



# Dry Chemical Fixed Pipe Fire Suppression System General Specifications

## Features

- Fast knockdown of fires
- Detection and control flexibility
- Sizes to match various hazards
- Unique fluidization techniques
- Extensive full-scale testing
- Proven reputation

## Description

ANSUL® dry chemical fixed pipe fire suppression systems are self-contained units, designed by factory-trained personnel, consisting of a pressure vessel constructed to ASME standards, nitrogen cylinders meeting U.S. Department of Transportation standards, automatic detection devices and electric or pneumatic manual actuation devices. These systems use ANSUL dry chemical extinguishing agents such as PLUS-FIFTY B, PLUS-FIFTY C, Purple-K, and FORAY; or dry powder agents such as MET-L-X, LITH-X and MET-L-KYL.

## Application

ANSUL dry chemical piped fire suppression systems are designed to provide full-time fire protection in high-risk areas where large, potentially disastrous fires could occur. They provide a means of detection and suppression for complex hazards which are too difficult and inaccessible for manual means of fire fighting; or for areas where fires could be too large and hazardous for fire fighters to enter and fight.

## Capacities

Unit Size	PLUS-FIFTY C		Purple K		FORAY		MET-L-X		LITH-X		MET-L-KYL	
	lb	(kg)	lb	(kg)	lb	(kg)	lb	(kg)	lb	(kg)	lb	(kg)
PS-150	150	(68)	125	(57)	125	(57)	150	(68)	125	(57)	150	(68)
PS-300	300	(135)	270	(122)	270	(122)	300	(135)	270	(122)	300	(135)
PS-500	500	(225)	450	(203)	450	(203)	500	(225)	450	(203)	500	(225)
PS-1000	1000	(454)	900	(406)	900	(406)	1000	(454)	900	(406)	1000	(454)
PS-2000	2000	(900)	1800	(817)	1800	(817)	2000	(900)	1800	(817)	2000	(900)
PS-3000	3000	(1350)	2700	(1215)	2700	(1215)	3000	(1350)	2700	(1215)	3000	(1350)

Unit Size	Nitrogen Cylinder Size		Number of Nitrogen Cylinders	Bursting Disc Size (in.)	Approximate Weight	
	ft <sup>3</sup>	(m <sup>3</sup> )			lb.	(kg)
PS-150	110	(3.11)	1	1 1/2	535	(242.7)
PS-300	220	(6.23)	1	1 1/2	675	(306.2)
PS-500	400	(11.33)	1	2	598	(271.3)
PS-1000	400	(11.33)	2	3	1158	(525.3)
PS-2000	400	(11.33)	4	4	2106	(955.3)
PS-3000	400	(11.33)	6	4	2975	(1349.4)

Typical applications include:

- Petroleum and petrochemical loading racks, refinery processing equipment, product transfer and storage areas and offshore platforms
- Marine tanker decks, machinery spaces and loading docks
- Manufacturing plant paint spray booths, dip and quench tanks, warehouses, hazardous materials storage buildings, machinery lubricating systems and flammable liquid storage areas
- Machining centers
- Metal chip collection systems
- Aircraft parts manufacturing plants
- Special hazard (combustible metal and/or pyrophoric material) handling and storage areas
- Utility transformers, turbines and control equipment
- Mining lubrication areas, conveyor drives and fueling areas

## Ordering Information

All ANSUL dry chemical piped fire suppression systems (PS-150, PS-300, PS-500, PS-1000, PS-2000, PS-3000) are compatible with ANSUL PLUS-FIFTY B, PLUS-FIFTY C, Purple-K, FORAY, MET-L-X, LITH-X and MET-L-KYL agents.

All piped fire suppression systems are available in epoxy finish. Optional skids are available for all size systems.

Contact Johnson Controls, applications engineering, for assistance in determining the correct system for your application.

# Specifications

## 1.0 GENERAL

### 1.1 Elements:

- 1.1.1 Dry chemical fire suppression systems.
- 1.1.2 Accessory equipment.

### 1.2 Quality Assurance

- 1.2.1 The dry chemical suppression system shall be designed and manufactured by a company having at least 15 years experience in the design and manufacture of large capacity dry chemical fire suppression equipment.
- 1.2.2 The installed dry chemical fire suppression system shall be inspected and tested only by manufacturer trained and approved personnel.

### 1.3 Warranty

- 1.3.1 The manufacturer shall provide a one year warranty that products are free from defects in materials and workmanship.

## 2.0 PRODUCTS

### 2.1 Acceptable Products

- 2.1.1 ANSUL Dry Chemical Fixed Pipe Fire Suppression System or equivalent.

### 2.2 Primary System

- 2.2.1 The dry chemical tank shall be of welded steel construction with a welded circumferential seam. The dry chemical tank shall be designed and constructed according to the latest ASME unfired pressure vessel code for a working pressure of 250 psi (17 bar). It shall be stamped with the appropriate ASME code symbol. The dry chemical tank shall be fitted with one 4 in. (101 mm) I.D. fill opening in the top head, and shall be provided with a discharge outlet suitable for the system application. The actual capacity of the dry chemical container shall be as shown in the Capacities chart. (Specifying Engineer to specify size. See chart.)
- 2.2.2 The dry chemical tank shall be fitted with a gas tube arrangement to fluidize the dry chemical, pressurize the dry chemical tank, and maintain a nominally constant pressure in the tank during discharge. The gas tube shall be provided with check valves to prevent dry chemical back-up.
- 2.2.3 The dry chemical tank shall be provided with one fill cap. The cap shall consist of a cast aluminum body equipped with two handles extending from opposite sides of the cap. These handles shall permit hand tightening to a point which inhibits leakage under normal operating pressure. The cap shall be equipped with a rubber gasket inserted in a machined recess. A safety vent hole shall be located in the fill cap so that the cap is capable of pressure venting while at least 3 1/2 threads are still engaged.
- 2.2.4 The dry chemical or powders for this system shall be formulated and produced by the system manufacturer and meet the requirements for the system manufacturer; the dry chemical shall also meet the requirements of Underwriters Laboratories Incorporated and Factory Mutual Laboratories. The dry chemical or powders shall be furnished in metal or plastic pails with water-tight replaceable covers.

