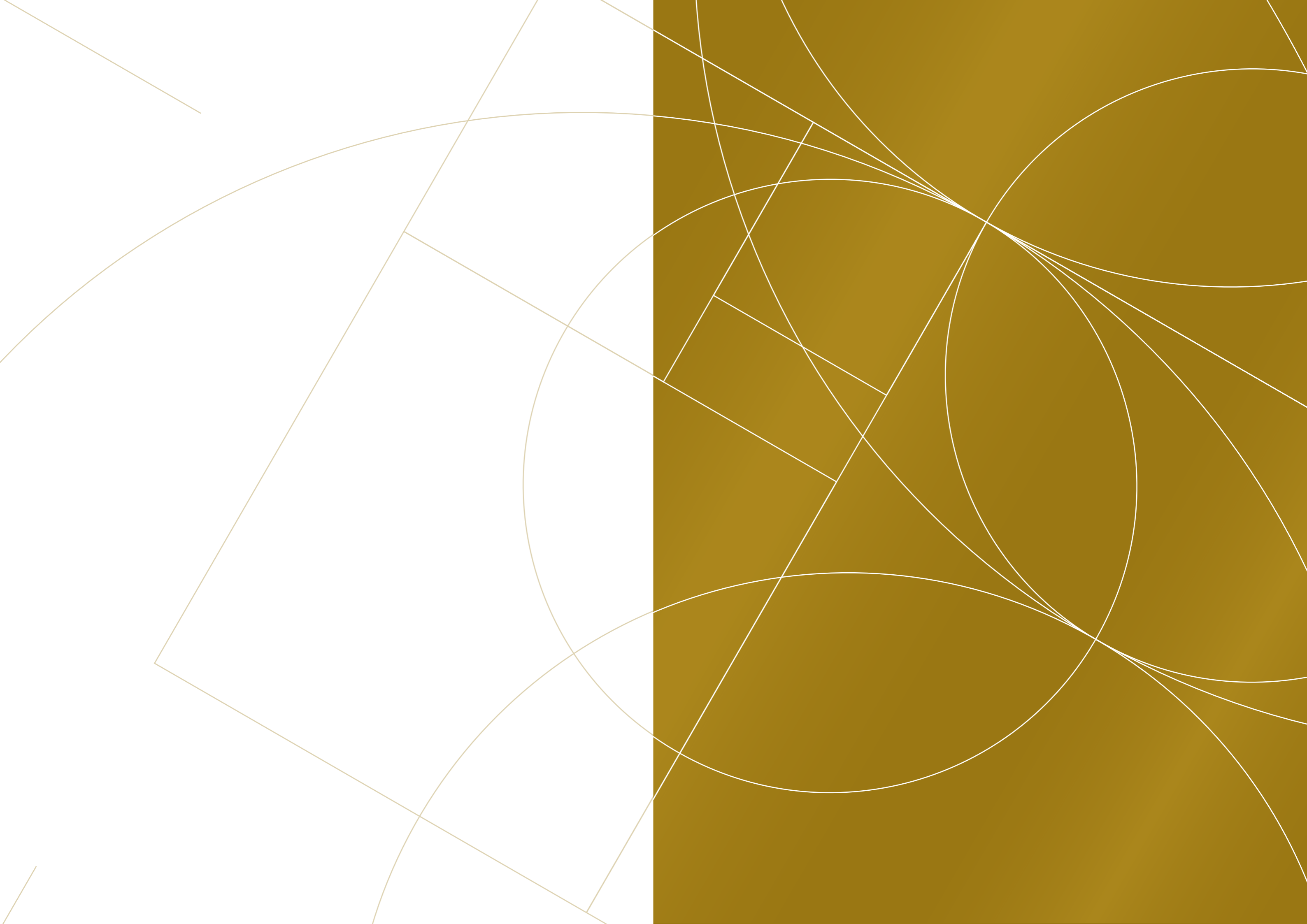




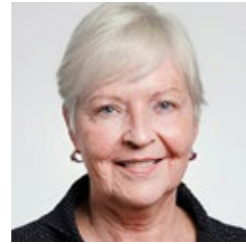

STANDARDS
Australia **100**

CELEBRATING 100 YEARS 1922-2022



1000

FOREWORD



2022 marks 100 years

Over the past century, Standards Australia has gone through many shifts and evolutions. From its inception in 1922 as the Australian Commonwealth Engineering Standards Association, its period as the Standards Association of Australia and through to the present day, Standards Australia has always sought to better the lives of Australians.

We have pioneered world-first innovations in safety standards that have kept Australians safe, many of which have been adopted by nations around the globe. We have worked with all industries, all levels of government, and also worked with communities to help shepherd technology as it emerged.

The history of this outstanding organisation has taught us that Standards Australia is an incredibly robust entity. It has weathered difficult times and come out the other side having learnt from them. It has developed standards both responsively and proactively, building on learnings from past events to anticipate the future.

Standards Australia is an organisation that truly has the people's interest at its core. Through our centenary year, we are acknowledging everything Standards Australia has achieved to survive and thrive in this 100-year period of the most dramatic change in human history. Today we are the inheritors and stewards of the legacy of this long history and the work of all who have gone before us.

As we look to our next 100 years, our focus must be to build on this heritage, to unleash the great potential of this organisation, and to become a global leader in trusted solutions that deliver exceptional and unique value to Australia and the world.

Tracey Gramlick, Chair of the Board

Improving life—today and tomorrow



It is an honour and privilege to be the CEO of Standards Australia in its centenary year.

As we celebrate this milestone, it is appropriate to reflect on the concept of legacy. As CEO of this great national asset, I am very conscious that we who lead the organisation today are the stewards of the legacy created by those who have gone before us.

Every day, in pursuing our goals, we seek to build upon the legacy of our forebears: those who contributed to the work and achievements of Standards Australia over its hundred-year history. I believe we can best honour and celebrate the past by building on the endeavours of our predecessors.

So, our centenary is not just an anniversary, it is an opportunity to reflect on the past hundred years and draw on that legacy to help shape the next hundred. It is our objective to create a better future and pass this organisation on to the next generation with greater capability to deliver even more value to Australia.

As we celebrate our centenary and look to the future, we are working hard to remain responsive to the needs and expectations of our stakeholders, contributors, and the Australian community, developing future standards solutions to meet global needs.

In this context, the challenge is to make sure we continue adapting and innovating to enable us to add even greater value to the Australian economy and community. This is reflected in our vision to be a global leader in trusted solutions that improve life—today and tomorrow.

The Standards Australia of the future will continue to support traditional areas of activity and standardisation, while also being proactive in developing strategies and standards to meet the many new needs of the modern world.

Our passion, our purpose and our focus is to advance the organisation's great journey—contributing our expertise, knowledge and learnings both locally and globally.

With many competing needs and considerations, the focus remains simple: continue developing and maintaining the standards we need today, whilst ensuring they remain relevant and accessible tomorrow.

