Guide to Standards - Building and Construction

Your snapshot of Australian Standards® and Certification

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Introduction

This guide provides information on Standards, Certification schemes and other industry specific information that may be of interest to anyone working within the building industry, including information relevant to manufacturers, importers and suppliers of building products.

You can find Standards relevant to the building and construction industry via the SAI Global **InfoStore** Subject Area **Construction materials and building**. Here, the Preface, Table of Contents, Foreword and Scope of most Australian Standards® are available.

Disclaimer: The information contained in these pages is provided by way of indicative guidance only and SAI Global Limited does not represent that it is accurate or complete or suitable for any particular specific purposes. The onus remains with users to satisfy themselves of their requirements and needs for their own particular circumstances.

An invaluable resource is **HB 50-2004, Glossary of building terms** which provides an alphabetical list of terms as well as over 80 illustrations of general and specific items used in the building and construction industry. Also, a number of the terms described in **HB 50-2004** are included in different types of Australian (AS) and Australian/New Zealand (AS/NZS) Standards listed in this guide.

Building Regulations

The current edition of the Building Code of Australia (BCA) references approximately 160 Australian and International Standards. Typically each year, the BCA is updated and released in May by the Australian Building Codes Board (ABCB).

The SAI Global **BCA + Standards** online service is ideal for organizations working within or supplying to the building industry. Subscribers to the service have access to both volumes of the Building Code of Australia as well as all of the referenced within it.

For information on Building and Construction industry regulators, refer to the section **Building regulators** of this guide.

Renovating Homes and New Homes

An excellent source of information for renovators, designers, and purchasers of new homes is the Standard **AS 4226-2006**.

AS 4226-2008, Guidelines for safe housing design provides guidelines for the design of safe dwellings. This Standard describes the factors that should be taken into account to reduce the likelihood of an injurious accident occurring in association with any building element, or fitting, either alone or in association with other elements. Detailed information on the areas below are covered in the Standard:

- **Access and egress** – Detailed information on requirements for stairs, railings and balustrades used in residential buildings. The information in this Standard should be read together with the details that are included in Clause 3,9 in Volume 1 to the Building Code of Australia
- **Floor planning** – In Section 4 of the Standard there is information on recommended layouts for doorways and furniture located in residential dwellings
- **Kitchen layouts** – Detailed diagrams providing information on layouts for different types of kitchens. Information on location requirements for kitchen units is included in **AS/NZS 4386.2:1996, Domestic kitchen assemblies – Installation** and **AS/NZS 5601 SET:2010, Gas installations Set**
- **Hazards for children** – A diagram illustrating child-resistant catches for windows and doors

There are separate headings within this guide which provide more information on Standards covering design, manufacturing and installation requirements for specific types of building products.

Building Contracts

Australian building contracts are covered by the **AS 2124, General conditions of contract - Annexures Series** and **AS 4000, General conditions of contract Series**. There is also an Australian contract for swimming pools and spas; **AS 2160.1-1998, Contract for the supply and construction of a swimming pool or spa – Concrete swimming pool or spa**.

Australian Standards® contracts are available in the following formats:

- PDF (WaterMarked editions)
- PDF (Editable editions)
- Hardcopy editions
- Word formats

Information on our range of options covering these areas is available here: **www.saiglobal.com/Contracts**.

Building Inspections

The Australian Standards® which provide information on pre-purchase inspections for residential buildings and timber pest inspections is the **AS 4349, Inspection of building Series**.

AS 4349.0-2007

AS 4349.0-2007, Inspection of buildings – General requirements provides information on what should be included in inspection agreements and building inspection reports.

AS 4349.1-2007

AS 4349.1-2007, Inspection of buildings – Pre-purchase building inspections – General requirements indicates how inspection agreements and inspection reports should be prepared and completed by persons and organizations responsible for undertaking pre-purchase building inspections for different types of residential buildings.

AS 4349.3-2010

AS 4349.3-2010, Inspection of buildings – Timber pest inspections provides information on methods used to undertake non-invasive timber pest inspections for different classes of buildings.

Building Tolerances

Information on tolerances for building products manufactured from different types of materials is included in **HB 31-2002, Handbook of building construction tolerances – Extracts from building products and structural Standards**. This handbook includes extracts from information included in **AS 3600-2001, Concrete structures**. A 2009 edition of this Standard is now available and tolerances for concrete structures designed to this Standard are included in Clause 17.5.

HB 31-2002 does not include information on recommended tolerances for plastering and floor tiling. Information on recommended tolerances for plastering is included in Table 1 of **HB 161-2005, Guide to plastering**. Tolerances for tiling floors with ceramic tiles are included **AS 3958.1-2007, Ceramic tiles – Guide to the installation of ceramic tiles**.

In 2007 the Victorian Building Commission produced the publication '**Guide to Standards and Tolerances'**.

Energy Efficiency Building Products

General Information

Energy efficiency requirements for different classes of buildings are included in the 2010 edition to the BCA and the State/Territory legislation adopted under the BCA.

For Standards on sustainability and energy efficiency requirements for buildings and building materials, Technical committees managed by the International Organization for Standardization (ISO) and the European Committee for Standardization (EN) have produced a number of Standards, technical reports and drafts.

A list of publications on this topic include:

- **ISO 15392:2008, Sustainability in building construction – General principles**
- **ISO 21930:2007, Sustainability in building construction – Environmental declaration of building products**
- **ISO 21931-1:2010, Sustainability in building construction – Framework for methods of assessment of the environmental performance of construction works – Part 1: Buildings**
- **ISO/TS 21929-1:2006, Sustainability in building construction – Sustainability indicators – Part 1: Framework for development of indicators for buildings**
- **EN 15643-1:2010, Sustainability of construction works – Sustainability assessment of buildings – Part 1: General framework**
- **PREN 15978:2009, Sustainability Of Construction Works – Assessment Of Environmental Performance Of Buildings – Calculation Method**
- **SR CEN TR 15941:2010, Sustainability Of Construction Works – Environmental Product Declarations – Methodology for Selection and use of Generic Data**

The European draft Standards are designated with a PREN prefix. The technical reports are provided with a SR CEN TR prefix.

The key areas covered under this topic are solar panels, lighting products and water heaters.

Solar Panels Connected to Hot Water Systems and Heat Pumps

Manufacturers of solar panels connected to hot water systems and heat pumps can apply for certificates under the Australian Government's Renewable Energy Certificates Schemes (RECS). In order for certificates to be issued, manufacturers are required to certify their solar panels to the requirements covered by:

- **AS/NZS 2172:2007, Solar and heat pump water heaters – Design and construction**
- **AS/NZS 4234:2008, Heated water systems – Calculation of energy consumption**

Solar water heaters connected to water supplies are also required to be certified to **AS 3498-2009, Authorization requirements for plumbing products – Water heaters and hot-water storage tanks**.

SAI Global's **StandardsMark** and **WaterMark** schemes can be used to certify manufacturers of these types of solar panels to relevant Standards.
For further information on the above schemes you can refer to the **SAI Global's Product Certification Schemes** section of this guide.

Inverters used with solar panels should be designed and manufactured to the requirements specified in **AS 4777.2-2005, Grid connection of energy systems via inverters – Inverter requirements.** Grid protection devices used with inverters should be tested to the requirements defined in **AS 4777.3-2005, Grid connection of energy systems via inverters - Grid connection requirements**.

Installation Standard for these types of inverters are included in **AS 4777.1-2005, Grid connection of energy systems via inverters – Installation requirements** and **AS/NZS 3000:2007, Electrical installations (known as the Australian/New Zealand Wiring Rules)**.

The installation Standard for all types of solar panels (also known as photovoltaic arrays – PV arrays) should be installed by following the details outlined in **AS/NZS 5033:2005, Installation of photovoltaic arrays (PV) arrays.**

Solar Panels (Stand-Alone Products – Not Connected to Hot Water Systems and Heat Pumps)

Standards Australia has not established any manufacturing Standards for solar panels that are not connected to hot water and heat pumping systems. However, there are number of **IEC** Standards and **EN** Standards for these types of solar panels.

Information on Standards for Inverters, Grid protection devices, Solar panels and installation can be found in the above section **Solar Panels Connected to Hot Water Systems and Heat Pumps** of this guide.

Lighting Products

Energy efficiency levels for interior lighting can be accessed by following the information that is included in Clause 10.7 of **AS/NZS 1680.1:2006, Interior and workplace lighting – General principles and recommendations.** Also, information on characteristics for different types of lighting systems is included in Table 9.2 of this same Standard.

SAI Global supplies Standards providing information on energy efficiency requirements for the types of lighting products listed below:

LED Lights

Standards Australia has not established any specific manufacturing Standards for LED lights. Modules and units supplied with all types of LED lights used indoors and outdoors should be tested to meet **IEC 62031 Ed 1.0, LED modules for general lighting – Safety specifications** or **I.S. EN 62031:2008, Led Modules for General Lighting - Safety Specifications**.

Fluorescent Lamps

Australian and New Zealand energy efficiency Standards for fluorescent lamps are covered by the **AS/NZS 4782, Double-capped fluorescent lamps Series**.

Fluorescent Lamp Ballasts

Energy efficiency Standards for fluorescent lamp ballasts are included in the **AS/NZS 4783, Performance of electrical lighting equipment Series**.

Self-ballasted Lamps

Energy efficiency levels for self-ballasted lamps are determined by completing tests to the **AS/NZS 4847, Selfballasted lamps for general lighting services Series**.

Transformers and Converters for Extra Low Voltage (ELV) Lamps

Australian and New Zealand energy efficiency tests for transformers and converters used with Australian Extra Low Voltage energy lamps are included in the **AS/NZS 4879, Performance of transformers and electronic step-down convertors for ELV lamps Series**.

Incandescent Lamps

Australian and New Zealand energy efficiency tests for incandescent (tungsten filament and tungsten halogen) lamps are included in the **AS/NZS 4934, Incandescent lamps for general lighting services Series**.

Water Heaters

The **Australian Government's Ministerial Council on Energy** (part of the Australian Government's Department of Resources, Energy and Tourism) along with all the State Governments, has prepared a **National Hot Water Strategic Framework.** One of the key recommendations of the framework is to phase-out the use of conventional electric resistance water heaters.

