

# Indoor Wall Pads: Achieving Code Compliance

- ⊕ *An assessment of current-day building codes and life safety codes, as they relate to indoor wall pad applications and fire protection for building construction and existing facilities.*



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# Indoor Wall Pads: Achieving Code Compliance

## INTRODUCTION

Indoor wall pads exist to provide safety for gymnasium occupants. Wall pads are typically thought of as a product designed and installed to protect those individuals who engage in sport or physical education activities. It is less often considered that indoor wall pads should also be thought of as a building material that must perform adequately to meet the codes and standards of modern building construction and finish.

Wall pads, which are partially composed of foamed plastic materials, have been identified as a potential fire hazard and threat to the safety of building occupants. It is important to understand the specific requirements that wall pads should meet to be approved in accordance with today's most widely adopted building codes and life safety codes. In addition, it is the responsibility of manufacturers, owners, architects, specifiers, contractors, and local code officials to ensure that code-compliant wall pads are selected and installed within a building.

## Summary

- Indoor wall pads are defined as an interior finish under two widely adopted model codes, the NFPA 101 Life Safety Code and the International Building Code.
- The International Building Code and NFPA 101 Life Safety Code imply that indoor wall pad assemblies must be tested in accordance with NFPA 286 or UL 1715.
- Wall pads that only contain individual fire-tested components (i.e. vinyl facing or foam filler) do not meet code under NFPA 101 nor International Building Code. Wall pad assemblies should be tested as a complete panel.
- Specifying an indoor wall pad assembly with an ASTM E84 rating does not meet the most current code language set forth by the International Building Code or NFPA 101 Life Safety Code.
- Several steps should be taken by manufacturers, owners, architects, specifiers, contractors, and local code officials to guarantee a safe, code-compliant indoor wall pad is installed within a building.



+ A school gymnasium wall is lined with wall pads, which terminate at an exit door.

# Indoor Wall Pads: Achieving Code Compliance

## DEFINITION OF INDOOR WALL PADS

An indoor wall pad is broadly defined as an exposed, fixed panel assembly capable of providing impact attenuation when a human makes contact with an interior wall surface. ASTM Standard F2440, *Standard Specification for Indoor Wall/Feature Padding*, more specifically establishes that wall pads are assembled prior to use and should be installed in such a manner that all panel sections fasten securely together. Pads are typically installed no more than four inches from the floor, up to 6 feet tall. (ASTM, 2010) Additionally, ASTM F2440 establishes minimum shock absorption properties that a wall pad shall be capable of achieving.

Indoor wall pads are commonly fabricated using three primary material components:

- Rigid Backing Board
- Foamed Plastic Filler
- Textile or Vinyl Facing or Cover

Wall pad manufacturers choose from an expansive list of materials to fabricate their wall pad assemblies. Each material component of the pad assembly carries individual specifications that may meet particular standards- including fire rating standards. While individual material components of the wall pad may carry a particular rating or meet a certain standard, the wall pad itself should only be evaluated as a finished product assembly. This is the only acceptable method that should be used to evaluate the performance of a wall pad.

## APPLICABLE BUILDING CODES AND LIFE SAFETY CODES

There are two widely adopted model codes that guide the use of indoor wall pads within various building occupancy types.

- |   |  |
|---|--|
| - The International Building Code (IBC) | <i>Adopted for Building Construction</i>         |
| - The NFPA 101 Life Safety Code         | <i>Adopted for New &amp; Existing Facilities</i> |

It is important for professionals to understand the distinct purposes and differences of building code and life safety code. In general terms, building code strives to address all components of building construction and design, while life safety code may focus solely on life safety and fire prevention. It should specifically be noted that the NFPA 101 Life Safety Code provides standards for both new and existing facilities.

Any member who is professionally responsible for the liabilities of building performance or the safety of building occupants should become familiar with the requirements of these model codes as they relate to indoor wall pads. These codes are frequently adopted by local and state jurisdictions and sponsored by insurance companies.

## CODE CLASSIFICATION OF INDOOR WALL PADS

Indoor wall pads are specifically classified as an interior finish within a building, as defined by the NFPA 101 Life Safety Code.

“Fixed or movable walls and partitions, paneling, wall pads, and crash pads applied structurally or for decoration, acoustical correction, surface insulation, or other purposes shall be considered interior finish and shall not be considered decorations or furnishings” (NFPA, 2015).

Similarly, the International Building Code defines interior wall and ceiling finish as:

“The exposed interior surfaces of buildings, including but not limited to: fixed or movable walls and partitions; toilet room privacy partitions; columns; ceilings; and interior wainscoting, paneling, or other finish applied structurally or for decoration, acoustical correction, surface insulation, structural fire resistance or similar purposes, but not including trim” (ICC, 2015) .

