



CAMPUS FIRE SAFETY CODE TALK

Campus Fire Safety e-NewZone

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How to apply NFPA 1, Fire Code to a makerspace on college campuses

Last year I was visiting my alma mater, Worcester Polytechnic Institute, and got to check out a brand new building that had just opened on campus the week before. As I entered the front of the building I noticed a sign welcoming visitors/residents/students to the “makerspace.” I know this is not a new concept but the word as well as the concept seem to be growing in popularity. Since then I feel like I have heard about makerspaces (also referred to as “hackerspaces”) in office building, at colleges, and universities, and even in K-12 schools. Perhaps it is an existing concept but used more recently to market facility designs as collaborative, modern, innovative, and entrepreneurial.

So, what exactly is a makerspace?

A quick search online finds one definition of makerspace to be “a place in which people with shared interests, especially in computing or technology, can gather to work on projects while sharing ideas, equipment and knowledge.” The development of makerspaces grew from the maker culture which leans heavily on the idea that learning is done through doing (ironically the WPI motto of theory and practice is very much in line with the maker culture). Whether for employees, students, researchers or scientists, these spaces promote collaboration with a hands-on experience in an inspiring and innovative environment. And they are popping up all around us!

How does NFPA 1 apply to a makerspace?

When I saw this makerspace in person I asked myself, “How would the Code apply to such a unique space?” (I am not sure that’s the first question on everyone’s mind, but it was on mine.) From a Fire Code perspective there are a number of things to consider. First, what is the occupancy classification of the space? Chapter 6 of NFPA 1 addresses occupancy classification. A makerspace could fall under a few options: industrial, assembly, or educational occupancies are the ones that come to mind. Further understanding of how the space is used (Is it instructional or industrial? Will there be any hazardous materials present as part of laboratory type work or experiments?); if it is part of a larger overall space



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(is it incidental to an industrial use to an assembly area or office building, for example?); and what occupants will be present there (K-12, more than 50, college level, for example) will help to classify the occupancy of the space appropriately.

Let's talk more about the building at WPI that I referenced above.

There are many different types of spaces included in the building. Prototyping lab, multiple active learning classrooms (group learning, moveable furnishings), teaching laboratory (including a robotics lab and the makerspace), a gallery, a video recording suite, counter service food vendors, and a multi-story dormitory on the upper levels. Phew, that's a lot. It most certainly was designed as a dormitory since that is the predominant occupancy in the building and then the final occupancy of the first two levels is dependent on a further analysis of how the space is used and occupied. The makerspace is part of the teaching laboratory and open to most of the floor.

The Code guides users to business occupancies for instructional type laboratories. But, if part of a larger 'gallery' space or on a floor, which may also include multiple college classrooms of 50 or more people, the designer may have included the makerspace into the assembly occupancy space, and applied the Code as necessary. Occupancy classification determines how the remainder of the Code is applicable as much of the codes provisions for life safety, egress design, and fire protection systems are occupancy dependent.

Besides occupancy classification, other provisions of NFPA 1 unique to makerspaces include, but are not limited to, the following:

- Chapter 26 for laboratories using chemicals. Where the makerspace includes laboratory facilities that use chemicals the handling and storage of such chemicals would comply with Chapter 26 which mandates compliance with NFPA 45.
- Chapter 60 for hazardous materials. Where the makerspace contains high hazard contents, it and its contents must comply with Chapter 60 of NFPA 1 and any additional requirements specific to the materials from Chapters 61 through 75.
- Chapter 20 for occupancy-specific provisions related to interior finish, furnishings and contents and operating features.
- Chapter 13 for occupancy-specific provisions related to fire protection systems.



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- Section 14.8 for capacity of the means of egress. Egress design and occupant load calculations should make sure to carefully understand how the makerspace is used so that the correct number of people present in the space can be estimated.

Makerspaces are only going to become more and more popular in new building design and even as existing buildings modernize their space. Today we seem to put a lot more emphasis on collaboration, innovation, openness and sharing, all of which are supported by the makerspace model. If your jurisdiction is responsible for enforcing the Code or reviewing new makerspace designs, I hope you will find this discussion helpful in your work ahead.

NOTE: This article first appeared as a post on NFPA's blog, NFPA Today, in November 2018 as part of Ms. Bigda's "Fire Code Fridays" series, and has been edited.

Link to original blog:

<https://community.nfpa.org/community/nfpa-today/blog/2018/11/02/nfpa-1-how-to-apply-the-code-to-a-makerspace-firecodefridays>





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