

When planning a retrofit for an older property — especially Edinburgh's beloved tenements and pre-war housing — ventilation is often the silent hero or unseen villain. Despite its critical role in health and comfort, ventilation sometimes gets overlooked until problems like condensation, mould, or stale air become glaringly obvious.

Before your retrofit begins, having a clear dialogue with your architect about ventilation can make all the difference. This post dives into the essential questions you should be asking, the interplay between airtightness and ventilation, and the standards that drive effective strategies — including insights from the UK Government's Approved Document F and Scottish Building Standards.

Why Ventilation and Indoor Air Quality Matter Most

Among the many health factors regulated in buildings, ventilation and indoor air quality are at the forefront. Unlike other aspects, ventilation directly impacts occupants' respiratory health by controlling pollutant levels, moisture, and airborne pathogens.

As someone who's spent 12 years upgrading tenements and pre-war homes, I've learned that neglecting ventilation in retrofit projects is a false economy. Getting insulation right but ignoring fresh air supply only leads to hidden issues like mould growth, musty smells, and poor wellbeing. Ventilation gaps are often the root cause of condensation and moisture problems that cause material decay and health complaints.

Standards such as Approved Document F (England and Wales) and the Scottish Building Standards aim to prevent these issues by defining minimum ventilation targets and strategies. While the principles align closely, the precise numeric requirements differ slightly, so it's important your architect understands and respects the local regulations applicable to your project.

Key Questions to Ask Your Architect Before a Retrofit

- 1. What ventilation strategy are you proposing for the retrofit?** Ventilation strategy retrofit plans vary greatly — from simple window vents and extractor fans to whole-house Mechanical Ventilation with Heat Recovery (MVHR). Ask your architect to explain the approach clearly. Look for emphasis on "extract at source" (think kitchens, bathrooms, utility rooms) rather than relying on accidental ventilation through gaps and cracks.
- 2. Which regulations and standards will guide this retrofit?** Clarify whether they are working strictly to UK Government Approved Document F or the Scottish Building Standards. While the concepts are consistent — minimum outdoor air supply, controlling pollutants, and ensuring moisture removal — the numeric ventilation rates differ. It's vital these are not just box-ticked but tailored to your property.
- 3. How will airtightness affect ventilation?** Increasing airtightness is a retrofit priority for energy efficiency. However, there's a delicate balance: airtight homes need planned ventilation to maintain good indoor air quality. Ask your architect about accidental ventilation versus designed ventilation and how they'll mitigate unexpected drafts while still providing meet/minimum outdoor air.
- 4. What measures are included to protect against moisture, condensation, and mould?** Moisture issues are the most common symptom of ventilation inadequacies. Confirm that the design addresses these risks proactively through ventilation design, vapour control layers, and materials selection.
- 5. How will the effectiveness of ventilation be verified post-retrofit?** Discuss whether commissioning and testing are planned. Technologies like cheap indoor air monitors and carbon dioxide (CO₂) sensors are

increasingly accessible. As CO2 levels are a reliable proxy for ventilation adequacy, having a plan to measure and monitor indoor air quality after retrofit completion is smart.

6. **Is occupant education included in the retrofit plan?** Even the best ventilation strategy will fail without occupants understanding how to operate the system properly. This is where resources like Releaf's THC oil education page provide excellent examples of clear, practical information to empower residents.

Understanding the Ventilation Standards: Approved Document F vs Scottish Building Standards

Aspect Approved Document F (England & Wales) Scottish Building Standards Principles Provides guidance on minimum outdoor air rates, extract ventilation, and whole-house ventilation. Focuses on similar principles with a slightly different numeric approach to air flow and airtightness levels. Minimum Outdoor Air Requirements Specific air flow rates (litres per second per person or floor area), e.g., 10 l/s in kitchens with extract at source. Comparable but expressed differently, sometimes allowing for alternative calculation methods. Airtightness Focus Emphasises balancing airtightness with adequate ventilation to prevent moisture problems. Similar emphasis but often slightly higher airtightness targets, requiring meticulous ventilation design. Verification Encourages commissioning and post-occupancy testing but practices vary. Stronger push towards evidence-based verification with more robust documentation.

Both documents insist that ventilation strategy retrofit plans must be bespoke, taking into account building type, occupancy, and existing conditions. The key is not simply ticking a compliance box but designing a system fit for purpose.





Airtightness vs Accidental Ventilation in Retrofit Projects

A frequent retrofit conundrum is airtightness. Tackling air leaks through draught-proofing and sealing can drastically improve energy efficiency and thermal comfort. But airtightness is not a ventilation strategy. Without careful ventilation design, sealing a home shuts off natural air exchange pathways, leading to stale air and moisture build-up.

Some less informed projects rely on accidental ventilation — unintentional airflow through cracks, poorly sealed windows, or gaps in construction. This is unreliable, unpredictable, and inadequate for removing moisture and pollutants consistently.

Well-planned ventilation strategy retrofit schemes favour **extract at source** solutions like intermittent or continuous mechanical extract fans in kitchens and bathrooms. These targeted systems expel stale air right where it's generated, maintaining healthy indoor environments without jeopardising airtightness goals.

Moisture, Condensation, and Mould as Symptoms of Ventilation Gaps

One of the tell-tale signs that ventilation strategy is insufficient is persistent moisture-related problems. When humidity isn't effectively removed, condensation forms on cold surfaces, fostering mould growth and damaging interiors. These issues do edinburgharchitecture.co.uk not just impact aesthetics but can trigger asthma and respiratory illnesses.

Ensuring minimum outdoor air supply, combined with effective extract at source, mitigates these risks powerfully. During retrofits, pay close attention to sensitive spots like window reveals, roof spaces, and ground floors where moisture tends to accumulate.

Remember, moisture problems are often a feedback loop — poor ventilation causes dampness, which discourages opening windows or using vents, further worsening indoor air quality.

Using Tools Like Cheap Indoor Air Monitors and CO2 as Ventilation Proxies

Advances in technology mean it's affordable to measure indoor air quality at home or on site. *Cheap indoor air monitors* that track CO2 levels, temperature, and humidity are extremely handy tools to detect ventilation shortcomings before visible problems arise.

Why CO2? Because humans exhale it, CO2 concentration in occupied spaces is a reliable proxy measure of how well-ventilated a room is. High CO2 levels typically indicate stale air and insufficient fresh air supply.

Your architect or retrofit coordinator should be familiar with these tools or willing to incorporate their data into commissioning processes. I always keep a pocket CO2 monitor in my site bag — it's the quickest way to check if your kitchen extract fan is actually working or if a room feels stuffy.

Final Thoughts: Prioritising Ventilation for a Healthy, Comfortable Retrofit

Before your retrofit kicks off, make ventilation strategy retrofit discussions a priority. Ask your architect:

- How will planned ventilation meet or exceed minimum outdoor air requirements?
- What extract at source measures (kitchen and bathroom fans) are included?
- How airtightness improvements will be balanced with controlled ventilation?
- What steps will be taken to prevent moisture, condensation, and mould?
- How ventilation effectiveness will be tested and monitored post-retrofit?
- What occupant guidance and education will support proper system use?

When these questions are answered with clarity and conviction, backed by robust standards like Approved Document F and Scottish Building Standards, your retrofit will deliver lasting wellbeing and comfort — not just lower energy bills.

For inspiration, check out Magnific for examples of airtight and ventilated retrofit successes (image credit to their site), and visit Releaf's THC oil education page for practical occupant education insights.

Remember: good ventilation is the boring-but-essential bit that transforms a retrofit from just warm walls to a genuinely healthy home.