Transitioning to the new respiratory protection standards

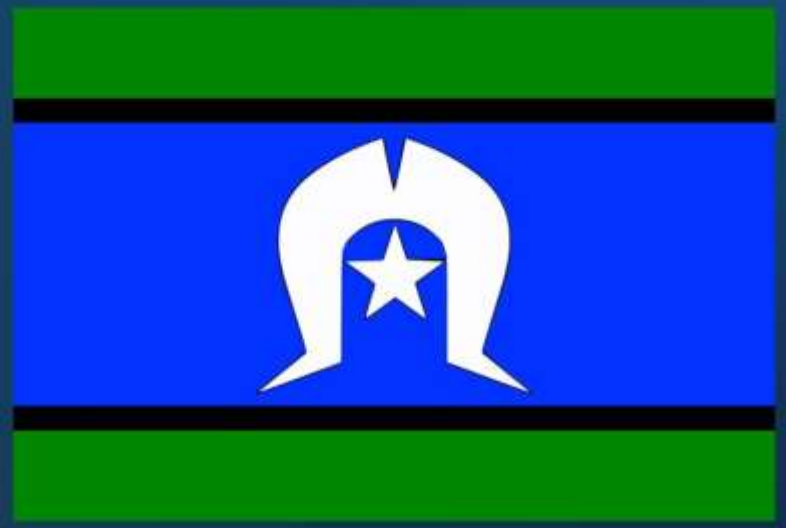
SF-010, Occupational Respiratory Protection

Acknowledgement of Country

We acknowledge the traditional owners of the various lands in which we live, meet and work.

In the SA office, we're on the land of the Gadigal People of the Eora Nation.

We pay our respects to Elders, past and present.



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You are encouraged to refer to the full standard(s) referenced, which can be purchased through the Standards Australia Store, or any Standards Australia authorised distributor.

Distribution Partners

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SF-010, Occupational Respiratory Protection - Nominating Organisations

Nominating Organisation	Stakeholder Interest Category (SIC)	Role Title
Association of Accredited Certification Bodies	Certification Bodies	Participating Member
Australasian Fire and Emergency Service Authorities Council	Technical Associations	For Information Only
Australian Chamber of Commerce and Industry	Suppliers' Associations	Participating Member
Australian Council of Trade Unions (ACTU)	Unions and Employee Associations	Participating Member
Australian Industry Group	Manufacturers' Associations	Participating Member
Australian Institute of Health & Safety	Professional Associations	Participating Member
Australian Institute of Occupational Hygienists	Professional Associations	Participating Member
Australian Institute of Petroleum	User and Purchasing Bodies	Participating Member
Composites Australia Inc	Manufacturers' Associations	Participating Member
CSIRO	Research and Academic Organisations	Participating Member
Department of Health and Aged Care (Australian Government)	Government Organisations	Participating Member
Fire and Emergency New Zealand	New Zealand	Participating Member
Individual Expert	Independent	Co-Opted
Joint Accreditation System of Australia & New Zealand	Certification Bodies	Participating Member
National Measurement Institute	Testing Bodies	Participating Member
New Zealand Institute of Safety Management	New Zealand	Participating Member
New Zealand Occupational Hygiene Society	New Zealand	Participating Member
NEXTgen	Independent	Co-Opted
Royal Australian Chemical Institute Inc.	User and Purchasing Bodies	Participating Member
Safe Work Australia	Regulatory and Controlling Bodies	For Information Only
SafeWork NSW	Testing Bodies	Participating Member
Site Safe New Zealand Inc	New Zealand	Participating Member
Standards New Zealand (SNZ)	New Zealand	Ex-Officio
Therapeutic Goods Administration (TGA)	Regulatory and Controlling Bodies	Participating Member
VicLab (Testing Interests Australia)	Testing Bodies	Participating Member
Weld Australia	Technical Associations	Chairperson
WorkSafe New Zealand	New Zealand	Participating Member

Standards

- Voluntary documents that set out specifications, procedures and guidelines.
- Aim to ensure products, services and systems are safe, consistent, and reliable.
- No requirement for the public to comply with standards, unless State and Commonwealth governments often refer to them in legislation. Standards then become mandatory.
- Form “best practice” to support “duty of care”

Categories of standards include, but are not limited to:

International Standards
These are developed by ISO, IEC and ITU for countries to adopt for national use.

National Standards
These are developed either by a national standards body (like Standards Australia) or other accredited bodies. Created in Australia or are adoptions of international standards.

Source:

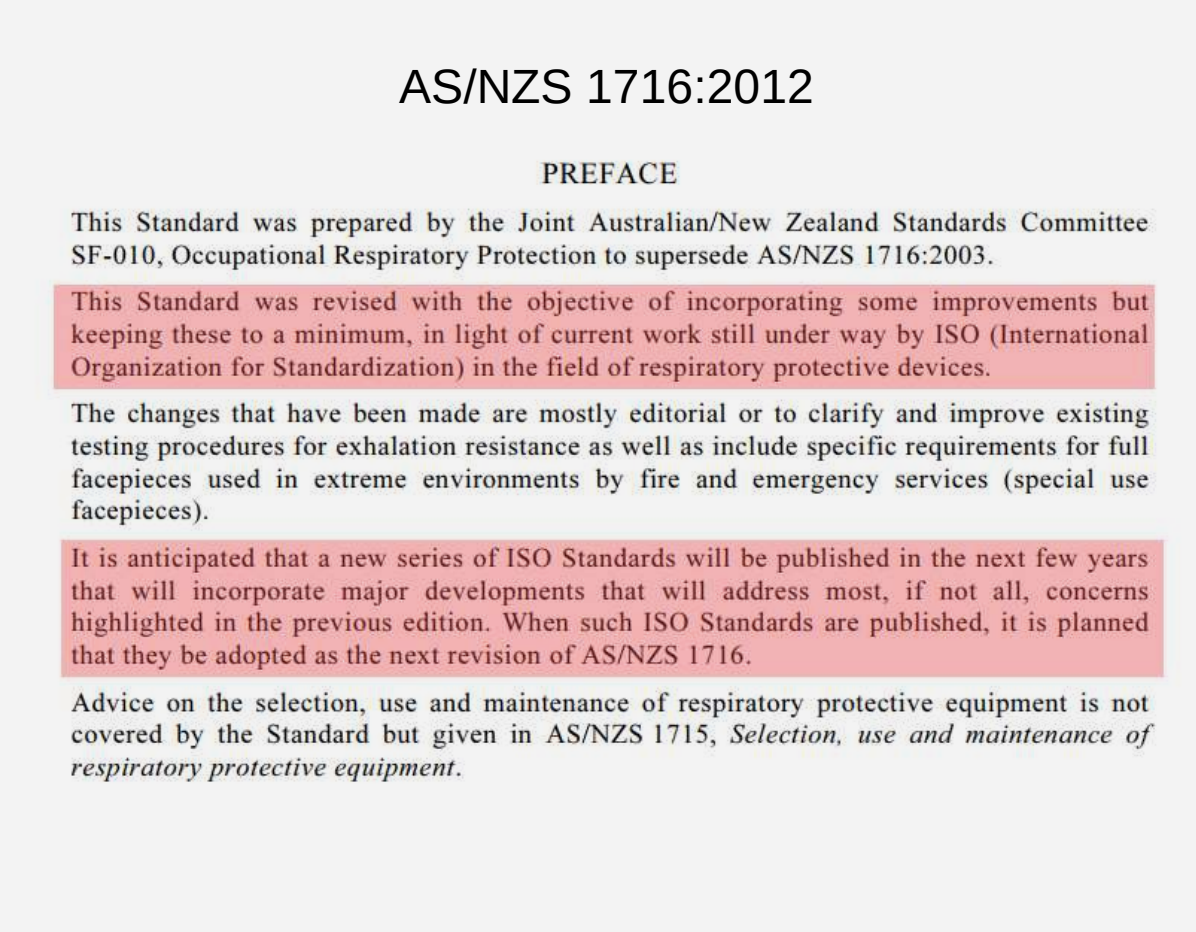
Benefits of ISO Respiratory Protection Devices (RPD) Standards

