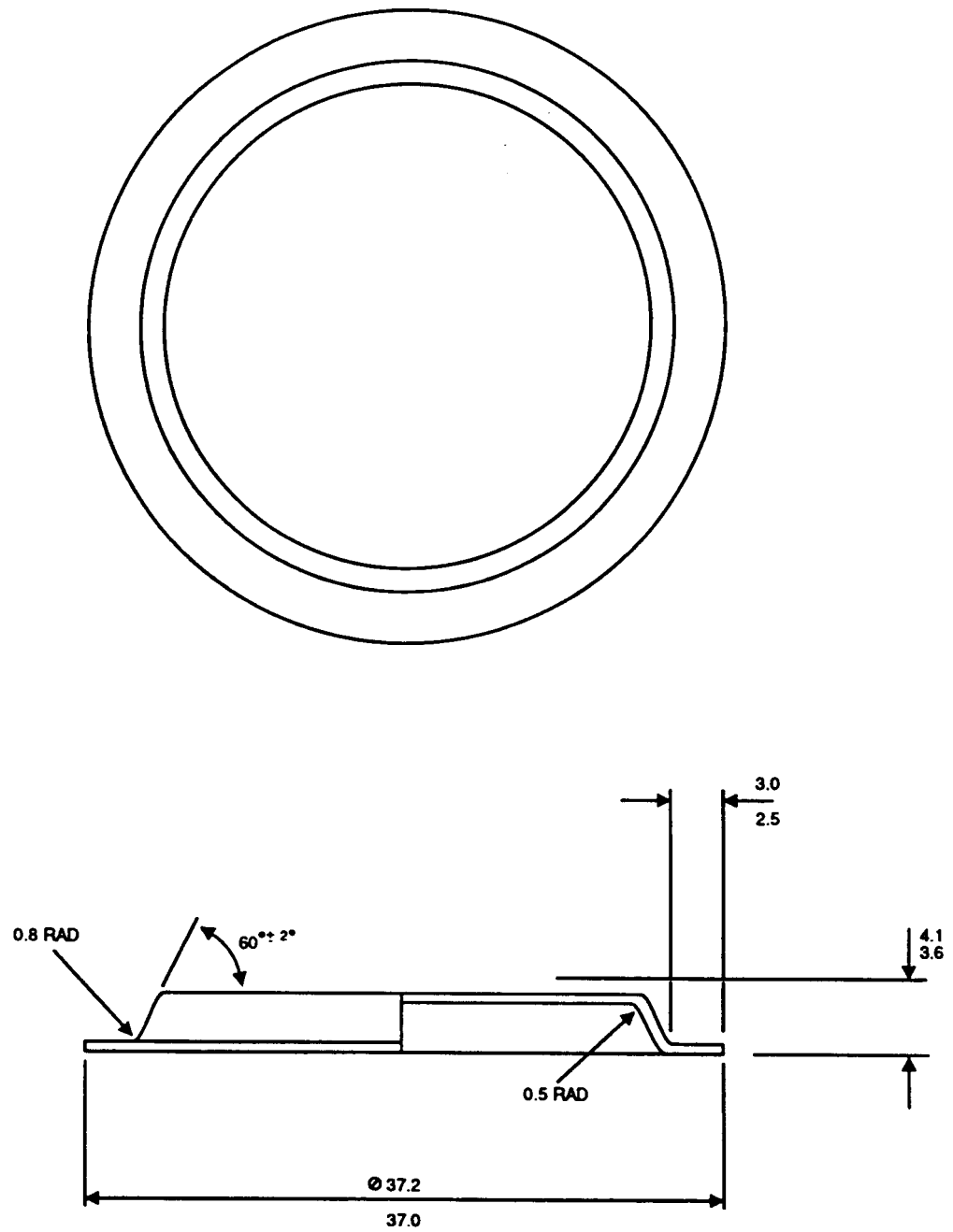
Fig 2 General Arrangement Drawing of Battery, Non-rechargeable, Alkaline Manganese Dioxide, 7 V



NOTES:

