



EXTINGUISHER COMPANY, INC.



FIRE SYSTEMS

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Monroe Kitchen
Equipment, Inc.

Fire Suppression Systems

Sapphire® Pre-Engineered Clean Agent System

Features

- UL/ULC Listed
- Effective Total Flooding on Class A, B, and C Fires
- Clean Agent Suitable for Protection of High-Value Assets
- Long-Term, Sustainable Alternative To Halon, HFCs and PFCs

Application

The SAPPHIRE® Pre-Engineered System utilizes 3M™ NOVECT™ 1230 Fire Protection Fluid as the suppression agent. NOVEC 1230 fluid can effectively be applied in total flooding fire suppression applications in the following areas:

- Data Processing Centers
- Tape Storage
- Vaults
- All normally occupied or unoccupied electronic areas where equipment is either very sensitive or irreplaceable
- Telecommunications including Cellular sites and Switching Centers
- Military Systems including Combat Vehicles and Marine Engine Rooms
- Transportation including Merchant Marine Vessels and Mass Transit Vehicles
- Recreation including Pleasure Craft and Race Cars

Environmental Impact

The SAPPHIRE Clean Agent Fire Suppression System utilizes 3M™ NOVECT™ 1230 Fire Protection Fluid. This fluid has 0.0 ozone depletion potential, an atmospheric lifetime of just five days, and a global warming potential of 1.0. NOVEC 1230 fluid is registered with the U.S. EPA under TSCA and European ELINCS. It has met the requirements of registration under SNAP (Significant New Alternatives Policy) and is approved for use as an alternative to Halon 1301 for total flooding applications in occupied spaces.

Description

The ANSUL SAPPHIRE Pre-Engineered System is an automatic, fixed nozzle, fire suppression system using 3M™ NOVECT™ 1230 Fire Protection Fluid for Class A, B, and C fires.



For more information on our Fire Systems, please [email us](mailto:info@monroeextinguisher.com) or call 585-235-3310.



Sapphire Fire Suppression Systems

The system is designed and installed in accordance with the National Fire Protection Association (NFPA) Standard 2001, "Clean Agent Fire Extinguishing Systems." It is listed by Underwriters Laboratories, Inc. (UL) and Underwriters of Canada (ULC).

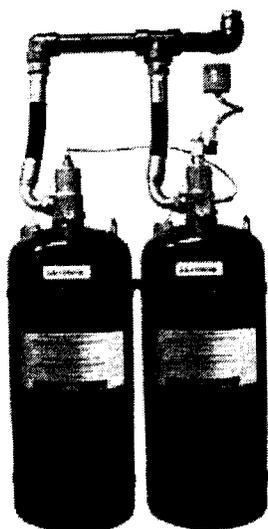
The system is capable of automatic detection and actuation and/or remote manual actuation.

The detection portion of the fire suppression system allows for automatic detection by means of the AUTOPULSE® Control System. Several different detection options are available.

Exposure to NOVEC 1230 at design concentrations up to 10% (NOAEL) is not hazardous to health. Refer to NFPA 2001, Section 1-6 "Safety," for exposure requirements. As with halons, the EPA and the National Fire Protection Association recommend that unnecessary exposure to any agent be avoided and that personnel evacuate protected areas as quickly as possible to avoid the decomposition products of the fire.

A system installation and maintenance manual is available containing information on system components and procedures concerning design, operation, inspection, maintenance, and recharge.

The system is installed and serviced by authorized distributors that are trained by the manufacturer.



Basic Use – The SAPPHIRE Pre-Engineered Clean Agent Fire Suppression System is particularly useful for suppressing fires in hazards where an electrically non-conductive medium is essential or desirable; where clean up of other agents present a problem; or where the hazard is normally occupied and requires a non-toxic agent.

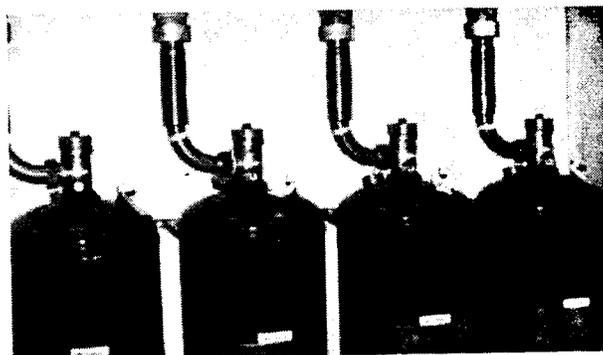
Composition and Material – The basic system consists of extinguishing agent stored in steel containers. Various types of actuators, pneumatic and electric, are available for release of agent into the hazard area. The agent is distributed and discharged into the hazard area through a network of pipe and a nozzle. The nozzle is drilled with a fixed number of orifices designed to deliver a uniform discharge to the protected area. On large hazards, where two or more tanks are required, actuation design can be utilized to actuate multiple tanks.

