

FM-200 Waterless Fire Protection For Marine Applications



Built by Derecktor Shipyards, Alaska Marine Highway System high-speed ferries use fast-acting, people-safe, space-efficient FM-200.



Gre

CHEMICAL CORPORATION



Fast-acting FM-200 prevents extensive fire and collateral damage to this luxury yacht.

Shipboard Fires Are Major Threats To Safety

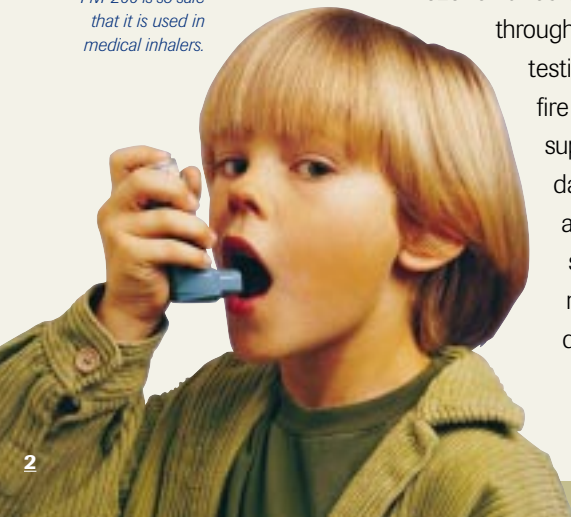
Of all the perils at sea, one of the most dangerous is fire. Difficult to deal with and potentially deadly, fire leaves the crew and passengers caught between two unforgiving elements. There's no local fire department to call. It's up to the crew to control the fire. Fire-fighting at sea and on water is especially demanding. That's why you need the fast, people-safe, and effective fire suppressant—FM-200® Waterless Fire Protection. Every second counts when a fire occurs onboard. FM-200 systems reach extinguishing levels in less than 10 seconds. Since even a few seconds can be the difference between survival and a life destroying catastrophic fire, with FM-200 onboard you have a crucial margin of safety.

Safe For People, Equipment, and Environment

Manufactured by Great Lakes Chemical Corporation, an international specialty chemical solutions provider with operations in over 25 countries, FM-200 was originally developed to replace ozone-depleting fire suppressants such as halon 1301. FM-200 does not deplete stratospheric

ozone. It has been proven safe for people through extensive pharmacological testing rivaled by no other fire suppressant. Many fire suppressants cause collateral damage to the equipment and the assets they were supposed to protect. But not FM-200. It deploys quickly and cleanly without

FM-200 is so safe that it is used in medical inhalers.



leaving any residue or causing collateral damage. FM-200 is the world's most trusted choice in waterless fire protection. Offshore and on, FM-200 has been safely used in over 100,000 space-efficient applications in over 70 countries.

Shipboard fire protection systems must be designed so that safe navigation can be maintained in the event the system is activated. It's critically important that engine rooms be protected by fire suppression systems that are people-safe even when manually operated. Even systems installed in normally unoccupied spaces can be dangerous if they discharge during servicing or other times when people may be exposed.

Unlike carbon dioxide (CO₂) and HCFC 124, FM-200 is safe for people and can be used in occupied spaces on all types of vessels. FM-200 has been proven to be so safe that the chemical is approved as a propellant for pharmaceutical inhalers. Unlike many other fire suppressants, FM-200 does not breakdown or metabolize when inhaled, which allows quick removal through normal respiration once the individual is no longer exposed.

Shipboard Fires Demand Rapid Fire Suppression

Marine vessels, from naval ships to tankers to ferries, contain all the necessary elements for a fire. You have heat and fuel in the form of high-pressure fuel lines, paints, electrical ignition sources, and of course, abundant oxygen to complete the fire equation. Stopping fire early is the key to saving lives and protecting valuable vessels and other assets.

Fires grow rapidly until fully involved. Fast-acting FM-200 stops fires in the early critical stages before they can cause significant damage.

FM-200 is used on both the USS Harry Truman and the USS Ronald Reagan aircraft carriers.



Quick suppression minimizes the production of toxic combustion by-products including carbon monoxide. Delays in extinguishment may result in loss of lives, increased damage, and higher repair costs.

FM-200 systems have been tested in accordance with IMO/SOLAS requirements, UL listed, US Coast Guard (USCG) approved and approved by many of the world's leading marine regulatory agencies.

