

Flexible Fire Sprinkler Connections for Ducts

By Norman J. MacDonald III

Flexibility is the most cost-effective way to protect facilities from duct fires. Flexible sprinkler connections enable faster, leak-free installation that cut labor costs by more than 80%. They enable rapid, safe inspection without the need for an expensive access hatch. With no rigid joints, they also provide superior, long-term system integrity, even in seismically active areas, because they accommodate both incident-related building movement and shifts over time.

Invented and patented by FlexHead Industries to protect the exhaust ducts in semi-conductor cleanroom manufacturing facilities — some of the most expensive real estate on earth, with some of the most caustic and dangerous exhaust interiors — flexible sprinkler connections are now used in applications as diverse as paint booths, plating lines, paper and pulp processing lines, automotive processing lines, grease ducts, biotech labs, trash compactor chutes, etc.

This article discusses the physical attributes of flexible fire sprinkler connections, and the financial/economic advantages of flexible connections over traditional hard pipe armovers.

Why Flexible?

Flexible connections offer consistent advantages over traditional hard pipe armovers. Most obviously, they involve fewer joints between the feeder line and the sprinkler head, which eliminates most of the handwork that a hard pipe armover requires, and substantially reduces the number of potential sources of leaks. The distinguishing element of a flexible connection, the hose, is the key reason that installation, ongoing inspection, and maintenance are vastly superior to hard pipe.

First, installation goes much faster because only two connections are necessary: Linking into the feeder line, then installing and connecting to the mounting block. Even

unexpected obstacles, such as other ducts or wall segments, are quickly circumvented; It's a simple matter of routing the connection through the available space. Typical installations take about ten minutes per head.

The flexible connection also eliminates the need for an expensive access hatch in the duct for inspection and maintenance. Inspection and maintenance are a simple matter of unbolting the head from the mounting block, and extracting it from the duct. There is no need for inspectors to work inside the duct. Additionally, sensitive operations do not need to be shut down while inspections and maintenance are in progress.

The net gains are a better cost and staffing model for installations, and more cost-efficient, effective ongoing maintenance.

The Anatomy of a Flexible Connection

The typical flexible duct unit consists of a threaded pipe nipple to connect to the main or the branch feeder line, flexible connecting hose in standard lengths, a top flange with an integrated reducing fitting that the sprinkler head is attached to, and a mounting block that attaches to the duct. It is important that contractors are able to get a mounting block that is appropriate to the size and material of the duct in order to achieve a tight, durable fit. FlexHead units also include a head-protecting polybag environment that prolongs the life of the sprinkler head inside the duct, and significantly reduces costly false alarms associated with corroding sprinkler heads.

The Economics of Flexibility

The cost of materials often leaps out in a first-time evaluation of a flexible sprinkler system, and for obvious reasons. All else being equal, stainless-steel technology can't compete with black pipe if the price of

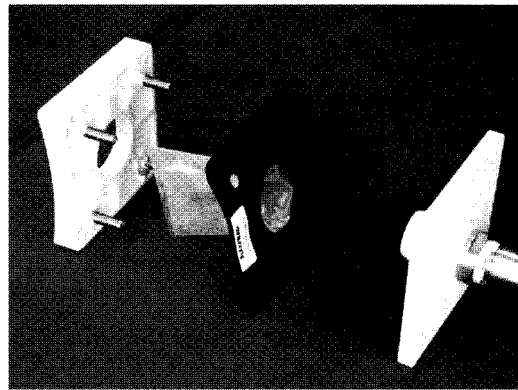
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material is the only criterion. But, in the case of sprinkler systems, all is not equal — and a quick look at the overall picture shows that, just like performance, the economics of flexible systems are much better than traditional hard pipe.

First, the installed cost of flexible systems is at least cost-competitive with hard pipe, but the material/labor ratio is different. Using a conservative benchmark, a typical installer can complete at least four flexible installations in the time it normally takes to do one hard pipe armover. Field assessment reveals that the actual ratio is even better than this. In the case of “difficult” installations, it is much better. Why is this?

Factory-assembled flexible installations require only three steps: Connect to the feed line, install the mounting block, and install the sprinkler connector in the mounting block. Further savings are realized because no expensive access hatch needs to be purchased and installed into the duct for routine inspections or maintenance. Access doors can typically cost as much as the entire flexible connection. With flexible connections, inspection and maintenance are a simple matter of unbolting the sprinkler head assembly from the mounting block, and pulling it out of the duct. Since the inspectors do not need to work inside the duct, sensitive operations do not need to be shut down while inspections or maintenance are in progress.



Easier Installation, Better Operational Profile

In summary, flexible fire sprinkler connections for ducts give contractors more options for staffing and scheduling. They can use their normal crew to complete installation and maintenance faster, or use a smaller crew to complete the work in the same time-frame that normally requires a full hard pipe crew. Flexible installations typically have better leak integrity, so call-backs are virtually nonexistent. High-quality materials and factory assembly also extends the life of components, which leads to better total cost of ownership over the life of the system. These are among the reasons why owners of semiconductor manufacturing facilities pioneered the use of flexible connections for ducts, and why numerous other industries have since adopted them.

About the Author:

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