



Who is Brett & why is he here?

- **Mechanical engineer**
representing local and international consultancies since 1990's
- **ME-062-01 and ME-062-02 subcommittee member**
including AS/NZS 1668.1, AS 1668.2, AS 1668.4
- **Training & seminars**
including Smoke Control, Fire Dampers, Essential Safety Measures, 2016 Roadshow for AIRAH, bespoke training for other organisations and industry bodies.
- **Director, It's Engineered**
mechanical services consultancy supporting other practitioners throughout the industry
DESIGN | REVIEWS | TRAINING | ADVICE | SUPPORT



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DEVELOPMENT OF STANDARDS

- Committees of volunteers representing various industry bodies & stakeholder roles
- Changes only made following advice and feedback from stakeholders
- Standards reflect industry consensus, to guide a practitioner's ideas
- Some Standards are adopted by reference in legislation, codes or contracts (eg: AS 1668.1 & AS 1668.2)
- **As stakeholders, your feedback is critical!**



AS 1668.1:2015

DRAFT AMENDMENT 1 (OUT NOW!)

The use of ventilation and air conditioning in buildings

Fire and smoke control in buildings

Presented by
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AS 1668.2:2012

AMENDMENT 2 (Dec 2016)

The use of ventilation and air conditioning in buildings

Mechanical ventilation in buildings

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AS 1668.1:2015

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INTRODUCTION

- This presentation has been prepared assuming the audience has practical experience in the application of AS/NZS 1668.1:2015
- It is focused on proposed changes as part of the amendment project only
- Participation in public comment is encouraged!



WHY AMEND IT ALREADY?

- Feedback received since the 2015 revision was published.
- AIRAH's Roadshow on the revised set of Standards last year was a big source of this **feedback**. Feedback has been generally positive regarding the changes made in the 2015 revision, but this new proposed amendment reflects requests from the industry for **further clarifications**.
- Timing wise, we expect the proposed amendment can be resolved in time for reference in **NCC 2019**.
- Like the recent amendment to AS 1668.2, this update to AS 1668.1 is classified as a "revised text amendment". So while there are a number of refinements, there shouldn't be any significant technical changes.



AMENDMENT STATUS

- The amendments aren't set in stone yet.
- This is a proposed amendment and it is subject to the Public Comment process.
- The public comment period opened at midnight on Monday 17th July 2017 and will close at midnight Monday 18th September 2017.



SOME NOTABLE PROPOSALS ...



ZONE PRESSURISATION

- Some misunderstandings in the application of Zone Pressurisation Systems (Section 8)
- We received clarification from ABCB that these systems were never intended to be applied horizontally between fire compartments
- If the BCA only requires this strategy between multi-storey (vertical) fire compartments, ABCB needs a PFC from industry to identify the need for clarifications
- Wording in the Standard needs to prevent any conflict with the BCA



ZONE PRESSURISATION

- I encourage further debate in the industry regarding potential benefits of horizontal applications, but this will need to be supported with needs and evidence that changes are necessary.
- Appendix A remains in AS 1668.1 as a guide to anyone trying to implement horizontal smoke control in the likes of health and aged-care buildings.
- Designers should also be aware that this smoke-control strategy relates only to fire compartments, **not smoke compartments.**



MINOR & MAJOR OPENINGS

- Terminology relating to “minor” and “major” systems has been improved
- Larger openings = increased risk in the spread of smoke when the combined area of openings between fire compartments
- These revisions in the 2015 edition were intended to establish a prescriptive limit for BCA requirements on openings that may “... **unduly contribute to the spread of smoke . . .**”.



SUBDUCTS

- Subduct terminology has progressed again, making it clearer that these should only be used to exempt the use of fire dampers in some exhaust systems and only where these include an opening into fire rated shafts or ducts.
- Air needs to continue to flow through subducts to prevent the back flow of smoke, so associated fans must continue to operate in a fire, and fire dampers cannot be installed in series with a subduct at any point through the system's airpath.
- Use of a subduct at the most upstream point of a smoke exhaust system is unnecessary.



