RISE | Retrofit information, support & expertise

RdSAP10 and PAS 2035:2023

Different approaches to ventilation, and minimising conflict

Supply chain advice pack

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Introduction

RdSAP 10 and PAS 2035 are used in conjunction for the delivery of Warm Homes retrofit projects but their differing perspectives of ventilation can create disparity in outcomes. This advice pack explores the reasons for this and suggests ways to minimize the impact on projects.

This advice pack will cover the differences and similarities of how RdSAP10 and PAS2035:2023 approach ventilation measures, where and why conflicts arise, and how to minimise conflicts between the two specifications.

Overview Comparison → Where and why conflicts arise → How to minimise conflicts

Overview comparison

How RdSAP 10 approaches ventilation

RdSAP 10 treats ventilation as one component in the energy balance. RdSAP 10 has commentary on heat loss and fan energy, however it does not consider whether the dwelling is adequately ventilated.

Key characteristics of what RdSAP10 assesses:

- Feature-based inputs:
  - Chimneys and flues: number and type (open, closed, disused).
  - Extract fans: presence and count in wet rooms.
  - Background vents: trickle vents, wall vents, etc.
  - Openable windows and frame types: in fluence infiltration assumptions.

Source: Boggs Inspection Services

Source: DIY Works

Source: Deposit Photos

Source: Needhams Windows

- Purpose of the data:
  - Infiltration rate and ventilation heat loss are derived from these inputs plus dwelling form and exposure.
  - Fan power consumption is included.
- Nature of the judgement:
  - The assessor records what exists; there is no formal test of "adequate vs inadequate" ventilation.
  - The EPC output software may show options like "add extract fans" where ventilation is relying only on air infiltration, or "seal chimneys", where they are open, but these are energy options, not mandatory safety measures.

A dwelling can score well on energy while still having poor real-world ventilation (e.g. blocked vents, under-performing fans, occupant behaviour) which RdSAP does not fully capture. RdSAP does not require you to upgrade ventilation when you tighten the fabric; it just recalculates the numbers.

> In essence, RdSAP 10 views ventilation as a parameter, not a system to be designed.

How PAS 2035:2023 approaches ventilation

PAS 2035:2023 treats ventilation as a critical risk area that must be actively assessed, designed, and delivered whenever retrofit measures are installed—especially those that increase airtightness.

Core elements:

- Adequacy and risk:
  The Retrofit Assessor must record:
  - Existing ventilation provisions (fans, vents, windows, door undercuts).
  - Evidence of damp, mould, and condensation.
  - Occupant concerns and usage patterns.

The question being asked is: "Is this adequate for the post-retrofit dwelling?"

- Minimum standard for a "complete" system:
  Typically requires:
  - Decentralised mechanical extract ventilation (dMEV) in all wet rooms (kitchen, bathroom, WC, utility) to defined rates.
  - Background ventilators in all habitable rooms sized to calculated requirements.
  - Purge ventilation via openable windows in all habitable rooms .
  - Air transfer (e.g. door undercuts) where needed.

If these are not present or not adequate(e.g. there are signs of mould), the design must include ventilation upgrades as part of the retrofit.

- Link to airtightness and fabric measures:
  - Any measure that significantly reduces uncontrolled air leakage (e.g. EWI, IWI, new windows, sealing and draught-proofing works) triggers a need to review ventilation adequacy.
  - Adjust or upgrade the ventilation system so that IAQ and moisture control are maintained.
  - Airtightness targets and tests, where used, must be compatible with the ventilation strategy.
- Evidence and accountability:
  - The Retrofit Designer specifies the ventilation solution.
  - The Installer delivers it.
  - The Retrofit Coordinator checks that it is installed, working correctly and documented.
  - Ventilation is therefore a designed, commissioned system, not just a background assumption.

For PAS 2035 ventilation is a safety-critical system that must be actively ensured.

Where and why conflicts arise

Because the two frameworks have different purposes, they can pull a project in subtly different directions.

Potential conflict when the EPC says it's fine but PAS says it's inadequate

Scenario:

RdSAP 10 shows existing fans and some trickle vents; the EPC model treats ventilation as "normal".

- PAS 2035 assessment finds:
  - Persistent condensation on windows.
  - Mould in corners.
  - Undersized or poorly performing fans.
- Conflict:
  - From an EPC perspective, the dwelling may look acceptable and even benefit from further air tightening.

- From a PAS 2035 perspective, ventilation is inadequate and must be upgraded before or alongside fabric measures.

- Risk if ignored:
  - Post-retrofit, the dwelling may well become more air-tight, exacerbating damp and mould despite a "better" EPC rating.