Water heaters should be certified under the **WaterMark** scheme. The **WaterMark** certification Standard for these types of heaters is **AS 3498-2009, Authorization requirements for plumbing products – Water heaters and hot-water storage tanks**. For further information on the above schemes you can refer to the **SAI Global's Product Certification Schemes** section of this guide.

The Australian and New Zealand energy efficiency Standard for different types of solar, gas and electric water heaters is **AS/NZS 4234:2008, Heated water systems – Calculation of energy consumption**.

Thermal Insulating Materials

The manufacturing Standard for thermal insulating materials used to insulate walls and ceilings in domestic buildings is **AS/NZS 4859.1-2009, Materials for the thermal insulation of buildings – General criteria and technical provisions**. Early fire hazard tests for these types of materials are included in **AS/NZS 1530.3:1999, Methods for fire tests on building materials, components and structures - Simultaneous determination of ignitability, flame propagation, heat release and smoke release**.

These types of insulating materials are installed by following the information that is included in **AS 3999-1992, Thermal insulation of dwellings – Bulk insulation – Installation requirements**.

Information covering recommended clearance distances between insulating materials and lighting equipment is included in Clause 4.5.2.3, Section 4 in **AS/NZS 3000:2007, Electrical installations (known as the Australian/New Zealand Wiring Rules)**.

Electrical Wiring

Low voltage electrical wiring used in buildings should conform to the requirements outlined in **AS/NZS 3000:2007, Electrical installations (known as the Australian/New Zealand Wiring Rules).** There are also a number of Standards cross-referenced in **AS/NZS 3000:2007** covering electrical supply requirements for buildings.

The Australian and New Zealand electrical wiring Standard for work undertaken on construction sites **is AS/NZS 3012:2010, Electrical installations – Construction and demolition sites**.

Low voltage cables should be selected by following the methods outlined in **AS/NZS 3008.1.1:2009, Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical Australian installation conditions**.

Electrical installations can be inspected and tested by following the methods outlined in **AS/NZS 3017:2007, Electrical installations – Verification guidelines**. Electrical wiring can be periodically inspected by following the recommendations described in **AS/NZS 3019:2007, Electrical installations – Periodic verification**.

Portable types of electrical equipment should be tested and tagged by following the information that is included in **AS/NZS 3760:2010, In-service inspection and testing of electrical equipment**. Fixed types of electrical equipment can be inspected by following the information that is included in **AS/NZS 3017:2007**. Intervals that should be followed when inspected and tagging this type of equipment is included in **AS/NZS 3019:2007**.

Plumbing and Gas

Plumbers and gas fitters should purchase the **PLUMBING AND GAS SET-2005, Plumbing and Gas Installations Set on CD**. Purchasers of this product will receive the Standards listed below:

- **AS/NZS 3500.0:2003, Plumbing and drainage – Glossary of terms**
- **AS/NZS 3500.1:2003, Plumbing and drainage – Water services**
- **AS/NZS 3500.2:2003, Plumbing and drainage – Sanitary plumbing and drainage**
- **AS/NZS 3500.3:2003, Plumbing and drainage – Stormwater drainage**
- **AS/NZS 3500.4:2003, Plumbing and drainage – Heated water services**

- **AS/NZS 5601 SET:2010, Gas Installations Set**

These Standards are available in Hard Copy or PDF from our **Infostore**.

The plumbing Standards that are included in the **AS/NZS 3500 Series** are regulated by the **Plumbing Code of Australia 2004** as well as different types of State acts and regulations. Theses Standards and the **Plumbing Code of Australia 2004** are also available in the **PCA 3500 (Set)-2004, PCA with Plumbing & Drainage Set**.

More information on different types of water systems are outlined in the following paragraphs. It is important to note that these types of water systems should be installed by following the details outlined in **AS/NZS 3500.1:2003**, **AS/NZS 3500.2:2003**, **AS/NZS 3500.3:2003** and the **Plumbing Code of Australia 2004**.

Greywater Systems

Manufacturers of waste water treatment products can certify their products by obtaining assessment under SAI Global's **StandardsMark** and **WaterMark** certification schemes. For further information on the above schemes refer to the **SAI Global's Product Certification Schemes** section of this guide or you can contact the **SAI Global Product Services** division:
Phone: +612 8206 6322
Email: **product@saiglobal.com**

The Australian manufacturing Standard for greywater diversion devices is **ATS 5200.460-2005, Technical Specification for plumbing and drainage products – Grey water diversion device (GWDD).** The Australian technical specification is used to certify manufacturers of these types of devices under the **WaterMark** certification scheme.

The handbook **HB 326-2008, Urban Greywater Installation Handbook for Single Households** provides detailed information on requirements for different types of greywater diversion (GSD) devices and greywater treatment systems (GTS).

A useful flowchart providing information on recommended procedures for approving, installing and maintaining treatment systems is included in Figure 3.2 of **HB 326-2008**.

Diagrams providing information on recommended methods for installing untreated systems using gravity feeds are included in Clause 5.5, Section 5 of **HB 326-2008**.

Rainwater Tanks

The handbook **HB 230-2008, Rainwater Tank Design and Installation Handbook** provides essential information required by plumbers to approve, install and maintain above-ground, underground and underfloor water tanks located in single households, multi-unit dwellings, community and commercial buildings. It also provides detailed information on recommended prastises that should be followed to install tanks and technical details and specifications for pumps used with rainwater tanks.

As well as general applications for rainwater tanks, this publication also provides information on water tanks that can be used for garden irrigation, pools and spas, fire fighting and cooling towers.

It is important to note that the Handbooks **HB 326-2008, Urban Greywater Installation Handbook for Single Households** and **HB 230-2008, Rainwater Tank Design and Installation Handbook** are also available as a Set; **Rainwater and Greywater Set – 2009**.

Manufacturing Standards for Rainwater Tanks

There are Australian Standards® for the following types of rainwater tanks:

- Rotationally moulded plastic rainwater tanks – **AS/NZS 4766:2006, Polyethylene storage tanks for water and chemicals**
- Metal rainwater tanks – **AS/NZS 2179.1:1994, Specifications for rainwater goods, accessories and fasteners – Metal shape or sheet rainwater goods, and metal accessories and fasteners**
- Concrete tanks – **AS 3735-2001, Concrete structures retaining liquids**

Septic Tanks

The Australian and New Zealand manufacturing Standard **AS/NZS 1546.1:2008, On-site domestic wastewater treatment units - Septic tanks** is for Septic tanks using treated blackwater and greywater systems and holding tanks including Collection wells and pump wells.

Septic tanks that have been manufactured and tested to this Standard should be installed by following the methods described in **AS/NZS 3500.2:2003, Plumbing and drainage – Sanitary plumbing and drainage**.

The on-site management Standard for septic tanks using primary, secondary and other types of land application systems is **AS/NZS 1547:2000, On-site domestic wastewater management**. This Standard covers the following areas:

- Performance requirements for on-site wastewater management systems
- Management, operation and maintaining requirements for on-site wastewater management systems
- Methods used to demonstrate compliance with performance requirements for on-site wastewater management systems

Aerated Wastewater Treatment Systems

The Australian and New Zealand manufacturing Standard for aerated wastewater treatment systems is **AS/NZS 1546.3:2008, On-site domestic wastewater treatment units – Aerated wastewater treatment systems**. Septic tanks used to contain aerated wastewater should be manufactured to meet **AS/NZS 1546.1:2008**.

Aerated wastewater treatment systems should be installed, operated and maintained by following the details prescribed in **AS/NZS 1547:2000, On-site domestic wastewater management**.

Applying Building Products

Waterproofing

There are a number of Australian Standards® for waterproofing for interior areas of buildings and Standards covering recommended practices for using membranes used on the outside of buildings.

Wet Area Membranes Used In Bathrooms, Kitchens and Laundries (Internal Areas of Buildings)

Information on processes used to design and install membranes and flashings located in bathrooms, kitchens and laundries located in residential buildings is included in **AS 3740-2010, Waterproofing of domestic wet areas**. Waterproofing membranes used for these types of applications should be manufactured and tested to **AS/NZS 4858:2004, Wet area membranes**.

Information on methods used to waterproof internal areas of residential buildings is also included in Section 3.8 of Volume 2 to the 2010 edition of the Building Code of Australia.

Waterproofing Exterior Areas Of Buildings (Decks and Roofs)

Waterproofing membranes used for exterior applications should be designed and installed by following the principles outlined in **AS 4654.2-2009, Waterproofing membrane systems for exterior use – Above ground level – Design and installation**.

The Australian manufacturing Standard for membranes used to waterproof exterior areas of buildings is **AS 4654.1-2009, Waterproofing membrane systems for exterior use – Above ground level – Materials**.

Plastering

Australian Standards® for drywall plastering are covered by the information that is included in the Australian/New Zealand Standard **AS/NZS 2589:2007, Gypsum lining – Application and finishing**. The Australian/New Zealand manufacturing Standard for gypsum plaster is **AS/NZS 2588:1998, Gypsum plasterboard**.

Detailed information on different types of plastering systems is included in **HB 161-2005, Guide to plastering**. The Australian handbook also includes information on recommended mixing ratios for rendered surfaces.

Building Practises

Scaffolding

Information on design, manufacturing requirements and test methods for different types of scaffolding are included in **AS/NZS 1576.1:2010, Scaffolding – General requirements**. Suspended scaffolding systems should be tested to meet the requirements outlined in **AS 1576.4-1991, Scaffolding – Suspended scaffolding**.

Please see the preface to **AS/NZS 1576.1:2010** for a warning statement concerning the use of scaffolding systems that do not meet the performance requirements of **AS/NZS 1576.1:2010**

Scaffolding can be erected and dismantled by following the recommendations described in **AS/NZS 4576:1995, Guidelines for scaffolding**.

Couplers and tubes used with scaffolding should be manufactured and tested to:

- **AS/NZS 1576.2:2009, Scaffolding – Couplers and accessories**
- **AS/NZS 1576.3:1995, Scaffolding – Prefabricated and tube-and-coupler scaffolding**

AS 6001-1999, Working platforms for housing construction provides information on methods for constructing working platforms from scaffolding equipment, building timber and other equipment typically located on building sites.

