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August 14, 1991

Mr. Al Reventas
Shintech, Inc.
#24 Greenway Plaza, Suite 811
Houston, TX 77046

REF: 88-076 - VINYL INSTITUTE CODES

Dear Al,

As a follow-up to my earlier letter relating to the twelve ICBO code change proposals having potential impact on Vinyl Institute member companies, only three code change proposals out of the twelve submittals we identified are on the challenge agenda. They are Items #192, #193, and #269. (See original text & challenge text attached).

It is our opinion that the challenges to Items #192 and #193 will probably fail while Item #269 will probably pass.

Code Change items #192 and #193 propose to eliminate a requirement for "suitable fire stops" in fire-rated walls and ceilings when "fire sprinklers and attachments" penetrate only a single member. ICBO staff criticizes the vagueness of the proposal and properly so. If the proponent responds to this analysis with an amendment specifying what hardware is allowed to penetrate, they could succeed. Reasoning is that a metal pipe or support hangers that would be no larger in area than the specified 100 square inches could be directly related to the acceptable steel electrical outlet boxes. If an amendment spells out such material, then it would be difficult to oppose especially when the sprinkler system is an added safeguard.

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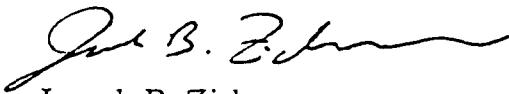
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Mr. Al Reventas
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Challenges to Code Change Item #292 attempt to correlate the proposed Uniform Mechanical Code Standard No. 10-3, Test Method For Fire and Smoke Characteristics of Electrical Cable and Plastic Sprinkler Pipe with UL Standard No. 910. Since the proponent and UL both submitted the same request, it places credibility on the proposal. The challenges describe the plastic pipe test samples and how they are placed on the tray. This change stands a good chance of passage.

Sincerely yours,



Joseph B. Zicherman
President

JBZ:sml
88076-10.Lsl

Attachments

cc: R. Gottesman - w/a

CTL026974

hallways or corridors. There is also a technical problem with Section 3802 (h). There are quick-response sprinklers and there are standard sprinklers. There is not, however, a quick-response standard sprinkler. A quick-response sprinkler is now defined as a fast-response version (standard) sprinkler. The code as currently written requires a sprinkler that is not manufactured.

184—Membership Action A A/R A/A FS D

192—As Submitted

4304 (f)-91-1—N.F.S.A.—[F.R.A.]

Sec. 4304 (f). Revise the first sentence of the first paragraph as follows:

Walls may have openings for fire sprinklers and attachments, and steel electrical outlet boxes not exceeding 16 square inches in area, provided the aggregate area of such openings is not more than 100 square inches for any 100 square feet of wall or partition area.

Reason: Approval of this change would allow the penetration through a single membrane of a fire-resistant-rated wall assembly by fire sprinklers and their attachments. This would also eliminate the requirement for rated sealant around the actual sprinkler. There is no evidence that penetrations of a single membrane by a fire sprinkler has created any problem in a fire situation. A similar proposal has been submitted to allow this exemption for rated ceiling assemblies.

Analysis: Section 4304 (e), Item 1, now allows sprinkler piping to penetrate a membrane of a fire-resistive wall when suitable fire stops are used. The proposed change would allow omission of any fire stop when the opening is for "fire sprinklers and attachments." What is a suitable fire stop would depend on the purpose of the wall and its construction. For example, if a wall is an occupancy separation in which openings are required to be protected, the fire stop should maintain the integrity of the wall. If the wall is not required to have opening protection, suitable protection could consist of the traditional escutcheon covering a minimum-sized opening. The wording "fire sprinklers and attachments" is vague and may not accomplish the proponent's intent. Is "attachments" the piping for the sprinkler? Allowing omission of all fire stopping does not seem appropriate.

192—Committee Action

4304 (f)-91-1—N.F.S.A.

Disapproval

Reason: Section 4304 (f) allows sprinkler piping to penetrate a membrane of a fire-resistive wall when suitable fire stops are used. The proposed change would allow omission of any fire stop when the opening is for "fire sprinklers and attachments." What is a suitable fire stop would depend on the purpose of the wall and its construction. For example, if a wall is an occupancy separation in which openings are required to be protected, the fire stop should maintain the integrity of the wall. If the wall is not required to have opening protection, suitable protection could consist of the traditional escutcheon covering a minimum-sized opening. The wording "fire sprinklers and attachments" is vague and may not accomplish the proponent's intent. Are "attachments" the piping for the sprinkler? Allowing omission of all fire stopping does not seem appropriate.

192—Challenge

National Fire Sprinkler Association requests Approval.