U.S. Navy Adopts Big Fire Protection In The Smallest Package

In marine applications where space is at a premium, FM-200 systems are the superior choice. First, FM-200 has high extinguishing efficiency. Next, FM-200 is stored in cylinders as a liquid and pressurized for quick release. Due to its low boiling point, FM-200 discharges as a gas. This combination results in far less cylinder storage space than many other fire suppression systems.

When compared to high pressure CO₂ systems, FM-200 weighs 50% less and requires 50% less cylinders. In vessels of all types where space is a significant cost factor, FM-200 systems save space for more productive uses. More cargo space equals more earnings over the life of a container ship.

Lower system weight also translates into greater fuel efficiency and savings. This is one of the reasons the U.S. Navy installs FM-200 systems in many of their supply vessels and aircraft carriers. FM-200 systems are also the fire-fighting system of choice for many of the USCG patrol boats. Reduced weight,

reduced fuel consumption, and effective fire protection were just what the Alaska Marine Highway System needed when they installed FM-200 systems onboard their high-speed ferries.

With the production phase out of halon 1301 in 1993, the U.S. Navy ran extensive tests on FM-200 gas to ensure it could safely meet their toughest fire-fighting requirements. FM-200 was pitted against some of the Navy's most dangerous shipboard fires. FM-200 proved to be the safest, most space-efficient, fast-acting fire suppression system available. Even the Navy's new Lewis & Clark class combat logistics force ships have FM-200 Waterless Fire Protection Systems onboard. FM-200 can offer your crew and vessels this same outstanding fire protection in the most space-efficient package.

FM-200® Removes Heat Energy Not Oxygen

Effective on Class A, Class B, and Class C fires, FM-200 gas extinguishes fires quickly through a combination of chemical and physical heat removal. FM-200 does not smother flames by removing oxygen. FM-200 removes heat energy from fire, not oxygen from the environment. FM-200 absorbs heat from the flame zone and interrupts the chemical chain reaction of the combustion process. When fires are stopped this fast, it minimizes the risk of explosion and extensive damage.



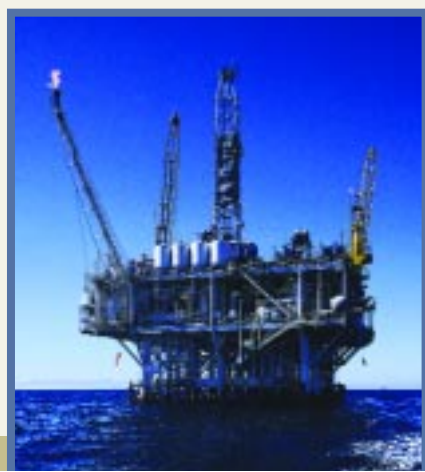
The Navy's newest nuclear-powered aircraft carrier, the USS Ronald Reagan, was commissioned with FM-200 onboard.

FM-200 waterless protection systems are designed for uniform distribution throughout the protected area of a vessel. FM-200 is ideal for engine enclosures, electrical controls, machinery compartments, and other marine applications. Unlike water or water mist which may be unable to penetrate inside cabinets or reach a fire that is underneath machinery compartments, FM-200 gas penetrates with three-dimensional capability, easily reaching into obscure or hard to reach areas.

Causes No Collateral Damage

FM-200 not only prevents extensive fire damage; it can eliminate collateral damage to equipment and instruments. FM-200 does not leave any oily residues, particulates, or corrosive material after discharge. With some fire suppression systems, such as water, foam, or dry chemicals, the extinguishant can be as damaging as the fire. The associated clean up, repair, and disaster recovery processes often result in extensive delays and operational downtime.

Unlike water, FM-200 is non-conductive and non-corrosive, so it's safe to use around all types of electronics and electrical equipment. Properly designed FM-200 systems prevent thermal shock to sensitive electronics which can occur during CO₂ discharges.



FM-200 protects all types of offshore supply and support vessels including platform supply and anchor handlers.

With FM-200, you have a fire protection system that deploys quickly and cleanly without leaving any residue. It won't cause collateral damage. That's why so many museums, hospitals, and cutting-edge technology organizations choose FM-200.

The Safe Fire Protection Choice

When evaluating marine fire suppression systems, it's easy to focus on protecting the valuable vessels and operational equipment. It's easy to lose sight of your greatest need: protecting human life. What happens to your crew and passengers when your fire suppression system deploys? If you have a FM-200 Waterless Fire Protection System, you can breathe easy.

Once a system has discharged, you can remove FM-200 and any harmful fire combustion by-products from the space by simple ventilation. You can resume normal operations almost immediately.

