

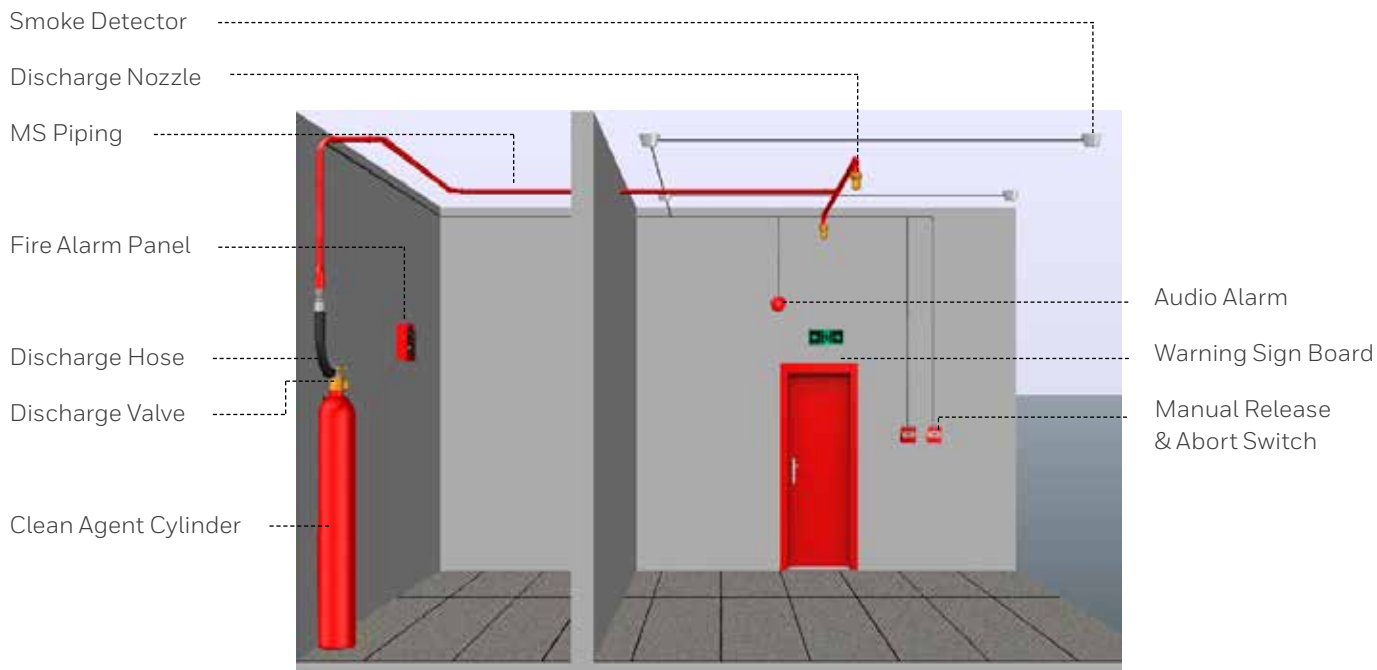
25 and 42 Bar,
HFC-227ea
Clean Agent System

25 and 42 bar fire suppression system to protect high-value assets, using an agent safe for humans and the environment

42 Bar HFC-227ea Clean Agent Fire Suppression System

Typical HFC-227ea Clean Agent System Layout

HFC-227ea is the time-tested fire suppression system for facilities that cannot afford the downtime associated with a fire or typical water-based fire suppression systems. HFC-227ea agent systems extinguish fire quickly by discharging in 10 seconds. Stopping ordinary combustible, electrical, and flammable liquid fires before they cause significant damage. When fire is extinguished this quickly, it means less damage, lower repair costs, and an extra margin of safety for people. It also means less downtime and disruption of business. Apart from being rapid and effective, this extinguishing agent is recognized by the US Environmental protection Agency as a safe agent for the environment.



What is HFC-227ea ?

The US EPA, in the Federal Register, May 12, 1993, recognized the inherent safety of HFC-227ea in accepting it for use in occupied space protection at up to 9.0% v/v without mandated egress times, or up to 10.5% v/v with mandated egress times. This means that occupied spaces can be safely evacuated, even in the presence of HFC-227ea at design concentrations. Most HFC-227ea systems are designed at concentrations between 7.0% - 7.5% v/v.

How Does it Work ?

HFC-227ea's mechanism of extinguishing fires is active. Its primary action is through physically cooling the fire at the molecular level. HFC-227ea literally removes heat energy from the fire to the extent that the combustion reaction cannot sustain itself. It does not work by oxygen starvation.

Safe for Humans and the Environment

The EPA evaluates The Significant New Alternatives Policy (SNAP) to ensure chemicals wouldn't cause greater damage to human health or the environment. HFC-227ea clean agents is a SNAP approved.

