

BROCHURE

FLEXHEAD

a brand of  **ANVIL[®]**
INTERNATIONAL

WE INVENTED THE CONCEPT OF FLEXIBLE FIRE PROTECTION™

We invented the concept of flexible fire protection™

Welcome to FlexHead Industries

The first FlexHeads were installed in a semiconductor plant (now an Intel plant) in 1986. They are still in service today; they were tested and accepted by Factory Mutual Research Corporation (FMRC). In the early 1990's, FlexHead and FMRC worked together to draft the first ever approval standard, FM 1637 FMRC testing criteria for a flexible sprinkler fire sprinkler component. Shortly after, FlexHead received its first FMRC approval.

Today, FlexHead holds over fifty Factory Mutual approvals and several Underwriters Laboratories listings for flexible sprinkler connections. Our semiconductor products are currently protecting several major semiconductor plants with sprinkler connections. Semiconductor facilities are generally considered to be the most sensitive environments in the world; costing billions to build and housing billions of dollars worth of tools for making semiconductors. With shutdown costs approaching \$2,000 per second, per plant, you can see why they are given this title. Companies such as these do not take chances with their fire protection components; they use FlexHead systems.

Over 25 years ago, FlexHead introduced our FM approved and UL listed commercial sprinkler system which is designed to be used in commercial buildings. FlexHead uses the same flexible hose technology used in semiconductor clean rooms and adapted it to accommodate the commercial sprinkler market. The FlexHead product is the only flexible fire sprinkler fitting that has been through full seismic qualification testing using the "ICC AC-156 Seismic Qualification Testing of Non Structural Components." The FlexHead product is FM 1637 approved and UL 2443 listed.

Today, the FlexHead commercial product is currently protecting commercial buildings including hospitals, schools, military bases, large retail projects, colleges, universities, government buildings, and many airports.

FlexHead's manufacturing facility is audited by FM Global and Underwriters Laboratories for conformance to their exacting quality control programs. FlexHead's own in house quality control program vastly exceeds both FMRC and UL quality control requirements. FlexHead has been a principal member of the NFPA 318 Technical Committee helping to write fire protection codes for the Protection of Semiconductor Fabrication Facilities for a decade.

The FlexHead hose is manufactured out of 100 percent stainless steel (which is corrosion resistant) and has a fully welded construction. The life expectancy of the FlexHead product is equal to or greater than traditional hard pipe armovers.

FlexHead Industries was acquired by Anvil International in April 2018. For more than 165 years, Anvil International has provided quality products combined with the latest technology, industry expertise, and superior customer service. This is why Anvil is a trusted, go-to source for all fire protection piping systems. The unmatched range of domestic and globally sourced products provides versatile and dependable performance for wide range of applications.

More information on the FlexHead product can be found at: www.flexhead.com

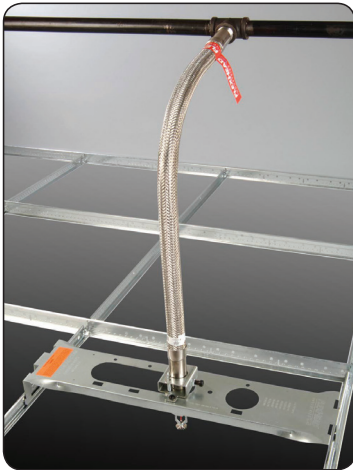
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FLEXHEAD INDUSTRIES IS COMMITTED TO THE ENVIRONMENT AND GREEN BUILDING PRINCIPLES

FlexHead Industries demonstrates its commitment to sustainability by supporting LEED (Leadership in Energy and Environmental Design) principles and USGBC (U.S. Green Building Council) objectives. Millions of gallons of water are drained from sprinkler piping every year. FlexHead products can help minimize hydrostatic testing during initial installation which involves filling the piping with water, pressurizing the system to check for leaks and draining down the system. FlexHead Products can also eliminate the need to drain sprinkler piping during tenant fitups and/or sprinkler head relocations. It's just one more way FlexHead helps reduce operating costs as it increases the value and sustainability of your property.

HIGHEST QUALITY AVAILABLE



FlexHead Industries manufactures the highest quality products available for use in fire protection systems. We pride ourselves in providing the very best products to our customers. In fact, we were the first company to offer flexible fire protection technology to the market over 25 years ago. We continue to develop new products and are the pioneers in flexible fire protection.

FlexHead is the ONLY product that:

- Has undergone full-scale head deployment testing
- Is seismically qualified for use in Seismic Design Categories C, D, E & F
- Is made of 100% 304 stainless steel including end fittings
- Is fully welded without the need for o-rings or gaskets
- Is covered by a AAA rated insurance company providing over \$10 million in coverage
- Is 100% factory leak tested ready to install out of the box requiring virtually no in-field assembly
- Has been tested for compatibility with Blazemaster® CPVC pipe
- Has a proven design with over twenty-five years in-field use
- Has a bracket system with a full 6 inch base providing extra stability to the sprinkler head to ensure proper alignment when the system is installed, pressurized, or activated
- Comes with a minimum bend radius tool to ensure proper installation
- Was the first flexible sprinkler connection to be used in typical suspended ceilings without additional supports or hangers
- Has serial number identification with complete audit tracking of finished goods and component parts used in the manufacturing process

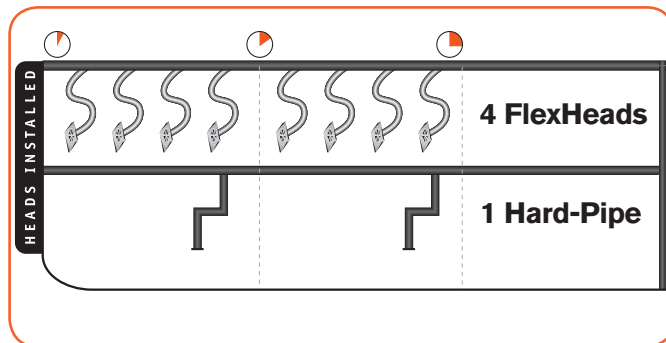
SEISMICALLY QUALIFIED

FlexHead flexible sprinkler connections allow for independent movement between sub-mains and ceilings. FlexHead Industries satisfactorily completed full-scale seismic qualification testing at the Structural Engineering Earthquake Simulation Laboratory located at the State University of New York at Buffalo. Tests were conducted using the International Code Council (ICC) acceptance criteria "ICC-ES AC-156 Seismic Qualification Testing of Nonstructural Components." **This is the first time a sprinkler component has been seismically certified using test criteria accepted by the ICC.** Qualified for use in Seismic Design Categories C, D, E and F, they meet all International Building Code requirements without needing an unsightly oversized ring, sleeve or adaptor where the ceiling meets the sprinkler head. FlexHead connections are FM-approved and UL-listed, having passed rigorous tests for hydrostatic pressure, vibration, friction loss, fatigue, head deployment, corrosion and water hammer. Every hose is leak-checked at the factory. Their burst pressure exceeds 3,000 pounds and is compatible with FM/UL sprinkler heads.

Connect sprinkler heads to sub-mains at least four times faster.

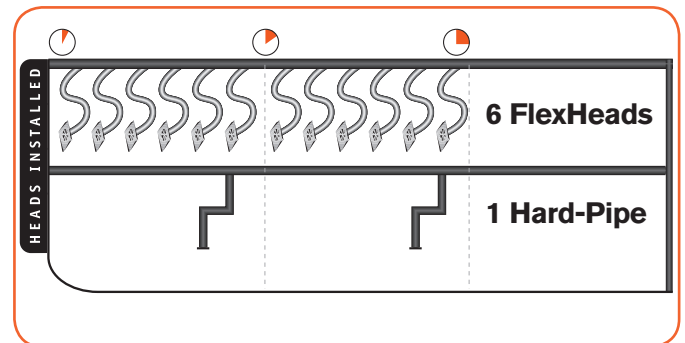
FlexHead systems connect sprinkler heads to sprinkler sub-mains in about a quarter of the time it takes to install hard pipe. Add in the fact that less-skilled people can do the work, and you're looking at significant productivity gains. Expect even greater savings in retrofits, where FlexHead installs six to seven times faster than hard pipe. Everything about FlexHead says "fast installation." You don't need to install bracing or hangers. There's no on-site assembly. Every sprinkler connection is a finished, pre-constructed assembly, from the 1" pipe connector to the sprinkler head outlet. You pay a little more for FlexHead connections compared to black iron armovers. But their labor savings far exceed the materials premium.

New construction comparison



During a typical installation, a minimum of four FlexHeads can be installed in the same time it takes to do one hard-pipe.