- Harmonise standards globally.
- Standardise terminology and definitions.
- Potential to harmonise protection factors.
- Change the focus from:
  - performance by design (product centric), to;
  - performance required by the wearer (human centric)
- Greater consideration of the burden of RPD upon the wearer e.g. individual characteristics, Intensity of work and the ‘work of breathing’

Transitioning to new respiratory protection standards

Standards Australia SF-010 Committee long term plans to adopt

- With the history of ISO standards development, previous committees and Standards Australia's plan was to adopt the ISO suite of standards.
- ISO standards took longer than anticipated leading to current standards AS/NZS 1715/1716 being quite old.
- The first ISO standards adopted by SF-010 was in 2015 being the Human Factors (HF) Technical Specifications. Second HF editions were adopted in 2021. Third HF edition adopted in 2024.



AS/NZS 1716:2012

PREFACE

This Standard was prepared by the Joint Australian/New Zealand Standards Committee SF-010, Occupational Respiratory Protection to supersede AS/NZS 1716:2003.

This Standard was revised with the objective of incorporating some improvements but keeping these to a minimum, in light of current work still under way by ISO (International Organization for Standardization) in the field of respiratory protective devices.

The changes that have been made are mostly editorial or to clarify and improve existing testing procedures for exhalation resistance as well as include specific requirements for full facepieces used in extreme environments by fire and emergency services (special use facepieces).

It is anticipated that a new series of ISO Standards will be published in the next few years that will incorporate major developments that will address most, if not all, concerns highlighted in the previous edition. When such ISO Standards are published, it is planned that they be adopted as the next revision of AS/NZS 1716.

Advice on the selection, use and maintenance of respiratory protective equipment is not covered by the Standard but given in AS/NZS 1715, *Selection, use and maintenance of respiratory protective equipment*.

Existing standards

AS/NZS 1715:2009	**AS/NZS 1716:2012**
Selection, use and maintenance of respiratory protective equipment	Respiratory Protective Devices

- Australia & New Zealand have adopted the ISO Respiratory Standards which will eventually replace AS/NZS 1715 & 1716 Standards
- Both standards remain current and have been reconfirmed until 2030
- Planned supersede date will be reviewed in 3 years
- The new ISO standards are operational in parallel with the existing AS/NZS 1715 and AS/NZS 1716 during the transition period

Transitioning to new respiratory protection standards

Australia & New Zealand Respiratory Protection Standards

Current Standard

AS/NZS 1715:2009, *Selection, use and maintenance of respiratory protective equipment*

Planned to be superseded by 1 JAN 2030

New AS/NZS ISO Respiratory Standards & Technical Specifications

AS/NZS TS ISO 16975.1:2023 (ISO/TS 16975.1:2016)

Selection, use and maintenance – Part 1: Establishing and implementing a respiratory protective device program

AS/NZS TS ISO 16975.2:2023 (ISO/TS 16975.2:2016)

Selection, use and maintenance – Part 2: Condensed guide to establishing and implementing a respiratory protective device program

AS/NZS ISO 16975.3:2023 (ISO 16975-3:2017)

Selection, use and maintenance – Part 3: Fit-testing procedures

AS/NZS ISO 16975.4:2024 (ISO/TS 16975.4:2022)

Selection, use and maintenance – Part 4: Selection and usage guideline for respiratory protective devices under pandemic/epidemic/outbreak of infectious respiratory disease

Main one for Workplaces

Transitioning to new respiratory protection standards

AS/NZS 1716:2012 – One standard with many sections

AS/NZS 1716:2012 Respiratory Protective Devices

Planned to be superseded by 1 JAN 2030

New AS/NZS Respiratory Standards & Technical Specifications

Terms & Definitions

AS/NZS ISO 16972:2023 (ISO 16972:2020) Terms and Definitions

+

Classification

SA/SNZ TS ISO 16973:2023 (ISO/TS 16973:2016) Classification

Underpinning Science

Human Factors

- AS/NZS ISO 16976.1:2024 (ISO 16976-1:2022) Respiratory Flowrate
- AS/NZS ISO 16976.2:2024 (ISO 16976-2:2022) Anthropometrics
- AS/NZS ISO 16976.3:2024 (ISO 16976-3:2022) Physiological Limitations
- AS/NZS ISO 16976.4:2024 (ISO 16976-4:2023) Work of Breathing
- AS/NZS ISO 16976.5:2024 (ISO 16976-5:2023) Thermal Effects
- AS/NZS ISO 16976.6:2024 (ISO 16976-6:2023) Psycho-physiological
- AS/NZS ISO 16976.7:2024 (ISO 16976-7:2023) Hearing and Speech
- AS/NZS 16976.8:2024 (ISO 16976-8:2023) Ergonomics Factors

For Manufacturers

Performance

- AS/NZS ISO 17420.1:2022 (ISO 17420-1:2021, MOD) General
- AS/NZS ISO 17420.2:2021 (ISO 17420-2:2021 (ED 1.0) MOD) Filtering RPD
- AS/NZS ISO 17420.3:2021 (ISO 17420-3:2012) Thread connection
- AS/NZS ISO 17420.4:2022 (ISO 17420-4:2021, MOD) Supplied Breathable Gas RPD
- AS/NZS ISO 17420.6:2022 (ISO 17420-6:2021, MOD) Special Application Escape
- AS/NZS ISO 17420.7:2022 (ISO 17420-7:2021, MOD) Special application marine, mining, welding and abrasive blasting
- SA/SNZ ISO /TS 17420.8:2023 (ISO/TS 17420-8:2021, MOD) CBRN Nuclear Filtering
- SA/SNZ ISO/TS 17420.9:2023 (ISO/TS 17420-9:2021, MOD) CBRN Supplied Air