Why 42 Bar System ?

While a 25 bar system is suitable for the majority of hazards. A 42 bar offers additional flexibility in the design of systems to protect larger or more complex hazards. These include those incorporating directional valves for multi-zone protection and where system cylinders are to be located further from the protected area.



Typical Applications



DATA PROCESSING

Innovation in the speed and capacity of data processing hardware has exponentially increased the ability to store critical data. This has led to widespread use of electronic data storage and the expansion of data centers. Due to which the data centers have to run 24 by 7 which leads to an increase in overheating and fire scenarios.

Area of Applications :

- Data Center.
- UPS Rooms.
- Electrical Rooms.
- Sub-Floors Area.

COMMUNICATIONS

Electronic communication are so portable, reliable and instantaneous that they are taken for granted. The equipment that provides such communication is heavily used and could overheat. Data management and communication hubs could be prone to fire.

Area of Applications :

- Switching Equipment.
- Power & Battery Area.
- Cell Sites.
- Standby Engine Area.



OIL & GAS

Oil refinery operators perform a range of tasks from the control room. They monitor the processes remotely through electronic representations shown on monitors. Operators make sure that processes keep running as per SOP. They are responsible to take appropriate actions in case of irregularities or emergencies.

Therefore control room and control system equipment are vital to safe operations in a facility that handles processes within refinery. Clean agent suppression system extinguishes fire without causing harm to the control room equipment.

Area of Applications :

- Control Room.
- Metering Stations.

System Components

NFPA 2001, Requirements For Minimum Values				
Agent	Class A MEC	Class A Design	Class C Design	Class B Design
HFC-227ea	5.2	6.7	7.0	8.7

Environmentally Friendly	
Description	HFC-227ea
Ozone Depletion Potential (ODP)	0.0
Global Warming Potential (GWP)	3220
Atmospheric Lifetime (Years)	31-42 DAYS
SNAP (Yes / No)	YES

HFC-227ea Fire Suppression Agent

HFC-227ea agent complies with NFPA Standard 2001 standard on "Clean Agent Fire Extinguishing Systems." EPA SNAP Program (Significant New Alternate Policy)

The HFC-227ea is classified as suitable for use in occupied areas and has no ozone depleting potential (ODP)

Description

HFC-227ea systems reach extinguishing levels in 40 seconds or less, stopping ordinary combustible, electrical, and flammable liquid fires before they can cause significant damage. That's the fastest fire protection available. When a fire is extinguished this quickly, it means less damage, lower repair costs, and an extra margin of safety for people. It also means less downtime and disruption of business.

Physical & Chemical Properties

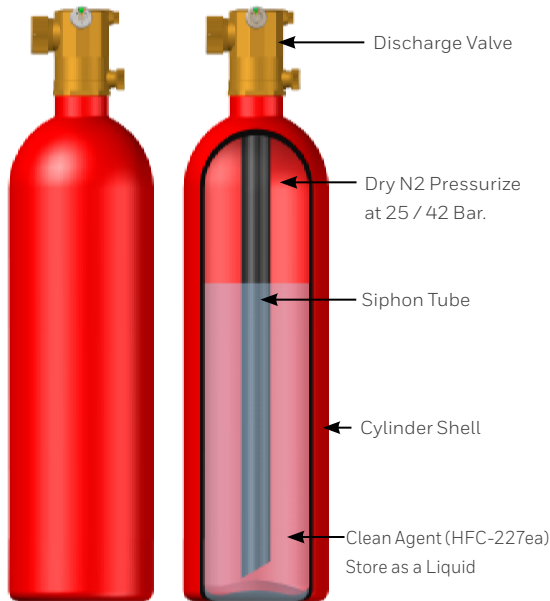
Empirical formulae.....	CF ₃ CHFCF ₃
IUPAC Designation.....	1,1,1,2,3,3,3,-Heptafluoropropane
ASHRAE Designation.....	HFC-227ea
Molecular Weight.....	170.03
Boiling Point at 1 Atm.....	-2.6 °C (-16.4 °F)
Freezing Point.....	-131°C (-204°F)
Heat Vaporization @B.P.....	56.7Btu/ib
Viscosity, Vapor @ 1 atm.....	0.028038 lb/ft-hr
No Observable Adverse Effect Level	9.0%
Lowest Observed Adverse.....	>10.5%
Ozone Depletion Potential.....	0.0
Atmospheric Lifetime, years.....	34.2 years
Global Warming Potential.....	3220

HFC-227ea Cylinder

The cylinders are manufactured and marked in accordance with IS 7285 Standard and approved by PESO for their use. The cylinders are available in following sizes. 34ltr., 80ltr, 120ltr and 140ltr. And welded cylinder are complying to DOT specification. The cylinders are available in following sizes. 15ltr, 29ltr, 49ltr, 80ltr, 104ltr, 148ltr, 227ltr and 369ltr,

The cylinders are charged with HFC-227ea and super pressurized with dry nitrogen at a total pressure of 360 psig (25 bars) or 610 psig (42 bars) at 70°F (21°C) to assure rapid discharge at temperatures as low as 32°F (0°C) storage temperature.