Energy optimisation vs health-first design

- RdSAP 10 view:
  - Adding more ventilation (e.g. bigger fans, more background vents) usually increases heat loss and fan energy, slightly worsening the EPC.

- PAS 2035 view:
  - Adequate ventilation is non-negotiable, even if it slightly reduces the modelled energy performance.
- Conflict:
  - Stakeholders focused on EPC scores (e.g. minimum band targets) may resist ventilation upgrades that appear to diminish the rating.
  - PAS 2035 requires you to prioritise occupant health and moisture safety over marginal EPC gains.

Data granularity vs real-world performance

RdSAP 10:

- Counts fans and vents but does not test:
  - Whether fans are correctly ducted, commissioned, or used.
  - Whether vents are blocked or painted shut.

PAS 2035:

- Requires a qualitative and condition-based assessment (signs of damp, mould, occupant feedback).

Conflict:

- A dwelling can look "well ventilated" in RdSAP but fail PAS 2035 adequacy tests.
- If project decisions are made only on EPC outputs, hidden ventilation risks may be missed.

How to minimise conflict in practice

RdSAP 10 and PAS 2035 should be thought of as complementary tools rather than competing authorities.

Use RdSAP 10 as the energy lens, not the safety gate

Principle:

- Let RdSAP 10 tell you how energy and CO_2 change with different ventilation options.
- Let PAS 2035 decide what level of ventilation is non-negotiable for health and moisture.

Practical steps:

- Model both states in RdSAP:
  - Existing ventilation.
  - Upgraded, PAS-compliant ventilation (extra fans, background vents).
- Accept that the PAS-compliant scenario is the baseline for real-world design, even if the EPC is slightly worse.

Align data collection between the two processes

Principle:

- Avoid doing a "thin" EPC survey and a separate, richer PAS 2035 survey that contradict each other.

Practical steps:

- When collecting RdSAP 10 data:
  - Also note visible damp/mould, blocked vents, noisy or non-functional fans, and occupant comments.
  - Record **door undercuts** and any obvious air transfer issues.
- Use this richer picture to:
  - Inform the PAS 2035 assessment.
  - Avoid over-optimistic assumptions about ventilation in the EPC model (e.g. don't record a fan as "present and working" if it clearly isn't).

Make ventilation a standard measure in fabric-improving projects

Principle:

- Treat ventilation upgrades as part of the package, not an optional extra. (N.B. PAS 2035;2023 requires that an airtightness strategy is produced by the Retrofit Designer or Retrofit Coordinator)

Practical steps:
For any project involving; new windows, external wall insulation/internal wall insulation and significant air sealing.

Build in:

- dMEV in all wet rooms as standard.
- Background vents in habitable rooms where missing or undersized.

Then:

Model that configuration in RdSAP 10 as the "with measures" scenario. This avoids a situation where the EPC assumes a more air-tight fabric but unchanged ventilation, while PAS 2035 demands upgrades.

Communicate trade-offs clearly to decision-makers

Principle:
Most conflict is not technical—it's about expectations and priorities.

Practical steps:
Present side-by-side outputs:

1. Scenario A: Fabric measures only, minimal ventilation upgrades (EPC-optimised, but non-compliant with PAS).
2. Scenario B: Fabric + PAS-compliant ventilation (slightly lower EPC, but safe and compliant).

Explain:

- Why Scenario B is the only acceptable route under PAS 2035.
- How the small EPC difference buys reduced risk of damp, mould, complaints, and liability.

Document assumptions and decisions

Principle:
Transparency reduces future disputes.

Practical steps:
In the retrofit plan and EPC notes, record:

- The ventilation assumptions used in RdSAP 10.
- The PAS 2035 ventilation strategy (fans, vents, door undercuts, airtightness considerations).

- If the RdSAP model cannot fully reflect the designed system (e.g. specific fan types or controls), note it explicitly so others understand the gap.

A simple mental model to keep you aligned

RdSAP 10 asks: "Given this set of features, what is the dwelling's energy performance?"

Whilst,

PAS 2035:2023 asks: "Given this retrofit, what must we do to keep the dwelling safe, healthy, and durable?"

So to minimise conflict:

1. Let PAS 2035 set the minimum ventilation standard.
2. Use RdSAP 10 to quantify the energy impact of meeting that standard.
3. Design, specify, and model as if the PAS-compliant ventilation is part of the core measure set, not an optional extra.

Resources

Podcast: All RISE podcasts are available here.

Podcast: "Indoor air quality and retrofit with the University of York" available here.

Masterclass: All RISE masterclasses are available here.

Masterclass "Navigating RdSAP 10" available here.

Advice pack: All RISE advice packs available here.

Advice pack: "RdSAP Changes for the Supply Chain (RdSAP v.10)" available here).

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