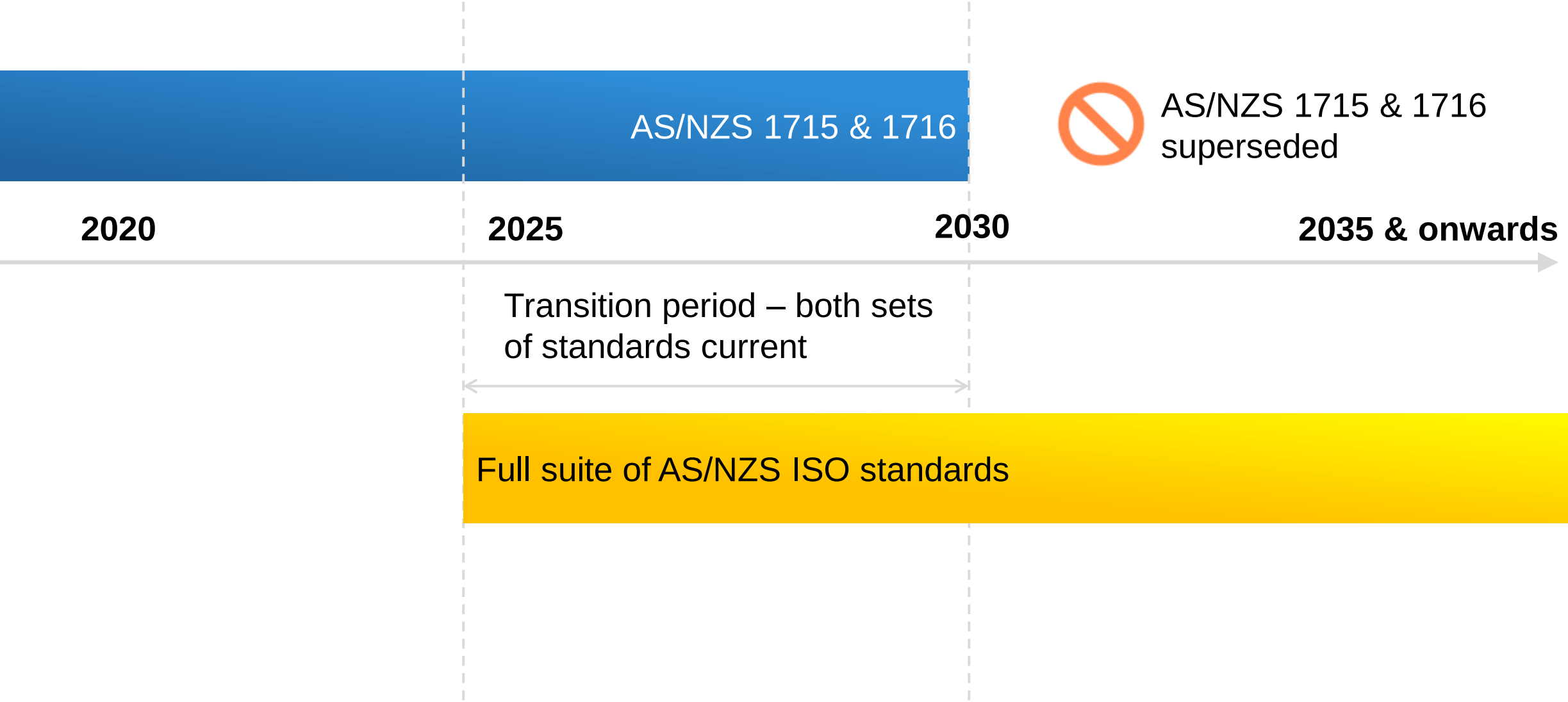
Test Methods

- AS/NZS ISO 16900.1:2021) (ISO 16900-1:2019) Test Method Inward Leakage
- AS/NZS ISO 16900.2:2023 (ISO 16900-2:2017) Breathing Resistance
- AS ISO 16900.3:2015 (ISO 16900-3:2012) Particle Penetration
- AS ISO 16900.4:2015 (ISO 16900-4:2011) Gas Capacity
- AS/NZS ISO 16900.5:2021 (ISO 16900-5:2016/Amd.1:2018) Headforms & tools
- AS/NZS ISO 16900.6:2022 (ISO 16900-6:2021) Mechanical Strength
- AS/NZS ISO 16900.7:2021 (ISO 16900-7:2020) Practical Performance
- AS/NZS ISO 16900.8:2021 (ISO 16900-8:2015) Airflow Assisted RPD
- AS/NZS ISO 16900.9:2023 (ISO 16900-9:2015) CO2 Concentration
- AS/NZS ISO 16900.10:2022 (ISO 16900-10:2015) Flame Heat Exposure
- AS ISO 16900.11:2015 (ISO 16900-11:2013) Field of Vision
- AS/NZS ISO 16900.12:2021 (ISO 16900-12:2016) Work of Breathing
- AS/NZS ISO 16900.13:2021 (ISO 16900-13:2015) Closed Circuit CO2
- AS/NZS ISO 16900.14:2021 (ISO 16900-14:2020, MOD) Sound Level Measurement

Note: **ISO 17420.5:2021 Special Application Fire Services** has been published by ISO but is not planned to be currently adopted in Australia at this time but will in the future to align with AFAC timeline with future local planned adoption of ISO 11999. AFAC has indicated its intention to align with (under development) through .