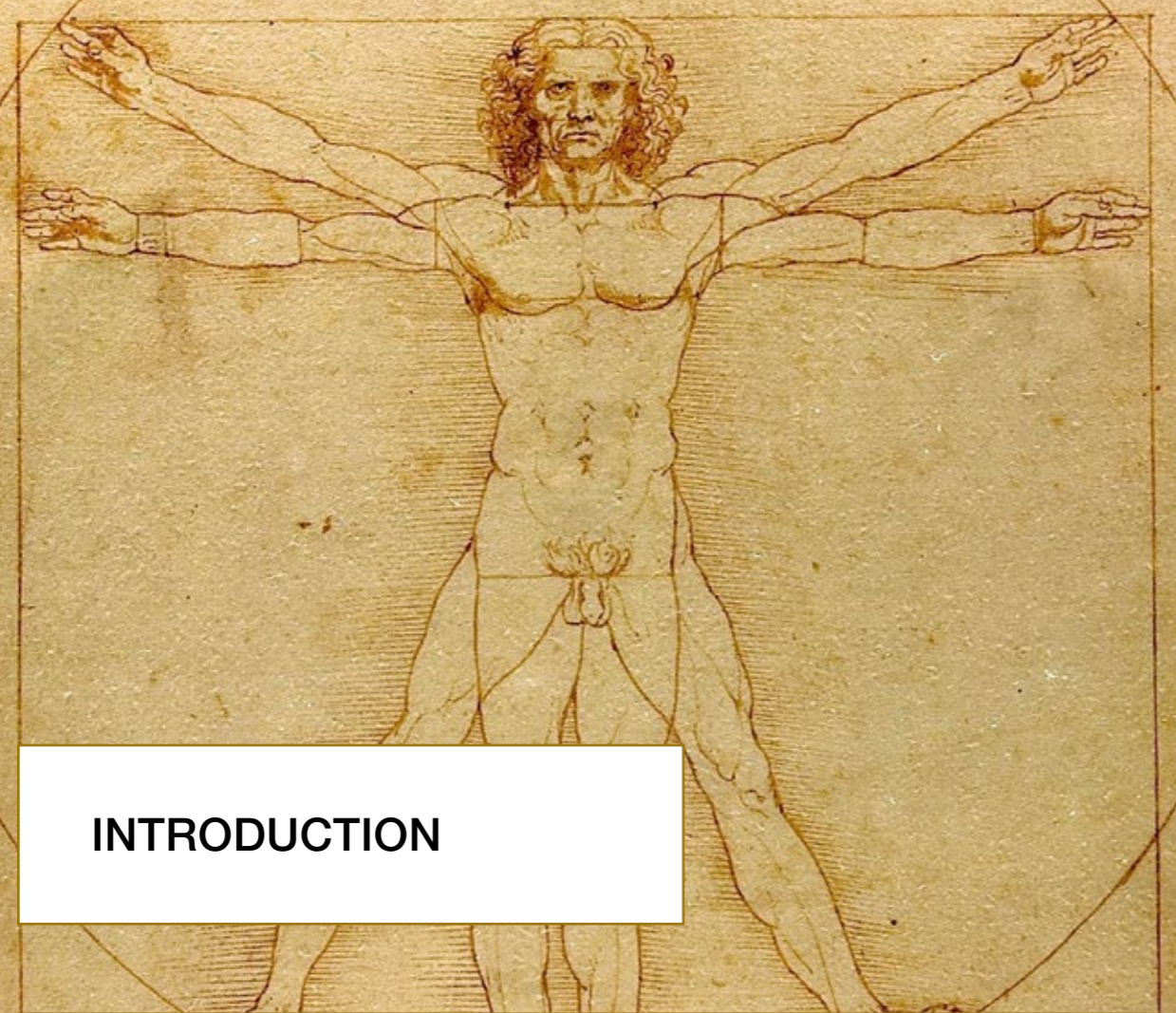
To everyone who has worked with or for Standards Australia over the years, I thank you for your commitment and support. I look forward to working with all our stakeholders and contributors as we continue our journey to make an even greater contribution to Australia, its economic and social advancement and to the region in which we live.

Adrian O'Connell, Chief Executive Officer



Standards Australia can trace its heritage to the construction of one of Australia's most iconic structures—the organisation's first standard was associated with the steel used to build the Sydney Harbour Bridge.

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INTRODUCTION

Evidence of standardisation can be found 7000 years ago in ancient Egypt. One of the first documented standards was the Code of Hammurabi, a set of 282 codes used to govern the kingdom of Babylon, written almost 4000 years ago. The Code governed trade and business relationships together with social norms.

In structuring and shaping the development of civilisation through curated and democratised measures, standards go hand-in-hand with cultural and economic growth.

The way we communicate and conduct business, from our ability to connect with people over networks and online to the availability of cyber transactions has been shaped and monitored by standards. The formalisation of this process is guided and implemented by national standards bodies such as Standards Australia.

Standards have been in practical use for hundreds of years. Leonardo da Vinci used precision instruments to meticulously measure and draw his "Vitruvian Man" in 1490.

The first standards developed during and after the industrial revolution underpinned progress for industry, trade, mass-production and construction enabling efficiency and safety. Without standards there simply is no way to trade goods or information. Without standards, every new invention would need to start from a blank sheet of paper.

Today, standards give communities confidence. Tomorrow they will continue to evolve and provide structure to the way we live, engage and work.

National standards organisations propose, write and help implement precise measurements of industry and also provide global connections between nations.

Like many of its international counterparts, Standards Australia is an independent, non-government, not-for-profit organisation acting as the nation's peak standards development organisation.

The work of Standards Australia enhances the nation's economic efficiency and international competitiveness and contributes to a safe and sustainable environment for all Australians.

Standards Australia's vision is to be a global leader in trusted solutions that improve life—today and tomorrow.

This year, Standards Australia celebrates 100 years of delivery, and acknowledges the efforts of all its contributors to the socio-economic development of Australia and the international community. Standards are embedded within our technical infrastructure, from building and construction, electrical wiring, to the digitisation of the physical and meta worlds where standards support the digital connection of everything to everything.

The standards developed and adopted by Standards Australia over the past 100 years continue to improve our quality of life.

This book outlines Standards Australia's journey from its establishment as the Australian Commonwealth Engineering Standards Association in 1922 through to today.

Standards Australia and its contributors work to better the lives of Australians by building and safeguarding national icons, promoting the efficiency of industry production and processes and establishing norms that guide decision making.

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Darwin was levelled by Cyclone Tracy on Christmas Eve 1974. In the aftermath, Standards Australia worked to improve building standards across Australia—helping to increase safety and resilience.

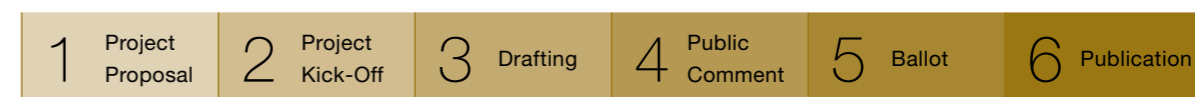


More Human Than Mechanical—How Standards Are Developed

Most countries have a national standards body. In many countries they are a government body, while in others they are a voluntary association formed to allow industry, government and community groups to come together in a neutral environment to build consensus. The standards body creates technical committees—from industry, government, professional bodies and community representative groups—to agree on the adoption or development of standards to suit national requirements and connect internationally. As Australia’s national standards body, and as a signatory, we work to comply with the WTO Agreement on Technical Barriers to Trade and other similar international trade agreements.

Australia has more than 9,000 standards that cover almost every aspect of our lives. They’re the cornerstone of Australian industry and society—improving the quality, comfort and safety of everyday life. Each standard has been developed through a structured process of formation. The below outlines the stages of development for Standards Australia, though each national body has their own version of this.

