

PermaShield Pipe FM Approval

FM Approval Guide - Air Handling, System Components



Duct Systems - Commercial (Class Number 4922)

Experience has shown that duct materials may transmit fire from one area to another, even when they have obtained relatively low flame spread ratings from other test methods. Fire spread within a duct system is dependent upon the relative combustibility of the basic duct or lining, the diameter or cross-section of the main header and branch lines, the air flow and its structural integrity. Fire spread may be limited by resistance to ignition or by using some form of interruptor or damper to prevent flame propagation. Ducts that incorporate interruptors or dampers in their design or do not maintain their structural integrity in fire situations are not suitable for use as a smoke exhaust duct.

FM Approved ducts are designed for general use in exhausting noncombustible chemical fumes and corrosive vapors and/or exhausting smoke in fire situations without the need for automatic sprinkler protection where permitted using applicable FM Global Property Loss Prevention Data Sheets.

General Restrictions and Limitations: All FM Approved ducts have the following restrictions and limitations unless shown otherwise in the individual company listing.

1. The product(s) must be manufactured with the identical resin(s), formulation(s) and construction details on file.
2. All products shall meet all physical requirements of the current SMACNA Manuals Industrial Duct Construction Standards, and/or NBS Voluntary Product Standard PS-15, as appropriate.
3. Ducts may be round or rectangular. The minimum dimension shall be a nominal 12 in. (0.3 m) with a maximum dimension of a nominal 60 in. (1.5 m).
4. The manufacturer shall determine the suitability of the duct system for specific corrosive environments and should be consulted for recommended corrosive applications.
5. Vertical sections of duct shall not exceed 15 ft (5 m) or penetrate other fire areas; otherwise, internal sprinklers shall be required.
6. If the process served by a duct system produces combustible vapors or flammable residue which can build up inside the duct, or consists of more than 1 ft² (0.3048 m²) of flammable liquid per inlet, then sprinkler protection will be required as recommended in FM Global Property Loss Prevention Data Sheet 7-78.
7. The ASTM E 84, Standard Test Method for Surface Burning Characteristics ratings shown are based on tests using flat sheets. Caution: These numerical flame spread and smoke density values do not define the hazards presented by this or any other material under actual fire conditions.

Fume and/or Smoke Exhaust Duct Systems for Use in Cleanrooms

These systems are designed for general purpose use in exhausting noncombustible corrosive fumes without the need for automatic sprinkler protection where permitted by applicable FM Global Property Loss Prevention Data Sheets, subject to the General Restrictions and Limitations shown above in the general introduction for ducts.

The ducts do not incorporate physical internal interruption which may impede immediate smoke removal. Therefore, the ducts may be utilized for smoke removal when properly designed and sized.

In addition to meeting the design criteria stated above, the exterior surfaces of these systems have been successfully tested in accordance with the FM Approvals Cleanrooms Materials Flammability Test Protocol as described in Test Standard 4910 and meet acceptance criteria for flame propagation and smoke damage.

Special Restrictions and Limitations:

1. When used in cleanroom applications, the duct systems require the presence of an emergency exhaust blower located within the system that is capable of providing a minimum air speed in the duct of 600 ft per minute (3 m/sec).
2. These duct systems also meet all the requirements as Fume Exhaust Ducts and Fume and/or Smoke Exhaust Duct Systems.

PermaShield Pipe Circular or rectangular stainless steel duct coated on the interior with an electrostatically applied PermaShield thermoplastic resin coating. The total interior coating thickness shall not exceed an average 16 mil (0.40 mm).

The minimum diameter dimension shall be a nominal 4 in. (100 mm) with a maximum dimension of a nominal 60 in. (1.5 m).

The ASTM E 84 Standard Test Method for Surface Burning Characteristics results at a 20 ga. (0.95 mm) thickness: Flame Spread 0, Smoke Density 20.

- a. Vertical height of individual risers within the duct system are not restricted, however, they shall not penetrate other fire areas. PSP-EZ Clamp shall not exceed 15 ft (4.6 m).
- b. Series 300 stainless steel, cast stainless steel or carbon steel rotating exterior overlying companion rings for diameters 4 to 30 in. (100 to 762 mm).
- c. Series 300 stainless steel rotating or carbon steel welded flange for diameters 32 to 60 in. (813 to 1524 mm).
- d. Stainless steel PSP-EZ Clamp for diameters 4 to 14 in. (100 to 356 mm).