Retrofit comparison



During a typical installation, a minimum of six FlexHeads can be installed in the same time it takes to do one hard-pipe.

Want pinpoint locations? No problem.

The design makes it easy to accurately locate sprinkler heads every time. If the spec calls for center-of-tile placement, you can do it with ease. In fact, you get center-of-tile placement every install whether the spec calls for it or not. It takes one more headache out of specifying and bidding.

Accommodate floor plan changes.

Need to relocate sprinkler heads? No problem. With its built-in flexibility it's much easier to move heads to a new location to accommodate new layouts or uses of the space.

Retrofits in less time.

Need to comply to code in unsprinklered buildings? In contrast to costly and labor-intensive hard-pipe retrofits, FlexHead connections install in minutes in even the most restrictive spaces.

Shorten your time to occupancy.

Faster installation times help get end-users into their spaces more quickly—and get installers on their next projects faster. FlexHead connections virtually eliminate punch list items commonly found with hard-pipe armovers.

COMMERCIAL FLEXIBLE SPRINKLERS



COMMERCIAL FLEXIBLE SPRINKLERS

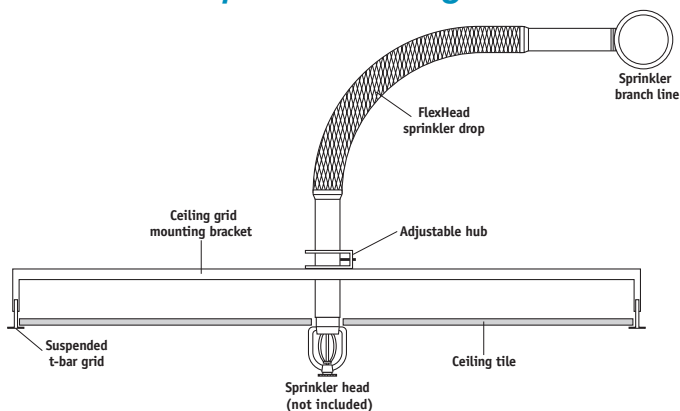
Unlike traditional hard-piped fire protection systems, FlexHead sprinkler connections allow engineers, architects, contractors and building owners a degree of versatility previously unavailable, featuring:

- FM approved & UL listed system
- Industrial grade material
- Acceptable for use in a return-air plenum
- Perfect center-of-tile and aesthetic uniformity
- Approved for use with medium and heavy load grids (ASTM C635, 636)
- 100% leak-tested connections
- All welded, no o-rings
- Adjustable height and sprinkler alignment
- Proven technology
- Ceiling system compatibility
- Compatible with FM / UL sprinklers
- Meets 2013 NFPA 13 guidelines

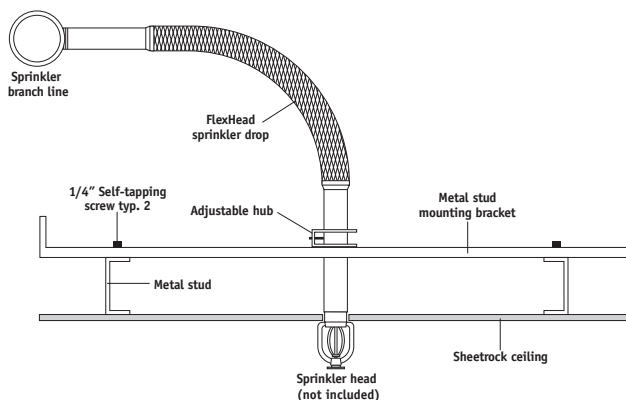
The benefits of installing FlexHead Commercial Connections include:

- Uniform bids / construction schedules
- Reduced man power and labor costs
- Retrofit existing buildings within confined spaces quickly and easily
- Increased efficiency
- Quick and easy installation
- Simple friction loss / water pressure calculations
- Relocate and reconfigure without draining and disassembling
- Flexible design provides versatility for changes in floor plan or occupancy
- Reduced service calls
- No call-backs due to quality manufacturing
- Rapid construction schedules allowing fast-track building occupancy

FlexHead Suspended Ceiling Detail



FlexHead Sheetrock Ceiling Detail



Each FM approved and UL listed unit is ready to install, pressure- and leak-tested, and comes complete with a flexible stainless steel hose and mounting bracket with adjustable hub.

FRICTION DATA LOSS & SPECIFICATIONS

FlexHead Model #	Internal I.D.	Outlet Orifice Size	Hose Assembly Length	Maximum Number of 90-degree Bends			Maximum Equivalent Length of Schedule 40, Nominal 1in. Diameter Pipe, ft		Maximum Ambient Temperature Rating F (C)	Maximum Rated Pressure psi (kPa) / psi (kPa)		Maximum K-factor
				3" – UL	8" – FM		FM	UL		Standard	H-Series	
					175psi	300psi						
2024, 2024H	1	1/2 (1.27)	2 (0.6)	3	1	2	18.4	11	300° (148°)	175 (1205) / 300 (2068)		5.62
2036, 2036H	1	1/2 (1.27)	3 (0.9)	3	2	3	26.6	16	300° (148°)	175 (1205) / 300 (2068)		5.62
2048, 2048H	1	1/2 (1.27)	4 (1.2)	4	3	4	30.3	24	300° (148°)	175 (1205) / 300 (2068)		5.62
2060, 2060H	1	1/2 (1.27)	5 (1.5)	4	4	4	35.8	29	300° (148°)	175 (1205) / 300 (2068)		5.62
2072, 2072H	1	1/2 (1.27)	6 (1.8)	4	4	4	45.6	35	300° (148°)	175 (1205) / 300 (2068)		5.62
2024 75, 2024H 75	1	3/4 (1.90)	2 (0.6)	3	1	2	14.7	12	300° (148°)	175 (1205) / 300 (2068)		14.0
2036 75, 2036H 75	1	3/4 (1.90)	3 (0.9)	3	2	3	21.8	18	300° (148°)	175 (1205) / 300 (2068)		14.0
2048 75, 2048H 75	1	3/4 (1.90)	4 (1.2)	4	3	4	29.0	23	300° (148°)	175 (1205) / 300 (2068)		14.0
2060 75, 2060H 75	1	3/4 (1.90)	5 (1.5)	4	4	4	36.1	29	300° (148°)	175 (1205) / 300 (2068)		14.0
2072 75, 2072H 75	1	3/4 (1.90)	6 (1.8)	4	4	4	43.2	32	300° (148°)	175 (1205) / 300 (2068)		14.0
						175psi, 300psi						
2024E, 2024HE	1	1/2 (1.27)	2 (0.6)	3	1	2	26.4, 14.7	19	300° (148°)	175 (1205) / 300 (2068)		5.62
2036E, 2036HE	1	1/2 (1.27)	3 (0.9)	3	2	3	30.1, 21.8	23	300° (148°)	175 (1205) / 300 (2068)		5.62
2048E, 2048HE	1	1/2 (1.27)	4 (1.2)	4	3	4	33.8, 29.0	27	300° (148°)	175 (1205) / 300 (2068)		5.62
2060E, 2060HE	1	1/2 (1.27)	5 (1.5)	4	4	4	37.5, 36.1	32	300° (148°)	175 (1205) / 300 (2068)		5.62
2072E, 2072HE	1	1/2 (1.27)	6 (1.8)	4	4	4	41.2, 43.2	35	300° (148°)	175 (1205) / 300 (2068)		5.62
2024E 75, 2024HE 75	1	3/4 (1.90)	2 (0.6)	3	1	1	14.7	18	300° (148°)	175 (1205) / 300 (2068)		14.0
2036E 75, 2036HE 75	1	3/4 (1.90)	3 (0.9)	3	2	2	21.8	23	300° (148°)	175 (1205) / 300 (2068)		14.0
2048E 75, 2048HE 75	1	3/4 (1.90)	4 (1.2)	4	3	3	29.0	23	300° (148°)	175 (1205) / 300 (2068)		14.0
2060E 75, 2060HE 75	1	3/4 (1.90)	5 (1.5)	4	4	4	36.1	29	300° (148°)	175 (1205) / 300 (2068)		14.0
2072E 75, 2072HE 75	1	3/4 (1.90)	6 (1.8)	4	4	4	43.2	32	300° (148°)	175 (1205) / 300 (2068)		14.0
2036F	1.25	1/2 (5.6)	3 (0.9)	3	-		16.0		300° (148°)	175 (1205) / 300 (2068)		5.62
2048F	1.25	1/2 (5.6)	4 (1.2)	4	-		19.6		300° (148°)	175 (1205) / 300 (2068)		5.62
2072F	1.25	1/2 (5.6)	6 (1.8)	4	-		22.8		300° (148°)	175 (1205) / 300 (2068)		5.62
2036F75	1.25	3/4 (14)	3 (0.9)	3	-		9.3		300° (148°)	175 (1205)		14.0
2048F75	1.25	3/4 (14)	4 (1.2)	4	-		11.4		300° (148°)	175 (1205)		14.0
2072F75	1.25	3/4 (14)	6 (1.8)	4	-		15		300° (148°)	175 (1205)		14.0
2036F100	1.25	1 (14)	3 (0.9)	3	-		7.1		300° (148°)	175 (1205)		22.4
2048F100	1.25	1 (14)	4 (1.2)	4	-		8.3		300° (148°)	175 (1205)		22.4
2072F100	1.25	1 (14)	6 (1.8)	4	-		10.1		300° (148°)	175 (1205)		22.4

