UL 203

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Pipe Hanger Equipment for Fire Protection Service

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UL Standard for Safety for Pipe Hanger Equipment for Fire Protection Service, UL 203

Ninth Edition, Dated January 20, 2005

Summary of Topics

This new edition of ANSI/UL 203 is a periodic re-issuance to ensure that UL's Standards remain up to date with regard to format and editorial issues such as numbering, pagination, and cross-referencing. This new edition also includes new and revised requirements for Special/ Standard Pipe Hangers, Hangers for Thermoplastic Sprinkler Pipe, Upward Thrust Test, and Installation Instructions.

The following table lists the future effective dates with the corresponding reference.

Future Effective Date	Reference
January 20, 2007	Paragraph 11.1.2, Table 11.2, and Sections 13 and 15

The new requirements are substantially in accordance with UL's Bulletin(s) on this subject dated July 13, 2004 and November 8, 2004. The bulletin(s) is now obsolete and may be discarded.

As indicated on the title page (page 1), this UL Standard for Safety is an American National Standard. Attention is directed to the note on the title page of this Standard outlining the procedures to be followed to retain the approved text of this ANSI/UL Standard.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: http://ulstandardsinfonet.ul.com/ulforeword.html

The master for this Standard at UL's Northbrook Office is the official document insofar as it relates to a UL service and the compliance of a product with respect to the requirements for that product and service, or if there are questions regarding the accuracy of this Standard.

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The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if the applicant elects this option, it should be noted that compliance with all the requirements in this Standard will be required as a condition of continued Listing and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

This Standard consists of pages dated as shown in the following checklist:

Page	Date
1-18	January 20, 2005

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UL 203

Standard for Pipe Hanger Equipment for Fire Protection Service

The First and Second editions were titled ″Standard for Pipe Hanger Equipment″.

First Edition – January, 1958
Second Edition – June, 1963
Third Edition – May, 1966
Fourth Edition – October, 1971
Fifth Edition – September, 1977
Sixth Edition – March, 1985
Seventh Edition – October, 1989
Eighth Edition – October, 1996

Ninth Edition

January 20, 2005

The most recent designation of ANSI/UL 203 as an American National Standard (ANSI) occurred on January 4, 2005.

This ANSI/UL Standard for Safety, which consists of the Ninth edition is under continuous maintenance, whereby each revision is ANSI approved upon publication. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Written comments are to be sent to UL-RTP Standard Department, 12 Laboratory Dr., P.O. Box 13995, Research Triangle Park, NC, 27709-3995.

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

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INTRODUCTION

1 Scope

1.1 These requirements cover the performance of pipe hanger equipment for use in supporting piping employed in sprinkler systems, water-spray systems, and other piping systems used for fire-protection service.

1.2 Requirements for the installation of pipe hangers and auxiliary equipment and limitations for use of specific sizes of hangers and pipe are included in the Standard for the Installation of Sprinkler Systems, NFPA 13, and the Standard for Water-Spray Fixed Systems for Fire Protection, NFPA 15.

1.3 These requirements cover design variations of hangers defined in Section 5, and do not cover products fabricated from rods of iron or steel with diameters specified by the Standard for the Installation of Sprinkler Systems, NFPA 13, such as U-type hangers, hanger rods, coach screws, and similar products.

2 Components

2.1 Except as indicated in 2.2, a component of a product covered by this standard shall comply with the requirements for that component.

2.2 A component is not required to comply with a specific requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or

b) Is superseded by a requirement in this standard.

2.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

4 Undated References

4.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

5 Glossary

5.1 For the purpose of this standard the following definitions apply.

5.2 BAND HANGER – A type of hanger that is adjustable and utilizes a band looped around the pipe.

5.3 BRACKET – A cantilever-type hanger that is attached directly to a vertical surface of the building structure.

5.4 ″C″ CLAMP – A hanger that grips a flange by means of a jaw and setscrew combination.

5.5 CEILING FLANGE – A hanger that is attached directly to an overhead surface of a building structure.

5.6 CLAMP – A hanger that is rigidly attached to the flange of a steel structural member.

a) Beam Clamp – A clamp that is rigidly attached to both edges of the bottom flange of a structural member.

b) Top and Bottom Beam Clamp – A clamp that is rigidly attached to one edge of the top or bottom flange of a structural member.