These cylinders have the optional facility of Switch-in-Gauge unit, designed to monitor the pressure of the cylinder. The 2 in 1 unit offers the facility to monitor cylinder pressure locally and remotely via using Fire Alarm Panel interface unit or any other control panel.



Flexible Discharge Hose

Flexible hoses are used to connect the agent storage cylinders to the manifold in multiple cylinders arrangement. Flex hoses are made out of Reinforce Rubber Hose. Hose size is 1.1/2" 2" and 3" size.



Flexible Actuation Hose

The Flexible Actuation hose is 1/4" stainless steel wire braided hose. It is used in multiple cylinder bank systems to connect pressure activated devices to the system.



Cylinder Mounting Strap

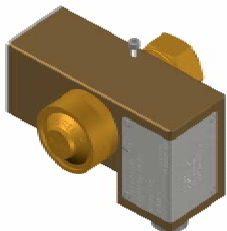
The MS Straps or brackets are used to mount the cylinder in vertical position.



Electric Cum Manual Actuator

The Electric control head is an electromechanical device mounted on the master cylinder actuation port. The Electric control head gets actuated/triggered only after receiving a 24 VDC, 2 amps signal from the fire alarm panel or other similar source. Once actuated it will trigger the master cylinder and eventually open up the discharge outlet of the cylinder. It also houses a manual release plunger which can be used to manually trigger the cylinder actuation port.

The actuator also has a supervisory switch. The function of the supervisory switch is to provide the signal to control panel in case the actuator is demounted or removed from cylinder valve. This makes it an important feature as described in NFPA



1-1/2" Manifold Check Valve

In case of multiple cylinder arrangements where the master and slave cylinders share a common manifold or are connected in main/reserve arrangement, a manifold check valve becomes a must. The manifold check valve prevents backflow from the manifold in case the system be inadvertently discharged. Manifold check valve to be installed in the vertical position only. Please refer arrow mark during installation.



180° & 360° Degree Nozzle

HFC-227ea Nozzles are available in two discharge patterns 180° and 360° degree.

Discharge nozzles have an NPT female pipe thread for attachment to the discharge piping network. The nozzles are selected basis of the hazard to be protected against. It helps to achieve the best flow rate and distribution of HFC-227ea in the protected hazard area

Part number/orifice for nozzle will be generated by HFC-227ea fire suppression system design software.



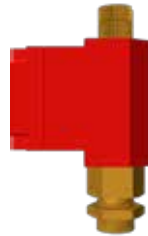
Pressure Operated Control Head

In multiple cylinder system, a pressure operated control head is mounted on each slave cylinder. On the actuation of electric control head mounted on master cylinder. Pressure from the master cylinder is transferred to each pressure operated control head. Which enables it to pneumatically actuate the cylinder it is mounted on.



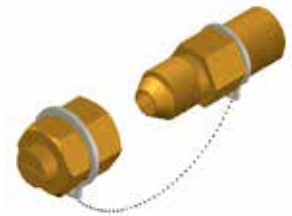
Manifold / Piping Agent Discharge Pressure Switch

The discharge pressure switch is activated by pressure from the agent during discharge and can be used to signal an control panel that the system has discharged. The pressure switch incorporates a reset button which has to be depressed following a discharge.



Master Cylinder Adapter Kit

The master cylinder adapter kit provides the means of connecting the flexible actuation hose to the master and slave cylinder assembly. This enables system to actuate the Slave Cylinder.



Male Tee

The male tee is primarily used in manifold system for connecting actuation hose from one slave cylinder to the next.



Male Elbow

The male elbow is used on the last slave cylinder in manifold system.



Technical Specifications

HFC-227ea CLEAN AGENT FIRE SUPPRESSION

SYSTEM

Type of System : Total Flooding System

Name of Agent : HFC-227ea (CF₃CHF₂CF₃) Design Code : NFPA-2001 Standard on Clean Agent Fire Extinguishing Systems (Latest)

Charging Pressure : 25 Bar (360 PSIG) Or 42 Bar (610 PSIG)

Discharge Time : 10 seconds maximum.

