

Australian Standard™

**Methods for fire tests on building  
materials, components and structures**

**Part 4: Fire-resistance test of elements  
of construction**

**STANDARDS**  
Australia



This Australian Standard was prepared by Committee FP-018, Fire Safety. It was approved on behalf of the Council of Standards Australia on 11 July 2005. This Standard was published on 9 September 2005.

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The following are represented on Committee FP-018:

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Australian Fire Authorities Council  
Australian Building Codes Board  
Australian Chamber of Commerce and Industry  
Australian Industry Group  
Australian Institute of Building  
Building Research Association of New Zealand  
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*This Standard was issued in draft form for comment as DR 04100.*

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**Part 4: Fire-resistance test of elements  
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First published as part of AS A30—1935.  
Second edition 1958.  
Revised and redesignated in part as AS 1530.4—1975.  
Fifth edition 2005.

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Published by Standards Australia GPO Box 476, Sydney, NSW 2001, Australia

ISBN 0 7337 6866 0

## PREFACE

### General

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee FP-018, Fire Tests on Building Components, Materials and Structures, to supersede AS 1530.4—1997.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

### Development and International Standards

This Standard follows the general principles and procedures contained in the ISO 834 series, *Fire-resistance test—Elements of building construction*, of Standards and other related ISO documents but has consolidated them in one document, in line with previous editions of AS 1530.4. Reference was also made to relevant European Standards, as appropriate.

The development process for this revision was to consider the relevant ISO Standards and adopt the ISO requirements unless there was a sound technical basis for retaining and/or providing different requirements, that is, the ISO requirements were not consistent with Australian Building design and construction practices or the changes would impose a substantial cost on industry without an appreciable gain.

It is the intention of the Committee to participate in the ISO TC92 process and propose changes to ISO 834 and related Standards such that full adoption of ISO 834 can be proposed during the next review of AS 1530.4.

### Variations to ISO 834

Typical examples of significant variations from ISO requirements include the following:

- (a) The retention of the specification for furnace thermocouples from the previous edition with an option to use the plate thermocouple prescribed in ISO 834-1:1999. The use of the plate thermocouple is described in Appendix B. The use of the plate thermocouple was not adopted in full because of concerns about the durability of the design and the disruption this would cause to industry with little apparent advantage. These issues are being debated internationally. The impact of the plate thermocouple is to reduce the performance of some forms of construction. This would lead to increases in construction cost. The non-mandatory option of including plate thermocouples in tests enables manufacturers to generate data for international markets whilst causing minimum disruption to the Australian industry.
- (b) The retention of duct test methods based on earlier versions of AS 1530.4 because the ISO 6344 Fire resistance tests: Ventilation ducts Standard is not applicable to many Australian applications.
- (c) The retention of thermocouple positions for structurally critical temperatures and test procedures for structural elements to maintain compatibility with design Standards.
- (d) The inclusion of test methods for critical services and alternate test methods in the Appendix that relate to BCA applications that are not addressed in ISO Standards.
- (e) Test methods and standard configurations for service penetrations, test methods for control joints and some failure criteria for doorsets have been retained to be consistent with Australian construction practices, other standards and materials of construction.

### Changes to the 2004 edition

Major changes to the 2004 edition of AS 1530.4 include the following:

- (a) A general transition towards [ISO 834](#) and greater accuracy in the test procedures, which is expected to lead to greater consistency and uniformity of test data, to facilitate international applicability.
- (b) The inclusion of permissible variations from tested specimens in each section, to facilitate greater direct application of test data (this has required transfer of material from [AS 1905](#) and [AS 4072.1](#)).
- (c) The adoption of the cotton pad test for determining performance under the criteria of integrity.
- (d) The adoption of methods based on the [ISO 10294](#) series, *Fire-resistance test—Fire dampers for air distribution systems*, for testing fire dampers and performance criteria has been established in line with currently approved damper. This will also encourage the development of combined heat and smoke dampers.
- (e) The inclusion of test procedures for critical services.
- (f) The inclusion of informative appendices to facilitate testing under alternate heating regimes to provide data for evaluation of alternate building solutions for compliance with the BCA.
- (g) Details of test procedures for assessing the ability of ceiling systems to protect structural elements.
- (h) Provisions of additional guidance assist with the reporting of test results.

### Building Code of Australia (BCA)

This Standard will be referenced in the Building Code of Australia (BCA) by way of BCA 2006 to be published by 1 May 2006, thereby superseding the previous edition of AS 1530.4—1997.

### Referenced documents

This Standard references documents in clauses of both a normative and informative nature. Normative referenced documents, are listed in Clause 1.5 and a complete list of both normative and informative referenced documents are provided in Appendix H.

### Normative and informative

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 the Standard, whereas an ‘informative’ appendix is only for information and guidance.

### Notes and commentaries

The use of Notes in this Standard is of an advisory nature only. They provide explanations and guidance on recommended design consideration or technical procedures, as well as an informative cross-reference to other documents or publications.

*This Standard incorporates a Commentary on some clauses. The Commentary directly follows the relevant clause is designated by ‘C’ preceding the clause number and is printed in italics in a panel. The Commentary is for information only and does not need to be followed for compliance with the Standard.*

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# STANDARDS AUSTRALIA

## Australian Standard

### Methods for fire tests on building materials, components and structures

#### Part 4: Fire-resistance test of elements of construction

## SECTION 1 SCOPE AND GENERAL

### 1.1 SCOPE

This Standard provides methods for determining the fire resistance of various elements of construction when subjected to standard fire exposure conditions.

#### NOTES:

- 1 Radiant heat measurements are given in Appendix A.
- 2 Alternative heating and radiation exposure conditions, which may be used for evaluation of alternative solutions, voluntary upgrades and other applications where the standard heating regime may not be applicable, and additional procedures to meet special requirements are given in Appendix B.
- 3 Unless one of the alternative heating regimes is specifically required, the standard time temperature curve applies (see Figure 2.10.1).
- 4 [AS 1720.4](#), [AS 3600](#), [AS 3700](#) and [AS 4100](#) may also be used to determine the fire resistance of an element of construction.
- 5 The assessment of smoke production and smoke spread when testing specimens is outside the scope of this Standard. Significant smoke spread or smoke production can occur even though an element of construction may have achieved high FRLs. Other test methods, such as AS 1530.7, may be considered when evaluating the potential for smoke spread.

### 1.2 OBJECTIVE

The objective of this Standard is to provide building designers, manufacturers, test laboratories and regulatory authorities with a set of uniform requirements for heating conditions, test procedure and criteria for the determination of fire resistance of an element of building construction.

NOTE: Test reports include information that may assist building designers. Records of temperature at critical times may be used by a designer to assess the fire resistance of a variant of the tested prototype where the procedure for such an assessment is defined in the appropriate design standard or code. In certain cases, the test methods described herein provide information for the determination of—

- (a) resistance to the incipient spread of fire through ceiling systems;
- (b) safe distances for the spacing of combustible materials from elements that provide a separating function;
- (c) radiant heat flux from doorsets, shutter assemblies, and glazing; and
- (d) the cross-sectional area of air ducts to provide functional operation while providing fire resistance.