5.7 CLAMP (RISER) – A type of pipe clamp used to support risers at various levels.

5.8 CLEVIS HANGER – A type of split ring hanger.

5.9 CLIP – A pipe support, usually one piece and nonadjustable, that only partially embraces a pipe and attaches directly to a building structure.

5.10 CONCRETE INSERT – A hanger that is intended to be inserted into freshly poured concrete by which means the hanger is attached to the building structure.

5.11 COUPLING – A hanger used to connect expansion shells or fasteners to a rod. Couplings have male or female threads and have straight, reducing, or increasing patterns.

5.12 EXPANSION ANCHOR (SHIELD OR SHELL) – A hanger that is inserted into a self-drilled or predrilled hole in concrete and then ″set,″ usually by tightening of a bolt, setting of a cam or semisoft member, or forced expansion over a hardened steel plug.

5.13 HANGER – A unit assembly used singly or in combination with other assemblies for supporting or hanging pipe.

a) Standard Pipe Hanger – A hanger constructed to fit the appropriate rod sizes specified in Table 6.1 for the sizes of pipe shown and having the strength to support the largest pipe size for the corresponding rod size.

b) Special Pipe Hanger – A hanger that has a maximum pipe size intended for use with the product less than the maximum referenced for a rod size (for example, the straight eye socket with 3/8 inch (9.5 mm) rod size for use with 2 inch (50.8 mm) maximum pipe size).

5.14 POWDER DRIVEN FASTENER – A hanger where the shank of the fastener is driven into concrete or steel by use of a special impact tool powered by an explosive charge similar to a firearm charge. Fasteners have male or female threads.

5.15 RETAINING STRAP – A hanger part used to hold a hanger in its intended position, usually on a beam.

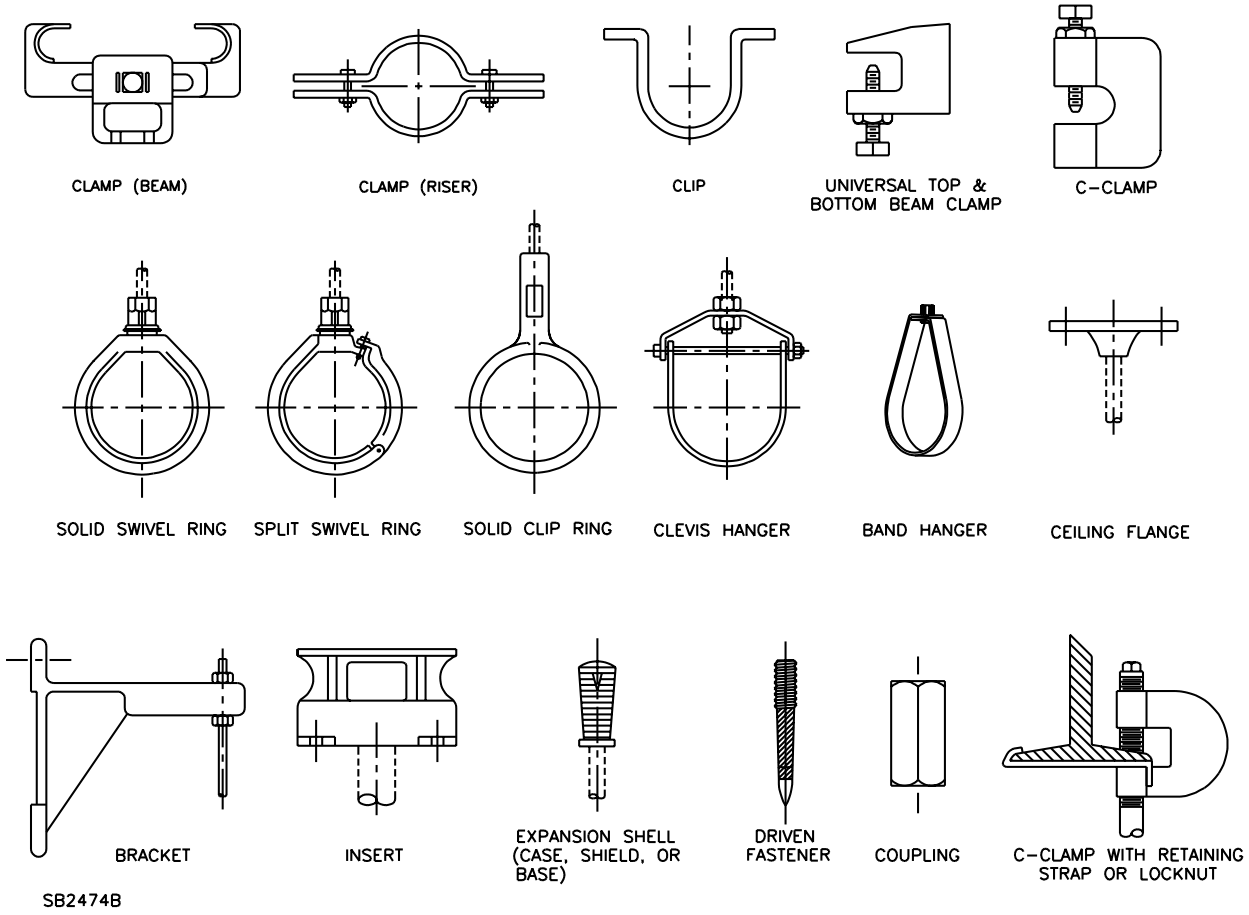
5.16 RING – A pipe hanger that completely encircles a pipe without a positive gripping action.

