

When space makes waste

The hidden real estate costs of inert gas fire suppression systems

Using expensive real estate to house the extra cylinders required in an inert gas fire suppression system can add up to significantly higher costs over the life of the system.

An easily-overlooked cost factor in choosing any fire protection system is the amount of floorspace needed to house it. Because an inert gas system typically requires many more cylinders to protect a given space than a system utilizing 3M™ Novec™ 1230 Fire Protection Fluid, it will have a significantly larger footprint – and more space means higher ongoing real estate costs. The difference can be dramatic, as illustrated by the examples below of real estate costs in several large metropolitan areas around the world (New York City, Tokyo and Hong Kong). Regardless of their location, end users will want to be aware of this “hidden” cost when considering the installation or replacement of a clean agent fire protection system.

Calculating the “extras”

Commercial real estate rental costs in large metropolitan areas help illustrate the total cost of ownership of an inert gas system relative to a system using Novec 1230 fluid. Monthly rental costs can now average about \$150 per square foot in a large metropolitan area such as New York City – and can be even higher in other parts of the world. Use of this expensive real estate for agent cylinder storage is an important consideration, as it affects the total cost of ownership.

The following example provides an estimate of the difference in real estate costs between an inert gas

system and a system using Novec 1230 fluid. The example uses rental prices (as noted in Business News Daily, July 17, 2012) for a typical inert gas system in New York (Manhattan):

- **System size:** This example supposes a typical clean agent system being installed to protect a 50 × 50 × 8 ft. volume, plus a 50 × 50 × 1 ft. sub-floor. The rent per sq. ft. would be \$150 per month.
- **Concentration:** The system is designed for a Class C Energized Fire hazard @ 4.5% for a system using Novec 1230 fluid and 38.5% for IG-541 (inert gas) per the 2012 edition of NFPA 2001.
- **Cylinder requirements:** This size system will require 26 inert gas cylinders (2 rows of 13 × 150 bar, 425 ft³ capacity cylinders), but only two cylinders containing Novec 1230 fluid (total of 917 lbs of agent stored in 2 × 500 lb cylinders). Note that the Novec 1230 fluid cylinders may be installed inside the hazard space being protected, and do not require any additional storage space.

It is also important to note that inert gas systems may also require a main and reserve system to compensate for the fact that, once the system discharges, there can be substantial delays for recharge of the system. The need for a reserve system doubles the footprint of the inert gas system.

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- Footprint:** NFPA codes for egress and maintenance require a 3 ft. clearance in front of the cylinders; this space mandate must be added to the total footprint for each system. The adjusted footprint for the above noted system becomes approximately 65 sq. ft. for an inert gas system and 12 sq. ft. for a system utilizing 3M™ Novec™ 1230 Fire Protection Fluid.
- System real estate cost comparison:** Considering monthly rental costs of \$150 per sq. ft., the annual real estate cost in New York City for a clean agent system using Novec 1230 fluid would be \$21,600, if the cylinders cannot be stored in the space being protected. The annual real estate cost for housing an inert gas system would be \$117,000 per year.

Using the example above, the annual real estate savings for a system containing Novec 1230 fluid (vs. an inert gas system) is \$95,400 per year.

International Real Estate Costs

Rental costs for the following global locations were calculated using the same system parameters as those listed for the New York City example:

Solids	Tokyo		Hong Kong	
	Inert Gas	Novec 1230 fluid	Inert Gas	Novec 1230 fluid
Monthly rental cost	\$187 per sq. ft.		\$247 per sq. ft.	
Annual real estate cost	\$145,860	\$26,928	\$192,660	\$35,568
Estimated savings	-	\$118,932	-	\$157,092

Assumptions:

- 2175 psig (150 bar) inert gas system used in the cost calculation
- 500 psig (34.5 bar) Novec 1230 fluid based system used in the cost calculation
- 3"-0" floor clearance in front of the cylinders included in square footage

Summary

As these examples show, the cost of additional real estate substantially adds to the total cost of ownership of an inert gas system. Space devoted to cylinder storage is no longer available for occupancy or installation of valuable assets, and – depending on the location – this extra space can carry a hefty real estate cost.

Fire suppression systems using Novec 1230 fluid are much more compact, typically requiring 80% less space compared to an inert gas system – offering valuable savings over the lifetime of the systems. For the New York City example, the real estate savings are valued at almost \$2 million over a 20-year system lifetime.

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3M™ Novec™ 1230 Fire Protection Fluid is an advanced clean agent fire suppression material, based on a proprietary chemistry from 3M. It was designed to address industry needs for clean agent fire protection that is safe and effective, while offering a sustainable environmental profile that no other halocarbon agent can match. This includes: Zero ozone depletion potential; a 5-day atmospheric lifetime, and; a Global Warming Potential of 1. Because of these properties, Novec 1230 fluid is not targeted for phase-down or regulatory restrictions anywhere in the world. It is approved for use in total flooding fire suppression systems by the U.S. EPA and most major regulatory bodies. All of this makes Novec 1230 fluid today's sustainable choice for clean agent fire protection.

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.

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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