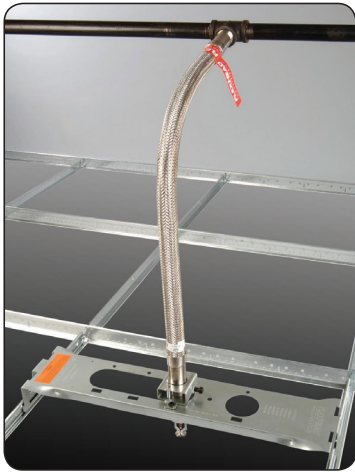
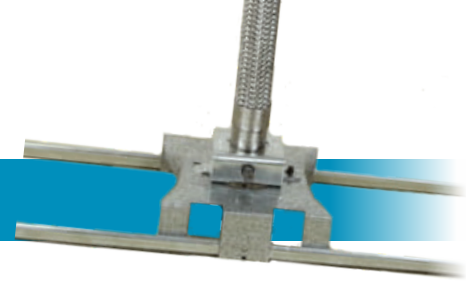
Model Numbers: The "H" designates high pressure unit rated to 300 psig and the "E" designates elbow style unit. The "F" designates high flow rate using 1 1/4" internal hose diameter.

FlexHead products are intended for use in hydraulically designed wet, pre-action, deluge or dry pipe sprinkler connections per NFPA 13, 13R, and 13D guidelines. The hydraulic loss of the FlexHead connector needs to be included in the hydraulic design calculations the same as a valve or fitting. **Each FlexHead sprinkler drop has a 3" minimum bend radius per UL guidelines, and a 8" minimum bend radius per FM guidelines.**

****FM Equivalent Length Numbers include maximum "K" factor sprinkler head that is listed.****

* Equivalent lengths are shown with maximum number of 90 degree bends at the minimum bend-radius. Different values were obtained by FM and UL due to the differences in minimum bend radius, testing protocol and calculation methods. Please see individual testing standards for more information relative to friction loss (Equivalent Length of Pipe).

800.829.6975



DESCRIPTION

- Fully assembled out of the box for ease of installation
- No loose parts
- Allows the sprinkler head to be installed prior to bracket installation
- Optional factory installed sprinkler head
- Compatible with any sprinkler head on the market
- Stable 6" width mounting bracket
- Hoses available in 24", 36", 48", 60" and 72" lengths

FlexHead mounting bracket with built-in safety feature

The FlexHead mounting bracket has a built-in safety feature that allows the mounting bracket to stay securely attached to the suspended ceiling Tbar without positive attachment to the Tbar with screws. Factory Mutual has tested and approved the FlexHead mounting bracket to be snapped onto the ceiling Tbar without positive attachment to the Tbar. (Screws securing mounting bracket are required for UL installation).

Other flexible fire sprinkler mounting brackets have no built-in safety feature

The mounting brackets for other flexible fire sprinkler fittings just sit on the top of the suspended ceiling Tbar without a secure connection. They lack a built-in safety feature and must have screws properly installed to attach to the suspended ceiling Tbar to secure it. If the screws are not attached properly there would be a potential failure of the sprinkler system.

FlexHead hose has the fewest potential leak joints

The FlexHead hose is the only flexible that has fully welded construction and whose hose is completely leak tested before shipment. Other flexibles cannot make this claim. No leaks on the job site save time and money.

FlexHead does not have "O" rings, rubber or gaskets

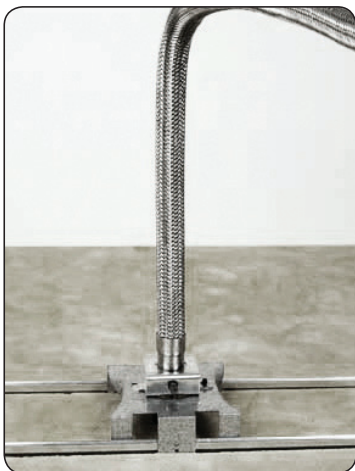
The FlexHead hose does not contain gaskets, rubber or "O" rings. Other flexibles do have "O" rings, rubber and/or gaskets.

FlexHead hose is manufactured out of 100% corrosion resistant 304 stainless steel

Other flexibles have hoses that have a combination of metals and are manufactured out of stainless steel and zinc plated steel.

FlexHead quicker installation

FlexHead has fewer installation steps compared to other flexible fire sprinkler fittings. Other flexible hoses must have the drops at end of their hoses tightened to specific torques per their installation instructions. Not required by FlexHead since drops are welded on FlexHead hose.



ARMSTRONG® TECHZONE™

FlexHead Flexible Sprinkler Connections consist of fully welded, stainless-steel hose assemblies and a bracketing system that connects sprinkler heads to the branch lines. The mounting bracket is specifically designed to be compatible with the Armstrong TechZone™ suspended ceiling systems. These systems install in a quarter of the time of hard pipe armovers, allowing for rapid installation or relocation of sprinkler heads in suspended ceilings. The flexible hose connection assures center-of-ceiling tile location for sprinkler heads. Each FlexHead connection comes with a mounting bracket and a one-piece, leak-tested sprinkler drop.

Our Flexible Sprinkler Connections are compatible with any contractor-installed sprinkler head of choice and are available in both ½ & ¾ outlet sizes. This pressure-leak tested system is available in 2', 3', 4', 5' & 6' (0.6 - 1.8 m) hose lengths, making it ideal for any commercial application. FlexHead has a low-profile unit as well to accommodate even the most space restrictive projects.

All our commercial sprinkler connections are Factory Mutual (FM) approved and UL listed and are manufactured in an FM/UL audited facility. The standard unit is rated at 175PSI with a 300PSI unit available for high pressure applications. Available with 2', 3', 4', 5', or 6' hose lengths, the connection makes it perfect for any commercial application.

INSTITUTIONAL MODEL



DESCRIPTION

- FlexHead institutional sprinkler hose: 304 stainless steel
- UH-1 bracket (retaining flange): G90 galvanized steel

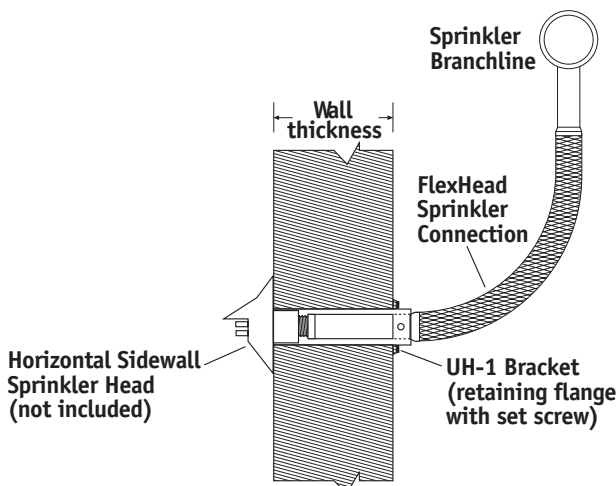
The FlexHead Institutional Sprinkler Connection uses our UH-1 Bracket (retaining flange) to secure the flexible sprinkler hose to the concrete wall or ceiling. These connections have been specifically designed for use in institutional mental health occupancies, correctional facilities, or anywhere a likelihood of tampering with fire sprinklers by the occupants may exist.

The institutional sprinkler connection consists of a flexible hose in lengths from 2-6 feet and a retaining flange; and is approved for use with pendant or sidewall institutional sprinkler heads. These connections are designed to be installed in concrete wall or ceiling penetrations using institutional sprinkler heads. They are compatible with any institutional sprinkler head on the market.



