



Amy Beasley Cronin  
Secretary, Standards Council

11 March 2011

To: Interested Parties

Subject:

Standards Council Decision (Final):	<b>D#11-5</b>
Standards Council Agenda Item:	<b>SC#11-3-3-e, 11-3-4-d and 11-3-5-d</b>
Date of Decision*:	1 March 2011
TIA Nos. 1015, 1012 and 1013 on NFPA 13, 13D and 13R, all 2010 editions	

Dear Interested Parties:

At its meeting of February 28 – March 1, 2011, the Standards Council considered an appeal on the above referenced matter.

The Council's decision is now available and is attached herewith.

Sincerely,

A handwritten signature in black ink that reads "Amy Beasley Cronin".

Amy Beasley Cronin  
Secretary, NFPA Standards Council

- c: D. Berry, M. Brodoff, L. Fuller, M. Klaus, J. Goyette  
Members, TC on Residential Sprinkler Systems (AUT-RSS)  
Members, TC on Sprinkler System Installation Criteria (AUT-SSI)  
Members, TCC Automatic Sprinkler Systems (AUT-AAC)  
Members, TC on Inspection, Testing, and Maintenance of Water-Based Systems (INM-AAA)  
Members, NFPA Standards Council (AAD-AAA)  
Individuals Providing Public Comment and Appeal Commentary

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\*NOTE: Participants in NFPA's codes and standards making process should know that limited review of this decision may be sought from the NFPA Board of Directors. For the rules describing the available review and the method for petitioning the Board for review, please consult section 1-7 of the NFPA Regulations Governing Committee Projects and the NFPA Regulations Governing Petitions to the Board of Directors from Decisions of the Standards Council. Notice of the intent to file such a petition must be submitted to the Clerk of the Board of Directors within 15 calendar days of the Date of Decision noted in the subject line of this letter.



Standards Council Decision (Final):	<b>D#11-5</b>
Standards Council Agenda Item:	<b>SC#11-3-3-e, 11-3-4-d and 11-3-5-d</b>
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***SUMMARY ACTION:*** *The Standards Council voted to deny the appeal and issue TIA Nos. 1015, 1012 and 1013 on NFPA 13, NFPA 13D and NFPA 13R, respectively. In addition, the Council directed further activities as set forth in the decision.*

In August of 2010, the Standards Council voted to issue three Tentative Interim Amendments (TIAs), the effect of which, pending further technical committee consideration, was to prohibit the use of antifreeze within the dwelling unit portions of sprinkler systems. In doing so, the Council took the unusual step of issuing TIAs without the full support of the responsible sprinkler committees. This was because the Council was presented with an unusual and compelling situation in which the status quo in the existing sprinkler documents was no longer tenable, and in which the circumstances required emergency action. (See Standards Council Decision #10-10 [August 5, 2010]). In its decision, the Council stressed that its action was strictly an interim measure that would remain in place "unless and until the responsible technical committees, after due consideration and any correlation by the [Technical Correlating Committee], reach consensus on a different approach." The Council, moreover, stressed that "it is not undertaking to make any final technical determination about the correct course of action that may eventually emerge. The technical issues concerning the content of NFPA codes and standards are generally for the responsible consensus-based technical committees to determine, and the same should be true in this case." In turning the matter back to the sprinkler committees, the Council noted that the TIAs all involved standards that address the design and installation of new sprinkler systems. It asked the technical committees to examine the important question of what should be done to address antifreeze in existing residential sprinkler systems. Finally, the Council noted that the TIAs did not address antifreeze in nonresidential commercial applications and suggested the need for further research and consideration of the treatment of nonresidential commercial applications as well. (See Standards Council Decision #10-10).

The sprinkler committees have now completed the review and consideration of the antifreeze issues as anticipated in Standards Council Decision #10-10. The technical committees have developed and reached consensus on three new TIAs related to the use of antifreeze in sprinkler systems that proposed to supersede the TIAs previously issued on an interim basis by the Council.

