
Overview

This standard is for those who carry out air tightness and/or air change rate testing of buildings of any size or complexity. It covers those preparatory activities carried out prior to the conduct of the air tightness test.

You are required to respond to requests for air tightness testing from clients and liaise with them as to the timing and conduct of the tests and the implications of testing on the functioning of the building. You must clearly explain fees and payment procedures, the terms and conditions, activities to be undertaken, as well as any limitations or constraints in relation to the air testing of the building.

You are required to investigate matters which are important to ensure that an accurate calculation of air tightness can be achieved including the building structure, fabric and its component parts as well as any significant factors that may influence the conduct of the air tightness testing including weather conditions, the nature of ventilation systems and the inter-relationship of floors, roofs and walls. You are also required to make an accurate evaluation of the building envelope and calculate the required fan flow required to undertake the air tightness testing. In some cases your investigations may reveal problems that prevent you from undertaking the testing of the building; you are expected to inform the client and explain the reasons for not being able to conduct the testing.

Performance criteria

You must be able to:

Agree and confirm instructions to carry out air tightness testing

- P1 respond to requests to carry out air tightness tests from prospective clients and clarify their requirements and expectation
- P2 explain to the client the terms and conditions under which you will conduct the air tightness testing including fees, payment procedures, cancellation/notice arrangements and relevant standard(s)
- P3 explain to the client the limitations and constraints of the planned air tightness testing including any disruptions involved to the normal operation of the building and its occupants
- P4 confirm the instruction and terms, conditions and arrangements that have been agreed including any time limits and requirements for site attendance either verbally or in writing
- P5 confirm with the client, or other occupiers, volume and envelope area calculations, and the date and time of the air tightness testing either verbally or in writing
- P6 confirm with the client, or other occupiers, any specific requirements that apply to the air tightness testing including health and safety risk assessment and on-site procedures
- P7 identify any circumstances that prevent you from undertaking the air tightness testing and explain the reasons to the client

Investigate matters relating to the conduct of the air tightness testing

- P8 make an evaluation of the construction and complexity of the building envelope prior to the test being carried out
- P9 estimate and/or calculate the envelope area of the envelope/volume of the building using floor, roof and wall areas in order to prepare an estimate for clients
- P10 obtain air tightness target for the building
- P11 identify any extensions to the existing building and whether or not they should be treated as a new building
- P12 take into account the recommended air tightness standards for different building types
- P13 identify areas of the building to be included within the conditioned space
- P14 establish whether the building must be tested for air tightness through pressurisation or depressurisation or an average of both

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- P15 establish the location of any heating, ventilation and air conditioning equipment and all internal doors and windows that will affect the air tightness testing to ensure that suitable airflow rates can be achieved to all elements of the building and to assess temporary sealing requirements
 - P16 conduct an initial health and safety risk assessment of the building to inform the planned air tightness testing procedure
 - P17 establish the most appropriate number and location of variable flow test fans to achieve equal pressure throughout the building
 - P18 establish the equipment requirements for the conduct of the air tightness testing
 - P19 establish how access for air tightness testing equipment will be achieved
 - P20 calculate the necessary fan flow required to undertake the air tightness testing
 - P21 identify any air flow restrictions around selected test fan locations
 - P22 identify location of useable electrical power supplies and their impact on planned fan locations
 - P23 establish local restrictions in the building which will affect air tightness testing such as normal working hours and work patterns

Knowledge and understanding

You need to know and understand:

Agree and confirm instructions to carry out air tightness testing

- K1 the relevant and current test Standards and regulations to be applied
- K2 the definition of air permeability, air tightness, air leakage index and air change rates
- K3 the causes of air leakage
- K4 the effect of air leakage on building energy efficiency and performance
- K5 the difference between air leakage and the controlled flow of air via ventilation
- K6 what constitutes appropriate ventilation rates for different buildings
- K7 what constitutes a “conditioned” building and the differences between naturally and mechanically ventilated buildings including mixed mode ventilation systems
- K8 the contribution of air permeability measurement and control to health and safety, human comfort, energy efficiency and compliance with building regulations
- K9 the principles and purpose of air pressure testing
- K10 the effects of building structure, fabric, finishes, cladding and condition on air permeability
- K11 the types of fan pressurisation systems and their impact on air tightness testing procedures
- K12 ways of categorising buildings based on function, size, ventilation systems and inter-relationship of building components
- K13 the impact of building categories on the selection of air tightness testing procedures
- K14 what constitutes a building envelope/volume and the key components of buildings to be taken into consideration for air testing purposes
- K15 how to calculate the envelope area/volume of the building from wall, floor and roof areas
- K16 the function of initial air tightness target value for the building in the air tightness testing process
- K17 the role of air tightness testing in establishing the Energy Performance Certificate asset value of a building
- K18 the recommended air testing standards for different building types
- K19 the principles and effects of heat transfer by air leakage
- K20 the limitations of heat gains and losses
- K21 what constitutes a representative sample of new buildings with reference to demonstrating compliance under building regulations
- K22 air leakage test requirements for: dwellings on construction; simple

- buildings other than dwellings; and complex buildings other than dwellings
- K23 energy performance targets for buildings
- K24 ways of eliciting client requirements and expectations regarding air tightness testing
- K25 normal business terms and conditions for the conduct of air tightness testing and relevant Standards
- K26 the limitations and constraints of the planned air tightness testing including any disruptions involved to the normal operation of the building and its occupants
- K27 the circumstances that prevent the undertaking of air tightness testing

Investigate matters relating to the conduct of the air tightness testing

- K28 the effects of adverse weather conditions on the accuracy of the air tightness testing results
- K29 what constitutes an extension to an existing building and whether or not it should be treated as a new building for air tightness testing purposes
- K30 the recommended air tightness standards for different building types
- K31 the areas of buildings normally included within the conditioned space
- K32 the different methods to be adopted when testing for air tightness through pressurisation or depressurisation
- K33 the effect of different types of heating, ventilation and air conditioning equipment on the air testing procedure
- K34 the effect of internal doors and windows on the air tightness testing procedure
- K35 how to conduct an initial high level health and safety risk assessment of a building and how it will inform the conduct of the planned air tightness testing procedure
- K36 the most appropriate number and location of variable flow test fans to achieve appropriate flow of air and the required pressure values
- K37 access requirements for air tightness testing equipment
- K38 how to calculate the necessary fan flow required to undertake the air tightness testing
- K39 the impact of any air flow restrictions around selected test fan locations
- K40 the impact of the location of useable electrical power supplies on planned fan locations
- K41 the impact of local restrictions in the building on air tightness testing including normal working hours and work patterns

K42 how to evaluate the impact of significant factors that may influence the conduct of the air tightness testing

K43 the factors that prevent the carrying out of air tightness testing of the building

ASTATT1

Prepare to carry out air tightness testing



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