



The following interview was featured in Fire Protection Contractor magazine, January 2019 Special Systems issue.

Understanding Water Mist's Benefits, Trends and Opportunities – Q&A with Fike Corporation

Members of the fire protection team at Fike Corporation recently discussed the past, present and future of applying water mist within certain industries and applications.

- Jason Jones – Global Product Manager, Fire Suppression
- Brad Stillwell – Director of Special Projects
- Derek Wickersham – Business Development Manager, Water Mist
- Amos Leap – Product Manager, Fire Suppression

What is water mist and how is it used in fire protection?

JJ – The differentiator between water mist and sprinkler systems is that a water mist system disperses an ultra-fine spray of water that NFPA technically defines as water droplets smaller than 1,000 microns. Anything above 1,000 microns is considered a water sprinkler droplet.

DW – Water mist is an alternative to a sprinkler system and uses a fraction of the water consumption. For example, in a deluge application of similar hazards, a water mist system uses up to 90 percent less water compared to sprinklers, and on a light hazard it uses up to 50 percent less water.

JJ – Water mist also provides “3D protection” because its ultra-fine water droplets can penetrate in and around partially concealed spaces. That’s something you don’t get with a larger sprinkler droplet. And that’s one of the characteristics that classifies water mist as a *special hazard* system. That’s a big distinction to make—sprinklers obviously provide fire protection, but there’s a whole class of systems— like water mist and gaseous agent systems—that provide *special hazard fire protection*. Special hazard protection means we are protecting high-value assets that could be damaged by traditional suppression systems, like sprinkler systems. It’s really going a step beyond to make sure we don’t just give people a chance to get out of the building and preserve the building structure but that we also save the critical assets that are within that space.

BS – Special hazard fire protection could also be called “mission-critical fire protection.” That’s when assets are so critical that traditional sprinklers aren’t going to give the level of protection required. Water mist is often a cost-effective solution to protect these mission-critical assets.

JJ – When a mission critical system goes down, the economic health of a company may be at stake— that’s why it’s worth going a step beyond to protect these systems from fire. We are protecting business *processes* and keeping them running. A few examples include a data center processing credit card transactions or an airline scheduling and tracking flights.

What are some industries that are now adopting water mist over other suppressants and why?

DW – The power industry is adopting water mist for the protection of turbines that generate the electricity that supplies the electric grid. If any of those were to go down, it could shut down a grid, so



they are considered another one of those mission-critical assets. We see water mist being used to replace older CO₂ systems in these turbines as well. Insurers and plant safety personnel appreciate the fact that water mist is benign when it comes to human and environmental safety. We see this same retrofit activity occurring in the food and beverage industry, where CO₂ systems being used to protect industrial oil cookers are being replaced with water mist.

AL – Also we've seen automotive paint booths and even light hazard applications like office spaces, hotels, schools and churches adopt water mist. We also see it in new construction. When it comes to light hazard, water mist is gaining traction due to the much lower levels of collateral damage it produces versus a sprinkler system.

BS – Available infrastructure – like city water supply – also weighs into the decision to go with water mist. Recently, a (major fast food restaurant) installed a Fike DuraQuench water mist system because the water main was not big enough to supply a sprinkler. Their options were to either put in a huge reservoir, dig out the water main to make it big enough to supply a traditional sprinkler system, or to use DuraQuench. They chose DuraQuench over these other options due to cost and convenience.

DW – I think another thing that's driven adoption of Fike's DuraQuench system in particular, is flexibility. Because DuraQuench operates in the low-to-intermediate pressure range (with a typical operating pressure of around 175 psi), versus high pressure water mist systems that operate at pressures greater than 1,000 psi, we can use lower-pressure pipe and fittings that can't be used on other systems. For example, with industrial oil cookers, a common issue we encounter is the raising and lowering of the vent hood. How do you install pipe on a system that moves up and down? When you are operating at lower pressures, you have the option of using a flexible sprinkler drop that will go up and down with the hood. This kind of design flexibility is harder to come by on a high pressure water mist system.

What different types of water mist systems are available today?

BS – Water mist systems were first developed in Europe, and the first systems were high-pressure systems. These systems pushed water through a micro orifice with the goal of delivering the smallest possible droplets. They accomplished this by producing pressures of 1,000 to 2,000 psi. These high-pressure systems still account for the lion's share of the market. Unfortunately, high-pressure pumps mean high cost, and these early systems proved to be among the most expensive forms of special hazard fire protection. It was only in the past few years that manufacturers like Fike recognized the benefits of low to medium pressure systems and started bringing them to market. These systems still delivered the primary benefit of water mist – less collateral damage than a sprinkler system – but they did it without the need for specialized, high-pressure components. With these systems, you can use traditional sprinkler components when it comes to things like check valves, deluge valves and even piping. CPVC piping is even an option with these systems in some applications.