1. All dimensions in mm.
2. Material to be nickel plated steel.
3. Finish-free from grease and burrs.

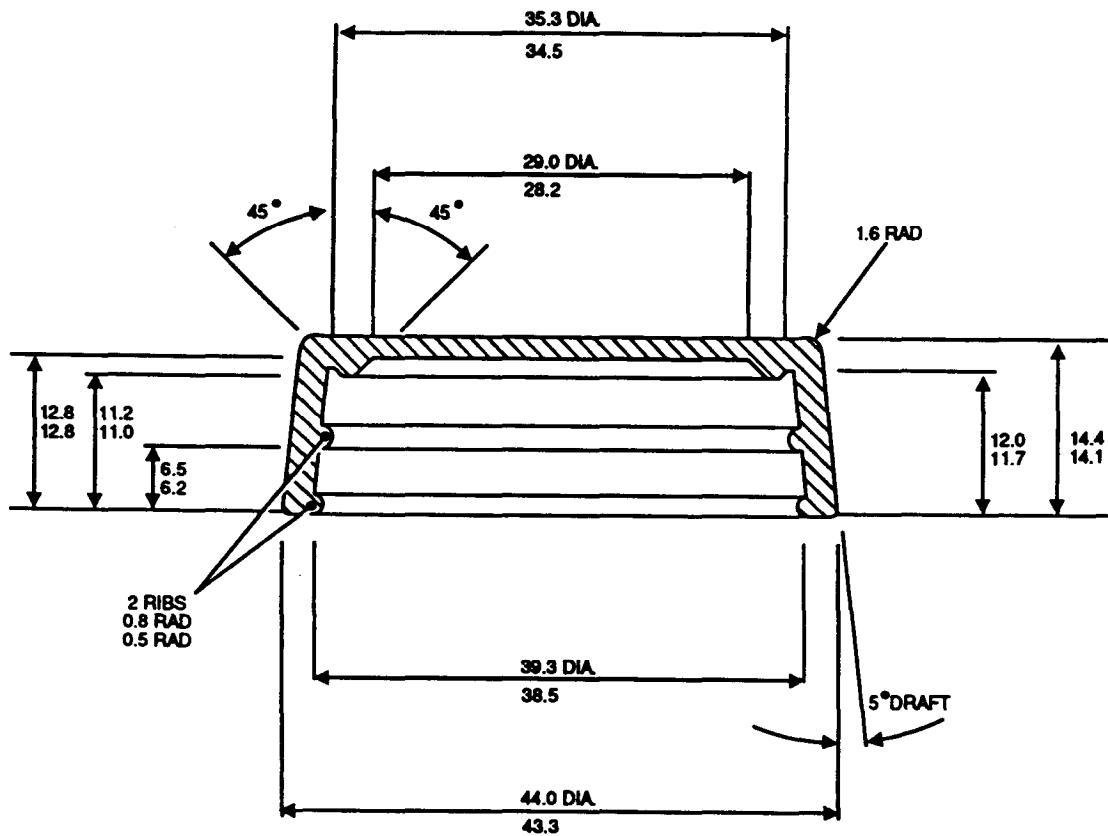
Fig 3 Positive Terminal Drawing



NOTES:

1. All dimensions in mm.
2. Material to be nickel plated steel.
3. Finish-free from grease and burrs.

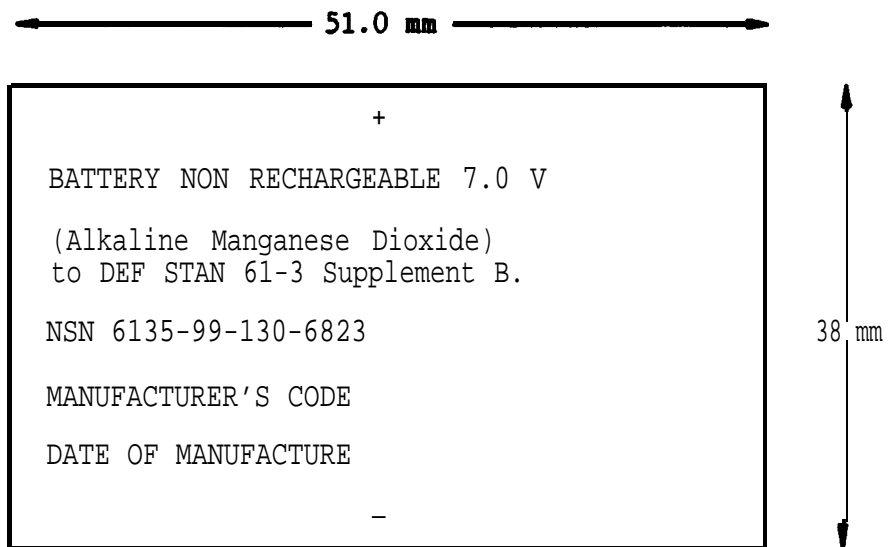
Fig 4 Negative Terminal Drawing



NOTES:

1. All dimension in mm.
2. Material to be thermoplastic rubber, Shell Krayton Type No 3202, 55 degree Shore, Black or an approved equivalent.

Fig 5 Protective End Cap Drawing



NOTE: Characters to be 4.0 mm high, legibly and durably marked.

Fig 6 Label Drawing

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The following Defence Standard file reference relates to the work on this Standard D/D Stan/371/08/10

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.



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Removal of Product Qualification Approval

IMPORTANT ANNOUNCEMENT

1. This Standard contains a Product Qualification Approval (PQA) scheme. 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. "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

¹ Defence Council Instruction (General) 197/97; Quality Temporary Memorandum 5/98; Chief of Defence Procurement Instruction CDPI/TECH/250 (draft)

² 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.