Guide to Standards - Energy Efficiency
Table of Contents

Introduction .................................................................................................................. 4
Good Management Practice ......................................................................................... 4
  Energy Management Systems .................................................................................. 4
  Energy Audits .......................................................................................................... 5
  Risk Management .................................................................................................... 5
  Environmental Management .................................................................................... 5
  OH&S Management .................................................................................................. 6
Climate Change ............................................................................................................ 6
  Greenhouse Gas Emissions ....................................................................................... 6
  Flood Control ........................................................................................................... 8
Alternative Energy Sources .......................................................................................... 8
  Risk Assessment ....................................................................................................... 8
  Safety of Machinery ................................................................................................. 8
  Electrical Safety ....................................................................................................... 8
  Electromagnetic Compatibility (Radio Interference Standards) ................................ 9
  Wind Farms ............................................................................................................... 9
  Solar Energy ............................................................................................................ 10
  Geothermal Energy ................................................................................................. 12
  Nuclear Power .......................................................................................................... 12
  Coal Sequestration ................................................................................................... 14
Energy Efficiency Standards for Buildings ................................................................. 14
  National Construction Code (NCC) Referenced Australian Standards .................. 14
  Energy Efficiency Schemes ...................................................................................... 15
  Energy Audits for Buildings .................................................................................... 15
  Sustainability Standards ......................................................................................... 15
  Energy Efficient Lighting ......................................................................................... 15
  Heating and Ventilation Systems ............................................................................ 16
  Skylights ................................................................................................................... 16
  Solar Panels, Solar Water Heaters and Heat Pumps ................................................ 17
  Windows and Doors ................................................................................................. 17
Energy Efficiency for Electrical Equipment ............................................................... 17
  Airconditioners ........................................................................................................ 18
  Lighting Products ..................................................................................................... 19
  White Goods ............................................................................................................. 20
  Electric Heating Appliances (Storage Water Heaters) ............................................ 21
  Heat Pumps – Water Heaters ................................................................................... 21
  Televisions and Set-Top Boxes .............................................................................. 21
  Swimming Pool Pumps ............................................................................................. 21
  Power Supplies ......................................................................................................... 21
  Electric Motors ......................................................................................................... 21
Energy Efficiency Standards for Gas Appliances ....................................................... 22
  Gas Water Heaters .................................................................................................. 22
  Gas Space Heaters ................................................................................................... 22
Water Efficient Appliances ......................................................................................... 22
SAI Global Certification Schemes ............................................................................... 24
  Product Certification ............................................................................................... 24
  Management Certification ....................................................................................... 25
Online Resources ........................................................................................................ 27
Regulators ................................................................................................................... 28
Environmental Protection Regulators
Coal and Mining Regulators
Building Regulators
Energy Efficiency (Electrical Equipment) Regulators
Gas Appliances Regulators
Customer Service Contacts
Introduction

Organizations throughout the world are increasingly facing energy efficiency challenges. This guide provides information on Standards and certifications specifically focusing on the topics of energy management and climate change. This guide also referenced publications that provide information on commonly used energy efficient products.

Those interested in the development of Energy Efficiency Standards may be interested in work that is being undertaken by the IEC SG1 Energy Efficiency and Renewable Resource Group. The information contained in this guide references a number of International (ISO) and (IEC) Standards.

Good Management Practice

General information on good management practice strategies that can be followed by organizations is included in:

- AS 3806-2006, Compliance programs
- AS 4608-2004, Dispute management systems
- AS/NZS 5050:2010, Business continuity – Managing disruption-related risk
- AS 8000-2003, Corporate governance – Good governance principles
- AS 8001-2008, Fraud and corruption control
- AS 8002-2003, Corporate governance – Organizational codes of conduct
- AS 8003-2003, Corporate governance – Corporate social responsibility
- AS 8004-2003, Corporate governance – Whistleblower protection program for entities
- ISO 26000:2010, Guidance on social responsibility
- GB 014, Business Improvement Series

There is also a detailed outline of all of major types of management related Standards and Certification schemes included in the Standards Guide - Good Management Practice.

Energy Management Systems

The International Organization for Standardization (ISO) has published energy efficiency management Standard; ISO 50001:2011, Energy management systems – Requirements with guidance for use. The International Standard was also endorsed as a European Standard.

Companion document providing detailed information on definitions relating to energy management and energy efficiency have been published as European standard. These Standards are listed below:

- EN 15900:2010, Energy efficiency services – Definitions and requirements
- SR CEN/CLC TR 16103:2010, Energy management and energy efficiency – Glossary of terms

The International Standard on energy management is based on the types of Plan-Do-Check-Act techniques that are described in the management Standards listed below:

• SR OHSAS 18001:2007, Occupational health and safety management systems - Requirements

Energy Audits

Energy audits can be commissioned and conducted by following the details that are included in AS/NZS 3598-2000, Energy audits. This outlines processes for identifying opportunities for cost effective investments to improve efficiency and effectiveness in the use of energy. Persons completing the types of audits described in this Standard may also be able to apply the principles and practices included in ISO 50001:2011.

Internal and external audits to different types of management certification programs can be undertaken by following the recommendations that are included in ISO 19011:2009, Guidelines for auditing management systems.

Risk Management

Information on different types of risk management strategies and techniques are included in:

• ISO/IEC 31010:2009, Risk management – Risk assessment techniques is an ideal companion to AS/NZS ISO 31000:2009 as it contains detailed information on different types of risk assessment techniques including risk management consequence and probability matrices.
• HB 158-2010, Delivering assurance based on ISO 31000:2009 – Risk management provides detailed information on strategies that can be used by internal auditors and other types of assurance providers to reduce levels of risk.

HB 203:2006, Environmental risk management – principles and process provides detailed information on risk assessment strategies that can be used to manage different types of environmental risks.

Environmental Management

AS/NZS ISO 14001:2004, Environmental management systems – Requirements for guidance for use specifies requirements for an Environmental Management System (EMS) to enable an organization to develop and implement objectives which take into account requirements about significant environmental aspects. This Standard is based on the Plan-Do-Check-Act (PDCA) continuous process improvement methodology that forms the basis for all management system certification Standards.

AS/NZS ISO 14004:2004, Environmental management systems – General guidelines on principles, systems and supporting techniques provides guidance on the establishment, implementation, maintenance and improvement of an Environmental Management System (EMS) and its coordination with other management systems. This Standard also includes information on the potential environmental impacts of products and services provided by organizations.

Environmental Assessments

AS/NZS ISO 14015:2003, Environmental management – Environmental assessment of sites and organizations provides guidance on how to conduct an Environmental Assessment of Sites and Organizations (EASO) through a systematic process of identifying environmental aspects and issues. It can help determine any business consequences and is an ideal publication for organizations that are required to manage and report on energy efficiency levels.

AS/NZS 14021:2000, Environment labels and declarations – Self-declared environmental claims (Type II environmental labelling) provides information on methods that should be followed by organizations to make environmental declarations without the assistance of a third party. Organizations relying on the advice of third parties to make environmental claims should follow the principles and practices that are included in ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations.
AS/NZS ISO 14031:2000, Environmental management – Environmental performance evaluation – Guidelines provides detailed information on key performance indicators that can be used by organizations to assess their environmental performance.

Life Cycle Assessments

ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines specifies requirements and guidelines for completing a Life Cycle Assessment (LCA) of a product or service which includes a definition of the goal and scope of a LCA, life cycle inventory (LCI) analysis, life cycle impact assessment (LCIA) and life cycle interpretation. Sample data sheets that can be used to undertake these types of assessments are also included in this Standard.