JJ – One other thing when we talk about different types of water mist systems, and there is a place for each one of these, is what I'd call fixed or containerized systems and pumped or continuous supply systems. In smaller volumes, it may be more cost effective to use a nitrogen-driven system like Fike's MicroMist system. It has a water supply that's held in a tank and a nitrogen supply that's held in a separate tank. The nitrogen is used when we detect a fire to push the water through the system. Those



are typically more cost effective on smaller spaces under 10,000 cubic feet. Once you get up above that volume, it makes more sense to have a pumped system. With a pumped system, you get the advantage of connecting to the building's water supply. Your system is going to run until someone shuts the system off, and you don't have to worry about having a limited supply of water or nitrogen.

DW – Also once the fire is extinguished, a pumped system is quickly and easily reset and you have immediate fire protection again, as opposed to a containerized system where you must refill the tanks, resulting in downtime in between.

Why did Fike choose to focus on mid-to-low-pressure water mist systems?

JJ – Since 1996, when the NFPA 750 standard was developed, high-pressure systems dominated the market because everyone was focused on creating the smallest droplets possible. It made for a more expensive system, so in 2014 we asked ourselves, "How can we improve on that?" We improved on it by developing a lower-pressure system without singularly focusing on producing the smallest water droplets possible.

BS – How important is droplet size, anyway? I would say that third-party approvals, like FM Global are more important. You look for the manufacturers with systems approved for the hazard you are trying to protect. For example, you can rest assured that if you are installing a system that is FM approved to protect a combustion turbine, it has been tested and proven to put out fires in that application. At that point, does it matter whether you're putting the fire out with 300 micron droplets or 100 micron droplets?

JJ – There's a point of diminishing returns. You spend more and more to make smaller and smaller droplets and what do you really gain? In the end, the system has either been demonstrated to be effective for a given application or it has not.

DW – We also focused on the low pressure end of the spectrum to make it easier for installers and owners to procure components locally and to make the system simpler and easier to service. High-pressure system components can't be bought off the shelf locally.

What were the market trends in the industry that led Fike to develop DuraQuench?

JJ – High-pressure water mist systems were known to be complex and difficult to maintain. We wanted a system that didn't require the distributor to have to buy the pipe, fittings, installation tools, valves and other components from Fike, although we do offer all those items. So, if a part breaks, you can probably find a replacement part locally and still have an FM-approved system.

AL – We also heard from our customers that they didn't like having to rely on the water mist OEM to do their system design. Because of DuraQuench's simplicity, anyone who knows how to run sprinkler design software can design a DuraQuench system.

JJ – One other thing that was a well-known fact in the water mist industry is that if you order a system you might wait six months for delivery. On high-pressure systems, you have highly specialized components. Often times they are shipped from overseas if you're here in the United States. What



we've done is taken Fike's smaller-company mentality and responsiveness, and applied that to the world of water mist. In doing this we've cut that six-month lead time by two-thirds. Finally, we knew that environmental concerns were driving the market to adopt water mist at an accelerating rate. Increasingly the market wants fire extinguishing systems that have minimal environmental impact. Obviously, water is about as green as you can get.

What trends do you see developing in the future in regards to water mist technology and its applications?

AL – I think you'll see more players follow Fike's lead in introducing low- and mid-pressure systems because I think the market recognizes that droplet size is one consideration but it's one of many factors, like cost, design flexibility, ease of getting pieces and parts, and simplicity and reliability.

DW – In Europe water mist is more prevalent than it is in the United States. They actually have systems for single family dwellings. We see more movement in this direction in the US as well.

JJ – I think AHJs are getting more educated on water mist. We've been pleasantly surprised at the AHJs' willingness to consider new technologies like lower-pressure pumped water mist systems. Being able to show an AHJ your FM approval goes a long way. I think sprinkler contractors are getting better educated about water mist too. They are starting to see this as an opportunity when they have a special hazard to protect within a bigger building. They recognize that water mist is a better option than sprinklers when it comes to protecting a critical asset or process, in many cases.

DW – I think it allows traditional sprinkler contractors to get into the special hazard business, and it also allows special hazard fire suppression companies to get into that light hazard market that is typically the domain of the sprinkler contractor.

BS – Water is a great fire suppressing agent. You go all the way back to the Great Chicago Fire and historically water has saved a lot of lives and property. Although we believe clean gaseous agents offer the highest level of protection, water still has a huge place in the market and is an invaluable resource for fire protection.

About Fike

Founded in 1945, with headquarters located in the Kansas City area, Fike Corporation is the experienced, trusted expert in explosion protection, pressure relief, pressure activation and fire alarm and suppression solutions. In addition to its manufacturing facilities in the United States, Belgium, Canada and the U.K., Fike has sales and service offices throughout North and South America, Europe, Asia and the Middle East. Visit fike.com to learn more about the company and its best-in-class industrial safety hazard solutions.

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