a) Solid Clip Ring – One that has to be slipped onto the end of the pipe and is not able to be opened in any way for attachment to the pipe after the pipe line is assembled.

b) Split Swivel Ring – One that is capable of being opened so that the pipe is able to be put into the ring after the pipe line is assembled.

c) Solid Swivel Ring – A solid ring that has a top swivel in which the hanger is able to be connected to a rod after it has been installed on the pipe.

Figure 5.1
Some common types of pipe hanger equipment



CONSTRUCTION

6 General

6.1 A standard pipe hanger shall be constructed to fit the appropriate rod sizes specified in Table 6.1 for the sizes of pipe shown and shall have the strength to support the test loads, specified in the Pull Test, Section 11, without rupture, pullout, or release of load. Washers shall not be used to reduce an oversize hole to accommodate a rod. A special pipe hanger shall be permitted to be used with a maximum pipe size less than the maximum referenced for a rod size in Table 6.1 when marked with the maximum pipe size (See 14.1).

Table 6.1
Hanger rod sizes

Pipe size			Minimum hanger rod size	
Nominal inches	OD			
	Inches	(mm)	Inch	(mm)
3/4	1.05	(26.7)	3/8	(9.6)
1	1.32	(33.4)	3/8	(9.6)
1-1/4	1.66	(42.2)	3/8	(9.6)
1-1/2	1.90	(48.3)	3/8	(9.6)
2	2.38	(60.3)	3/8	(9.6)
2-1/2	2.88	(73.0)	3/8	(9.6)
3	3.50	(88.9)	3/8	(9.6)
3-1/2	4.00	(101.6)	3/8	(9.6)
4	4.50	(114.3)	3/8	(9.6)
5	5.56	(141.2)	1/2	(12.7)
6	6.63	(168.3)	1/2	(12.7)
8	8.63	(219.2)	1/2	(12.7)
10	10.75	(273.1)	5/8	(15.8)
12	12.75	(323.9)	5/8	(15.8)

6.2 A bracket shall be of such construction that the reactive force on any one bolt or screw is no greater than the load applied on the cantilever portion of the device.

6.3 Accommodation of some items of hanger equipment, such as powder-driven fasteners and 1/4 and 5/16 inch (6.4 and 7.9 mm) size expansion anchors, to the standard hanger rod sizes shall be achieved by use of increaser couplings that have the strength to support the test loads applicable to the maximum pipe sizes intended for use with the hanger equipment.

6.4 Ceiling flanges for pipe sizes up to 2 inches shall have at least two supporting screw holes; for pipe sizes 2-1/2 to 8 inches, not less than three supporting screw holes.

6.5 Hanger-rod sizes designated in Table 6.1 are the nominal diameters associated with machined threads. The diameter of a rod provided with a rolled thread shall be not less than the root diameter of the thread.

7 Materials

7.1 Hangers and their components shall be made of ferrous materials.

Exception: When nonferrous materials, for example, plastics, are used, they shall be investigated to evaluate their resistance to external fire exposure and effects of aging.