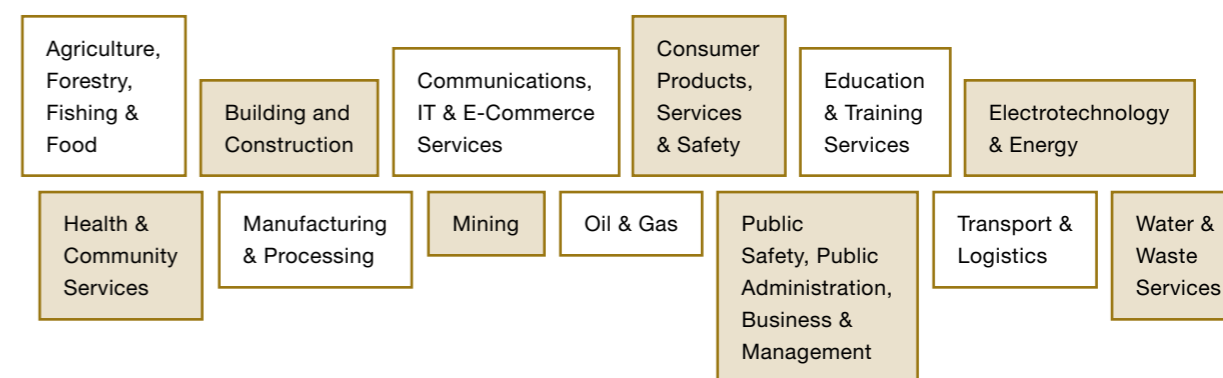
There are six main stages in the development of an Australian Standard®:



STANDARDS AND THE LAW

On their own, standards are voluntary. Unless specified in contracts, there is no requirement for the public to conform to standards. However, State and Commonwealth governments often refer to standards in their legislation. When this happens, these standards can become mandatory, and sometimes one way of demonstrating compliance with the law.

ACROSS ALL INDUSTRIES



As industries have changed over the last 100 years, so, too, has the way they use standards. Globalisation and global trade have led to a preference for the development and adoption of International Standards wherever possible through the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC)—two multilateral organisations of which Standards Australia is the Australian member.

WHAT IS A STANDARD?

Standards are born from a desire for efficient functionality. They are the documentation of performance requirements or specifications of a product, process, service or system to ensure they are safe, reliable and fit for purpose.

Standardisation forms part of a wider national and international technical infrastructure that includes measurement, calibration, testing, conformity assessment, certification, registration and accreditation.

Industry, public authorities and community organisations use all these tools to promote orderly commerce and a safe and sustainable environment. Without this infrastructure, nothing in our modern world would work as it does today.

Standards Australia’s process is built on the consensus of interested and impacted stakeholders who come together to agree on what precise requirements should be included in documented norms. As our economy has shifted, so, too, has the way that standards are developed, with a strong preference for performance-based standards allowing in-market innovation wherever possible.

Standards are used by industries and governments as an alternative to, and sometimes, within regulation.

*Standards
‘underpin much,
if not most, of
what we do as
consumers, as
employees, as
business people,
as citizens, day
by day’.*
— *Physicist and
meteorologist,
David Ellyard*



The Australian War Memorial in the ACT utilises many standards, including AS 3700:2018, *Masonry Structures*, and AS 2700s-1985, which applies to sandstone finishes.

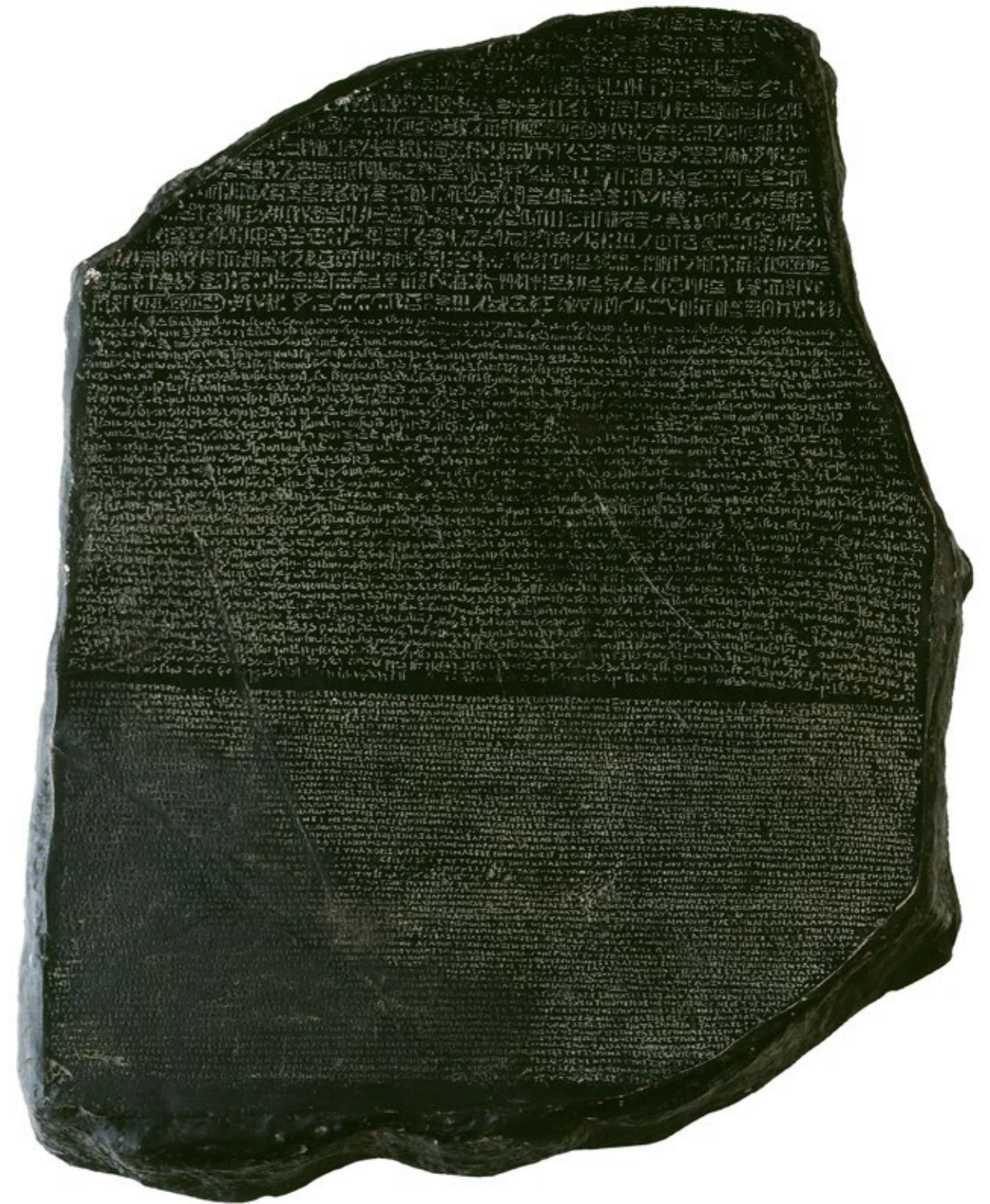
A HISTORY OF STANDARDS

Ancient Trailblazers

Throughout recorded history, human societies have relied on some element of standardisation. Language itself requires that words have agreed, or standardised, meanings, and writing relies on certain standardised symbols conventionally standing for specific sounds or ideas. Barter and trade could never have succeeded without agreed measures of length, weight and volume. Exchange has depended on currencies where units represent a conventional equivalent of a commodity—of another kind of standard—such as gold.

The first standards date back to the ancient Babylonian and Egyptian civilisations from 7,000 years ago. Used mainly as a benchmark for weights and measures, they provided a single reference point against which all other weights and measures in society could be standardised.

These various units of measure evolved over time to become more universal. And as civilisation became more industrialised and complex, so too did the standards we live by.



Above: The Rosetta Stone, which contains text for a decree in three standard written scripts, was crucial in allowing ancient languages to be understood.



Right: The ancient Egyptians had standardised units of measurement for weights. Just as they are today, these standards were updated over time.

