AS/NZS 1660.5.1:2005

Australian/New Zealand Standard™

# Test methods for electric cables, cords and conductors

# Method 5.1: Fire tests—Test for vertical flame spread of vertically-mounted bunched wires or cables

STANDARDS AUSTRALIA

STANDARDS NEW ZEALAND
Paerewa Aotearoa

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-003, Electric Wires and Cables. It was approved on behalf of the Council of Standards Australia on 25 October 2004 and on behalf of the Council of Standards New Zealand on 15 October 2004.
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Australian/New Zealand Standard™

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# Method 5.1: Fire tests—Test for vertical flame spread of vertically-mounted bunched wires or cables

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# PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-003, Electric Wires and Cables to supersede AS/NZS 1660.5.1:1998, *Test methods for electric cables, cords and conductors*, Method 5.1: *Fire tests—Tests on bunched cables.* It is one of a set of fire tests for electric cables included in the AS/NZS 1660 series.

The objective of this Standard is to set out a method that will define the ability of bunched cables to restrain flame propagation in defined conditions.

This Standard adopts the content of IEC 60332-3, *Tests on electric cables under fire conditions,* Part 3: *Test for vertical flame spread of vertically-mounted bunched wires or cables* (all Parts). While this Standard is technically equivalent to the IEC Standards, it has been structured to include all six Parts of IEC 60332-3 in the one Australian/New Zealand Standard. This has been necessary due to the fact that AS/NZS 1660.5.1 is referenced as such in a number of other Standards. It was not possible to accommodate a further division within the Standards numbering system adopted by Standards Australia.

The technical content of AS/NZS 1660.5.1 and IEC 60332-3 is aligned as follows:

| IEC 60332-3 Part | AS/NZS 1660.5.1 Section |
|---|---|
| 10: Apparatus | 2 |
| 21: Category AF/R | 3 |
| 22: Category A | 4 |
| 23: Category B | 5 |
| 24: Category C | 6 |
| 25: Category D | 7 |

This Standard differs from the 1998 version in that it has adopted the technical contents of IEC 60332.3 (all Parts).

As this Standard adopts the content of an International Standard a full point should be substituted for a comma when referring to a decimal marker in Figure 4 and Figure 6.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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# INTRODUCTION

AS/NZS 1660.5.6 specifies methods of test for flame spread characteristics for a single vertical insulated wire or cable. It cannot be assumed that, because a wire or cable meets these requirements, a vertical bunch of similar cables or wires will behave in a similar manner. This is because flame spread along a vertical bunch of cables depends on a number of features, such as—

(a) the volume of combustible material exposed to the fire and to any flame which may be produced by the combustion of the cables;

(b) the geometrical configuration of the cables and their relationship to an enclosure;

(c) the temperature at which it is possible to ignite the gases emitted from the cables;

(d) the quantity of combustible gas released from the cables for a given temperature rise;

(e) the volume of air passing through the cable installation; and

(f) the construction of the cable, for example armoured or unarmoured, multi- or single-core.

All of the foregoing assume that the cables are able to be ignited when involved in an external fire.

This Standard gives details of a test where a number of cables are bunched together to form various test sample installations. For easier use and differentiation of various test categories, the Sections of this Standard are designated as follows:

Section 2: Apparatus

Section 3: Category A F/R

Section 4: Category A

Section 5: Category B

Section 6: Category C

Section 7: Category D

Sections 3 to 7 define the various categories and the relevant procedures. The categories are distinguished by test duration, the volume of non-metallic material of the test sample and the method of mounting the sample for the test. In all categories, cables having at least one conductor of cross-sectional area greater than 35 $mm^2$ are tested in a spaced configuration, whereas cables of conductor cross-sectional area of 35 $mm^2$ or smaller are tested in a touching configuration.

The categories are not necessarily related to different safety levels in actual cable installations. The actual installed configuration of the cables may be a major determinant in the level of flame spread occurring in an actual fire.

The method of mounting described in Category A F/R (Section 3) is intended for special cable designs used in particular installations.

Categories A, B, C and D (Sections 4 to 7 respectively) are for general use where different non-metallic volumes are applicable.

Additional categories, especially to cover the use of small diameter communication cables in closely bunched configurations, will be further considered when more data are available.