ISO 14040:2006, Environmental management – Life cycle assessment – Principles and framework covers LCA and LCI studies and information on how decisions can be made to determine the environmental aspects and impacts of products and services. Both ISO 14040:2006 and ISO 14044:2006 are referenced in the National Carbon Offset Standard which was introduced by the Australian Government Department of Climate Change and Energy Efficiency.

AS/NZS ISO 14041:1999, Environmental management – Life cycle assessment – Goal and scope definition and inventory analysis expands on the principles that are included in AS/NZS ISO 14040:1998 and specifies the requirements and procedures necessary for the compilation and preparation of the goal and scope for a Life Cycle Assessment (LCA) as well as for performing, interpreting and reporting a Life Cycle Inventory analysis (LCI).

OH&S Management

Safety signs should be designed by following the information contained in:

- AS 1319-1994, Safety signs for the occupational environment
- ISO 7010:2011, Graphical symbols – Safety colours and safety signs – Registered safety signs

More comprehensive information on different types of OH&S Standards is included in the Guide to Standards – Occupational Health and Safety.

Climate Change


Greenhouse Gas Emissions

Management and Reporting

Different levels of greenhouse gas emissions can be sampled and reported on by following the principles and practices described in AS 14064 Series of Standards. Methods used to determine levels of greenhouse gas emissions can be also be determined by following information contained in the AS 4323 Series of stationary source emission Standards.

Sampling methods used to measure the presence of biofuels are also included in the ASTM Standards listed below:

- ASTM D6866-12, Standard test methods for determining the biobased content of solid, liquid and gaseous samples using radiocarbon analysis
- ASTM D 7026-13, Standard guide for sampling and reporting of results for determination of biobased content of materials via carbon isotope analysis
- **ASTM D7459-08, Standard practice for collection of integrated samples for the speciation of biomass (Biogenic) and fossil-derived carbon dioxide emitted from stationary source emissions**

**AS ISO 14064.2-2006, Greenhouse gases – Specification with guidance at the project level for quantification and reporting of greenhouse gas emission reductions and removal enhancements (ISO 14062-2:2006, MOD)** provides principles, requirements and guidance at the project level for quantification, monitoring and reporting of activities intended to cause greenhouse gas (GHG) emission reductions. This Standard is a modified edition of **ISO 14064.2:2006**.

**AS ISO 14064.3-2006, Greenhouse gases – Specification with guidance for the validation and verification of greenhouse gas assertions** provides principles, requirements guidance for those conducting or managing the validation and/or verification of greenhouse gas (GHG) assertions. This Standard is identical to **ISO 14064.3:2006**.

The **AS ISO 14064 Series** can be purchased individually or as **AS ISO 14064 Set-2008, Greenhouse gases Set**.

**AS ISO 14065-2009, Greenhouse gases - Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition** specifies principles and requirements for bodies that undertake validation or verification of greenhouse gas emissions.

**ISO 14066-2011, Greenhouse gases – Competence requirements for greenhouse gas validation teams and verification teams** specifies competency levels for teams engaged to verify and validate greenhouse gas emissions. This Standard expands on the competency levels that are described in **AS ISO 14065-2009**.

**Carbon Sinks (Forestry Management and Land Development)**

**AS 4708-2007, Forest management – Economic, social, environmental and cultural criteria and requirements for wood production (known as the Australian Forestry Standard)** specifies performance requirements for economic, social, environmental and cultural criteria that are considered to be most important for ensuring that a forest is well managed. This Standard is intended for voluntary application to any forests in Australia being managed for wood production, whether native or planted forests. This Standard can be used by itself, or together with the certification requirements that are included in **AS/NZS ISO 14001:2004, Environmental management systems - Requirements with guidance for use**.

**AS 4708-2007** can be used in conjunction with its Supplements for more detailed implementation:

- **AS 4708 Supp 2-2007, The Australian Forestry Standard – Guidance for medium and large plantation forest ownerships (Supplement 2 to AS 4708-2007)** ensures the development of a management plan that establishes a strategic framework for forest management and compliance with legal, and other requirements to which the organization subscribes.

**AS 4707-2006, Chain of custody for certified wood and forest products** establishes minimum criteria and requirements for Chain of Custody (CoC) certification for wood or forest projects originating from a defined forest area that has been certified to **AS 4708-2007**.

**AS 4970-2009, Protection of trees on development sites** provides information on methods that can be used to protect trees located on areas subjected to land development, or areas that may be suitable for development applications.
Carbon sinks can be verified and reported by following the information that is included in AS 4978.1-2006, Quantification, monitoring and reporting of greenhouse gases in forest projects – Afforestation and reforestation.

AS 4707-2006, Chain of custody for certified wood and forest products establishes minimum criteria and requirements for Chain of Custody (CoC) certification for wood or forest projects originating from a defined forest area that has been certified to AS 4708-2007.

Sampling Greenhouse Gas Emissions

Standards Australia has not established any specific Standards relating to sampling greenhouse gas emissions, however organizations can sample greenhouse gas emissions by following the types of principles and practices that are included in the AS ISO 14064, Greenhouse gases Series and AS 4323, Stationary source emission Series.

Sampling Standards that can be used to measure the presence of biofuels in the atmosphere include:

- **ASTM D6866-11, Standard test methods for determining the biobased content of solid, liquid and gaseous Samples using radiocarbon analysis**
- **ASTM D7459-08, Standard practice for collection of integrated samples for the speciation of biomass (biogenic) and fossil-derived carbon dioxed emitted from stationary emission sources**

**Flood Control**

The British Standards Institution (BSI) has prepared; **BS 8533:2011, Assessing and managing flood risk in development. Code of practice** which can be used to help manage different types of floods.

**Alternative Energy Sources**

**Risk Assessment**

Hazard Operability Studies (HAZOP) techniques are commonly used to complete risk assessments on different types of plant equipment which can be used for alternative energy systems. These types of risk assessment techniques are described in AS IEC 61882-2003, Hazard and operability studies (HAZOP studies) – Application guide.

More information on risk management can be found in the Good Management Practice - Risk Management section of this guide.

**Safety of Machinery**

Machinery used with alternative energy sources should be designed and guarded by following the information that is included in AS 4024, Safety of machinery Series. More information on safety Standards for different types of machinery is also included in the Guide to Standards - Occupational Health and Safety.

**Electrical Safety**

High voltage electrical equipment used with alternative energy sources should be designed, installed, maintained and selected by following the details that are included in the Energy Networks Association (ENA) publications.

ENA publications and guidelines are available as an online package that is always updated with the latest editions.

Please contact the Major Accounts Team if you would like to subscribe to this service on:

PHONE: 131 242
EMAIL: major.accounts@saiglobal.com
Electrical safety requirements for different types of machinery are included in **AS 60204.1-2005, Safety of machinery – Electrical equipment of machines – General requirements (IEC60204-1, Ed. 5 (FDIS) MOD)**.

Safe practices for using high voltage electrical equipment are included in the **AS 5804, High-voltage live working Series**. Tests for high voltage equipment can be completed by following the methods described in **AS 60060.3-2008, High-voltage test techniques – Definitions and requirements for on-site testing**.

Safe work practices for persons using low voltage electrical equipment are included in **AS/NZS 4836:2011, Safe working on or near low-voltage electrical installations and equipment**.

Low voltage electrical equipment used with alternative energy systems should be designed by following the principles and practices described in **AS/NZS 3000:2007, Electrical installations (known as the Australian/New Zealand Wiring Rules)**. Fixed installations can be tested by following the requirements in **AS/NZS 3017:2007, Electrical installations – Verification guidelines** and **AS/NZS 3019:2007, Electrical installations – Periodic verification**.