Transitioning to new respiratory protection standards

Transition Period Timeline 2025–2030 and beyond

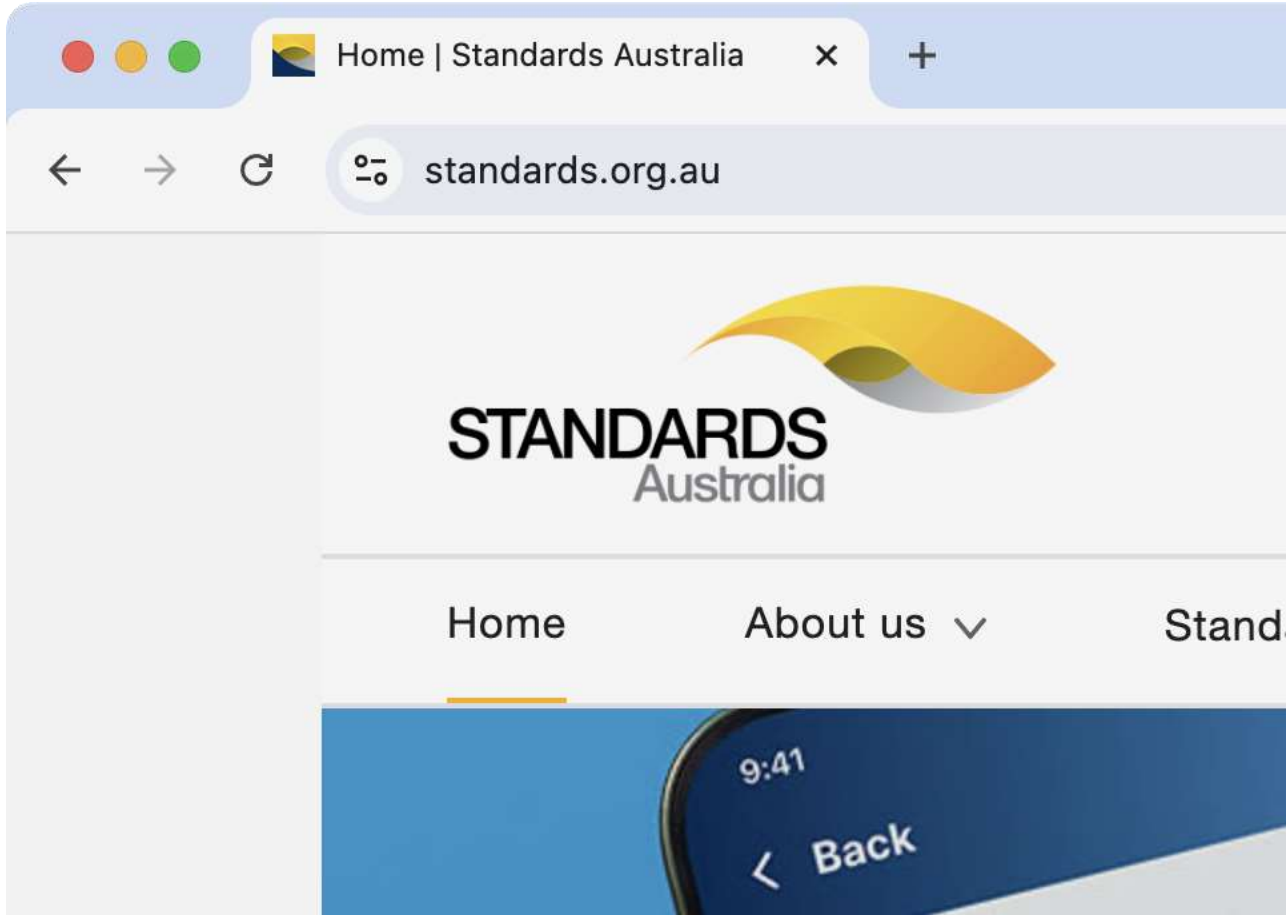


Standards Australia communication

Lots of communication and education required for all stakeholders.

Planned Communications

- Webinars
- Whitepaper
- Landing page for all information and resources accessible to all stakeholders
- Superseded date communications on Standards Australia Store and referenced landing page



Respirator Manufacturers

- Critical for all manufacturers to be aware of and become familiar with.
- Manufacturers already working on products planned to be released in next few years and beyond, so should start using AS/NZS ISO standards as requirement reference.
- Start to plan for existing products to be tested/classified/marked to ISO standards/classifications.
- Certification bodies do not accredit to superseded standards, though some limited exceptions may apply
- 5 years will go quickly…

Testing Laboratories

- Chicken and egg challenge
- Limited test labs globally accredited to ISO standards
  - Viclabs (Australia) - Range of 16900 standards
  - BSI (UK) – Range of 17420 standards
- With our transition timeline to ISO and communication to industry, expecting more labs to become accredited to ISO as more commercially attractive moving forward

Certification Bodies

- Certification bodies will work with manufacturers on their transition plan for their product range.
- Key partner for manufacturers to work with.

Workplaces/Users

- Awareness that changes are coming with the standards & classification of respirators they use in future years.

Regulators

- Legislative amendments may be required to replace current standards mentioned i.e. silica regulation
- Moving forward to also reference AS/NZS ISO standards where AS/NZS 1716 & 1715 is referenced when reviewed/updated
- Training for Inspectors and relevant parties on new standards, transition timeline & on how to interpret
- Closer to 2030, remove references to AS/NZS 1716 & 1715 in documentation/resources e.g. codes of practice and only reference AS/NZS ISO standards 2030 onwards

Transitioning to new respiratory protection standards

Comparison between existing Standards and ISO Classification

	Today AS/NZS	ISO
Basic Classification	Type	Total Inward Leakage (TIL) Lab Test
Work Rates	Not Classified	4 Work Rate Classes W1, W2, W3, W4
Particle Filters	3 (P1, P2, P3)	Potential for 20 (4 Work rates and 5 Efficiencies F1, F2, F3, F4, F5)
Gas and Vapour	Classified by capacity (AUS, Class 1, Class 2, Class 3)	Classified by capacity and work rate for wider range of gas/vapour classes
Selection and Use	Based on Required Minimum Protection Factor	Based on ISO Classification – Protection level linked to TIL – Work Rates

ISO TS 16973 Classification – Protection Class

- Protection Classification will be derived from Total Inward Leakage (TIL% max)
- 15-member panel
- Passing fit test required
- No type related limits on class
- Theoretically, a respirator can achieve the highest or lowest PC class regardless of what ‘type’ it is.

Protection Class	TIL MAX (%)
PC1	20
PC2	5
PC3	1
PC4	0.1
PC5	0.01
PC6	0.001

ISO TS 16975-1 Selection and Use – Protection Level

- ISO defines Protection Level as “the degree of respiratory protection allocated to a respiratory protective device, that is expected to be provided to wearers when used within an effective respiratory protection program”.
- ISO ‘protection levels’ are based on a laboratory test and assigned regardless of ‘Type’ of respirator.
- Protection Level applied like an “Assigned Protection Factor (APF)” or “Required Minimum Protection Factor (RMPF)” to reduce workers exposure to beneath the Workplace Exposure Standards/Limits.

Class	Protection Level $PL = \frac{1}{TIL_{MAX}} * 100 * \frac{1}{SF}$ (%)
PC1	4
PC2	10
PC3	30
PC4	250
PC5	2000
PC6	10000

Further real-world performance validation of Protection Levels from ISO required. Area of discussion for the committee to lower Protection Levels