Temporary Edge Protection Systems

The Standards listed in the below paragraphs provide information on types of temporary protection systems for those who work on roofs slopes no greater than 35° on residential and commercial buildings.

Please note that the following Standards are not designed to replace scaffolding or fall-arrest systems that may be used for people who plan on working at heights. For more information on Scaffolding Standards, see the **Scaffolding** section of this document.

AS/NZS 4994.1:2009

The Australian and New Zealand Standard **AS/NZS 4994.1:2009, Temporary edge protection – General requirements** sets out requirements for the design, manufacture and testing of equipment that is intended to provide protection at the roof edge to workers installing, altering, repairing or removing cladding on housing and residential buildings having roof slopes of not more than 35° to the horizontal.

AS/NZS 4994.2:2009

Temporary roof edge protection systems can be installed and dismantled by following the methods outlined in **AS/NZS 4994.2:2009, Temporary edge protection – Roof edge protection – Installation and dismantling**.

AS/NZS 4994.3:2010

The objective of **AS/NZS 4994.3:2010, Temporary edge protection – Installation and dismantling other than roof edges** is to improve the safety of people performing any work near openings in floors, near the edges, or other elevated level working surfaces not being roofs of residential or commercial buildings.

Building Design Standards

Limit State Design Standards and Loads Imposed On Structures

Australian (AS) and Australian/New Zealand (AS/NZS) building design Standards are based on limit state design engineering methods. Definitions for this term are included in the Standard; **AS ISO 8930-2005, General principles on reliability of structures – List of equivalent terms**.

The structural engineering Standards referenced in the 2010 edition of the Building Code of Australia are all based on limit state design engineering methods. Detailed information on concepts concerning limit state engineering on Australian (AS), Australian/New Zealand (AS/NZS) and International (ISO) Standards are referenced below:

- **AS/NZS 1170.0:2002, Structural design actions – General principles**
- **AS/NZS 1170.1:2002, Structural design actions – Permanent, imposed and other actions**
- **AS/NZS 1170.2:2002, Structural design actions – Wind actions**
- **AS/NZS 1170.3:2003, Structural design actions – Snow and ice actions**
- **AS 1170.4-2007, Structural design actions – Earthquake actions in Australia**
- **AS 4055-2006, Wind loads for housing**
- **AS 5104-2005, General principles on the reliability of structures**
- **AS ISO 13822-2005, Basis for design of structures – Assessment of existing structures**
- **ISO 13823:2008, General principles on the design of structures for durability**
- **ISO 15928-1:2003, Houses – Description of performance – Part 1: Structural safety**
- **ISO 15928-2:2005, Houses – Description of performance – Part 2: Structural serviceability**
- **ISO 15928-3:2009, Houses – Description of performance – Part 3: Structural suitability**

Steel Structures

Australian engineering Standards for structures using hot and cold steels are; **AS 4100-1998** and **AS/NZS 4600:2005.** There are also commentaries to the above Standards; **AS 4100 Supp 1-1999** and **AS/NZS 4600 Supp 1:1998.** The most recent Australian engineering Standards for steel structures are based on limit state design engineering methods.

There may be situations where persons are required to assess structures that were designed by using allowable stress (also known as working stress design methods). Engineering Standards using these methods are:

- **AS 1250-1981, The use of steel structures (known as the SAA Steel Structures Code)** (incorporating Amdt 1) (Superseded by **AS 4100-1990**)
- **AS 3990-1993, Mechanical equipment – Steelwork**. This Standard is referenced in the conveyor design code; **AS 1755-2000, Conveyors – Safety requirements**.

AS 4100-1998

AS 4100-1998, Steel structures defines minimum requirements for the design, fabrication, erection and modification of steelwork in structures in accordance with the limit state design method. This Standard covers engineering applications for buildings, structures, cranes, roadways and pedestrian bridges constructed of steels. The commentary to this Standard is **AS 4100 Supp 1-1999**.

AS/NZS 4600:2005

Cold-formed steels used for light engineering purposes can be used by the methods described in **AS/NZS 4600:2005, Cold-formed steel structures**. This Standard can also be used to design requirements for structures manufactured from steel pipes.

Australian Standards® for heavily engineered structures (e.g. bridges and cranes) do not reference **AS/NZS 4600:2005**. Australian design requirements for these types of structures are covered by **AS 4100-1998**.

Concrete Design

Information on design requirements for the design and construction of concrete buildings, or members containing reinforcing steels or tendons are included in **AS 3600-2009, Concrete structures**.

Section 15 in **AS 3600-2009** provides some general information on design requirements for pedestals and footings that do not contain reinforcing steels or tendons. Footings supplied with reinforcing steels should be designed by meeting the requirements described in **AS 2870-2011, Residential slabs and footings**.

The handbooks listed below provide commentaries and interpretations to the 2001 edition of **AS 3600-2009**:

- **HB 64-2002, Guide to concrete construction**
- **HB 71-2002, Reinforced concrete design in accordance with AS 3600-2001**

Masonry

In Australia there are two types of design Standards for structures manufactured from masonry units:

1. **AS 3700-2001, Masonry structures** is used to design structures that are manufactured from mortared joints. This also has a commentary Standard; **AS 3700 Supp 1-2004, Masonry structures – Commentary (Supplement to AS 3700-2001)**. **SAI Global** supplies a **AS 3700 Set-2007, Masonry structures Set** containing both of these Standards. Earth-retaining structures that are not constructed from mortared joints should be designed to the requirements outlined in **AS 4678-2002, Earth-retaining structures**

2. Masonry structures used with residential buildings and small non-habitable buildings (e.g. garages) may be designed by following the methods outlined in **AS 4773.1-2010, Masonry in small buildings – Design**. Designers of these types of structures also have the option of following the structural design requirements that are included in **AS 3700-2001.** The Standard **AS 4773.1.2010** is not referenced in the 2010 edition of the Building Code of Australia, however Australian Standard **AS 3700-2001** is referenced.

AS 3700-2001 and **AS 4773.1-2010** are based on limit state engineering design methods. Masonry structures designed to either of these Standards will conform to the loads covered in the **AS/NZS 1170, Structural design actions Series**. Wind loads for masonry structures used with residential buildings can also be calculated by following the methods outlined in **AS 4055-2006, Wind loads for housing**.

AS 3700-2001

The Australian structural design Standard for buildings using reinforced, unreinforced and prestressed masonry materials is **AS 3700-2001, Masonry structures**. This also has a commentary Standard; **AS 3700 Supp1-2004**. These publications are also available in **AS 3700 Set-2007, Masonry structures Set**.

Certain sections of this Standard cover different areas of masonry structures:

- Section 7 is the Structural design requirements for unreinforced masonry
- Section 8 covers design requirements for reinforced masonry structures
- Section 9 includes information on design requirements for prestressed masonry
- Section 10 defines the durability levels for masonry structures. More importantly, a list of durability requirements for mortar used with masonry is included in Tables 10.1 and 10.2 of the Standard. Also, durability levels for mortar can be assessed by following the tests outlined in **AS/NZS 4456.10:2003, Masonry units and segmental pavers and flags – Methods of test – Determining resistance to salt attack**
- Appendix E covers exposure levels for different types of environments that can affect the durability and performance of masonry structures
- Section 6 includes fire resistant tests for masonry units. These types of units should be tested to **AS 1530.4-2005, Methods for fire tests on building materials, components and structures – Fire-resistance test of elements of construction**

AS 4773.1-2010

The recently published **AS 4773.1-2010, Masonry in small buildings - Design** can be used to design residential buildings and small non-habitable structures manufactured from masonry products. **AS 3700-2001** should be used to design all other types of structures using mortared joints.

Glass

The Australian design Standard which is based on limit state design engineering methods and is for buildings using safety glass is **AS 1288-2006, Glass in buildings – Section and installation**.

Tables providing information on thickness levels for glass calculated by using limit state design methods are included in **AS 1288 Supp 1-2006**. The information in this Standard is of particular use to those who require information on thickness details for glass used on different types of balustrades.

A commentary to **AS 1288-2006** is also available for sale; **HB 125-2007, The glass and glazing handbook (including guide to AS 1288, Glass in buildings – Selection and installation).**

The following sets are also available:

- **AS 1288 Plus CD Set-2006**

- **AS 1288.Set-2006**

Residential Slabs and Footings

Footings used with single dwellings and town-houses should be designed to the requirements defined in **AS 2870-2011, Residential slabs and footings**. This Australian Standard® provides details for the following types of footings:

- Pad footings
- Rafts
- Waffle slabs
- Strip footings
- Stiffened slabs
- Pier on Slab and Pier on Beam footings

Timber Structures and Timber Frames

Timber engineering Standards are all based on limit state design engineering methods. There are two major timber engineering Standards; **AS 1684, Residential timber-framed construction Series** which outlines the methods for timber frames designed for single and two-storey residential buildings and **AS 1720.1-2010, Timber structures - Design methods** which outlines the methods for all other types of structures.

Information covering design, installation, fixing and erection requirements for timbers used for structural applications in residential buildings is included in the **AS 1684 Series**:

- **AS 1684.1-1999, Residential timber-framed construction – Design criteria**
- **AS 1684.2-2010, Residential timber-framed construction – Non-cyclonic areas**
- **AS 1684.3-2010, Residential timber-framed construction – Cyclonic areas**
- **AS 1684.4-2010, Residential timber-framed construction – Simplified – Non-cyclonic areas**

Australian Standard® **AS 1684.4-2010** is a simplified version of **AS 1684.2-2010**. The Standard only covers framing requirements for basic non-cyclonic wind speed categories (N1 and N2).

Wind speeds for all non-cyclonic areas (N1, N2, N3 and N4) are included in **AS 1684.2-2010** and Wind speeds for cyclonic areas (C1, C2 and C3) are included in **AS 1684.3-2010**.

Wind speeds for timber framed buildings can be designed and calculated by following the methods described in either **AS/NZS 1170.2:2002, Structural design actions – Wind actions** or **AS 4055-2006, Wind loads for housing**.