FM-200 systems require as little as 8.7% concentration, which does not significantly reduce oxygen levels so it's safe for occupied areas. Some fire suppression systems, such as CO₂, work by lowering the oxygen content of the protected space to extremely low levels. As a result, CO₂ is a deadly asphyxiant at the high concentrations required to extinguish fire and should not be used in occupied spaces. FM-200 has been included in NFPA 2001 and listed as acceptable by the US SNAP since their inception.

It has been proven safe in countless system activations around the world with people in the room. No wonder leading agencies such as the U.S. Environmental Protection Agency (EPA) and the United Nations International Development Organization have chosen FM-200 systems to protect their most valuable assets as well as their people.



FM-200 systems require 50% less cylinders than similar CO₂ systems resulting in more cargo space on barges and container ships.

The Best Environmental Choice

One of the most potentially devastating events to affect the environment is uncontrolled fire. Fire pollutes; it can create toxic combustion products that are deadly to plants, animals, and people. It releases carbon dioxide, the most common greenhouse gas linked to global warming. FM-200 stops fires fast, before they can do any damage to the environment, people, or other natural resources.

Great Lakes Chemical Corporation is a Responsible Care® company. Responsible Care is the American Chemistry Council's program ensuring the responsible management of chemicals, including how chemical products are manufactured and used safely. Great Lakes has an integrated management plan that encompasses the entire life cycle of FM-200.

By thoroughly testing FM-200, making sure it meets the highest quality, purity, and reliability standards; and working closely with governments around the world, Great Lakes ensures FM-200 is the leading environmentally responsible fire suppression solution.



The 135-foot aluminum Cloud Nine Dinner Cruise Yacht built by Austal USA chose FM-200 because it's safe for people, equipment, and the environment.

EPA Uses FM-200® In New Green Facility

Even the EPA endorses FM-200 systems. When the EPA opened its new National Computer Center in 2003, FM-200 systems were installed in 15 areas. According to an article in *Environmental Design & Construction Magazine*, the building incorporates EPA's green purchasing goals under Executive Order 13101. By incorporating green building and construction practices, the EPA ensures its activities mirror what they are encouraging others to do.

A quote from the article states "The chemical (FM-200) is an effective, environmentally sound choice for fire protection, as it will not harm the Center's sensitive equipment and does not contribute to stratospheric ozone layer depletion."

By selecting FM-200 systems, the EPA clearly demonstrates that they understand what's at stake when it comes to protecting the environment now and in the future. More importantly, the article states that the EPA wanted an environmentally friendly and technologically advanced fire suppressant system capable of discharging within 10 seconds of fire detection. Simply stated, the EPA understands that an uncontrolled fire is the most serious environmental issue of all.



FM-200 stops fires quickly and safely on the tug, Rob Roy.

The Responsible Choice

Look at our record and you will see that there are many sound reasons why FM-200 systems are the environmentally responsible choice:

- FM-200 is the world's most thoroughly tested fire suppression gas.
- FM-200 does not deplete stratospheric ozone.
- Well-maintained FM-200 systems are non-emissive.
- FM-200 can last forever in pressurized cylinders.
- System design limits thermal decomposition by-products.
- At the end of the fire suppression system's service life, FM-200 gas can be recovered and recycled for component use in many other useful products.

Water taxis at Universal Orlando Theme Park use FM-200 to protect passengers and engine compartments.

FM-200® Approvals, Listings, and Tests

FM-200 was developed in response to the phase-out of ozone-depleting CFCs such as halon 1301 and HCFC 124. FM-200 is a member of the non-ozone-depleting hydrofluorocarbons (HFCs) and is accepted and approved for fire suppression worldwide. Due to the importance of HFCs such as FM-200 in meeting Montreal Protocol emission requirements, even the Kyoto Protocol has mechanisms to allow for continued growth of HFCs by promoting responsible use and reducing the emissions of other gases.

Conversely, production of HCFCs such as HCFC 124 has been restricted by the Montreal Protocol. Each country has developed its own schedule for HCFC phase-out with the European Union adopting an accelerated schedule for the reduction of HCFCs. In 2003, the fire suppressant HCFC 124 is not accepted in many countries.

FM-200 has been tested and approved for use around the world by the following organizations:

- NFPA
- Underwriters Laboratories
- FM Global
- International Marine Organization
- International Convention for the Safety of Life at Sea
- United States Coast Guard
- American Bureau of Shipping
- Lloyd's Register





FM-200 is UL listed and approved for worldwide use by IMO/SOLAS and USCG.