The new TIAs, which were presented to the Council at its meeting of February 28 – March 1, 2011 are: TIA Nos. 1015, 1012 and 1013 on the 2010 editions, respectively, of NFPA 13, *Standard for the Installation of Sprinkler Systems*, NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two- Family Dwellings and Manufactured Homes*, and NFPA 13R, *Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height*. Also considered by the Council at the meeting was an appeal relating to the TIAs from Dana Haagensen, Massachusetts Department of Fire Services. The appeal requested that the Council not issue the new TIAs and that the three existing TIAs issued in Standards Council Decision D#10-10, and which would be superseded by the new TIAs, remain in place. The existing TIAs, for new installations, prohibit the use of antifreeze solutions within all NFPA 13D applications and within the dwelling unit portions of NFPA 13 and NFPA 13R sprinkler systems.

As suggested above, the new TIAs replace the complete prohibition on the use of antifreeze in the dwelling unit portions of new sprinkler systems. Described in general terms, TIA Nos. 1015, 1012 and 1013, taken together: limit the antifreeze solutions used in sprinkler systems to manufacturer premixed antifreeze solutions only; limit the use of antifreeze in sprinkler systems to specified volume concentrations based on one of the types of permitted solutions; provide additional provisions based on the type of sprinkler for NFPA 13 sprinkler systems; and provide additional requirements for NFPA 13D systems including provisions for annual testing and provisions based on whether the NFPA 13D system is new or existing. The TIAs do not address existing systems designed to NFPA 13 or 13R, however, another TIA on NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, that is being issued concurrently with these TIAs and that has not been the subject of an appeal, does address antifreeze concentrations for these systems. (See Minute Item 11-3-6, Standards Council Meeting of February 28-March 1, 2011; see also Minute Item 11-3-7, for another TIA on NFPA 25, which did not pass ballot and has not been appealed.) The individual TIAs must, of course, be consulted for the precise terms of the provisions they contain.

The three new TIAs were balloted through the responsible Technical Committees (TC) – the Technical Committee on Sprinkler System Installation Criteria for NFPA 13, and the Technical Committee on Residential Sprinklers for NFPA 13D and NFPA 13R – as well as the Technical Correlating Committee on Automatic Sprinkler Systems (the TCC). Balloting was completed in accordance with the NFPA *Regulations Governing Committee Projects*, to determine if it had the necessary three-fourths majority support on technical merit and emergency nature in favor of issuance. All three TIAs passed the ballots of the TCs and the TCC on both technical merit and emergency nature. One public comment was received.

The appeal requests that the Council overturn the action recommended by the NFPA codes and standards development process and not issue the TIAs. On appeal, the Standards Council accords great respect and deference to the codes and standards development process. In conducting its review, the Council will overturn the result recommended through that process, only where a clear and substantial basis for doing so is demonstrated. The Council has reviewed the entire record concerning this matter and

has considered all the arguments raised in this appeal. In the view of the Council, this appeal does not present any clear and substantial basis on which to overturn the result recommended by the NFPA codes and standards development process. Accordingly, the Council has voted to deny the appeal and issue TIA Nos. 1015, 1012 and 1013.

As indicated above, the Council's previous action in limiting the use of antifreeze in sprinkler systems was intended as an interim measure to allow the sprinkler committees the time and opportunity to review the available information and research and make the final consensus determination about what should or should not be contained in the sprinkler standards concerning the antifreeze issues. The sprinkler committees have now processed the issues and reached a consensus, meeting in each case the demanding three-quarter majority vote. The committees have reviewed and considered the available information, including the research presented in the Fire Protection Research Foundation report, *"Antifreeze Solutions in Home Fire Sprinkler Systems, Phase II Research Final Report"* issued in 2010. Moreover, and importantly, the TIAs address the use of antifreeze in nonresidential commercial applications and in existing installations, subjects that were not able to be addressed in the previous TIAs. The committees have arrived at reasonable conclusions based on the available information and the many considerations that must be weighed in arriving at consensus judgments. Since absent compelling circumstances were not presented here, the Council must defer to the consensus judgments of the committees.