8 Protective Coatings

8.1 When a hanger or part of a hanger is made of flat iron or steel, the thickness of the metal, unless protected by coating as described in 8.2, shall be at least 3/16 inch (4.8 mm).

Exception No. 1: Retaining strap material for a "C" clamp fabricated from unprotected flat steel not less than 1/8 inch (3.2 mm) #11 gauge (nominal 0.120 inches) thick.

Exception No. 2: Clevis-type hangers and other flat iron hangers, fabricated from steel at least 1/8 inch (3.2 mm) #11 gauge (nominal 0.120 inches) thick and at least 1 inch (25.4 mm) wide and when the support (hanger) exhibits strength values, under test, of 1-1/2 times the load requirements specified by Table 11.1 or Table 11.2 as applicable.

Exception No. 3: "C" clamps fabricated from not less than 1/8 inch (3.2 mm) #11 gauge (nominal 0.120 inches) thick unprotected steel and formed of a double thickness so as to create at least a 1/4 inch (6.4 mm) thick section at the throat of the clamp, when the clamp exhibits strength values, under test, of 1-1/2 times the load requirements specified by Table 11.1 or Table 11.2 as applicable.

Exception No. 4: Pressed-steel concrete inserts fabricated from unprotected steel not less than 1/8 inch (3.2 mm) #11 gauge (nominal 0.120 inches) thick when it complies with all other applicable requirements.

8.2 With reference to the requirements of 6.1, the following coatings meet the intent of this requirement:

a) A zinc coating having a minimum thickness of 0.0005 inch (0.0127 mm) on all outside surfaces and 0.0003 inch (0.0076 mm) on all inside surfaces. The thickness of the coating is to be established by the Metallic Coating Thickness Test, Section 9.

b) A hot-dipped mill galvanized sheet steel conforming with the coating designation G90 in Table I of the Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process, A653/A653M, with not less than 40 percent of the zinc on any side, based on the minimum single spot test requirement in this ASTM Designation. The weight of the zinc coating is to be determined by any equivalent method; however, in case of question, the weight of the coating shall be established in accordance with the test method of the Standard Test Method for Weight (Mass) of Coating on Iron or Steel Articles with Zinc or Zinc-Alloy Coatings, A90/ASTM A90M. The edges of a stamping complying with this requirement are not required to be plated.

c) Any other metallic or nonmetallic finish or combination of the two which, when subjected to comparative tests, indicates it provides corrosion protection equivalent to the coating by either item (a) or (b) above.

9 Use in Environmental Air Handling Spaces

9.1 Pipe hangers having nonmetallic components and intended for use in ceiling cavity environmental air handling spaces shall be tested in accordance with the requirements in the Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces, UL 2043, and comply with the applicable requirements of the Standard for the Installation of Air Conditioning and Ventilating Systems, NFPA 90A.

PERFORMANCE

10 Metallic Coating Thickness Test

10.1 The solution to be used for this test is to be made from distilled water and is to contain 200 grams per liter or reagent grade chromic acid (CrO_3) and 50 grams per liter of chemically pure concentrated sulfuric acid (H_2 SO_4). The latter is equivalent to 27 milliliters per liter of chemically pure concentrated sulfuric acid, specific gravity 1.84, containing 96 percent of H_2 SO_4.

10.2 Except as specified in 10.3, the metallic coating thickness test described in 10.4 – 10.11 shall be used to determine the thickness of a zinc or cadmium coating.

10.3 As an alternative to the test described in 10.4 – 10.11, a nondestructive test method as specified in Standard Test Method for Measurement of Coating Thickness by X-Ray Spectrometry, ASTM B568 or an equivalent test method shall be used to determine the thickness of a zinc or cadmium coating. Whenever referee measurements are required, the test described in 10.4 – 10.11 is to be used.

10.4 The solution to be used for this test is to be made from distilled water and is to contain 200 grams per liter of reagent grade chromic acid (CrO_3) and 50 grams per liter of chemically pure concentrated sulfuric acid (H_2 SO_4). The latter is equivalent to 27 milliliters per liter of chemically pure concentrated sulfuric acid, specific gravity 1.84, containing 96 percent of H_2 SO_4.