Additional Equipment Includes – AUTOPULSE Control panels, releasing devices and alarms, strobes and warning signs. All or some are required when designing a total system.

3M™ NOVEC™ 1230 Fire Protection Fluid – NOVEC™ 1230 fluid, referenced as FK-5-1-12 in NFPA 2001 and ISO 14250, is a fluorinated ketone (or fluoroketone) with a chemical structure of $CF_3CF_2C(O)CF(CF_3)_2$. It is a clear, colorless, odorless, liquid that is super-pressurized with nitrogen and stored in high-pressure tanks as part of the total SAPPHIRE system. Although stored in liquid form, NOVEC 1230 fluid will turn to a gas upon discharge, making it an effective total flooding agent for a variety of hazards. As a clean agent, it leaves no residue behind and will not affect sensitive high-value electronics. Refer to Extinguishing Agent Data Sheet Form No. F-2003127 for more detailed information.

Tank Assembly – The agent storage tanks are manufactured in accordance with DOT4BW450 and consist of a tank fitted with a valve and internal siphon tube. Tanks are available in two sizes: 40 lb. and 80 lb. (18 kg and 36 kg). A nameplate is adhered to the tank displaying the agent weight, and gross weight. Agent quantities are available in 1 lb. fill increments.

Electric Actuator – The 24 VDC electric



actuator is required to electrically actuate the tank valve. An electric signal is received from the AUTOPULSE Control Panel which operates the solenoid in the actuator. This causes the actuator to open the tank valve and discharge the agent. On multiple tank systems, only one electric actuator is required, on the master tank valve. The remaining tanks will be actuated pneumatically through 1/4 in. stainless steel hose installed between each pilot pressure port.

Pneumatic Actuator – The pneumatic actuator is required to pneumatically actuate the agent tanks. The actuator operates from the pressure from the nitrogen cartridge located in the ANSUL AUTOMAN® II-C release. When the pneumatic actuator is pressurized, the internal actuator piston pushes down on the valve stem, opening the tank valve, allowing the agent to discharge.

AUTOPULSE Control System – The AUTOPULSE Control system is designed to monitor fixed fire hazards. The control system can automatically actuate the fire suppression system after receiving an input signal from one or more initiating devices, i.e., manual pull station or detector. The control system incorporates an internal power supply, in-line emergency batteries, and solid state electronics.

ANSUL AUTOMAN II-C Releasing Device – The ANSUL AUTOMAN II-C releasing Device consists of a metal enclosure which contains a spring-loaded puncture pin release mechanism, an actuation cartridge, electrical circuitry, and an input/output terminal strip for making electrical connections. The ANSUL AUTOMAN II-C releasing device provides automatic pneumatic actuation of the SAPPHIRE System. When wired to an AUTOPULSE Control System, it will provide supervised electric detection and release. It also provides manual actuation using the strike button on the release enclosure.

Nozzles – Two sizes of discharge nozzles are available: 1 1/4 in. thread size to be used on the 80 lb. (36 kg) tank distribution piping and a 1 in. thread size to be used on the 40 lb. (18 kg) tank distribution piping. Nozzles are designed to discharge agent in a 360° pattern.

Technical Data

Applicable Standards – The SAPPHIRE system complies with the NFPA Standard 2001, "Standard for Clean Agent Fire Extinguishing Systems, and EPA Program SNAP, "Significant New Alternate Policy".

System is listed by Underwriters Laboratories, Inc. (UL) and Underwriters Laboratories of Canada (ULC).

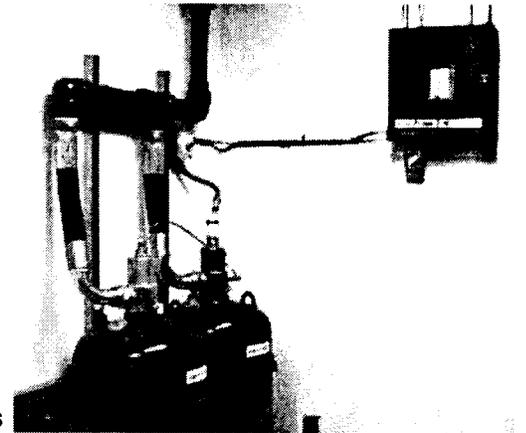
Installations

All system components and accessories must be installed by personnel trained by the manufacturer. All installations must be performed according to the guidelines stated in the manufacturer's design, installation, operation, inspection, recharge, and maintenance manual.

Availability and Cost

Availability – SAPPHIRE Pre-Engineered Clean Agent Fire Suppression Systems are sold and serviced through a network of independent distributors located in most states and many foreign countries.

Cost – Cost varies with type of system specified, size, and design.



Technical Services

For information on the proper design and installation, contact a local authorized SAPPHIRE System distributor. The ANSUL applications engineering department is also available to answer

design and installation questions. Call 800-TO-ANSUL (862-6785).