Inverters used with grid connected power sources should be installed to the requirements included in **AS 4777.1-2005, Grid connection of energy systems via inverters – Installation requirements**. Information on design and manufacturing requirements for inverters is included in **AS 4777.2-2005, Grid connection of energy systems via inverters – Inverter requirements**. Inverters that are not used with grid connected power sources should conform to the requirements included in **AS/NZS 5603:2009, Stand-alone inverters – Performance requirements**.

Lightning protection requirements for electrical equipment can be assessed by following the information included in **AS/NZS 1768:2007, Lightning protection**.

Rotating electrical machines used in Australia and New Zealand should be designed to meet the requirements that are included in the **AS/NZS 1359, Rotating electrical machines - General requirements Series**.

For more information on energy efficiency requirements for rotating machinery, refer to the **Energy Efficiency for Electrical Equipment** section.

**Electromagnetic Compatibility (Radio Interference Standards)**

Electrical and electronic equipment used and sold in different countries should be tested to Electromagnetic Compatibility (EMC) Standards. The Australian Government’s **C-Tick** scheme can be used to demonstrate compliance to EMC Standards. Information on compliance arrangements that should be followed by manufacturers, suppliers and importers of equipment is included in the **Australian Communication and Media Authority (ACMA) publication Electromagnetic compatibility, compliance and labelling: Information for suppliers of electrical and electronic devices, vehicles and devices with internal combustion engines in Australia**.

**Wind Farms**

***Wind Turbines***

**IEC 61400, Wind turbines Series** provides information on design and safety requirements for different types of large turbines. Specifically, information on design requirements for turbines is included in **IEC 61400-1 Ed. 3.0, Wind turbines – Part 1: Design requirements**. This Standard also includes information on recommended operational and maintenance requirements for large turbines.

Power quality levels and performance requirements for turbines used on wind farms can be determined by following the information that is included in **AS 61400.21-2006, Wind turbines – Measurement and assessment of power quality characteristics of grid connected wind turbines**. Conformity requirements for turbines used on wind farms can be accessed by following the details that are included in **IEC 61400-22 Ed. 1.0, Wind turbines – Part 22: Conformity testing and certification**.
Information on Noise levels for wind farms are described in the AS 1055, Description and measurement of environmental noise Series. Those responsible for ascertaining noise levels on wind farms can also follow the recommendations that are included in IEC 61400-11 Ed. 2.1, Wind turbine generator systems – Part 11: Acoustic noise measurement techniques.

Building and Design

All structures used on farms should be designed to conform to relevant structural engineering Standards. Current Australian engineering practices used to design different types of buildings are included in the AS/NZS 1170, Structural design actions Series.

Detailed information on different types of building Standards is also included in the Guide to Standards – Building and Construction.

Fixed ladders used on wind farms should conform to the requirements that are included in AS 1657-1992, Fixed platforms, walkways, stairways and ladders – Design, construction and installation.

Solar Energy

The terms ‘Photovoltaic (PV) arrays’ and ‘Photovoltaic (PV) modules’ are commonly used to describe requirements for solar systems. Definitions for terms commonly used to describe different types of solar panels are included in IEC/TS 61836 Ed. 2.0, Solar photovoltaic energy systems – Terms, definitions and symbols.

Installing Solar Systems

AS/NZS 5033:2005, Installation of photovoltaic (PV) arrays provides information on installation, maintenance and commissioning requirements for photovoltaic (PV) arrays with d.c. open voltage circuit voltages up to 600V between positive and negative conductors, or up to + 600V with respect to earth and a maximum power of 30kW. This Standard also includes detailed information on wiring diagrams for different types of PV arrays. AS/NZS 5033:2005 does not apply to photovoltaic systems or arrays operating at less than 25Vd.c. and with a power of less than 25W.

Wiring processes for these types of systems should follow the principles and practices that are included in AS/NZS 3000:2007, Electrical installations (known as the Australian/New Zealand Wiring Rules).

Manufacturing and Design

Information on the manufacturing and design of solar panels. However information on this topic is included in:

- IEC 61215 Ed. 2.0, Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval provides information on design, manufacturing and marking requirements for crystalline silicon terrestrial photovoltaic modules.
- IEC 61646 Ed. 2.0, Thin-film terrestrial photovoltaic (PV) modules - Design qualification and type approval includes information on design and manufacturing requirements for thin film solar panels. This Standard applies to all terrestrial flat plate module materials not covered by IEC 61215 Ed. 2.0.
- IEC 61345 Ed. 1.0, UV test for photovoltaic (PV) modules includes ultraviolet tests for different types of solar panels.
- IEC 61730-1 Ed. 1.0, Photovoltaic (PV) module safety qualification – Part 1: Requirements for construction provides information on construction requirements for different types of solar panels.
- IEC 61730-2 Ed. 1.0, Photovoltaic (PV) module safety qualification – Part 2: Requirements for testing includes tests for different types of solar panels.

IEC 61215 Ed. 2.0, IEC 61646 Ed. 2.0 and the IEC 61730 Series are all referenced in AS/NZS 5033:2005.
EN 50380-2003, Datasheet and nameplate information for photovoltaic modules provides information on certificates that should be provided by manufacturers, importers and supplier of solar panels. The information in this Standard is appropriate for panels that have been tested to the European equivalent of IEC 61215 Ed. 2.0 which is EN 61215:2005.


Power Systems
Stand-alone power systems used with different types of solar energy sources should be designed and installed by following the information that is included in the AS/NZS 4509, Stand-alone power systems Series.

IEC 62446 Ed. 1.0, Grid connected photovoltaic systems – Minimum requirements for system documentation, commissioning tests and inspection provides information on documentation that should be submitted to customers following the installation of grid connected photovoltaic (PV) systems. This Standard covers requirements for panels that have been tested to IEC 61730-1 Ed. 1.0.

IEC 62124 Ed. 1.0, Photovoltaic (PV) stand alone systems – Design verification includes information on test methods and procedures that can be used to determine requirements for stand-alone PV systems. Information on recommended marking requirements for these types of systems is also included in this Standard.

Battery chargers used with solar panels should be tested to the requirements described in IEC 62509 Ed. 1.0, Battery charge controllers for photovoltaic systems – Performance and functioning.

I.S. EN 50530:2010, Overall efficiency of grid connected photovoltaic inverters includes information on measuring power point tracking efficiency levels of inverters, which are used in grid-connected photovoltaic systems.

Solar Water Heaters and Pumps
Solar water heaters and pumps that are required to be assessed under the Australian Government’s Renewable Energy Certificates (REC) scheme should be designed and tested to the requirements included in AS/NZS 2712:2007, Solar and heat pump water heaters – Design and construction and AS/NZS 4234:2008, Heated water systems – Calculation of energy consumption.

Energy efficiency tests for heat pump water heaters are also included in AS/NZS 5125.1:2010, Heat pump water heaters – Performance assessment – Air source heat pump water heaters.

Solar Collectors
Glass solar collectors used on buildings should be installed by following the details that are included in AS 1288-2006, Glass in buildings – Selection and installation.

Thermal Performance Tests
AS/NZS 2535.1:2007, Test methods for solar collectors – Thermal performance of glazed liquid heating collectors including pressure drop (ISO 9806-1:1994, MOD) provides information on methods that can be used to determine the steady-state and quasi-state thermal performance of solar collectors.

Solar Collectors for Swimming Pools

AS 2369.2-1993, Materials for solar collectors for swimming pool heating – Flexible or plasticized polyvinyl chloride provides information on requirements for polyvinylchloride (PVC) materials used in the manufacture of unglazed collectors intended for solar heating of swimming pools.
AS 3634-1989, Solar heating systems for swimming pools includes detailed information on design, installation and commissioning requirements for solar-heated systems used with swimming pools.