10.5 The test solution is to be contained in a glass vessel such as a separatory funnel with the outlet equipped with a stopcock and a capillary tube of 0.025 inch (0.64 mm) inside bore and 5.5 inches (139.7 mm) long. The lower end of the capillary tube shall be tapered to form a tip, the drops from which are 0.025 milliliters each. To preserve an effectively constant level, a small glass tube shall be inserted in the top of the funnel through a rubber stopper and its position is to be adjusted so that, when the stopcock is open, the rate of dropping is 100 ±5 drops per minute. An additional stopcock is permitted to be used in place of the glass tube to control the rate of dropping.

10.6 The sample and the test solution shall be conditioned to the test room ambient temperature, which shall be 21.1 – 32.2°C (70 – 90°F).

10.7 Each sample is to be thoroughly cleaned before testing. All grease, lacquer, paint, and other nonmetallic coatings are to be removed completely by means of solvents. Samples are then to be thoroughly rinsed in water and dried. Care is to be exercised to avoid contact of the cleaned surface with the hands or any foreign material.

10.8 The sample to be tested is to be supported from 0.7 – 1 inch (17.8 – 25.4 mm) below the orifice, so that the drops of solution strike the point to be tested and run off quickly. The surface to be tested is to be inclined 45 degrees from the horizontal.

10.9 The stopcock is to be opened and the time, in seconds, is to be measured until the dropping solution dissolves the protective metallic coating, exposing the base metal. The base material is exposed when the first appearance of the base metal is recognizable by the change in color.

10.10 Each sample of a test lot is to be subjected to test at three or more points, excluding cut, stenciled, and threaded surfaces, on the inside surface and at an equal number of points on the outside surface, at places where the metallic coating is expected to be the thinnest. On enclosures made from precoated sheets, the external corners that are subjected to the greatest deformation are able to have thin coatings.

10.11 The thickness of the coating being tested is to be calculated by specifying the appropriate thickness factor from Table 10.1 for the temperature at which the test was conducted and multiplying that factor by the time, in seconds, required to expose the base metal as noted in 10.9.

Table 10.1
Thickness of coating factors

Temperature		Thickness factors, 0.00001 inch (0.0003 mm) per second
°F	(°C)	Zinc platings
70	(21.1)	0.980
71	(21.7)	0.990
72	(22.2)	1.000
73	(22.8)	1.010
74	(23.3)	1.015
75	(23.9)	1.025
76	(24.4)	1.033
77	(25.0)	1.042
78	(25.6)	1.050
79	(26.1)	1.060
80	(26.7)	1.070
81	(27.2)	1.080
82	(27.8)	1.085
83	(28.3)	1.095
84	(28.9)	1.100
85	(29.4)	1.110
86	(30.0)	1.120
87	(30.6)	1.130
89	(31.1)	1.141
89	(31.7)	1.150
90	(32.2)	1.160

11 Pull Test

11.1 General

11.1.1 A pipe hanger shall support the required loads specified in 11.1.2 for 1 minute without rupture, pull out, or complete release of load. Sample pipe hangers are to be installed in a tension-compression test apparatus in a manner duplicating as closely as possible their intended field installation.

Table 11.1
Pull test load requirements for hangers for metallic sprinkler pipe

Pipe size, inches	Required load	
	lb-f	(Newtons)
3/4	750	(3336)
1	750	(3336)
1-1/4	750	(3336)
1-1/2	750	(3336)
2	750	(3336)
2-1/2	850	(3781)
3	1050	(4670)
3-1/2	1250	(5560)
4	1500	(6672)
5	2000	(8896)
6	2650	(11787)
8	4050	(18014)
10	5850	(26020)
12	7900	(35139)

Table 11.2
Pull test load requirements for hangers for thermoplastic sprinkler pipe

Table 11.2 effective January 20, 2007

Pipe size, inches	Required load	
	Lb-f	(Newtons)
1/2	340	(1512)
3/4	340	(1512)
1	340	(1512)
1-1/4	340	(1512)
1-1/2	340	(1512)
2	340	(1512)
2-1/2	400	(1779)
3	500	(2224)
4	750	(3336)

11.1.2 The required load for hangers intended shall be determined by one of the following as applicable:

a) For metallic pipe, multiplying the weight of a span of 15 feet (4.57 m) of water-filled Schedule 40 steel pipe by 5, plus a fixed load of 250 pounds-force (1112 N); or a minimum load of 750 pounds (340.2 kg). See Table 11.1.

b) For thermoplastic pipe, multiplying the weight of the maximum a span of water-filled thermoplastic pipe by 5, plus a fixed load of 250 pounds-force (1112 N) or a minimum load of 340 pounds-force (1512 N). See Table 11.2 for loads for CPVC pipe.

c) Paragraph 8.1 Exceptions, No. 1, 2 and 3

11.1.2 effective January 20, 2007

11.1.3 The test apparatus is to be started slowly until there is no slack in the test assembly. The test sample is then subjected to an increasing load until the required load is achieved.

