

# Get the Facts About Fire Extinguisher Selection

When fire breaks out on an industrial work site or in a manufacturing facility, the impact—on people, property and profitability—can be significant. It's estimated that in the U.S. between 2009 and 2013, fire departments responded to an average of 37,000 industrial or manufacturing fires each year, resulting in:

- 279 civilian injuries
- 18 civilian deaths
- \$1 billion in property damage<sup>1</sup>

The stakes are high and the risk is great. It's not surprising, then, that when decisions are made about equipping work sites with fire extinguishers—the first line of firefighting defense—most organizations insist on quality. Often, decision makers defer to the UL fire ratings with the expectation that the higher the rating the better the firefighting capability. For some fires, that's true. But when it comes to fires in high-risk environments, *the opposite can be true*.

The National Fire Protection Association recognized this anomaly in its 2007 NFPA 10, Subsection 5.5, which covers specific hazards including pressurized flammable liquids and gasses, three-dimensional fires, and obstacle fires. For these Class B fires, the NFPA 10 technical committee concluded that extinguisher size and flow rates should be the basis of extinguisher selection, not UL fire ratings, since the ratings on higher flow extinguishers tend to be lower than those on lower flow units.

Because Section 5.5 calls for selecting extinguishers that may have lower UL fire ratings, it is counter-intuitive to many. As a result, there remains a great deal of confusion about High Flow Fire Extinguishers in the marketplace today. How can lower-rated extinguishers possibly be more effective in suppressing certain fires than those with higher UL ratings? Unfortunately, the confusion can put people, property and profitability at unnecessary risk.

## Understanding the High-Risk, Low-UL-Rating Connection

When establishing a fire extinguisher Class B rating, one of the UL 711 considerations is discharge time—the length of time it takes for the dry chemical agent to discharge from the extinguisher. For certain fires, the longer the discharge, the better, and a longer discharge time may offer novice users time to correct any misapplication.

The slow rate of discharge, however, becomes problematic in high-risk environments where there is a greater likelihood of pressure fires, gravity fed/three dimensional and obstacle fires. In these situations, the operator needs an extinguisher that meets or exceeds a minimum of one pound per second flow rate. In other words, he or she needs a high-flow extinguisher that delivers a lot of chemical—fast. Yet, because high-flow extinguishers tend to have lower UL ratings (because of UL's discharge time criteria), they are sometimes dismissed as being less capable when, in fact, they are the optimal choice for these high-risk environments.

The NFPA 10 technical committee, recognizing the inconsistency, established this standard a decade ago; now, new test results validate that standard.

## What the New Test Results Show

In the summer of 2017, Johnson Controls conducted a series of tests designed to compare the firefighting effectiveness of various extinguishers in flammable liquid in-depth and pressurized flammable liquid and gas fires. The results confirm the findings of NFPA 10 subsection 5.5, ten years prior.

*Under the test conditions, across multiple types of Class B fires in high-risk environments, high-flow cartridge operated extinguishers provide the best protection even though they may not have the highest UL ratings.*

## Not All High-Flow Extinguishers are Created Equal

Although the most recent tests continue to show high-flow extinguishers can perform better in high-risk environments with flammable liquids and gases, not all high-flow extinguishers are created equal. It's important to get the right tool for the job; one that will minimize risk to people and property in the event of a fire, and will also deliver the best return on investment.

For example, a cartridge operated portable extinguisher typically carries a higher initial cost when compared to a stored pressure model. But leading cartridge operated models offer greater lifetime value because their features are designed specifically for the operational and environmental challenges of high-risk industries.

### When Uptime is a Priority

High-risk environments require worksite fire extinguishers to be fully functional before any work can commence. So if an extinguisher has been used, damaged, or accidentally discharged there can be considerable downtime until the unit is replaced or recharged.

A cartridge operated portable extinguisher can be recharged on site in a matter of minutes without any special tools which means the process will typically have little or no impact on uptime. By contrast, stored pressure extinguishers must be recharged by a trained service technician at a distributor's shop using special equipment or by bringing a qualified technician and their equipment directly to the site which can also cause considerable downtime.

### When Durability is a Priority

In tough, high-hazard environments, fire extinguishers are put to the test. They may be subject to heavy vibration, hard shocks, harsh weather or direct sunlight; less-than-optimal conditions. It's not unusual, for example, for gauges on stored pressure extinguishers to become damaged, for valves to break off, for leaks to occur or for Mylar nameplates to fade in direct sunlight, making it difficult to know if the model meets current listing standards or should be removed from service. Quality cartridge operated portable extinguishers, by contrast, leave little to chance. They are designed specifically to endure conditions found in most industrial, high-risk environments, with heavier gauge steel shells, fewer potential leak paths than stored pressure models, and the elimination of inherently fragile gauges. And as a result of the propellant cartridge discharge, the agent is fluidized immediately prior to use which helps to combat the compaction effects of significant vibration.

### When Reliability is a Priority

A fire extinguisher can only be effective if it works when it's needed. Cartridge operated portables are designed so that all moving parts can be inspected at any time, not just every six years as is the case with stored pressure models.

By offering easy, any-time accessibility to the mechanics of the extinguisher, cartridge operated portables give everyone at the worksite the confidence in knowing that if they reach for an extinguisher, it will perform as expected, because there are no second chances when it comes to fighting fire.

### When Ease-of-Use is a Priority

To fight any fire effectively, the person operating the extinguisher must be able to move around easily and safely while holding the extinguisher. This is especially critical in high-risk environments where the operator may not be able to run away from the threat. For that reason, flexibility and ease-of-use is often a priority for organizations focused on minimizing risk.

Today's leading cartridge operated portables take ease-of-use into consideration, with ergonomically designed features to maximize operator performance. Carrying handles are positioned so the extinguisher hangs at a 45-degree angle off to the side so it can be easily carried up and down stairs. Nozzles are designed to point at the base of the fire when squeezed for easier and more precise agent delivery. Hoses are longer, giving operators greater flexibility to use the fire extinguisher.

When combined, features such as these make it possible for people to fight fires more effectively, minimize potential damage to property and, most importantly, minimize risk to themselves and their colleagues.

## The Right Tool for the Toughest Jobs

In high-risk environments, cartridge operated high-flow extinguishers are designed to deliver a number of advantages over traditional stored pressure models: Greater uptime, ease of use, durability and reliability. Combined, these attributes deliver not only the best firefighting effectiveness when faced with pressure, obstacle or three dimensional fires, they can also deliver a greater lifetime value.

While the selection of a high-flow extinguisher may seem counter intuitive as it may have a lower rating, remember that in these situations higher flow rate is more important than UL fire rating. The National Fire Protection Association recognized this in its 2007 edition of NFPA 10, and recent testing validates that NFPA mandate: As a result, professionals in high-risk industries are urged to look beyond the UL rating, and ensure they select extinguishers with the firefighting capability, reliability, and durability necessary to protect people, property and profitability in the event of a fire.