Reason: It is unclear why the committee denied this change. The proposal does not expand the allowable 16 square inches of unprotected penetrations currently allowed (for electrical outlet boxes) in a nonsprinklered building. The change would only allow up to 16 square inches of unprotected openings, including the sprinklers and attachments, in a sprinklered building.

192—Membership Action A A/R A/A FS D

193—As Submitted

4305 (b)-91-1—N.F.S.A.—[F.R.A.]

Sec. 4305 (b). Revise Exception 1 as follows:

~~Openings for noncombustible sprinkler pipe~~ Sprinklers and attachments and openings for steel electrical . . . (Balance of exception to remain unchanged.)

Reason: Approval of this change would allow the penetration through a single membrane of a fire-resistant-rated ceiling assembly by fire sprinklers and their attachments. This would also eliminate the requirement for rated sealant around the actual sprinkler. There is no evidence that penetrations of a single membrane by a fire sprinkler have created any problem in a fire situation. A similar proposal has been submitted to allow this exemption for rated ceiling wall assemblies.

Analysis: See analysis to code change 4304 (f)-91-1.

193—Committee Action

4305 (b)-91-1—N.F.S.A.

Disapproval

Reason: See reason for code change 4304 (f)-91-1.

193—Challenge

National Fire Sprinkler Association requests Approval as Revised.

Revision:

Sec. 4305 (b), page 699. Revise Exception 1 as follows:

Openings for noncombustible sprinkler pipe, fire sprinklers and attachments and openings for steel electrical outlet boxes . . . (Balance to remain unchanged.)

Reason: It was never the intent to permit the penetration of the sprinkler piping through the ceiling membrane as the proposal as submitted indicated. It is the intent that noncombustible sprinklers and their noncombustible attachments be allowed to penetrate the ceiling assembly. Currently the code allows up to 100 square inches per 100 square feet of steel electrical outlet boxes to penetrate a rated floor-ceiling assembly in a nonsprinklered building. Allowing noncombustible fire sprinklers and their attachments to be included in this same 100 square inches in a fully sprinklered building appears to be at least as safe.

193—Membership Action A A/R A/A FS D

194—As Submitted

(See Committee Action)

194—Committee Action

4306-91-1—T.C.C.

Approval

Sec. 4306 (a). Revise as follows:

Where required by this code for the fire protection of openings, ~~fire-resistive~~ assemblies shall meet the requirements of this ~~chapter~~ section.

Development Committee in preparing a broader-based code change to address makeup air for wider application.

268—Challenge No. 3

Arizona Chapter requests Disapproval.

Reason: The proposal is redundant and proposes an inappropriate way to provide makeup air. Makeup air should be provided, but needs vary with each installation and cannot be addressed with a cookbook remedy for combustion air.

268—Challenge No. 4

Northwest chapters request Disapproval.

Reason: It appears to apply to both domestic and commercial dryers when inserted in the U.M.C. where proposed. If makeup air is an issue, why is it limited to closets and confined spaces and not merely included as a requirement for installation regardless of location within the building? The requirement is unclear in regards to opening requirements. Is it included in the opening provided for combustion air, or is it in addition to that?

268—Membership Action A A/R A/A FS D

269—As Submitted

M-A-10-3-91-1—B.F.G.—[Mech.]

U.M.C. Standard No. 10-3. Revise as follows:

1. Revise heading as follows:

UNIFORM MECHANICAL CODE STANDARD NO. 10-3 TEST METHOD FOR FIRE AND SMOKE CHARACTERISTICS OF ELECTRICAL CABLE AND PLASTIC SPRINKLER PIPE

Based on Standard No. 910, 1982 1985 and Standard No.
1887, 1989 of Underwriters Laboratories Inc.

See Section 1002, Uniform Mechanical Code

2. Sec. 10.301. Revise as follows:

This is a test method for determining values of flame distance and smoke density for exposed electrical and plastic sprinkler pipe that are to be installed in concealed spaces above suspended ceilings used as air plenums without the cables being enclosed in raceways in those spaces. The purpose of this test method is to determine whether the flame-propagation and smoke-generating characteristics of these cables without raceways and the plastic sprinkler pipe are in accordance with the provisions of Exception 6 or 7 to Uniform Mechanical Code Section 1002 (a).

3. Sec. 10.302. Revise as follows:

This test method does not cover the construction or performance requirements for cables or their electrical and other performance requirements sprinkler pipe, nor does it cover the electrical requirements of the cables.

4. Sec. 10.303. Revise paragraphs 4, 9, 15 and 16 as follows:

... comparable to the following:

Maximum effective temperature—1,200°F.

Bulk density—~~12.5~~ 21.0 ± 1.5 lbm/ft.³

Thermal conductivity—0.50-0.71 Btu•inch per hour•square foot
at 300-700°F.