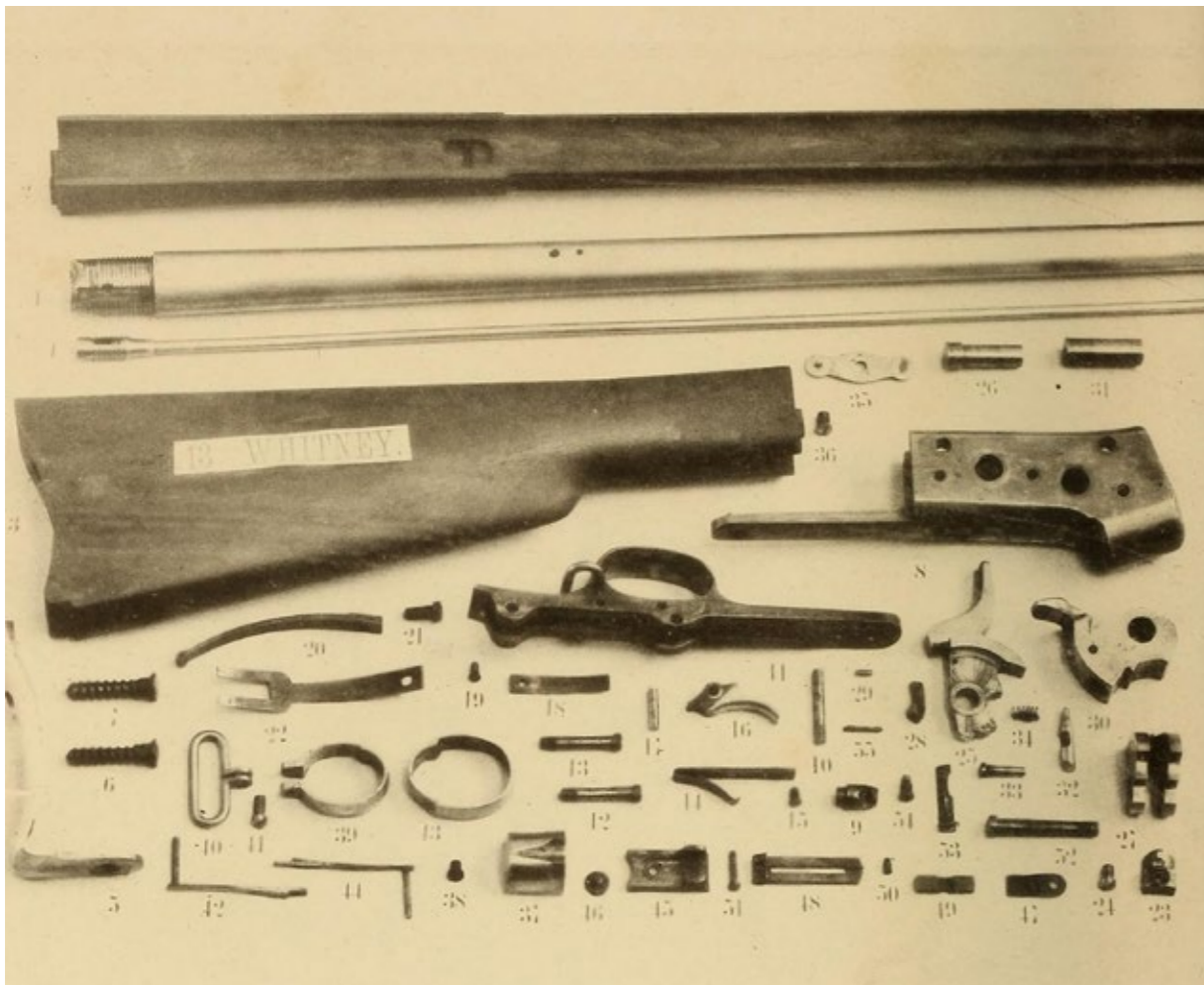
From Craftsmanship to Mass Production

From ancient civilisation through to the modern world we live in today, standards have continued to shape the way we operate in almost every industry.

History has shown that through great revolutionary shifts like the Industrial Revolution, standards have both led and followed these changes.

From the late 18th century, standardisation became a dominant theme in modernisation and trade enablement. This story began with the principle of manufacturing products with interchangeable parts. In the latter half of the 18th century, Eli Whitney facilitated the concept of mass production to combat the cumbersome process of craftsmanship. Contracted by the United States Government to deliver 10,000 muskets, he implemented a division of labour.

Previously, a musket would be crafted by a single pair of hands. When an element malfunctioned, only that specific craftsman could fix it. While a musket was always a musket, there were no common sizing, manufacturing, or interoperability requirements. Whitney separated tasks involved in building weaponry and constructed pieces of the musket with patterns and guides. This way, each part was built to the same standard and then assembled at the end of production lines. When



Standardisation of musket parts revolutionised not only the manufacture of weapons, but had an enormous impact on manufacturing as a whole.

a mechanism malfunctioned, it was simple, easy and cost-effective to replace. Whitney became 'the modern father of standardisation' with his process becoming the basis of standardisation in industry throughout the world.

Whitney's concept and division of labour essentially delivered two enormous advantages:

1. Muskets could be produced at a fraction of the previous cost.
2. Parts could easily be replaced when they wore out or were damaged.

Because of these monumental advantages in mass-production, the standard was adopted in other forms, and Whitney's concept was used throughout the world in many different applications.

Standards development helped achieve dramatic economies of scale. As such, standards underpinned the mass manufacture of quality products at minimal unit cost.

The principles of Whitney's division of labour and patterned parts were adopted officially by Great Britain, with the formation of the world's first national standardisation movement. The British Engineering Standards Committee (which was to become the British Standards Institution, or BSI) was founded in 1901 and paved the way for other countries to follow. World War I further drove the need for national and international standardisation, to allow for the manufacturing, trade and movement of mass-produced goods across borders.

For example, the British Empire (including Australia) would equip its diverse armed forces with the highly standardised Lee Enfield 303 infantry rifle used in both World Wars. Parts made anywhere in the Empire would fit into rifles made anywhere else in the world. This would become a common pattern in economic history—military innovations leading civil ones.



Eli Whitney's principles found a place in Australian small arms manufacture; the first rifle to be produced at the Lithgow Small Arms Factory was the Lee Enfield 303. This image shows engineering works in Chippendale machining parts for the Factory. Credit: State Library of NSW.



We interact with standards every day without knowing it, e.g. commuting to work— AS 1742.12:2017 is a manual for traffic control devices used by buses, trams and other vehicles. Today, Standards Australia is working to adopt and develop standards to support mass automated transportation. 20 years ago, these types of innovations were science fiction. Today, with the help of globally aligned standards, they're becoming science fact.

100 Years of Standards



Early 1900s

Initial efforts to make standards were interrupted by WWI.

1919

Engineering, science, mining and chemical groups began planning the formation of a national standards association.

1922

12 October: Main Committee of the "Australian Commonwealth Engineering Standards Association" formally gazetted.

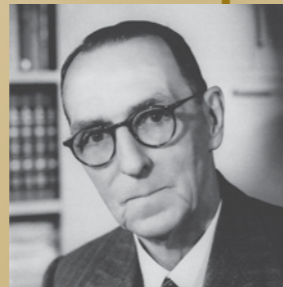


1920s and 1930s

Growing industrialisation, expanding factories and car production prompted the introduction of standards to address workplace safety.

1925

Joined the International Electrotechnical Commission (IEC), a membership that continues today.



1924

William Rayner Hebblewhite, the first and longest-serving CEO, appointed.



1929

Renamed "Standards Association of Australia" (SAA).



1931

First edition of the Wiring Rules published. It was the most used standard of the 21st century.



