CITY OF LOS ANGELES
CALIFORNIA

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RESEARCH REPORT: RR 5609
EFFECTIVE DATE: 05/01/2008
EXPIRATION DATE: 05/01/2009
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GENERAL APPROVAL - Renewal - "Flexible Sprinkler Hose with Threaded End Fittings and Bracket," manufactured by FlexHead Industries. See attached page for list of approved models.

DETAILS

A FlexHead sprinkler connection is comprised of a multi-port ceiling bracket with hardware and welded, one inch (1") stainless steel braided flexible sprinkler drop. The flexible sprinkler connection (hose) is available in one-foot (1') increment up to a maximum six foot (6') length of Type 304 stainless steel hose liner. Mounting brackets are first secured to ceiling to install FlexHead under a ceiling. For drywall ceilings, the mounting bracket is attached to the metal studs supporting the ceiling. The threaded end of the FlexHead sprinkler drop is secured to a branch line and other end of sprinkler drop is secured a mounting bracket. A tested and listed sprinkler is attached to a FlexHead sprinkler drop through mounting bracket. These products are in compliance with Factory Mutual Global Testing Standard FM 1637 and Underwriters Laboratories, Inc., Standard UL 2443.

The approval is subject to the following conditions:

1. These products may be installed to support fire sprinkler heads directly without requiring additional hangers in hydraulically designed fire protection systems in residential and commercial buildings in accordance with National Fire Protection Association (NFPA) Standard 13.

2. The maximum length up to six feet (6') need not be supported as required by Sec.9.2.3.5.1 of Standard NFPA 13, 2007 Edition.

3. The inlet shall have at least one inch (1") size male or female Nominal Pipe Threads (NPT) in accordance "Standard for Pipe Threads, General Purpose," ANSI/ASME B1.20.1. Outlet shall have one half inch (½"), three quarter inch (3/4") or one inch (1") female NPT threads.

4. Assembly and installation of FlexHead and fittings shall comply with UL and FM listings and manufacturer's installation instructions.

5. In a "Light Hazard" occupancy of Standard NFPA 13, when sprinkler heads are supported by suspended ceilings, ceiling shall meet Standard C-635 of American Society of Testing Materials (ASTM) and shall be installed in accordance with ASTM Standard C-636.

6. When supported by suspended ceilings, Building plan check approval and permit shall be secured showing compliance with ASTM Standard C-635 and ASTM Standard C-636 prior to installing these products.

7. These products may be installed in return air plenums, HVAC duct systems, and commercial kitchen exhaust ducts.

8. The maximum distance between hangers for branch lines, to which these products are attached to, shall be in accordance with Table 6-2.2 of Standard NFPA 13.

9. These products may be installed, where system pressure does not exceed 175 psi.

10. FlexHead may be installed in concealed combustible spaces, as referenced by NFPA 13, that are required to be sprinkled if the sprinkler head that is used is listed for the use in such spaces in accordance with applicable sprinkler specifications.

11. FlexHead may be installed to secure sprinkler systems in attics with sprinklers that are specifically listed for use in attic spaces. Based on the sprinkler head listing FlexHead may be used in attic spaces when used to feed wet system sprinklers below the ceiling in compliance with applicable sprinkler specifications.

12. In protected (unexposed) installations FlexHead may be used in sprinkler systems employing sprinkler heads rated at 225 °F or lower for standard pendent and horizontal sidewall heads. Quick-response heads shall be rated at 155 °F or less.

13. Where used in buildings greater than 75 feet in height, all horizontal pipes, sizes 1-1/2" and larger, including any permitted connections to vertical risers, to which these FlexHeads are attached, shall be seismically designed in accordance with the Los Angeles Building Code. All other horizontal pipes shall comply with NFPA 13, requirements for seismic bracing where applicable, and for sizes 1-1/2" and larger shall also be secured with sway bracing at each change in direction.

14. Penetration of fire rated occupancy separations, division walls or construction envelopes shall be sealed with through penetration fire stop systems that satisfy all of the following:

    - listed by an approved testing or listing agency.
    - approved by City of Los Angeles Research and Development Division.
    - recommended by the system manufacturer for use with FlexHead hose and fittings.

15. This piping shall be pressure tested accordance with manufacturer's recommendations, and NFPA 13, whichever is more stringent, before and after being closed in by a building finish, to assure hydrostatic integrity, and to verify absence of mechanical damage.

16. For fire protection systems using FlexHeads following shall be required:

    a. Complete plans of the proposed fire sprinkler systems shall be submitted to Mechanical Plan Check and shall be approved prior to installation.

b. A fire sprinkler permit shall be obtained as required in Section 94.103.1 of the City of Los Angeles Plumbing Code, 2008 Edition.

18. Each flexible sprinkler hose with threaded end fittings shall be permanently marked with following:

(1) Manufacturer's name or trademark and logo.

(2) Nominal size.

(3) Rated working pressure.

(4) Model Designation.

(5) "FM," and "UL" listing marks.

DISCUSSION

Current product samples were examined. Test report titled, "Seismic Qualification Tests of Sprinkler Systems" in accordance with "Seismic Qualification Testing of Nonstructural Components" - AC 156 from Department of Civil, Structural, and Environmental Engineering, University at Buffalo, has been reviewed by Mechanical Testing Laboratory. The information and supporting test data submitted by the applicant show that, these products are suitable for the intended use and comply with Los Angeles Plumbing Code in quality, strength, fire resistance, effectiveness, durability and safety.

For this General Approval to be valid on any individual construction project in the City of Los Angeles, an engineer or inspector of the Department of Building and Safety must make a determination that all conditions of General Approval required to provide equivalency have been met in the case of each construction project under consideration.

This approval is granted under Sections 94.301.1, 94.301.2, 94.2001, 94.2002.0, and 94.2004 of the Los Angeles Plumbing Code, 2008 Edition.

Approved by:

for Thomas Liu, Director
Mechanical Testing Laboratory
Engineering Bureau

Prepared by: Jason Tran
Mechanical Testing Laboratory

FlexHead Industries

Research Report RR 5609

"Flexible Sprinkler Hose with Threaded End Fitting"

List of Approved Models, Friction Loss Data, and Specifications

FlexHead Model #	Internal Diameter True-Bore (inch)	Outlet Size (inch)	Hose Assembly Length (ft.)	Equivalent length of 1" schedule 40 pipe (ft.)	Maximum Rated Pressure (psi.)
2024	1	1/2	2	3.5	175
2036	1	1/2	3	4.8	175
2048	1	1/2	4	6.8	175
2060	1	1/2	5	8.5	175
2072	1	1/2	6	8.9	175
2024	1	3/4	2	7.8	175
2036	1	3/4	3	8.1	175
2048	1	3/4	4	17.9	175
2060	1	3/4	5	19.9	175
2072	1	3/4	6	24.3	175