NFSA The Voice of the Fire Sprinkler Industry

e-TechNotes

Editor-Kenneth E. Isman, P.E. *Issue No. 255*
December 11, 2012

Compatibility of Nonmetallic Pipe

For years, there has been concern about the compatibility of nonmetallic pipe with certain substances with which the pipe comes into contact in the built environment. Some of these concerns involve products that come into contact with the nonmetallic pipe during construction but are incompatible with the nonmetallic pipe. Other concerns involve products that are incompatible with the pipe material that typically come into contact with the pipe some time during the time that the pipe is in service.

Since the incompatible products cannot always be controlled by the installing contractor, the solution has been to inform everyone in the construction process, including manufacturers of other products that are also used in sprinkler systems, sprinkler contractors, general contractors, contractors involved in other trades, and building owners so that everyone knows what products should not come into contact with non-metallic piping system (pipe and fittings).

Until recently, some manufacturers of the nonmetallic piping products have made available lists of known compatible and incompatible products and conveyed that information directly to customers on their websites. Listing laboratories have, for the most part, stayed out of the compatibility issue saying that they have listed/approved the nonmetallic pipe products for use in sprinkler systems by evaluating their performance in accordance with their standards, which include items such as fire resistance and ability to hold pressure, but do not include compatibility with potential substances in the built environment. The labs have warned that it is not possible to dream up every source of potential contamination and develop standard tests to determine if the piping system will be affected. A situation that makes the evaluation of compatibility even more difficult is the role that combinations of potential contaminants might have. While the pipe might not react to individual materials in any significant way, a combination of the materials may cause a serious problem. The number of tests that would have to be run to determine absolute compatibility would be astronomical, and nobody would be able to afford the tests. Therefore, the listing/approval labs have taken the position that the users of nonmetallic pipe will need to determine for themselves if it is the right product to use on any given job.

While manufacturers of nonmetallic piping systems will still play a role in identifying potential compatibility concerns in the future, the burden is beginning to shift, due to a number of forces in the marketplace. This edition of e-TechNotes will be focused on explaining the upcoming shift in the responsibilities regarding the compatibility of nonmetallic pipe. Note that the environment is constantly shifting. This information is based on what is known today, at the time of this printing. The situation may change in the future, and we will strive to keep our members informed if that happens.

NFPA 13 and NFPA 13R

One of the big changes that will be occurring is in the philosophy of NFPA 13 (which has been copied into NFPA 13R as well). In the past, very little information about nonmetallic pipe was actually found in the standard. Section 6.3.6.1 in NFPA 13-2010 (similar section in previous editions and in NFPA 13R) said that nonmetallic pipe could be used as long as it was listed for fire sprinkler service. But the specific use conditions were left to the manufacturers of the pipe and the listing/approval labs to work out. In the 2013 edition of

NFPA 13 and NFPA 13R, that will begin to change. CPVC piping systems will take on a more generic position in the standard. It will still need to be specifically listed for fire sprinkler service, but some specific use conditions will be contained in the standard. On the issue of compatibility, the 2013 edition of NFPA 13 will say the following (with the same language in NFPA 13R, just with different section numbers):

6.3.7.2* When nonmetallic pipe is used in combination systems utilizing steel piping internally coated with corrosion inhibitors and nonmetallic piping, the steel pipe coating shall be investigated for compatibility with the nonmetallic piping by a testing laboratory.

A.6.3.7.2 When fabricating steel pipe for a combination (CPVC–steel) system, the cutting oil and lubricants can cause performance degradation of the CPVC piping. Cutting oils and lubricants found to be compatible are available and should be used.

6.3.7.3* When nonmetallic pipe is used in combination systems utilizing steel pipe that is not internally coated with chemical corrosion inhibitors, no additional evaluations shall be required.

A.6.3.7.3 Other construction materials include but are not limited to materials used in fabrication of the sprinkler system, additives to water supplies, cable and wiring, and certain insecticides and fungicides.

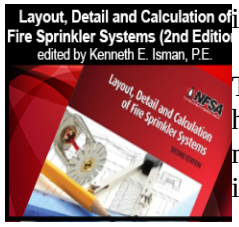
6.3.7.4 When nonmetallic pipe is used in combination systems utilizing steel pipe, cutting oils and lubricants used for fabrication of the steel piping shall be compatible with the nonmetallic pipe materials.

6.3.7.5 Fire-stopping materials intended for use on nonmetallic piping penetrations shall be investigated for compatibility with the nonmetallic pipe materials.