Geothermal Energy

For information specific to geothermal energy sources see:

- ASTM E957-03, Standard Terminology Relating to Geothermal Energy which includes definitions for processes and equipment used in geothermal plants.
- ASTM E974-00 (2006), Standard Guide for Specifying Thermal Performance of Geothermal Power Systems provides requirements for geothermal power plants using flashed steam as well as diagrams illustrating requirements for these types of systems.

Pressure vessels used with geothermal systems located in Australia should be designed to meet the requirements in AS 1210-2010, Pressure vessels.

Nuclear Power

Design and Construction

Loading and structural integrity requirements nuclear powerplants can be determined by using the information contained in the AS/NZS 1170 series of standards.

The American Society for Mechanical Engineers (ASME) has produced ASME OM:2012, Operation and maintenance of nuclear power plants. There are also a number of ASME pressure vessel Standards for nuclear power facilities.

Instrumentation, Equipment and Control Systems

IEC 60964 Ed. 2.0, Nuclear power plants - Control rooms - Design provides information on design requirements for main control rooms used in nuclear power plants. The details contained in this Standard can be used to design new control rooms, or modify existing control rooms to conform to appropriate operational and safety requirements.

The principles described in IEC 60964 Ed. 2.0 can be applied by following the information that is included in IEC/TR 62247 Ed. 1.0, Nuclear power plants – Main control room design – A review of the application of IEC 60964 (1989).

IEC 61513 Ed. 1.0, Nuclear power plants – Instrumentation and control for systems important to safety – General requirements for systems provides information on design, operational, maintenance and commissioning requirements for instruments and control systems used in power plants. The information contained in this Standard is based on principles covered in the IEC 61508, Functional safety of electrical/electronic/programmable electronic safety-related systems Series which have been adopted by both AS 61508 Series and I.S. EN 61508 Series.

ASTM C1217-00 (2012), Standard guide for design of equipment for processing nuclear and radioactive materials provides guidelines for equipment used in shielded cell or canyon facilities for processing of nuclear and radioactive materials.

Centralized systems used to provide radiological support to persons working in power stations can be designed by following the methods described in IEC 61559-1 Ed. 1.0, Radiation protection instrumentation in nuclear facilities – Centralized systems for continuous monitoring of radiation and/or levels of radioactivity – Part 1: General requirements.

IEC 60709 Ed. 2.0, Nuclear power plants - Instrumentation and control systems important to safety - Separation provides separation requirements for instruments and control systems used with nuclear power stations.

Life cycle and management processes for software used with instruments located on power plants are described in IEC 60880 Ed. 2.0, Nuclear power plants - Instrumentation and control systems important to safety - Software aspects for computer-based systems performing category A functions.
Instrument and control equipment used with nuclear power plants can be classified by following the information contained in IEC 61226 Ed. 3.0, Nuclear power plants - Instrumentation and control important to safety - Classification of instrumentation and control functions.

IEC 62340 Ed. 1.0, Nuclear power plants - Instrumentation and control systems important to safety - Requirements for coping with common cause failure (CCF) can be used to determine common failure requirements for hard-wired or computer-based equipment used in nuclear power plants.

ASME PV CODE 3, Boiler and pressure vessel code – Rules for construction of nuclear facility components Series provides information on pressure equipment used in nuclear facilities.

Safety Requirements

Nuclear power stations should be evacuated by following information that is provided by the Australian Nuclear Science and Technology Organization (ANSTO).

ASTM E1168-95(2008), Standard guide for radiological protection training for nuclear facility workers provides information on recommendations for the protection of workers employed at nuclear facilities.

IEC 60960 Ed. 1.0, Functional design criteria for a safety parameter display system for nuclear power stations includes safety requirements for display systems used in nuclear power stations.

IEC 61559-2 Ed. 1.0, Radiation in nuclear facilities – Centralized systems for continuous monitoring of radiation and/or levels of radioactivity – Part 2: Requirements for discharge, environmental, accident, or post-accident monitoring functions applies to the integration of radiation monitoring functions into a centralized system.

ISO 7753:1987, Nuclear energy – Performance and testing requirements for criticality detection and alarm systems specifies performance and testing requirements for criticality detection and alarm systems.

ISO 14943:2004, Nuclear fuel technology – Administrative criteria related to nuclear criticality safety covers criteria for the administration of nuclear criticality-safety-related activities for operations which take place outside of reactors and for which there exists a potential for criticality accidents.

ISO 17873:2004, Nuclear facilities – Criteria for the design and operation of ventilation systems for nuclear installations other than nuclear reactors specifies the requirements concerning the design and use of ventilation systems in nuclear installations such as hot cells, nuclear fabrication and examination laboratories, plutonium-handling facilities, reprocessing plants, enrichment facilities, nuclear-waste treatment facilities and storage facilities.

More information on safety Standards can be found in the Good Management Practice - OH&S Management section of this guide.

Quality Assurance

Organizations operating nuclear facility facilities can adopt the types of quality certification programs that are recommended in AS/NZS ISO 9001:2008, Quality management systems – Requirements.

Standards relating to nuclear energy can also be found in the Subject Area Energy and heat transfer engineering.
Coal Sequestration

Information for Coal Sequestration plants include: Underground Pipelines

Information on design and manufacture requirements for pipelines manufactured from glass-reinforced plastics are included in the ISO 14692, Petroleum and natural gas industries - Glass-reinforced plastics (GRP) piping Series.

Underground pipelines used to convey carbon dioxide, or other forms of carbon can be designed, operated and maintained by following the information included in:

- **AS 2885.0-2008, Pipelines – Gas and liquid petroleum – General requirements** includes general information on design, operational and installation requirements for different types of gas and liquid petroleum pipelines.
- **AS 2885.1-2007, Pipelines – Gas and liquid petroleum – Design and construction** describes methods for designing pipelines manufactured from carbon and carbon-manganese materials used to convey single-phase and multi-phase hydrocarbon fluids.
- **AS 2885.2-2007, Pipelines – Gas and liquid petroleum – Welding** covers information on methods used to weld and fabricate gas and liquid petroleum pipelines.
- **AS 2885.4-2010, Pipelines – Gas and liquid petroleum – Submarine pipeline systems** includes information on design, installation, testing and welding requirements for submarine petroleum pipelines.

Drilling Equipment

Information on steel used to manufacture drilling equipment is included in the AS/NZS 1554 Series of structural steel welding Standards.

ISO 13533:2001, Petroleum and natural gas industries – Drilling and production equipment – Drill-through equipment includes diagrams illustrating requirements for different types of drilling and production equipment.

API 6A Ed .20 (2010), Specification for wellhead and christmas tree equipment includes information on manufacturing requirements for different types of drilling equipment.

ISO 10423:2009, Petroleum and natural gas industries – Drilling and production equipment – Wellhead and Christmas tree equipment covers requirements for wellheads, valves and fittings that are used with different types of well intervention equipment.

Both ISO 11960:2011, Petroleum and natural gas industries – Steel pipes for use as casing or tubing for wells and ISO 10405:2000, Petroleum and natural gas industries – Care and use of casing and tubing cover information on correct practices for caring and using casing and tubing products.

Field inspection requirements for oil country tubular goods (OCTG) are included in ISO 15463:2003, Petroleum and natural gas industries – Field inspection of new casing, tubing and plain-end drill pipe.

API 5CT Ed 9(2011), Specification for casing and tubing provides information on requirements for casing and tubing products used with different types of drilling equipment.

