

Specification for

Electromechanical components for electronic equipment: testing procedures and measuring methods —

**Part 5: Impact tests (free components),
static load tests (fixed components),
endurance tests and overload tests**

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Electronic Components Standards Policy Committee (ECL/-) to Technical Committee ECL/21, upon which the following bodies were represented:

- EEA (the Association of the Electronics, Telecommunications and Business Equipment Industries)
- Electronic Components Industry Federation
- Ministry of Defence
- National Supervising Inspectorate

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National foreword

This Part of BS 5772 has been prepared under the direction of the Electronic Components Standards Policy Committee. It is identical with IEC Publication 512-5:1992, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 5: Impact tests (free components), static load tests (fixed components), endurance tests and overload tests* published by the International Electrotechnical Commission (IEC).

It supersedes: BS 5772-5:1979
BS 5772-5:Supplement 1:1981
BS 5772-5:Supplement 2:1982

which are withdrawn.

It should be read in conjunction with Part 1 *General* of BS 5772:1985 (IEC 512-1:1984) which contains information on fundamental test methods and procedures to be employed in implementing the requirements of this standard.

Cross-references

International standard	Corresponding British Standard
IEC 68-2-13:1983	BS 2011 <i>Environmental testing</i> Part 2.1M:1984 <i>Test M. Low air pressure</i> (Identical)
IEC 512-1:1984	BS 5772 <i>Basic testing procedures and measuring methods for electromechanical components for electronic equipment</i> Part 1:1985 <i>General</i> (Identical)

The Technical Committee has reviewed the provisions of IEC 65:1985 and IEC 130-1:1988 to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard. A related British Standard to IEC 65:1985 is BS 415:1990 *Specification for safety requirements for mains-operated electronic and related apparatus for household and similar general use*.

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 and ii, pages 1 to 12, 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.

Section 0. General

0.1 Scope

The tests contained herein, when required by the detail specification, shall be used for electromechanical components within the scope of technical committee no. 48¹⁾.

They may also be used for similar devices when specified in a detail specification.

0.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 512. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 512 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 65:1985, *Safety requirements for mains operated electronic and related apparatus for household and similar general use.*

IEC 68-2-13:1983, *Environmental testing — Part 2: Tests. Test M: Low air pressure.*

IEC 130-1:1988, *Connectors for frequencies below 3 MHz — Part 1: General requirements and measuring methods.*

IEC 512-1:1984, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 1: General.*

Section 1. Impact tests (free components)

1 Test 7a: Free fall (repeated)

1.1 Object

The object of this test is to define a standard test method to assess the ability of a component to withstand the impacts it would receive when dropped repeatedly.

1.2 Preparation of the specimen

Unless otherwise specified, the specimen shall not be mounted or wired, but shall be fitted with normal accessories according to the detail specification.

1.3 Test method

The specimen shall be tested in a tumbling barrel as shown in Figure 1.

The barrel turns at a rate of approximately 5 rev/min.

The total number of revolutions (falls) shall be according to the detail specification.

NOTE When IEC 65 applies, the barrel revolves 50 times if the mass of the specimen is up to 250 g and 25 times if the mass is greater than 250 g.

1.4 Final examination

The specimen shall be visually examined according to test 1a.

If required by the detail specification, the operation shall be checked.

1.5 Requirements

There shall be no broken parts or damage that would impair normal operation.

1.6 Details to be specified

When this test is required by the detail specification, the following details shall be given:

- preparation of the specimen;
- accessories to be installed, when appropriate;
- total number of revolutions (falls);
- operational requirements;
- any deviation from the standard test method.

2 Test 7b: Mechanical strength impact

2.1 Object

The object of this test is to detail a standard test method to assess the ability of an electromechanical component on the end of a cable or wire bundle to withstand impacts it could receive when dropped on to a hard surface.