The spans listed in the supplements to **AS 1684.2-2010**, **AS 1684.3-2010** and **AS 1684.4-2010** are linked to wind speeds and grades for visually (F) and mechanically (MGP) graded timbers. Purchasers of PDF editions of these Standards will receive the supplements in attached Winzip files. The supplements for hard copies of this Standard are included on a CD-Rom. Timber frames should be constructed on slabs and footings that have been designed to **AS 2870-2011, Residential slabs and footings**.

The Standard **AS 1720.1-2010, Timber structures – Design methods** sets out limit state design methods for the structural use of different types of timbers.

Engineered solutions may be required where designs for timber frames are not covered by **AS 1684.2-2010**, **AS 1684.3-2010** and **AS 1684.4-2010** If this is the case, the methods outlined in **AS 1720.1-2010, Timber structures – Design methods**.

Timber Structures (Trusses)

Timber trusses should be installed by following the methods outlined in **AS 4440-2004, Installation of nailplated timber trusses**. Engineering and design practices for timber trusses are included in **AS 1720.1-2010**.

Composite Structures

Beams manufactured from steel and concrete can be manufactured and designed by following the requirements outlined in **AS 2327.1-2003, Composite structures – Simply supported beams**.

Piling Code

AS 2159-2009, Piling - Design and installation defines the minimum requirements for the design and construction of piled footings for civil engineering and building structures on land or immediate offshore locations. The information in the Standard does not cover requirements on submerged piles, however this information is included in the Standard **AS 4997-2005, Design for the design of maritime structures**.

Earth-Retaining Structures

Earth-retaining structures that are not constructed from mortared joints should be designed to the requirements outlined in **AS 4678-2002, Earth-retaining structures**. These types of structures are designed to retain soil, rock and other types of materials.

Manufacturing requirements for masonry products used with earth-retaining structures are included in **AS/NZS 4455.3:2008, Masonry units, pavers, flags and segmental retaining wall units - Segmental retaining wall units**.

Construction tolerances for earth-retaining structures are described in Clause 6.2 of **AS 4678-2002**.

Building Products

Timbers

General Information

There are a number of Australian Standards® for **timber structures**, **sawn timbers** and **wood-based panels**. In 2010, Standards Australia also released new Standards for engineered timber products. Typically, these types of engineered timber products do not need to be treated with timber preservatives. Manufacturing and test methods for these types of timber products are included in the **AS/NZS 4063, Characterization of structural timber Series**. Framing requirements for these types of timbers are also included in **AS 1684.2-2010, Residential timber-framed construction – Non-cyclonic areas**, **AS 1684.3-2010, Residential timber-framed construction – Cyclonic areas** and **AS 1684.4-2010, Residential timber-framed construction – Simplified – Non-cyclonic areas**. If you require information on timber flooring, refer to the **Flooring** section in this document.

Timbers used in Australia should be tested to the **AS/NZS 1080, Timber - Methods of test Series**. Manufacturing Standards for different types of timbers consist of specific moisture content levels for timbers. Moisture levels for timbers are determined by following the methods outlined in **AS/NZS 1080.1:1997, Timbers – Methods of test – Moisture content**.

Preservative treatment tests for sawn and round timbers are included in the **AS 1604, Specification for preservative treatment Series**. Natural durability levels for timbers can be determined by following the methods described in **AS 5604-2005, Natural durability ratings**.

Durability details for timbers used for above-ground and in-ground situations are included in Appendix B in **AS 1684.2-2010** and **AS 1684.3-2010.** Durability levels for timbers are expressed in terms H1-H6 ratings. A table listing natural durability levels for different types of timber species used for framing are included in Appendix G of **AS 1684.2-2010** and **AS 1684.3-2010**.

Timber Structures (Timber Framing products)

Information covering design, installation, fixing and erection requirements for timbers used for structural applications in residential buildings is can be found in the Buidling Design section under **Timber Structures and Timber Frames** of this guide.

Conventional Timbers Requiring Preservative Treatment

Sawn and round timbers used for structural applications should be either visually (F Grades) or mechanically (MGP) graded timbers. Spans listing sizes for these types of timbers are included in the **AS 1684.2-2010, AS 1684.3-2010** and **AS 1684.4-2010** Standards.

There are Australian Standards® for visually graded softwoods, hardwoods and plywoods. Visual grades for timbers are also linked to structural grades for seasoned and unseasoned timbers. Information on methods used to determine strength details for structural grades are included in **AS 1720.1-2010, Timber structures - Design methods**.

Visual grades for timbers are included in the Standards listed below.

- **AS 2082-2007, Timber – Hardwood – Visually stress-graded for structural purposes**
- **AS 2858-2008, Timber – Softwood – Visually stress-graded for structural purposes**
- **AS 3818, Timber - Heavy structural products - Visually graded Series**

Information on methods used to determine requirements for mechanically (MGP) timbers are included in **AS/NZS 1748:2006, Timber – Mechanically stress-graded for structural purposes** and **AS 1720.1-2010**.

Engineered Wood Products (EWP Timbers)

Engineered wood products can be used for a wide variety of applications. Manufacturing requirements and information on methods used to determine strengths for these types of timbers is included **AS/NZS 4063.1:2010, Characterization of structural timber – Test methods** and **AS/NZS 4063.2:2010, Characterization of structural timber – Determination of characteristic values.** Building practises for engineered wood products are also described in Appendix J of **AS 1684.2-2010** and **AS 1684.3-2010.**

Plywood Timber

Australian (AS) and Australian/New Zealand (AS/NZS) Standards for different types of plywood are listed below:

- **AS/NZS 2269.1:2008, Plywood – Structural – Determination of structural properties – Test methods**
- **AS/NZS 2269.2:2007, Plywood – Structural – Determination of structural properties – Evaluation methods**
- **AS/NZS 2272:2006, Plywood – Marine**
- **AS/NZS 2097:2006, Methods for sampling veneer plywood**
- **AS/NZS 2098, Methods of test for veneer and plywood Series**
- **AS/NZS 2271:2004, Plywood and blockboard for exterior use**
- **AS 6669-2007, Plywood – Formwork**

Metals

General Information

This section of the guide provides information on Australian, British, European and ASTM Standards for different types of metals. The ideal product for organizations requiring comprehensive and up-to date information on metals is SAI Global's **Metals Infobase**.

Australian Standards® for metals generally provide information on manufacturing requirements, sampling methods, chemical compositions, mechanical properties and heat treatment details for materials.

Steels used off-shore and in Australia should be designated with Workstuff or Unified Numbering System (UNS) numbers. Metals supplied or manufactured outside the United States are commonly designated with UNS numbers. A Workstuff number for steels will start with 1 and it will then have 4 digits eg (1.222). Workstuff numbers can also be used to provide details on suppliers of different types of steels.

A list of UNS numbers, chemical properties for steels and details for Standards referencing UNS numbers is included in teh ASTM publication '**Unified Numbering System Ed.11 (2008) Metals and Alloys in the Unified Numbering System (uns)**'.

Suppliers and purchasers of steels should check to see if the manufacturers of steels supply certificates conforming to the documentation requirements specified in the European Standards referenced below:

- **EN 10168:2004, Steel Products – Inspection Documents – List of Information and Description**
- **EN 10204:2004, Metallic Products – Types of Inspection Documents**

Yield stress levels for metals conforming to Australian Standards® can be determined by completing the types of tests that are included in **AS 1391-2007, Metallic materials – Tensile testing at ambient temperature**.

SAI Global also supplies Australian Standards® for **destructive**, **non-destructive**, **mechanical** and **hardness** tests for metals. Methods used to assess properties for irons and steels are included in the **AS 1050, Methods for the analysis of iron and steel Series** and **AS/NZS 1050, Methods for the analysis of iron and steel Series** of Standards.

There are number of metal Standards that are similar to International (ISO) and ASTM Standards.

Stainless Steels

There are no current Australian Standards® specifying chemical, mechanical, and heat treatment properties for stainless steels. However, a number of Australian Standards® reference different editions of **ASTM A240M.** Stainless steels used in Australia may have chemical properties, mechanical properties, heat treatment conditions and tolerances conforming to the European (EN) and ASTM Standards referenced below:

- **ASTM A280M/A240M-09a, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications**
- **I.S. EN 10088-1:2005, Stainless Steels – Part 1: List of Stainless Steels**
- **I.S EN 10088-2:2005, Stainless Steels – Part 2: Technical Delivery Conditions For Sheet/plate and Strip of Corrosion Resisting Steels for General Purposes**
- **I.S EN 10088-3:2005, Stainless Steels – Part 2: Technical Delivery Conditions For Semi-finished Products. Bars, Rods, Wires, Section and Bright Products Of Corrosion Resisting Steels for General Purposes**

Structural Steels

The Australian and New Zealand (AS/NZS) Standards listed below include information on chemical and mechanical properties, tolerances and dimensions for different types of structural steels:

- **AS/NZS 1163:2009, Cold-formed structural steel hollow sections**
- **AS 1442-2007, Carbon steels and carbon-manganese steels – Hot-rolled bars and semi-finished products**
- **AS 1397:2001, Steel sheet and strip – Hot-dipped zinc-coated or aluminium/zinc-coated**
- **AS/NZS 3678:1996, Structural steel – Hot-rolled plates, floorplates and slabs**
- **AS/NZS 3679.1:2010, Structural steel – Hot-rolled bars and sections**
- **AS/NZS 3679.2:1996, Structural Steel – Welded I sections**

Wrought Alloy and Hardened Steels

The Standard for wrought alloy and hardened steels is **AS 1444-2007, Wrought alloy steels – Standard, hardenability (H) series and hardened and tempered to designated mechanical properties**. Hardness steels are included in the Australian Standards® listed below:

- **AS 1815, Metallic materials - Rockwell hardness test Series**
- **AS 1816, Metallic materials - Brinell hardness test Series**
- **AS 1817, Metallic materials - Vickers hardness test Series**

Steels for Pressure Equipment

Material groupings for Australian, API and ASME Standards used to manufacture pressure equipment are included in Table 2.1 of **AS 4458-1997, Pressure equipment – Manufacture**. Information on chemical, mechanical, heat treatment properties, dimensions and tolerances for steels used to manufacture pressure vessels is included in **AS 1548-2008, Fine grained, weldable steel plates for pressure equipment**.

Reinforcing Bars Used With Concrete and Masonry

Steel reinforcing materials used with structures should be tested to align with **AS/NZS 4671:2001, Steel reinforcing materials**.