1959

The government required SAA to seek around half of its income from non-Commonwealth grants.

1950

King George VI granted SAA a Royal Charter.

1968

Certification marking of products indicating compliance with Australian Standards began.



"For wartime standardisation speed is so vital that normal methods must be abandoned..."
— 1940 Annual Report



WWII brought an urgent need for the development of standards for defence. Most of the work of SAA and the consensus process was suspended.

1946

Post-war standardisation shifted to meet the emerging needs of rural construction, post-war conversion, the growing car manufacturing industry, workforce training, electricity and fuel production, and industrial technology.

1947

International Organization for Standardization (ISO) established with Australia as a founding member.



1973

Joined Pacific Area Standards Congress (PASC) as a founding member.

1988

SAA became Standards Australia and signed a Memorandum of Understanding with the Federal Government. This recognised Standards Australia as the peak non-government standards development organisation.



1990

Standards Australia restructured to streamline processes and make the organisation more responsive.

1992

First joint standard with New Zealand published.

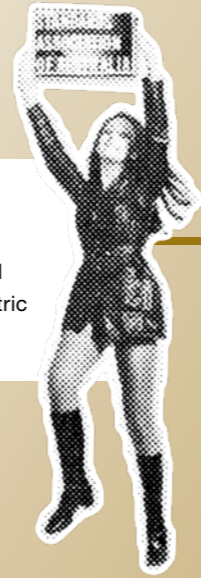


ISO 9000 series of standards on quality management systems took the world by storm.

ISO 9000 boosted Standards Australia's quality assurance operations, and became a key feature of business and government operations in a short period of time.

1970

Metric Kate launched to popularise the metric conversion process.



1999

Standards Australia became a Public Company.

1997

One of the first to have delivered standards and technical publications via the internet.

1996

Signed up to the voluntary Code of Good Practice for Preparation, Adoption and Application of Standards issued by the World Trade Organisation.

1995

Risk management standard AS/NZS 4360 published. It was later used as the basis for ISO 31000.

1969

SAA shifted focus towards meeting consumer needs, forming a Consumer Standards Advisory Committee.

2003

Responding to the Kean Review, Standards Australia divested its commercial businesses to SAI Global Limited through a public offering on the Australian Stock Exchange.

2015

W. R. Hebblewhite Medal created to recognise exceptional and dedicated contribution to standards development.



2019

Standards Australia won back rights to sell its own standards.

STANDARDS Australia

2005

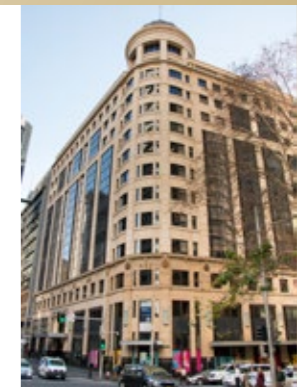
A new logo was launched, based on the golden mean—nature's perfect standard.

2006

The Productivity Commission report into standard setting emphasised Standards Australia's important role.

2007

Moved to the current location in Exchange Centre, Bridge Street, Sydney.



2022: Standards Australia celebrates its centenary.

1922
— 1947

Manufacturing and War-Time Standards

The modern discipline of standardisation first arose through the context of mass-production.

Developed across Europe and the United States prior to and during the First World War, standards were reactively shaped through the need for consistency and efficiency across relevant industries.

When Australia's standards body was established, however, mass-production and this form of industry barely existed. Early efforts helped industry develop processes as they formed, saving the time, cost and confusion of retrospective correction.

Lessons from our overseas counterparts and the development of industry in Australia brought about the vital requirements to establish our national standards association.

These lessons from our overseas counterparts, together with the growing development of industry in Australia, brought about the vital requirements to establish our national standards association and helped inform the way it would operate.

Standards have helped build our nation.

The British Engineering Standards Committee became officially recognised in 1901 and inspired the rapid establishment of a variety of similar organisations in the United States and other Commonwealth countries of the time.

By 1910, Australia had begun to take notice, applying the concept with a preparation of uniform Wiring Rules. These were formed by the Electrical Association of Australia.

Australia's journey toward supported and recognised standards development continued into 1918 when the Commonwealth Institute of Science and Industry (CISI) requested a conference of engineers from each state.

Recommendations from each representative aligned in their pursuit to launch a national standards movement and by 1919 the Institute of Engineers Australia had been founded. Made up of 11 committees, one of its central roles was to form and implement standards (as seen by the eventual work to come from two committees in particular: the Engineering Standards Committee and the Electrical Wiring Rules and Standards Committee). Although this development would continue to create and implement the concept of standardisation, it was another few years before an official national association was formed.

Discussions, collaborations and contributions continued. Eventually a conference was convened by the Institution of Engineers, Australia and attended by the Institute of Science and Industry, the Australian Institute of Mining and Metallurgy, and the Australian Chemical Institute and became the driving force behind a monumental moment in our history. Recommendations from these bodies for a national standards association were eventually accepted by Government, and the Main Committee was Gazetted in October, 1922.

**A CONFERENCE
CONVENED BY
THE INSTITUTION
OF ENGINEERS
BECAME THE
DRIVING FORCE
BEHIND A
MONUMENTAL
MOMENT IN OUR
HISTORY.**

The Australian Commonwealth Engineering Standards Association (ACESA) was founded on 12 October 1922 and in 1929 became the Standards Association of Australia (SAA), a name it retained until 1988, when it became Standards Australia.



The Main Committee was made up of representatives from:

- The Institution of Engineers, Australia (now Engineers Australia).
- The Commonwealth Institute for Science and Industry (now CSIRO).
- The Australian Institute of Mining and Metallurgy.
- The Australian Chemical Institute.

The contributors who formed the Main Committee were named in the Gazette notice and many would go on to become prominent figures in the history of Standards Australia.

Among them were Commonwealth Statistician, Director of CISI and the first chairman of ACESA, Sir George Knibbs; its second chairman, Sir George Julius; and John Bradfield, CMG, Chief Engineer for Metropolitan Railway Construction in Sydney. This founding Committee would also soon acquire the pioneering scientist and barrister Gerald Lightfoot, as well as Standards Australia's first and longest serving CEO: William Rayner Hebblewhite OBE. Both Lightfoot and Hebblewhite would go on to dedicate almost 30 years to establishing the modern standards movement.

The inaugural meeting of ACESA was held on 2 November 1922, and its first standard introduced the same year was used to help build Sydney's iconic Harbour Bridge.

This demonstrated how our national standards would develop, adapt and innovate through necessity as well as foresight-based planning.

FROM LATE 1918 EMERGENCY AND CRUCIAL STANDARDS ALLOWING FOR NATIONAL PROGRESSION WERE MADE POSSIBLE WITH FINANCIAL AND GOVERNMENTAL SUPPORT.

Any development of standards requires resourcing in the form of people, time and finance. This is where a contribution from Gerald Lightfoot was largely instrumental in the establishment of standards in Australia.

Following his advocacy for the creation of a national standards body, Lightfoot was responsible for securing funding for ACESA and CISI. As Secretary and Chief of Bureau of Information for CISI, Lightfoot had published *Engineering Standardisation*, in 1919. There he outlined the steps taken from late 1918 in gathering support for a Commonwealth engineering standards association. This became an important moment, as crucial standards that allowed for our own national progression would not have been possible without this financial and governmental support.

In addition to these financial contributions from government, the Standards Association of Australia (SAA) had alternative means for funding through selling published standards, which supported the operation of the

organisation through the Great Depression. The first edition of the flagship publication, the SAA *Wiring Rules*, was published in 1931.

