



Novec[™]

Brand

Cost-effective fire protection. Without compromise.

3M[™] Novec[™] 1230 Fire Protection Fluid vs. CO₂

Why is CO₂, a lethal gas, still used in total flooding applications to protect important assets from fire?

As halons were phased out of general use over the past 30 years, CO₂ made sense as a cost-effective fire protection substitute. But with the increased availability of proven non-lethal and cost-effective fire protection alternatives, it seems that continued use of CO₂ in total flooding fire suppression applications is driven more by inertia than the desire for a particular performance requirement.

It's time to switch to a smarter alternative. 3M[™] Novec[™] 1230 Fire Protection Fluid provides a safe, sustainable agent to cost-effectively protect important assets.

Performance without compromise

Fire suppression should be about protection of property, people, continuity of operation and the environment. CO₂ used in fire suppression compromises the safety of people in order to protect property. NFPA 12, the Standard on Carbon Dioxide Extinguishing Systems, states that, with limited exceptions, "new total flooding carbon dioxide systems shall not be installed in normally occupied enclosures..."¹ It goes on to detail enclosure lockout and extensive signage protocols to avoid injury or death.

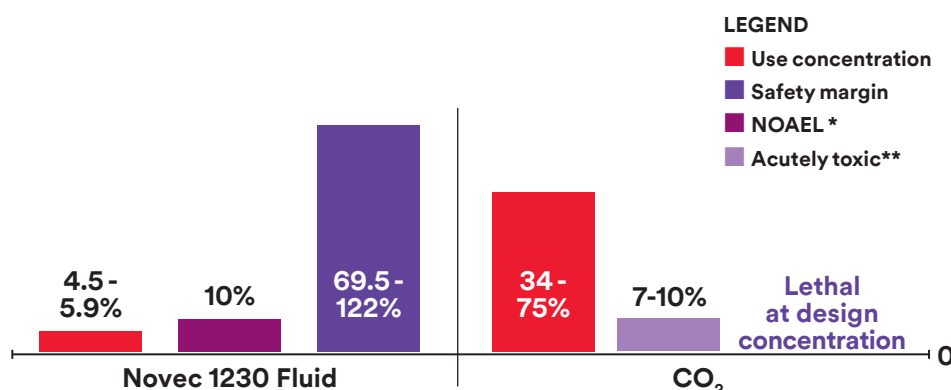


Figure 1. Margin of safety of clean agent fire suppressants – Class B hazards

*No Observed Adverse Effect Level
(2015 Edition of NFPA 2001)

**Unconsciousness in a few minutes
(NFPA 12, 2015 Edition)

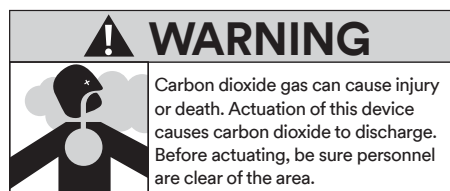


Figure 2. Sign at each manual actuation station.

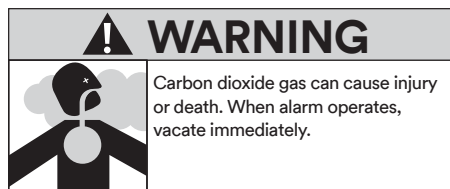


Figure 3. Sign in every protected space.

Because CO₂ is a lethal gas, NFPA 12 specifies extensive signage protocols for CO₂-based fire protection systems.

Don't delay

Because CO₂ is a lethal and odorless gas, delays are built into CO₂ fire suppression systems. A combination of pre-discharge alarms and lock out procedures, for example, are required by NFPA 12 to evacuate personnel from protected spaces before CO₂ is discharged. Delays, however, only allow fires to grow and cause more damage. When a discharge time delay is omitted, a supervised lockout is required anytime personnel are present in the protected area or space.² It's also important to note that abort switches are not required for CO₂ systems, meaning once a discharge starts, it cannot be stopped.

Due to its large margin of safety (Figure 1), discharge time delays and lockout procedures are not required for fire suppression systems using Novec 1230 fluid. Discharge of a system using

3M Science. Applied to Life.™

Novec 1230 fluid can occur almost immediately, while the fire is still small – without the danger to human health inherent with CO₂ (Figure 1).