Energy Efficiency Standards for Buildings

National Construction Code (NCC) Referenced Australian Standards

Energy efficiency requirements for different classes of buildings are included in the National Construction Code (NCC). We provide a NCC + Referenced Australian Standards subscription
service and BCA + Referenced Australian Standards subscription service. Volumes to the National Construction Codes listed below:

- Volume 1 – Class 2-9 buildings
- Volume 2 – Class 1 and 10a buildings
- Volume 3 - Plumbing Code of Australia

For access to more information on Building & Construction including the National Construction Code + Referenced Australian Standards, visit our Building & Construction Resource Centre.

**Energy Efficiency Schemes**

Energy efficiency requirements for commercial buildings are outlined in the National Commercial Building Disclosure Scheme. Energy efficiency levels for residential buildings are described in the National Australian Built Environment Rating System.

**Energy Audits for Buildings**

Information on energy audits for buildings is included in AS/NZS 3598:2000, Energy audits.

**Sustainability Standards**

Information on Structural integrity requirements for buildings are contained in the AS/NZS 1170 series of standards. Other types of design standards that are referenced in the National Construction Code. International and European standards that outline sustainability requirements for buildings:

- **ISO 15392:2008, Sustainability in building construction – General principles** contains information applicable to building and other construction works, as well as to the materials, products, services and processes related to the life cycle of buildings and other construction works.
- **ISO 21930:2007, Sustainability in building construction – Environmental declaration of building products** includes information on the determination of environmental requirements for building products.
- **ISO 2129-1:2011, Sustainability in building construction – Sustainability indicators – Part 1: Framework for the development of indicators and a core set of indicators for buildings** defines processes that should be followed when addressing the economic, environmental and social aspects of a building using a common framework and a set of indicators.

Information on service life planning, life costing and auditing requirements for buildings and assets are included in the ISO 15686, Building and constructed assets - Service life planning Series.

- **EN 15643 Series of standards, provides information on social, economic and environmental indicators that can be used to assess sustainability requirements for buildings.**
- **EN 15942:2011, Sustainability of construction works – Environmental product declarations – Communication format business-to-business**. Includes information on communication strategies that can be used to determine environmental requirements for different types of buildings.

**Energy Efficient Lighting**

**Interiors of Buildings**

The AS/NZS 1680, Interior and workplace lighting Series provides information on principles and recommendations for the lighting of interiors of non-residential buildings.
Specifically, energy efficient lighting levels can be determined by following the principles and recommendations that are included in **AS/NZS 1680.1:2006, Interior and workplace lighting – General principles and recommendations**.

### Roads, Public Spaces and Pedestrian Areas

Energy efficient lighting used to illuminate roads, public spaces and pedestrian areas should be designed and installed by following the recommendations covered in the **AS/NZS 1158 Series**:

- **AS/NZS 1158.1.1-2005, Lighting for roads and public spaces – Vehicular traffic (Category V) lighting – Performance and design requirements** provides energy auditing requirements for lighting used to illuminate freeways, arterial roads and sub-arterial roads.
- **AS/NZS 1158.3.1:2005, Lighting for roads and public spaces – Pedestrian area (Category P) lighting - Performance and design requirements** includes energy auditing requirements for lighting used on roads on which the visual requirements of pedestrians are dominant. This Standard also covers lighting requirements for open-air car parks.
- **AS/NZS 1158.4:2009, Lighting for roads and public spaces – Lighting of pedestrian crossings** includes energy auditing requirements for lighting products used to illuminate pedestrian crossings.
- **AS/NZS 1158.5:2007, Lighting for roads and public spaces – Tunnels and underpasses** provides energy auditing requirements for lighting systems used to illuminate tunnels.

### Heating and Ventilation Systems

Persons responsible for installing heating, ventilation and cooling systems in residential and domestic type dwellings can follow the practices that are recommended in **HB 276:2004, A guide to good practice for energy efficient installation of residential heating, cooling & air conditioning plant & equipment**.

Ductwork used with heating, ventilation and cooling (HVAC) systems should meet the requirements that are included in **AS 4254-2002, Ductwork for air-handling systems in buildings**.

Thermal resistance and energy efficiency requirements for ductwork are included in:

- **AS 4426-1997, Thermal insulation of pipework, ductwork and equipment – Selection, installation and finish** covers the selection, installation and finish of thermal insulation for pipework, ductwork, tanks, vessels, and equipment in the temperature range -75°C to +800°C, but excludes manufactured pre-insulated equipment, structural insulation of buildings and cold stores, fireproofing structures, refractory linings of plant, airborne installations and all external underground mains.
- **AS 4508-1999, Thermal resistance of insulation for ductwork used in building air conditioning** specifies requirements relating to the optimum thermal resistance of insulation for rigid and flexible ductwork and associated fittings used in heating, air conditioning and evaporative cooling systems of buildings and dwellings.

Please refer to the **Energy Efficiency for Electrical Equipment - Airconditioners** section for information on energy efficiency Standards for ducted, split and window wall units.

### Skylights

Energy performance requirements for skylights can be determined by following the details that are included in **AS 4285-2007, Skylights**. This Standard also includes detailed information on manufacturing, packaging and labelling requirements for different types of skylights.

Information on recommended natural lighting levels for skylights are included in **AS/NZS 1680.1:2006, Interior and workplace lighting – General principles and recommendations**.

For more information on skylights including design, manufacturing and installation requirements for safety glass, you can refer to the **Guide to Standards – Building and Construction**.
Solar Panels, Solar Water Heaters and Heat Pumps

Energy efficiency requirements for solar water heaters and heat pumps can be determined by following the tests that are included in AS/NZS 4234:2008, Heated water systems – Calculation of energy consumption and AS/NZS 5125.1:2010, Heat pump water heaters – Performance assessment – Air source heat pump water heaters.

Solar water heaters and heat pumps required to be registered under the Australian Government’s Renewable Energy Certificates (RECS) scheme should be designed to meet the requirements that are included in AS/NZS 2712:2007, Solar and heat pump water heaters – Design and construction.

The SAI Global StandardsMark scheme can be used to certify solar hot water systems and heat pumps to the above Standards. For further information on these schemes you can refer to the SAI Global Product Certification Schemes section of this guide or contact the Product Certification Services Group on:
PHONE: +61 2 8206 6322
EMAIL: product@saiglobal.com

For more information on solar panels and solar collectors, you can refer to the Alternative Energy Sources - Solar Energy section of this guide.

Windows and Doors

Air infiltration tests for window assemblies are specified in AS 2047-1999, Windows in buildings – Selection and installation. Air infiltration levels can be determined by completing the tests that are included in AS 4420.4-1996, Windows – Methods of test – Air infiltration tests.

Efficiency and thermal performance levels for windows and doors can be calculated by following the methods that are included in:

- ISO 10077-1:2006, Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 1: General which specifies the methods for the calculation of the thermal transmittance of windows and pedestrian doors consisting of glazed/and or opaque panels fitted in a frame, with and without shutters.
- ISO 12567-1:2010, Thermal performance of windows and doors – Determination of thermal transmittance by the hot-box method – Part 1: Complete windows and doors specifies a method to measure the thermal transmittance of a door or window system, specifically thermal ratings for frames, sashes, shutters, blinds, screens, panels, door leaves and fittings.

Energy Efficiency for Electrical Equipment

The Australian Government’s Equipment Energy Efficiency (E3) Program is responsible for regulating Standards for different types of electrical equipment.

For information on electrical safety or radio interference Standards for different types of household and related types of electrical equipment, you can refer to the Guide to Standards – Household Electrical Equipment.
Airconditioners

Energy Performance Standards

Room and Packaged Airconditioners


**AS/NZS 3823.1.2:2001, Performance of electrical appliances – Airconditioners and heat pumps – Test methods – Ducted airconditioners and air-to-air heat pumps – Testing and rating for performance** specifies the conditions on which the capacity and energy consumption of factory-made, electrically driven, mechanical-compression, ducted air conditioners and ducted heat pumps are based.