In voting to issue these TIAs, the Council stresses that the sprinkler committees' consideration of issues related to antifreeze is not at an end. The sprinkler standards are in the Annual 2012 revision cycle, and that the content of the new TIAs will be considered as Proposals during the process. The Fire Protection Research Foundation report discussed areas where future research might be needed, as, for example, in the area of commercial applications. It is anticipated that further research will be conducted and information developed that will aid the sprinkler committees in their continuing consideration of issues raised by the use of antifreeze in sprinkler systems. In the meantime, the Council is requesting, both in aid of the committees' work and for the Council's information, that the sprinkler committees, representatives of the relevant sprinkler industries, the Fire Protection Research Foundation, and any other parties with relevant information provide reports to the Council at its next meeting identifying research needs, planned or ongoing research, and any other activities or developments related to the use of antifreeze in sprinkler systems.

Council Member Roland Huggins recused himself during the deliberation and vote on the issue.



Tentative Interim Amendment

# NFPA 13

## Standard for the Installation of Sprinkler Systems

2010 Edition

**Reference:** 3.4.1.1 Premixed Antifreeze Solution, 7.6.1.5, 7.6.2, and A.7.6

**TIA 10-2**

*(SC 11-3-3/TIA Log #1015)*

Pursuant to Section 5 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2010 edition. The TIA was processed by the Technical Committee on Sprinkler System Installation Criteria and the Technical Correlating Committee on Automatic Sprinkler Systems, and was issued by the Standards Council on March 1, 2011, with an effective date of March 21, 2010.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a proposal of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Add a new definition as 3.4.1.1 to read as follows:

**3.4.1.1 Premixed Antifreeze Solution.** A mixture of an antifreeze material with water that is prepared by the manufacturer with a quality control procedure in place that ensures that the antifreeze solution remains homogeneous.

2. Remove the new section 7.6.1 that was added by issuance of TIA No. 10-1 (Log #1000) and renumber sections.

3. Revise 7.6.1.5 to read as follows:

**7.6.1.5** A placard shall be placed on the antifreeze system main valve that indicates the manufacture type and brand of the antifreeze solution, the concentration by volume of the antifreeze solution used, and the volume of the antifreeze solution used in the system.

4. Revise 7.6.2.1 to read as follows:

**7.6.2.1\*** Antifreeze solutions shall be limited to premixed antifreeze solutions of glycerin (chemically pure or United States Pharmacopoeia 96.5%) at a maximum concentration of 48% by volume, or propylene glycol at a maximum concentration of 38% by volume.

5. Add a new 7.6.2.1.1 to read:

**7.6.2.1.1** Premixed antifreeze solutions of propylene glycol exceeding 40% concentration by volume shall be permitted for use with ESFR sprinklers where the ESFR sprinklers are listed for such use in a specific application.

6. Add new 7.6.2.1.2 to read as follows:

**7.6.2.1.2** Premixed antifreeze solutions other than those described in 7.6.2.1 that are listed for use in sprinkler systems shall be permitted to be used.

7. Add a new 7.6.2.1.3 to read as follows:

**7.6.2.1.3** All premixed antifreeze solutions shall be provided with a certificate from the manufacturer indicating the type of antifreeze, concentration by volume, and freezing point.

8. Delete current Table 7.6.2.2 and replace it with the following table in the annex renumbered as Table A.7.6.2.1

**A.7.6.2.1** See Table A.7.6.2.1.

**Table A.7.6.2.1 Properties of Glycerin and Propylene Glycol**

Material	Solution (by volume)	Specific Gravity at 77°F (25°C)	Freezing Point	
			°F	°C
Glycerin (C.P. or U.S.P. grade)	0%	1.000	32	0
	5	1.014	31	-0.5
	10	1.029	28	-2.2
	15	1.043	25	-3.9
	20	1.059	20	-6.7
	25	1.071	16	-8.9
	30	1.087	10	-12
	35	1.100	4	-15.5
	40	1.114	-2	-19
	45	1.130	-11	-24
	50%	1.141	-19	-28
Propylene glycol	0	1.000	32	0
	5	1.004	26	-3
	10	1.008	25	-4
	15	1.012	22	-6
	20	1.016	19	-7
	25	1.020	15	-10
	30	1.024	11	-12
	35	1.028	2	-17
	40	1.032	-6	-21

C.P.: Chemically Pure; U.S.P.: United States Pharmacopoeia 96.5%.

