

# How putting out the fire could be putting you out of business.

## 3M™ Novec™ 1230 Fire Protection Fluid vs. Water Mist Systems

For all of human history, water has been used to extinguish fires because it is cheap, effective and plentiful.

Although water sprinklers are an excellent option for controlling structural fires, water can be highly destructive to the electronic devices and communications systems that power our modern life.

Water mist systems – an evolution of sprinkler technology – have been promoted as a less damaging alternative to conventional sprinklers. But the reality is, water mist is still water. It is wet and messy, electrically conductive, and can require costly cleanup. It can destroy the critical assets that keep businesses running. And in today's electronic age, where there is no time for downtime, that is catastrophic for your business.

### **Standards matter.**

Due to the limitations of water-based systems, clean extinguishing agents have been developed to extinguish fires that threaten critical electronic assets. As a clean agent, 3M™ Novec™ 1230 Fire Protection Fluid is governed by NFPA 2001 – the industry standard establishing baseline performance for clean agent fire suppression.

Because water mist is not a clean agent, it is not covered by NFPA 2001. Instead, it is covered by another standard: NFPA 750. These standards have different performance requirements. For example, NFPA 750 for water mist does not require extinguishment but rather requires, “each system must be evaluated on a performance basis for controlling, suppressing, or extinguishing a fire”. Additionally, the time frame for any degree of performance is undefined. As noted in NFPA 750, “The standard does not provide definitive fire performance criteria, nor does it offer specific guidance on how to design a system to control, suppress, or extinguish a fire.”

For specifiers and users of water mist fire suppression systems, this means you need to take extra precautions to understand the level of protection provided to your facility.

### **Water mist is still water.**

As you can imagine, a prolonged water mist discharge can create a messy, wet environment and cause significant damage to electronic and paper assets. And that creates a significant impact to business continuity.

One organization, FM Global, has weighed in with guidelines related to mission critical facilities and fire protection. FM Global is recognized

as a global leader specializing in loss prevention services primarily to large corporations around the world. FM Global's Data Sheet 5-32 states, “When it is essential to reduce equipment damage from an incipient fire to minimum possible levels, or to facilitate the return to service, provide an FM Approved clean agent fire extinguishing system with detection to protect the data equipment within the data processing equipment room. This is to supplement the automatic sprinkler or water mist system protecting the facility or raised floor.”

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) published thermal guidelines for Mission Critical Facilities, Technology Spaces, and Electronic Equipment with a recommendation to power down equipment in data processing environments when relative humidity levels exceed 80%.

Related to this, a recent study by Rutgers University<sup>1</sup> concluded that humidity is a greater threat to hard drive reliability than temperature variations. The findings suggest that relative humidity is the biggest negative factor in disk reliability, even when the data center is operating within industry standards.<sup>2</sup>

1. Manousakis, I., Sankar, S., McKnight, G., Nguyen, T. D., and Bianchini, R. Environmental Conditions and Disk Reliability in Free-cooled Datacenters. In *Proceedings of the 14th USENIX Conference on File and Storage Technologies* (2016).

2. Doyle, E. Research: Humidity hits disk drives harder than temperature variations. *DatacenterDynamics* (2016).

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### A cleaner solution

Novec 1230 fluid is designed to extinguish a fire in its incipient stage – before it has a chance to spread. With any fire suppression system, cost is always a factor. That’s why it’s important to consider that the high pressure cylinders, increased generator sizes, high voltage pumps, additional power requirements and stainless steel piping required for a water mist system can dramatically drive up system costs.

Lifecycle costs should also be considered. For instance, NFPA 750 includes recommendations for legionella bacteria testing of stored water supplies for water mist systems at semiannual and annual maintenance intervals.

When you add it all up, the verdict is clear. Compared to water mist systems, Novec 1230 fluid offers superior fire protection, while helping to ensure continuity of operations in the event of a fire emergency.

### Typical Physical Properties (Not for specification purposes)

Property	3M™ Novec™ 1230 Fire Protection Fluid	Water Mist
Applicable Standard	NFPA 2001	NFPA 750
Target Fire	Incipient Stage	Larger Fires
Heat Threshold Necessary for Performance	No	Yes
Conductivity	Non-conductive	Conductive. Equipment should power down immediately.
Residue after fire extinguished	None	Water and particulates from smoke
Discharge time to achieve 95 % of the MDC*	10 seconds (NFPA 2001)	No definitive fire performance (NFPA 750)
Space Consideration	Agent cylinders	Nitrogen cylinders, pumps, generators, and water tanks
Routine Testing Recommended for Microbial Growth	No	Yes – semiannual to measure and prevent reoccurrence
Degree of Hazard Protection	Complete room protection	Local hazard protection
Extinguishment Performance	Class A, B, C Extinguish	Class A and B Control, Suppress or Extinguish

\*MDC = Minimum Design Concentration

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## The 3M™ Novec™ Brand Family

The Novec brand is the hallmark for a variety of proprietary 3M products. Although each has its own unique formula and performance properties, all Novec products are designed in common to address the need for safe, effective, sustainable solutions in industry-specific applications. These include precision and electronics cleaning, heat transfer, fire protection, protective coatings, immersion cooling, advanced insulation media replacement solutions and several specialty chemical applications.

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3M™ Novec™ Engineered Fluids • 3M™ Novec™ Aerosol Cleaners • 3M™ Novec™ 1230 Fire Protection Fluid • 3M™ Novec™ Electronic Grade Coatings • 3M™ Novec™ Electronic Surfactants • 3M™ Novec™ Dielectric Fluids

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Issued: 5/16 11532HB  
60-5002-0921-2