**AS/NZS 3823.2:2009, Performance of electrical appliances – Airconditioners and heat pumps – Energy labelling and minimum performance standard (MEPS) requirements** specifies the energy labelling requirements for single-phase non-ducted air conditioners and the MEPS requirements for single-phase and three-phase air conditioners up to a rated total cooling capacity of 65 kW that fall within the scope of **AS/NZS 3823.1.1:1998, AS/NZS 3823.1.2:2001 or AS/NZS 3823.1.3:2005**.

**AS/NZS 3823.3:2002, Performance of electrical appliances – Airconditioners and heat pumps – Calculation of performance for minimum energy performance standard (MEPS) requirements** specifies procedures for calculating the performance of factory-made residential, commercial and industrial, electrically driven, mechanical compression, single-package and split-system, ducted and non-ducted air conditioners for determining their compliance with MEPS requirements.

Closed Control Airconditioners

Close control airconditioners can be single and multiple units and they are designed to monitor temperature and humidity conditions.

Tests used to measure capacities and energy consumption requirements for close control airconditioners are included in **AS/NZS 4965.1:2008, Performance of close control airconditioners – Testing for rating**.

**AS/NZS 4695.2:2008, Performance of close control airconditioners – Minimum energy performance standard (MEPS) requirements** specifies information & design guidelines for cooling systems used with refrigerants.

**Demand Response Enabling Devices**

Energy requirements for air conditioners can be reduced by using Demand Response Enabling Devices. Operational instructions for these types of devices are included in **AS 4755.3.1-2008, Demand response capabilities and supporting technologies for electrical products – Interaction of demand response enabling devices and electrical products – Operational instructions and connections for airconditioners**.

**Refrigerants**

Information on refrigerants used with different types of airconditioners is contained in **AS/NZS 1677.1:1998, Refrigerating systems – Refrigerant classification**. This Standard includes numbering and classification requirements for different types of refrigerants as well as properties for different types of refrigerants.
Cooling systems used with refrigerants should be designed to conform to the information in **AS/NZS 1677.2:1998, Refrigerating systems – Safety requirements for fixed applications**.

**Equipment Used with Airconditioning Systems**

**AS 4211.1-1996, Gas recovery or combined recovery and recycling equipment – Fluorocarbon refrigerants from automotive airconditioning systems** specifies the minimum equipment requirements for safe and efficient recovery or combined recovery and recycling of refrigerants directly removed from and intended for reuse in automotive air conditioning systems.

**AS 4211.3-1996, Gas recovery or combined recovery and recycling equipment – Fluorocarbon refrigerants from commercial/domestic refrigeration and airconditioning systems** specifies the minimum equipment requirements for safe and efficient recovery or combined recovery and recycling of refrigerants, in both the liquid and vapour state, that have been directly removed from and are intended for reuse in, any commercial or domestic HVAC/R system which contains a refrigerant.

**Lighting Products**

**Linear Fluorescent Lamps**


**Fluorescent Lamp Ballasts**

Lighting products used with these types of ballasts should be tested to **AS/NZS 60901:2003, Single-capped fluorescent lamps – Performance specifications**. Energy efficiency levels for ballasts used with fluorescent lamps can be determined by following the methods that are included in:

- **AS/NZS 4783.1:2001, Performance of electrical lighting equipment – Ballasts for fluorescent lamps – Method of measurement to determine energy consumption and performance of ballasts lamp circuits** provides methods of energy consumption and performance levels for ballasts used with different types of fluorescent lamps.
- **AS/NZS 4783.2:2002, Performance of electrical lighting equipment – Ballasts for fluorescent lamps – Energy labelling and minimum energy performance standards requirements** includes information on classification, labelling and minimum energy requirements for ballasts designed to operate on 230V to 250Va.c. at 50Hz.

**Self-Ballasted Lamps**

Discharge lamps supplied with integrated ballasts also need to meet energy performance tests. Energy performance levels for these types of lamps that are intended for domestic and similar general lighting purposes can be determined by following the methods in:

- **AS/NZS 4847.1:2010, Selfballasted lamps for general lighting services – Test methods – Energy performance** specifies test methods and conditions for self-ballasted compact fluorescent lamps (CFLs) and other gas-discharge lamps with integrated means for controlling starting and stable operation.

**Incandescent (Tungsten Filament and Halogen) Lamps**

Energy performance levels for incandescent lamps can be determined by following the methods in:

- **AS/NZS 4934.1(Int):2008, Incandescent lamps for general lighting service – Test methods – Energy performance** is an interim Standard which specifies test methods for the
energy performance of tungsten filament and tungsten halogen lamps used in general lighting services.

- **AS 4934.2-2011, Incandescent lamps for general lighting services – Minimum Energy Performance Standards (MEPS) requirements** includes information which can be used to determine Minimum Energy Performance (MEPS), maximum wattage and other requirements for incandescent lamps, both tungsten filament and tungsten halogen.

**White Goods**

**Transformers for Halogen Lamps**

Introduction for energy efficiency levels for transformers used with halogen lamps can be determined by following information that is included in the **AS/NZS 4879 Series of Standards**.

**Household Refrigerators and Freezers**

For energy efficiency requirements on refrigerators and freezers refer to:

- **AS/NZS 4474.1:2007, Performance of household electrical appliances – Refrigerating appliances – Energy consumption and performance** which contains information on test conditions, methods used to assess temperature performance of refrigerators and energy consumption requirements for refrigerating appliances.

- **AS/NZS 4474.2:2009, Performance of household electrical appliances – Refrigerating appliances – Energy labelling and minimum energy performance standard requirements** includes algorithms used to calculate energy efficiency ratings and performance requirements (MEPS).

**Refrigerated Display Cabinets**

Energy consumption levels for remote and self-contained refrigerated display cabinets are included in **AS 1731.14-2003, Refrigerated display cabinets – Minimum energy performance standard (MEPS) requirements**. The levels described in this Standard can be measured by following tests that are included in **AS 1731.9-2003, Refrigerated display cabinets – Electrical energy consumption test** and **AS 1731.12-2003, Refrigerated display cabinets – Measurement of the heat extraction rate of the cabinets when the condensing unit is remote from the cabinet**.

**Liquid Chillers**

Minimum energy requirements for air and water-cooled liquid chilling units with cooling capacities greater than 350kW are included in **AS/NZS 4776.2:2008, Liquid-chilling packages using the vapour compression cycle – Minimum energy performance standard (MEPS) and compliance requirements**. This Standard references tests and rating requirements that are included in **AS/NZS 4776.1:1:2008, Liquid-chilling packages using the vapour compression cycle – Method of rating and testing for performance – Rating** and **AS/NZS 4766.1:2:2008, Liquid-chilling packages using the vapour compression cycle – Method of rating and testing for performance – Testing**.

**Washing Machines**

Energy performance requirements for washing machines are included in **AS/NZS 2040.1:2005, Performance of household electrical appliances – Clothes washing machines – Methods for measuring performance, energy and water consumption**. The **AS/NZS 2040.1 Supp Series** can be used to test washing machines to the requirements described in **AS/NZS 2040.1:2005**.

**AS/NZS 2040.2:2005, Performance of household electrical appliances – Clothes washing machines – Energy efficiency labelling requirements** describes and illustrates energy labels applied to washing machines tested to these Standards.

