FIRE-RATED VENTILATION DUCTS

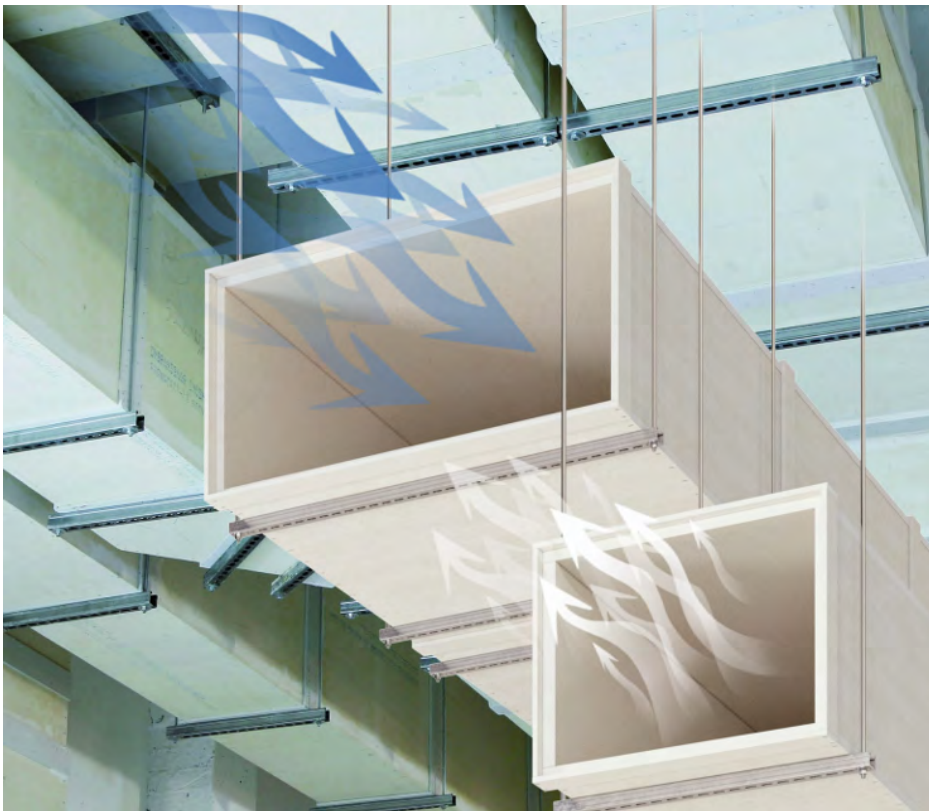
In large buildings such as office towers, hospitals, shopping centres, and airports, the complexity of mechanical systems increases significantly. Among these systems, ventilation ducts play a crucial role in maintaining indoor air quality and thermal comfort. However, in the event of a fire, these same ducts can become dangerous conduits for smoke and flames—unless they are properly protected. This is where fire-rated ventilation ducts become essential.

Fire-rated ventilation ducts are specially designed and tested to resist the passage of fire and smoke for a specified duration, typically 30 to 120 minutes. They are constructed using fire-resistant materials and are often insulated to maintain their integrity under extreme temperatures.

To prevent fire from spreading from one fire compartment to another part of the building - along stairways, rooms and general access corridors - all building materials and structural elements need to share a common fire classification and fire resistance rating. To avoid the spread of fire via the HVAC system, this also needs to be fire-rated.

Compartment walls and floors must have a fire resistance, which means that the performance criteria of load-bearing capacity (stability), integrity and insulation have been met for a duration of 30 to 240 minutes. It is therefore extremely important that, where compartmentation boundaries are penetrated by a ventilation channel, the fire separation criteria for the penetrated elements are maintained. To avoid that the HVAC ducting channel become a conduit along which fires or hot smoke can spread to other areas, it needs to be fire-rated.

The fire performance of a duct which penetrates a fire resisting element requires a careful specification. Metal sheet ducts fail to meet internationally accepted fire protection requirements. They heat up and deform



rapidly due to the effects of fire. They can even accelerate the spread of flame and smoke. The PROMADUCT® system comes with more than 200 classification reports and has been submitted to hundreds of fire tests that prove its performance. Whatever the floorplan of your building, you can fit in a PROMADUCT® ductwork that will ensure maintenance free ventilation and a fire safe protection of the building and its users.

European fire safety regulations consistently require the containment of fire and smoke between compartments to ensure building safety. In most cases, this is achieved through the use of certified fire dampers, which are widely accepted as the standard solution across countries.

However, there are opportunities—depending on the national and project context—to use fire-rated ducting systems in combination or independently, which can simplify the installation and improve long-term system performance.