- 2.2.5 The nitrogen cylinders provided for the system shall meet D.O.T. Code 3A2015 or 3AA2400. The nitrogen cylinder(s) shall be mounted in a vertical or horizontal position. The method of mounting shall be designed to permit easy access for operation and replacement of the cylinder.
- 2.2.6 Each nitrogen cylinder valve shall be provided with an Underwriters Laboratories Listed, Quick-Opening valve having the following capabilities:
  - 2.2.6.1 To be opened manually from a remote location by means of a pneumatic actuator.
  - 2.2.6.2 To be opened manually at the valve by Quick-Opening lever action or conventional hand-wheel action.
  - 2.2.6.3 All three opening methods shall not interfere with each other.
  - 2.2.6.4 The valve shall be provided with an integral safety relief set at 3015-3360 psi (207-231 bar) for 110 and 220 ft.<sup>3</sup> cylinders and 3600-4000 psi (248-275 bar) for 400 ft.<sup>3</sup> cylinders to relieve at 3360 psi (248 bar) and 4000 psi (275 bar) maximum at 160 °F (71 °C), respectively.
  - 2.2.6.5 The valve shall be provided with an integral pressure gauge reading from 0 to 3000 psi (0 to 206 bar) for 110 and 220 ft.<sup>3</sup> cylinders and 0 to 4000 psi (0 to 275 bar) for 400 ft.<sup>3</sup> cylinders, marked to show the operable range of pressure.
  - 2.2.6.6 The valve shall be constructed of corrosion-resistant materials throughout. All moving parts subject to wear shall be of hardened stainless steel and/or beryllium/copper alloy.
- 2.2.7 The nitrogen supply shall be directed through one regulator per nitrogen cylinder. The regulator shall be designed for an outlet pressure of 210 to 230 psi (14 to 15 bar). Maximum inlet pressure shall be 3000 psi (206 bar). Each regulator shall have a spring loaded pressure relief valve. The regulators shall be connected to the nitrogen cylinder by 3/8 in. (9 mm) I.D. wire or polyester braid hose.
- 2.2.8 A bursting disc assembly consisting of a bursting disc union designed to rigidly hold the disc in place, and the disc itself shall be located at the tank outlet in the discharge pipe to ensure proper fluidization of the dry chemical prior to discharge. The bursting disc union may utilize screwed fittings or a flanged assembly based on the size of the dry chemical tank or the product outlet pipe size. The disc shall be constructed of nickel and shall be pre-scored to ensure a positive full burst at rated pressure.
  - 2.2.8.1 The bursting disc assembly shall seal the tank during pressurization to allow the internal pressure to build to the rated value, providing the force needed to discharge the contents of the dry chemical tank through the fixed nozzle system at rated nozzle pressure and flow rate.

## Specifications (Continued)

### 2.0 PRODUCTS (Continued)

#### 2.2 Primary System (Continued)

2.2.8.2 The pre-discharge delay as the dry chemical tank pressurizes shall be sufficient to ensure that the dry chemical will be properly fluidized through the action of the nitrogen being fed through the gas tube. The bursting disc shall also function as a vapor barrier to help prevent the migration of moisture into the dry chemical storage tank from the distribution piping.

2.2.8.3 Bursting discs shall be replaced after each use.

2.2.9 A pneumatic actuation system utilizing a nitrogen filled cartridge shall be provided to open the nitrogen cylinders. The actuation system shall operate from either an electric or manual signal

2.2.10 The paint system utilized to protect the equipment shall be of a corrosion-resistant type to the harsh environmental conditions and shall meet the following processes:

##### 2.2.10.1 Red Epoxy Paint System

- Surface preparation: Near white grit blast SSPC-SP10-63T
- First coat: Zinc-rich primer
- Top coat: Epoxy polyester
- Hard to spray areas to be brush painted

#### 2.3 Auxiliary Equipment

2.3.1 A nitrogen cylinder weather hood shall be provided to cover and protect the nitrogen cylinder valves, gauges and Quick-Opening mechanisms from rain. The weather hood shall open along the full length of the front for convenient service or replacement of the nitrogen cylinders.

2.3.2 A skid shall be available for mounting of the agent tank and nitrogen tank(s). The skid shall be steel, welded construction, sized and reinforced to provide the required strength of the intended application, protected from corrosion by special surface treatments: sandblasting, primer and red epoxy coatings.

2.3.3 The dry chemical system shall include electrical device(s) to actuate the system upon receipt of an electric impulse from either the detection system or a manual station. Provisions for manual operation of the actuation device shall be included on or adjacent to the device.

2.3.4 A manual pneumatic actuator shall be available to provide pneumatic actuation of the dry chemical system from a remote location, independent of electrical power.

2.3.5 Flush mount, surface mount and explosion proof models of electric actuation stations shall be available to electrically actuate the dry chemical unit from a remote location. Specifying engineer to select appropriate device for each application.

Safety Data Sheets (SDS) are available at [www.ansul.com](http://www.ansul.com)

**Note:** The converted values in this document are provided for dimensional reference only and do not reflect an actual measurement.

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