FIRE RATED ASSEMBLIES

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 703.3 of the IBC states the building elements, components or assemblies shall be determined in accordance with the test procedures stated within ASTM E119 or UL 263 or established by the following methods or procedures:

1. Fire-resistance designs documented in approved sources, IE the testing was ran and can be correlated to the specific design.
2. Prescriptive designs as described in Section 721 of known materials.
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 protection methods allowed by Section 104.11.
6. Fire-resistance designs certified by an approved agency.

REQUIRED RATINGS – Load Bearing Walls

Once the Type of Construction is known, the design is then referred back to Tables 601 and 602 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.

<table>
<thead>
<tr>
<th>Building Element</th>
<th>Type I</th>
<th>Type II</th>
<th>Type III</th>
<th>Type IV</th>
<th>Type V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearing Walls</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>HT</td>
</tr>
<tr>
<td>Exterior</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Interior</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1/HT</td>
</tr>
<tr>
<td>Non-Bearing Walls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See Table 602</td>
</tr>
</tbody>
</table>

Actual testing of ArmorWall to furnace during ASTM E119 2-hour endurance testing.
REQUIRED RATINGS – Nonbearing 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 602 provides limitations based upon the distance the structure is from the lot line or another structure, defined as the fire separation distance within IBC. Often this is stated with the following distances where X = the fire separation distance in feet.

\[
X < 5; \ 5 \leq X < 10; \ 10 \leq X < 30; \text{ or } X \geq 30
\]

As you move the building structure closer to the lot line, then fire requirements for the nonbearing walls become greater, meaning that they would need to demonstrate a longer performance in most applications.

The full table can be found and viewed for no fee at the ICC Store at [https://codes.iccsafe.org](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.

Asymmetrical Walls

To further complicate fire ratings, the 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 feet. Section 705.5 states that these walls need only be rated for exposure to fire from the inside; whereas walls within 10 feet of the fire separation distance by either a lot line or another structure, shall be rated 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.
TESTING AND RATINGS

The ASTM E119 or UL 263 tests are very stringent in application 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.

ArmorWall Structural Insulated Sheathing™ products have been tested at both UL and other approved third party fire labs around the country to demonstrate compliance with multiple assemblies for the Designer of Record. In order to better assist in choosing an assembly type and layers, MaxLife has created our ArmorWall Rated Assemblies handbook of reference that includes drawings of the assemblies, as well as sound ratings and NFPA 285 current approvals. The most current version will always be posted on our website on the Design Professional page under the ArmorWall Rated Assemblies handbook link within the UL 263 and ASTM E119 section. Or you can simply click here to download:

ArmorWall Rated Assemblies Handbook.pdf

With over 30 different wall designs and thicknesses available, it can be confusing so we encourage any further questions to contact Technical Services at 1-844-MAX4YOU.

As MaxLife Industries is constantly Innovating the Building Enclosure™ this design guide will often be updated once new testing and systems are available. Always use the most current version of the ArmorWall Rated Assemblies handbook that is posted at www.maxlifeindustries.com

Disclaimer
MaxLife 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.