

NFPA® 13-Proposed 2013 Edition

Standard for the Installation of Sprinkler Systems

TIA Log No.: 1054

Reference: Chapter 6

Comment Closing Date: June 1, 2012

Submitter: Bob Caputo, Fire & Life Safety America

STAFF NOTE - This TIA modifies text that was created at the ROP and ROC meeting. The legislative text shown below is based on modifications to ROP/ROC language, not 2010 text.

1. Revise Chapter 6 to read as follows:

Chapter 6 System Components and Hardware

6.1 General. This chapter shall provide requirements for correct use of sprinkler system components and hardware.

6.1.1* Listing.

6.1.1.1 Materials or devices not specifically designated by this standard shall be used in accordance with all conditions, requirements, and limitations of their special listing.

6.1.1.1.1 All special listing requirements shall be included and identified in the product submittal literature and installation instructions.

6.1.1.2 All materials and devices essential to successful system operation shall be listed, unless the requirements of 6.1.1.3, 6.1.1.4, or 6.1.1.5 are met.

6.1.1.2.1 Valve components (including valve trim, internal parts, gaskets and the like) shall not be required to be individually listed.

6.1.1.3 Equipment as permitted in Table 6.3.1.1 and Table 6.4.1 shall not be required to be listed.

6.1.1.3.1 Nonmetallic pipe and fittings included in Table 6.3.1.1 and Table 6.4.1 shall be listed.

6.1.1.4 Materials meeting the requirements of 9.1.1.2, 9.1.1.5.2, and 9.1.1.5.3 shall not be required to be listed.

6.1.1.5 Components that do not affect system performance such as drain piping, drain valves, and signs shall not be required to be listed.

6.1.1.6 The new materials or devices listing instructions shall identify and specify the existing system components, including the fluids conveyed, with which the new listed materials, devices or components are compatible.

6.1.1.6.1 This listing requirement shall also apply to chemical or material modifications made to components listed in Table 6.3.1.1 and Table 6.4.1.

6.1.2 Reconditioned Components.

6.1.2.1 The use of reconditioned valves and devices as replacement equipment in existing systems shall be permitted.

6.1.2.2 Reconditioned sprinklers shall not be permitted to be utilized on any new or existing system.

6.1.3 Rated Pressure. System components shall be rated for the maximum system working pressure to which they are exposed but shall not be rated at less than 175 psi (12.1 bar) for components installed above ground and 150 psi (10.4 bar) for components installed underground.

6.3 Aboveground Pipe and Tube.

6.3.1 General.

6.3.1.1 Pipe or tube shall meet or exceed one of the standards in Table 6.3.1.1 or be in accordance with 6.3.7.9.

6.3.1.1.1* Underground pipe shall be permitted to extend into the building through the slab or wall not more than 24 inches.

Table 6.3.1.1 Pipe or Tube Materials and Dimensions

Materials and Dimensions	Standard
Ferrous Piping (Welded and Seamless)	
<i>Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use</i>	ASTM A 795
<i>Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless Wrought Steel Pipe</i>	ANSI/ASTM A 53
<i>Specification for Electric-Resistance-Welded Steel Pipe</i>	ANSI/ASME B36.10M
	ASTM A 135
Copper Tube (Drawn, Seamless)	
<i>Specification for Seamless Copper Tube</i>	ASTM B 75
<i>Specification for Seamless Copper Water Tube</i>	ASTM B 88
<i>Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube</i>	ASTM B 251
<i>Fluxes for Soldering Applications of Copper and Copper-Alloy Tube</i>	ASTM B 813
<i>Brazing Filler Metal (Classification BCuP-3 or BCuP-4)</i>	AWS A5.8
<i>Solder Metal, Section 1: Solder Alloys Containing less than 0.2% lead and Having Solidus Temperatures Greater than 400°F</i>	ASTM B 32
<i>Alloy Materials</i>	ASTM B 446
CPVC	
<i>Nonmetallic Piping Specification for Special Listed Chlorinated Polyvinyl Chloride (CPVC) Pipe</i>	ASTM F 442
Brass Pipe	
<i>Specification for Seamless Red Brass Pipe</i>	ASTM B 43

6.3.1.2 Steel pipe shall be in accordance with 6.3.2, 6.3.3, or 6.3.4.

6.3.1.3 Copper tube shall be in accordance with 6.3.5.

6.3.1.4 Chlorinated polyvinyl chloride (CPVC) Nonmetallic pipe shall be in accordance with 6.3.7.

6.3.1.5 Brass pipe shall be in accordance with 6.3.7.

6.3.2* **Steel Pipe—Welded or Roll-Grooved.** When steel pipe referenced in Table 6.3.1.1 is used and joined by welding as referenced in 6.5.2 or by roll-grooved pipe and fittings as referenced in 6.5.3, the minimum nominal wall thickness for pressures up to 300 psi (20.7 bar) shall be in accordance with Schedule 10 for pipe sizes up to 5-in. (125-mm), 0.134 in. (3.40 mm) for 6-in. (150-mm) pipe, 0.188 in. (4.78 mm) for 8-in. and 10-in. (200-mm and 250-mm) pipe, and 0.330 in. (8.38 mm) for 12-in. (300-mm) pipe.