FRICTION LOSS	FlexHead Model #	Outlet Size	Hose Assembly Length ft (cm)	FM Bend Radius	UL Bend Radius	Equivalent Length Length of Schedule 40, Nominal 1in. Diameter Pipe, ft (m)		Maximum Number of 90 Degree Bends		Maximum Ambient Temperature Rating	Maximum K Factor	Maximum Rated Pressure
		in (cm)		in	in	FM	UL	FM	UL	F (C)		psi (kPa)
	2024I	1/2 (1.27)	2 (0.6)	8	3	18.4 (5.6)	11	1	3	300° (148°)	5.6	175 (1205)
	2036I	1/2 (1.27)	3 (0.9)	8	3	26.6 (8.1)	16	2	3	300° (148°)	5.6	175 (1205)
	2048I	1/2 (1.27)	4 (1.2)	8	3	30.3 (9.2)	24	3	4	300° (148°)	5.6	175 (1205)
	2060I	1/2 (1.27)	5 (1.5)	8	3	35.8 (10.9)	29	4	4	300° (148°)	5.6	175 (1205)
	2072I	1/2 (1.27)	6 (1.8)	8	3	45.6 (13.9)	35	4	4	300° (148°)	5.6	175 (1205)
	2024I	3/4 (1.91)	2 (0.6)	8	3	11.6 (3.5)	12	-	3	300° (148°)	14.0	175 (1205)
	2036I	3/4 (1.91)	3 (0.9)	8	3	16 (4.9)	18	-	3	300° (148°)	14.0	175 (1205)
	2048I	3/4 (1.91)	4 (1.2)	8	3	17.9 (5.4)	23	-	4	300° (148°)	14.0	175 (1205)
	2060I	3/4 (1.91)	5 (1.5)	8	3	24.7 (7.5)	29	-	4	300° (148°)	14.0	175 (1205)
	2072I	3/4 (1.91)	6 (1.8)	8	3	28.9 (8.8)	32	-	4	300° (148°)	14.0	175 (1205)

* The "I" indicates an "Institutional" flexible hose with a pressure rating of 175 psi (1205 kPa). Approval of these models of flexible metal sprinkler hose is limited for use with pendant and horizontal sidewall applications with a UH-1 ceiling/wall bracket manufactured by FlexHead Industries, Inc. The FlexHead bracket, UH-1 (Universal Hub), is a one piece unit.



UH-2 BRACKET MODEL



DESCRIPTION

- FlexHead sprinkler hose: 304 stainless steel
- UH-2 bracket: G90 galvanized steel
- 3/8" threaded rod (not included)

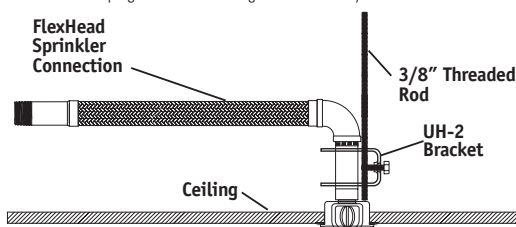
The UH-2 Bracket attaches to the concrete deck above the ceiling using a threaded rod secured to the building structure which is attached to the bracket. **The maximum length of rod that can be used with the UH-2 bracket is 2ft off the structure.** This is perfect for confined space applications where you have a concrete deck above the ceiling that can be used to secure the threaded rod to the building structure.

The rod can be cut to length and the UH-2 bracket can be moved up or down to create the perfect fit-up between the sprinkler head and the ceiling. This bracket system can be used in both commercial suspended ceilings (T-bar grid) and Sheetrock ceilings and is compatible with all our commercial models including 2024E, 2036E, 2048E, 2060E and 2072E. The "E" designates elbow style hose assembly typically used in confined space applications.

FRICTION LOSS DATA AND SPECIFICATIONS	FlexHead Model #	Outlet Size in (cm)	Hose	Maximum Number of 90-degree Bends 8" – FM		FM Maximum Equivalent Length of Schedule 40, Nominal 1in. Diameter Pipe, ft FM		Maximum Ambient Temperature Rating F (C)	Maximum Rated Pressure psi (kPa) / H-Series psi (kPa)
				175psi	300psi				
	2024, 2024H	1/2 (1.27)	2 (0.6)	1	2	18.4		300° (148°)	175 (1205) / 300 (2068)
	2036, 2036H	1/2 (1.27)	3 (0.9)	2	3	26.6		300° (148°)	175 (1205) / 300 (2068)
	2048, 2048H	1/2 (1.27)	4 (1.2)	3	4	30.3		300° (148°)	175 (1205) / 300 (2068)
	2060, 2060H	1/2 (1.27)	5 (1.5)	4	4	35.8		300° (148°)	175 (1205) / 300 (2068)
	2072, 2072H	1/2 (1.27)	6 (1.8)	4	4	45.6		300° (148°)	175 (1205) / 300 (2068)
	2024, 2024H	3/4 (1.90)	2 (0.6)	1	2	14.7		300° (148°)	175 (1205) / 300 (2068)
	2036, 2036H	3/4 (1.90)	3 (0.9)	2	3	21.8		300° (148°)	175 (1205) / 300 (2068)
	2048, 2048H	3/4 (1.90)	4 (1.2)	3	4	29.0		300° (148°)	175 (1205) / 300 (2068)
						175 psi	300 psi		
	2024E, 2024HE	1/2 (1.27)	2 (0.6)	1	2	26.4	14.7	300° (148°)	175 (1205) / 300 (2068)
	2036E, 2036HE	1/2 (1.27)	3 (0.9)	2	3	30.1	21.8	300° (148°)	175 (1205) / 300 (2068)
	2048E, 2048HE	1/2 (1.27)	4 (1.2)	3	4	33.8	29.0	300° (148°)	175 (1205) / 300 (2068)
	2060E, 2060HE	1/2 (1.27)	5 (1.5)	4	4	37.5	36.1	300° (148°)	175 (1205) / 300 (2068)
	2072E, 2072HE	1/2 (1.27)	6 (1.8)	4	4	41.2	43.2	300° (148°)	175 (1205) / 300 (2068)
	2024E, 2024HE	3/4 (1.90)	2 (0.6)	1	2	14.7	14.7	300° (148°)	175 (1205) / 300 (2068)
	2036E, 2036HE	3/4 (1.90)	3 (0.9)	2	3	21.8	21.8	300° (148°)	175 (1205) / 300 (2068)
	2048E, 2048HE	3/4 (1.90)	4 (1.2)	3	4	29.0	29.0	300° (148°)	175 (1205) / 300 (2068)
	2060E, 2060HE	3/4 (1.90)	5 (1.5)	4	4	36.1	36.1	300° (148°)	175 (1205) / 300 (2068)
	2072E, 2072HE	3/4 (1.90)	6 (1.8)	4	4	43.2	43.2	300° (148°)	175 (1205) / 300 (2068)

Model Numbers: The "H" designates high pressure unit rated to 300 psig and the "E" designates elbow style unit. *FM Bend Radius 8"

FM equivalent length numbers include maximum "k" factor sprinkler head that is listed



LOW-PROFILE MODEL FOR UNISTRUT®



DESCRIPTION

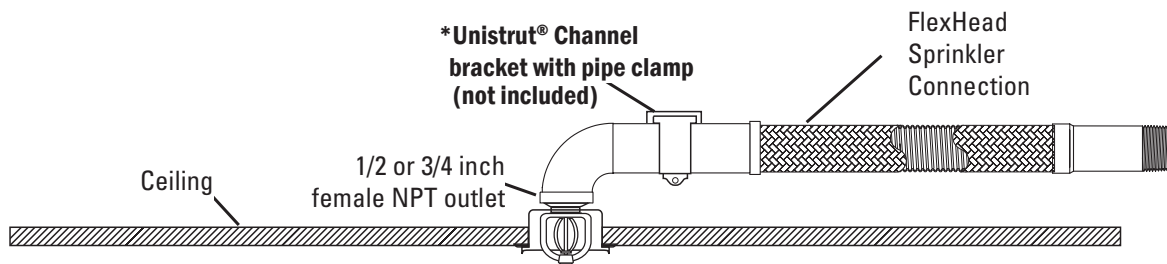
- FlexHead sprinkler hose: 304 stainless steel
- Unistrut channel with pipe clamp (not included)

The FlexHead Low-Profile Model uses traditional Unistrut Channel to secure the FlexHead sprinkler hose to the building structure. This model is perfect for applications where you have very limited space and a concrete deck above the ceiling that can be used to secure the flexible hose to the building structure. This configuration allows the installer to attach the Unistrut Channel in the general location of the sprinkler head and adjust it later once the final fit-up is ready to be completed.