Transitioning to new respiratory protection standards

SA/SNZ ISO TS 16973 Classification – Work Rates

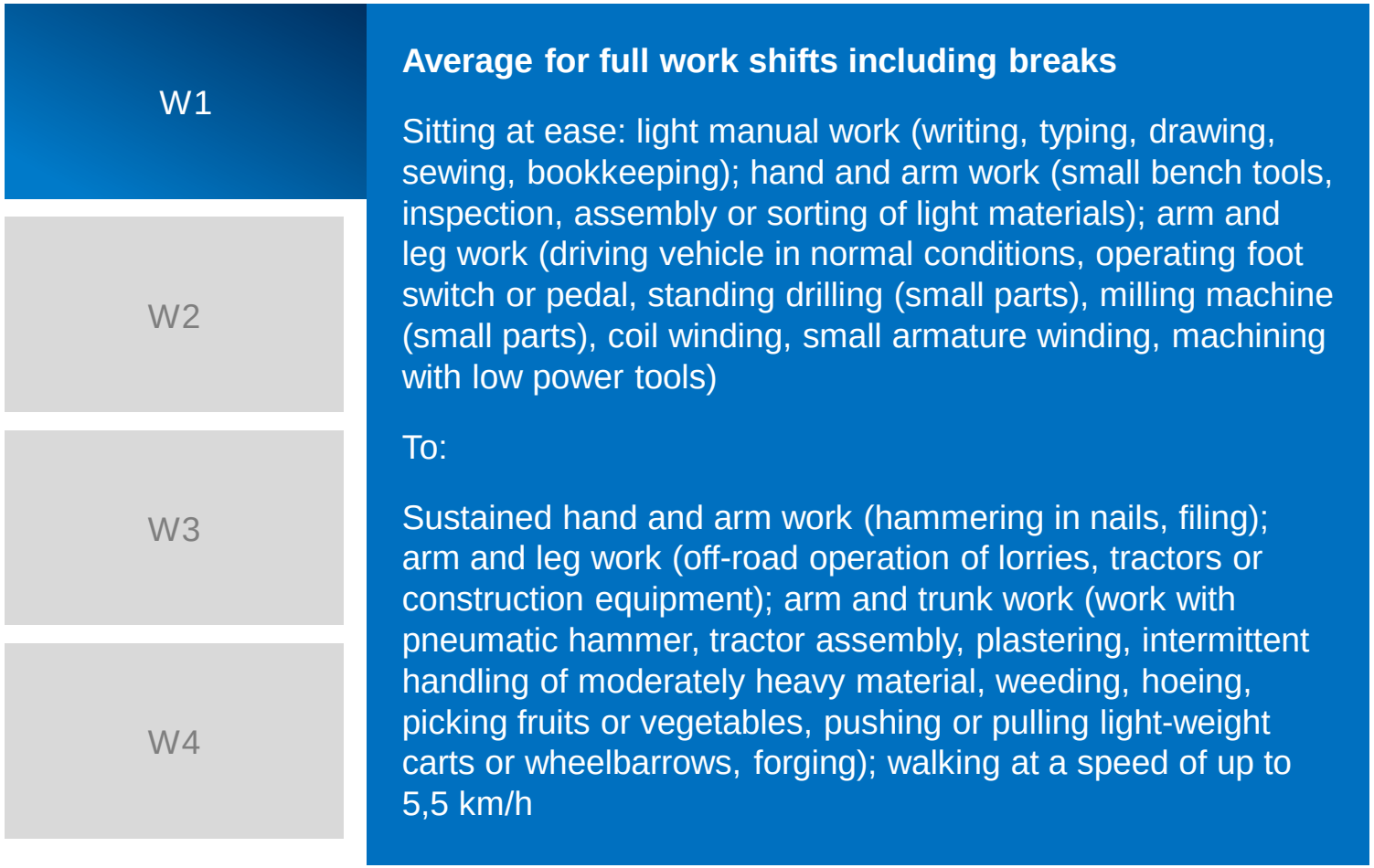
4 Work Rate Classes

- Examples for different types of work in ISO TS 16973
- Work rates comes from ISO 8996
- Work Rate Class drives performance requirement flow rates
- Manufacturer determines what Work Rate Class to test to

Determining Work Rate Class

Selection and use standard ISO 16975.3 Section 7.3.3.4 directs user to what Work Rate Class is needed

- W1 – W2 likely would cover about 70-80% of industrial workplaces



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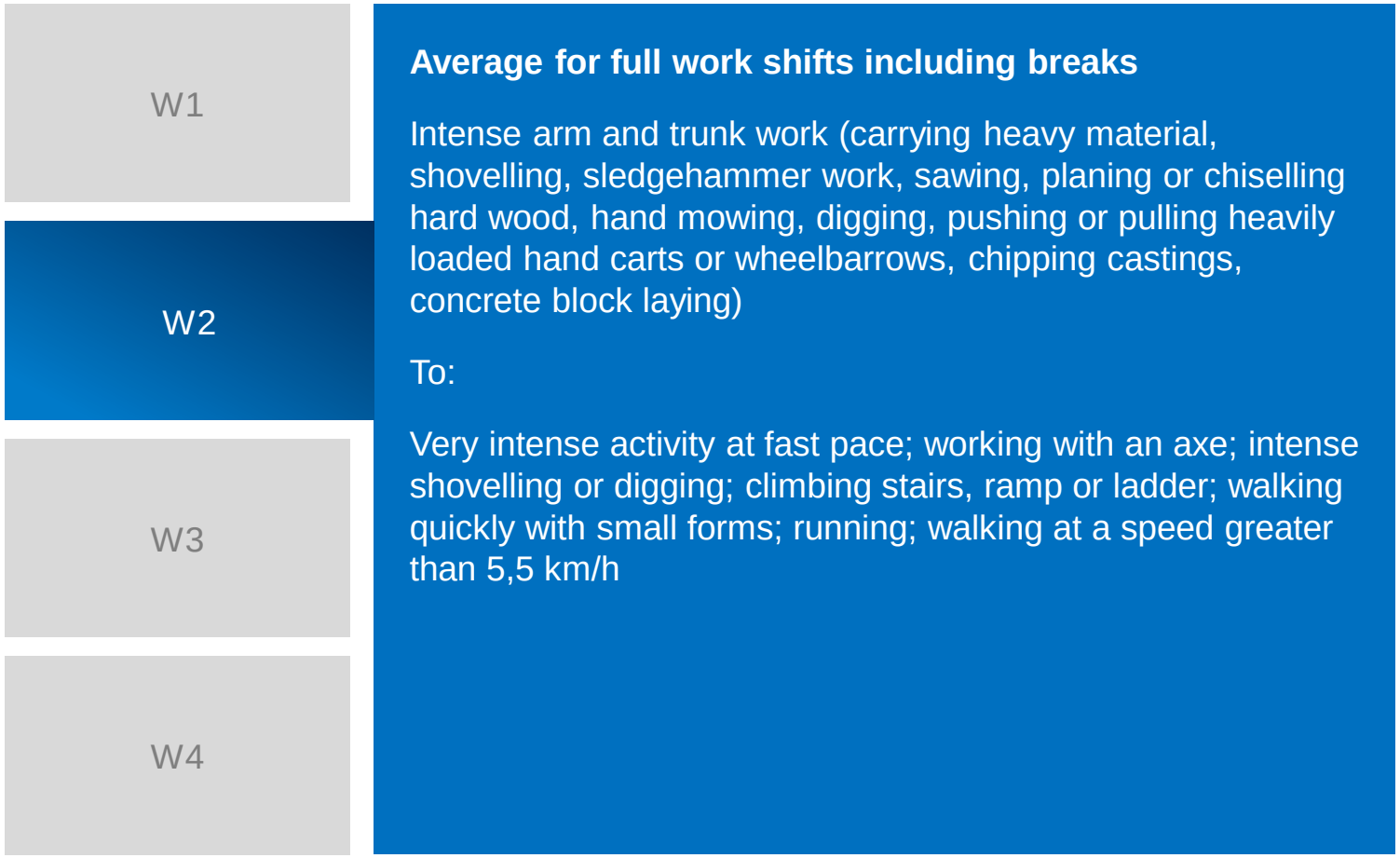