DUCTWORK MATERIALS

- Narrowed specification of ductwork materials and construction, to those requirements relevant to fire and smoke control.
- While other Standards may specify aspects such as thermal breaks and labelling, this is outside the scope of AS 1668.1 and is best handled by the relevant Standard.



STAIR PRESSURISATION INTAKES

- Intake locations should prevent the simultaneous loss of both stairs
- Separate intake locations for separate stairs
- Some minor adjustments to the protection of electrical components associated with stair pressurisation systems



FIRE SERVICES COORDINATION

- Other than some minor clarifications in Section 4's diagrams, information relating to the protection of interfaces between the mechanical and fire-protection systems remains unchanged.
- It's intended that this amendment will be published in conjunction with a similar update to AS 1670.1, while we work to eliminate any potential conflicts.
- I'm interested in the views of members regarding the potential reduction in content, to simply refer to AS 1670.1 for these requirements, which is actually the requirement of these clauses anyway.
- Would a reduction in duplicated text between the Standards actually make this clearer?



BASELINE DATA

- Commentary added to Clause 4.15, derived from the definition in the recently revised edition of AS 1851.
- This highlights the benefit of Baseline Data in enabling routine service and performance verification of systems specified in the Standard.



SHARING KITCHEN SHAFTS

- Limitations in the sharing of kitchen exhaust shafts should now be clearer in Section 6.
 - For other kitchen exhaust
 - For other ducts



KITCHEN FAN OPERATION IN FIRE MODE

- While an operating hood must not be shut down in fire mode, it's accepted that an eventual loss of voltage will result in the system stopping anyway
- (unless the kitchen exhaust is designed to form part of the building's smoke control system).



SHUTDOWN SYSTEMS

- Section 7 altered to reflect the intent that it applies to systems that are not required to run in fire mode.
- A Shutdown System in accordance with this Standard is in fact a **very basic form of smoke control**, with major openings automatically closed and fans stopping to prevent the spread of smoke through ventilation openings.
- Commentary is added in Section 5 to highlight that the shutdown override also applies to plant manually set to “ON”.



STAIR PRESSURISATION DOORS

- “above/adjacent” was introduced in 1998 & was intended to apply to a single additional compartment. Proposed wording makes this clearer.
- Again, I encourage further debate among stakeholders regarding the suitability of this requirement in light of modern research and applications.
- But suitably supported feedback is necessary before this strategy can be overhauled in a future revision.



“NOTES”

- There are a number of instances where the word “NOTE:” was applied when formatting the final 2015 revision, not as intended by the sub-committee.
- These have been corrected to prevent any inadvertent non-compliances.



AS/~~NZS~~ 1668.1

- Standards Australia has advised us that from this amendment, the publication will no longer be a joint Australian/New Zealand Standard, simply AS 1668.1.
- Members working in New Zealand will need to keep an eye out on any applicable changes in NZ legislation.



SUMMARY

- Clarifications should again make these existing requirements easier to follow.
- I encourage members to review a copy of the draft (available from www.standards.org.au).
- If any of the proposed wording still seems unclear, comments should be submitted to Standards Australia during the Public Comment period, so the technical sub-committee has the necessary feedback with which to work.



Thank you

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AS 1668.2 OBJECTIVES

In simple terms,

- permissible **ventilation rates** considering **health & amenity** within buildings
- maintain **general contaminants** (body odours, VOC's etc) at **levels acceptable to most occupants**
- Dispose of **contaminated air** without creating a **nuisance or hazard**



INTRODUCTION

- AS 1668.2 is one of the most important Standards for those of us working in ventilation, so the details of the changes are something we should be all familiar with.
- With each clarification, I believe this amendment will benefit the industry by making the existing requirements a little easier to follow.
- Download a copy of Amendment 2 and have a look.
- This presentation has been prepared assuming the audience has suitable practical experience in the application of AS 1668.2:2012 and is focused on proposed changes as part of the amendment project only.