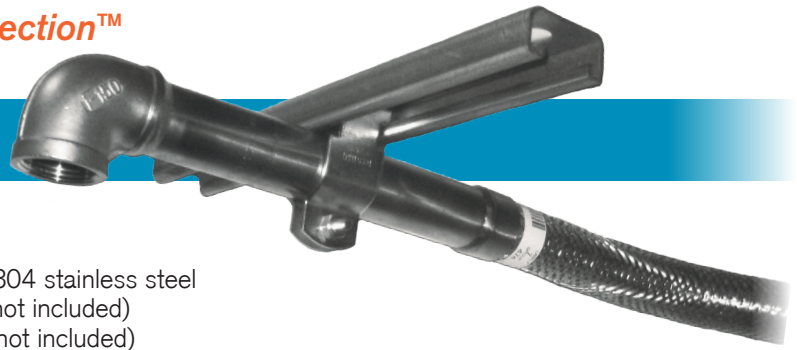
The Unistrut Channel is initially attached to the building structure on one side and can be rotated 360 degrees while the flexible hose can be adjusted along the length of the Unistrut Channel to get perfect head placement without any reconfiguration of sprinkler piping. These models are designed for use in commercial suspended ceilings and Sheetrock ceilings having very limited space ranging from 2½ inches to 6 inches from the concrete deck of the ceiling.

FRICTION LOSS	FlexHead Model #	Outlet Size in(cm)	Maximum k-Factor	Hose Assembly Length ft(m)	Number of Bends	Bend Radius in	Equivalent Length Length of Schedule 40, Nominal 1 in. Diameter Pipe, ft(m)	Maximum Ambient Temperature Rating F(C)	Maximum Rated Pressure psi(kPa)
	2024IE-LP	1/2(1.27)	5.6	2 (0.6)	1	7	26.4(8.0)	300°(148°)	175(1205)
	2036IE-LP	1/2(1.27)	5.6	3 (0.9)	2	7	30.1(9.1)	300°(148°)	175(1205)
	2048IE-LP	1/2(1.27)	5.6	4 (1.2)	3	7	33.8(10.3)	300°(148°)	175(1205)
	2060IE-LP	1/2(1.27)	5.6	5 (1.5)	3	7	37.5(11.4)	300°(148°)	175(1205)
	2072IE-LP	1/2(1.27)	5.6	6 (1.8)	4	7	41.2(12.5)	300°(148°)	175(1205)
	2024IE-LP 75	3/4(1.90)	14	2 (0.6)	1	7	14.7(4.5)	300°(148°)	175(1205)
	2036IE-LP 75	3/4(1.90)	14	3 (0.9)	2	7	21.8(6.6)	300°(148°)	175(1205)
	2048IE-LP 75	3/4(1.90)	14	4 (1.2)	3	7	29(8.8)	300°(148°)	175(1205)
	2060IE-LP 75	3/4(1.90)	14	5 (1.5)	3	7	36.1(11.0)	300°(148°)	175(1205)
	2072IE-LP 75	3/4(1.90)	14	6 (1.8)	4	7	43.2(13.1)	300°(148°)	175(1205)

* The "IE LP" indicates a "low profile" elbow unit welded on the end of the hose. Approval of these models of flexible metal sprinkler hose incorporates a stainless steel elbow welded on the outlet end of the hose and with Unistrut® Channel and pipe clamp is limited to securing these models to the building structure. These models are for use in commercial suspended ceiling (T Bar Grid) and Sheetrock suspended ceiling with very limited room between floors. **Equivalent length numbers include maximum "k" factor for sprinkler head that is listed.**



DROP NIPPLE



DESCRIPTION

- FlexHead sprinkler hose: 304 stainless steel
- Unistrut with pipe clamp (not included)
- Drop nipple with reducer (not included)
(also compatible with adjustable drop nipples)

The FlexHead Drop Nipple Model uses traditional Unistrut to secure the FlexHead sprinkler hose to the building structure. The flexible hose is attached to a drop nipple with reducer during final fit-up and is also compatible with adjustable drop nipples. This model is perfect for applications where you have a concrete deck above the ceiling that can be used to secure the flexible hose to the building structure. This configuration allows the installer to attach the Unistrut in the general location of the sprinkler head during the rough installation.

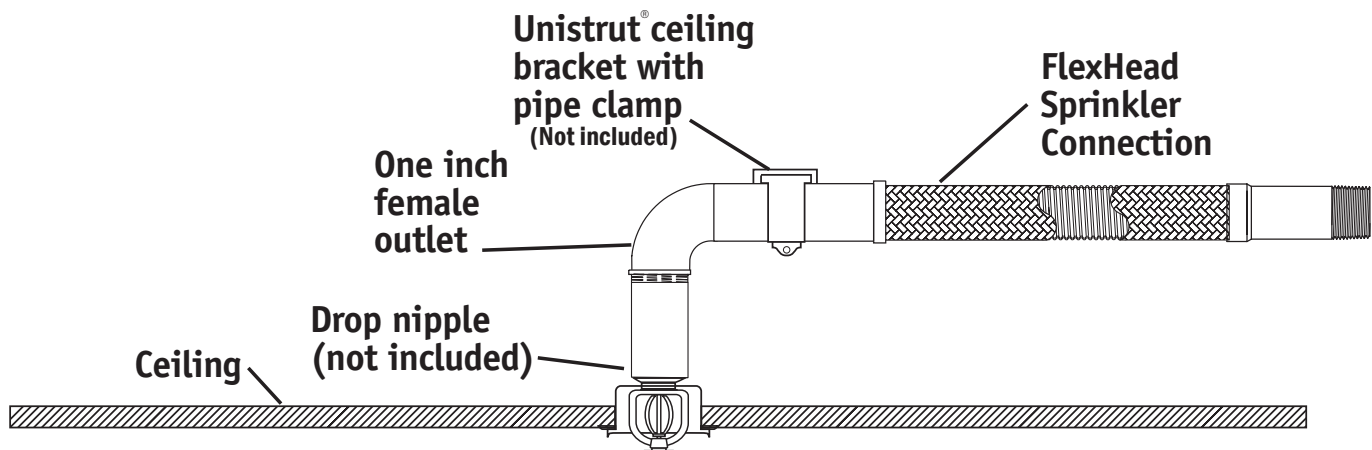
The Unistrut is initially attached to the building structure on one side and can be rotated 360 degrees while the flexible hose can be adjusted along the length of the Unistrut to get perfect sprinkler head placement without any reconfiguration of sprinkler piping. These models are designed for use in commercial suspended ceilings and Sheetrock ceilings.



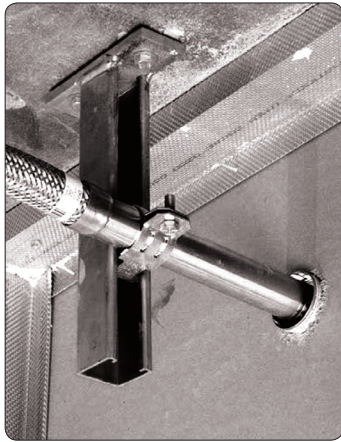
FRICTION LOSS	FlexHead Model #	Outlet Size in(cm)	Hose Assembly Length ft(m)	Equivalent Length Length of Schedule 40, Nominal 1 in. Diameter Pipe, ft(m)	Maximum Ambient Temperature Rating F(C)	Maximum Rated Pressure psi (kPa)	k-Factor	Minimum Bend Radius in(mm)	Number of Bends
	2024-IE-G	1(2.54)	2(0.6)	10.7 (3.4)	300°(148°)	175(1205)	22.4	7 (180)	1
	2036-IE-G	1(2.54)	3(0.9)	15.1 (4.6)	300°(148°)	175(1205)	22.4	7 (180)	2
	2048-IE-G	1(2.54)	4(1.2)	21.5 (6.5)	300°(148°)	175(1205)	22.4	7 (180)	3
	2060-IE-G	1(2.54)	5(1.5)	25.3 (7.7)	300°(148°)	175(1205)	22.4	7 (180)	3
	2072-IE-G	1(2.54)	6(1.8)	26.9 (8.1)	300°(148°)	175(1205)	22.4	7 (180)	4

* The "IE-G" indicates a "low profile" elbow unit welded on the end of the hose. This model will have a 1 inch female outlet. Approval of these models of flexible metal sprinkler hose incorporates a stainless steel elbow welded on the outlet end of the hose and with Unistrut® channel and pipe clamp is limited to securing these models to the building structure. These models are for use in commercial suspended ceilings (Tbar Grid) and Sheetrock suspended ceilings.

* Equivalent length numbers include maximum "K" factor for sprinkler head that is listed.



