



BUILDINGS BULLETIN 2018-003

OTCR

Supersedes: 2015-013

Related Bulletin(s) 2012-011

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Issuance Date: April 30, 2018

Purpose: This document establishes acceptance criteria for fire resistive duct assemblies as approved alternative protection in the NYC Construction Codes.

Related Code Section(s):	AC 28-113	BC 424	MC 607.2.1
		BC 713.3.1	MC 513.3
		BC 716	MC 513.10.2
		BC 909.3	MC 502.10
		BC 909.10.2	MC 504
		BC 1704.14 (Item 1)	MC 506.3
		BC 1704.15	MC 511
		BC 1704.27	MC 604.3

Subject(s): Fire-resistance-rated construction; fire resistive duct assemblies; Ducts and air transfer openings; Penetrations; Duct insulation assembly; Rigid ventilation air duct assembly.

Background: NYC Construction Codes do not prescribe the use of fire-resistive duct assemblies. This bulletin permits the use of fire resistive duct assemblies as alternative protection in applications where a damper would interfere with the intended operation of the duct. For example, section MC 607.2.1 permits approved alternative protection of required smoke control systems. This bulletin establishes several fire resistive duct assemblies identified as options for alternative protection.

Description: This bulletin addresses the following types of fire resistive duct assemblies:

- Flexible duct wrap insulation applied to code-prescribed ducts – foil scrim encapsulated blanket of various thicknesses. The material is directly applied to the duct surface and is used to achieve a fire-resistance rating.
- Rigid duct assemblies – individual duct sections that are fastened together as fire tested. Each individual section is comprised of welded inner steel framework that is clad with a thick fire-resistant panel.
- Factory manufactured commercial duct assemblies – factory fabricated sheet metal duct system with additional applied fire resistive material.

Evaluation Scope: NYC Construction Codes

Evaluation Criteria: Pursuant to section AC 28-113, the Office of Technical Certification and Research recognizes and establishes acceptance criteria for fire resistive duct assemblies in accordance with:

1. ISO 6944, "*Fire-Resistance Test for Ventilation Ducts*"¹. Ducts shall be tested and evaluated for stability, integrity and insulation (thermal) and,
2. ASTM E 814/UL 1479, "*Fire Test of Through-Penetration Firestop*"² and,
3. ASTM E84, "*Standard test Method for Surface Burning Characteristics of Building Materials*"³.

An acceptable assembly shall be tested and listed to the above referenced standards by an approved agency and shall comply with the NYC Construction Codes and the conditions and restriction of this bulletin.

ISO 6944 references testing requirements for Duct A and Duct B test specimens:

- Duct A - for ventilation duct assembly that passes through the fire environment without openings. See ISO 6944 Figures 1 and 2.
- Duct B – for ventilation duct assemblies where the duct contains an opening within the fire environment. See ISO 6944 Figures 1 and 2.

The stability, integrity and insulation ratings per ISO 6944 for the fire resistive duct shall be equal to or greater than the highest fire resistance rating of any assembly penetrated, or a minimum of 2 hours.

Uses: This bulletin addresses fire resistive duct assemblies used as alternative protection in applications where a damper would interfere with the intended operation of the duct. Such applications include, but are not limited to:

1. Fire resistive duct assemblies used in dedicated smoke control systems including stairwell and vestibule pressurization as per section BC 607.2.1.
2. Cross-over floor ducts (conventional HVAC ducts that traverse a floor from one shaft to another) provided that no opening exist in the entire length of the horizontal cross- over duct connecting the two.

Conditions of Acceptance: Fire resistive duct assemblies shall be designed in accordance with the NYC Construction Codes and other applicable provisions including but not limited to the following:

A. Design

1. Fire resistive duct assemblies shall be designed in accordance with the NYC Construction Codes, manufacturer's recommendations, the conditions of the required listing, and conditions of this bulletin.

B. Installation Requirements

1. Installation requirements shall be in accordance with the manufacturer's instructions, the applicable listing, and the conditions of this bulletin.
2. Size limitation of ducts, duct enclosures and penetrations shall be in accordance with the listing agency, or for site-specific installation, as approved by OTCR.
3. Where the fire rated duct assembly penetrates a fire-rated assembly, the resulting opening around the ventilation system shall be fire stopped with a firestop system tested in accordance with ASTM E 814/UL 1479 as per section BC 713.
4. The F and T rating of the firestop system shall be equal to or greater than the hourly insulation rating of fire resistive duct assembly, and F rating of the firestop system shall be equal to or greater than the hour integrity and stability rating of the fire resistive duct assembly.

5. The fire resistive duct assembly shall be protected from the point of penetration of a fire resistance rated ceiling, wall, floor or any concealed spaces to the outlet terminal.
6. Fire resistive duct assemblies shall have a flame spread rating of not more than 25 and a smoke developed rating of not more than 50 pursuant to ASTM E 84 as per section MC 604.3.
7. Fire resistive duct assemblies shall be labeled as per section AC 28-113.4. All shipments and deliveries of materials shall be accompanied by a certificate or label certifying that the materials shipped or delivered are equivalent to those tested and approved.

C. Inspections

1. Pursuant to sections BC 1704.15 and 1704.27 the installation of fire resistive duct assemblies shall be subject to special inspection requirements of Chapter 17 of the Building Code and 1 RCNY section 101-06. Special Inspection of fire-resistive duct assemblies shall include the following:
 - a. Smoke control in stairwell and vestibule pressurization system inspections shall be in accordance with sections BC 909.3, MC 513.10.2, MC 513.3, and BC1704.15. Complete the statement of special inspection under "Smoke Control System, BC 1704.15" in Section 3 of the TR1 form.
 - b. Special Inspection of firestop systems shall be in accordance with section BC 1704.27. Complete the statement of special inspection under "Firestop, Draftstop and Fireblock Systems, BC 1704.27" in Section 3 of the TR1 form.

D. Restriction and Prohibited Installation

1. Pursuant to ISO 6944, Section 1.4, the following applications shall not be permitted:
 - a. Duct materials which are extremely sensitive to thermal shock.
 - b. Ducts installed above fire-resistance-rated suspended ceilings where ducts rely on the performance of the ceiling for their fire resistance.
 - c. Duct lined on the inside with combustible material or which in practice may accumulate combustible deposit on their inside face such as kitchen extract duct and grease duct.
2. Fire resistive duct assemblies shall not be accepted as an alternative to code required shaft enclosures.
3. Duct systems regulated by sections MC 502.10, MC 504, MC 506.3, MC 510 and MC 511.

Referenced Standards:

1. ISO 6944-85, *"Fire resistance tests-Ventilation ducts, International Organization for Standardization"*.
2. ASTM E 814-2006, *"Standard Test Method for Fire Tests of Through-penetration Fire Stops, ASTM International"*
3. ASTM E 84-2007, *"Standard Test Method for Surface Burning Characteristics for Building Materials, ASTM International"*