

Reliability of systems, equipment and components —

Part 13: Guide to reliability test conditions for consumer equipment —

Section 13.5 Ground mobile equipment — Low degree of simulation

ICS 29.020

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee DS/1, Reliability and maintainability systems, upon which the following bodies were represented:

- Association of Consulting Engineers
- Association of Project Managers
- British Gas plc
- British Railways Board
- British Telecommunications plc
- Chartered Institution of Building Services Engineers
- City University
- Civil Aviation Authority
- Consumer Policy Committee of BSI
- Consumers' Association
- Cranfield University
- Defence Manufacturers Association
- Electricity Association
- Federation of the Electronics Industry
- GAMBICA (BEAMA Ltd.)
- Institute of Logistics
- Institute of Quality Assurance
- Institute of Risk Management
- Institute of Value Management
- Institution of Electrical Engineers
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- London Underground Ltd.
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- Mercury Communications Limited
- Ministry of Defence
- National Computing Centre Ltd.
- Railtrack
- Railway Industry Association
- Royal Institution of Chartered Surveyors
- Royal Statistical Society
- Safety and Reliability Society
- Society of Environmental Engineers
- Society of Motor Manufacturers and Traders Limited
- University of Bradford
- West Midlands Enterprise Board

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Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Introduction	1
1 Scope	1
2 Normative references	2
3 Definitions	2
4 Applicability	2
5 Basic assumptions concerning operational environment	3
6 Pre-exposure tests	4
7 Description of the test cycle	5
8 Relevant test time	7
Annex A (informative) Bibliography	9
Figure 1 — Test cycle	8
Table 1 — Climatic conditions encountered for a long period of time	3
Table 2 — Examples of equipment	3
Table 3 — Climatic conditions according to IEC 721-2-1	4
Table 4 — Climatic conditions: externally carried equipment	6
Table 5 — Climatic conditions: internally carried equipment	6
Table 6 — Vibration test severities	7
List of references	Inside back cover

National foreword

This Part of BS 5760 has been prepared by Technical Committee DS/1 and is the English language version of IEC 605-3-5:1996 *Equipment reliability testing — Part 3: Preferred test conditions — Section 5: Test cycle 5: Ground mobile equipment — Low degree of simulation* and its corrigendum March 1996, published by the International Electrotechnical Commission (IEC).

This Part of BS 5760 describes preferred test conditions with a low degree of simulation referred to in BS 5760-10.1:1993 and is applicable to direct current (d.c.) powered mobile equipment.

BS 5760 is published in a series of Parts and Sections. It provides comprehensive guidance on many aspects of reliability management as follows:

- *Part 0: Introductory guide to reliability;*
- *Part 1: Guide to reliability and maintainability programme management;*
- *Part 2: Guide to assessment of reliability;*
- *Part 3: Guide to reliability practices: examples;*
- *Part 4: Guide to specification clauses relating to the achievement and development of reliability in new and existing items;*
- *Part 5: Guide to failure modes, effects and criticality analysis (FMEA and FMECA);*
- *Part 6: Guide to programmes for reliability growth;*
- *Part 7: Guide to fault tree analysis;*
- *Part 9: Guide to the block diagram technique (BS EN 61078);*
- *Part 10: Guide to reliability testing;*
- *Section 10.1: General requirements;*
- *Section 10.2: Design of test cycles;*
- *Section 10.3: Compliance test procedures for steady-state availability;*
- *Section 10.5: Compliance test plans for success ratio;*
- *Part 11: Collection of reliability, availability, maintainability and maintenance support data from the field;*
- *Part 12: Guide to the presentation of reliability, maintainability and availability predictions;*
- *Part 13: Guide to reliability test conditions for consumer equipment;*
- *Section 13.1: Conditions providing a low degree of simulation for indoor portable equipment;*
- *Section 13.2: Conditions providing a high degree of simulation for equipment for stationary use in weatherprotected locations;*
- *Section 13.3: Conditions providing a low degree of simulation for equipment for stationary use in partially weatherprotected locations;*
- *Section 13.4: Conditions providing a low degree of simulation for equipment for portable and non-stationary use;*
- *Section 13.5: Test conditions for ground mobile equipment — Low degree of simulation;*
- *Part 14: Guide to formal design review;*
- *Part 15: Guide to the Application of Markov techniques;*
- *Part 16: Guide to stress screening;*
- *Section 16.1: Repairable items manufactured in lots;*
- *Part 17: Statistical test and estimation methods.*

Further Parts of BS 5760 are envisaged in order to provide guidance on other techniques of reliability management.