SIDEWALL MODEL FOR SOFFITS

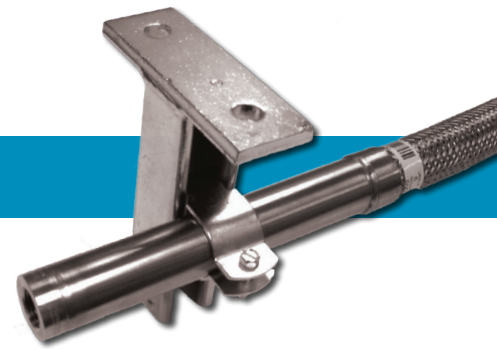


MATERIALS

- FlexHead sprinkler hose: 304 stainless steel
- Tolco-BR-22 or Unistrut P2944 bracket with pipe clamp (not included)

The FlexHead Sidewall Model for Soffits uses strut to secure the FlexHead sprinkler hose to the building structure. This model is perfect for hotel applications when you have a soffit in a room where a sidewall sprinkler head needs to be installed. This configuration allows the installer to attach the strut in the general location of the sprinkler head and adjust it later once the final fit-up is ready to be completed.

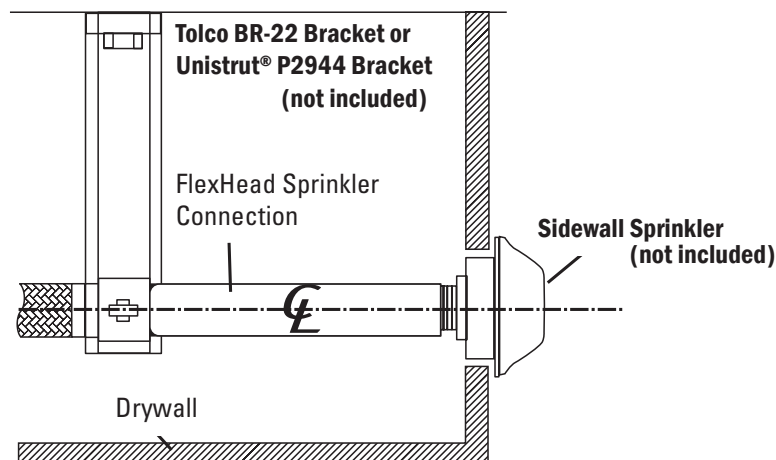
The flexible hose can be adjusted up and down along the length of the strut and within the pipe clamp to get perfect head placement without any reconfiguration of sprinkler piping. These models are designed for use in commercial Sheetrock ceilings having a soffit within the ceiling where sprinkler coverage is required.



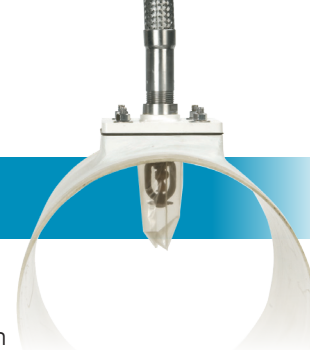
FRICTION LOSS	FlexHead Model #	Outlet Size in(cm)	Maximum k-Factor	Hose Assembly Length ft(m)	Number of Bends	Bend Radius in	Equivalent Length Length of Schedule 40, Nominal 1 in. Diameter Pipe, ft(m)	Maximum Ambient Temperature Rating F(C)	Maximum Rated Pressure psi(kPa)
	2024I	1/2(1.27)	5.6	2 (0.6)	1	8	18.4(5.6)	300°(148°)	175(1205)
	2036I	1/2(1.27)	5.6	3 (0.9)	2	8	26.6(8.1)	300°(148°)	175(1205)
	2048I	1/2(1.27)	5.6	4 (1.2)	3	8	30.3(9.2)	300°(148°)	175(1205)
	2060I	1/2(1.27)	5.6	5 (1.5)	4	8	35.8(10.9)	300°(148°)	175(1205)
	2072I	1/2(1.27)	5.6	6 (1.8)	4	8	45.6(13.9)	300°(148°)	175(1205)

* Sidewall application with a Tolco-BR-22 or Unistrut® P2944 channel support bracket. The channel length is limited to 6 and 12 inches.

* Equivalent length numbers include maximum "K" factor for sprinkler head that is listed.



INDUSTRIAL/DUCT SPRINKLERS



DESCRIPTION

FlexHead flexible sprinkler systems have been protecting exhaust ducts in semi-conductor/electronics facilities for more than fifteen years with no reported failures or leaks, and no sprinkler-related downtime. During normal operation, patented FlexHead technology contributes to productivity by allowing the process to continue even during routine maintenance.

FM-Approved FlexHead Sprinklers Install in Minutes

FlexHead sprinkler systems come complete with a flexible, stainless-steel hose, sprinkler head of choice, mounting block, and head-protecting polybag with gasket that prolongs the life of the sprinkler head. Mounting blocks are available for all types of exhaust ducts.

Typical installations take about 10 minutes per head. Total cost is less than traditional hard-pipe installations, which take up to four hours per head, and require an expensive, separate access port for inspection.

Factory Mutual has approved FlexHead's complete exhaust duct sprinkler system, including the mounting block. Out of the box installations meet insurance requirements. Traditional hard-pipe installations must be individually inspected.

Features and Benefits

Combining patented FlexHead sprinkler systems with the best corrosion resistant duct material costs less than half of any non-sprinkler duct materials and provides the most cost-efficient choice in exhaust duct systems. FlexHead sprinkler systems also offer:

- Labor-saving, simplified installation takes minutes instead of hours
- Patented polybag/gasket assembly creates clean mini-environment for sprinkler heads within ducts, prolonging the life of sprinkler heads, and preventing production downtime caused by false alarms
- Wide variety of mounting blocks are available to accommodate all types of exhaust ducts (Steel, PVC, FRP, PP)
- FM-approved right out of the box. Meets all insurance requirements
- Eliminates need for costly access panel mounted on duct as is mandatory with hard-pipe sprinklers
- Preventive maintenance takes 10 minutes—with NO required FAB shutdown—unlike hard-pipe
- Flexible hoses allow for independent motion (sway) between duct and water main to compensate for duct vibration and during possible seismic activity—eliminating potential leaks, and allow for multiple design choices and flexibility during retrofit and expansion

FRICTION LOSS	FlexHead Model #	Orifice Size in	Hose Assembly Length ft(m)	Equivalent Length of 1" Schedule 40 pipe, ft(m)	Maximum Rated Pressure psi(kPa)
	XX24	1/2in.	2ft (0.6m)	11ft (3.6m)	175 (1205)
	XX36	1/2in.	3ft (0.9m)	19ft (5.8m)	175 (1205)
	XX48	1/2in.	4ft (1.2m)	21ft (6.4m)	175 (1205)

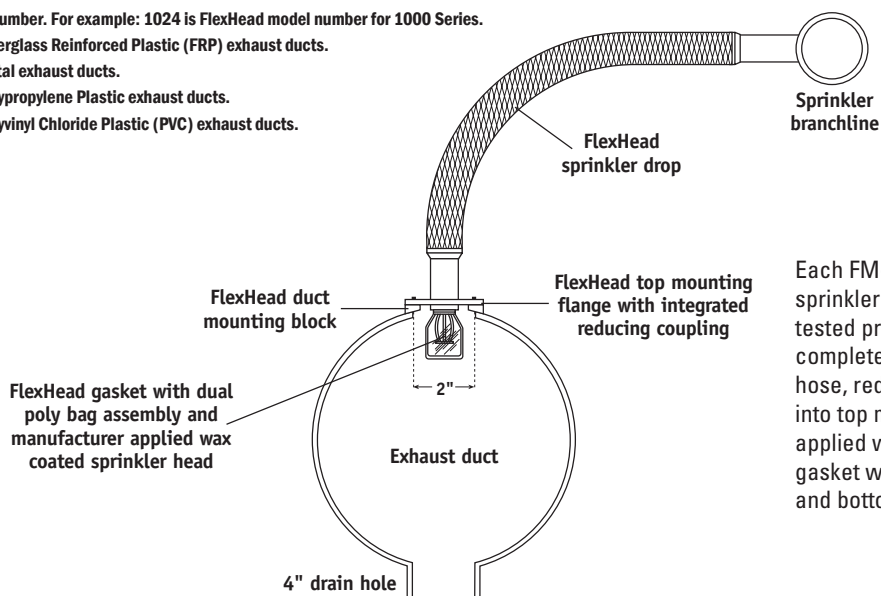
"XX" represents the model number. For example: 1024 is FlexHead model number for 1000 Series.

