
Overview

This standard is for those involved in the calculation of the area of building envelopes in order to permit costing and work planning, the development test specifications and to make accurate calculations of air permeability. Single dwellings and other small, simple building envelopes are defined as being predominantly formed from flat surfaces acting at right-angles to each other, and have a gross internal volume equal to, or less than, 4000m³. Large, non-simple building envelopes are defined as buildings that incorporate at least one or more elements formed by complex geometry including, but not limited to, curves, multiple angle pitch roof interfaces, tapered (on plan) pitched roof, and exceeds 4000m³ gross internal volume. The volume calculation is the volume inside the thermal line.

You are required to obtain accurate dimensions of buildings and discrete building envelopes from drawings and/or through on-site measurements. You must use measurements of the air barrier for all wall, floor and ceiling areas (e.g. the warm face of insulation) taking into account building shape, layout, levels, and cold and warm roof areas.

You are also required to identify any special measurement requirements of the building, as they can be technically involved shapes, conservatories and dormers in roofs. You will identify which structures and building features to exclude from the calculation. You must check all measurements and apply the correct calculations. The competence of the technician must be appropriate for the calculations of the envelopes to be determined. You must keep all calculations and supporting information such as drawings, photographs sketches, site measurements and observations.

Performance criteria

You must be able to:

- P1 obtain accurate dimensions of buildings from drawings and any other existing data relevant to the standard(s) being tested to
- P2 ensure that measurements are based on the correct scale
- P3 take on-site measurements to confirm or supplement information already available as necessary
- P4 sketch plans and sections where none have been provided with sufficient dimensions to enable the building envelope to be accurately calculated
- P5 amend plans and sections provided where they do not correctly represent the built building
- P6 identify and measure all surfaces that define the air test envelope
- P7 identify the nature and positioning of insulated areas in order to include or exclude specific areas of the building to be measured including parapets, party walls & walls, conservatories, extensions and cold roof structures
- P8 ensure that reveals and fireplaces are not taken into account when calculating building area
- P9 apply checks of measurement such as openings, storey heights and the overall average envelope areas of different types of building envelope
- P10 input accurate data in correct fields in area calculation software and check accuracy of input values
- P11 apply estimate checks to ensure software calculated values are realistic and consistent with other available information and estimates of area
- P12 check final area values against previously obtained building data as a final check on accuracy
- P13 keep calculations and supporting information including drawings, sketches, photographs, site measurements and observations in order to show how area values were obtained
- P14 apply appropriate geometry to enable to calculate envelope elements
- P15 interpret standard conventions used in construction drawings
- P16 envelope area calculations must be undertaken to reflect testing methodology employed upon the test area

Knowledge and understanding

You need to know and understand:

- K1 the relevant and current test Standard and regulations to be applied
- K2 mathematical and geometric theorems and standard calculation used in relation to building envelope geometry
- K3 how to interpret building drawings and scales to establish accurate internal measurements for all building envelopes regardless of media
- K4 how to take on-site measurements to confirm or add to measurement information already available
- K5 how to identify and measure all surfaces that separate conditioned interiors from unconditioned exteriors
- K6 how to identify the nature and positioning of insulated areas in order to include or exclude specific areas of the building to be measured in line with the testing methodology
- K7 building components which can be excluded from area calculations including parapets, canopies, party walls/floors, reveals, fireplaces and insulated conservatories, extensions, walls and ceilings
- K8 the importance of calculating areas for each level of the building separately
- K9 how to apply estimate checks on results for openings, storey heights and the overall average envelope areas for different types of building envelope
- K10 the data input fields used in area calculation software and the units of measurement being used
- K11 how to input accurate data in correct fields in area calculation software and how to check the accuracy of input values
- K12 commonly occurring input errors to area calculation software and how to avoid them
- K13 how to apply estimate checks to ensure software calculated values are realistic and consistent with other available information and estimates of area
- K14 what checks can be carried out to verify area values against previously obtained building data as a final accuracy check
- K15 how to identify, capture and store calculations and supporting information including drawings, sketches, photographs, site measurements and observations in order to show how area values were obtained for certification and accreditation purposes and in the case of challenges to results
- K16 understand standard conventions used in construction drawings

ASTATT6

Calculate the area of building envelopes



Developed by Asset Skills

Version Number 1

Date Approved November 2014

Indicative Review Date November 2019

Validity Current

Status Original

Originating Organisation Asset Skills

Original URN ASTATT6

Relevant Occupations Air Tightness Tester

Suite Air Tightness Testing

Keywords air tightness testing; building envelopes; dimensions of buildings