11.1.4 A hanger other than a riser clamp, whose holding power is dependent on the tightness of a bolt, nut, cap screw, lock nut, setscrew, or other machine or roll-threaded part, is to be installed in the test apparatus and subjected to test with the threaded members tightened to the values specified in Table 11.3.

Table 11.3
Applied torques for threaded parts

Thread size		Applied torque	
Inches	(mm)	Pound-inches	(N·m)
1/4	(6.4)	40	(4.52)
5/16	(7.9)	50	(5.65)
3/8	(9.5)	60	(6.78)
7/16	(11.1)	90	(10.2)
1/2	(12.7)	125	(14.1)
9/16	(14.3)	180	(20.3)
5/8	(15.9)	250	(28.2)
3/4	(19.1)	400	(45.2)
7/8	(22.2)	665	(75.1)
1	(25.4)	990	(111.9)

11.1.5 A riser clamp is to be tightened to the torque value specified by the manufacturer prior to testing.

11.2 Concrete inserts

11.2.1 Pipe hangers intended for installation in concrete are to be installed in a manner duplicating as closely as possible their intended field installation in concrete blocks as specified in 11.2.2, and shall support the appropriate short-term test load specified in Table 11.1 for 1 minute without rupture, pull out, or complete release of load.

11.2.2 With respect to 11.2.1, the concrete blocks are to be at least 14 by 14 by 8 inches (356 by 356 by 203 mm) in size, made from a mixture of one part Portland cement, two parts torpedo sand, and four parts crushed limestone or gravel, or of a mixture of these proportioned so that the 28 day compressive strength is from 2500 to 3000 psi (17.2 to 20.7 MPa), and reinforced by eight 1/4 inch (6.4 mm) steel rods. Four of the rods are to be placed in the concrete-block form in a plane 1-1/2 inches (38.1 mm) from and parallel with the top of the form and the other 4 rods similarly arranged from the bottom. Each set of four rods is to be arranged in the form so that each of the four sides of the form has a rod placed 3 inches (76.2 mm) in from the side.

11.2.3 Sample inserts are to be cast in the concrete blocks (one insert per block), and the blocks cured for at least 28 days. After this period, the concrete blocks with concrete inserts in place are to be arranged for testing and the inserts subjected to an increasing load until the required loading as specified in Table 11.1 is achieved. The test equipment supports are to be no closer to the centerline of an anchor point than ten diameters of the anchor rod. In order to verify the required compressive strength of the concrete, test inserts are to be poured from the same concrete batch as the test blocks and tested to verify the compressive strength.

11.3 Expansion shells

11.3.1 Expansion anchors (shields or shells) are to be installed for performance tests in the concrete blocks specified in 11.2.2 (one expansion anchor per block), after the blocks have cured for at least 28 days. Each sample expansion anchor is to be installed in the manner and at the depth specified by the manufacturer.

11.3.2 Following installation of test samples in the concrete blocks, each block and sample assembly is to be secured in the test apparatus and subjected to an increasing load until the required loading as specified in Table 11.1 is achieved.

11.4 Fasteners (including powder-driven)

11.4.1 Samples of fasteners, including powder-driven fasteners, designed for use in concrete are to be driven into the concrete blocks specified in 11.2.2.

11.4.2 Each test fastener for use in concrete is to be driven into the concrete to the full depth of the shank. Following installation of test samples in the concrete blocks, each block and sample assembly is to be secured in the test apparatus and subjected to an increasing load until the required loading as specified in Table 11.1 is achieved.

11.4.3 Samples of fasteners intended for use in steel are to be driven into steel having thickness(es) in which it is intended for use and having hardness values (Brinnell) of not less than 140 nor more than 240. Each sample is to penetrate to the full depth of the shank until the point protrudes 1/8 inch (3.2 mm) beyond the surface of the underside of the steel plate. The steel and fastener assembly is then to be subjected to an increasing load until the required loading as specified in Table 11.1 is achieved.

