Vector
Fire Technology Inc.

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Planit Safe™ - Clean Approach to Foam System Testing

Introduction

Vector Fire Technology, Inc. is a Fire System Service Company committed to the inspection and testing of Foam Fire Protection Systems in an environmentally friendly manner. To support this effort, we have developed our Planit Safe concept, which encompasses all aspects of our business. As a Planit Safe company we offer a unique package of services developed with environmental compatibility in mind

Planit Safe involves a new concept for testing foam systems without releasing any foam concentrate to the environment. An alternative non-foaming environmentally benign test liquid is used in place of the foam concentrate stored in the system. This substitute liquid is specifically formulated to mimic the physical properties of the actual foam concentrate while having characteristics that enable its injection rate to be monitored by refractive index or preferably conductivity measurement. These are the two industry accepted methods of determining proportioning system injection rate as described in NFPA Standards 11, 16, 16A and 409. Since the proportioned solution from a Planit Safe test is non-foaming and contains no environmentally harmful chemicals, it is usually acceptable for direct release to storm drains leading to municipal waste water treatment facilities. Detailed information relative to the effluent released must be provided to local authorities having jurisdiction prior to the system test. MSDS documentation containing detailed environmental information such as BOD and COD are available for most test liquids from Vector Fire Technology, Inc. The Planit Safe testing procedure is applicable to bladder tank and pump type balanced pressure proportioning systems. This method can save considerable time and expense while preventing possible environmental and effluent discharge issues related to foam solution discharge.

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Injection of Alternate Test Liquid

Direct Substitution Method

In some cases, the alternate test liquid can be used by simply substituting it for actual foam concentrate in the foam system. This can be done for some initial system startup tests by placing the test liquid in the foam tank and performing proportioning tests as if actual foam concentrate was being used. Although this sounds like a simple solution, it can add some complication due to problems involved in cleaning the residual test liquid out of the tank after testing.

Most pump type balanced pressure proportioning systems are easier to test with alternate test liquids since they usually have some type of auxiliary foam pump suction and return connections that are normally used as flush in and out points. These points can normally be used to connect a container of alternate test liquid to the proportioning system and conduct a proportioning test. The foam tank suction and return valves on the system would be closed to isolate the test liquid from the actual foam in the system. Foam concentrate contained in the foam pump and piping would be drained and placed in the foam storage tank or disposed of.

Interface Device for Bladder Tank Systems

When installed bladder tank systems are involved an additional component is required to act as a separator to isolate the foam concentrate or water and alternate test liquid. In this case injection of the alternative test liquid is accomplished by means of a portable isolation/injection device that stores the liquid and then expels the contents into the system proportioner. The device is capable of withstanding at least 200 psi operating pressure and provides a means to positively separate the test liquid from the foam concentrate used to force it out of the device and into the proportioner. Alternately, water pressure can also be used to expel the test liquid thereby saving the complication of forcing the foam concentrate back into the foam tank after testing. Typically 2-1/2 inch fire hose is used to interconnect the injection device to the foam system. Hose connection points are added to the foam concentrate or water feed piping to enable the device to be temporarily tied into the foam system for testing. Vector Fire Technology, Inc. supplies the interface device and interconnecting hoses for this type of testing. Usually the test connection points required for Planit Safe tests are added by the system owner or contractor.

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Instrumentation for Proportioning Measurement of Alternate Test Liquid

Several measurements of proportioning system performance can be monitored and recorded by laptop computer simultaneously during a Planit Safe test procedure. Typically measurements include conductivity of the proportioned solution, system flow rate, and pressures at various points on the system. Conductivity and flow are measured by means of on line sensors installed downstream of the proportioner. Pressure transducers are placed wherever system pressure readings are desired. All system monitoring instrumentation is connected by shielded waterproof cables to a data acquisition package and laptop computer that monitors and records system performance in real time. The laptop computer is programmed to reflect percent injection rate by comparing the measured conductivity of the test solution stream to the conductivity of various percentages of precisely pre-measured solutions made with the alternate test liquid and on site water. Once the instrumentation is installed, on line real time data can be monitored and recorded very quickly thus reducing the total volume of solution discharged. System performance data can usually be gathered in less than one minute from start of system operation. Since all data is recorded electronically at high speed it is possible to generate graphs and charts showing system performance from start to finish of test. This enables much better analysis of system performance than the current test procedures that depend on grab samples of the proportioned solution stream.