Cast and Forged Steels

Information covering manufacturing requirements for cast and forged steels is included in:

- **AS 1448-2007, Carbon steel and carbon-manganese steels – Forgings (ruling section 300 mm maximum)**
- **AS 2074-2003, Cast steels**

These Standards include information on chemical compositions, mechanical properties and heat treatment conditions for materials used to manufacture cast and forged steels.

Irons

Information on properties for different types of irons is included in the Australian Standards® referenced below:

- **AS 1830-2007, Grey cast iron**
- **AS 1831-2007, Ductile cast iron**
- **AS 1832-2007, Malleable cast iron**
- **AS 2027-2007, Abrasive-resistant cast irons**

- **AS 5049-2007, Cast iron – Designation of microstructure of graphite**
- **AS 5052-2007, Compacted (vermicular) graphite cast irons – Classification**

Aluminium Alloys

Aluminium alloys should be anodized by following the methods described in **AS 1231-2000, Aluminium and aluminium alloys – Anodic oxidation coatings**. Australian Standards® for different types of aluminium alloys are listed below.

- **AS/NZS 1734:1997, Aluminium and aluminium alloys – Flat sheet, coiled sheet and plate**
- **AS/NZS 1865:1997, Aluminium and aluminium alloys – Drawn wire, rod, bar and strip**
- **AS/NZS 1866:1997, Aluminium and aluminium alloys – Extruded rod, bar and hollow shapes**
- **AS/NZS 1867:1997, Aluminium and aluminium alloys – Drawn tubes**
- **AS 1874-2000, Aluminium and aluminium alloys – Ingots and castings**

Thickness levels and mechanical properties for alloys used for structural purposes are listed in the Tables 3.3 (a) and 3.3 (b) referenced in **AS/NZS 1664.1:1997, Aluminium structures – Limit state design** and **AS/NZS 1664.2:1997, Aluminium structures – Allowable stress**.

Coppers

There are number of Australian (AS) and Australian/New Zealand (AS/NZS) Standards for products manufactured from different types of **copper.** Plumbing products (e.g. taps, pipes and waste fittings) should be manufactured from dezincification resistance (DR) brass. The Standard for dezincification resistance brass is **AS 2345-2006, Dezincification resistance of copper alloys**.

Masonry

General Information

There are Australian Standards® covering structural design, manufacturing, test methods and tolerances for masonry products. Detailed information on definitions for masonry products and diagrams for bricks, blocks and masonry units are included in **HB 50-2004, Glossary of building terms**.

Reinforcing materials used with masonry structures should be tested to **AS/NZS 4671:2001, Steel reinfocing materials**.

Product (Manufacturing Standards)

In the below paragraphs, a number of common types of products used with masonry structures which relate to different types of Australian manufacturing Standards are listed.

Laboratory tests for these types of products are included in the **AS/NZS 4456, Masonry units and segmental pavers and flags Series**.

Masonry Units Used for Walls

Masonry units (e.g. bricks) constructed from mortared joints should be tested to align with the Standard **AS/NZS 4455.1:2008, Masonry units, pavers, flags and segmental retaining wall units – Masonry units**. Masonry units tested to this Standard should also be designed to meet the requirements specified in **AS 3700-2001, Masonry structures**.

Alternatively, masonry units used to build earth-retaining structures that are designed to **AS 4678-2002, Earth-retaining structures** should also be tested to align with **AS/NZS 4455.3:2008**. These types of structures are not designed by using mortar connected joints.

SAI Global also supplies Australian Standards® for refractory materials.

Segmental Pavers and Flags

Pavers and flags used for pedestrian and road traffic control purposes should be tested to the methods prescribed in **AS/NZS 4455.2:2010, Masonry units, pavers, flags and segmental retaining wall units – Pavers and flags**. A definition for the term 'flags' is included in Clause 1.4.7 of this Standard.

Mortar

Mortar used with masonry structures should be tested to align with the Standard **AS 2701-2001, Methods of sampling and testing mortar for masonry construction**. Diagrams illustrating different types of mortar joints are included in Part 2 of **HB 50-2004**.

Durability levels for mortars are described in **AS 3700-2001** and **AS 4773.1-2010**.

Masonry Cement

The Australian manufacturing Standard for cement used with masonry structures is **AS 1316-2003, Masonry cement**. Test methods for these types of cements are included in the **AS/NZS 2350, Methods of testing portland and blended cements Series**.

Wall Ties, Anchors and Lintels

Wall ties used with masonry structures should be designed and manufactured to the requirements specified in **AS/NZS 2699.1:2000, Built-in components for masonry construction – Wall ties**.

Masonry anchors and other types of connecting devices should be designed and manufactured by following the information that is included in **AS/NZS 2699.2:2000, Built-in components for masonry construction – Connectors and accessories**.

Lintels and shelf-angles used with masonry structures should be manufactured and tested to meet the Standard **AS/NZS 2699.3:2002, Built-in components for masonry construction – Lintels and shelf angles (durability requirements)**.

Design and durability requirements for wall ties and other types of connecting devices used with masonry structures also included in **AS 3700-2001, Masonry structures** and **AS 4773.1-2010, Masonry in small buildings - Design**.

Concrete Products

SAI Global supplies a wide variety of publications on concrete and cement.

Precast concrete products are not installed with reinforcing steels. Reinforced concrete structures use reinforced steels that have been tested to **AS/NZS 4671:2001, Steel reinforcing materials**.

Definitions for different types of concrete and related products is included in **HB 50-2004**.

Structural Design Publications

Concrete Structures

Information on design requirements for the design and construction of concrete buildings, or members containing reinforcing steels or tendons are included in **AS 3600-2009, Concrete structures**. Section 15 in the Standard provides some general information on design requirements for pedestals and footings that do not contain reinforcing steels or tendons. Footings supplied with reinforcing steels should be designed by meeting the requirements described in **AS 2870-2011, Residential slabs and footings**.

Standards Australia not established any handbooks to the 2009 edition of **AS 3600**. The publications listed below provide commentaries and interpretations to the 2001 edition of this Standard.

- **HB 64-2002, Guide to concrete construction**
- **HB 71-2002, Reinforced concrete design in accordance with AS 3600-2001**

Precast Concrete

The National Precast Concrete Association of Australia is responsible for preparing and publishing **NP:PCH-2009, Precast Concrete Handbook**. It is the ideal publication for those who require detailed information on design requirements for buildings and other types of structures using precast and plain concrete products.

Concrete Tanks

Concrete tanks designed to contain liquids can be manufactured and designed to the details outlined in **AS 3735-2001, Concrete structures retaining liquids**. Users of this Standard should also follow the design details that are included in **AS 3600-2009**. The document number for the commentary to **AS 3735-2001** is **AS 3735 Supp 1-2001**.

Tilt-Up Construction

Flat reinforced concrete panels can be designed by following the methods described in **AS 3850-2003, Tilt-up concrete construction** and **AS 3600-2009**.

Concrete Septic Tanks

Information on manufacturing and design requirements for concrete septic tanks is included in **AS/NZS 1546.1:2008, On-site domestic wastewater treatment units – Septic tanks**.

Concrete Products – Manufacturing Standards

Laboratory tests for concrete are included in **AS 1012, Methods of testing concrete Series**. Information on manufacturing Standards for concrete are included in the following paragraphs.

AS 1379-2007

Information on manufacturing requirements for normal, special class, hardened concrete and plasticized concrete are included in **AS 1379-2007, Specification and supply of concrete**. There is also a commentary to this Standard which is **AS 1379 Supp1-2008**.

Information on required comprehensive strength levels for different types of concrete are included in **AS 1379-2007**.

Sampling procedures used to manufacture concrete are described in **AS 1012.1-1993, Methods of testing concrete – Sampling of fresh concrete**.

Fire tests for concrete products which are tested to meet **AS 1379-2007** are included in **AS 1530.4-2005, Methods for fire tests on building materials, components and structures - Fire-resistance test of elements of construction**.

AS 1478.1-2000

Chemical admixtures used to manufacture concrete should be tested to meet Standard **AS 1478.1-2000, Chemical admixtures for concrete, mortar and grout – Admixtures for concrete**.

Cement

Portland and blended cements supplied in Australia should be tested to blended cements used with concrete and masonry structures. These types of cements should be tested to align with the Standard **AS 3972-2010, General purpose and blended cements.** Laboratory tests for these types of cements are included in the **AS 2350, Methods of testing portland and blended cements Series**.

Supplementary materials (e.g. fly ash) used with cements should be tested to meet the **AS/NZS 3582, Supplementary cementitious materials for use with portland and blended cement Series**.

Doors

General Information

There are Australian manufacturing Standards for fire doors, powered doors for pedestrian access and egress, aluminium security doors and grills and lockets supplied with different types of doors.

There are no current Australian Standards® for timber doors. Information on Australian Standards® for timber doors was previously included in the Standards listed below:

- **AS 1909-1984, Installation of timber doorsets**
- **AS 2688-1984, Timber doors**
- **AS 2689-1994, Timber doorsets**

In September 2004 Standards Australia indicated that the status of these Standards was to be changed to 'obsolescent' as they were no longer recommended for new equipment or for best current practise. These Standards have only been retained in order to provide for those who are servicing existing requirements.

Powered Doors for Pedestrians

Powered doors used by pedestrians should be designed, installed and operated by following the information that is included in **AS 5007-2007, Powered doors for pedestrian access and egress**.

Fire Doors

Fire doors used and supplied in Australia should be tested to meet the Standard **AS 1905.1-2005, Components for the protection of openings in fire-resistant walls – Fire-resistant doorsets**. Fire tests for these types of doors are included in **AS 1530.4-2005, Methods for fire tests on building materials, components and structures - Fire-resistance test of elements of construction**.

Aluminium Security Doors and Grills

The Australian manufacturing Standard for aluminium security doors and window grilles is **AS 5039-2008, Security screen doors and security window grilles**. Aluminium security doors and window grilles can be installed by following the methods outlined in **AS 5040-2003, Installation of security screen doors and window grilles**.