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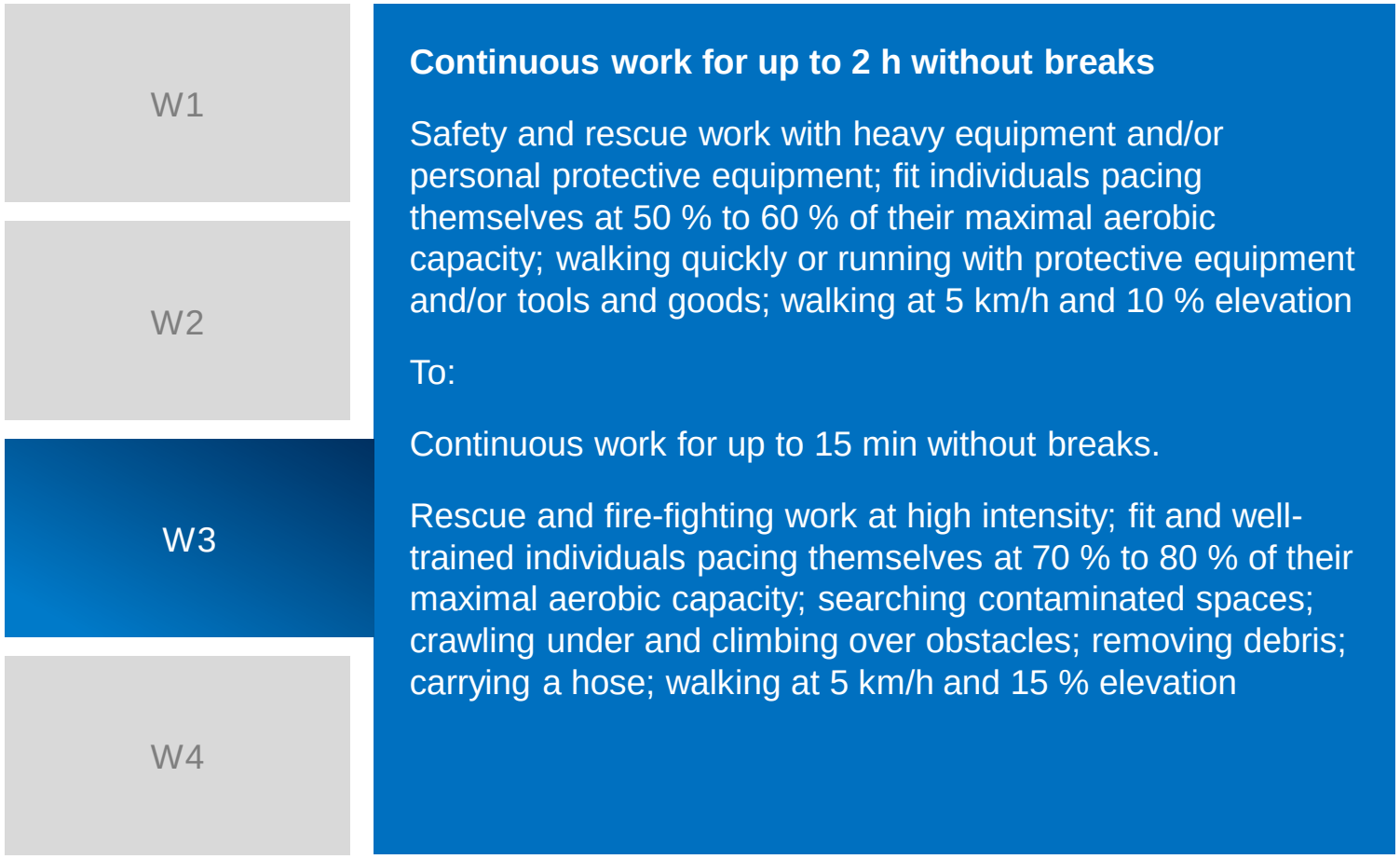

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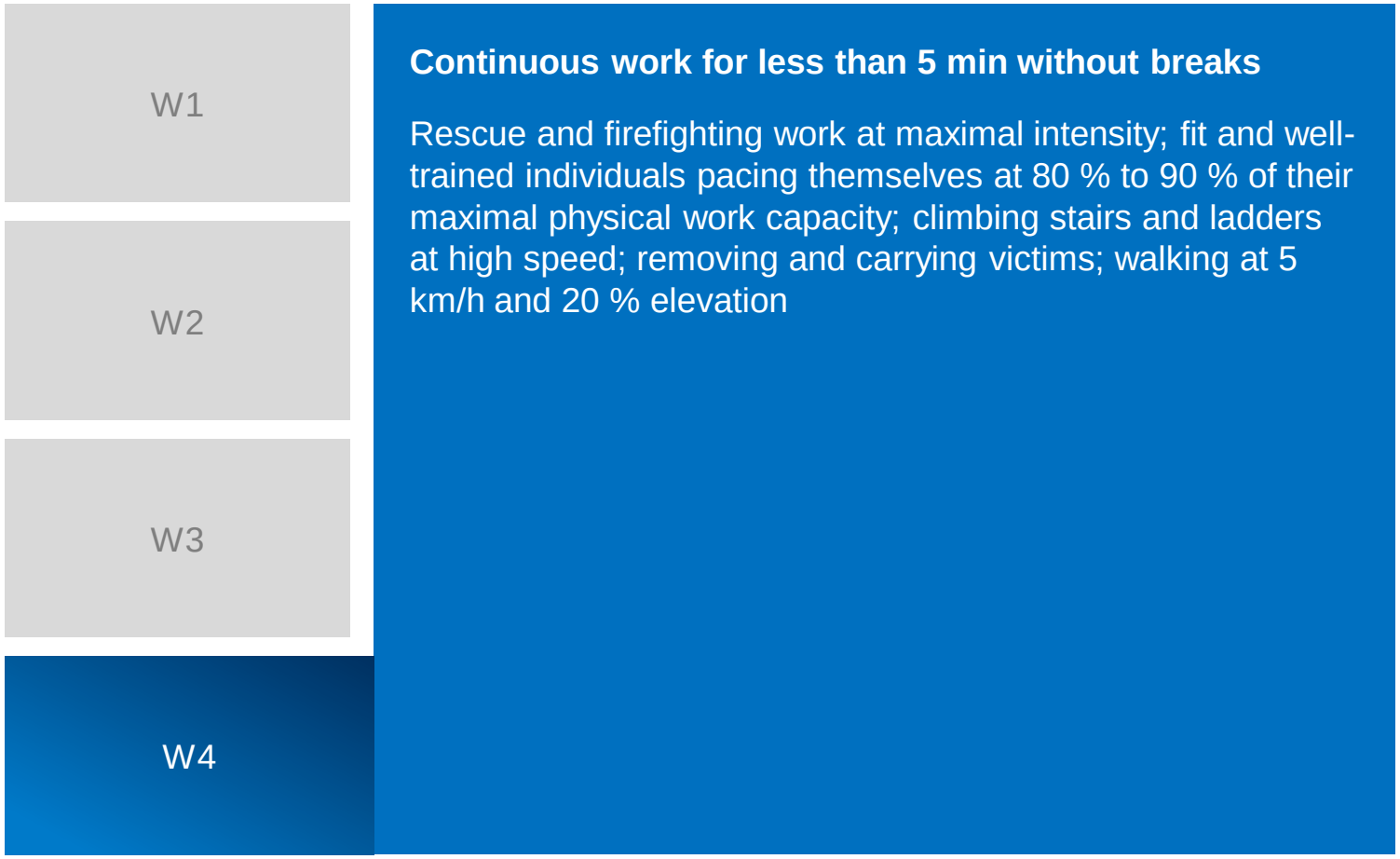


