



The risks of low-cost smoke control solutions

Achieving financial savings on fire-engineered smoke control solutions by using non-compliant products



Routes to compliance with Building Regulations



Approved Documents

- Principally ADB
- Performance requirements and applicable standards well defined:
 - E.g. 1.0m² A.O.V. tested to EN12101-2



Fire Engineering

Bespoke design for project based on various reference documents, e.g. BS9999, and open to interpretation.

CFD Modelling

Often deemed the “be all and end all” of design, CFD Design can lead to insufficient attention being paid to product and installation standards.



Legal Requirements

Construction Products Regulation in Great Britain

Products must be independently tested to a harmonized standard and supplied with a declaration of performance.

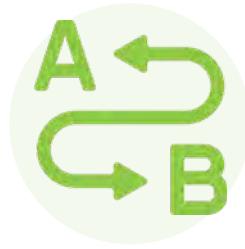


Mechanical Smoke Shafts



Familiar Solution

Most commonly employed fire engineered solution.



Common Uses

Used to justify extended travel distances in higher risk residential buildings.



Benefits

Less space required compared to BRE natural smoke shaft or pressurization system.

Mechanical Smoke Shafts: Common Non-Compliances



Lack of approval

Until they are included in ADB, the *SCA guide to smoke control in residential buildings* and *BS9999* are the most appropriate guidance documents.



Buyer Knowledge

Vendors routinely take advantage of buyers' lack of knowledge or experience to offer sub-standard solutions.



Grey areas

The SCA recently produced a paper on the common grey areas and the implications of not complying with legal requirements.

Cost savings for cheating

- ➡ Vendors will offer **cheaper solutions that do not follow best practice** either for commercial gain or through ignorance or incompetence.
- ➡ **Buyers may not have the technical knowledge** to spot these cheats and take the saving on the word of the vendor that everything is compliant.
- ➡ This was a common theme throughout the **Grenfell Inquiry evidence**.

How much will you save by compromising on compliance?

The **average cost** for the supply and installation of a mechanical smoke shaft system using certified products **for a 10-storey building is in the region of £110,000.00.**

An example of the cost difference between compliant and non-compliant products for the common grey areas is outlined in the next slides, together with recommended actions to reduce risk.



Smoke Shaft Ventilators

The current version of the SCA Guide to smoke control in apartment buildings specifies that products should be multi-zone smoke control dampers CE marked to BS EN 12101 Part 8.



Cost difference to the project: **£6,150.00**

Bottom line

The cost difference between a certified BS EN 12101:8 multi-zone smoke damper and an ad-hoc uncertified actuated fire door can be as much as £615.00.

The cost difference to the project would be in the region of £6,150.00.

Recommended Buyer Action

Obtain a Declaration of Performance to BS EN 12101-8.

Natural Ventilators



Cost difference: **£570.00 per window**

Bottom line

The cost-saving for using an untested window and actuator combination over a certified ventilator would be around £600.00.

Recommended Buyer Action

Obtain a declaration of performance to BS EN 12101:2.

Control Panels



A fire alarm control panel being used as the main control panel in a mechanical smoke control system



An antiquated non-compliant fireman's override switch

Cost difference to the project: **£2,930.00**

Bottom line

The installed cost difference for a certified BE EN12101:10 certified product over an untested unit is around £300.

Recommended Buyer Action

Obtain a declaration of performance to BS EN 12101:10 from your supplier.

Smoke extract fans with inverter control



Bottom line

For a typical system, the installed cost difference for a certified product would be around £1,230.00.

Recommended Buyer Action

If the proposed system uses inverters to control fans, obtain written confirmation that the fan and inverter combination has been tested together to BS EN 12101:3.

Cost difference to the project: **£1,230.00**

Electrical Wiring

Cables should comply with the following categories for fire survival in accordance with BS 8519 as appropriate for different applications:

- Category 1 (PH30/F30 minute survival time) – activation and monitoring only
- Category 2 (PH60/F60 minute survival time) – Means of escape systems
- Category 3 (PH120 + Annex B/F120 minute survival time) – Firefighting systems

Incorrect cable classifications can be a source of cost-cutting and the installed variation between category 1 and 2 is around £3/m and for category 2 and 3 as much as £5/m.

Cost difference to the project: **£3,090.00**

Bottom line

Cost variation for using the wrong cable classification could easily be in excess of £3,000.

Recommended Buyer Action

Obtain written confirmation that cable categories are in accordance with BS8519 and thoroughly check technical submissions.