Garage Doors

There are no Australian Standards® for garage doors that are used for commercial and industrial applications. Information on Australian Standards® for designing, manufacturing, installing and operating domestic garage doors is covered by:

Domestic Garage Doors

- **AS/NZS 4504, Domestic garage doors - Methods of test Series**
- **AS/NZS 4505:1998, Domestic garage doors**

Garage Doors for Commercial and Industrial Applications

There are a number of **European Standards** for garage doors used for commercial and industrial situations.

Formwork

Formwork used with plasticized concrete can be constructed and designed by following the details that are included in **AS 3610-1995, Formwork for concrete**. Documentation and surface finishing requirements for different classes of formwork are included in **AS 3610.1-2010, Formwork – Documentation and surface finish**.

Plywood used with formwork should be tested to meet **AS 6669-2007, Plywood - Formwork**.

Glass

There are a number of Australian Standards® covering design and installation requirements for safety glass installed in buildings. There are also Australian/New Zealand (AS/NZS) manufacturing and marking requirements for safety glazing materials and windows. Information on these areas is covered in the following paragraphs.

Design and Installation Standards

Safety glass used in buildings should be designed to conform to the requirements that are included in **AS 1288-2006, Glass in buildings – Selection and installation**. The supplement to **AS 1288-2006 (AS 1288 Supp 1-2008)** includes span tables for glass panels that are subjected to different types of wind speeds. The handbook to **AS 1288-2006** is **HB 125-2007, The glass and glazing handbook (including guide to AS 1288, Glass in buildings – Section and installation)**.

Wind speeds for glass panels should be calculated by following the methods described in **AS 1170.2-1989**, **AS/NZS 1170.2:2002** or **AS 4055-2006**.

Glass insulating units can be selected and installed by following the methods described in **AS/NZS 4667-2000, Insulating glass units** and the requirements that are included in **AS 1288-2006**.

Manufacturing Standards

Glass installed to the requirements outlined in **AS 1288-2006, Glass in buildings – Selection and installation** should be manufactured to the test methods and marking requirements that are included in **AS/NZS 2208:2006, Safety glazing materials in buildings**. In addition, safety glass manufactured to the above Standards should be cut, finished and marked by following the details outlined in **AS/NZS 4667:2000, Quality requirements for cut-to-size and processed glass**.

Windows, Glass Doors, Louvres, Shopfronts and Window Walls

AS 2047-1999, Windows in buildings – Selection and installation defines requirements for the types of building products listed below:

- Windows (Window frames)
- Sliding glass doors
- Adjustable louvers
- Shopfronts
- Window walls with one-piece framing elements

Glass thickness requirements for these types of building products is included in **AS 1288-2006, Glass in buildings – Selection and installation**.

Wind loads for windows can be determined by following the methods outlined in **AS/NZS 1170.2:2002, Structural design actions - Wind actions** or **AS 4055-2006, Wind loads for housing**. Laboratory tests for windows and window assemblies are included in the **AS 4420 Windows - Methods of test Series**.

Materials used to manufacture window frames should conform to the requirements described in Section 3 of **AS 2047-1999, Windows in buildings - Selection and installation**.

Roofing Materials

There are a number of Australian (AS) and Australian/New Zealand (AS/NZS) Standards for different types of roofing products. Generally there are Standards for the following types of roofing products:

Roofing (Cladding and Flashings)

Persons working on metal roofs should follow the procedures that are recommended in **HB 39-1997, Installation code for metal roof and wall cladding**.

Metal sheet materials used for roof and wall cladding should be designed and installed by following the procedures described in **AS 1562.1-1992, Design and installation of sheet roof and wall cladding – Metal**.

Roofing materials manufactured from corrugated fibre-cement can be manufactured and installed by following the methods prescribed in **AS/NZS 1562.2:1999, Design and installation of sheet roof and wall cladding – Corrugated fibre-reinforced cement**.

Roofing materials manufactured from plastics can be manufactured and installed by following the details outlined in **AS 1562.3-2006, Design and installation of sheet roof and wall cladding – Plastic**.

There are only British (BSI) and European (EN) Standards for cladding manufactured from natural stone:

- **EN 1469:2004, Natural Stone Products – Slabs for Cladding – Requirements**
- **BS 8298:1994, Code of practice for design and installation of natural stone cladding and lining**

Pliable Building Membranes

Building sheets providing an underlay to cladding should be manufactured by following the methods outlined in **AS/NZS 4200.1:1994, Pliable building membranes and underlays – Materials**. The installation Standard for materials manufactured to this Standard to is **AS/NZS 4200.2:1994, Pliable building membranes and underlays – Installation requirements**.

Damp-proof courses should be designed to meet the manufacturing and performance requirements that are included in **AS/NZS 2904:1995, Damp-proof courses and flashings**.

Laboratory tests for damp-proof courses and flashings are included in the **AS/NZS 4347, Damp-proof courses and flashings - Methods of test Series**.

Roofing Tiles

Roofing tiles manufactured from concrete, terracotta and composite materials should be manufactured to the details that are included in **AS 2049-2002, Roof tiles**. Test methods for roofing tiles are included in the **AS 4046, Methods of testing roof tiles Series** and installation methods for tiles manufactured to this Standard is **AS 2050-2002, Installation of roof tiles**.

Flooring

There are number of Australian (AS) and Australian/New Zealand (AS/NZS) and European (EN) Standards for flooring products. This section of the guide provides information on Standards for floor coverings and different types of flooring tiles.

Ceramic Tiles

Manufacturing Standards

The Australian manufacturing Standard for ceramic tiles is **AS 4662-2003, Ceramic tiles – Definitions, classification, characteristics and marking**. This Standard is a modified edition of the International Standard **ISO 13006:2008, Ceramic tiles - Definitions, classification, characteristics and marking** and Australian variations of the International Standard are included in Appendix ZA of **AS 4662-2003**.

Test methods for ceramic tiles are included in the **AS 4459, Methods of sampling and testing ceramic tiles Series**. Some of the Australian test methods are identical and have been modified to Standards that are included in the **ISO 10545, Ceramic tiles Series**.

Grouts used with ceramic floor tiles can be manufactured and tested to the **AS 4992, Ceramic tiles - Grouts and adhesives Series**. These Standards are identical to previous editions of the **ISO 13007, Ceramic tiles - Grouts and adhesives Series**.

Installation Standards

Ceramic tiles should be installed by following the methods described in **AS 3958.1-2007, Ceramic tiles – Guide to the installation of ceramic tiles**.

Natural Stone (Granite and Marble Tiles)

Standards Australia has not established any Standards for natural stone tiles. Information covering manufacturing Standards for natural stone tiles is covered by the European Standards listed below:

- **EN 12057:2004, Natural stone tiles – Modular tiles – Requirements**
- **EN 12058:2004, Natural Stone Products – Slabs for Floors And Stairs – Requirements**
- **EN 12059:2004, Natural Stone Products – Dimensional Stone Work – Requirements**

Information covering design and installation requirements for natural stone tiles is included in the British Standards listed below.

- **BS 5385-1:2009, Wall and floor tiling. Design and installation of ceramic, natural stone and mosaic wall tiling in normal conditions. Code of practice**
- **BS 5385-2:2006, Wall and floor tiling. Design and installation of external ceramic, natural stone and mosaic wall tiling in normal conditions. Code of practice**
- **BS 5385-5:2009, Wall and floor tiling. Design and installation of terrazzo, natural stone and agglomerated stone tile and slab flooring. Code of practice**
- **BS 8000-11.2:1990, Workmanship on building sites. Code of practice for wall and floor tiling. Natural stone tiles**

Carpets – Textile Floor Coverings

Carpets used in different types of non-residential buildings are required to meet critical radiant flux fire tests. Critical radiant flux levels for floor coverings are measured by following the methods described in **AS ISO 9239-1:2003, Reaction to fire tests for floor coverings – Determination of the burning flux levels for building materials**.

Critical radiant flux levels for floor covering used in different types of buildings are also listed in volume 1 to the 2010 edition of the Building Code of Australia. The Australian and International Standard is more commonly used however an alternative to use is **AS 2404-1980, Textile floor coverings – Fire propagation of the use-surface using a small ignition source**.

A list of Australian (AS) and Australian/New Zealand Standards (AS/NZS) for textile floor coverings (carpets) is included below:

- **AS/NZS 1385:2007, Textile floor coverings – Metric units and commercial tolerances for measurement**
- **AS/NZS 2111, Textile floor coverings - Tests and measurements Series**
- **AS/NZS 2119:1997, Textiles for floor coverings – Machine-made – Sampling and cutting specimens**
- **AS 2404-1980, Textile floor coverings – Fire propagation of the use-surface using a small ignition source**
- **AS 2454-2007, Textile floor coverings – Terminology**
- **AS/NZS 2455.1:2007, Textile floor coverings – Installation practice – General**
- **AS/NZS 2455.2:2007, Textile floor coverings – Installation practice – Carpet tiles**
- **AS/NZS 2914:2007, Textile floor coverings – Informative labelling**
- **AS/NZS 3733:1995, Textile floor coverings – Cleaning maintenance of residential and commercial carpeting**
- **AS 4288-2003, Soft underlays for textile floor coverings**

Resilient and Laminate Floors

Standards Australia has not established any Standards for resilient floors. Information on recommended practises for laying and maintaining these types of floor coverings are included in **AS 1884-1985, Floor coverings – Resilient sheet and tiles – Laying and maintenance practices**.

In September 2004 Standards Australia indicated that the status of some Standards was to be changed to ‘obsolescent’ for those Standards which were no longer recommended for new equipment or for best current practise. These Standards have only been retained in order to provide for those who are servicing existing requirements.

Timber Floors

Tongued, grooved strip, plywood and particleboard flooring can be installed by following the methods outlined in **AS 1684.3-2010**, **AS 1684.4-2010** and Section 5 of **AS 1684.2-2010**. Timber floors can be sanded by following the methods outlined in **AS 4786.2-2005, Timber flooring – Sanding and finishing**.

The Australian and New Zealand manufacturing Standard for particleboard flooring is **AS/NZS 1860.1:2002, Particleboard flooring – Specifications**.

Information on grading requirements for sawn and round timbers used for flooring and decking is included in **AS 2796.2-2006, Timber – Hardwood – Sawn and milled products – General description** and **AS 4785.2-2002, Timber – Softwood – Sawn and milled products – Grade description**.

