Building with conscience.

Technical Hotline

Sto Product and System Compliance with NFPA 285

What is NFPA 285?

NFPA 285 is titled, *Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components*.

NFPA 285 is a 2-story fire test to determine if an exterior wall assembly which contains **combustible** materials can be used in construction where the code requires exterior walls to be of **noncombustible construction**. The pass/fail criteria are based on the extent of fire spread (determined visually and by embedded sensors). Details of the actual test method are available from the National Fire Protection Association (NFPA), https://www.nfpa.org/.

Why is NFPA 285 important?

NFPA 285 is important for the safety of the building occupants during a fire and the safety of emergency personnel responding to a fire. It provides an indication that the spreading of a fire will not be made significantly worse by the presence of the tested combustible materials.

NFPA 285 is also important because it has become one of the standard tests required to demonstrate that a product or system complies with the fire safety requirements of the International Building Code (IBC) for use on “noncombustible construction”.

What is “noncombustible construction”?

Noncombustible construction is, in its purest form, construction that uses only materials that do not burn, such as steel and concrete. Certain buildings are required to be of noncombustible construction based on their occupancy and/or height (hi-rise residential condominiums, government buildings, hospitals, schools, etc.). The use of combustible materials in the construction of exterior walls of these buildings is often necessary to achieve required levels of moisture protection or continuous insulation, or both. NFPA 285 was developed to assess whether or not a particular type, amount, or configuration of combustible material could be used and still maintain an acceptable level of safety in the event of a fire.

Is testing for use in noncombustible construction a new requirement?

No. Wall assemblies with combustible components such as foam plastic insulation have been required to perform some version of large-scale fire test for the same purpose as NFPA 285 since the 1980’s.

Originally the test for EIFS was not “NFPA 285”, but previous versions of the same or similar test with Uniform Building Code numbers UBC 17-6, UBC 26-4 and UBC 26-9. (A detailed history of the development of the test is presented in an appendix to the test method which can be purchased from NFPA).

A requirement for testing combustible air/water-resistive barriers in noncombustible construction was added to the IBC in 2012 (Section 1403.5). This addition brought attention to NFPA 285 because of its application to non-foam-plastic materials and manufacturers. Design professionals became more aware of NFPA 285 and began to ask for information to verify that the materials being specified had been included in a tested assembly.

If the air/water-resistive barrier is the ONLY combustible component in the wall assembly, and the 2015 IBC or later version of the IBC is the applicable code, then wall assemblies (without foam plastic) may be qualified for use based on small scale tests of the air/water-resistive barrier. The results of the fire tests must comply with the exceptions listed under Section 1403.5 in the 2015 IBC (or corresponding section in later versions of the IBC).

What is a “tested assembly”?

The tested assembly is exactly what was tested. The description of the test specimen in an NFPA 285 report states the product names, generic product types, and material thicknesses. The construction details at the head of a window opening and other pertinent details of the base wall panel are also reported.

Why is the detail of the assembly important?

The nature of fire is that one cannot necessarily predict the performance of one combination of materials based on another. If one material is exchanged for another, it may change the fire test performance in a way that cannot be predicted. Similarly, if the order of application of materials is changed, the fire performance of the overall assembly can change – even if the materials are the same.

What if my back-up wall is not the same as the back-up wall used in the NFPA 285 test?

The test evaluates whether or not the presence of combustible components in the tested wall assembly applied over the noncombustible back-up wall construction causes excess flame spread over the face or within the core of the assembly, or within the interior space from one story to the next. Project specific framing details or the use of masonry components in the field constructed assembly does not negate the NFPA 285 test, provided the base wall construction is noncombustible.

How does Sto comply with NFPA 285?

Sto has performed the testing through nationally recognized and accredited independent testing labs. We have tested StoTherm® ci, StoEnergy Guard®, and StoPowerwall® ci. (Some older systems were tested to older versions of the test method, but they are generally accepted by fire consultants and building code evaluation services as substitutes for NFPA 285). Specific, tested wall assemblies are

listed in building code evaluation reports under the section that references “Use in Types I-IV (Noncombustible) Construction.” This reference will not appear in an evaluation report that involves combustible wall coverings or components if NFPA 285 requirements have not been satisfied.