Power Distribution



Certified ATS with a bypass facility : **£1,890.00**

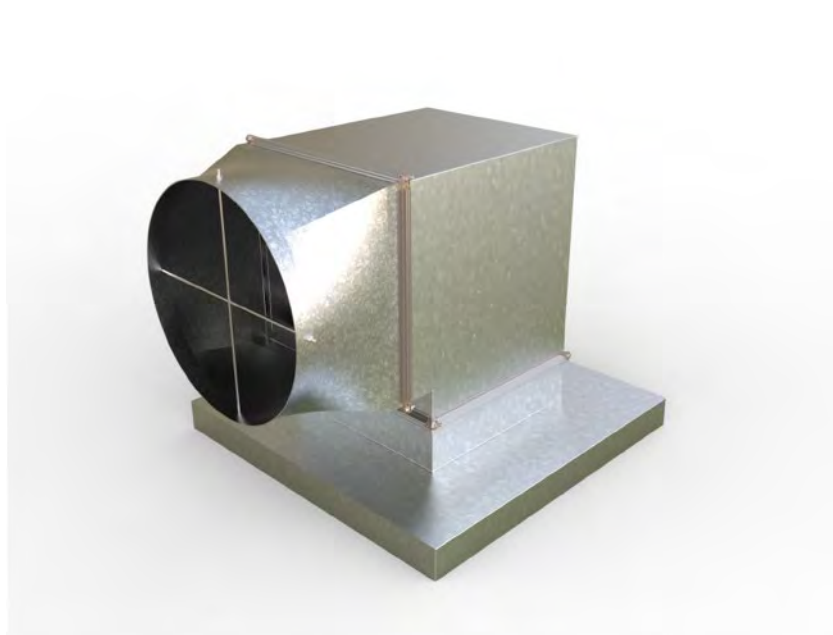
Bottom line

The use of non-tested ATS units is very common and the incorporation of a maintenance bypass is quite rare. The total cost premium for a certified ATS unit with a bypass facility is in the region of £2,000.00.

Recommended Buyer Action

Obtain a declaration of performance to BS EN 60947-6 and written confirmation that the ATS incorporates a maintenance bypass arrangement.

Ductwork



Bottom line

Unclassified ductwork is often used for external sections as a cost-saving measure typically reducing the cost by £2,000.

Recommended Buyer Action

Obtain declaration of performance to BS EN 12101:7.

Cost difference to the project: **£1,980.00**

Professional Indemnity Insurance

Following the Grenfell tower tragedy, contractors have been hit by spiralling PI insurance costs. More than 70% of contractors said their PI insurance costs increased by at least 20%, and 22% said that the cost had more than doubled.

It has also been exposed that some insurers have included fire safety exclusions. Here is a typical example of the most onerous of these exclusions revealed in an article featured by the Howden Group.

“This policy shall not indemnify the insured for any claim, circumstance, loss, liability, cost, expense or defence costs, or part thereof, arising in respect of or in any way related to or in connection with the fire safety of any building.”

There is evidence that some contractors within the fire industry are taking out PI insurance policies containing such clauses to reduce costs which would effectively render them useless.

Bottom line

The cost of correct PI insurance can be as much as **five times** that of cover with fire safety exclusions.

Recommended Buyer Action

To mitigate these risks, always check the policy wording and certificate of insurance from the vendor company, to ensure they meet the policy requirements.

The Regulatory Reform

Smoke Control Maintenance

The Regulatory Reform (Fire Safety) Order 2005 (RRO) states that a **building's "responsible person"** (generally a building owner, manager or FM) **must ensure proper operational service and maintenance of smoke control systems**. This is achieved by regular testing.

Recommended Buyer Action

Use Eyeball remote monitoring and testing software.



Summary

Based on the figures in this presentation, the potential maximum gross cost saving to the client for utilising non-compliant products is likely to be less than 0.003% or £30,000 on a £10m build cost, not taking into account the cost of tendering and the additional fees associated with the late design work.

Specifiers and buyers have a responsibility to assess the suitability of proposals from vendors to reduce the occupant risks and stop exposing businesses to financial penalties. **Ultimately, the risk remains with the purchaser and relying on the vendor saying a product is compliant will not be a defence in court.**

Gross cost saving : **less than 0.003% or £30,000** on a £10m build cost

Recommended Buyer Actions:



Always ask for a Declaration of Performance for all products supplied



Always assess the competence of vendors and insist on third party certification as a minimum

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