From Efficiency to Safety

After rapid industrialisation, efficiency in production ruled. However this also highlighted the lack of safety standard measures, and every decade since the 1920s brought its own safety challenges to overcome.

The early 1920s were a period of economic prosperity, urbanisation and modernisation for our nation. As such, many standards we still use today come from this time. An appetite for

Australian export commodities, and documented Empire trade agreements from the 1932 Imperial Conference, made trade possible and a strong contributor to the national economy at the time. Driven by mining and factory output, efficiency was paramount to continued socio-economic development. Because of this, safety measures became somewhat overlooked. The relatively new industrial machines were dangerous, as was a lack of workplace safety culture. It would, however, be decades before Australia significantly shifted its thinking about acceptable hazards, both on and off the job.

By the start of World War II, more than a quarter of Australian workers were employed in manufacturing. This became our biggest industry, overtaking agriculture which previously had been our largest employing sector. When factory safety measures would have been vastly important to most families, focus deviated to support war efforts. SAA recalibrated its priorities and invested in the development of supportive standards for war-related production. These included standardisation of:

- Alloy steels,
- Electrical equipment for aircraft,
- Tropic-proofing treatments, and
- Packaging.

One of the most important new standards was for screw heads. Previously these had been sent to the front line in a variety of sizes, which made maintenance of guns, tanks, planes and ships more complicated than needed. This is where the “father of standardisation” Eli Whitney’s division of labour and concept of standardised “parts” really became influential.

By the mid 1940s, SAA published “War Emergency” standards and in 1947 we solidified our international alliances through our founding partnership of the International Organization for Standardization (ISO).

The early 1920s were a period of economic prosperity, urbanisation and modernisation for our nation, and many standards we still use today come from this time.

1947 — 1972

A Postwar Era

With World War II coming to an end in 1945, efforts could be redirected back to our national interest. The value of industrial standards development was now apparent in the minds of most and began to inform the expansion of Australian industrialisation.

Post-war development focused on:

- Rural construction
- Conversion of munitions and armament factories to civilian uses
- Encouragement of an Australian car manufacturing industry
- Workforce training and employment opportunities
- Securing electricity supplies
- Fuel production
- Industrial technology

Due to the increase in population through migration, there was an upsurge in construction that prompted the need for building standards from engineering structural loads through to product and construction specifications.

Growing interest in the prevention of accidents in industry led to substantial work from the Standards Association of Australia (SAA) on specifications for personal protective equipment and codes for safe work practices.

Many of the new standards developed through this 25-year period were the result of methodical and planned goal setting by governments, industry and unions working together to achieve economic growth. However, a small number of standards were developed due to unforeseen or catastrophic

The value of industrial standards development became apparent during war-time and informed the expansion of Australian industrialisation as a whole. Post-war migratory schemes led to an upsurge in building that prompted the increase in activity for building standards.

events. The core of much of today's work health and safety legislation in Australia emerged following a single case at a building site in 1956. A group of workers were elevating large buckets of hot bitumen to the roof of a five-story building and one spilt onto an employee below. Because of this incident, the High Court ruled that the employer had a duty "...to take reasonable care to avoid exposing the employee to unnecessary risk of injury".

This is still a legal responsibility for employers today and something we may take for granted.

In line with worldwide trends, in the 1960s the SAA increased its efforts developing standards for consumer goods.

Driven in part by US President Kennedy's *Bill of Consumer Rights* in 1962, steps were taken through Australia's national standards body to involve and consult the consumer movement. In 1969, SAA formed a Consumer Standards Advisory Committee that would represent the consumer viewpoint. This allowed for their voice to be heard during the discussion and formation of standards. In response to the growing consumer rights movement, as well as to meet the requirements of regulatory authorities, SAA set out at this time to enter the certification arena. It had been an objective of the Association from very early days to develop and operate an Australian StandardsMark like many standards bodies around the world. At the time the only field of application was for production certification, indicating compliance with an Australian (product) Standard. However, it was not for some years that changes in the Commonwealth Trades Mark Act allowed the registration of the StandardsMark by the Trademark authorities.



Some other significant events of the late 1960s included the Australian Government's adoption of the International Organization for Standardization's (ISO) standard paper sizes and an early decision by the SAA to change its publications to International Standard (A4) sizes for published documents.

A second workplace incident became a further catalyst for safety standards in Australia. 15 October 1970 marked the tragic event where 35 workers were killed when a 112m span of the WestGate Bridge collapsed. It was Australia's worst industrial accident and drove landmark reforms in Victorian workplace health and safety practices.

By the end of the 1972 financial year, SAA became instrumental in the creation of many important standards, employed 155 staff nationally and had a turnover of approximately \$1.7M (of which nearly 45 per cent was derived from government sources).

1972
— 1997

Commodification, Metrication and Globalisation

Throughout the 1970s Australia had to ‘metricate’. The transitions from imperial forms of measurement to a full adoption of the metric system saw the implementation of a new generation

Standards Australia played a contributing factor in the success of metrication in Australia in the 1970s.

of standards. Standards Australia played a contributing factor in the success of metrication in Australia, using its ‘Metric Kate’ icon to help assist in popularising metrics.

1971 also saw an innovation in the operations of the Standards Association of Australia (SAA), having introduced a Rulings service to complement the Wiring Rules, with a special printed binder for the Rulings available separately. This, amongst other innovations, contributed greatly to the development of a responsive standards-setting system in Australia. Through this

period, the global standards movement was intent on:

- Efficiency of output, concluded to be possible only with more industry support.
- Regular and timely information on and participation in, the international standardisation organisations: International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC).
- Sufficient funding to provide the necessary infrastructure.

As a leading standards body in the Pacific region, 1973 saw Standards Australia become an inaugural member of Pacific Area Standards Congress (PASC), which aimed to promote standards development in the region and to ensure buildings, bridges and tunnels were safe.

This agenda became even more relevant in the wake of the catastrophic Cyclone Tracy. On Christmas Eve, 1974 Cyclone Tracy swept through northern Australia with wind gusts reaching 217 km/h, taking with it homes and the lives of 71 people. It was a devastating event that will be forever remembered, and a key moment in time where standardisation of residential buildings would be reformed and applied across the entire nation. Today, Darwin is stronger than ever, thanks to these standards which continue to advance to meet changing climatic conditions.

As Australia’s economy continues to evolve, the concept of performance-based test methods became widespread within the process of standards creation. By the early 1970s, SAA noted that about a third of all standards published were Methods of Tests or contained test methods and, in so doing, reinforced the close cooperation which existed between the National Authority of Testing Agencies (NATA) and Standards Australia.

The important work of the organisation continued, and the 1976 World Standards Day saw a Conference of Standards Committee Chairs whose specific task was to prepare the *Operating Rules for Technical Committees and Chairs*. 1976 marked the Year of the Disabled and many businesses in the Australian community sought to improve wheelchair access. One of the first industries to comply was the domestic airline industry, with terminals and aircraft themselves being provided with easier access for people with an ambulant disability. The SAA responded by publishing a draft *Code of Practice for Design for Access and Mobility* which gave guidelines to architects and builders in making new and existing buildings accessible to people with disabilities. This document today—as an example of many, and through the work of a dedicated committee of experts—has evolved significantly and continues to support other measures in providing access to people with disabilities to our built environment.

CYCLONE TRACY WAS A DEVASTATING 1974 EVENT THAT WILL BE FOREVER REMEMBERED, IN PART AS THE KEY MOMENT WHEN STANDARDISATION OF RESIDENTIAL BUILDINGS WOULD BE REFORMED AND APPLIED ACROSS THE ENTIRE NATION.

Globally, the 1980s and 1990s were characterised by incredible change in science, technology and sociology.

