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**No. 0514-E**

# Tech 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), [www.nfpa.org](http://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 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 “noncombustible construction”.

### What is “non-combustible 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 noncombustible construction based on their usage and/or size (large commercial buildings, 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 run for EIFS was not “NFPA 285”, but previous versions of the same or similar tests 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 water-resistive barriers in noncombustible construction wall assemblies 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/moisture barrier is the ONLY combustible component in the wall assembly, and the 2015 IBC is the applicable code, then wall assemblies may be qualified for use based on small scale tests of the air/moisture barrier. The results of the fire tests must all comply with the exceptions listed under Section 1403.5 in the 2015 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 is 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 back-up wall construction for all tests is the same. 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 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 (as StoTherm and StoTherm NExT), Sto EnergyGuard, Sto Powerwall, and Sto QuikSilver systems. (Some of the older systems were tested to the older versions of the test method, but they are accepted by fire consultants and building code evaluation services as being acceptable substitutes for NFPA 285.) Specific, tested wall assemblies are listed in the code evaluation reports under the section titled, “Noncombustible Construction”. This section will not appear in an evaluation report if NFPA 285 requirements have not been satisfied.

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

The 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?

The ESR will indicate compliance in several places. Primarily, though, section **2.0 Uses** will clearly state to which construction types the subject product or system may be applied. Construction Types I, II, III, and IV are classified as noncombustible construction. For example from ESR-1748 for StoTherm NEXt:

### 2.0 USES

StoTherm® NEXt® systems are exterior insulation and finish systems (EIFS) complying with IBC Section 1408 and IRC Section R703.9. The systems comply with the requirements of IBC Section 1408.4.1 and IRC Section R703.9 as EIFS with drainage.

StoTherm® NEXt® systems may be used in fire-resistance-rated construction when installed in accordance with Section 4.6 of this report; and in any construction type (IBC Types I through V) when installed in accordance with Section 4.5.

The second paragraph states “any construction type”, which includes noncombustible construction. Reference is made to Section **4.5 Use in Types I through IV (Noncombustible) Construction**, which restates the recognition and directs the reader to a table of recognized systems.

Some reports, especially those for systems that are not EIFS, will specifically call out NFPA 285 in section **6.0 Evidence Submitted**. StoTherm reports do not currently call this out, partially because recognition is based on older versions of fire tests.

## 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, walls in which the only combustible element is the air/moisture barrier exceptions are provided 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.

# Tech Hotline

## **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 experience, his 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, 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”. (Certain Type V (combustible) wall assemblies have hourly ratings.)

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