RISE | Retrofit information, support & expertise

Main Changes of PAS 2035:2023 from 2035:2019

Supply chain advice pack

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Introduction

PAS 2035 was created in response to the recommendations of the Each Home Counts report (2016)[1] and is the Publicly Available Specification (PAS) which "*offers comprehensive guidance for energy retrofitting in existing homes, ensuring efficiency, sustainability, and improved performance*"[2].

First published in 2019, PAS 2035 outlines how retrofit projects should be managed and delivered. It aims to guide a holistic approach which considers a building as a system of elements, interfaces and occupants that interact and not as a set of elements that are independent of each other.

The first version of the standard was PAS 2035:2019 and this was subsequently updated several times before the publication in September 2023 of PAS 2035:2023[3], which is available to download free from the BSI website.

PAS 2035 is the overarching document in the Retrofit Standards Framework and all other standards referred to in PAS 2035 are part of the framework (see section 15 of PAS 2035). PAS 2035 and the Retrofit Standards Framework can be applied to all domestic retrofit activity.

All retrofit projects being delivered under Warm Homes funding, must use PAS 2035:2023.

For projects which have had assessments done using PAS2035:2019, they will be able to convert those assessments to PAS 2035:2023-compliant assessments, for a limited period (see TrustMark website).

Key changes

- PAS 2035 guidance clauses were updated to reflect changes in UK national policy and emphasize the role of PAS 2035 in protecting the consumer.
- Clauses have been included to facilitate scale retrofit by allowing retrofit design to commence based on assessments of archetypes.
- The risk assessment process has been simplified to avoid unintended complexities.
- Change of emphasis from measures-based retrofit to whole dwelling retrofit.
- Clarification of the role of the Retrofit Coordinator, including site visits and recording of non-compliance (see 9.2).
- Producing a Medium-Term Improvement Plan is now mandatory rather than guidance.
- Requirement to produce an airtightness strategy for all projects, which can include setting of an airtightness target and air leakage testing.

1 Each Home Counts Report

[2] BSI PAS 2035 information

[3] PAS 2035: 2023 Publication

- Clarification of what happens in the PAS 2035 process if historic significance is identified.
- 'Further Monitoring and Evaluation' references the BS 40101 Building Performance Evaluation standard. 'Monitoring and Evaluation' is now considered from inception through to project completion.
- A process has been included whereby distressed (emergency) replacement of heating appliances can retrospectively comply with PAS 2035.

A full list of the changes can be found on pages ii & iii of the **PAS 2035: 2023 document.**

Two of the most important changes; requirements for a Medium-Term Improvement Plan and an Airtightness Strategy, are detailed below.

The Medium-Term Improvement Plan (MTIP)

"8.1.5: *The whole-dwelling scope for improvement in energy efficiency for each dwelling shall be identified, even if only limited improvements can be undertaken in the short term. A medium-term improvement plan shall be prepared for every dwelling."*[3]

- The MTIP is now mandatory for all PAS 2035 retrofit projects.
- The MTIP is a central component of the PAS 2035:2023 framework, designed to ensure that energy efficiency improvements to homes are strategic, staged, and sustainable over time.
- An MTIP is a structured plan that outlines how a dwelling can be improved in terms of energy efficiency, comfort, and resilience over a medium-term horizon (typically 20–30 years). It is based on the findings of the Whole Dwelling Assessment and is tailored to the specific needs and characteristics of the property.
- It sets out a sequenced pathway of improvements, ensuring that short-term measures do not compromise future upgrades, taking into account the building's age, construction type, condition, and occupancy patterns and incorporates findings from the retrofit risk assessment, ensuring that measures are appropriate and safe.
- The Retrofit Coordinator is responsible for developing the MTIP, using input from the Retrofit Assessor and Designer.
- It must be shared with the homeowner or landlord, ensuring transparency and informed decision-making.

The Airtightness Strategy

"8.2.35: *Where the retrofit design includes any EEMs for the improvement of the building fabric (e.g. insulation, airtightness, replacement windows), the Retrofit*

Designer or Retrofit Coordinator shall develop an airtightness and air leakage testing strategy as part of the retrofit design.

(Note 1- The strategy should consider the impact of EEMs on the airtightness of the building and should:

- *Explain the benefits of air leakage testing and the risks of not doing so.*
- *Include the airtightness target(s) should one be set for the dwelling(s), especially where a whole-house retrofit is undertaken or if required to specify the correct ventilation system (see Annex C).*
- *Recommend any other airtightness or air leakage testing required before, during or after installation of the EEMs."*[3]

An airtightness strategy under PAS 2035 outlines how a building will be made more airtight during retrofit works, while ensuring that ventilation, moisture control, and occupant health are not compromised.

A PAS 2035 airtightness strategy should include the following key components:

1. Airtightness Target Setting
   - Define a quantitative airtightness target, typically expressed as air permeability (e.g., $m^3/hr/m^2$ at 50 Pa).
   - Targets are based on building type, age, and retrofit goals.
2. Whole-Dwelling Assessment

   Conduct a comprehensive assessment of the building's current condition, including:
   - Existing air leakage paths.
   - Ventilation systems.
   - Building fabric and interfaces.
3. Design and Specification

   Integrate airtightness measures into the retrofit design, including:
   - Sealing around windows, doors, service penetrations.
   - Use of airtight membranes and tapes.
   - Detailing at junctions and interfaces.
4. Ventilation Strategy Alignment

   Ensure airtightness improvements are balanced with adequate ventilation:
   - If post-retrofit air permeability is better (i.e. lower) than 5 $m^3/hr/m^2$, continuous mechanical ventilation (e.g., MVHR or MEV) is recommended.
   - For leakier buildings, intermittent or passive ventilation may be acceptable.
5. Air Leakage Testing

   Perform pre and post-retrofit air pressure testing to:

- Validate the effectiveness of airtightness measures.
- Ensure compliance with the set target.

6. Installation Quality Assurance

   - Ensure airtightness measures are installed by qualified professionals.
   - Include on-site inspections and photographic evidence in the retrofit documentation.

7. Monitoring and Handover

   Provide clear documentation of:
   - Airtightness test results.
   - Locations of key airtightness features.
   - Maintenance guidance for occupants.

8. Risk Management

   Identify and mitigate risks such as:
   - Moisture accumulation.
   - Poor indoor air quality.
   - Thermal bridging.

Summary

PAS 2035:2023 puts more emphasis on delivery of larger scale retrofit projects and more weight on the Retrofit Coordinator's (RC) responsibilities around compliance and non-compliance.

A whole-house approach and the importance of maintaining good indoor air quality are cornerstones of high quality, PAS-compliant retrofit projects.

Suppliers should keep this in mind and that lodgement of all the required project documentation is an essential part of compliance.

Suppliers should always check with the RC regarding their own obligations for the provision of documentary and/or photographic evidence needed for lodgement with TrustMark, as this is also a key requirement for unlocking the payment of grants for publicly funded domestic retrofit projects.

Updates have been made to the General Permitted Developments of the Town and Country Planning Act, easing regulations to support the scaling up of heat pump installation, on the road to reaching net zero.

RISE resources

Disclaimer: some content referred to may be about PAS 2035:2019.

Podcast: "PAS for Warm Homes Projects" available here.

Masterclasses: PAS 2035 playlist – available here.

Podcast: "PAS 2035 lessons for Warm Homes with The Specifics Group" available here.

Supply Chain Toolkits: available here.

Podcast: "The value of PAS 2035" available here.

Masterclass: "PAS 2035:2023: What's new?" available here.

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