

FirePro to replace aged-pressurised gas suppression systems.

1. Ageing pressurised cylinders & Enclosure Integrity

1.1 Ageing Cylinders and Pressure Vessels

- Cylinders require **periodic hydrostatic testing** (typically every 10 years).
- Older cylinders often **fail test**, making them non-compliant and requiring full replacement.
- Manufacturers discontinue older models, making **spares unavailable**.
- Transporting and testing high-pressure vessels is increasingly regulated and costly.

1.2 Pipework Integrity Degradation

- Gas systems rely on **leak-tight pipe networks** designed for specific flow rates.
- Over time, corrosion, joint fatigue, or building alterations cause:
 - Flow imbalance
 - Pressure loss
 - Non-compliance with design standards
- Re-engineering pipework is often **more expensive than replacing the system entirely**.

1.3 Refill and Recharge Costs

- FM-200 and CO₂ require **specialist refill facilities**.
- FM-200 (HFC-227ea) is now subject to **F-Gas phase-down**, making refills:
 - Scarce
 - Increasingly expensive
- CO₂ refills require hazardous-materials transport and are increasingly regulated.

1.4 Environmental and Regulatory Pressure

- FM-200 has a **high Global Warming Potential (GWP ≈ 3,220)** and is being phased out.
- Many insurers and authorities now discourage CO₂ due to **life-safety risks**.
- Replacement parts for older systems are discontinued as manufacturers shift to new technologies.

1.5 System Reliability Declines Over Time

- Pressure loss in cylinders
- Valve failures



- Actuator degradation
 - Obsolete detection/control interfaces
 - Increasing false discharges due to ageing components
- All of these drive-up maintenance costs and reduce system reliability.

Why enclosure seal integrity matters

In simple terms: pressurised gas systems only work properly if the room can hold the gas long enough to put the fire out. If the enclosure is leaky, the gas escapes, the concentration drops, and the system can't do its job.

A door fan test is a 'moment in time'. No different to a Government MOT test on a vehicle. It means that at the time of testing everything was verified as compliant. What it doesn't mean is that the enclosure will remain compliant for the next 364 days until the next test is undertaken.

1. Pressurised gas systems need a specific concentration to extinguish a fire

FM-200, CO₂, and similar systems work by **filling the room with a calculated amount of gas**. If the room leaks, the gas escapes and the concentration falls below the level needed to stop combustion.

Think of it like trying to fill a bathtub with the plug out — it never reaches the level you need.

2. Leaks let the gas escape too quickly

Every protected room has small gaps:

- under doors
- around cable penetrations
- ductwork
- wall joints
- ceiling voids

If these aren't sealed properly, the gas flows straight out, especially because it is discharged at high pressure.

3. The system is designed assuming the room can "hold" the gas

Applicable BS/EN Standards require a minimum hold time, usually 10 minutes. This gives the fire time to cool and prevents re-ignition.

If the room can't hold the gas for that long, the fire can restart even if the initial discharge knocked it down.

4. Poor room integrity makes the system unsafe and non-compliant

If the enclosure fails a room integrity test (door fan test), the system is considered **non-compliant** because it cannot guarantee protection.

This leads to:



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- failed inspections
- increased maintenance costs
- potential insurance issues
- risk of system failure during a real fire
- Repeat making good to retest and achieve 'pass' status

5. Leaks increase the risk of accidental gas migration

Escaping gas can move into adjacent areas, which is especially dangerous with CO₂ because it can displace oxygen in occupied spaces.

6. Maintaining seal integrity becomes harder over time

Buildings change:

- new cables are installed
- contractors drill holes
- doors warp
- ducts are added or modified
- Building structures move over time

Every change introduces new leakage paths, meaning **constant maintenance** is required to keep the system compliant.

Why this problem doesn't exist with FirePro

FirePro condensed aerosol does not rely on room pressurisation or gas concentration. It works by chemically interrupting combustion, not by flooding the room with a gas volume.

So FirePro:

- Has far greater tolerance to poor enclosure seal.
- does **not** need room integrity tests
- is unaffected by building leakage
- Does not require over pressure venting

This is one of the major reasons FirePro is ideal for retrofit, older buildings, and rooms where maintaining airtightness is impractical.

2. Why FirePro Is a Superior Replacement Option

2.1 No Pressurised Cylinders



- FirePro generators are **solid-state**, all electrical, non-pressurised units.
- No hydrostatic testing, no pressure loss, no cylinder replacement.
- Eliminates the single biggest lifecycle cost of gas systems.

2.2 No Pipework or Nozzles

- FirePro is **modular** and installed directly in the risk area.
- No pipework to leak, corrode, or re-engineer.
- Ideal for retrofit projects where pipework replacement is impractical.
- Will liberate expensive real estate footprint required to house pressurised cylinders

2.3 Minimal Maintenance

- Only **annual inspection** and maintenance routines are required.
- No weighing of cylinders, no pressure checks, no flow calculations.
- Service costs are typically >50–60% lower than gas systems over the lifecycle.
- Does not require F-Gas certified personnel

2.4 Long Service Life

- Comes with 3-year supply warrantee and 15-year certified lifecycle
- No refills, no recharging, no consumables.

2.5 Environmentally Superior

- Negligable ODP / GWP
- No PFAS, CFC's
- No greenhouse gas emissions
- This removes the regulatory and cost pressures associated with FM-200.

2.6 Safer Than CO₂

- Non-toxic at design concentrations
- BS/EN 15276 lays out all required measures for safe system operation
- Optional hold off, abort and door interlock options

2.7 Lower Installation Costs

- No cylinders



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- No manifold
- No pipework
- No floor loading issues
- No structural reinforcement
- Simple electrical activation via control panel (e.g., Kentec Sigma XT)

3. Summary: Why Replacement Makes Commercial and Technical Sense

Issue	Pressurised Gas Systems (FM-200 / CO ₂)	FirePro Condensed Aerosol
Lifecycle Cost	High – cylinders, refills, hydrostatic testing	Very low – no pressure vessels
Regulatory Risk	Increasing (F-Gas, CO ₂ safety)	Zero GWP, fully compliant
Maintenance	Complex, expensive	Minimal
System Integrity	Dependent on pipework and pressure	Solid-state, no pressure
Refill Availability	Declining, costly	Not required
Retrofit Feasibility	Often difficult or impossible	Simple, modular
Safety	CO ₂ hazardous to personnel	BS/EN 15276 lays out all required measures for safe system operation

In short: gas systems become expensive to maintain because they rely on ageing pressure vessels, regulated gases, and complex pipework. FirePro eliminates all of these failure points and provides a cleaner, safer, lower-cost, long-life alternative.



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