A list of recommended moisture levels for timbers is included in Appendix E of **AS 1684.2-2010** and **AS 1684.3-2010**. The appendix also includes information on recommended moisture levels for timber flooring.

Fire Tests

Building materials used in Australia should be designed to conform to different types of fire tests. It should be noted that **AS 1530.7-2007** is based on the International Standard **ISO 5925-1:2007**.

Fire Tests – Combustibility, Flammability, Ignitability, Heat Release and Smoke Release Tests Used To Measure Early Fire Hazard Properties for Building Products

- **AS 1530.1-1994, Methods for fire tests on building materials, components and structures – Combustibility tests for materials**
- **AS 1530.2-1993, Methods for fire tests on building materials, components and structures – Test for flammability of materials**
- **AS/NZS 1530.3:1999, Methods for fire tests on building materials, components and structures – Simultaneous determination of ignitability, flame propagation, heat release and smoke release**

Fire Tests – Fire Resistance Levels (FRL) Tests

- **AS 1530.4-2005, Methods for fire tests on building materials, components and structures – Fire-resistance test of elements of construction**

Fire Tests – Buildings Located In Bushfire Prone Areas

- **AS 1530.8.1-2007, Methods for fire tests on building materials, components and structures – Tests on elements of construction for buildings exposed to simulated bushfire attack – Radiant heat and small flaming sources**
- **AS 1530.8.2-2007, Methods for fire tests on building materials, components and structures – Tests on elements of construction for buildings exposed to simulated bushfire attack – Large flaming sources**
- **AS/NZS 3837:1998, Method of test for heat and smoke release rates for materials and products using an oxygen calorimeter**

Fire Tests – Smoke Control Doors

- **AS 1530.7-2007, Methods for fire tests on building materials, components and structures – Smoke control door**. (Note: This Standard is not used to complete tests on fire doors that have been manufactured to **AS 1905.1-2005** The Australian fire door Standard only references tests that are included in **AS 1530.4-2005**.

Acoustic Tests

Building panels, partitions and floor coverings supplied in different types of buildings should be tested to measure airborne sound (weight reduction indices) and impact sound levels. Information on Australian (AS) and Australian/New Zealand (AS/NZS) Standards covering these topics is included below.

All of the Standards referenced below, with the exception of **AS 1191-2002, Acoustics - Method for laboratory measurement of airborne sound transmission insulation of building elements** are identical to International Standards.

Airborne Sound (Sound Weight Reduction Indices)

- **AS/NZS 1276.1:1999, Acoustics – Rating of sound insulation in buildings and of building elements – Airborne sound insulation**
- **AS/NZS ISO 717.1:2004, Acoustics – Rating of sound insulation in buildings and of building elements – Airborne sound insulation**

Impact Sound Levels

- **AS 1191-2002, Acoustics – Methods for laboratory measurement of airborne sound transmission insulation of building elements**
- **AS ISO 140.6-2006, Acoustics – Measurement of sound insulation in buildings and of building elements – Laboratory measurement of impact sound insulation of floors**
- **AS ISO 717.2-2004, Rating of sound insulation in buildings and of building elements – Impact sound insulation**
- **AS/NZS ISO 140.7:2006, Acoustics – Measurement of sound insulation in buildings and of building elements – Field measurement of impact sound insulation of floors**

Balustrades

Balustrades can look great in any given property, but without following the proper safety requirements they can cause serious injuries and fatalities. For those who are working with steel, wire, glass, aluminium or timber, there are Standards which can provde assistance.

Balustrades located in residential buildings can be designed by following the information that is included in part 3.9 to volume 1 of the 2010 edition of the Building Code of Australia.

Balustrades can also be designed by following the methods described in **AS 1657-1992, Fixed platforms, walkways, stairways and ladders – Design, construction and installation**. Applications of this Standard are included in part D2.18 in volume 2 to the 2010 edition of the Building Code of Australia. Relevant information may also be included in Commonwealth and State building and workplace health and safety legislation.

Balustrades located in different types of non-residential buildings accessed by persons with disabilities should be designed to the requirements covered in **AS 1428.1-2009, Design for access and mobility – General requirements for access – New building work**.

Information on clearances and heights for balustrades used in residential buildings is included in Clause 11.6 of **AS 4226-2008, Guidelines for safer housing design**.

Glass Balustrades

Glass balustrades should be designed by following the methods outlined in Section 7 of **AS 1288-2006, Glass in buildings - Selection and installation**. Span tables for glass panels are also included in **AS 1288 Supp 1-2006**.

Loads and Safety Factors for Balustrades

Balustrades should be designed and engineered to conform to the types of loads and safety factors that are included in the Australian and New Zealand (AS/NZS) Standards listed below:

- **AS/NZS 1170.0:2002, Structural design actions – General principles**
- **AS/NZS 1170.1:2002, Structural design actions – Permanent, imposed and other actions**
- **AS/NZS 1170.2:2002, Structural design actions – Wind actions**

An alternative wind loading Standard for residential buildings is **AS 4055-2006, Wind loads for housing**.

Fences and Gates

There are a few Australian Standards® for chain-link security fences and gates, swimming pool fences and electric fences. Standards Australia has not established any Standards for metal fences that don't use barbed wire and timber fences. Metal fences can be painted and metal finished by following the methods prescribed in **AS/NZS 2311:2009** and **AS/NZS 2312:2002**.

Chain Link Security Fences and Gates

Australian manufacturing Standards for chain link security fences are covered by the **AS 1725, Chain link fabric fencing Series**.

Swimming Pool Fences and Gates

Manufacturing requirements for pool fences is included in **AS 1926.1-2007, Swimming pool safety – Safety barriers for swimming pools**. Swimming pool fences should be located by following the methods described in **AS 1926.2-2007, Swimming pool safety – Location of fencing for private swimming pools**. These Standards are referenced in the 2010 edition to the Building Code of Australia as well as State and Territory building legislation.

The Australian manufacturing Standard for gates used with swimming pools is **AS 2820-1993, Gates units for private swimming pools**.

Glass pool fences should be designed and installed by following the techniques described in **AS 1288-2006, Glass in buildings - Selection and installation**.

Electric Fences

The Australian and New Zealand installation Standard for electric fences is **AS/NZS 3014:2003, Electrical installations – Electric fences**.

Slip Resistance

Information on pendulum and ramp (R) slip resistance tests for surfaces are included in **AS/NZS 4586:2004, Slip resistance classification of new pedestrian surface materials** and **AS/NZS 4663:2004, Slip resistance measurement of existing pedestrian surfaces**.

The only publication providing information on recommended pendulum and ramp slip resistance ratings for areas in different types of buildings is **HB 197:1999, An introductory guide to the slip resistance of pedestrian surface materials**.

Painting and Metal Finishing

There are a number of Standards covering recommended practises for painting buildings and Standards covering manufacturing requirements for paints. Persons storing large quantities of paints may also need to store products by following the details that are included in **AS 1940-2004, The storage and handling of flammable and combustible liquids**.

AS/NZS 2311:2009

AS/NZS 2311:2009, Painting of buildings provides a guide to products and procedures for the painting of buildings for general domestic, commercial and industrial use. Section 5 of this document includes tables listing recommended painting systems for new interior and exterior surfaces.

AS/NZS 2312:2002

AS/NZS 2312:2002, Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings provides guidelines for selection and specification of coating systems for protection of structural steel work against corrosive environments.

Standards Commonly Used By Architects and Building Designers

Disabled Access Standards

Architects and builders designing non-residential buildings where disabled persons may be present, should primarily follow the methods described in the **AS 1428, Design for access and mobility Series**. This series of Standards are also available as a set, **AS 1428 (Set)-2010, Design for access and mobility Set**. Information on Standards that are included in the **AS 1428 Series** are detailed in the following paragraphs.

AS 1428.1-2009

The information in **AS 1428.1-2009, Design for access and mobility – General requirements for access – New building work** is used to ensure persons with different types of disabilities have unimpeded access to different types of buildings. This Standard should not be used to ensure single detached residential buildings are designed to cater for persons with disabilities. Information covering this area is included in **AS 4299-1995, Adaptable housing**.

AS 1428.1-2009 includes diagrams illustrating required circulation spaces for parts of buildings that are accessed by persons with disabilities. Detailed information on diagrams for ramps, handrails and stairs used by persons with disabilities to access buildings is included in Sections 10 and 11 of the Standard.

It is also important to note that stairs, walkways and ramps should have slip-resistant surfaces.

AS 1428.2-2002

Persons wishing to design buildings by meeting the requirements defined in **AS 1428.1-2001** can follow the methods described in **AS 1428.2-2002, Design for access and mobility – Enhanced and additional requirements – Buildings and facilities**.

AS 1428.3-1992

AS 1428.3-1992, Design for access and mobility – Requirements for children and adolescents with physical disabilities defines requirements for facilities not located in private residencies that are designed to cater for children and adolescents with physical disabilities. This Standard can be used together with **AS 1428.1-2009**.

AS 1428.4.1-2009

Tactile ground surface indicators not located in private dwellings for persons with disabilities should be designed by following the details that are included in **AS 1428.4.1-2009, Design for access and mobility – Means to assist the orientation of people with vision impairment – Tactile ground indicators**. This Standard can be used together with **AS 1428.1-2009**.

AS 1428.5-2010

AS 1428.5-2010, Design for access and mobility – Communication for people who are deaf or hearing impaired provides information on the types of hearing devices that should be locate in non-private dwellings accessed by persons with a hearing impairment.

AS 4299-1995

Architects and builders responsible for ensuring residential buildings are newly designed/modified for persons with disabilities can follow the recommendations described in **AS 4299-1995, Adaptable housing**.

Off-Street and On-Street Carparks

Design requirements for off-street and on-street parking structures are included in the **AS/NZS 2890, Parking Facilities Series**. These publications are also available in a Set, **AS/NZS 2890 (Set):2009, Parking Facilities Set**. Information on these Standards is detailed in the following paragraphs.

AS/NZS 2890.1:2004

Off-street parking structures should be designed by following the methods described in **AS/NZS 2890.1:2004, Parking facilities – Off-street car parking**. Also, information on layouts for angle and parallel parking spaces are included in Section 2 of this Standard.