6.3.3 Steel Pipe — Threaded. When steel pipe referenced in Table 6.3.1.1 is joined by threaded fittings referenced in 6.5.1 or by fittings used with pipe having cut grooves, the minimum wall thickness shall be in accordance with Schedule 30 pipe [in sizes 8 in. (200 mm) and larger] or Schedule 40 pipe [in sizes less than 8 in. (200 mm)] for pressures up to 300 psi (20.7 bar).

6.3.4 Specially Listed Steel Pipe. Pressure limitations and wall thickness for steel pipe specially listed in accordance with 6.3.7.9 shall be permitted to be in accordance with the pipe listing requirements.

6.3.5* Copper Tube. Copper tube as specified in the standards listed in Table 6.3.1.1 shall have a wall thickness of Type K, Type L, or Type M where used in sprinkler systems.

6.3.6 Brass Pipe. Brass pipe specified in Table 6.3.1.1 is permitted in the Standard Weight in sizes up to 6 in. (150 mm) for pressures up to 175 psig (12 bar) and in the Extra Strong Weight in sizes up to 8 in. (200 mm) for pressures up to 300 psig (20.7 bar).

6.3.7* CPVC Plastic Nonmetallic Pipe. CPVC Nonmetallic pipe in accordance with Table 6.3.1.1 shall be investigated for suitability in automatic sprinkler installations and listed for this service.

6.3.7.1 Listed CPVC nonmetallic pipe shall be installed in accordance with its listing limitations, including installation instructions.

6.3.7.1.1 Manufacturer's installation instructions shall include its listing limitations.

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

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

6.3.7.4 When CPVC 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 CPVC the nonmetallic pipe materials.

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

6.3.7.6 Other construction materials such as paint, electrical and communication wiring, thread sealants, and gasket lubricant shall not come in contact with CPVC nonmetallic pipe materials unless they have been evaluated as compatible with CPVC the nonmetallic pipe materials by a testing laboratory.

6.3.7.7 CPVC Nonmetallic pipe listed for light hazard occupancies shall be permitted to be installed in ordinary hazard rooms of otherwise light hazard occupancies where the room does not exceed 400 ft² (37 m²).

6.3.7.8 CPVC Nonmetallic pipe shall not be listed for portions of an occupancy classification.

6.3.7.9* Listed Pipe and Tubing.

6.3.7.9.1 Other types of pipe or tube investigated for suitability in automatic sprinkler installations and listed for this service, including but not limited to CPVC and steel, and differing from that provided in Table 6.3.1.1 shall be permitted where installed in accordance with their listing limitations, including installation instructions.

6.3.7.9.2 Pipe or tube listed for light hazard occupancies shall be permitted to be installed in ordinary hazard rooms of otherwise light hazard occupancies where the room does not exceed 400 ft² (37 m²).

6.3.7.9.3 Pipe or tube shall not be listed for portions of an occupancy classification.

6.3.7.9.4 Bending of listed pipe and tubing shall be permitted as allowed by the listing.

6.3.7.10 Pipe and Tube Bending.

6.3.7.10.1 Bending of Schedule 10 steel pipe, or any steel pipe of wall thickness equal to or greater than Schedule 10 and Types K and L copper tube, shall be permitted when bends are made with no kinks, ripples, distortions, or reductions in diameter or any noticeable deviations from round.

6.3.7.10.2 For Schedule 40 and copper tubing, the minimum radius of a bend shall be six pipe diameters for pipe sizes 2 in. (50 mm) and smaller and five pipe diameters for pipe sizes 2 ½ in. (65 mm) and larger.

6.3.7.10.3 For all other steel pipe, the minimum radius of a bend shall be 12 pipe diameters for all sizes.

6.3.7.11 Pipe and Tube Identification.

6.3.7.11.1* All pipe, including specially listed pipe allowed by 6.3.7.9, shall be marked along its length by the manufacturer in such a way as to properly identify the type of pipe.

6.3.7.11.2 The marking shall be visible on every piece of pipe over 2 ft (610 mm) long.

6.3.7.11.3 Pipe identification shall include the manufacturer’s name, model designation, or schedule.

6.4 Fittings.

6.4.1 Fittings used in sprinkler systems shall meet or exceed the standards in Table 6.4.1 or be in accordance with 6.4.2 or 6.4.4.