... A draft-gauge manometer to indicate static pressure shall be ~~connected in the vent pipe upstream of the damper and the photoelectric cell opening inserted through the top at the midwidth of the tunnel, just downstream of the air-intake shutter.~~

... below the top surface of the gasketing tape and within 1.0 foot of ~~the vent end of the test chamber at the center of the width of the chamber~~ 23 feet ± 1/4 inch from the centerline of the burner ports and at the center of the width of the chamber.

A No. 18 AWG thermocouple (nominal wire cross section of 1620 CM) embedded 0.125 inch below the floor surface of the test chamber shall be mounted in refractory or portland cement at distances of 13.5 and ~~24.0~~ 23.0 feet from the fire end of the test-chamber burner ports.

5. Sec. 10.304. Revise the heading as follows:

Test Specimens—Cables

6. Sec. 10.305. Add a new Section 10.305 as follows and renumber remaining sections accordingly:

Test Specimens—Pipe

Sec. 10.305. One single 24.0-foot length of plastic sprinkler pipe shall be installed in the bottom of the tray.

The specimen shall be laid in the center of the tray. The pipe specimen shall be placed on a mesh screen in the tray. The mesh screen shall be galvanized wire cloth with 0.047-inch wire diameter and having 0.75-inch openings. The length of pipe is to be fastened to the screen with fasteners as described in the next paragraph.

Bare copper tie wires not larger than No. 18 AWG (nominal wire cross section of 1620 CM) may be used to fasten the specimen to the mesh screen and rungs of the tray wherever a tie is necessary to keep a specimen in contact with the rung and to minimize movement during the test. A tie is not to be used in any manner that alters the ability of the specimen to transmit gases and/or vapor longitudinally through the core of the specimen.

6. Sec. 10.306 (new Section 10.307). Revise the second and fourth paragraphs as follows:

The furnace shall be preheated and cooled as described in Section 10.305~~6~~.

The test equipment shall be adjusted and conditioned as described in Section 10.305~~6~~ with the ~~openable~~ test specimens in place.

7. Sec. 10.307 (new Section 10.308). Revise Item 7 as follows:

7. ~~For electrical cable~~ The weight of nonmetallic components ... (Balance of item to remain unchanged.)

8. Sec. 10.308 (new Section 10.309). Revise as follows:

To be acceptable for installation exposed in concealed space above suspended ceilings used as air plenums, electrical cable and plastic sprinkler pipe shall:

(Balance of section to remain unchanged.)

Reason: To update the standard to reflect wording in the current edition of UL 910 and incorporate provisions for testing plastic sprinkler pipe (per UL 1887) which uses the same test chamber, test procedure and acceptance criteria. Section 1002 (a), Exception 7, was added to the Uniform Mechanical Code in September 1989. This would eliminate an inconsistency between the Uniform Building Code and U.M.C. Standard No. 10-3.

Analysis: None.

269—Committee Action

M-A-10-3-91-1—B.F.G.

Approval as Revised

U.M.C. Standard No. 10-3. Revise as follows:

1. Revise heading as follows:

UNIFORM MECHANICAL CODE STANDARD NO. 10-3

TEST METHOD FOR FIRE AND SMOKE CHARACTERISTICS OF ELECTRICAL CABLE AND PLASTIC SPRINKLER PIPE

Based on Standard No. 910, 1982 1985 and Standard No.
1887, 1989, of Underwriters Laboratories Inc.

See Section 1002, Uniform Mechanical Code

2. Sec. 10.301. Revise as follows:

This is a test method for determining values of flame distance and smoke density for exposed electrical cables and plastic sprinkler pipe that are to be installed in concealed spaces above suspended ceilings

used as air plenums without the cables being enclosed in raceways in those spaces. The purpose of this test method is to determine whether the flame-propagation and smoke-generating characteristics of these cables without raceways and the plastic sprinkler pipe are in accordance with the provisions of Exception 6 or 7 to Uniform Mechanical Code Section 1002 (a).

3. Sec. 10.302. Revise as follows:

This test method does not cover the construction or performance requirements for cables or their electrical and other performance requirements sprinkler pipe, nor does it cover the electrical requirements of the cables.

4. Sec. 10.303. Revise paragraphs 4, 9, 15 and 16 as follows:

... comparable to the following:

Maximum effective temperature—1,200°F.

Bulk density—~~12.5~~ 21.0 ± 1.5 lbm/ft.³

Thermal conductivity—0.50-0.71 Btu•inch per hour•square foot•°F. at 300°F. to 700°F.

... A draft-gauge manometer to indicate static pressure shall be connected in the vent pipe upstream of the damper and the photoelectric cell opening inserted through the top at the midwidth of the tunnel, just downstream of the air-intake shutter.

