



## Guidance for Embedding CPVC in Concrete

One year ago, the September 9, 2008, issue of NFSA's *eTechAlert* (No. 126) reported that an issue had arisen relative to whether NFPA 13 allowed the embedment of CPVC in concrete. Informal interpretations had been requested from both the NFSA and the NFPA, and the responses were essentially the same: NFPA 13 does not prohibit this practice, but there are obvious concerns for potential damage and long-term maintenance. These concerns are not dissimilar to compatibility issues, which for the most part are not part of current listing limitations.

Although no changes were proposed to NFPA 13 on this subject during the development of the 2010 edition of NFPA 13, the Lubrizol Corporation now provides specific guidance on the subject for its BlazeMaster® CPVC:



## BLAZEMASTER® PIPE & FITTING INSTALLATIONS IN CONCRETE

BlazeMaster® CPVC pipe and fittings are acceptable for use in embedded concrete. Direct contact with concrete does not have any adverse effect on BlazeMaster® materials. Typical recommended installation practices should be followed. In addition, particular care must be paid to the following guidelines.

1. As the BlazeMaster® pipe is laid out be certain that it does not come in contact with sharp objects or edges, such as rocks, metal, or structural members.
2. Although CPVC pipe has some degree of flexibility, in laying out the pipe it is best to use straight runs of pipe. It is possible for CPVC pipe to be snaked when it is laid out. This can be useful in some installations when some offset from a straight run can be helpful in avoiding various construction obstacles. However, straight runs of pipe will minimize any stress that is exerted on the pipe. When the pipe is embedded in concrete there is no opportunity to relieve any stress once the concrete is poured. Therefore, it is important to layout the piping such that the stress is minimized from the time of installation.
3. Avoid the contact of BlazeMaster® pipe and fittings with construction materials that are incompatible with CPVC. Verify the suitability of a particular product for use with CPVC with the manufacturer of the particular construction material.
4. Steps must be taken to prevent the wire mesh or reinforcing bars from causing any abrasion damage to the BlazeMaster® pipe and fittings. This is mostly of concern prior to pouring the concrete.
5. When there are pipe joints that will eventually be covered in concrete, the installation must be pressure tested prior to pouring the concrete. If there will not be any joints covered by concrete, there is no need to pressure test the system prior to pouring the concrete.
6. Prior to the pouring of the concrete, the BlazeMaster pipe should be intermittently secured to prevent movement during this process. Nonabrasive, plastic fasteners are good choices for this application.
7. Care should be taken so that the BlazeMaster pipe and fittings are not damaged by the tools and equipment used to pour and finish the concrete.
8. As the concrete is poured, periodically check to see that the pipe has not moved from its intended positioning.
9. During the concrete pouring process jostle the pipe periodically to assure that there are no air pockets around the pipe. The pipe should be fully covered in concrete. There is a possibility of abrading the pipe if large air pockets are permitted to form around the pipe.
10. Thermal expansion and contraction is not an issue for BlazeMaster® pipe and fittings that are embedded in concrete. Those forces are relieved in a manner that does not affect the pipe or fittings. However, expansion and contraction must still be incorporated in the design of those sections of pipe that are not embedded in concrete. Failure to adequately allow for stress at these points may result in damage to the pipe where it enters and exits the concrete.

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The practice of embedding CPVC sprinkler piping, along with plumbing and other service piping, is reportedly more common in countries outside North America. In Panama, for example, it is reported that this has been done in more than 50 high-rise buildings. Sprinkler adapters are typically protected during the concrete pour through the use of sections of 2-inch diameter PVC filled with sand. Following the pour and removal of the wood forms, the sand is dug out from the floor below to provide access to install sprinklers.

**Upcoming "Technical Tuesday" Online Seminar – September 15<sup>th</sup>**

**Topic: Math**

**Instructor: Victoria B. Valentine, P.E., NFSA Director of Product Standards**

**Date: September 15, 2009**

Math is a fundamental tool used throughout fire protection systems from their planning and detailing to their inspections as the systems mature. This seminar will include a review of mathematical functions, significant figures and interpreting graphs on a basic level. On the intermediate level problems using algebra, geometry and trigonometry will be discussed. In addition, metric measurements will also be covered focusing on converting. (Great study guide for NICET Work Elements 41004, 41010, and 43010)

To register or for more information, contact Dawn Fitzmaurice at (845) 878-4207.

**Upcoming "Business Thursday" Online Seminar – September 24<sup>th</sup>**

**Topic: Roles of the System Inspector and AHJ**

**Instructors: Dominick Kasmauskas, NFSA New York Regional Manager and Russ Fleming, NFSA Executive Vice President**

**Date: September 24, 2009**

This seminar focuses on the assigned roles and obligations of both the system inspector and the Authority Having Jurisdiction charged with the enforcement of NFPA 25. It will highlight areas in which the inspector must be careful to avoid crossing the line into hazard analysis and evaluation of system design capabilities. What are the options for the AHJ who would like to see these issues addressed? How are system deficiencies and impairments best reported?

To register or for more information, contact Dawn Fitzmaurice at (845) 878-4207.

Additional training opportunities available include...