SA/SNZ ISO TS 16973 Classification – Respiratory Interface Class

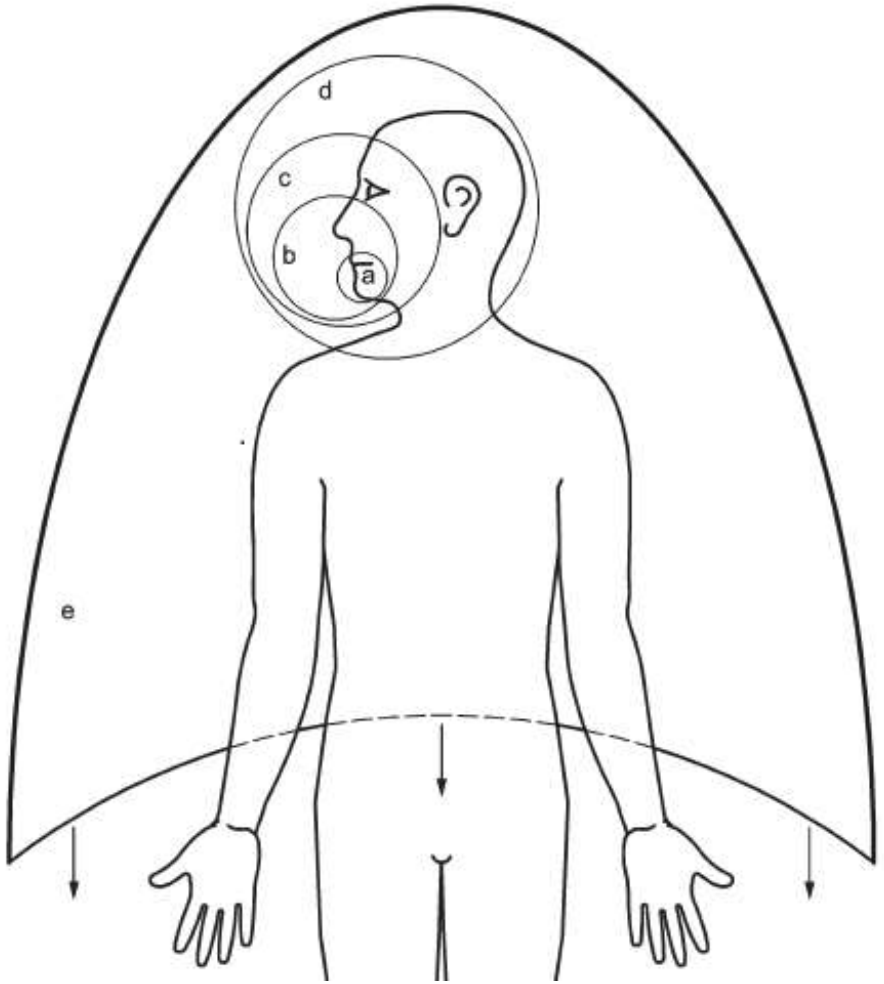


Table 3 – Respiratory interface classes

RI Class	RI area	Type
eL	e – more than head, up to complete body	L – Loose fitting
eT	e – more than head, up to complete body	T – Tight fitting
dL	d – Head	L – Loose fitting
dT	d – Head	T – Tight fitting
cL	c – Face	L – Loose fitting
cT	c – Face	T – Tight fitting
bL	b – Nose and mouth	L – Loose fitting
bT	b – Nose and mouth	T – Tight fitting
aL	a – Mouth only	L – Loose fitting
aT	a – Mouth only	T – Tight fitting

Transitioning to new respiratory protection standards

SA/SNZ ISO TS 16973 Classification – Filtration

Class (Minimum particle filter efficiency)	F1 (80%)	F2 (95%)	F3 (99%)	F4 (99,9%)	F5 (99,99%)
Type Gas filter	OV Organic Vapours	BC Basic	AC Acidic	OG Organic Gases	NOX Nitrous Oxides
Class	1 2 3 4	1 2 3 4	1 2 3 4	1	1 2 3
Type Specific gas filter	ND Nitrogen Dioxide	OZ Ozone	HCN Hydrogen Cyanide	MB Methyl Bromide	FM Formaldehyde	HG Mercury
	1 2 3	1	1 2 3 4	1 2 3	1 2 3	1 2 3
	AH Arsine	HF Hydrogen Fluoride	CD Chlorine Dioxide	CO Carbon Monoxide	ETO Ethylene Oxide	PH Phosphine
Class	1	1 2 3	1	1 2 3	1 2	1 2 3

Product Label Colours:
Particulate = White
Gas & Vapour = Blue

Transitioning to new respiratory protection standards

SA/SNZ ISO TS 16973 Classification – Special Applications

Each may have its own minimum Protection Level / Protection Class, Work Rate and specific testing

Class Firefighting	Class Chemical, Biological, Radiological and Nuclear	Class Marine (Shipboard and Offshore)	Class Mining	Class Abrasive Blasting	Class Welding	Class Escape (Nominal service life in t min)
FF5 Structural Firefighting R2						**ESMN t** Mining Escape
FF4 Structural Firefighting R1			**MN4** Firefighting R2			**ES MA t** Marine Escape
FF3 Hazardous Materials	**CBRN3** First on-scene responder		**MN3** Firefighting R1			**ES CBRN t** CBRN Escape
FF2 Rescue	**CBRN2** Responder (known threat environment)	**MA2** Firefighting	**MN2** Underground explosive atmosphere			**ES FF t** Escape from fire
FF1 Wildland Firefighting	**CBRN1** Gas Receiver/First Receiver	**MA1** Hazardous Materials	**MN1** Underground non-explosive atmosphere	**AB** Abrasive Blasting	**WE** Welding	**ES XX t** Escape General Filtering (xx is gas filter type)
						ES t Escape General Supplied breathable gas

RPD Classification for Special Application

SA/SNZ TS ISO 16973 Classification Example

A filtering facepiece protecting the wearer against harmful particles, with a total inward leakage of < 20%, being validated for ISO work rate 1 and having a minimum filter efficiency of 99%. See Table below.

Performance	Class
Protection class	PC1
Work rate	W1
Respiratory Interface	bT
Particle Filter Efficiency	F3w1

