NFPA 285: Transparency in Engineering Judgements

For Commercial Wall Assemblies

NFPA 285 - 2019

What's New

NFPA updated its 285 standard to a new 2019 version with several changes including a new title for the standard; *"Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components"*. A few of the technical changes in the 2019 edition are:

- Test wall construction now allows wood studs
- Construction of test wall now requires specific locations for two joints in the exterior veneer when panels are used. This mainly applies to MCM, HPL, & FRP panel type veneers
- Window head, jamb, and sill protection now specified

What this means is that previous NFPA 285 tests may not meet the 2019 edition.

Ahead of the Curve

DuPont always strives to go above and beyond to ensure product safety, sustainability, and resilience. Even though the new NFPA 285 test method may not yet be a code requirement (though previous versions of the test have been required by the IBC since its inception), DuPont products and assemblies are being tested per the 2019 standard. This means specifiers and code officials do not need to consider changes in the version of the building code between when a project is specified and when it is actually constructed.

In addition to testing to the latest version of NFPA 285, DuPont™ Thermax™ Brand Insulation meets < 25 Flame Spread Index (FSI) and < 450 Smoke Developed Index (SDI), which is Class A, for both core material AND finished product per ASTM E84. View UL report BRYX.R5622 for details. DuPont™ Styrofoam™ Brand Insulation meets < 25 FSI and < 450 SDI (Class A) per ASTM E84. View UL report BRYX.R3573 for details.

CODE REPORTS, NFPA 285 TEST EXTENSIONS, AND ENGINEERING JUDGEMENTS

Code Reports

The International Code Council Evaluation Service (ICC-ES) issues evaluation reports that can make it simple to verify that a certain material complies with code requirements. These are very useful and are available publicly. However, it is worth noting that the main limitation with evaluation reports is that there can be a lag time for these to be updated, which can result in outdated information.

NFPA 285 Test Extension Letters vs. Engineering Judgements
Given the nearly unlimited combination of materials that can be specified in a wall assembly, it is impractical and cost prohibitive to test all possible combinations. Test extension letters, often referred to as "build a wall", are used to make substitutions to the actual NFPA 285 tested walls. DuPont contracts with fire science engineering firms to develop test extension letters based on NFPA 285 tests and several other smaller scale fire tests.

Engineering judgements are typically specific to a building where conditions vary from what was tested or what is permitted by the test extension letter. Engineering judgements generally require a Professional Engineer (PE) stamp.

Find DuPont's NFPA 285 test extension letters in the Document Library on the website.

Engineering Judgements
Engineering judgements are evaluations, reasoned extrapolations, and solutions to a set of variables using testing, data and research as the basis of validation to determine if the newly supplied data will change the anticipated results. An Engineering judgement provides variations or substitutions to the tested assembly design configuration.

A few examples of widely accepted engineering judgements in the building industry include structural design and Underwriter Labs (UL) Fire-Resistance Ratings. A building's structure is designed using principles that have been proven through testing, but the particular structure and combination of these pieces is not physically tested before the structure is built. Rather, a set of calculations is completed, typically with the use of structural modeling software, to create the engineering judgement that the structure will perform to meet the project requirements. The same is true for UL Fire-Resistance Ratings in diverse applications such as walls, roofs, and floors. The UL Fire-Resistance Ratings are based on the testing of ASTM E119, and an engineering judgement is used to extrapolate the listings across additional products and configurations as compared to the original tests.

Section 104.11 of the IBC 2018 (and similar sections in previous code versions) **gives building officials authority to accept test extension letters and engineering judgements** that meet the intent of the code: "*The building official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions."

A LOOK AT MATERIALS

Differences in Reporting
The current reporting requirements for Surface Burning Characteristics (ASTM E84) for composite materials such as polyisocyanurate insulation allows for the property of only the core to be tested and reported instead of reporting the results of the entire product including facers.

Many polyisocyanurate insulation manufacturers will report only results for the core of their product (without the facers), but *not* report the value for the finished product that would actually be installed. Thermax™ Brand Insulation is Class A for both the core material (without the facers) AND the finished product. See UL Report BRYX.R5622 for details. For information on other manufacturers, and the value for their finished products vs. core material, you can find it on UL's Product iQ search.

Non-Combustibles: Do They Burn?
Non-combustible materials are defined in Section 703.5 of the IBC. In order to be classified as non-combustible, materials are tested to ASTM E 136 and then meet a set list of criteria based on the results of the test. The material can only lose a specific percent of weight of the material, burn in a certain way and have temperatures within the specimen rise (or not) from ambient tester temperature. The code also has a way for composite materials to be classified as non-combustible where the core is tested separately from the facer; the facer is allowed to be combustible. In summary, the term non-combustible in no way means that the material does not burn.

Additionally, when a material is combustible it does not mean it cannot be fire resistant. Tests such as ASTM E119 are designed to show that assemblies which contain materials defined as combustible in the code are fire resistant for a specified period of time.

Regardless of the material chosen for a project, it is important to design a robust wall system that takes all of these factors into account.

SUMMARY

With NFPA 285's new 2019 test version, DuPont has continued to stay ahead of the curve by testing its assemblies to the latest, more rigorous standard. Code reports, test extension letters, and engineering judgements are all accessible ways to verify that a particular assembly meets the intent of the code, and Section 104.11 of the IBC 2018 gives building officials authority to accept these for project documentation.

DUPONT™

For more information visit
building.dupont.com
or call 1-800-448-9835

43-D100636-enUS-1019 CDP