Many loose building materials are classified as Decorative Materials and Furnishings under IBC and NFPA 101. These products are only required to meet the flame propagation criteria of tests such as NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films* (ICC, 2015; NFPA, 2015). Wall pads, however, are specifically considered an interior finish under the aforementioned model codes and must be tested more stringently than decorative materials and furnishings in order to meet code requirements.

## CODE REQUIREMENTS: FOAMED PLASTIC INTERIOR FINISH MATERIALS

Indoor wall pads are largely composed of cellular or foamed plastic materials. Both IBC and NFPA 101 codes state that foamed plastic materials, whether exposed or used in conjunction with a vinyl facing or cover, shall not be used as an interior wall finish unless they meet specific criteria. Cellular or foamed plastic materials are only permitted when subjected to large-scale fire tests that substantiate both their combustibility and smoke release characteristics (ICC, 2015; NFPA, 2015).

NFPA 101 and IBC have designated four available standard tests to assess the combustibility of various foamed plastic materials. Foamed plastics must be tested in accordance with one of these four tests to be permitted for use under guidance of either model code. There are two notable large-scale tests available that can adequately assess the combustibility of wall pad assemblies.

- NFPA 286. *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.*
- ANSI/UL 1715. *Standard for Fire Test of Interior Finish Material* (including smoke measurements, with total smoke not to exceed 1000 m<sup>2</sup>)

These tests should be performed on the finished foamed plastic assembly in its end-use configuration. As previously stated, testing of an individual assembly component (such as a foam filler or vinyl facing) does not properly qualify a wall pad assembly to be used as an interior finish within a building.

## WALL PAD ASSEMBLIES RATED UNDER ASTM E-84

There is much confusion surrounding wall pad specifications and assumed requirements for testing in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*. A wall pad assembly that is solely tested in accordance with ASTM E84 does not appropriately qualify that pad to be accepted under International Building Code or NFPA 101 Life Safety Code. While an ASTM E84 rating may satisfy the requirements of other interior finish materials, cellular or foamed plastics must be tested in accordance with NFPA 286, UL 1715, UL 1040, or FM 4880.

Given practical consideration, differences in testing between ASTM E84 (also known as a tunnel test) and tests such as NFPA 286 (also known as a large-scale test) help better prescribe the selection of large scale tests like NFPA 286 for testing of foamed plastic materials. This is because tunnel testing alone might not properly assess the potential fire hazard of plastics (NFPA, 2015). Rather, tests that simulate the conditions of actual product use (i.e. NFPA 286) have been deemed appropriate for testing foamed plastic materials such as wall pads.



+ At left: An NFPA 286 large-scale room test is performed on a wall pad assembly, configured to match end-use conditions.



+ At right: Wall pads are placed horizontally and aligned end-to-end for an ASTM E84 tunnel test.

## CONCLUSION

Indoor wall pads have been identified as a potential fire hazard and threat to the safety of building occupants. As such, model building codes and life safety codes have been modified over the past decade to better address the fire hazards that wall pads and other foamed plastics can present.

Wall pads should be treated as interior finishes within a building, not decorative materials or furnishings. Wall pads are often permanently or semi-permanently installed and as such should be considered interior wall surfaces. Wall pads are often placed within close proximity to marked exit doors and other areas of egress- making it even more critical that a fire-rated pad assembly is selected.

Wall pads, and other foamed plastic interior finish materials, must be tested in accordance with NFPA 286 or another comparable large-scale test in order to comply with International Building Code or NFPA 101 Life Safety Code. The test should simulate the conditions of actual product use, by arranging the wall pads in an upright manner and fastening the sections securely together. Solely testing in accordance with ASTM E84 does not appropriately qualify a wall pad assembly for code compliance, under current guidance of IBC or NFPA 101.

Individual components of wall pads, including the vinyl covering material or the foam filler, may be individually rated in accordance with fire tests such as NFPA 701 or ASTM E84. While these ratings may improve the overall performance of the wall pad assembly during a fire, the pad does not comply with NFPA 101 or IBC unless the entire pad assembly is tested as a complete panel in accordance with NFPA 286 or another approved large-scale test. As such, it is extremely important to review the specifications of various wall pad assemblies with detail.

Most importantly- it is the responsibility of all parties, not one specific individual or group, to ensure that code-compliant wall pads are selected and installed within a building.

## REFERENCES

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**Are your wall pads ready for a fire?**

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