8. Delete 7.6.2.3 and Table 7.6.2.3.

9. Revise 7.6.2.4 to read as follows:

**7.6.2.4** A premix antifreeze solution with a freezing point below the expected minimum temperature for the locality shall be provided.

10. Delete existing 7.6.2.5 as well as the Figures 7.6.2.5(a), 7.6.2.5(b), and 7.6.2.5(c) and Annex A.7.6.2.5.

11. Delete 7.6.2.6.

12. Add an asterisk to Section 7.6 and a new Annex A.7.6 to read as follows:

**A.7.6** In cold climates and areas where the potential for freezing of pipes is a concern, options other than antifreeze are available. Such options include installing the pipe in warm spaces, tenting insulation over the piping (as illustrated in NFPA 13D), listed heat tracing, and the use of dry pipe systems and preaction systems.

13. In A.7.6.2, delete the second paragraph.

**A.7.6.2** Listed CPVC sprinkler pipe and fittings should be protected from freezing with glycerine only. The use of diethylene, ethylene, or propylene glycols is specifically prohibited. Laboratory testing shows that glycol-based antifreeze solutions present a chemical environment detrimental to CPVC.

*14. Delete existing A.7.6.2.4 and Figure A.7.6.2.4.*

**Issue Date:** March 1, 2011

**Effective Date:** March 21, 2011

(Note: For further information on NFPA Codes and Standards, please see [www.nfpa.org/codelist](http://www.nfpa.org/codelist))

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Tentative Interim Amendment

# NFPA 13D

## Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes

2010 Edition

**Reference:** 3.3.9.1 Premixed Antifreeze Solution (New), 4.1.4, 5.2.7, 8.3.2, 8.3.3, and A.4.1.4

**TIA 10-2**

*(SC 11-3-4/TIA Log #1012)*

Pursuant to Section 5 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*, 2010 edition. The TIA was processed by the Technical Committee on Residential Sprinkler Systems and the Technical Correlating Committee on Automatic Sprinkler Systems, and was issued by the Standards Council on March 1, 2011, with an effective date of March 21, 2011.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a proposal of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. *Undo all of the changes made by TIA No. 10-1 (Log #994) to sections 3.3.9.1, 4.1.4, 5.2.7, 8.3.2 and 8.3.3 returning NFPA 13D to the text of the published 2010 edition with the following changes:*

2. *Add a new definition as 3.3.9.1.1 and related annex note to read as follows:*

**3.3.9.1.1\* Premixed Antifreeze Solution.** A mixture of an antifreeze material with water that is prepared and factory-mixed by the manufacturer with a quality control procedure in place that ensures that the antifreeze solution remains homogeneous.

**A.3.3.9.1.1** Where a tank is used as the water supply for the sprinkler system, the tank is not permitted to be filled with antifreeze.

3. *Revise 4.1.4 and related annex note to read as follows:*

**4.1.4\* Antifreeze Systems.**

**A.4.1.4** Sampling from the top and bottom of the system helps to determine if the solution has settled. Antifreeze solutions are heavier than water. If the antifreeze compound is separating from the water due to poor mixing, it will exhibit a higher concentration in the lower portion of the system than in the upper portions of the system. If the concentration is acceptable near the top, but too low near the water connection, it may mean that the system is becoming diluted near the water supply. If the concentration is either too high or too low in both the samples, it may mean that the wrong concentration was added to the system.

On an annual basis, test samples should be drawn from test valve B as shown in Figure 8.3.3.2.1(1), especially if the water portion of the system has been drained for maintenance or repairs. A small hydrometer can be used so that a small sample is sufficient. Where water appears at valve B, or where the sample indicates that the solution has become weakened, the entire system should be emptied and refilled with acceptable solution as previously described.

Where systems are drained in order to be refilled, it is not typically necessary to drain drops that are less than 36 inches in length. Most systems with drops have insufficient volume to cause a problem, even if slightly higher concentration solutions collect in the drops. For long drops with significant volume, consideration should be given to draining drops if there is evidence that unacceptably high concentrations of antifreeze have collected in these long drops.