The language in NFPA 13 does not require that nonmetallic pipe be evaluated for compatibility with all known objects in the marketplace. Instead, NFPA 13 focuses on three issues:

1. The compatibility of the nonmetallic pipe in a system that also has steel pipe with some sort of corrosion inhibitor. In this case, the nonmetallic pipe and the corrosion inhibitor need to be evaluated for compatibility. If the steel pipe has no corrosion inhibitor coating, this evaluation is not required.
2. The cutting oils and lubricants used for the fabrication of steel pipe need to be compatible with the nonmetallic pipe if the nonmetallic pipe is going to be used in a system that also has steel pipe.
3. The fire-stopping materials that fill the holes around the nonmetallic pipe as it goes through walls and partitions with fire resistance ratings in order to maintain those ratings need to be evaluated to make sure that it is compatible with the nonmetallic pipe being used.

These three issues are considered by the NFPA 13 committees to be a good first start at trying to address the issues of compatibility while trying to help the listing labs focus on the biggest concerns. The language was intentionally written in such a way that the Authority Having Jurisdiction can look at a wide variety of sources, including the evaluation of the manufacturers of products, to determine acceptable compatibility.



There are a number of manufacturers that have specifically addressed the compatibility issue. The two that have specifically released new information in the past few months will be discussed in this article. If other manufacturers wish to disseminate information on compatibility through the NFSA, they need to send the information to this editor for future consideration.

NFPA 13D

Interestingly, NFPA 13D has chosen to remain silent on this subject. While the issues of compatibility on nonmetallic pipe are the same, the focus of combinations of steel and nonmetallic pipe and firestopping are generally not issues in single family dwellings. Wanting to keep their standard simple and easy to use, the committee responsible for NFPA 13D has chosen to keep their standard out of the compatibility discussion.

This does not mean that you can ignore the situation. When using nonmetallic pipe in NFPA 13D systems, you still need to use the pipe in accordance with the listing, which includes the manufacturer's instructions. This

means that you still need to follow the recommendations of the manufacturer with respect to compatibility.

Lubrizol's Compatibility Program

For many years, The Lubrizol Corporation has maintained a compatibility program for their FlowGuard Gold®, BlazeMaster® and Corzan® CPVC pipe and fitting products. This program is called the FBC™ System Compatible Program (with the FBC standing for each of their three CPVC products). For full information on this compatibility program, go to Lubrizol's website at: http://www.lubrizol.com/BuildingSolutions/ChemicalCompatibilityFinder.html.

Lubrizol does inform users on their website that the compatibility program is only for their CPVC products. Specifically, they say, "all CPVC products are not identical. In particular, different CPVC products contain base resins with various molecular weights, as well as differing chlorine contents and compound additives. As a consequence of these diverging characteristics, the FBC™ System Compatible Program can only help determine chemical compatibility with the aforementioned Lubrizol brands." In the past, Lubrizol has included compatibility information in the following 16 different categories:

1. Antimicrobial coated steel fire sprinkler piping (aftermarket applied)
2. Antimicrobial coated steel fire sprinkler piping (factory applied)
3. Cutting oil
4. Fire blocking, noncombustible sealants
5. Firestop cast-in devices
6. Firestop collars
7. Firestop sealants
8. Firestop wraps
9. Freeze protection
10. Gasket and gasket lubricant
11. Insulation
12. Leak detectors
13. Seismic/expansion devices
14. System accessories
15. Termiticide/insecticide
16. Thread sealants

The Lubrizol compatibility program grew naturally as Lubrizol sought to inform its customers about Lubrizol's understanding regarding compatibility. However, as the program has grown and the industry has changed, Lubrizol has determined that some products constitute more than true ancillary products that are primarily intended for installing CPVC products. For such products, Lubrizol has determined that it is not appropriate for Lubrizol to take a position about compatibility. Instead, the responsibility lies with the manufacturer of the ancillary product to determine compatibility if the manufacturer intends for its product to be used with Lubrizol's CPVC piping system materials. Lubrizol also notes "a product's absence from the FBC™ System Compatible Program does not mean that it is non-compatible with the aforementioned Lubrizol brands. A user should then consult with the manufacturer of that product to determine compatibility."

In August of 2012, Lubrizol announced, "Products that are not used in the installation process and/or are not designed or manufactured to come into contact with our CPVC products will not be listed on our chemical compatibility program." There was some initial confusion as to what that meant because all of the products currently in the program "come into contact" with their CPVC pipe and fitting materials.