ISO RPD classification and marking: PC1 W1 bT F3

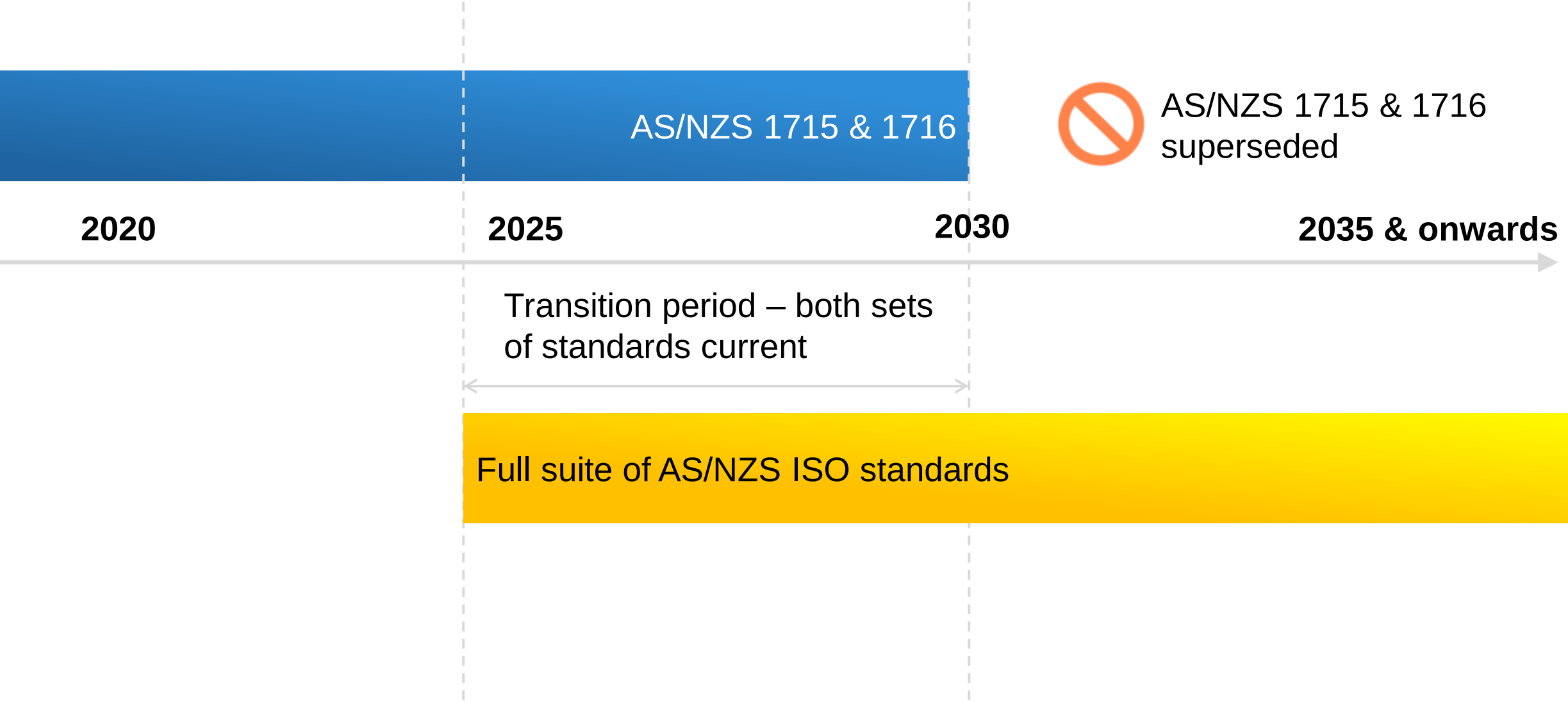
Refer to SA/SNZ TS ISO 16973 Annex B for further classification examples of different respirator types

Conclusion

- Australia & New Zealand are some of the first countries globally to adopt the suite of ISO RPD standards
- AS/NZS 1715 & 1716 planned to be superseded in 2030
- Changes are coming to RPD standards, terminology and classification in future years
- The committee is currently reviewing the protection levels in 16975.1 and is seeking additional support from ISO
- Lots of market education is required during the transition period and ongoing
- Still a few years away from actual ISO-classified products on the market

Transitioning to new respiratory protection standards

Transition Period Timeline 2025–2030 and beyond



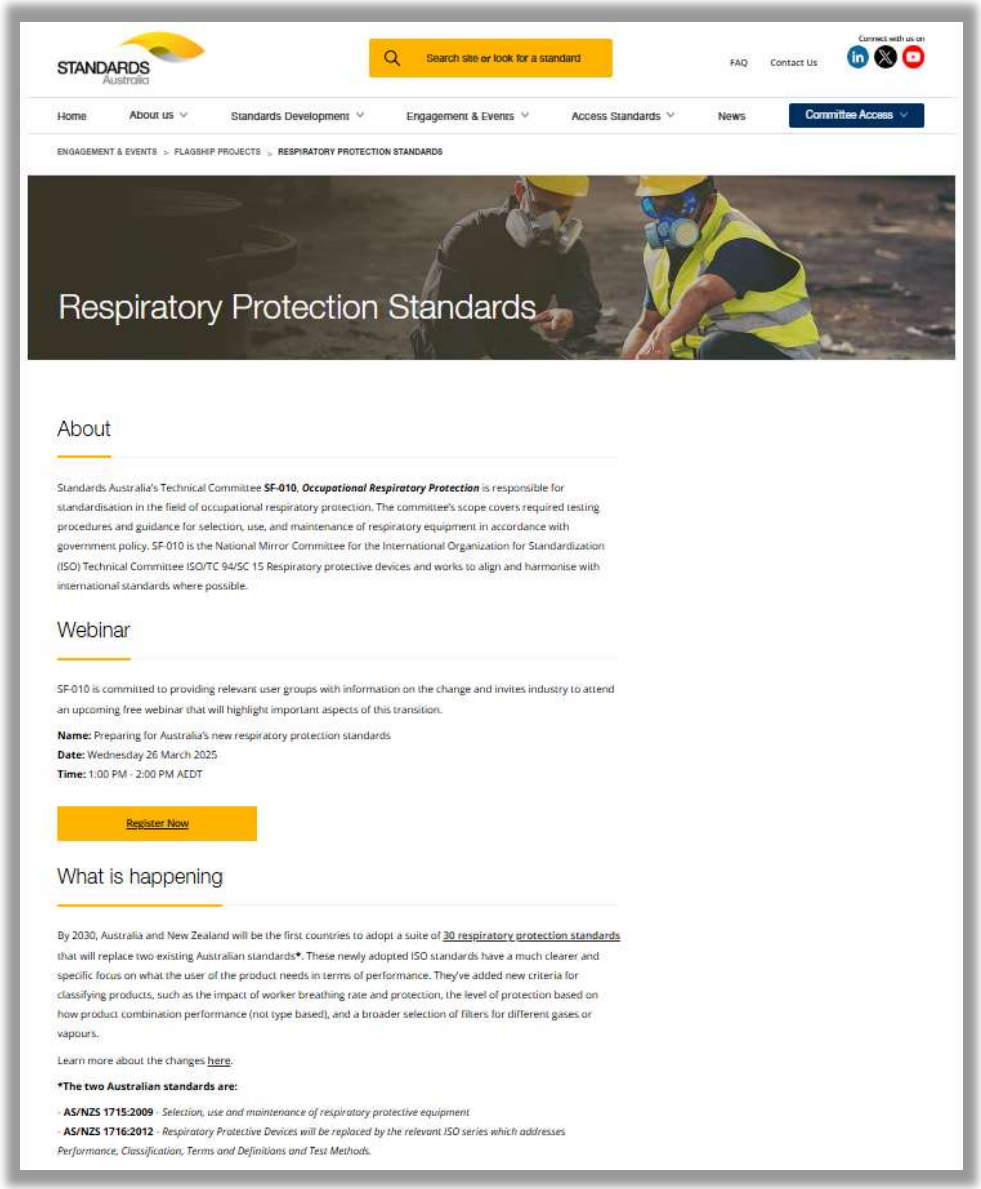
Stay updated

- **Visit the dedicated webpage**: For the latest updates and detailed information, visit our Respiratory Protection Standards webpage:

- **Complete the post-event survey**: Please complete the post-event survey to let us know the best way to provide you with information in the future.

- **Follow Standards Australia on LinkedIn**: Stay connected and receive updates by following Standards Australia on LinkedIn.

- **Contact us**: If you have any questions or need further information, feel free to reach out to our team.

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