



Luminous Egress Path Markings

It's More Than the Eye Can See

By Mark A. Goska, AIA, LEED AP

When the 2009 edition of the International Code Council (ICC) family of codes was created and adopted, a little-known change in the International Building Code (IBC) and the International Fire Code (IFC) came into effect that, when enforced, can have a substantial impact on both construction and O&M budgets. What is this code requirement, you ask? Well, it's the requirement to install luminous egress path markings along the exit pathways in buildings having occupied floors located more than 75 feet above the lowest level of fire department vehicle access.

What are luminous egress path markings, and how long have they been a requirement for life safety? The National Fire Protection Association's (NFPA) Life Safety Code defines photoluminescence as "having the ability to store incident electromagnetic radiation typically from ambient light sources, and release it in the form of visible light." In other words, photoluminescent material absorbs energy provided by visible light and near visible light and then releases that energy at some later time, also in the form of light."¹

HISTORY

The use of photoluminescent markings began in the 1980s with the FAA requiring the use of electrically powered markings on commercial aircraft. Since that time, the NFPA and other code councils have passed the requirement for photoluminescent egress path mark-

ings in response to accidents involving fatalities, including the attacks on and the collapse of the World Trade Center towers on September 11, 2001. In 2007, the ICC adopted the requirement of pathway markings along the exit pathways, including the stairwells, of new

and handrails under emergency conditions. The provisions of Section 1024 add an additional level of safety to the egress path by requiring the installation of photoluminescent or self-illuminating marking systems which do not require electrical power and its associated wiring

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high-rise buildings of most occupancy groups: assembly, business, educational, institutional, mercantile, and transient residential (hotels). This requirement was included in the 2009 editions of the IBC and IFC and in 2008 was amended to include existing high-rise buildings for the IBC 2009 edition. Interestingly enough, R2 occupancies, which include dormitories and fraternity/sorority houses, are not included in this requirement.

QUESTIONS

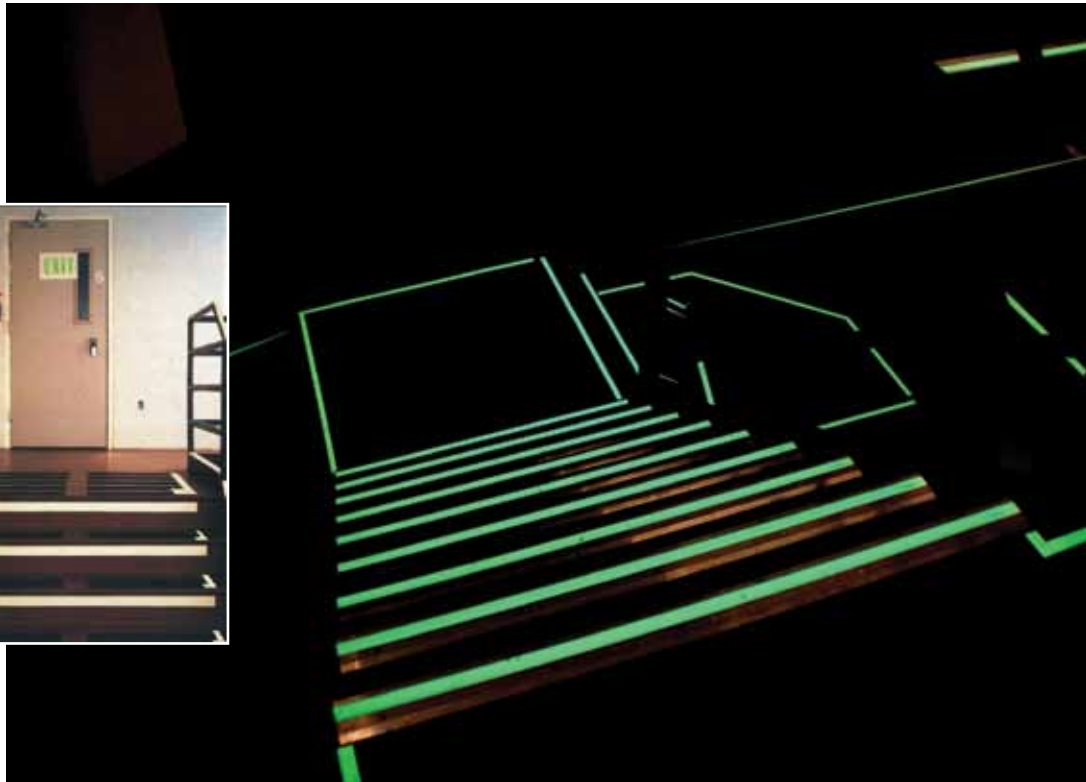
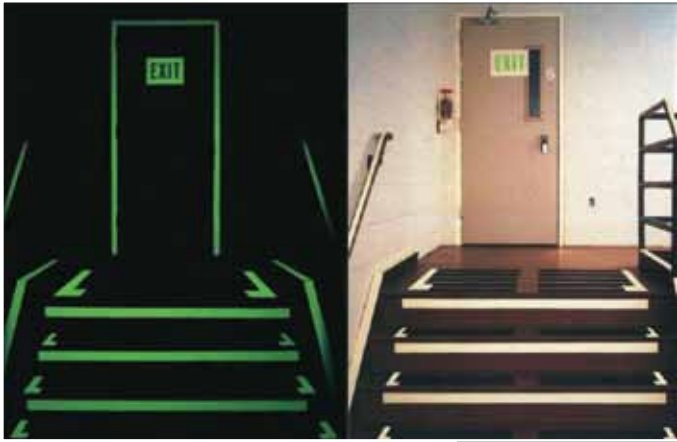
As one looks at the code requirement and compares it to the life safety features that are currently in place, the question of why is this needed arises. Per the ICC, the justification for this requirement states, "Improved safety for individuals negotiating stairs during egress of a high-rise building is provided by improving visibility of stair treads