1000 Series is limited to Fiberglass Reinforced Plastic (FRP) exhaust ducts.

1100 Series is limited to metal exhaust ducts.

1200 Series is limited to Polypropylene Plastic exhaust ducts.

1300 Series is limited to Polyvinyl Chloride Plastic (PVC) exhaust ducts.



Each FM-approved, ready-to-install sprinkler system is pressure- and leak-tested prior to shipping and comes complete with a flexible stainless-steel hose, reducing coupling integrated into top mounting flange, manufacturer applied wax coated sprinkler head, gasket with dual poly bag assembly and bottom mounting block

CLEANROOM SPRINKLER CONNECTIONS



DESCRIPTION

For over a decade, FlexHead sprinkler systems have been protecting cleanrooms in places such as Taiwan, China, Singapore, Israel, Europe, and North and South America. With over 100,000 sprinkler systems installed worldwide, FlexHead's product quality is matched by no other. Installed, our systems provide fire protection, contamination protection, and peace of mind.

FlexHead Industries' all stainless-steel, one-piece system is leak-tested, and available cleaned and polybagged prior to shipping. The 100% stainless-steel construction requires no painting or epoxy coating—eliminating the danger of paint particulates being released during installation or relocation. Designed to work with any major manufacturer's ceiling grid, FlexHead sprinkler systems provide maximum protection against fire, leaks, and contamination due to particulate discharge. Each FM approved, ready-to-install system comes complete with a flexible stainless-steel hose, one-piece stainless-steel sprinkler drop with O-ring seal and grid attachment, and is available with or without an FM-approved sprinkler head. But here's the best part: Initial installation cost of a FlexHead system is less than the alternative choices, and the ongoing cost of ownership is significantly less as well.

Simple Installation, Easy Relocation, Faster Cleanroom Certification

With no required in-field assembly, each one-piece system installs in about 10 minutes. It's a simple matter of connecting to the sprinkler main, inserting the one-piece, stainless-steel sprinkler drop with O-ring seal through the ceiling grid and securely fastening it down. Uniform, ultraclean grid penetration eliminates the need for escutcheons. In service, the flexible connection between the sprinkler main and ceiling grid dissipates any vibration, so gel seals remain intact, even in seismically active areas.

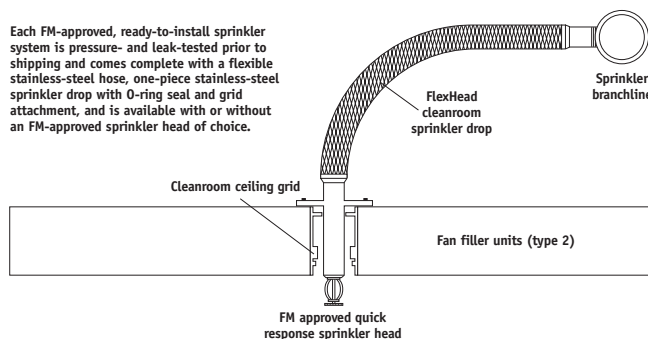
Because installation takes a fraction of the time of hard-pipe systems, cleanrooms can be certified and online faster—a critical factor in getting your cleanroom up and running. And unlike traditional hard-pipe methods, relocation of Flexhead units can occur without the need to shut down and drain the entire fire sprinkler system, or to worry about the particulate contamination caused when hard-pipe systems are disassembled. This means there is virtually no downtime while sprinkler heads are moved to accommodate new tool or floor-plan reconfiguration.

- FM-approved right out of the box. Meets all insurance requirements
- Leak-tested assembly installs in a fraction of hard-pipe installation time—accelerating clean-room certification and operational readiness
- Allows quick and easy relocation when floor plan changes due to reconfiguration of tool layout
- Pre-cleaned and sealed for shipping. All stainless- steel construction means no particulation into cleanroom, and eliminates epoxy painting of sprinkler pipes
- Allows for independent motion (sway) between ceiling grid and water main to accommodate filter vibration and during possible seismic activity— eliminating potential leaks and protecting gel seals
- Eliminates ceiling stress/leaks due to mis-aligned hard-pipe installation
- Uniform sprinkler-head protrusion through grid and stainless-steel construction eliminate the need for unsightly escutcheons

FRICTION LOSS	FlexHead Model #	Orifice Size in	Hose Assembly Length ft(m)	Equivalent Length Length of 1" Schedule 40 pipe, ft(m)	Maximum Rated Pressure psi(kPa)
	CRX 0036	1/2in	3ft (0.9m)	15.1ft (4.6m)	175(1205)
	CRX 0072	1/2in	6ft (1.8m)	27.5ft (8.4m)	175(1205)

* 1 inch nominal diameter flexible metal sprinkler hose for providing a connection to automatic sprinklers in cleanroom ceilings. "X" represents the ceiling grid manufacturer FlexHead manufactures sprinkler systems compatible with all major cleanroom ceiling grids.

Each FM-approved, ready-to-install sprinkler system is pressure- and leak-tested prior to shipping and comes complete with a flexible stainless-steel hose, one-piece stainless-steel sprinkler drop with O-ring seal and grid attachment, and is available with or without an FM-approved sprinkler head of choice.



FLEXHEAD STANDARD SPECIFICATION



DIVISION 21 MECHANICAL – SECTION 15300 FIRE PROTECTION PIPING

FLEXIBLE SPRINKLER HOSE FITTINGS FOR FIRE PROTECTION SERVICE

A. Manufacturer: FlexHead Industries, Inc.

1. Contact: 56 Lowland Street, Holliston, MA 01746; Telephone: (800)829-6975; Fax: (508)893-6020; Email: sales1@flexhead.com; Website: www.flexhead.com
2. Substitutions: Allowed if substitute product meets regulatory requirements, performance criteria and material specifications listed below.

B. Description:

1. Regulatory Requirements: Provide flexible stainless steel hose fittings that comply with the following requirements:
 - a. In accordance with General Requirements contained in Division 1 of specification.
 - b. In accordance with NFPA 13.

C. Performance Criteria: Comply with the following to suit project requirements:

1. FM 1637 Approval Standard for Flexible Sprinkler Hose with Threaded End Fittings.
2. UL 2443 Standard for Flexible Sprinkler Hose with Fittings for Fire Protection Service.
3. ICC-ES AC-156 Acceptance Criteria for Seismic Qualification by Shake-Table Testing of Nonstructural Components and Systems.

D. Materials: FlexHead Commercial Sprinkler Connections

1. FlexHead flexible stainless steel hose assemblies:
 - a. Straight Hose Assembly Lengths: {2ft length, Model #2024} {3ft length, Model #2036} {4ft length, Model #2048} {5ft length, Model #2060} {6ft length, Model #2072}
 1. {½ inch} {¾ inch} outlet.
 2. {175 psi} {300 psi} maximum rated pressure
 3. Fully welded non-mechanical fittings, braided, leak-tested with minimum 1 inch true-bore internal corrugated hose diameter made of 100% 304 stainless steel including end fittings.
 - b. Elbow Hose Assembly Lengths (For use in confined spaces): {2ft length, Model #2024E} {3ft length, Model #2036E} {4ft length, Model #2048E} {5ft length, Model #2060E} {6ft length, Model #2072E}
 1. {½ inch} {¾ inch} outlet.
 2. {175 psi} {300 psi} maximum rated pressure
 3. Fully welded non-mechanical fittings, braided, leak-tested with minimum 1 inch true-bore internal corrugated hose diameter made of 100% 304 stainless steel including end fittings.
2. FlexHead Ceiling Bracket: Direct attachment type having integrated snap-on clip ends positively attached to the ceiling using tamper-resistant screws and removable attachment hub with set screw for attaching and adjusting flexible hose.

APPLICABLE STANDARDS

American Society of Civil Engineers (ASCE) -SEI/ASCE 7-05, Section 13.5.6 Suspended Ceilings

ASTM International

- ASTM C635 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
- ASTM C636 Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels

FM Global Technologies LLC (FM) - FM Class Number 1637 Approval Standard for Flexible Sprinkler Hose with Threaded End Fittings

International Code Council (ICC)

- ICC International Building Code (IBC), 2006
 - Section 803.9 Acoustical Ceiling Systems
 - Section 1613 Earthquake Loads

National Fire Protection Association (NFPA)

- 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
- NFPA 13R Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height Underwriters Laboratories, Inc. (UL) - UL 2443 Standard for Flexible Sprinkler Hose with Fittings for Fire Protection Service

APPROVALS

Underwriters Laboratories, Inc. (UL) - UL Listed, VENF. EX5269, Flexible Sprinkler Hose Fitting

PHYSICAL/CHEMICAL PROPERTIES

Test reports are available to design professionals upon request.

PREPARATORY WORK

Installation should only be performed by qualified and licensed technicians in the fire protection field. Consult NFPA, FM, UL and state and local guidelines prior to installation.

