

Fact Sheet: Air tightness

What is air tightness?

The air tightness of a building refers to how much air unintentionally leaks in or out, for example through poorly sealed doors or windows, or gaps in the building envelope (such as around services penetrations). This can result in detrimental impacts on occupant thermal comfort, energy consumption and moisture management.

The University's approach

The University recognises the potential benefits of air-tight buildings but is also mindful that achieving air-tightness and a functional building requires knowledge, skills and diligence from the whole project team. The following points capture some lessons learnt to date on projects:

- Briefing
 - Be clear whether or not air-tightness is a functional requirement. For example, for a gallery space, air-tightness may be required so that internal temperature and humidity conditions can be maintained within acceptable ranges so that owners of artwork or artefacts will be prepared to loan the gallery their works.
- Design
 - Avoid mandating the use of overseas hardware or equipment (e.g. doors or windows) if local service support is not available
 - Sliding doors are generally not suitable for the boundary of air-tight spaces
 - Carefully consider where ceiling access panels will be located.
 - Ensure compatibility with the University's Security Design Standards.
- Tender
 - Drawings showing "air tightness line" to be included in tender documentation to minimise site issues or variations.
 - A schedule of how each penetration or other leakage point in the "air tightness line" will be managed / controlled is to be prepared.
 - Ask tenderers for evidence of their experience with delivering air-tight projects
- Construction
 - Include air-tightness as part of the commissioning plan for the project
 - Ensure that the contractor has considered the timing of air tightness test in relation to when reviews have been completed for seals, hardware, caulking etc
- Testing
 - Ensure that the contractor has allowed appropriate time for air-tightness testing within their programme. Multiple tests may be needed if a set level of air-tightness is required for practical completion.
- Operation & Maintenance
 - Be mindful that maintaining the air-tightness of the building requires diligence in operation, for example during any refurbishment works, new penetrations or services etc.

Useful references

AIRAH Building Physics Special Technical Group (2017) *Air Tightness Metrics to Improve Australian Building Envelope Integrity*, available at www.airah.org.au/Content_Files/Special-Technical-Groups/AIRAH-Building-Physics-STG-2017-Pressurization-Testing-Metrics.pdf

The Air Infiltration and Ventilation Association of Australia <http://aivaa.asn.au/>

BC Housing (2017) *Illustrated Guide - Achieving Airtight Buildings*, www.bchousing.org/publications/illustrated-guide-achieving-airtightness.pdf

Cheeseman, B. (2013) *Designing and Constructing for Airtightness*, BSRIA www.bsria.co.uk/information-membership/bookshop/publication/designing-and-constructing-for-airtightness/

International Energy Agency (2012) *Methods and techniques for airtight buildings*, http://tightvent.eu/wp-content/uploads/2012/04/CETE69_AIVC_Contributed_Report_14.pdf