and circuits."² Other questions and concerns regarding this code section are:

- is it retroactive
- who enforces this requirement in your jurisdiction
- what will it cost to install and maintain
- what is your responsibility for ensuring compliance, and
- are there options available for compliance?

ENFORCEMENT

This code requirement is located in both the IBC and the IFC. The IBC provides code requirements for new construction and the IFC for existing facilities, so yes, this is a retroactive code. Enforcement of the code varies by jurisdiction, however in our jurisdiction the fire marshal's office, both at the state and local levels, are charged with enforcement of this code requirement.



The cost impact for meeting this code requirement appears to be fluid. Some in our industry are seeing costs to install luminous egress path markings in existing buildings ranging from \$1,600 to \$1,700 per landing. This cost could vary depending on the material used, the method of installation, and, in the case of retrofits, the existing condition. The requirement to install luminous egress path markings is a life safety issue and, as such, it is the responsibility of the code enforcement entity to ensure that this requirement is met. Non-compliance of this code requirement could result in legal exposure should a catastrophic event occur.

ALTERNATIVE SOLUTIONS

Considering the potential cost impact of installing luminous egress path markings, there are alternative solutions available such as using luminous tape or photoluminescent paint in lieu of mechanically fastened egress path markings. All of these alternative solutions have inherent issues as well.

Using tape as a solution will require that the surfaces be cleaned prior to

installation and will need to be kept clean in order to help prevent the tape from losing its adhering capabilities. Like paint, the maintenance costs may be higher due to the need to reapply the material as a result of normal wear and tear from hand and foot traffic.

CONCLUSION

Luminous egress path markings provide an added safety feature to assist occupants of high-rise buildings to exit safely. This feature comes at a cost, but there may be trade-offs in cost when comparing it to the cost of operation and maintenance of emergency lighting and exit signage currently being used. “The main advantage to electrically powered pathway marking is that it can be brighter than photoluminescent technology, ... [yet] that brightness is dependent on a battery, wiring, and connections, which may fail to operate. Photoluminescent technology cannot fail to emit light once it has been “charged” by an ambient light source.”³

However, photoluminescent technology requires a minimum of 1-foot candle

of light and in some cases 2-foot candles of light to fully charge the product. This could be problematic if, for instance, the egress lighting located within the exit stairs is connected to a motion detector and doesn’t activate unless someone is in the stairway.

Careful assessment of your current life safety condition along with a discussion with your local code enforcement official is important before proceeding with implementation of this code requirement. 💰

ENDNOTES

1. What is Photoluminescent Marking? James D. Amy, *Building Operating Management*, July 2008
2. Section 1024 Luminous Egress Path Marking, 2009 International Fire Code Commentary, 10-144
3. What is Photoluminescent Marking? James D. Amy, *Building Operating Management*, July 2008

Mark Goska is executive director, quality & compliance, at the University of Alabama-Birmingham. He can be reached at mgoska@uab.edu.