With origins in the 1960s, by the late 1980s the internet was gaining momentum and globalisation spread beyond just trade.

Australia's economy continued to become more international and outward-looking, requiring greater certainty about the quality of standards of product being shipped across borders. By 1989, SAA was advocating that there was no benefit to Australian manufacturers in having a place in a regulatory and standardisation system that encouraged unique products to be manufactured

that could not be traded internationally. This came at a time when the world's largest economies were also embracing the adoption of International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) standards to ensure they would remain globally competitive.

By the end of the 1980s the Standards Association of Australia (SAA) had been officially renamed to Standards Australia. Standards Australia also surrendered its Royal Charter and became a Not-for-Profit Company limited by Guarantee.

In the 1990s another catastrophic event would force Standards Australia to reassess structural standards for housing in specific terrain prone to landslides.

By the late 1980s the internet movement was gaining momentum and globalised trade required greater certainty about the quality of standards of product being shipped across borders.

In July 1997, heavy rainfall triggered a landslide that destroyed the Bimbadeen and Carinya Lodges at the Thredbo Alpine Village in New South Wales. Inadequate retaining walls around houses were partly blamed for the catastrophe. Following this devastating event, aspects of the standards pertaining to this event were reviewed—in addition:

- The NSW Fire Brigade expanded its urban search and rescue division.
- Engineers Australia and the Australian Geomechanics Society formed a Taskforce on the Review of Landslides and Hillside Construction Standards, recommending improvements in landslide hazard zoning for urban areas, roads and railways; slope management; site

investigations, design, construction and maintenance; and landslide risk assessment.

- The site, along with a section of the Alpine Way, is now monitored with 25 inclinometers to detect any slope movement, and 12 piezometers to keep track of water flow in the soil.
- In 1998, three terraces with gabions and reinforced fill were constructed on the site and the Alpine Way was rebuilt with upslope retaining walls.

The 1990s saw support for committee participation in international standards increase again. International expert travel was subsidised to support meeting attendance and senior management was encouraged to seek positions of influence in both the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) and memberships of influential or Australian-sensitive special activities within the multilateral trade system.

From about 1990 the funds-in-trust approach for supporting committee participation was partly abandoned in favour of a more corporate budget.

1990
— 2022

The Creation of a Modern Standards Australia

The early 1990s saw both a restructure in the way standards would be developed and also a new business-like operating model.

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Consideration was given by Standards Australia, its members and governments, to a new way of managing the development of standards in Australia, and to the good order of the company. Through the 1980s, Standards Australia's subsidiary companies became leading organisations. Two reviews—the *Foley* and *Kean* reviews—saw attention given to the operations of Standards Australia and its performance as an organisation. This period also saw the start of the business transformation that continues today.

Through this period, a decision was made by the Board of Standards Australia to divest itself of its subsidiary company SAI Global, which had grown over decades, through a public listing on the

Australian Stock Exchange. At the same time, Standards Australia entered into a distribution agreement with SAI Global for the distribution of standards.

The Rise of Management Systems Standards and Electronic Distribution

Global quality management standards began to become part of the ordinary language of businesses from the 1980s. The ISO 9000 quality management series was developed through the 1980s and 1990s and consolidated in 2000. This expanded the reach and understanding of standards to new business communities. These standards saw technical experts from sectors like automotive, food processing and finance, working together to develop a system for the management of quality in an enterprise.

This period also saw the rise of management systems standards for other purposes, including the environmental management systems standards contained in the 14000 series. These international standards changed the way that companies understood and worked with standards and shaped the understanding of standards in Australia and around the world. These standards also led to work being done in other areas to support business excellence initiatives.

The rise of the modern management systems standards saw community understanding of standards increase well beyond the traditional areas of engineering, design and construction.

Through this period Standards Australia was one of the first movers to the electronic distribution of standards through subscription services, with standards able to be supplied initially on CD-ROM and later through the internet. International content from British, German and American organisations and the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) were also made available through these systems.

Off the back of this came a huge milestone for Standards Australia. As the world became evermore acquainted with the internet and 'online' storage and acquisition, Australia was the first national standards body to distribute its standards online.

The Hawke and Keating Commonwealth governments saw a strong push from Australia to integrate more with the international trade community. With this, Standards Australia's role, work and position in the economy changed; a significant focus was applied to contributing to, and adopting, international standards wherever possible. Several national harmonisation efforts resulted in Standards Australia and its committees working in different and more integrated ways. The harmonisation of work, health and safety laws—and, separately, the development of a national building code—led to significant efforts in reducing state and territory technical regulation and integrating national codes that referenced standards, often as one way of demonstrating conformance.

The 2000s: Significant Business, Operational and Organisational Reform

Standards Australia divested itself of SAI Global through a public listing in 2003. This divestment included the ‘five tick’ StandardsMark which had become synonymous with product quality in Australia.

A relocation to new premises in Bridge Street, Sydney, saw Standards Australia focus on its standards development work, its international engagement and the contribution experience of its technical committees and those who supported them. A whole-of-business transformation program was commenced, including establishing new criteria for commencing project work, an assessment of net benefit of a project being undertaken, and an international standards adoption-first policy across the board.

Initially, this program was designed for Standards Australia contributors, including its nominating organisations, technical committee members, and members of the public who wished to contribute

THE LATE 2010s SAW STANDARDS AUSTRALIA MODERNISING ITS DISTRIBUTION ARRANGEMENTS, WITH A DIRECT CHANNEL TO MARKET FOR THE FIRST TIME SINCE THE DIVESTMENT OF SAI GLOBAL.

to standards development. Targets around the administrative burden on contributors saw average development times more than halved in most cases.

Today, and building on this work, a Voice of Customer program has been implemented across the board to seek feedback from contributors, customers, and others we engage with to improve their experience.

The late 2010s saw Standards Australia also focused on modernising its standards distribution arrangements, leading ultimately to a move to a multi-channel, multi-distributor model. This resulted in Standards Australia establishing a direct channel to market for the first time since the divestment of SAI Global, together with a digitised standards catalogue in XML format. Standards Australia is viewed by its peers as a leader in next-generation standards distribution.

Standards Australia has helped guide improvements in workplace safety, such as the banning of asbestos, the creation of Safework Australia and the formation of the National Construction Code.

A review of Standards Australia’s governance structures was also undertaken. A Technical Governance Review saw an inclusive and community-led review of the technical governance of standards development, and a multi-year program of reform. Additionally, a review of accreditation governance was also commenced, resulting in improvements to how Standards Australia engages with organisations accredited to develop Australian Standards.

Importantly, a third review of the company’s constitution was embarked upon and, following unanimous support from members, implemented.

This review resulted in membership of the company opening to a broader range of organisations, and modern governance processes adopted through a new company constitution.

The COVID-19 pandemic saw Standards Australia working closely with government and industry to make sure we had the standards needed to navigate the pandemic, and to have them in the hands of those who needed them. The pandemic also gave rise to a significant shift, which is still underway, in how our community connects, with a rapid rise in virtual and online engagement.

2022

WHAT DOES STANDARDS AUSTRALIA LOOK LIKE IN ITS CENTENARY YEAR?

Standards Australia celebrates its centenary in 2022, a year in which the organisation made significant headway in many key strategic areas of focus. Our work today remains a reflection of the incredible effort that our contributors, members, staff and stakeholders have made in challenging times.

Standards Development

In every sector of the economy, our standards development team work hard to develop, adopt and maintain standards to support economic growth, international connectivity, health, safety and the environment. A trend that is impacting our work today is the increasing connectivity of the physical and built environment, and the proliferation of data in systems that were once static. Standards development remains Standards Australia's core business, nationally and internationally, with Australian experts leading incredible work in Australia and through international organisations.

