Tech Solutions 517.0

Fire-Rated Assemblies of DuPont™ ArmorWall™ Systems

Summary

The **ASTM E119 / UL 263 Standard Test Methods for Fire Tests of Building Construction and Materials/Fire Tests of Building Construction and Materials** is a very stringent test, but a necessary endeavor of any manufacturer dealing with fire design on the buildings that are constructed today in order to help protect the health and welfare of the public.

Introduction

According to the International Building Code (IBC) Chapter 6, Buildings are to be classified as one of the five construction types:

Type I and II
Construction in accordance with Table 601 are of noncombustible materials except as allowed by Section 603, which then points the designer to Chapter 26 for Foam Plastics and specifically Section 2603.

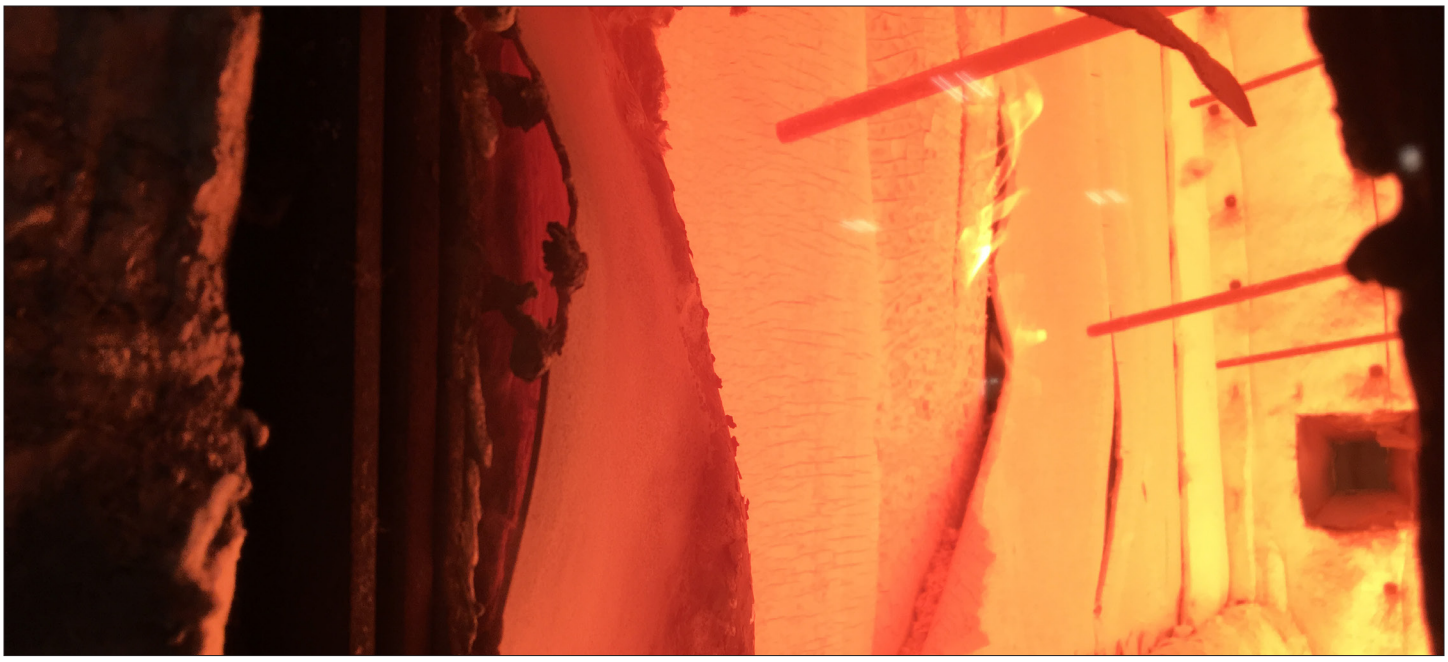
Type III
Construction of exterior walls are noncombustible and also permits the use of fire-retardant-treated wood in 2-hour assemblies or less in compliance with Section 2303.2.

Type IV
Construction built with Heavy Timber (HT).

Type V
Construction can be built using any materials as permitted by the code. Often this is where combustible material construction lies within the design community.

To achieve a fire-resistance rating, Chapter 7, Section 703.2.1 per IBC 2021 states the building elements, components or assemblies shall be determined in accordance with the test procedures stated within ASTM E119 or UL 263. In addition, fire-resistance rating can be established by the following methods or procedures:

1. Designs documented in approved sources.
2. Prescriptive designs as described in Section 721.
3. Calculations in accordance with Section 722.
4. Engineering analysis based on a comparison of building element, component or assemblies having been determined by previous tests from ASTM E119 or UL 263.
5. Alternative fire protection methods allowed by Section 104.11.
6. Designs certified by an approved agency.