When emptying and refilling antifreeze solutions, every attempt should be made to recycle the old solution with the antifreeze manufacturer rather than discarding it.

#### **4.1.4.1 Annual Antifreeze Solution Test and Replacement Procedure.**

**4.1.4.1.1** Samples of antifreeze solution shall be collected by qualified individuals in accordance with 4.1.4.1.1.1 or 4.1.4.1.1.2 on an annual basis.

**4.1.4.1.1.1** The system shall be drained to verify that (a) the solution is in compliance with 8.3.3, and (b) the solution provides the necessary freeze protection. Solution samples shall be taken near the beginning and near the end of the draining process.

**4.1.4.1.1.2\*** Solution samples shall be taken at the highest practical elevation and the lowest practical elevation of the system.

**A.4.1.4.1.1.2** If not already present, test connections (valves) for collection of solution samples should be installed at the highest and lowest practical locations of the system or portion of the system containing antifreeze solution.

**4.1.4.1.2** The two samples collected in accordance with the procedures specified in 4.1.4.1.1.1 or 4.1.4.1.1.2 shall be tested to verify that the specific gravity of both samples is similar and that the solution is in compliance with 8.3.3. The specific gravity of each solution shall be checked using a hydrometer with a suitable scale or a refractometer having a scale calibrated for the antifreeze solution.

**4.1.4.1.3\*** If concentrations of the two samples collected in accordance with the procedures above are similar and in compliance with 8.3.3, then (a) the solution drained in accordance with 4.1.4.1.1.1 can be used to refill the system, or (b) the existing undrained solution tested in accordance with 4.1.4.1.1.2 shall be permitted to continue to be used. If the two samples are not similar and not in compliance with 8.3.3, then a solution in compliance with 8.3.3 shall be used to refill the system.

**A.4.1.4.1.3** In the past, for some existing systems subject to extremely low temperatures, antifreeze solutions with concentrations greater than what is now permitted by NFPA 13D were used. Such high concentrations of antifreeze are no longer permitted. In situations where extremely low temperatures are anticipated, refilling the fire sprinkler system with a concentration of antifreeze solution currently permitted by the standard might not provide sufficient freeze protection without additional measures. Such measures might include converting the antifreeze system to another type of sprinkler system.

**4.1.4.1.4** A tag shall be attached to the riser indicating the date the antifreeze solution was tested. The tag shall also indicate the type and concentration of antifreeze solution (by volume) with which the system is filled, the date the antifreeze was replaced (if applicable), the name of the contractor that tested and/or replaced the antifreeze solution, the contractor's license number, a statement indicating if the entire system was drained and replaced with antifreeze, and a warning to test the concentration of the antifreeze solutions at yearly intervals per NFPA 13D.

*4. Add an asterisk to 8.3.3 and add a new A.8.3.3 to read as follows:*

#### **8.3.3\* Antifreeze Systems.**

**A.8.3.3** Where protection of pipes from freezing is a concern, options other than antifreeze are available. Such alternatives include running the piping in warm spaces, tenting insulation over pipe, dry-pipe systems, and preaction systems.

*5. Revise 8.3.3.2.1 to read as follows:*

**8.3.3.2.1\*** Unless permitted by 8.3.3.2.1.1, antifreeze solutions shall be limited to premixed antifreeze solutions of glycerine (chemically pure or United States Pharmacopoeia 96.5%) at a maximum concentration of 48% by volume, propylene glycol at a maximum concentration of 38% by volume, or other solutions listed specifically for use in fire protection systems.

*6. Add a new 8.3.3.2.1.1 to read as follows:*

**8.3.3.2.1.1.** For existing systems, antifreeze solutions shall be limited to premixed antifreeze solutions of glycerine (chemically pure or United States Pharmacopoeia 96.5%) at a maximum concentration of 50% by volume, propylene glycol at a maximum concentration of 40% by volume, or other solutions listed specifically for use in fire protection systems.