Lighting levels for roofed car parks are included in the Standard **AS/NZS 1680.2.1:2008, Interior and workplace lighting – Specific applications – Circulation spaces and other general areas**. Lighting requirements for open air car parks are included in **AS/NZS 1158.3.1:2005, Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance and design requirements**.

AS 2890.2-2002

Off-street parking facilities used by commercial vehicles can be designed by following the details that are included in **AS 2890.2-2002, Parking facilities – Off-street commercial vehicle facilities**.

AS 2890.3-1993

Parking facilities used by persons on bicycles should be designed by following the details that are included in **AS 2890.3-1993, Parking facilities – Bicycle parking facilities**.

AS 2890.5-1993

The Australian design Standard for on-street parking facilities is **AS 2890.5-1993, Parking facilities – On-street parking**.

AS/NZS 2890.6:2009

The Australian/New Zealand Standard for designing car parking facilities used by persons with disabilities is **AS/NZS 2890.6:2009, Parking facilities – Off-street parking facilities for people with disabilities**.

Interior Lighting

Lighting levels in areas where different types of tasks are undertaken are included in the **AS/NZS 1680, Interior lighting Series**. General information on methods used to assess lighting (lux) levels for different areas is included in **AS/NZS 1680.1:2006**. The information contained in **AS/NZS 1680.0:2009** and also the **AS/NZS 1680.2 Series** should also be assessed by following the lighting levels and good lighting practises that are described in **AS/NZS 1680.1:2006**.

More information on these Standards are outlined in the following paragraphs.

AS/NZS 1680.0:2009

The Australian and New Zealand Standard **AS/NZS 1680.0:2009, Interior lighting – Safe movement** sets out the minimum requirements for electric lighting systems within publicly accessible areas of buildings so as to provide visual conditions that facilitate the safe movement of people in the normal use of the building.

AS/NZS 1680.1:2006

AS/NZS 1680.1:2006, Interior and workplace lighting – General principles and recommendations includes the general principles and recommendations for the lighting of interiors of buildings for performance and comfort. It applies primarily to interiors in which specific visual tasks are

undertaken and takes into account both electric lighting and daylight. Information on lighting levels for specific types of tasks is included in the **AS/NZS 1680 Series**.

AS/NZS 1680.2.1:2008

AS/NZS 1680.2.1:2008, Interior and workplace lighting – Specific applications – Circulation spaces and other general areas sets out recommendations for the lighting of circulation spaces and other areas which commonly occur in buildings of various types. It contains material that adds to or amends the recommendations in **AS/NZS 1680.1:2006**. It is recommended that they be read in conjunction with each other as well as with any other applicable specific recommendations in the **AS/NZS 1680, Interior lighting Series**.

Information on recommended lighting levels for stairs and walkways are included in **AS/NZS 1680.2.1:2008**.

AS/NZS 1680.2.2:2008

Information on recommended lighting levels for office and screen-based tasks are included in **AS/NZS 1680.2.2:2008, Interior and workplace lighting - Specific applications – Office and screen-based tasks**.

AS/NZS 1680.2.3:2008

Information on recommended lighting levels for tasks undertaken in education and training facilities is included in **AS/NZS 1680.2.3:2008, Interior and workplace lighting – Specific applications – Education and training facilities**.

AS/NZS 1680.2.4:1997

Recommended lighting levels for different types of industrial tasks and related types of activities is included in **AS/NZS 1680.2.4:1997, Interior lighting - Industrial tasks and processes**.

AS/NZS 1680.2.5:1997

Information on recommended lighting levels for tasks undertaken in hospitals and medical facilities is included in **AS/NZS 1680.2.5:1997, Interior lighting - - Hospitals and medical tasks**.

Bushfire Prone Areas

Information and guidance on the siting of the building and methods and materials of construction for buildings in areas designated as bushfire prone. The following paragraphs detail the Standards relevant to this topic.

AS 3959-2009

AS 3959-2009, Construction of buildings in bushfire-prone areas provides essential information on construction methods for buildings that may be, or are subjected to, very low, low, moderate, high, very high and extreme bushfire attack level (BAL) categories. Heat flux levels for materials used to construct buildings subjected to these types of bushfire attack levels are:

- **AS 1530.8.1-2007, Methods for fire tests on building materials, components and structures – Tests on elements of construction in buildings exposed to simulated bushfire attack – Radiant heat and small flaming sources**
- **AS 1530.8.2-2007, Methods for fire tests on building materials, components and structures – Tests on elements of construction in buildings exposed to simulated bushfire attack – Large flaming sources**
- **AS/NZS 3837:1998, Method of test for heat and smoke release rates for materials and products using an oxygen combustion calorimeter** (Note: This Standard is used to complete fire tests for different types of timbers)

HB 330-2009

The handbook **HB 330-2009, Living in bushfire-prone areas** is the companion publication to **AS 3959-2009**. A list of frequently asked questions and replies to these types of questions for owners of buildings located in bushfire prone areas is included in Appendix B of **HB 330-2009.** A diagram providing information on materials that can be used to construct buildings located in these areas is also included.

Evacuating Buildings

All buildings with the exception of residential buildings (class 1A buildings as defined under the Building Code of Australia) should be evacuated by following the procedures described in **AS 3745-2010, Planning for emergencies in facilities**. The critical aspects of the Standard are summarized in the scope of **AS 3745-2010**. Copies of emergency evacuation diagrams are included in Appendix E of this same Standard.

Persons and organizations responsible for arranging evacuations of buildings may also be interested in the Standards and handbooks listed below:

- **AS 1670.4-2004, Fire detection, warning, control and intercom systems – System design, installations and commissioning – Sound systems and intercom systems for emergency purposes**
- **AS 1851-2005, Maintenance of fire protection systems and equipment**
- **AS 3806-2006, Compliance programs**
- **AS 4421-1996, Guards and patrols**
- **AS/NZS 5050:2010, Business continuity – Managing disruption-related risk**
- **AS/NZS ISO 31000:2009, Risk management – Principles and guidelines**
- **HB 167:2006, Security risk management**
- **HB 292-2006, A practitioners guide to business continuity management**
- **HB 293-2006, Executive guide to business continuity management**
- **HB 327:2010, Communicating and consulting about risk (Companion to AS/NZS 31000:2009)**

Demonstrating Compliance to Building Standards

Generally, there are three methods available to persons and organizations in the building industry wishing to demonstrate compliance to building Standards. These methods are summarized below.

Method 1 – Commissioning Assessments from Suitably Competent Persons

Suitably competent persons, organizations, industry bodies, industry associations and companies can be engaged to independently assess work undertaken in the building industry. This method of assessment should be used to demonstrate compliance to manufacturing Standards.

Method 2 - Type Testing (ISO Type 1 Scheme)

This is a commonly applied method that involves the commissioning of an independent and relevant accredited test report of a sample product, prepared by an accredited test facility that is then reviewed for compliance requirements of relevant Standards. The result of the process is often referred to as a 'Type Test Certificate' that may provide the user, or stakeholder with an enhanced level of confidence in a manufacturer's or suppliers claim of compliance.

Method 3 – Third Party Product Certification (ISO Type 5 Schemes)

Organizations and personnel wishing to provide a higher level of confidence to stakeholders in their claims of compliance may wish to engage the services of an independent third party to procure testing of an initial sample of a product, undertake an audit of the manufacturer's facilities, followed by ongoing batch and surveillance tests of products and audits at regular intervals. More detailed information on product certification schemes is included in **HB 18.67-2005, Conformity assessment – Fundamentals of product certification**.

SAI Global's Product Certification Schemes

SAI Global Limited is the largest provider of third party product certification and testing services within the Asia Pacific, and is accredited against a broad range of Australian and International Standards, via its wholly owned subsidiary SAI Global Certification Services Pty Limited. Further information can be sought by contacting us at **product@saiglobal.com**.

SAI Global Product Services offers a wide range of certification schemes tailored for building products.

StandardsMark

StandardsMark™ is a **System 5 certification scheme** which is used to certify manufacturers of electrical equipment to specific product performance Standards. The '5 ticks' StandardsMark™ certification requirements are:

- Testing of sample products by independent accredited laboratories
- Verification of test reports
- Audit of the manufacturing site for initial and ongoing compliance

CodeMark Scheme

SAI Global is accredited to certify manufacturers of building products under the CodeMark scheme.

Post and Marking Scheme for Safety Glass

The Post Cutting and Marking Scheme (an ISO Type 5 Scheme) has been designed specifically for manufacturers or suppliers to demonstrate compliance to **AS/NZS 4667:2000, Quality requirements for cut-to-size and processed glass**.

Please contact the **SAI Global Product Services** division if you require any further information on the above schemes.
Phone: +612 8206 6322
Email: **product@saiglobal.com**

Online Resources

For a list of online resources used to locate legislation, Government Departments, Law Foundations and Institutes.

Do you need online access to the Building Code of Australia and all the Australian Standards® referenced within it? - **www.saiglobal.com/BCA**

Do you need guidance on which Australian Standards® or parts thereof are referred to in legislation? - **www.saiglobal.com/Newsletters**

Would you like to be notified when Standards relevant to you are updated, amended or newly released? - **www.saiglobal.com/SW**

Do you need online access to the full text of your own customised selection of Australian Standards® as well as optional access to international Standards? - **www.saiglobal.com/Select**

Do you need to stay current on Australian Legislative, Regulatory and Compliance News? - **http://www.saiglobal.com/compliance/regulatory-news/asiapac/**

Would you like to drive continued organizational success with results-focused training and professional development? - **www.saiglobal.com/training**

Building Regulators

Australian Building Codes Board
Website: **http://www.abcb.gov.au/**

NSW Department of Planning
Website**: http://www.planning.nsw.gov.au/**

Building Commission
Website**: www.buildingcommission.com.au**

Planning SA
Website: **www.planning.sa.gov.au/**

WA Dept of Regional Development and Lands
Website: **www.rdl.wa.gov.au**

Workplace Standards Tasmania
Website: **www.wst.tas.gov.au/industries/building**

ACT Planning and Land Authority
Website: **www.actpla.act.gov.au/**

NT Department of Lands and Planning
Website: **www.dpi.nt.gov.au/**

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Building Products Certification Services

Product Certification Key Documents