3M™ 1230 Fire Protection Fluid Data/Specifications

Features

- UL/ULC listed as a component of the SAPPHIRE® Suppression System
- Effective, total flooding performance on Class A, B, and C fires
- Long-term, sustainable alternative to Halons, HFCs and PFCs
- Clean agent suitable for protection of high-value assets

Description

3M™ NOVEC™ 1230 Fire Protection Fluid, referenced as FK-5-1-12 in NFPA 2001 and ISO 14250, is a fluorinated ketone (or fluoroketone) with a chemical structure of CF₃CF₂C(O)CF(CF₃)₂. It is a clear, colorless, odorless, liquid that is super-pressurized with nitrogen and stored in high-pressure cylinders as part of a SAPPHIRE Suppression System.

Applications

Although stored in liquid form, NOVEC 1230 fluid will turn to a gas upon discharge making it an effective total flooding agent for a variety of hazards. As a clean agent, it leaves no residue behind and will not affect sensitive high-value electronics. Typical applications include:

- Telecommunication switch rooms
- Computer and electronic control rooms
- Hazards aboard ships
- Critical military applications

Environmental Impact

NOVEC 1230 fluid has 0.0 ozone depletion potential, an atmospheric lifetime of just five days, and a global warming potential of 1.0. NOVEC 1230 fluid is registered with the U.S. EPA under TSCA (Toxic Substances Control Act) and ELINCS (European List of Notified Chemical Substances). It has met the requirements of registration under SNAP (Significant New Alternatives Policy) and is approved for use as an alternative to Halon 1301 for flooding applications in occupied spaces.

Performance

NOVEC 1230 fluid suppresses fires via its cooling effect. It has been tested and listed at a design concentration of 4.2% (Class A, B, and C hazards) in conjunction with a SAPPHIRE total flooding system. With the NOAEL (No Observable Adverse Effect Level) measured at 10%, NOVEC 1230 fluid provides a substantial margin of safety in occupied spaces.

Approvals

NOVEC 1230 Fire Protection Fluid complies with NFPA 2001: Standard for Clean Agent Fire Extinguishing Systems. It is listed by Underwriters Laboratories (UL) and Underwriters Laboratories of Canada (ULC) as a component of the SAPPHIRE™ Suppression System. Containers meet the applicable U.S. Department of Transportation (DOT) specifications.

Physical Properties

Chemical formula	CF ₃ CF ₂ C(O)CF(CF ₃) ₂
Molecular weight	316.04
Boiling point @ 1 atm	49.2 °C (120.6 °F)
Freezing point	-108 °C (-162.4 °F)

aphire Fire Suppression Systems

Density, sat. liquid	1.60 g/ml (99.9 lbm/ft ³)
Density, gas 1 atm	0.0136 g/ml (0.851 lbm/ft ³)
Specific volume, 1 atm	0.0733 m ³ /kg (1.175 ft ³ /lb)
Liquid viscosity @ 0 °C/25 °C	.056/0.39 centistokes
Heat of vaporization @ BP	88.1 kJ/kg (37.9 BTU/lb)
Solubility of H ₂ O in NOVEC 1230 liquid	<0.001% by wt.
Vapor pressure @ 25 °C	0.40 bar (5.85 psig)
Dielectric strength relative to N ₂ @ 25 °C	2.3

SUPPRESSION SYSTEM

Wormald Australia > Fire Systems > Gaseous Agents > **SAPPHIRE™ Fire Suppression**



When fire breaks out in server rooms, data centres, museums and other sensitive environments, sometimes the solution can be as damaging as the fire.

Wormald's SAPPHIRE™ fire suppression system uses an inert carbon-based chemical that powerfully fights fire yet is safe for property, people, and to the environment. It looks like water but doesn't cause the damage normally associated with water because it contains no moisture. The result is lower repair bills and less impact on business.

SAPPHIRE™ has no harmful impact on the environment. It has an atmospheric lifetime of only five days while the closest chemical alternative has an atmospheric life time of 33–36 years.

Federal Government regulations for Ozone Depleting Substances and Synthetic Greenhouse Gases (ODS and SGG), places usage restrictions on chemicals that are defined as controlled substances due to their potential to harm the atmospheric environment. As an environmentally safe inert carbon-based chemical, SAPPHIRE™ is exempt from this legislation.

Protect your sensitive business data and equipment with SAPPHIRE™.

er but does not cause the damage normally associated with water
 eloped specifically to protect critical business assets, such as sensitive equipment
 erty, people, and to the environment
 ul impact on the environment. It has an atmospheric lifetime of only 5 days while the closest
 ve has an atmospheric life time of 33–36 years.
 etection system is able to detect fire at its earliest incipient phase, even before the flames start.
 extinguishment in seconds means fire damage is minimal and business interruption is minimal

FIRE SYSTEMS ENQUIRIES

First name

Last name

Contact phone number

Email address

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Wormald is committed to safeguarding your privacy.