International Engagement

ISO

Standards Australia's Chief Executive Officer, Adrian O'Connell, was appointed to ISO's Council for a three-year term, reinforcing Australia's role as a key contributor to the international standards system. Standards Australia was a founding member of ISO, and this appointment gives Australia a new voice in shaping the direction of the organisation. Karen Batt, Standards Australia's Head of International, was elected to the Technical Management Board (TMB) of ISO, following a long line of senior managers from Australia to undertake this role. Adam Stingemore, General Manager Engagement & Communications, was elected to the Commercial Policy Advisory Group, a group that advises the ISO Council on commercial matters including the modernisation of distribution arrangements.

IEC

Standards Australia's General Manager Operations, Kareen Riley-Takos, was elected as Australia's representative on the IEC Business Advisory Committee, responsible for financial planning, commercial policies and organisational structure.

Standards Hero and IEC Young Professional, Baoying Tong, was elected as the Australian representative on IEC's Diversity Advisory Committee.

These roles are in addition to Standards Australia's Director Ian Oppermann, who sits on the IEC Council Board. Clare Hobern, Senior Manager, International Engagement, was elected to the Standardization Management Board again, one of many senior managers to serve in this way.

Strategic Engagement

Standards Australia's engagement with industry and governments is strong in both strategic policy and standards development, helping Australia lead through the changes to our economy and community today.

Our Strategic Initiatives team delivers critically important projects and solutions for Standards Australia, prioritising issues that impact the economy across all industry sectors.

In 2022, Standards Australia has worked with stakeholders across government and industry to

solidify future opportunities for hydrogen, including developing communication tools detailing how current standards in the energy space apply to the development of key hydrogen systems.

As one example, we have developed a comprehensive *Data and Digital Standards Landscape* report which provides key recommendations for six key technology areas—setting the direction to guide Australia’s efforts.

Research & Analysis

In 2022, our Research & Analysis team worked to deliver solutions that benefit the company and the communities we serve.

Over the year, the team delivered important research reports on several important issues, like the circular economy and genomics, unmanned aerial vehicles and agricultural technology. This work is directed to the future of standards development, seeking to bring industry and government leaders together at an early stage of work.

The roll-out of the *Set the Standard* podcast series is seeking to bring new voices and faces to standards. Produced in-house, the podcast looks at emerging trends across numerous industries.

Serving Our Community

Standards Australia continued to work alongside business, government, emergency services and the community to address the challenges of the COVID-19 pandemic. The organisation’s technical committees expedited the publication of key standards for sectors, from risk management to performance requirements for respiratory products.

Over the year, Standards Australia also implemented several partnerships, programs and initiatives to ensure we reach our goals and work cohesively with our many stakeholders, members, contributors and staff.

Our NEXTgen program is structured to develop young professionals into future standards contributors and leaders by enhancing their standards knowledge and developing the necessary skills to become an effective committee member. NEXTgen entered its fifth year in 2022 and continues to grow in popularity and sign-ups.

Our technology team is working tirelessly in developing the platforms, systems and solutions our contributors need to progress their work as we continue our shift to modern systems with a focus on the contributor experience and making it easy for contributors to work with us.



Australia's landmark buildings utilise many standards that dictate requirements for everything from structural supports and concrete, to resistance to wind and storms, to electrical, plumbing, lighting and more.



A GLOBAL LEADER IN TRUSTED SOLUTIONS

The evolution of industries and technologies change the way society and business operate, creating opportunities but also new challenges. Take asbestos, for example—once a material used routinely without further thought, it is now completely banned.

Likewise, the concept of the gig economy could not have been imagined decades ago.

Just five years ago, the thought of Australia shipping hydrogen power to the world wasn't a concept. But now, these examples are the fabric of our daily lives.

Standards have been developed to support these emerging industries and facets of life. To remain robust and agile, Australia needs to anticipate future trends. Standards Australia works alongside industry, society and government to predict where and how it will need to support society in the coming decades.

Standards Australia's approach in response to this challenge is to focus on some of the most pressing areas of rapid transformation that would benefit from the research, development and application of new dedicated standards.

Key Areas of Focus for the Future

Cybersecurity

By 2025, there will be 75 billion smart devices connected to the internet globally and up to 60 per cent of them will be insecure.

Cybersecurity and the rapidly evolution of international commerce represents one of the greatest security challenges of the modern age. To help make this transition as smooth as possible, Standards Australia will seek to develop standards that protect government industry and end-users as they navigate the Internet of Things (IoT).

Standards Australia will partner with industry to develop tools to support digital safety for Australian consumers and businesses. This presents an opportunity to position us as a world leader in the field, and promote future collaboration with industry and government to address new and emerging challenges.

Natural Disasters

Unprecedented and unforeseen disasters cost the Australian economy an average of \$18.2 billion per year between 2006 and 2016, a figure that is expected to climb to \$39 billion a year by 2050.

Standards Australia hopes to improve resilience for the building industry, local councils and homeowners (future and current).

The Environment

The global economy consumes 100 billion tonnes of primary material each year and only 8.6 per cent of that is recycled.

We can't eliminate the waste that already exists in our environment but we can reduce the use of it in industry and household items. One of the most recognised models to do this is the idea of a circular economy. A circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.

Standards Australia is investigating ways to support sustainability into the future, without compromising Australia's continued socio-economic growth.

Low Emissions Technologies

In 2015, Australia signed the Paris Agreement. Since then, our nation has been on a journey to reduce emissions. As part of this promise, the Australian Government committed to investing \$22 billion into uncovering new low emissions technologies by 2030, including hydrogen.

A clean fuel that produces only water as waste, hydrogen can be produced from a variety of domestic resources, such as natural gas, nuclear power, biomass, and renewable power like solar and wind.

Standards Australia's efforts and outputs are increasing at pace to support this economic shift.

Critical and Emerging Technologies

This refers to a subset of advanced technologies that are significant to Australia. These include (but aren't limited to) advances in communication such as 5G and 6G communication, artificial intelligence, smart cities and the Internet of Things.

Harnessing the potential of Critical and Emerging Technologies (CET) is essential to Australia's competitiveness and economic growth. Standards Australia is committed to increasing influence with government and industry on issues arising from CET. This will require identifying, prioritising and addressing risks and opportunities to develop standards for CET that align with our own national interest.

Hydrogen has great promise as a clean, sustainable energy source—but, without standards, it cannot hope to enjoy everyday use in Australia.



First installed in 1932, the classic wooden escalators at Sydney's Wynyard train station have been re-imagined into an art installation above their modern replacement. If they were to be built today, they would be constructed according to AS 1735.1.1:2022, *Lifts, escalators and moving walks* (among others).





Our Continued Legacy

Standards Australia has a long history of important work that has improved the lives of Australians since its inception in 1922.

Standards Australia's purpose is driven by necessity. Standards improve society, foster a strong economy and help keep our communities safe. It's a legacy curated over many years and one that Standards Australia is proud to continue. History shows us that standards are a result of forward-thinking individuals coming together to form collaborative groups that can influence decision-makers.

The mission moving forward is to be at the forefront of proactively addressing the challenges of a changing world.

Standards Australia will continue to work with incredible thinkers and leaders of industries to help research, develop and implement standards that deliver trusted solutions that positively impact Australians today and tomorrow.

Our contributors are the heart and soul of Standards Australia. We bring together more than 5,000 technical, business, academic, government and community experts to form our technical committees.



The many committee names on these pages honour the efforts of contributors who generously give their time, knowledge and expertise in order to make a safer, more efficient Australia.



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