**Two-Week Layout Technician Training**

**September 14-25, 2009**

**Baltimore, MD**

**October 12-23, 2009**

**Phoenix, AZ**

For more information, contact Nicole Sprague using [Sprague@nfsa.org](mailto:Sprague@nfsa.org) or by calling 845-878-4200 ext. 149.

**In-Class Training Seminars**

Introduction to Sprinkler Systems (1/2 Day AM)	Alexandria, MN	Sept 8
NFPA 13 2002 Update (1/2 Day PM)	Alexandria, MN	Sept 8
Plan Review Policies & Procedures	Alexandria, MN	Sept 9
Inspection, Testing & Maintenance	Alexandria, MN	Sept 10
Commissioning & Acceptance Testing (1/2 Day)	Seattle, WA	Sept 15
CPVC Piping (1/2 Day)	Seattle, WA	Sept 15
Hydraulics for Fire Protection	Seattle, WA	Sept 16
Standpipe Systems for Fire Protection (1/2 Day)	Seattle, WA	Sept 17
Fire Pump Layout & Sizing (1/2 Day)	Seattle, WA	Sept 17
NFPA 13 2007 Update	Dayton, OH	Sept 16
Sprinklers for Dwellings	Dayton, OH	Sept 17
CPVC Piping Installation Requirements (1/2 Day)	Dayton, OH	Sept 18
Commissioning and Acceptance Testing (1/2 Day)	Dayton, OH	Sept 18
NFPA 13, 13R, 13D 2007 Update	Anaheim, CA	Sept 22
Hydraulics for Fire Protection	Anaheim, CA	Sept 23

Underground Piping (1/2 Day)	Anaheim, CA	Sept 24
Basic Seismic (1/2 Day)	Anaheim, CA	Sept 24
Plan Review Policies & Procedures	Berlin, VT	Sept 22
Sprinkler Protection for Rack Storage	Berlin, VT	Sept 23
CPVC Piping (1/2 Day)	Berlin, VT	Sept 24
Basic Seismic Protection (1/2 Day)	Berlin, VT	Sept 24
NFPA 13 Overview	Menasha, WI	Sept 30-Oct 1
Hydraulics for Fire Protection	Menasha, WI	Oct 2
Inspection, Testing & Maintenance	Concord, NH	Oct 13
Residential Sprinklers: Homes to High Rise	Concord, NH	Oct 14
Sprinklers for Dwellings	Concord, NH	Oct 15
Underground Piping (1/2 Day)	Woodland, CA	Oct 20
Commissioning & Acceptance Testing (1/2 Day)	Woodland, CA	Oct 20
Sprinkler Protection for General Storage	Woodland, CA	Oct 21
Sprinkler Protection for Special Storage	Woodland, CA	Oct. 22
Pumps for Fire Protection	Edwardsville, IL	Oct 27
Sprinkler Protection for General Storage	Edwardsville, IL	Oct 28
Sprinkler Protection for Rack Storage	Edwardsville, IL	Oct 29
NFPA 13 Overview	Pembroke, MA	Oct 27-28
Plan Review Policies & Procedures	Pembroke, MA	Oct 29
Inspection, Testing & Maintenance	Irving, TX	Oct 27
Hydraulics for Fire Protection	Irving, TX	Oct 28
NFPA 13, 13R, 13D 2007 Update	Irving, TX	Oct 29
NFPA 13, 13R, 13D 2007 Update	Effingham, IL	Nov 10
Plan Review Policies & Procedures	Effingham, IL	Nov 11
Hydraulics for Fire Protection	Effingham, IL	Nov 12
Sprinkler Protection for Rack Storage	Marana, AZ	Dec 8
Sprinkler Protection for General Storage	Marana, AZ	Dec 9
Basic Seismic Protection (1/2 Day)	Marana, AZ	Dec 10
Advanced Seismic Protection (1/2 Day)	Marana, AZ	Dec 10

These seminars qualify for continuing education as required by NICET.

To register or for more information, contact Dawn Fitzmaurice at (845) 878-4207 or send an e-mail to [seminars@nfsa.org](mailto:seminars@nfsa.org)

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*NFSA Tuesday eTechAlert is c. 2009 National Fire Sprinkler Association, and is distributed to NFSA members on Tuesdays for which no NFSA Technical Tuesday Online Seminar is scheduled. Statements and conclusions are based on the best judgment of the NFSA Engineering staff, and are not the official position of the NFPA or its technical committees or those of other organizations except as noted. Opinions expressed herein are not intended, and should not be relied upon, to provide professional consultation or services. Please send comments to Russell P. Fleming, P.E. [fleming@nfsa.org](mailto:fleming@nfsa.org).*

**About the National Fire Sprinkler Association**

*Established in 1905, the National Fire Sprinkler Association (NFSA) is the voice of the fire sprinkler industry. NFSA leads the drive to get life-saving and property protecting fire sprinklers into all buildings; provides support and resources for its members – fire sprinkler contractors, manufacturers and suppliers; and educates authorities having jurisdiction on fire protection issues. Headquartered in Patterson, N.Y., NFSA has regional operations offices throughout the country. [www.nfsa.org](http://www.nfsa.org).*

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