3M™ Novec™ 1230 Fire Protection Fluid protects important assets while providing the largest margin of safety for use in occupied spaces compared to any other clean agent. In other words, Novec 1230 fluid protects both people and property without creating additional risks that need to be managed.

CO₂ may be cheap... but owning a CO₂ system is not!

CO₂ is an abundant, inexpensive resource. But CO₂ fire suppression systems come with several expenses that add to the cost of ownership:

- Full discharge test required upon initial commissioning
- Employee training on the risks of CO₂, evacuation procedures, etc.
- Lockout valves to protect workers entering the protected space or adjacent spaces where CO₂ could migrate
- Annual system maintenance cost
 - System maintenance downtime costs
 - High pressure cylinder hydrostatic testing requirements
 - 30-day inspection requirements
 - 5-year hose testing requirements (along with corresponding downtime costs)
 - Semiannual weighing of cylinders (along with corresponding downtime costs)
- Costs for additional cylinder storage space

Lifetime system maintenance costs for systems employing Novec 1230 fluid are minimal – and transparent. The

With CO₂ system delays, time is not on your side!

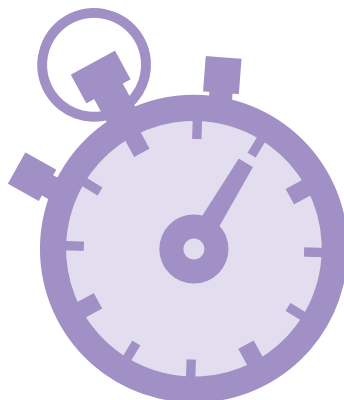


Figure 4. Some of the consequences of CO₂ system delays

costs involved in periodic inspection and testing of high-pressure systems can typically be avoided by choosing a system containing Novec 1230 fluid. Plus, systems using Novec 1230 fluid are more compact – requiring just one cylinder for every ten CO₂ cylinders in a typical system – offering valuable savings in space for cylinder storage (as shown in Figure 5).

It all adds up

CO₂ gas itself may be cheap, but the costs of ownership – and the risks to occupant safety – are simply too high to be ignored. For safe, sustainable fire suppression without compromise, Novec 1230 fluid is the smartest choice. It offers an unbeatable combination of high extinguishing performance, large margin of safety, and small physical and environmental footprints. Novec 1230 fluid is engineered to reduce risk. And that, after all, is what fire suppression is all about. ■

Delays

- Discharge delays and lockout procedures
- Long agent flow time
- For marine applications, there is a manual discharge delay of up to 30 minutes for “mustering” all crew

Consequences

- Fires have a chance to grow
- Increasing products of combustibility
- Equipment damage
- Visual obscuration

Enjoy peace-of-mind with Novec 1230 fluid.

- ✓ No discharge delays
- ✓ No lock-out
- ✓ Short agent flow time

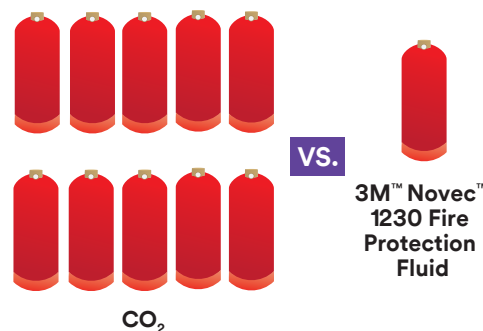


Figure 5. Space savings with Novec 1230 fluid-based systems

Per NFPA 12, Table 5.3.3(a) Flooding Factors.

18,400 ft³ / 20 ft³/lb = 920 lb CO₂
(10 × 100 lb cylinders)

18,400 ft³ × .05422 = 998 lb Novec 1230
(1 × 1,000 cylinder)

1. Excerpted in part from NFPA 12, 2015 Edition, paragraph 4.1.1.
2. NFPA 12, 2015 Edition, section 4.5.6.2.

APPROVALS

3M™ Novec™ 1230 Fire Protection Fluid is approved for use in commercial and industrial total flooding systems by the U.S. EPA and most major regulatory bodies around the world.

With third-party listings and approvals, you can trust Novec 1230 fluid to quickly extinguish a fire while helping protect people, equipment and the environment.



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 smart, safe and 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.

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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