**Dryers**

Information on energy performance requirements for rotary clothes dryers are included in **AS/NZS 2442.1:1996, Performance of household electrical appliances – Rotary clothes dryers – Energy consumption and performance**. The **AS/NZS 2442.1 Supp Series** can be used to test clothes dryers to meet the requirements in **AS/NZS 2442.1:1996**.

**Electric Heating Appliances (Storage Water Heaters)**

Energy efficiency tests for mains pressure and unvented water heaters are included in:

- **AS 1056.1-1991, Storage water heaters – General requirements** includes information which can be used to determine manufacturing and performance requirements for electric storage water heaters of 25L to 630L.
- **AS/NZS 4692.1:2005, Electric water heaters - Energy consumption, performance and general requirements** specifies test methods and performance and construction requirements for storage water heaters of rated hot water delivery up to 630L or nominal capacity of 710 L, heat exchanger water heaters with a heat storage volume up to 710L, and water heaters that use electric resistance as the primary energy source.

**Heat Pumps – Water Heaters**

Standards to help determine energy efficiency levels for heat pump water heaters include:

- **AS/NZS 2712:2007, Solar and heat pump water heaters – Design and construction**
- **AS/NZS 4234:2008, Heated water systems – Calculation of energy consumption**
- **AS/NZS 5125:1:2010, Heat pump water heaters – Performance assessment – Air source heat pump water heaters**

**Televisions and Set-Top Boxes**

Minimum energy performance requirements for televisions and set-top boxes are described in AS/NZS 62087.2.2:2010, *Power consumption of audio, video and related equipment – Minimum energy performance standards (MEPS) and energy rating label requirements for television sets*. This Standard refers to tests that are included in AS/NZS 62087.1:2010, *Power consumption of audio, video and related equipment – Methods of measurement*.

**Swimming Pool Pumps**

**AS 5102.1-2009, Performance of household electrical appliances – Swimming pool pump-units – Energy consumption and performance** includes information on energy efficiency and performance requirements for single phase units capable of operating at flow rates equal or greater than 120 L/min. Tests used to determine energy performance requirements for pool pumps are included in this Standard.

Information on energy performance requirements for swimming pool pumps is included in **AS 5102.2-2009, Performance of household electrical appliances – Swimming pool pump-units – Energy labelling and minimum energy performance standard requirements**.

**Power Supplies**

Energy efficiency levels for external power supply units can be determined by completing the types of tests that are included in **AS/NZS 4665.1:2005, Performance of external power supplies – Test method and energy performance mark**.

**AS/NZS 4665.2:2005, Performance of external power supplies – Minimum energy performance standard (MEPS) requirements** specifies Minimum Energy Performance Standard (MEPS) requirements for single output external power supplies with an output power up to 250W.

**Electric Motors**

**AS/NZS 1359.5:2004, Rotating electrical machines – General requirements – Three-phase induction motors – High efficiency and minimum energy performance standards requirements**
applies to three-phase cage induction motors with ratings from 0.73kW and up to but not including 185kW. The scope covers motors of rated voltages up to 1100 V a.c. This Standard should be read together with the details that are included in AS/NZS 1359.102.3:2000, Rotating electrical machines - General requirements - Methods for determining losses and efficiency - Three-phase cage induction motors.

AS 1359.101-1997, Rotating electrical machines – General requirements – Rating and performance. (Note: This Standard is still regulated by the Australian Government’s Equipment Energy Efficiency (E3) Program, however it has been superseded by AS 60034.1-2009, Rotating electrical machines – Rating and performance (IEC 60034-1, Ed. 11(2004) MOD)).

The information contained in AS 1359.101-1997 can be used to determine duty types, ratings, operating conditions, performance requirements and tolerances for all types of rotating machines. Performance requirements for low voltage switchgear is included in the AS/NZS 3439, Low-voltage switchgear and controlgear assemblies Series.

AS 1359.102.1-1997, Rotating electrical machines – General requirements – Methods for determining losses and efficiency – General can be used to determine the calculation of efficiency from the summation of individual losses or from measurement of total losses. This Standard specifies particular losses to be included for various types of machines. Tests used to calibrate machines including zero power-factor tests, retardation tests and electrical back-to-back tests are also included in this Standard.


**Energy Efficiency Standards for Gas Appliances**

The Australian Government’s Greenhouse Office has released a Strategy for Creating Energy Efficiency Standards for Gas Appliances. Currently there are only energy efficiency standards for gas water heaters and gas space heating appliances. Information on these standards is included below:

Please contact SAI Global Product Services for information on their Gas Safety Certification Scheme for different types of gas appliances.

**Gas Water Heaters**

Energy efficiency, performance and labelling requirements for gas water heaters can be determined by following the information that is included in AS/NZS 4552.2:2010, Gas fired water heaters for hot water supply and/or central heating – Minimum energy performance standards for gas water heaters.

**Gas Space Heaters**

Information on performance, energy efficiency and labelling requirements for gas space heating appliances are included in AS 4553-2008, Gas space heating appliances.

**Water Efficient Appliances**

Flow rates for these types of products are determined by completing the types of tests that are included in AS/NZS 6400:2005, Water efficient products – Rating and labelling.

The Australian Government’s Water Efficiency Labelling and Standards (WELS) Scheme is used to certify manufacturers of products to water efficiency Standards.
The SAI Global WaterMark scheme can be used to certify plumbed-in products and plumbing fittings. For more information on this scheme you can refer to the SAI Global Product Certification Schemes section of this guide or contact the Product Certification Services Group on the following:

PHONE: +61 2 8206 6322
EMAIL: product@saiglobal.com
SAI Global Certification Schemes

Product Certification

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.

The Product Certification Services Group offers a wide range of certification schemes tailored for products related to energy efficiency.

StandardsMark™
SAI Global offers StandardsMark™ Certification Schemes for a number of products:

- **Personal Protective Equipment Products** such as helmets, eye protectors, hearing protectors, respiratory products, fall arrests, safety shoes, safety clothing etc.
- **Fire Safety Products** such as fire extinguishers, smoke alarms and fire blankets.
- **Children’s Products** such as child car seats, prams, costs, babies’ dummies, flotation aids, toy safety, bicycle helmets and children’s nightwear.
- **Waste water Treatment Products** and **Water/Plumbing Products** such as pipes, septic tanks, grey water treatment systems and rainwater tanks.
- **Building Products** such as safety glass, doors, windows, chairs, ladders and insulation products.
- **Electrical Products** such as cords, plugs, sockets, appliance couplers, electrical equipment.

Electrical Safety Type Test Scheme

**Electrical Products** are classified into two groups:

1. **Declared Articles** – a ‘declared’ article may not be sold in Australia, unless the product is marked with an approval marking or a regulatory compliance mark. Such products include:

   - Household appliances such as toasters, clothes dryers, heaters, irons, refrigerators, range hoods, sewing machines, televisions and vacuum cleaners.
   - Accessories such as plugs, wall switches, outlet devices and flexible cords.
   - Body appliances such as hair dryers, electric blankets and razors.
   - Outdoor appliances such as hedge trimmers, swimming pool/ spa equipment.
   - Lighting such as decorative lighting, portable lamps and festival lights.

2. **Non-Declared Articles** – all ‘non-declared articles’ offered for sale in Australia and New Zealand must comply with minimum safety requirements.

Please contact the **Product Certification Services Group** if you require any further information on the above schemes.

**PHONE:** +61 2 8206 6322  
**EMAIL:** product@saiglobal.com

WaterMark Scheme

Plumbing products and plumbing fittings used in Australia are required to be certified under the WaterMark Certification Scheme. Approval is based on the certification of products to nominated Standards and Technical Specifications as listed in **AS 5200.000**.
The certification requirements for particular plumbing products are related to the ‘risk’ to the plumbing and drainage system, and are allocated to two levels:

- **WaterMark Level 1** - an audit program for higher risk products. Similar to the StandardsMark™ Scheme, it is a System 5 program, which demonstrates that the manufacturer has the capability to consistently manufacture a product to meet the relevant product Standard. It combines type testing of the product samples and a rigorous ongoing annual audit of the manufacturer.