Operating Temperature : 0°C to 55°C (32°F to 130°F)

Design Concentration : Class A Fire : 6.7 % I Class B Fire : 8.7 % Min I Class C Fire : 7.0 %

Approved Agency : Underwriters Laboratories Inc. (UL)

A. CLEAN AGENT CYLINDER

Type : Seamless and DOT

Design Code : NFPA-2001 / IS 7285 (Part 2) / DOT Capacity : For Seamless 34, 80, 120 and 140 Ltrs. And For DOT 15ltr, 29ltr, 49ltr, 80ltr, 104ltr, 148ltr, 227ltr and 369ltr,

Fill Density : 0.48kg/ltr to 1.12 kg/ltr. (30.0lb/ft³ to 70.0 Lb/ft³)

B. DISCHARGE NOZZLE

Type : 180 and 380 Degree

Material of Construction : Brass

Thread : NPT female thread

Size : 15NB, 20NB, 25NB, 32NB, 40NB & 50NB (1/2", 3/4", 1", 1-1/4", 1-1/2" & 2")

Nozzle Coverage Area : 13M X 13M (42.65 ft x 42.65 ft)

C. FLEXIBLE DISCHARGE HOSE

Material of Construction : Reinforced Rubber Hose.

Size : 40NB (1-1/2"), 50NB (2") and 80NB (3")

D. ELECTRIC CONTROL HEAD

Operation : Electrically and Manually by Manual Plunger

Operating Voltage : 24 VDC

Operating Current : 2.0 A

Environmental Criteria : Indoor / Dry use only

Seamless Cylinder	
Nomenclature	Part Number
34 Ltr. (84 lb.) Seamless Cylinder With 1-1/2" Valve Assembly, 25 Bar	10-250034-000
34 Ltr. (84 lb.) Seamless Cylinder With 1-1/2" Valve Assembly, 42 Bar	10-420034-000
80 Ltr. (198 lb.) Seamless Cylinder With 2" Valve Assembly, 25 Bar	10-250080-000
80 Ltr. (198 lb.) Seamless Cylinder With 1-1/2" Valve Assembly, 42 Bar	10-420080-000
120 Ltr. (297 lb.) Seamless Cylinder With 2" Valve Assembly, 25 Bar	10-250120-000
120 Ltr. (297 lb.) Seamless Cylinder With 1-1/2" Valve Assembly, 42 Bar	10-420120-000
140 Ltr. (346 lb.) Seamless Cylinder With 2" Valve Assembly 25 Bar	10-250140-000
140 Ltr. (346 lb.) Seamless Cylinder With 1-1/2" Valve Assembly, 42 Bar	10-420140-000

DOT Cylinder	
Nomenclature	Part Number
15 Ltr. (36 lb.) DOT Cylinder With 1-1/2" Valve Assembly, 25 Bar	10-250036-000
29 Ltr. (72 lb.) DOT Cylinder With 1-1/2" Valve Assembly, 25 Bar	10-250072-000
49 Ltr. (121 lb.) DOT Cylinder With 1-1/2" Valve Assembly, 25 Bar	10-250121-000
80 Ltr. (198 lb.) DOT Cylinder With 2" Valve Assembly, 25 Bar	10-250198-000
104 Ltr. (258 lb.) DOT Cylinder With 2" Valve Assembly, 25 Bar	10-250258-000
148 Ltr. (367 lb.) DOT Cylinder With 2" Valve Assembly, 25 Bar	10-250367-000
227 Ltr. (561 lb.) DOT Cylinder With 3" Valve Assembly, 25 Bar	10-250561-000
369 Ltr. (912 lb.) DOT Cylinder With 3" Valve Assembly, 25 Bar	10-250912-000

Accessories for 25 & 42 Bar System	
Nomenclature	Part Number
Electric cum Manual Actuator (Electric Control Head)	14-000031-000
Pressure Operated Control Heads (Pneumatic Actuator)	14-000032-000
1-1/2" Flexible Discharge Hose	14-000001-000
2" Flexible Discharge Hose	14-000002-000
3" Flexible Discharge Hose	14-000003-000
1/4" Flexible Actuation Hose	14-000004-000
Master Cylinder Adapter Kit	14-000050-000
Manifold / System Supervisory Switch	14-000081-000
1-1/2" Manifold Check Valve	14-000060-000
2" Manifold Check Valve	14-000061-000
3" Swing Type Manifold Check Valve	14-000062-000
360 Degree Nozzle	15-000001-xxx
180 Degree Nozzle	15-000002-xxx
Brass Male Tee	14-000051-000
Brass Male Elbow	14-000052-000

For more information

www.cryptzo.net

Cryptzo Engineering Private Limited

Plot No. A-158 & 159, Vile Bagad
MIDC Industrial Area Mangaon,
Dist-Raigad, Pin 402308, India
Tel. +91-22-41570555



Clean Agent Extinguishing Unit

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