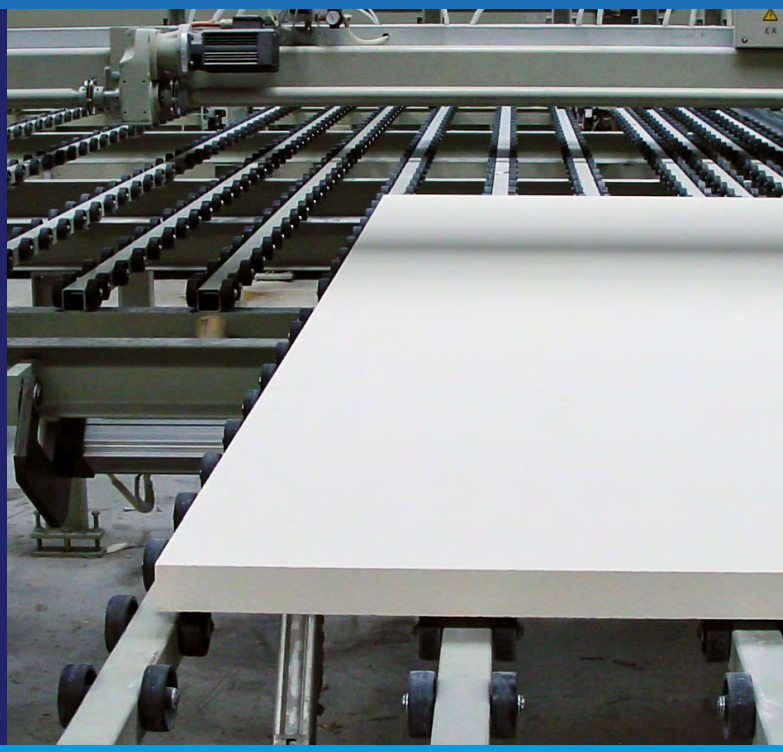
When it comes to smoke control, requirements vary more significantly. Not all European regulations mandate smoke extraction systems in every building type. In countries where smoke management is critical, prescriptive solutions are sometimes supplemented or replaced by performance-based designs that allow greater flexibility—especially in large or complex buildings.

At Promat, we actively work across many European markets and fully understand local regulations. Our experts can guide you in choosing the right ducting approach—whether you're aiming to optimize your fire damper layout, explore the use of fire-rated ductwork, or assess the best way to achieve compliant smoke control, including performance-based alternatives.

Talk to your local Promat expert to find the most efficient and compliant solution for your project.

Why choose for a PROMADUCT solution?

- → 30% less embodied carbon compared to standard steel duct solutions
- → Healthy indoor air with certified low emission boards
- → Energy saving, by using less dampers or combining smoke and ventillation ductworks
- → Saving space with efficient and compliant certified solutions
- → Long service life, with project proven durability over 25 years.



Promat products used for fire-rated ventilation:

PROMATECT®-LT, **PROMATECT®-L500**, **PROMATECT®-H**, **PROMACOL®-S**, **Promat-Kleber® K84**

WHY ARE FIRE-RATED VENTILATION DUCTS CRITICAL IN LARGE BUILDINGS?

1. Preventing fire and smoke spread

Ventilation systems connect multiple compartments and floors. Without fire-rated ducts, these systems can allow fire and smoke to spread rapidly, endangering lives and property. Fire-rated ducts contain the fire, helping to maintain compartmentation and slow the spread.

2. Protecting escape routes

In large buildings, safe evacuation depends on clear, smoke-free corridors and stairwells. Fire-rated ducts help ensure that smoke does not infiltrate these critical areas, allowing a safe escape for occupants.

3. Maintaining functionality of life-safety systems

Systems such as smoke extraction, pressurization, emergency ventilation, and fire detection or suppression rely on both ducts and electrical cabling that must remain operational during a fire. Fire-rated ductwork and protective enclosures ensure these systems continue to function and prevent fire spread, supporting life safety and regulatory compliance.

4. Regulatory compliance

Building codes and fire safety regulations in most jurisdictions require the use of fire-rated ducts in specific applications. Compliance ensures not only safety but also legal and insurance protection for building owners and operators.

5. Minimizing damage and downtime

By containing fire and smoke, fire-rated ducts help limit structural damage, reduce cleanup costs, and shorten recovery time after an incident, especially important in commercial and public buildings.

Applications

- High-rise offices and residentials
- Stairwell and lift shaft pressurization
- Laboratories and Industrial ventilation
- Hospital operating room ventilation