- **WaterMark Level 2** - a type test program for lower risk products. It is a System 1 program; therefore no assessment of the manufacturing process is required. The licence is issued for 3 years.

**CodeMark Scheme**

The [CodeMark Certification Scheme](#) is a regulatory Scheme where the relevant product must be compliant to a specific section of the Australian or New Zealand Building Code and the Standards referenced within it. In this Scheme the relevant product is tested and the manufacturer and possibly installation site(s) are audited for compliance.

**Gas Safety Certification Scheme**

SAI Global's [Gas Safety Products Certification Scheme](#) is a System 2/3 certification scheme, where compliance to the relevant standard is confirmed through independent testing and review of test reports. Ongoing compliance of the certified product is demonstrated via an annual product evaluation.

The SAI Global gas scheme incorporates:

- Type A gas appliances (up to 500MJ/h)
- Commercial catering equipment
- Industrial appliances (generally appliances up to and not exceeding 500MJ/h)
- Camping and leisure equipment
- Components.

**Management Certification**

The [Assurance Services Group](#) offers a wide range of certification schemes tailored for environmental management.

**ISO 14001 Environmental Management**

An Environmental Management System (EMS) is a framework which can be integrated with existing business processes to effectively identify, measure, manage and control environmental impacts and risks. An EMS also establishes the means for improving performance and moving towards environmental sustainability through best practice using Standards such as [ISO 14001](#).

**Greenhouse Gas Verified Emissions Program**

A two-tiered approach is available for providing businesses with independent validation and verification statements against [ISO 14064](#):

- **Tier I** - Carbon Managed
  Will help measure and manage the carbon emissions from a business and set clear policies for managing future reductions.

- **Tier II** - Carbon Neutral
  “Carbon Neutral" certification is for organizations that have established and verified their base year against Scope 1, 2 & 3 emissions and have set, implemented and are achieving greenhouse gas reduction targets.

**Forestry Management**

SAI Global expert auditors and accredited certification processes provide Forestry Managers with the ability to declare that forests meet recognized Standards of best practice.
In addition, the certification scheme is mutually recognized by the Programme for the Endorsement of Forest Certification Schemes (PEFC). This provides SAI Global certified clients with international recognition of their sustainable practices forestry management practices.

**FSC Chain of Custody**

SAI Global also undertakes audits to the Forest Stewardship Council (FSC) Chain of Custody Standard. Chain of custody certification provides a guarantee about the production of FSC-certified products. It is the path taken by raw materials from the forest to the consumer, including all successive stages of processing, transformation, manufacturing and distribution.
Online Resources

We have now made it faster and easier for you to be guided to Building & Construction Products and Services.

http://www.bca.saglobal.com

Do you need online access to the latest National Construction Code and all the Australian Standards referenced within it?
www.saiglobal.com/NCC

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

Do you need online access to the latest Plumbing Code of Australia and all the Australian Standards referenced within it?
www.saiglobal.com/PCA

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?
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

Need help creating safe work processes for your workplace?
www.saiglobal.com/is3-SWMS

Get anywhere, anytime access to information of which Australian Standards are referenced in which Australian Commonwealth, State and Territory legislation.
www.saiglobal.com/LexConnect
Regulators

Environmental Protection Regulators

Australian Government
Department of Climate Industry, Innovation. Climate Change, Science, Research and Tertiary Education
Website: www.climatechange.gov.au

Department of Sustainability, Environment, Water, Population and Communities
Website: www.environment.gov.au

NSW
Office of Environment & Heritage
Website: www.environment.nsw.gov.au

Victoria
Department of Sustainability and Environment
Website: http://www.dse.vic.gov.au

South Australia
Department of Environment, Water and Natural Resources
http://www.environment.sa.gov.au

Queensland
Department of Environment and Heritage
http://www.ehp.qld.gov.au

Western Australia
Department of Environment Regulation
http://www.der.wa.gov.au

EPA Tasmania

Northern Territory Environment Protection Authority
http://www.ntepa.nt.gov.au
ACT Government
Environment and Sustainable Development Directorate
http://www.environment.act.gov.au

**Coal and Mining Regulators**

Australian Government
Department of Resources, Energy and Tourism
Website: www.re.t.gov.au

NSW Government
Primary Industries, Minerals and Petroleum
Website: www.dpi.nsw.gov.au/minerals

State Government of Victoria
Department of Primary Industries
Website: new.dpi.vic.gov.au

Government of South Australia
Department of Primary Industries and Resources SA
Website: www.pir.sa.gov.au

Queensland Government
Mining and Safety
Website: mines.industry.qld.gov.au

Government of Western Australia
Department of Mines and Petroleum
Website: www.dmp.wa.gov.au

Tasmanian Government
Office of the Tasmanian Economic Regulator
Website: www.energyregulator.tas.gov.au

Northern Territory Government
Department of Resources – Minerals and Energy
Website: www.nt.gov.au/d/Minerals_Energy

ACT Government
Environment and Sustainable Development - ACT Planning and Land Authority (ACTPLA)
Website: www.actpla.act.gov.au
Building Regulators

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

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

NSW Planning & Infrastructure
Website: www.planning.nsw.gov.au

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

Government of South Australia, Planning, Transport and Infrastructure
Website: www.dpti.sa.gov.au

Building Commission
Website: www.buildingcommission.wa.gov.au

Workplace Standards Tasmania
Website: workplacestandards.tas.gov.au

ACT Government - Planning & Land Authority
Website: www.actpla.act.gov.au

Department of Land and Planning Services
Website: www.lands.nt.gov.au/building/index

Energy Efficiency (Electrical Equipment) Regulators

Australian Government
Australian GEMS Regulator
www.energyrating.gov.au

NSW
Energy Labelling
Trade and Investment NSW
http://www.dtiris.nsw.gov.au

Victorian Government
EnergySafe Victoria
Website: www.esv.vic.gov.au

Government of South Australia
Office of the Technical Regulator
Website: www.sa.gov.au/government/
Queensland
Electrical Safety Office
http://www.electricalsafety.qld.gov.au

Government of Western Australia
Energy Safety
Website:
www.commerce.wa.gov.au/energy/safety

Tasmanian Government
Office of Energy Planning and Conversation
Website: /www.dier.tas.gov.au/energy/home

Northern Territory Government
NT Worksafe
Website: www.worksafe.nt.gov.au

ACT Government
Environment and Sustainable Development
Website: www.actpla.act.gov.au
Gas Appliances Regulators

NSW Government
Fair Trading
Website: www.fairtrading.nsw.gov.au

Victorian Government
EnergySafe Victoria
Website: www.esv.vic.gov.au

Queensland Government
Department of Employment, Economic Development and Innovation
Website: www.deedi.qld.gov.au/default.htm

Government of South Australia
Office of the Technical Regulator
Website: www.sa.gov.au/government/entity

Government of Western Australia
Office of Energy Safety
Website: www.commerce.wa.gov.au/EnergySafety

Tasmanian Government
Department of Infrastructure, Energy and Resources – Office of Energy Planning and Conservation
Website: www.dier.tas.gov.au/energy

Northern Territory Government
NT Worksafe
Website: www.worksafe.nt.gov.au

ACT Government
Environment and Sustainable Development - ACT Planning and Land Authority (ACTPLA)
Website: www.actpla.act.gov.au
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Standards & Technical Information Group
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