2.2 Preparation of the specimen

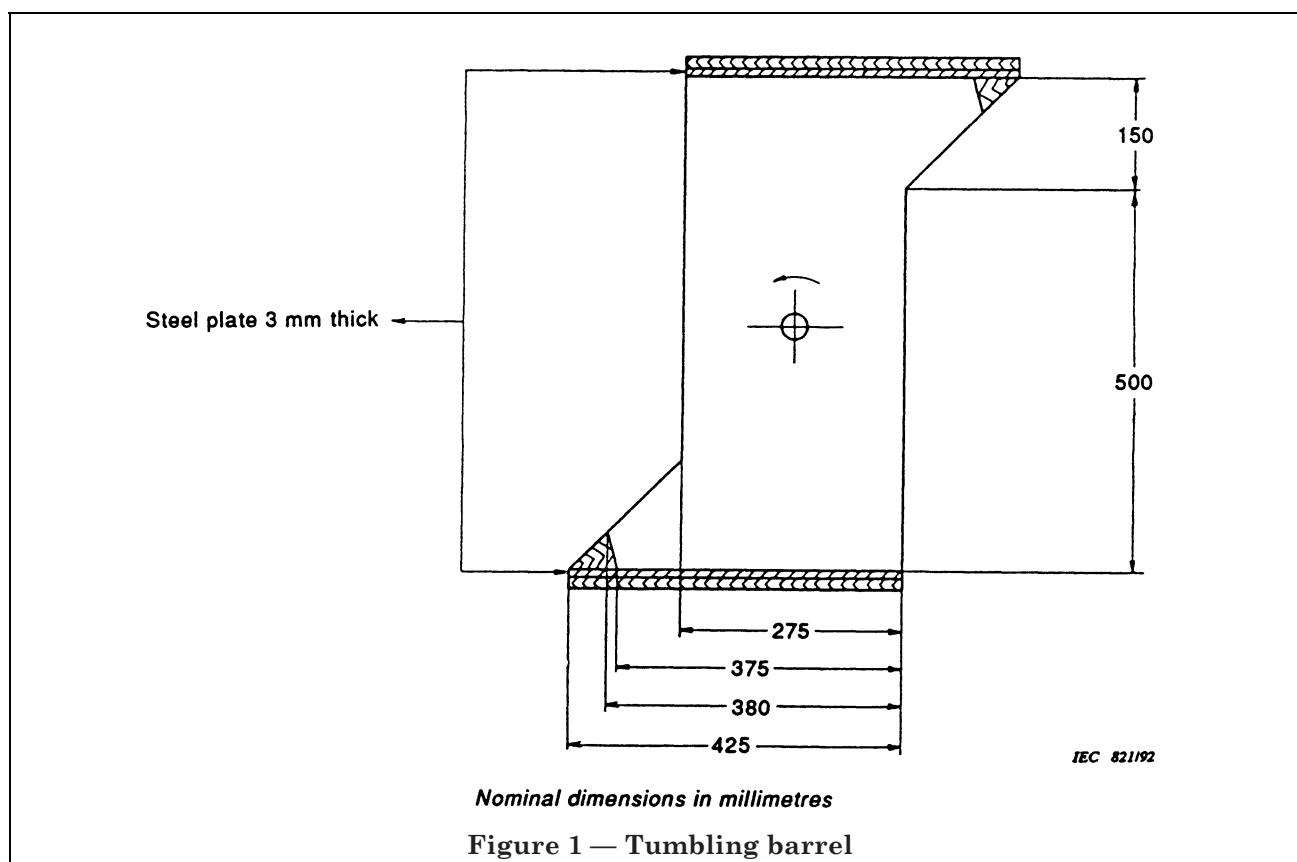
The specimen shall consist of a free connector or a similar component with its accessories fitted in the normal manner and wired as used in the normal application.

The specimen shall be prepared in accordance with the detail specification.

¹⁾ *Scope of technical committee 48:* To prepare international standards regarding components having an inherent electromechanical connecting, or switching function, intended for use in equipment for telecommunication and in electronic devices employing similar techniques.

NOTE 1 R.F. connectors will not be dealt with by this technical committee as they will be covered by technical committee 46 together with r.f. cables.

NOTE 2 Sockets for components such as crystals or electronic tubes shall be considered in co-operation with the relevant technical committee.



If the component is normally provided for use with different types of cables, the thinnest and/or most flexible type shall be used. The length of the cable or wire bundle shall allow the rear of the specimen to be $2\,250 \pm 10$ mm ($88,6 \pm 0,4$ in) from the point of attachment.

2.3 Test method

The specimen shall be attached in an appropriate manner at a distance of $2\,250 \pm 10$ mm ($88,6 \pm 0,4$ in) from the rear of the component so that the specimen may swing freely from a horizontal to a vertical position as shown in Figure 2.

NOTE An appropriate manner may be the attachment to a swivel. In many cases, however, simply attaching to a hook may be sufficient.

The specimen shall be attached at one of the following preferred heights:

- $2\,000 \pm 10$ mm ($78,7 \pm 0,4$ in)
- $1\,750 \pm 10$ mm ($68,9 \pm 0,4$ in)
- $1\,500 \pm 10$ mm ($59,1 \pm 0,4$ in)
- $1\,250 \pm 10$ mm ($49,2 \pm 0,4$ in)
- $1\,000 \pm 10$ mm ($39,4 \pm 0,4$ in)
- 750 ± 10 mm ($29,5 \pm 0,4$ in)
- 500 ± 10 mm ($19,7 \pm 0,4$ in)

A steel plate $300\text{ mm} \times 500\text{ mm}$ ($11,8\text{ in} \times 19,7\text{ in}$) of 25 mm thickness shall be positioned so that the component under test will fall on to it.

The specimen, attached at the specified height, shall be held in a horizontal position in an attitude as specified and dropped on to the steel plate. This cycle shall be repeated for a total number of times as specified in the detail specification.

2.4 Test requirements

The component shall be visually examined. There shall be no broken parts nor damage that would impair operation.