*7. Delete 8.3.3.2.2 and 8.3.3.2.3 and related Annex material A.8.3.3.2.3.*

*8. Move Table 8.3.3.2.3 to the annex and renumber as Table A.8.3.3.2.1 while deleting the rows in the table dealing with glycerine and 40% water, glycerine and 30% water, propylene glycol and 50% water and propylene glycol and 40% water. Add an annex note so that the annex and Table would appear as follows:*

**A.8.3.3.2.1** See Table A.8.3.3.2.1.

**Table A.8.3.3.2.1 Properties of Glycerine and Propylene Glycol**

Material	Solution (by volume)	Specific Gravity at 60°F (15.6°C)	Freezing Point	
			°F	°C
Glycerine (C.P. or U.S.P. grade)	50% water	1.145	-20.9	-29.4
Hydrometer scale 1.000 to 1.200				
Propylene glycol	60% water	1.034	-6	-21.1
Hydrometer scale 1.000 to 1.200 (subdivisions 0.002)				

C.P.: Chemically Pure; U.S.P.: United States Pharmacopoeia 96.5%.

9. Renumber 8.3.3.2.3.1 to 8.3.3.2.2.

**8.3.3.2.2** The concentration of antifreeze solutions shall be limited to the minimum necessary for the anticipated minimum temperature.

10. Delete 8.3.3.2.4, 8.3.3.2.5 and Table 8.3.3.2.5.

11. Renumber 8.3.3.2.6 as 8.3.3.2.3 and renumber A.8.3.3.2.6 as A.8.3.3.2.3. Also renumber Figure A.8.3.3.2.6 as Figure A.8.3.3.2.3.

**8.3.3.2.3\*** An antifreeze solution with a freezing point below the expected minimum temperature for the locality shall be installed.

**A.8.3.3.2.3** Beyond certain limits, an increased proportion of antifreeze does not lower the freezing point of the solution (*see Figure A.8.3.3.2.3*). Glycerine, diethylene glycol, ethylene glycol, and propylene glycol never should be used without mixing with water in the proper proportions, because these materials tend to thicken near 32°F (0°C).

12. Renumber 8.3.3.2.7 as 8.3.3.2.4 and revise to read as follows:

**8.3.3.2.4** The specific gravity of the antifreeze shall be checked by a hydrometer with a scale having 0.002 subdivisions in accordance with Figure 8.3.3.2.4(a) and 8.3.3.2.4(b).

13. Renumber Figure 8.3.3.2.3(a) as Figure 8.3.3.2.4(a) and delete the 50% curve.

14. Renumber Figure 8.3.3.2.3(b) as Figure 8.3.3.2.4(b) and delete the 60% and 70% curves.

**Issue Date:** March 1, 2011

**Effective Date:** March 21, 2011

(Note: For further information on NFPA Codes and Standards, please see [www.nfpa.org/codelist](http://www.nfpa.org/codelist))



Tentative Interim Amendment

# NFPA 13R

## Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height

2010 Edition

**Reference:** 4.7 and 5.4.3

**TIA 10-2**

*(SC 11-3-5/TIA Log #1013)*

Pursuant to Section 5 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 13R, *Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height*, 2010 edition. The TIA was processed by the Technical Committee on Residential Sprinkler Systems and the Technical Correlating Committee on Automatic Sprinkler Systems, and was issued by the Standards Council on March 1, 2011, with an effective date of March 21, 2011.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a proposal of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. *Delete Section 4.7, that was language added by the issuance of TIA No. 10-1-1 (Log #995) in August of 2010.*
2. *Delete new 5.4.3, that was language added by the issuance of TIA No. 10-1-1 (Log #995) in August of 2010.*
3. *Revise 5.4.4 to 5.4.3, that was language added by the issuance of TIA No. 10-1-1 (Log #995) in August of 2010 to read as follows:*

**5.4.3** Where antifreeze systems, dry pipe systems, and preaction systems are installed, they shall be installed in accordance with NFPA 13.

**Issue Date:** March 1, 2011

**Effective Date:** March 21, 2011

(Note: For further information on NFPA Codes and Standards, please see [www.nfpa.org/codelist](http://www.nfpa.org/codelist))

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