METHODS

Each FlexHead ceiling sprinkler connection includes a mounting bracket and a 1-piece, leak tested FlexHead sprinkler drop.

Attach the bracket to the t-bar ceiling grid; then attach the FlexHead sprinkler to the sub-main. Secure the sprinkler to the bracket. Test installation of sprinkler system for any leaks per NFPA guidelines.

PRECAUTIONS

Consult the manufacturer's installation instructions for complete installation information. Failure to follow the cited instructions may cause personal injury. During maintenance or inspection of FlexHead product, the facility fire protection system must be inactive. Do not attempt relocation or maintenance of FlexHead product while fire protections system is live.

BUILDING CODES

Current data on building code requirements and product compliance may be obtained from the manufacturer's technical support specialists. Installation must comply with the requirements of applicable local, state and national code jurisdictions.

AVAILABILITY

For information on product availability or to locate an authorized FlexHead distributor, contact FlexHead Industries, Inc.

COST

Budget installed cost information may be obtained from the manufacturer upon request.

MAINTENANCE

Contact the manufacturer for complete maintenance information.

TECHNICAL SERVICES

Design assistance and technical support are available upon request from the manufacturer's trained staff.

FILING SYSTEMS

- MANU-SPEC®
- Additional product information is available from the manufacturer upon request

EARTHQUAKE CASE STUDY



ONE STORE STAYS OPEN AFTER EARTHQUAKE

FlexHead flexible sprinkler systems have been protecting exhaust ducts in semi-conductor/electronics facilities for more than fifteen years with no reported failures or leaks, and no sprinkler related downtime. During normal operation, patented FlexHead technology contributes to productivity by allowing the process to continue even during routine maintenance.

Less than a year after SimplexGrinnell installed FlexHead flexible sprinklers in a new department store in Bayshore Mall, Mother Nature tested Eureka, CA, with a 6.5 earthquake.

This store's fire protection system remained intact and functional throughout the Saturday afternoon quake and its aftershocks, and the store opened for business Sunday morning. Unfortunately, the shaking breached the hard-pipe automatic sprinkler system protecting the rest of the mall, closing the 76 other stores for clean-up and repairs.

The Jan. 9, 2010 quake, which was centered about 25 miles off-shore from Eureka, sent shoppers scrambling at about 4:30 p.m. But after picking up fallen stock, minor cleanup, and the official safety inspection, this store re-opened the following morning. The rest of the mall remained closed until January 13, with damage estimated at \$6 million. SimplexGrinnell installed the FlexHead-equipped system in May 2009. Although FlexHead products meet the stringent Los Angeles seismic qualification (AC 156), the decision to use them was strictly economic.

"The earthquake [rating] didn't have anything to do with it," said Tim Madura, Service Contract Sales for SimplexGrinnell,

"It was economics; though, of course, I'm sold on the earthquake thing now! I had to be very competitive, and I knew I had to be low-priced. Using FlexHead was how we could price the job low enough to get it." The new department store was taking over an existing, 40,000-square-foot anchor-store attached to the main mall, gutting it in order to establish their own layout with new walls, ceilings and fixtures. The existing sprinkler system, which remained in place, was a typical 10x12 spacing with hard-pipe drops hanging down.

"The ceiling height changed [from the previous configuration], so we removed the drops and installed the FlexHeads with the sprinkler heads already attached," Madura said. "We wire-tied them up to the side of the drops until the ceiling went in. "Prior to the grid going in, the fire department did their 200-pound test for two hours with all our FlexHeads installed, and they were fine with that. Then we waited for the grid, and chased the grid people in there," he continued.

Madura estimates that using FlexHeads saved at least half of the time, cost and aggravation that hard-pipe installations incur. In addition to reducing the need for cutting and threading to a bare minimum, and completely eliminating the back-and forth adjustments typical to hard-pipe installation, using FlexHead also required only one drain-down and one 200-pound test.

"Some agencies will make you come back after you've cut in your drops," he explained. "But here, we drained it one time, put the heads on, and had it tested. We didn't have to drain each drop again or hard-pipe over to the center of tile. All we needed to do was remove the wire-tie, move the FlexHead over to where it was going to be, put our bracket on, put our tile in, put our escutcheon in and we were done."

The ability to work fast and efficiently also substantially improved another dimension of SimplexGrinnell's job cost.

"If we had used hard pipe, we would have had an additional trip up there (four hours away) just to put the escutcheons on, which would have been added cost to us," Madura said. "With FlexHeads, we were able to do it in one trip, and when we left the job, we were

“With FlexHeads, we were able to do it in one trip, and when we left the job, we were done way ahead of everybody else. And to me, that’s just tremendous!”

EARTHQUAKE CASE STUDY (CONT'D)

done way ahead of everybody else. And to me, that's just tremendous!"

This job included about 500 sprinkler heads, none of which were compromised by the earthquake. Even the escutcheons remained in place.

"This store didn't lose any escutcheons," Madura said, "and these were concealed, flat plate sprinkler covers. The other stores got beat up pretty badly, and, of course, lost very many escutcheons." Madura wasn't always sold on flexible sprinkler connections. He says that he needed to wait until there was a track record of how well they held up over time. When he was ready to use flexibles, he chose FlexHead because of the quality and the design of the products.

"FlexHeads are one solid piece, whereas some others have a removable end. To me, that's two extra potential leaks," he said. "Where anything screws together, you have a potential leak, and with FlexHead, it's only where you're connected to

the hard pipe and where your sprinkler head is. Also, because they're constructed of stainless steel, I think the FlexHeads are just a stronger product."

"I was on a service truck for a long time," he concluded. "And I've always had the mindset that I didn't want to give my customers something that wasn't the best or just because it's new to the market. Part of that is that I didn't want to have to come back and fix it down the road, and I've always operated that way. So I try to give my customers the best product that's out there, and this experience has made me very confident in FlexHead."

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FLEXHEAD PRODUCTS LIMITED WARRANTY

Flexhead Industries, Inc. warrants that its products will be free from defects in materials and workmanship under normal conditions of use and service for a period of one year from date of sale. Our obligation under this warranty is limited to repairing or replacing any product that is returned to us with transportation charges prepaid within one year after the date of original sale and that our examination shows to our satisfaction to have been defective in materials or workmanship under normal conditions of use and service. The decision as to whether to repair or to replace any product shall be made by us, and any repair shall be made at our facility. Notwithstanding the foregoing, the following are specifically excluded from the coverage of this warranty:

- (a) the sprinkler head of any Flexhead Industries, Inc. product, but Flexhead Industries, Inc. hereby assigns to the original purchaser of any such product the right to enforce the warranty, if any, issued by the manufacturer of such sprinkler head
- (b) defects resulting from ordinary wear and tear, including, without limitation, the replacement of the so-called poly bag components of any Flexhead Industries, Inc. product
- (c) products that have been altered in any manner by the buyer or by anyone other than Flexhead Industries, Inc.
- (d) products that have been subjected to misuse, abusive use, or damage by accident or casualty
- (e) products that have been installed or used in a manner contrary to our specifications, instructions or recommendation
- (f) products that have been installed or used in a manner that is not in compliance with all applicable requirements of any code, law, regulation or rule of any federal, state or local governmental or industry authority; and
- (g) products that have not been inspected and maintained in accordance with our specifications, instructions or recommendations, including, without limitation, our recommendations as to following the inspection and maintenance standards published by Factory Mutual Research Corporation (FMRC) and the National Fire Protection Association (NFPA); and
- (h) products that have been affected by Microbiologically Influenced Corrosion (MIC).

This warranty is not assignable and shall benefit only the original purchaser of a Flexhead Industries, Inc. product. If any provision hereof or any portion of any provision shall be held invalid, the remainder of this Limited Warranty shall not be affected thereby, and all provisions of this Limited Warranty shall remain valid and in full force and effect to the fullest extent permitted by law. THIS WARRANTY IS IN LIEU OF ALL IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY AND WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NOTWITHSTANDING ANY PROVISION TO THE CONTRARY HEREIN OR ANY APPLICABLE LAW TO THE CONTRARY, IN NO EVENT SHALL FLEXHEAD INDUSTRIES, INC. BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES UNDER ANY CIRCUMSTANCES WHATSOEVER, WHETHER ARISING FROM ANY BREACH OF THIS LIMITED WARRANTY OR OTHERWISE ARISING FROM OR IN CONNECTION WITH THE USE OR OPERATION OF, OR ANY DEFECT IN, ANY FLEXHEAD INDUSTRIES, INC. PRODUCT, OR OTHERWISE. The risk of damages from any breach of warranty with respect to injury to any person will be born by the purchaser of Flexhead Industries, Inc. product.

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