11.4.4 As powder-driven fasteners are limited in their use by the Standard for the Installation of Sprinkler Systems, NFPA 13, the applicable test-load requirements (see Table 11.1) are based on the following: when driven vertically or horizontally into concrete, powder-driven fasteners shall support piping no larger than 3-1/2 inches (88.9 mm) in diameter, and when driven into steel, they shall support piping no larger than 5 inches (127 mm) in diameter.

11.5 Welding studs

11.5.1 Welding studs are to be attached to steel plates that are not less than 3/16 inch (4.8 mm) thick using the tools and methods specified by the manufacturer. The test arrangement is then to be subjected to an increasing load until the required loading as specified in Table 11.1 is achieved.

11.6 ″C″ clamps

11.6.1 ″C″ clamps are to be tested in each possible mounting position, and a different sample used for each test.

Exception: ″C″ clamps clearly marked for installation in one specific position are to be tested in that position only.

12 Vibration Test

12.1 Expansion anchors (shields or shells), powder-driven fasteners, welded studs, ″C″ clamps not provided with a locknut or retaining strap, and any other hangers subject to change in their ability to retain their intended installation are to be vibrated for a period of 100 hours at a frequency of 35 hertz and an amplitude of 0.0325 ±0.0020 inch (0.826 ±0.051 mm); and shall then comply with the requirements of the Pull Test, Section 11.

12.2 For these tests, amplitude is defined as the maximum displacement of sinusoidal motion from position of rest or one-half of the total table displacement.

12.3 The test hanger is to consist of the smallest size of each type or series.

12.4 A hanger normally installed in concrete, such as a concrete insert or a powder-driven fastener, is to be installed in a concrete block, such as that specified in 11.2.2, weighing 130 pounds (59.0 kg). The hanger and block are to be mounted in the test fixture in a manner that results in the concrete block being test load supported by the hanger.

12.5 A hanger normally driven into, welded, or otherwise attached to steel is to be installed on the vibration test fixture in its intended manner. A hanger rod supporting a 130 pound (59.0 kg) test load is to be attached to the hanger.

12.6 The text fixture, together with the hanger and its load, is to be mounted in a vertical position on a vibration-test apparatus and vibrated in a vertical direction.

13 Upward Thrust Test

13.1 Pipe hangers intended to restrain vertical movement per NPFA 13 shall withstand the force of 340 pounds (1512 N) without a displacement of more than 1/8 inch (3.2 mm) when installed in accordance with the manufacturer's instructions.

13.1 effective January 20, 2007

13.2 Sample pipe hangers and the appropriate pipe are to be installed in a tension-compression test apparatus in a manner duplicating as closely as possible their intended field installation. Each assembly is then to be subjected to an increasing load until a load of 340 pounds-force (1512 N) is attained, in a, manner to evaluate the restraining feature, and the displacement measured.

13.2 effective January 20, 2007

MARKINGS

14 General

14.1 A hanger shall be plainly marked with the name or trademark of the manufacturer and the maximum pipe size.

Exception No. 1: A pipe hanger that is tested with the maximum size pipe it is able to accommodate is not required to be marked with the maximum pipe size.

Exception No. 2: The name or trademark for a product that is not able to be adequately marked due to product size, material, or similar limitations shall be placed on the smallest unit container when the product is packaged for shipment.

14.2 When a manufacturer produces pipe hanger equipment at more than one factory, each hanger shall have a distinctive marking to identify it as the product of a particular factory.

INSTRUCTIONS

15 Installation Instructions

15.1 Installation instructions shall be provided with each shipment of hangers requiring a specific bolt torque or hangers intended to restrain movement, and shall include at least the following items:

a) Assembly procedure for installation of the hangers;

b) Pipe and size specifications, when required, with which hanger is intended to be used;

c) Required torque for bolts (if bolts are used), when not marked on the hanger; and

d) Position on the pipe relative to sprinkler or nozzle location.

15.1 effective January 20, 2007

15.2 Installation instructions shall be provided with each shipment of hangers intended for the support of thermoplastic piping, and shall include at least the following items:

a) Orientation of pipe that hanger is intended to support – horizontal or vertical;

b) Orientation of mounting surface to which hanger is intended to be fastened – top, bottom or side.

15.2 effective January 20, 2007

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