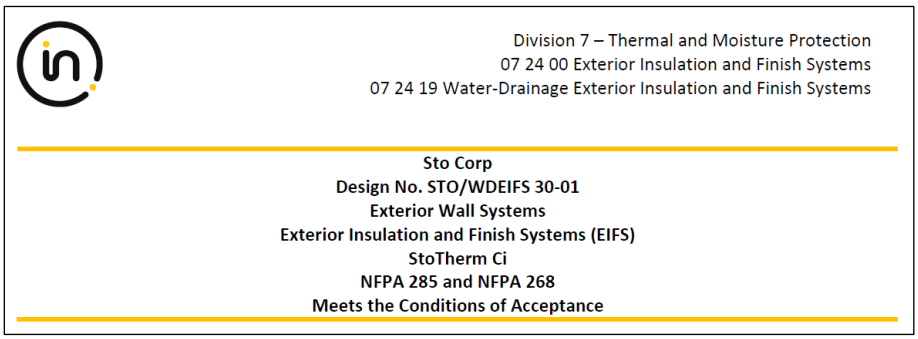
Can you provide me with a copy of the NFPA 285 test report?

Evaluation Service Reports (ESRs) are, in themselves, third-party reviews of independent test data that verify building code compliance. The ESRs account for fire tests that were run before NFPA 285 and additional fire tests that are required for certain systems or engineering analysis. The ESRs help avoid unnecessary confusion about tests run as UBC standards instead of NFPA 285, by stating recognition to be used in noncombustible construction. ICC ESRs are typically furnished in lieu of test reports since they establish compliance with building codes. If required a copy of the actual test report can be provided.

Where does the Evaluation Report demonstrate compliance with NFPA 285?

As an example, ICC ESR-1748 references **Table 4 – Assemblies for Use in Types I-IV Construction**, which lists back up wall construction and the StoTherm® ci Systems that are in compliance with NFPA 285.

Alternatively, Design Listings by ICC-ES, Intertek, and other product evaluation agencies, such as the heading of the one shown below by Intertek, specifically certify compliance with NFPA 285.



Division 7 – Thermal and Moisture Protection
07 24 00 Exterior Insulation and Finish Systems
07 24 19 Water-Drainage Exterior Insulation and Finish Systems

Sto Corp
Design No. STO/WDEIFS 30-01
Exterior Wall Systems
Exterior Insulation and Finish Systems (EIFS)
StoTherm Ci
NFPA 285 and NFPA 268
Meets the Conditions of Acceptance

Does every different combination of materials need to be tested per NFPA 285?

Under the 2012 Edition of the IBC, every wall assembly that includes a combustible water-resistive barrier must be tested. In some cases, qualified fire engineering consultants can perform rational analysis to “extend” the test results to some other wall assemblies that are judged to be more conservatively designed from a fire protection standpoint.

Under the 2015 Edition of the IBC and later editions, if the air/water-resistive barrier is the only combustible component in a wall assembly, exceptions to NFPA 285 testing are permitted based on successful completion of several specified small-scale tests.

What if I need a copy of an analysis?

Where a rational analysis has been performed, Sto Corp. has incorporated the results of the analysis into its ICC evaluation reports. In a few cases we have provided rational analysis on a job-by-job basis, based on level of importance of the project, fee structure associated with the analysis, likelihood of the analysis being favorable, and time frame, usually 30-60 days needed for the analysis.

What about combinations of materials that have not been tested or analyzed?

They should not be used on noncombustible construction without testing or an analysis. An analysis requires existing data and a rational means of applying that data to the proposed assembly. The fire engineering consultant must determine if analysis is an option based on his/her experience, his/her judgment, and the availability of relevant data.

What about NFPA 285 and "combustible construction"?

Combustible construction is identified as Type V. It is construction where "the structural elements are any material permitted" by the code. This is typically wood-framed construction. Because the structural elements are permitted to be combustible there is no requirement to perform NFPA 285.

How does NFPA 285 relate to hourly fire ratings?

The two are not directly related. Both NFPA 285 and an hourly rating may be required for some buildings, but not necessarily. An hourly fire rating is determined by ASTM E 119, *Standard Test Methods for Fire Tests of Building Construction and Materials,* which is a fire endurance test. The wall assembly is subjected to a fire for a predetermined period of time. If the wall meets certain criteria after the duration of the fire exposure, then an hourly rating is assigned to that assembly. A wall that is exposed to a fire for one hour and passes the test is a "one-hour rated wall."

Sto Americas

Sto Corp.
3800 Camp Creek Parkway
Building 1400, Suite 120
Atlanta, GA 30331
USA

Toll Free: 1800 221 2397
www.stocorp.com

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