Table 6.4.1 Fittings Materials and Dimensions

Materials and Dimensions	Standard
Cast Iron	
<i>Cast Iron Threaded Fittings, Class 125 and 250</i>	ASME B16.4
<i>Cast Iron Pipe Flanges and Flanged Fittings</i>	ASME B16.1
Malleable Iron	
<i>Malleable Iron Threaded Fittings, Class 150 and 300</i>	ASME B16.3
Steel	
<i>Factory-Made Wrought Steel Butt Weld Fittings</i>	ASME B16.9
<i>Butt Welding Ends for Pipe, Valves, Flanges, and Fittings</i>	ASME B16.25
<i>Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures</i>	ASTM A 234
<i>Steel Pipe Flanges and Flanged Fittings</i>	ASME B16.5
<i>Forged Steel Fittings, Socket Welded and Threaded</i>	ASME B16.11
Copper	
<i>Wrought Copper and Copper Alloy Solder Joint Pressure Fittings</i>	ASME B16.22
<i>Cast Copper Alloy Solder Joint Pressure Fittings</i>	ASME B16.18
CPVC	
<i>Chlorinated Polyvinyl Chloride (CPVC) Specification for Schedule 80 CPVC Threaded Fittings</i>	ASTM F 437
<i>Specification for Schedule 40 CPVC Socket Type Fittings</i>	ASTM F 438
<i>Specification for Schedule 80 CPVC Socket Type Fittings</i>	ASTM F 439

6.4.2 In addition to the standards in Table 6.4.1, ~~CPVC nonmetallic~~ fittings shall also be in accordance with 6.4.4 and with the portions of the ASTM standards specified in Table 6.4.4 that apply to fire protection service.

6.4.3 ~~CPVC Plastic Nonmetallic Fittings.~~ ~~CPVC Nonmetallic~~ fittings in accordance with Table 6.4.1 shall be investigated for suitability in automatic sprinkler installations and listed for this service. Listed ~~CPVC nonmetallic fittings~~ shall be installed in accordance with their listing limitations, including installation instructions.

6.4.3.1* When ~~CPVC nonmetallic~~ fittings are used in combination systems utilizing internally coated steel piping and ~~CPVC nonmetallic~~ fittings, the steel pipe shall be investigated for compatibility with ~~CPVC the nonmetallic fittings~~ by a testing laboratory. Cutting oils and Lubricants used for fabrication of the steel piping shall be compatible with ~~CPVC the nonmetallic fitting~~ materials.

6.4.3.2* When ~~CPVC nonmetallic~~ fittings are used in combination systems utilizing noninternally coated steel piping and ~~CPVC nonmetallic~~ fittings, no additional evaluations are required. Cutting oils and lubricants used for fabrication of the steel piping shall be compatible with ~~CPVC the nonmetallic fitting~~ materials.

6.4.3.3 Fire-stopping materials intended for use on ~~CPVC nonmetallic fitting~~ penetrations shall be investigated for compatibility with ~~CPVC the nonmetallic fitting~~ materials.

6.4.3.4 Other construction materials such as paint, electrical and communication wiring, thread sealants, and gasket lubricant shall not come in contact with ~~CPVC nonmetallic fitting material~~ unless they have been evaluated as compatible with ~~CPVC the nonmetallic fitting~~ materials by a testing laboratory.

6.4.4* Other types of fittings investigated for suitability in automatic sprinkler installations and listed for this service including, but not limited to, CPVC, and steel differing from that provided in Table 6.4.1, shall be permitted when installed in accordance with their listing limitations, including installation instructions.

6.4.5* Fitting Pressure Limits.

6.4.5.1 Standard weight pattern cast-iron fittings 2 in. (50 mm) in size and smaller shall be permitted where pressures do not exceed 300 psi (20.7 bar).

6.4.5.2 Standard weight pattern malleable iron fittings 6 in.(150 mm) in size and smaller shall be permitted where pressures do not exceed 300 psi (20.7 bar).

6.4.5.3 Fittings not meeting the requirements of 6.4.5.1 and 6.4.5.2 shall be extra-heavy pattern where pressures exceed 175 psi (12.1 bar).

6.4.5.4 Cast bronze threaded fittings in accordance with ASTM B15.15 shall be permitted where pressures do not exceed 200 psi (3.8 bar) for Class 125 fittings and 400 psi (27.6 bar) for Class 250 fittings.

6.4.5.5 Listed fittings shall be permitted for system pressures up to the limits specified in their listings.

6.4.6* Couplings and Unions.

6.4.6.1 Screwed unions shall not be used on pipe larger than 2 in. (50 mm).

6.4.6.2 Couplings and unions of other than screwed-type shall be of types listed specifically for use in sprinkler systems.

