



NFBA Technical and Research Committee

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Post Frame Construction and Best Practices

Fire Rated Wall Assemblies and Post Spacing

INTRODUCTION

The National Frame Building Association (NFBA) has coordinated a number of fire tests to determine the fire resistance rating of post frame assemblies since 2012. All of the testing has been done with posts located at 8' centers. Why is this and what would be the impact if posts were not located at 8' centers?

DISCUSSION

NFBA has actually run several tests to confirm the fire rated capabilities of typical post frame construction. These tests were completed on two separate occasions. The first in 2012 using 4 layers of 5/8" Type X gypsum on each side of the wall and the second test in 2018 with 3 layers of 5/8" Type X gypsum on each side of the wall. The test standard that is used to make this determination is ASTM E119 or UL 263. Both tests are very similar and provide the same performance information. Each is also referenced in the International Building Code (IBC) and the International Residential Code (IRC).

In these fire tests, an actual wall assembly is constructed and used as one wall of a contained space. An actual furnace is used as the opposite wall to generate heat in excess of 1850°F. The intent of the test is to determine the amount of time required for the temperature of the unexposed side of the wall to reach the ambient temperature plus 250°F. This is considered a safe temperature that will not promote ignition of fire on the unexposed side of the wall.

The size of the wall sample is the same as the size of the furnace opening so the heat is distributed across the sample as if a fully involved room was the fire source. That furnace opening size is ~ 9'.

The NFBA sample was constructed using an 8' post spacing to allow exposure on all sides to the heat associated with the fire. Horizontal girts were installed across the exposed face of the posts to provide connection points for the gypsum.

During the test the gypsum wall deflects towards the fire source as the gypsum dries out and decays. Obviously, this bowing towards the fire makes that section of the wall closer to the source and exposed to higher temperatures. If the columns were placed closer together, the unsupported girt length would be shorter; have less deflection and the gypsum would remain in place longer.



Post Frame Construction and Best Practices

Spacing between posts that are greater than 8' are generally not able to be tested in ASTM E119 or UL 263. An engineering analysis would be required to determine the fire resistance rating of these assemblies.

Summary

The 8' spacing between posts is the largest sample capable in this test configuration. This post spacing is justified based on actual testing and engineering judgements created for this particular assembly. Post spacing greater than 8' should be evaluated by a registered design professional to determine the allowable value as a fire-resistant assembly.

For more information, please visit the NFBA Web site at www.nfba.org

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- Advocating for the interests of our industry
- Recognition of industry-achievement awards
- Monitoring of industry issues, such as codes and standards
- Research to develop improved post-frame construction products and practices
- Promotional and marketing support for the post-frame construction industry
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