# WHITE PAPER

# Update for the New York City Building Code

# Fireblocking Requirements for Exterior Wall Assemblies Containing Combustible Components (NFPA 285)

## OVERVIEW

New York City is one of the most prominent building construction environments, not only in North America, but in the world. The current 2022 New York City Building Code (NYCBC) was issued on November 7, 2022, and has had a significant impact on the local cladding market. Prior to the 2022 edition, New York City issued building permits based on the 2014 New York City Building Code which was based on the model International Code Council (ICC) International Building Code® (IBC®).

Partially due to significant fires around the world, the 2022 New York City Building Code made significant amendments to design, performance, and inspection requirements for combustible exterior wall assemblies and exterior wall coverings. These new requirements created a direct conflict with the model IBC® code and prevalent construction techniques used in the City.

Recent testing and research work performed by Tenmat, a leading manufacturer of passive fire protection systems, and Pivoth Corp, consultant to Tenmat, has provided some clarity and developed at least one compliance path to allow the use of combustible cladding assemblies in New York City.

## DISCUSSION

One of the primary considerations for a rainscreen cladding assembly, or rainscreen system, is the ability of both air and water to enter and escape from the air cavity behind the exterior cladding. Rainscreen systems are made possible by advancements in the water resistive barrier that keeps significant air and water within the air cavity from entering the building. However, air and water movement (i.e., drainage and ventilation) behind the cladding requires unrestricted flow of both components.

Amendments for the 2022 NYCBC created a condition that required this open cavity to be blocked off with a qualified fireblocking material. This fireblocking is required in locations that include each floor line and around openings (NYCBC Section 718.2.6). Although the intent of adding fireblocking was to increase fire safety of the exterior wall assembly, it could have ripple effects that impact the function and performance of rainscreen systems.

The addition of fireblocking materials into the exterior air cavity restricts the free flow of air and water and, therefore, does not allow these elements to escape from behind the cladding through drainage or ventilation.

Blocking the exterior air cavity creates multiple performance issues including additional long-term exposure of the water resistive barrier to standing water which over time could penetrate into the building. Despite the intent of improving fire safety, the limitations preventing air and water evacuation made the use of many rainscreen cladding systems unworkable.

Tenmat, a leading manufacturer of intumescent materials and fire stopping products, hired Pivoth Corp to develop, organize, and lead an initiative aimed at overcoming this challenge in New York City. The objective was to submit an application including a portfolio of testing and documentation to obtain formal recognition of intumescent fireblocking (i.e., an intumescent cavity barrier) from the New York City Department of Buildings (NYCDOB) to satisfy the fireblocking requirements for exterior wall assemblies of the 2022 NYCBC. A major component of that testing program included extensive research from a series of fire tests including the large-scale NFPA 285 "Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components".

The NFPA 285 test program was required for two purposes.

First, the 2022 NYCBC requires that most exterior wall assemblies of Type I, II, III, and IV construction containing combustible materials are tested in accordance with, and pass, the performance criteria listed in the NFPA 285 test with fireblocking in place, at the specific location, as prescribed in the 2022 NYCBC. This requirement is a significant departure from the 2015 IBC® upon which the 2022 NYCBC is based. The 2015 IBC® contains an exception to the requirement to fire block the exterior wall covering where the full exterior wall assembly has passed NFPA 285 testing.

The NYCBC language and subsequent clarifying bulletin from the NYC DOB (Buildings Bulletin 2022-013), required all assemblies that did not previously have fireblocking in NFPA 285 tested wall assemblies, to run additional test(s) placing fireblocking in the assembly as prescribed in NYCBC Section 718.2.6.1.. It is important to note that guidance in Annex B of the more recent editions of the NFPA 285 standard indicated that if an NFPA 285 test assembly contains fireblocking, then moving the fireblocking to a different location within the assembly should be retested.



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Second, the use of intumescent fireblocking needed to be shown to provide equal or better performance than NYCBC prescribed fireblocking materials, such as mineral wool, in comparative NFPA 285 tests.

The 2022 NYCBC requirement to include fireblocking in NFPA 285 tests of wall assemblies has been a major hurdle for rainscreen panel manufacturers and system designers looking to comply with the requirements of the NYCBC. While the NYCBC language states that fireblocking shall be installed in areas that include around openings and at slab-edge locations (typically floor lines), the NFPA 285 test apparatus does not represent typical floor line locations. Therefore, strictly adhering to these installation requirements in NFPA 285 test specimens could have unwanted effects. Primarily, fireblocking would either cover or shield critical heat sensors (thermocouples) that determine whether a sample meets the performance requirements of the standard or not. However, the initial guidance provided by the NYCBC explicitly prohibited shielding the critical heat sensors, without providing a clear alternative solution. Without clear guidance on how to address these critical temperature sensors, many manufacturers have opted to postpone running the NFPA 285 test and have therefore missed out on project opportunities in New York City.

Through conversations and advisement from fire experts a final plan was defined, and a test layout was adopted by the team that provided some amount of confidence but still lacked certainty regarding NYCDOB acceptance.

The required testing proceeded using intumescent fireblocking and an MCM cladding assembly. Once successfully completed, Pivoth, on behalf of Tenmat, submitted an OTCR1 application going through the approval process step-by-step with New York City Department of Buildings, Office of Technical Certification and Research (OTCR). The OTCR application process lasted 14 months and included a detailed review from the Fire Department of New York (FDNY) and approval from the Department of Buildings commissioner's office. The result of this effort and extensive testing program resulted in a formal approval from the Department of Building's OTCR and a letter recognizing Tenmat FF102/50 intumescent fireblocking material as an approved fireblocking product under Section 718.2.1 #8 "other materials approved by the Commissioner".

The important point in all of this is that use of an intumescent fireblocking in the exterior air cavity allows the air cavity to remain open, facilitating drainage and ventilation during normal operations. Only during a fire event will the intumescent activate and expand to fill the air cavity and provide the fireblocking function to slow flame propagation within the air cavity.

The application for general recognition as "an acceptable approved material" for the use of the intumescent fireblocking in cavities as required by the NYCBC, included testing and research Tenmat performed using an MCM system as the cladding assembly. Many MCM manufacturers, dealers, and installers have not yet identified a good pathway for product or assembly acceptance in New York City and were postponing testing (like other material manufacturers), while hoping for more clarity directly from the NYCBC. The recognition of the Tenmat FF102/50 solution shows that a path to compliance is possible and includes references to testing documentation using MCM cladding assemblies.

The research conducted by Tenmat and the exhaustive presentations have created this opportunity for code compliant construction of exterior walls containing combustible elements in the City of New York. The work

has also created a guiding procedure for companies to test combustible wall assemblies comprised of alternate materials using the NFPA 285 for acceptance in New York City. Now research can continue on a variety of combustible exterior wall cladding assemblies for redirection of this important construction technique to the city of New York.

## SUMMARY

Based on the research done by Tenmat, and the multiple organization meetings held with the New York City Department of buildings, a pathway has been created to prove the performance of rain screen assemblies that will lead to the acceptance of these assemblies for use in New York City. For further information on this development, please contact Tenmat Inc. www.tenmatusa.com / 1-800-821-3436.

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