... below the top surface of the gasketing tape and within 1.0 foot of the vent end of the test chamber at the center of the width of the chamber 23 feet - 1/4 inch from the centerline of the burner ports and at the center of the width of the chamber.

A No. 18 AWG thermocouple (nominal wire cross section of 1620 CM) embedded 0.125 inch below the floor surface of the test chamber shall be mounted in refractory or portland cement at distances of 13.5 and ~~24.9~~ 23.0 feet from the fire end of the test chamber burner ports.

5. Sec. 10.304. Revise the heading as follows:

Test Specimens—Cables

6. Sec. 10.305. Add a new Section 10.305 as follows and renumber remaining sections accordingly:

Test Specimens—Pipe

Sec. 10.305. Plastic sprinkler pipe shall be installed to fill the bottom of the tray.

The pipe specimens shall be placed on a mesh screen in the tray. The mesh screen shall be galvanized wire cloth with 0.047-inch wire diameter and having 0.75-inch openings. The length of pipe is to be fastened to the screen with fasteners as described in the next paragraph.

Bare copper tie wires not larger than No. 18 AWG (nominal wire cross section of 1620 CM) may be used to fasten the specimen to the mesh screen and rungs of the tray wherever a tie is necessary to keep a specimen in contact with the rung and to minimize movement during the test. A tie is not to be used in any manner that alters the ability of the specimen to transmit gases or vapor longitudinally through the core of the specimen.

7. Sec. 10.306 (new Section 10.307). Revise the second and fourth paragraphs as follows:

The furnace shall be preheated and cooled as described in Section 10.305~~6~~.

The test equipment shall be adjusted and conditioned as described in Section 10.305~~6~~ with the open cable test specimens in place.

8. Sec. 10.307 (new Section 10.308). Revise Item 7 as follows:

7. For electrical cable ~~The~~ weight of nonmetallic components . . . (Balance of item to remain unchanged.)

9. Sec. 10.308 (new Section 10.309). Revise as follows:

To be acceptable for installation exposed in concealed space above suspended ceilings used as air plenums, electrical cable and plastic sprinkler pipe shall:

(Balance of section to remain unchanged.)

Reason: Electrical cable and plastic pipe should be loaded in the tray in the same way as for fire testing. A tendency to create special tests for each product should be resisted.

269—Challenge No. 1

B. F. Goodrich Company requests Approval as Revised with further revision.

Revision:

Sec. 10.305 of the proposal. Revise as follows:

Test Specimens—Pipe

Sec. 10.305. One single 24.0-foot length of plastic sprinkler pipe shall be installed to ~~fill~~ in the bottom of the tray.

The specimen shall be laid in the center of the tray. The pipe specimens shall be placed on a mesh screen in the tray. (Balance to remain unchanged.)

Reason: Changes made by the committee are not appropriate for the following reasons:

1. This introduces test conditions that are inconsistent with those of the UL 1887 standard referenced in the heading. Therefore, UL-listed plenum cables would be acceptable, but UL-listed fire sprinkler pipe would not be acceptable.

2. The UL investigation that lead to their report and the UL 1887 standard included tunnel tests on pipe water filled and empty. In addition, a full-scale plenum test was run in which wood cnb fires were built directly under the 3-inch pipe.

3. In the UL 1887 tests with 3-inch pipe, 45 pounds of plastic pipe were exposed in an 18-inch-wide tunnel with gas jets below and all the smoke was collected and measured. When compared with an actual fire sprinkler system in a light-hazard occupancy, the tunnel contained more than 25 times as much combustible material per square foot of ceiling area than an actual plenum would have.

269—Challenge No. 2

Underwriters Laboratories Inc. requests Approval as Revised with further revision.

Revision:

Sec. 10.305 of the proposal. Revise as follows:

Sec. 10.305. One single 24.0-foot length of plastic sprinkler pipe shall be installed to ~~fill~~ in the bottom of the tray.

The specimen shall be laid in the center of the tray. The pipe specimens shall be placed on a mesh screen in the tray. (Balance to remain unchanged.)

Reason: The use of a single length of plastic pipe as the sample for the UL 1887 test technically is substantiated based on results of a UL Fact-Finding Program (EX3648, 86NK2409). This program consisted of full-scale simulated air-handling plenum fire tests and tests using the UL 1887 procedure.

The installation of sprinkler piping in the full-scale test was representative of current field practice, which is one main line and several branch lines, as required. Typically, sprinkler piping is not installed in groups with minimum distance between branch lines specified in NFPA 13. A positive relationship was obtained between the results of the full-scale tests and the UL 1887 test with a single length sample. Accordingly, it is appropriate to maintain the single length sample as described in UL 1887 when investigating plastic sprinkler pipe for flame and smoke characteristics.

269—Membership Action A A/R A/A FS D

CTL026977