***Metal Ducts - Fire-Resisting Ductwork***

**Specifications of Non-Coated Fire-Resisting Ductwork:**

1. Fire-resisting ductwork shall be applicable for smoke extract system, car park ventilation system, kitchen extract system, corridor pressurization system and all emergency ventilation system.
2. Fire-resisting ductwork shall be non-coated manufactured by G90/Z275 zinc coated galvanized steel in accordance to ASTM A653 with slip-on flanges.
3. The ductwork shall provide a fire rating of up to 4-hours (240 mins) as per BS 476 Part 24 (BS 5588 – ISO 6944) or EN 1366 - Part 1 - Kitchen/Smoke Extracts & Pressurization, Part 8 - Multi-Compartment Smoke Extracts, Part 9 - Single-Compartment Smoke Extracts, standards.
4. The system shall be assessed by another independent certifying authority such as LPCB (Loss Prevention Certification Board) or Certifire or similar auditor to ensure the standards and norms are being adhered in fire and safety products supply and installation.
5. Non-coated fire-resisting duct system shall mandatorily provide a third-party approved test certificate by UKAS accredited testing laboratory; suitable for applications, where fire-resisting ductwork is required as per BS476 Part 24 and EN 1366 Part 1, Part 8 and Part 9 standards.
6. Fire-resisting ductwork shall be tested, evaluated and certified by independent laboratories such as Warringtonfire or British Research BRE for British standards.
7. The Non-coated fire-rated duct system shall be approved by local authorities having jurisdiction (AHJs) and shall carry a valid AHJs certificate with the test certification number/reference mentioned.
8. Non-coated fire-resisting ductwork is equivalent for use in applications where, specifications may refer to any coated duct systems without any prejudice as long as the performance criteria such as Stability, Integrity and Insulation are complied.
9. The Fire-resisting ductwork shall be tested for both Type A (Fire Outside) and Type B (Fire Inside) as per BS476 Part24:1987 (ISO 6944:1985) to meet design guidelines in accordance to BS5588: Part 9:1989, Method 3, for both horizontal and vertical ductwork.
10. The ductwork should be capable of providing Type A (fire outside) or Type B (fire inside) fire containment and, under normal non-fire operating conditions, should conform to the pressure classification of the current HVCA DW/144 Specification for Sheet Metal Ductwork.
11. The Fire-resisting ductwork shall not be tempered or modified at the site. If any modification is required, it must be executed by the manufacturer at their facility to maintain the stability & integrity ratings of the ductwork.
12. Any modified ducts marked during the inspection shall not be accepted. The consultant reserves the right to ask for replacement of those particular duct pieces.
13. All components used within the fire-resisting ductwork system, i.e., control dampers (VCD/NRD), sound attenuators, access doors shall have equal or higher certification as ductwork and shall be defined in third party certification.
14. The fire-resisting ductwork shall be tested for both Insulated ducts and Uninsulated ducts which shall be detailed in the third-party certification.
15. The fire-resisting ductwork should meet SMACNA, DW-144, NFPA requirements.
16. The complete fire-resisting duct system including duct, control dampers (VCD/NRD), sound attenuator, and, access doors should be tested and evaluated as an Assembly and approved by Civil Defense.
17. Hanger support and fixing accessories should comply to the manufacturer’s third-party certificate (CF761), where the hanger specification will be detailed for required fire rating; to ensure that the supports can withstand the weight of the ductwork system and maintain its position throughout the intended period.
18. The Kitchen extract/Grease Ducts ductwork system shall be fabricated with Carbon Steel/Black Steel/Mild Steel sheets not less than 16-gauge thickness or stainless steel not less than 18-gauge thickness as per NFPA-96. The joints shall be fully welded and heat resistant galvanic coating shall be applied to the duct skin to ensure the material is corrosion resistant.
19. Insulation for Kitchen extract/Grease ducts shall be tested and approved as per BS-476 Part24, ASTM E2816, ASTM E2336 for stability, Integrity and Insulation criteria and shall carry a valid civil defense approval.
20. The Fire-resisting Ductwork should be constructed in accordance with the Manufacturer Guide to provide:
	1. Stability – Min. 120 – Max. 240 minutes;
	2. Integrity - Min. 120 – Max. 240 minutes;
	3. Insulation - up to 180 minutes (subject to requirements);
	4. When tested to the requirements of BS476 Part24 by civil defense approved laboratory at temperature of 1049 °C for 2-hours or 1153°C for 4-hours (in accordance to ISO 834:1975 Fire Resistance Test Standard Time – Temperature Curve), with a valid civil defence certification mentioning certificate number & testing reference confirmation.



Figure 1: - Time – Temperature Curve

1. The contractor shall follow the manufacturer’s installation guidelines for supports, hangers, sealants, gaskets, clamps as directed in their installation schedule of ductwork by referring the approved third-party certificate (CF761).
2. The manufacturer shall certify the installed fire-resisting ductwork and submit a satisfactory/conformance inspection report to the consultant.
3. The duct shall be installed by civil defense approved contractor.
4. The manufacturer shall provide supply certificate for delivered material; if installation by the contractor is executed as per guidelines.
5. The fire-resisting duct manufacturer shall provide minimum 5 years of track record of at least 10 projects executed in GCC; to ensure the manufacturers credibility and manufacturing capabilities.
6. In addition to above, the fire-resisting ducts should meet requirements of the UAE Fire & Life Safety Code, Chapter 10 – Table 10.1 as mentioned below:
	1. Fire-resisting Ductwork for Smoke Control Systems (both exhaust and make-up air ducts) shall be manufactured to provide at least 2-hour fire resistance.
	2. Where a duct passes through other fire compartments of higher rating, the duct shall be constructed to have the same rating of that compartment. The rating shall apply to fire exposure from both interior and exterior of the duct or structure.
	3. Such fire rating of smoke control system ducts shall be evaluated and approved for Stability, Integrity and Insulation criteria for fire rating.
	4. The complete duct system including supports, hangers, joints, gaskets, sealant etc. shall be in compliance with the approved test standards, i.e., BS 476 Part 24 or EN-1366.
7. Static Pressure Limits: Fire-resisting ductwork shall be constructed to meet maximum pressure classification defined by fan manufacture irrespective of thicknesses approved for fire rating.

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| Pressure /Velocity | Class | Pressure level Range |
| Positive Pressure | Negative Pressure |
| Low | Class A | Up to + 500 Pa | Down to - 500 Pa |
| Medium | Class B | Up to + 1000 Pa | Down to - 750 Pa |
| High | Class C | Up to + 2000 Pa | Down to - 750 Pa |
| High | Class D | Up to + 2500 Pa | Down to - 750 Pa |
| **NOTE** Classifications are to DW /144 requirements |