Typical FM-200® Marine Applications

You will find FM-200 systems protecting all types of vessels worldwide. Since fast-acting FM-200 gas is effective on Class A, Class B, and Class C fires, it is used in numerous marine applications including the following:

- **Engine compartments**
- **Electronic controls**
- **Electrical equipment**
- **Generator compartments**
- **Communication centers**
- **Bilges**
- **Paint lockers**
- **Flammable liquid storage areas**
- **Cargo spaces**
- **To replace existing halon 1301 systems**
- **In all occupied spaces**

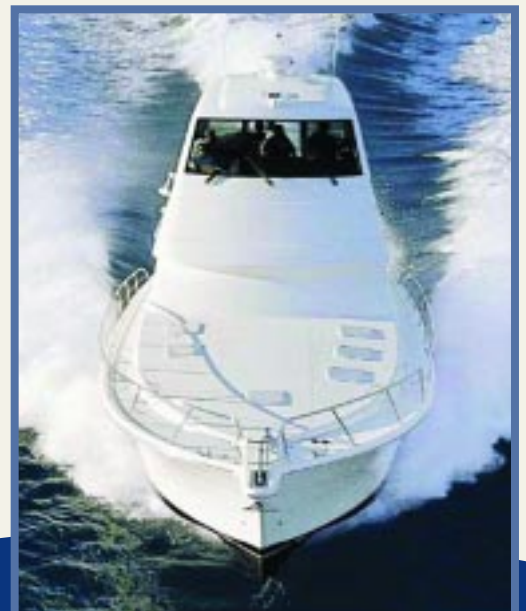
Put FM-200 Onboard

In the final analysis, we think you will agree that every second counts when fighting shipboard fires. You cannot afford to settle for minimum fire protection when lives and valuable assets are at stake. Find out for yourself why safety-conscious marine professionals are selecting FM-200 Waterless Fire Protection Systems for their vessels. Just call **877-686-7888** or visit **www.fm-200.com**.

Join These Marine Leaders

If you are looking for a fire-fighting system that is people-safe, fast-acting, space-efficient, and causes no collateral damage, then look no further. FM-200 Waterless Fire Protection Systems are protecting military, commercial, and recreational vessels around the world. Check out this list to see some of the many marine vessels that are using FM-200 Waterless Fire Protection.

- US Navy aircraft carriers—USS Harry Truman and USS Ronald Reagan
- US Navy T-AKE Lewis & Clark class combat logistics force ships operated by Military Sealift Command
- US Navy San Antonio class amphibious assault ships
- US Army Watercraft
- Mass Maritime Academy training ships—TS Enterprise and State of Maine
- Cloud Nine Monohull Dinner Cruise Yacht
- Alaska Marine Highway System ferries
- USCG patrol boats
- German Coast Guard patrol boats
- Turkish patrol boats
- Inland waterway barges in Europe
- Water taxis at Walt Disney World and Universal Orlando Theme Parks
- Numerous recreational boats such as Viking Yachts, Berger Boats, and the Riviera Group



The Riviera Group installs FM-200 systems on their luxury cruisers to protect navigation equipment and people.

The information contained in this publication is based on data currently available to Great Lakes Chemical Corporation (GLCC) and is thought to be correct. Since GLCC has no control over the use to which others may put the materials described in this publication, GLCC does not guarantee that the same results as those described herein will be obtained. No guaranty as to effectiveness or safety of any possible design for any articles using information contained in this publication is made or should be assumed.

GLCC makes no warranties of merchantability for fitness or a particular purpose, or any other express or implied warranty. Buyer assumes all risk and liability relating from the use of GLCC products. Nothing herein shall be construed as permission or a recommendation to practice a patented invention without a license.

All information and data contained herein is intended for use by technical trained personnel at their discretion and risk. The Material Safety Data Sheet (MSDS) and other product literature should always be read and understood prior to working with FM-200. All users of the materials described in this publication should make their own tests to determine the suitability of the materials, or the suitability of the materials in the design of an article for their own particular use.

FM-200 is a patented product of Great Lakes Chemical Corporation.
FM-200 is a registered trademark of Great Lakes Chemical Corporation.
© 2003 Great Lakes Chemical Corporation.



One Great Lakes Boulevard
West Lafayette, IN 47906
Tel: 877-686-7888
Fax: 765-497-6287
www.fm-200.com