Interior wall during ASTM E119 / UL 263 Fire-Rated Assembly testing

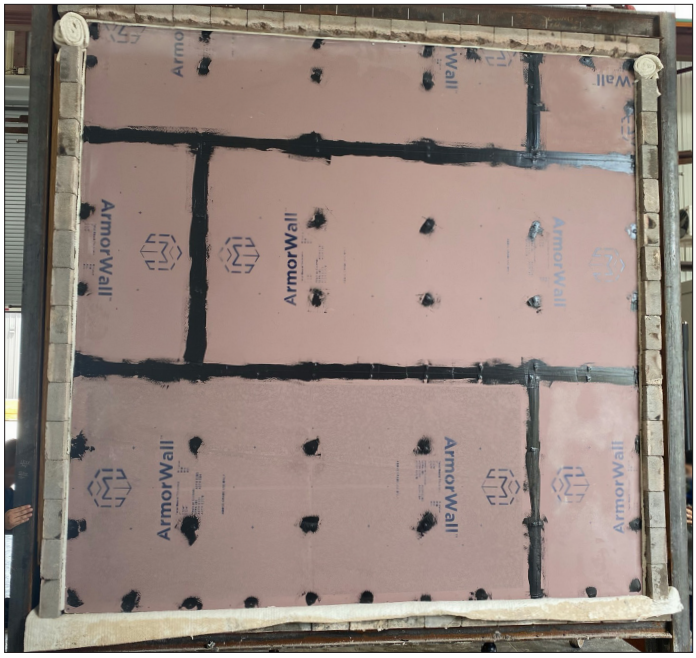
Required Ratings: Load Bearing Walls
Once the Type of Construction is known, the design is then referred back to Table 601 within Chapter 6 to better understand the requirements for each wall assembly within the Type and its requirements. A summary of Table 601 for exterior load bearing walls is listed below for reference.

Required Ratings: Non-Load Bearing Walls
Whereas the requirements for load bearing walls are most often derived from the Type of Construction, the fire resistance rating for non-bearing walls is derived from the type of materials used to the Occupancy Group of the proposed building design. Table 705.5 within the ICC code provides limitations based upon the distance the structure is from the lot line or another structure, defined as the fire distance within IBC. Often this is stated with the following distances where X = the fire separation distance in feet.

X < 5; 5 ≤ X < 10; 10 ≤ X 30; or X ≥ 30

As you move the building structure closer to the lot line, the fire requirements for the non-bearing walls become greater, meaning that they would need to demonstrate a longer performance in most applications. The full 705.5 Table can be found and viewed for no fee at the ICC Store at https://codes.iccsafe.org where the codes are searchable via each state or by year of the generic I-Codes. Either click on the state of choice, or search by Title and navigate to the code that pertains to the structure being designed.

Required Ratings: Asymmetrical Walls
I-Codes allow for a reduction in fire ratings from the exterior side of a wall assembly if the fire separation distance is greater than 10'. Section 705.5 states that these walls need only be rated for exposure to fire from the inside; whereas walls within 10' of the fire separation distance by either a lot line or another structure, shall be rated for both sides of the wall assembly. Thus in some applications the required wall rating is more dependent upon the interior finishes to meet the requirements of the fire rating rather than the exterior sheathing and components. This section is often misunderstood and often overlooked when attempting to determine fire ratings of the proposed wall assembly for a design.



ArmorWall™ Plus FR SIS panel being prepared for ASTM E119 / UL 263 testing

ArmorWall™ SP Plus FR SIS panel during ASTM E119 / UL 263 testing

Building Element	Type I		Type II		Type III		Type IV				Type V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Bearing Walls												
Exterior	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	3	2	2	1/HT	1	0
Nonbearing Walls												
Exterior	See Table 705.5											
Interior	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0

Table 601 for Exterior Load Bearing Walls

ArmorWall Fire-Rated Assemblies

DuPont™ ArmorWall™ Systems have been tested at approved third party fire labs around the country to demonstrate compliance with multiple assemblies for the Designer of Record. Assemblies with DuPont™ ArmorWall™ Plus Fire-Rated (FR) Structural Insulated Sheathing (SIS) panels have been tested and achieved ratings for up to 1 hour assemblies. Assemblies with DuPont™ ArmorWall™ SP Plus Fire-Rated (FR) Structural Insulated Sheathing (SIS) panels have been tested and achieved ratings for up to 2 hour assemblies.

In addition, ArmorWall™ Systems can be installed on all five construction types of buildings as classified by the International Building Code in Chapter 6. In order to assist in choosing an assembly type, we have created the DuPont™ ArmorWall™ Systems Rated Assemblies Handbook, which contains drawings of ASTM E119 and sound rating approved assemblies.

For more information, contact us at:
ArmorWall.CustomerService@DuPont.com
Or, visit the DuPont Performance Building Solutions (PBS) Resource Center for the most up-to-date handbook available.

NOTICE
DuPont™ ArmorWall™ Systems is a manufacturer of goods for the construction industry and not a design entity. Thus this information is provided for reference only to the designer. Certain jurisdictions also have local codes and fire jurisdictions that have other requirements that are not listed within the I-Codes which supersede these general guidelines.

The interior side of an ArmorWall™ Plus FR SIS panel after two hours of continuous testing

For more information visit us at armorwall.dupont.com or call 1-800-448-9835

43-D101174-enUS