Buyer's Guide: Fire Doors, Fire Dampers, and Smoke Curtains

1. Overview

Passive fire protection systems such as fire doors, fire dampers, and smoke curtains are critical in preventing the spread of fire, heat, and smoke within a building. Unlike active systems (sprinklers, alarms), they form barriers that contain the fire and enable safe evacuation.

These components are often required by building codes, fire regulations, and insurance standards, making proper selection, installation, and maintenance essential for compliance and safety.

2. Fire Doors

Purpose

Fire doors are specially constructed doors designed to resist the spread of fire and smoke between compartments for a specified time (e.g., FD30, FD60, FD90, FD120 minutes).

Key Buyer Questions

1. What fire rating (FD30, FD60, etc.) is required by local regulations?
2. Are the doors certified and tested to recognized standards (e.g., BS 476, EN 1634, UL 10C)?
3. Are they single or double-leaf doors?
4. Do they need glazing, vision panels, or acoustic performance?
5. Are self-closing mechanisms and intumescent seals included?
6. Are frames, hardware, and hinges fire-rated and compatible?
7. What is the required aesthetic or finish (painted steel, veneer, laminate)?

8. Is access control or electronic locking integration needed?
9. What maintenance requirements exist under law (e.g., 6-month inspections)?

Benefits	Negatives / Challenges
Compartmentalizes fire and smoke	Can be heavy and costly compared to standard doors
Protects evacuation routes (corridors, stairwells)	Require regular inspection and testing
Increases time for evacuation and fire response	Incorrect installation or tampering (e.g., wedging open) nullifies certification
Reduces property and asset loss	Limited design flexibility compared to non-fire-rated doors
Enhances compliance with building safety codes	

Compliance & Standards to be aware of

- BS 476 Part 22 – Fire resistance of elements
- BS EN 1634-1 – Fire resistance and smoke control tests
- BS 8214 – Installation of timber-based fire doors
- NFPA 80 (US) – Fire Doors and Other Opening Protectives
- Building Regulations (Approved Document B – UK)
- Third-party certification

Best Practices

- Always install with certified frames and hardware.
- Ensure intumescent strips and smoke seals are intact.
- Use fire-rated ironmongery only.
- Inspect doors every 6 months (more in high-traffic areas).

- Never wedge or prop fire doors open (use hold-open devices linked to alarm system).

3. Fire Dampers

Purpose

Fire dampers are installed in HVAC ductwork where it passes through fire-rated barriers. They automatically close to prevent fire and smoke from traveling through ducts.

Key Buyer Questions

1. What fire rating is required (typically 60–120 minutes)?
2. Are dampers tested to BS EN 1366-2 or UL 555 standards?
3. Do they require manual, fusible link, or motorized activation?
4. Are they rectangular, circular, or multi-blade type?
5. Will they be part of a smoke control system (requiring dual fire/smoke damper)?
6. Are access panels provided for maintenance and inspection?
7. Is automatic reset or remote indication needed?
8. Are installation clearances and supports compatible with duct design?

Benefits	Negatives / Challenges
Prevents fire/smoke spread through ventilation systems	Can be difficult to access for testing or maintenance
Protects escape routes and critical spaces	Improper installation can compromise fire compartment integrity
Can integrate with fire alarm/BMS systems	May restrict airflow if not properly designed
Essential for building code compliance	Requires regular inspection and testing (often annually)

Compliance & Standards to be aware of

- BS EN 1366-2 – Fire resistance tests for dampers
- BS EN 15650 – Requirements for fire dampers
- UL 555 – Standard for fire dampers (US)
- BS 9999 / Approved Document B (UK) – Fire safety in building design
- HVCA DW/145 – Installation and maintenance guidance

Best Practices

- Always install in accordance with manufacturer's tested configuration.
- Maintain clear access panels for testing.
- Link motorized dampers to fire alarm control panels.
- Perform annual functional tests and log results.
- Use fire-rated sealants and collars around penetrations.

4. Smoke Curtains

Purpose

Smoke curtains are flexible barriers (usually fiberglass or Kevlar-based) that deploy automatically to control smoke movement during a fire. They can channel smoke towards extraction points or compartmentalize open spaces like atriums or lobbies.

Key Buyer Questions

1. Is the curtain intended for smoke control, compartmentation, or egress protection?
2. What temperature resistance and duration are required (e.g., 600°C for 120 min)?
3. Are the curtains gravity fail-safe (deploy on power loss)?
4. Are they tested to BS EN 12101-1 or UL 10D standards?
5. Do they require local or centralized control?
6. Is integration with fire alarm or smoke detection systems needed?
7. What are the aesthetic and retraction requirements (hidden headboxes, ceiling-mounted)?
8. What maintenance access is available for periodic testing?

Benefits	Negatives / Challenges
Controls smoke movement, improving visibility and breathing conditions	Requires periodic testing and servicing (motors, control panels)
Enables safe evacuation and firefighting access	Power dependency — must fail-safe on power loss
Allows open-plan architectural designs while maintaining compliance	Can be **damaged** if not properly protected in public areas
Compact and unobtrusive when retracted	Costs may be higher than static barriers

Compliance & Standards to be aware of

- BS EN 12101-1 – Smoke and heat control systems: smoke barriers
- BS 7346-4 – Design, installation, and maintenance
- UL 10D / NFPA 105 – Smoke door assemblies and curtains (US)
- Approved Document B / BS 9999 – Building fire safety

Best Practices

- Ensure **fail-safe operation** (gravity deploy on power failure).
- Integrate with **fire alarm and smoke detection** for automatic operation.
- Test quarterly for deployment reliability.
- Ensure curtain overlap and side guides meet tested configurations.
- Train staff on **manual override procedures**.

5. Comparative Summary

Feature	Fire Doors	Fire Dampers	Smoke Curtains
Primary Function	Compartmentalize fire/smoke	Block fire/smoke in ducts	Control/contain smoke movement
Location	Walls, corridors, stairwells	HVAC duct penetrations	Atriums, open spaces, lobbies
Fire Rating	30–120 minutes	60–120 minutes	60–120 minutes (smoke-rated)
Activation	Manual/automatic closer	Fusible/motorized	Automatic (linked to alarm)
Testing Standard	BS 476 / EN 1634	EN 1366-2 / UL 555	EN 12101-1 / UL 10D
Maintenance	6-monthly	Annually	Quarterly
Integration	Access control, alarm	Fire alarm, BMS	Fire alarm, BMS

6. Final Recommendations

Always specify products with third-party certification.
Ensure design compatibility between all passive and active systems.

Keep an up-to-date Fire Strategy Plan showing all barriers and ratings.

Schedule routine inspection, testing, and documentation to maintain compliance.

Choose suppliers who provide installation, commissioning, and maintenance support.