



BUILDINGS BULLETIN 2012-011
OTCR

Supersedes: OTCR Buildings Bulletins 2009-028 and 2009-029

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Issuance Date: October 19, 2012

Purpose: This document establishes acceptance criteria for fire resistive duct assemblies as approved alternative protection in the 2008 NYC Construction Codes

Related Code	AC 28-113	BC 419.2	BC 909.10.2
Section(s):	BC 1704.13 (Item 1)	BC 712.3.1	MC 607.2.1
	BC 1704.25	BC 716	MC 513.3
		BC 909.3	MC 513.10.2

Subject(s): Fire-resistance-rated construction, fire resistive duct assemblies; Fire-resistance-rated construction, ducts and air transfer openings; Fire-resistance-rated construction, penetrations; Fire-resistance-rated construction, duct insulation assembly.

Background: Fire resistive duct assemblies may be used 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 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: 2008 NYC Construction Codes

Evaluation Criteria: Pursuant to section AC 28-113, the Office of Technical Certification and Research (OTCR) 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 E 84, "Standard Test Method for Surface Burning Characteristics of Building Materials"³.

An assembly shall be tested and listed to the above referenced standards by an approved agency and shall comply with the 2008 NYC Construction Codes and the conditions and restriction of this bulletin.

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:

- (1) fire resistive duct assemblies used in smoke control systems including stairwell and vestibule pressurization as per Section BC 607.2.1,
- (2) hazardous exhaust hood ducts as per Section BC 419.2 and NFPA 45⁴ section 8.10.3.1, and,
- (3) cross-over floor ducts (conventional HVAC ducts that traverse a floor from one shaft to another).

Fire resistive duct assemblies shall be of the following type as per ISO6944:

- Duct A – for ventilation duct assembly that pass through the fire environment without openings.
- Duct B – for ventilation duct assemblies where the duct contains an opening within the fire environment.

Conditions of Acceptance: Fire resistive duct assemblies shall be designed and installed in accordance with the 2008 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 2008 NYC Construction Codes, manufacturer's recommendations, the conditions of the required listings, 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 and duct enclosures 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 712.
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 hourly 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. The stability, integrity and insulation rating 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.
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 ANSI/NFPA90 A⁵.
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 1704.14 and 1704.25 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 BC 1704.14. Complete the statement of special inspection under "Smoke Control Systems, BC 1704.14" in Section 3 of the TR1 form.
 - b. Special inspection of firestop systems shall be in accordance with Section BC 1704.25. Complete the statement of special inspection under "Firestop, Draftstop and Fireblock Systems, BC 1704.25" in Section 3 of the TR1 form.

D. Restrictions 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. Note: previously published OTCR Buildings Bulletins [2009-027](#) and [2010-021](#) permits alternative grease duct assemblies serving Type I hoods.
2. Fire resistive duct assemblies shall not be accepted as an alternative to code required shaft enclosures.

Referenced Standards:

1. ISO 6944-85, "Fire resistance tests-Ventilation ducts, International Organization for Standardization".
2. ASTM E 814-00, "Standard Test Method for Fire Tests of Through-penetration Fire Stops, ASTM International".
3. ASTM E 84-01, "Standard Test Method for Surface Burning Characteristics of Building Materials, ASTM International".
4. NFPA 45-00, "Standard on Fire Protection for Laboratories Using Chemicals".
5. NFPA 90-12, "Standard for the Installation of Air-Conditioning and Ventilating Systems".