NOTE 1 A proposed BS 5760-8 *Guide to the assessment of reliability of systems containing software* is in preparation and is available as DD 198:1991.

Whilst mainly addressing system and equipment level reliability, many of the techniques described in the Parts of BS 5760 may also be applied at the component level. Further guidance on component reliability is given in BS CECC 00804:1996.

Guidance on specific aspects of maintainability is provided in the various Parts of BS 6548 *Maintainability of equipment*.

NOTE 2 This Part of BS 5760 makes reference to BS 4778 *Quality vocabulary*, and in particular to BS 4778-3.2, which contains definitions relating to concepts applicable to this Part of BS 5760. It is essential that these definitions and concepts should be fully understood if this guide is to be interpreted correctly. For this reason it is recommended that BS 4778 should be read in conjunction with BS 5760.

NOTE 3 BS 4778-3.2 deprecates the use of the terms “failure modes and effects analysis” and “failure modes, effects and criticality analysis”. It favours the use of “fault modes and effects analysis” and “fault modes, effects and criticality analysis”, and these terms are used throughout BS 5760-2. However, the older terms have been retained in BS 5760-5 in order to align it with the current versions of IEC 812.

Cross-references

Publication referred to	Corresponding British Standard
IEC 50(191):1990	BS 4778 <i>Quality vocabulary</i> Part 3 <i>Availability, reliability and maintainability terms</i> Section 3.2:1991 <i>Glossary of international terms</i> (Identical) BS EN 60068 <i>Environmental testing</i> BS EN 60068-2 <i>Test methods</i>
IEC 68-2-1:1990	BS EN 60068-2-1:1993 <i>Tests A. Cold</i> (Identical)
IEC 68-2-2:1974	BS EN 60068-2-2:1993 <i>Tests B. Dry heat</i> (Identical)
IEC 68-2-6:1995	BS EN 60068-2-6:1996 <i>Test Fc. Vibration (sinusoidal)</i> (Identical) BS 2011 <i>Environmental testing</i> Part 2.1 <i>Tests</i>
IEC 68-2-14:1984	Part 2.1N:1985 <i>Test N. Change of temperature</i> (Identical)
IEC 68-2-52:1984	Part 2.1Kb:1987 <i>Test Kb. Salt mist, cyclic (sodium chloride solution)</i> (Identical) BS EN 60068 <i>Environmental testing</i> BS EN 60068-2 <i>Test methods</i>
IEC 68-2-64:1993	BS EN 60068-2-64:1995 <i>Test Fh. Vibration broad-band random (digital control) and guidance</i> (Identical)
IEC 605-1:1978	BS 5760 <i>Reliability of systems, equipment and components</i> Part 10 <i>Guide to reliability testing</i> Section 10.1:1993 <i>General requirements</i> (Identical)
IEC 721-2-1:1982	BS 7527 <i>Classification of environmental conditions</i> Part 2 <i>Environmental conditions appearing in nature</i> Section 2.1:1991 <i>Temperature and humidity</i>

IEC 721-3-5:1985	BS EN 60721 <i>Classification of environmental conditions</i> BS EN 60721-3 <i>Classification of groups of environmental parameters and their severities</i> BS EN 60721-3-5:1993 <i>Ground vehicle installations</i> BS AU 243 <i>Methods of test for electrical disturbance by conduction and coupling</i>
ISO 7637-0:1990	Part 1:1991 <i>General</i> (Identical)
ISO 7637-1:1990	Part 2:1991 <i>Electrical transient conduction along supply lines only on passenger cars and light commercial vehicles with 12 V supply</i> (Identical)
ISO 7637-2:1990	Part 3:1991 <i>Electrical transient conduction along supply lines only on commercial vehicles with 24 V supply</i> (Identical)

Additional information. This standard is a guide and the use of the verbal forms “must” and “shall” in the text does not indicate mandatory requirements.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.