Re: Page B-216, Install Computer Room Inergen Fire Protection System, $115,700

Q. Please describe the Inergen fire suppression system and explain how its operation can extinguish a fire with no collateral damage to the computer equipment.

A. The Inergen fire suppression system works by reducing the oxygen content in a room to a level below that which will support combustion. It does this by discharging into the room naturally occurring, non-toxic gases into the air space, displacing sufficient amounts of oxygen so that fires are extinguished.

The Inergen agents comprise nitrogen (52%), argon (40%) and carbon dioxide (8%). The effect of discharging the Inergen system into a room is to reduce the oxygen level to approximately 12.5% from the normal level of approximately 21%. Most combustibles will not burn at oxygen levels below 15%. Therefore, reducing the level of oxygen to 12.5% is an effective means of fighting fires.

To compensate for the difficulties with breathing that might otherwise be associated with these reduced oxygen levels, the carbon dioxide levels are raised by a factor of three, from 1% to 3%. This is important because it is largely the presence of carbon dioxide, not the absence of oxygen, which stimulates breathing. The additional carbon dioxide safely increases the respiration rate and stimulates deep breathing.

Because the Inergen agents are non-toxic and are gases that are naturally occurring in the atmosphere, the system permits it to be deployed to

extinguish fires in a safe manner that will not endanger critical electronic equipment, as will water sprinkling systems or some other fire-fighting substances.

Attached for further reference is the Datasheet provided by the system manufacturer.

ANSUL®

INERGEN® FIRE SUPPRESSION SYSTEMS DATA SHEET

EXTINGUISHING AGENT

APPLICATION

INERGEN® extinguishing agent used in Ansul engineered systems is particularly useful for hazards where an electrical, non-conductive medium is essential or desirable; where clean-up of other agents presents a problem; where hazard obstructions require the use of a gaseous agent; or where the hazard is normally occupied and requires a non-toxic agent.

The following are typical hazards protected by INERGEN systems:

- Computer rooms
- Subfloors
- Tape storage
- Telecommunications/Switchgear
- Vaults
- Process equipment
- All normally occupied or unoccupied areas where electronic equipment is either very sensitive or irreplaceable

ENVIRONMENTAL IMPACT

INERGEN agent is a mixture of three naturally occurring gases: nitrogen, argon and carbon dioxide. As INERGEN agent is derived from gases present in the earth's atmosphere, it exhibits no ozone depleting potential, does not contribute to global warming, nor does it contribute unique chemical species with extended atmospheric lifetimes. Because INERGEN agent is composed of atmospheric gases, it does not pose the problems of toxicity associated with the chemically derived Halon alternative agents.

DESCRIPTION

INERGEN agent is a plentiful, non-corrosive gas that does not support combustion nor react with most substances. INERGEN agent contains only naturally-occurring gases which have no impact on the ozone or the environment in general. INERGEN agent is a mixture of three inerting (oxygen diluting) gases: 52% nitrogen, 40% argon, and 8% carbon dioxide. INERGEN agent extinguishes fire by lowering the oxygen content below the level that supports combustion. When INERGEN agent is discharged into a room, it introduces the proper mixture of gases that still allow a person to breathe in a reduced oxygen atmosphere. It actually enhances the body's ability to assimilate oxygen. The normal atmosphere in a room contains approximately 21% oxygen and less than 1% carbon dioxide. If the oxygen content is reduced below 15%, most ordinary combustibles will not burn. INERGEN agent will reduce the oxygen content to approximately 12.5% while increasing the carbon dioxide content to about 3%. The increase in the carbon dioxide ◂ content increases a person's respiration rate and the body's ability to absorb oxygen. Simply stated, the human body is stimulated by the carbon dioxide to breathe more deeply and rapidly to compensate for the lower oxygen content of the atmosphere.

PERFORMANCE

INERGEN is an effective fire extinguishing agent that can be used on many types of fires. INERGEN extinguishing system units are designed for total flooding protection against Class A surface burning, Class B flammable liquid, and Class C fires occurring within an enclosure by lowering the oxygen content below the level that supports combustion.

INERGEN agent has been tested by FMRC for inerting capabilities. Those tests have shown that INERGEN agent, at design concentrations between 40% and 50%, has successfully inerted mixtures of propane/air, and methane/air.

PHYSICAL PROPERTIES OF INERGEN

Specific gravity
0.085 lbs./cu. ft. (1.36 kg/m^3)

Vapor pressure
1925 psi @ 32 °F (132.7 bar @ 0 °C)
2175 psi @ 70 °F (149.9 bar @ 21 °C)
2575 psi @ 130 °F (177.5 bar @ 54 °C)

Vapor density
1.1 (Air = 1)

Approximate molecular weight
34

ORDERING INFORMATION

INERGEN filled cylinders for use in engineered systems may be ordered in sizes of 200, 250, 350, 425, and 435 cu. ft. ◂ (5.7, 7.1, 9.9, 12.0, and 12.3 cu. m.).

APPROVAL

INERGEN agent complies with the NFPA Standard 2001, Standard for Clean Agent Fire Extinguishing Systems and EPA Program SNAP, Significant New Alternate Policy.

Agent is listed and approved by Underwriters Laboratories, Inc. (UL) and Factory Mutual Research Corporation (FMRC).

Containers meet the applicable Department of Transportation (DOT) specifications.

ANSUL INCORPORATED
MARINETTE, WI 54143-2542
715-735-7411

Form No. F-9313-8

 Litho in U.S.A.