Qualified Technical Personnel

As is true with all technical procedures, qualified, well trained personnel are critical to assure that testing is done with proper care and attention to detail. With over fifty years experience involving design, test, and maintenance of foam systems, Vector Fire Technology, Inc. is uniquely qualified to provide the services required. Over two years have been devoted to developing the Planit Safe equipment, alternate test liquids, test procedures and training required to perform this service.

Where Has This Procedure Been Accepted?

The concept of using an alternative liquid in place of foam has been used in the industry for many years. In fact the appendix of NFPA 11 describes alternate means for testing system proportioning rate by using direct drop flow measurements from a calibrated tank, refractive index, and conductivity. Both Underwriters Laboratories and Factory Mutual have accepted proportioning systems for Listing purposes based on using alternative test liquids in conjunction with conductivity measurements. At a presentation to the U.S. Navy and Hughes Associates in late 2001 the Planit Safe procedure was demonstrated. Since that time U.S. Navy has accepted the Planit Safe method for testing some of their new hangar foam systems. Following is a list of places where the Planit Safe testing concept has been used or accepted for future use with tests pending.

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MBNA Helideck System, Newark, NJ
Petawawa Canadian Forces Base Hangar, Petawawa, Ontario, Canada
Gulfstream Aerospace Hangar, Savannah, GA
Arnold AFB Hangar, Tallahoma, TN
ComAir Hangar, Cincinnnati, OH
Chrysler Corp. Warehouse, Morrow, GA
Fisher Diagnostics Distribution Center, Middletown, VA
Fisher Scientific Distribution Center, Suwanee, GA
Lockheed Martin Test Cell facility, Marietta, GA
Fort Eustis, VA Aviation Support Helicopter Hangar, Newport News, VA
Transport Canada T-58 Maintenance Hangar, Ottawa, Canada
Purdue Pharma, Ardsley, NY
Cox Enterprises Hangar, Atlanta, GA
Delta Airlines Maintenance Hangar, Atlanta, GA
TVA Combustion Turbine Facility, New Johnsonville, TN
Greater Toronto Airport Authority 3 Bay 747 Hangar, Mississauga, ON, Canada
Bayer Pharmaceutical Waste Storage Building #46, West Haven, CT
BPXA Process Module, Northstar Island, AK (test conducted in Anchorage)
Sherwin Williams Distribution Center, Fredericksburg, PA
Willow Grove NAS Hangar 177, Willow Grove, PA.
Gelest Chemical, Fairless Hills, PA.
The Kerite Co., Seymour, CT
Firmenich Inc., Port Newark, NJ
Thomas Jefferson Hospital Helideck, Philadelphia, PA
St. Christophers Hospital Helideck, Philadelphia, PA
Getty Petroleum Marketing Terminal, Newark, NJ
Vopak Tank Farm Terminal, Wilmington, CA
Vopak (Univar) Warehouse, Commerce, CA
Sherwin Williams Manufacturing Plant- Baltimore, MD
Adhesives Research GMP Building, Glen Rock, PA
Willow Grove Naval Air Station Hangar 177, Willow Grove, PA
Cornell University Ornithology Laboratory, Ithaca, NY
Yankee Candle Inc. Warehouse Storage, Whately, MA
John Middleton Cigar Co. Mixing Room, King of Prussia, PA
Sherwin Williams Distribution Warehouse, Winter Haven, FL
Norfolk Naval Station Hangar 524, Norfolk, VA
Cherry Point Marine Base Hangar 250, Cherry Point, NC
Vopak Warehouse, Commerce, CA
Norfolk Naval Station Hangar 523, Norfolk, VA
Oceana Naval Station Hangar 200, Oceana, VA
Oceana Naval Station Hangar 500, Oceana, VA

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The Pentagon (no other info available)
Polarome International Warehouse, Jersey City, NJ
Sherwin Williams Minwax Plant, Flora, IL
Quest Diagnostics Hangar, Reading, PA
Getty Petroleum Marketing Terminal, Long Island City, NY
U.S. Navy Research Ship "Ex Shadwell", Mobile, AL
Ashland Chemical Warehouse, Totowa, NJ
Brunswick, ME NAS Hangar 6
Willow Grove, PA NAS Hangars 201 and 230
Sherwin Williams Distribution Center, Waco, TX
Sherwin Williams Plant, Garland, TX
McGuire AFB Hangar 3210
Surdex Hangar, Westminster, MD

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