Lubrizol has since clarified that they are only taking cutting oils and antimicrobial coatings (aftermarket products and factory applied) off of their list. This means that effective January 1, 2013, the FBC™ System Compatibility Program should still include items 4 through 16 in the list above.

Since this announcement was made, Lubrizol has heard a number of customers express concerns over the language of NFPA 13 and how difficult it will be to install CPVC in a system that also has steel pipe if Lubrizol eliminates the compatibility of cutting oils from their program. In an effort to help its customers with the

transition, Lubrizol published an announcement on November 19, 2012 that they will continue to publish compatibility information on cutting oils, "until industry acceptable compatibility testing programs are prepared and adopted (or accepted)".

Customers have not expressed the same concerns over Lubrizol dropping the antimicrobial coatings from their compatibility program because Factory Mutual has changed their standard 1635 to deal with the compatibility of these coatings with the plastic material.

Wheatland Tube

In a press release dated September 25, 2012, Wheatland Tube stated that, "Wheatland Tube has never warranted compatibility between its steel pipe products and CPVC products. Such a warranty would be impossible, as Wheatland does not now, nor has it ever had adequate information regarding the composition of parent materials used to manufacture CPVC from various manufacturers." In the past, Wheatland Tube referred people to the Lubrizol compatibility program if there were questions about the use of steel pipe in systems that would also have BlazeMaster pipe or other Lubrizol products.

Since Lubrizol will be discontinuing its inclusion of certain products used in steel pipe manufacturing and fabrication, Wheatland will no longer be referring to the Lubrizol compatibility program. Wheatland has stated that they are aware of the Factory Mutual approval for Wheatland Tube's product to be used in hybrid systems using both steel and CPVC piping. Their press release says that, "Wheatland assures its complete confidence in Factory Mutual" and "these statements are made by Factory Mutual based on their testing, not by Wheatland Tube".

It would appear that the user of Wheatland Tube products in systems that also have CPVC pipe would need to evaluate the approval from Factory Mutual, determine if there are any special items that they need to follow in order to be in accordance with the approval, and evaluate the project to make sure that the hybrid system is the correct selection.

Other Nonmetallic Piping Products

This e-TechNotes has focused on BlazeMaster CPVC and Wheatland Tube because these two manufacturers have specifically announced changes to the status quo in recent months. The issues of compatibility are not limited to these two products or even to CPVC piping materials. The language of NFPA 13 is for all nonmetallic pipes and all steel pipes used in hybrid systems. This means that all manufacturers of nonmetallic and steel pipes need to be aware of the subject and need to be taking proactive positions to clarify how their products can continue to be used.

Upcoming NFSA "Technical Tuesday" Seminar – December 18

Topic: Tips for Better Storage
Instructors: Karl Wiegand, E.I.T.
Date: Tuesday, December 18, 2012- 10:30 am EST

Most people understand that the rules for proper protection of storage occupancies depend on the commodity being stored and the storage arrangement (palletized, shelf or rack) and that different chapters of NFPA 13 apply to different combinations of commodity and arrangement. But what many people fail to appreciate in NFPA 13 is that Chapter 12 is full of important criteria that apply to all storage occupancies. This seminar will focus on the little known portions of Chapter 12 that need to be followed for all storage situations. In many cases, these sections can help the user protect a storage occupancy with a lesser demand, which provides the customer with better fire protection at a lower cost..

To register or for more information, click HERE or contact Michael Repko at (845) 878-4207 or e-mail to seminars@nfsa.org.

Upcoming In-Class Training Seminars

The NFSA training department also offers in-class training on a variety of subjects at locations across the country, and in recognition of the current recession has adopted a new reduced fee structure. Here are some upcoming seminars:

Jan 8-10	Westbury, NY	3-Day Inspection & Testing for the Sprinkler Industry
Jan 15	Brea, CA	Commissioning & Acceptance Testing/Basic Seismic
Jan 16-17	Brea, CA	2-Day Protection of Storage
Jan 17	Meridian, ID	Fire Sprinkler Design Options in the IBC
Jan 22-24	Wausau, WI	3-Day Inspection & Testing for the Sprinkler Industry
Jan 25	Wausau, WI	Inspection, Testing & Maintenance for the AHJ

These seminars qualify for continuing education as required by NICET, and meet mandatory Continuing Education Requirements for Businesses and Authorities Having Jurisdiction.

To register for these in-class seminars, click HERE. Or contact Michael Repko at (845) 878-4207 or e-mail to seminars@nfsa.org for more information.

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.