6.4.7 Reducers and Bushings.

6.4.7.1 Unless the requirements of 6.4.7.2 or 6.4.7.3 are met, a one-piece reducing fitting shall be used wherever a change is made in the size of the pipe.

6.4.7.2 Hexagonal or face bushings shall be permitted in reducing the size of openings of fittings when standard fittings of the required size are not available.

6.4.7.3 Hexagonal bushings as permitted in 8.15.20.2 shall be permitted to be used.

6.4.7.4 The requirements of 6.4.7.1 and 6.4.7.2 shall not apply to CPVC fittings.

Submitter's Substantiation: Revise Chapter 6 of NFPA 13 by changing the references to "CPVC" pipe and fittings to "nonmetallic" pipe and fittings. The exact words that need to be changed will depend on the section in order to be grammatically correct. The following is a list of the proposed changes, which will be followed by a draft of the affected sections:

1. 6.3.1.4, change "Chlorinated polyvinyl chloride (CPVC)" to "Nonmetallic pipe".
2. 6.3.7, change the title from "CPVC Plastic Pipe" to "Nonmetallic Pipe" and change the beginning of the section from "CPVC pipe" to "Nonmetallic pipe".
3. 6.3.7.1, change "Listed CPVC" to "Listed nonmetallic pipe".
4. 6.3.7.2, the first two times "CPVC" is used, replace it with "nonmetallic". The third time "CPVC" is used, replace it with "the nonmetallic piping".
5. 6.3.7.3, replace "CPVC" with "nonmetallic".
6. 6.3.7.4, the first time that "CPVC" is used, replace it with "nonmetallic". The second time that "CPVC" is used, replace it with "the nonmetallic pipe".
7. 6.3.7.5, the first time that "CPVC" is used, replace it with "nonmetallic". The second time that "CPVC" is used, replace it with "the nonmetallic pipe".
8. 6.3.7.6 the first time that "CPVC" is used, replace it with "nonmetallic pipe materials". The second time that "CPVC" is used, replace it with "the nonmetallic pipe".
9. 6.3.7.7, replace "CPVC" with "nonmetallic pipe".
10. 6.3.7.8, , replace "CPVC" with "nonmetallic pipe".
11. 6.4.2, change "CPVC" to "nonmetallic".
12. 6.4.3, change "CPVC Plastic" to "Nonmetallic" in the title. Then, the first time that "CPVC" appears in the section, change it to "Nonmetallic" and the second time that "CPVC" appears, change it to "nonmetallic fittings"
13. 6.4.3.1, change "CPVC" to "nonmetallic" the first two times it appears in the section. The third time that "CPVC" appears, change it to "the nonmetallic fittings". The fourth time that "CPVC" appears, change it to "the nonmetallic fitting".
14. 6.4.3.2, change "CPVC" to "nonmetallic" the first two times it appears in the section. The third time that "CPVC" appears in the section, change it to "the nonmetallic fitting".
15. 6.4.3.3, change the first "CPVC" to "nonmetallic fitting" and the second "CPVC" to "the nonmetallic fitting"
16. 6.4.3.4, change the first "CPVC" to "nonmetallic fitting material" and the second "CPVC" to "the nonmetallic fitting"

The language, as drafted by the committee in the ROP and ROC has the potential to create an adverse impact on the manufacturers of a single nonmetallic pipe and fitting product when the situation intended to be addressed by the changes (compatibility of the product with other items in the system) needs to be addressed for all nonmetallic materials.

The compatibility of nonmetallic pipe with elements that could reasonably be expected to be in the water as well as external elements that the pipe could reasonably be expected to come into contact with needs to be evaluated for all nonmetallic pipe and fitting products that get used in fire sprinkler systems, not just a single material.

Unfortunately, due to the grammar of the sections, the acronym “CPVC” could not easily be substituted with the single word “nonmetallic” in all cases. But in each case where a substitution was made, the broader term of “nonmetallic pipe” or “nonmetallic fitting” was used in singular or plural form in order to make the section grammatically correct.

In sections 6.3.7.9.1 and 6.4.4, “CPVC” has been intentionally left in the standard because it is a specific example of a type of pipe that is allowed under this section. In the annex sections, “CPVC” has been intentionally left in the text because these are statements of fact about a specific product.

Emergency Nature: Due to the potential adverse impact on a particular product, we believe that this TIA meets the definition of an “Emergency” under section 5.2(f) of the Regulations Governing Committee Projects.

Anyone may submit a comment by the closing date indicated above. To submit a comment, please identify the number of the TIA and forward to the [Secretary, Standards Council](#), 1 Batterymarch Park, Quincy, MA 02169-7471.