WHY AMEND IT?

- Most of the changes are quite small, although there are a lot of them.
- The changes are generally typographical or clarifications to wording for existing requirements.
- The update is classified as a “revised text amendment”, so there shouldn’t be many technical changes.
- This amendment was really an opportunity to address feedback collected from the industry over recent years.



What are the main changes?



REDUCING OUTDOOR AIR WITH FILTRATION

- In simple terms, outdoor air is used to dilute the contaminants in an enclosure.
- With sufficient filtration in the recycle air stream, contaminants are removed from the enclosure, so that less dilution is necessary.
- The use of filtration to reduce outdoor air quantities could only ever be applied to systems that would recycle room air through a high-efficiency filter.
- Filtration of 100% OA never enabled a reduction, and this amendment now makes this much clearer.



KITCHEN EQUIPMENT EXEMPTIONS

- Clarification is included for the types of equipment that should be exempt from local exhaust (hoods) requirements.
- Equipment such as coffee machines, microwaves, space heaters, plant room equipment and the like were never intended to be “captured” by these clauses.



“Other occupancies” in car parks

- Ventilation of other occupancies within car parks has been adjusted to make it clearer that any of the listed ventilation strategies should achieve an acceptable air quality.
- These do not all need to be achieved at the same time.



JET FANS

- AS 1668.2-2012 does enable some limited Deemed-To-Satisfy jet fan applications, but only to distort an air path and only in parallel.
- When applied in accordance with the Standard, one jet fan could never draw air from an air path already altered by another jet fan.
- **“these shall not be installed to operate in series”** has been included to make this clearer and to align with wording also included in AS/NZS 1668.1-2015.
- Remember that the use of **multiple jet fans** in series throughout a carpark will require a **Performance Solution** in accordance with the NCC, due to aspects of contamination and fire safety.



ARE CAR PARK EXHAUSTS OBJECTIONABLE?

- Car park exhaust air should not normally be treated as objectionable.
- A simple note has been added to make this clearer.



CO MONITORING AND CONTROL

- The use of CO monitoring to enable modulation of carpark ventilation rates should also apply to associated loading docks, driveways, workshops, lifts and the like. This amendment makes this clearer too.



HEALTHCARE TERMINOLOGY

- Several subtle clarifications have been included throughout the healthcare section to better align enclosure titles with industry practice, and reduce the risk of recirculating contaminants.



OUTDOOR AIR AND EXHAUST RATES

- Tables **A1** and **B1** (outdoor air and exhaust airflow rates) include a number of corrections to make them easier to apply.
- eg: inclusion of the comment to exempt **office based printing** from the document copying process exhaust.



F4 FILTRATION

- addressed concerns raised regarding the availability of F4 filters.
- Filters with an average (not maximum) efficiency of $20 < E_m < 40$ are now listed in Table D1 as an “undefined” class, and are not applicable for efficiency calculations.



APPENDICES

- While the value of the appendices to these Standards is all too often overlooked, there are useful corrections to the guidance provided in these that are worth a read,
- particularly the suggested steps to calculating reduced outdoor air quantities (as low as 2.5 L/s per person, when applied correctly).



APPLICATION

- **NCC 2016 references AS 1668.2-2012 Amendment 1**
- The timing of publication of Amendment 2 will allow the Australian Building Code Board time to consider adopting the amendment for **NCC 2019**.
- We will all need to wait and see if this happens.
- In my opinion, a reference to the non-technical clarifications provided in this amendment should help those of us applying the Standard to better understand what is required.



SUMMARY

- Ongoing development and improvement of these Standards requires feedback from stakeholders throughout the industry.
- The volunteers that make up Standards Australia's committees and sub-committees are selected to try to best represent all sectors of the industry and cannot implement changes on a whim.
- I encourage members to speak up if they see further opportunities to improve any part of these Standards.
- AIRAH is represented on many of the HVAC&R related Standards sub-committees and would be an appropriate channel to have your say.



Thank you

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