

---

# Automatic Fire Detection & Operation

## LVS™ Liquid Agent Fire Suppression System



### Application

The LVS Liquid Agent Fire Suppression System is designed in combination with an A-101 dry chemical system, for use on large, off-road type construction and mining equipment (such as large excavators/shovels, draglines, haul trucks, wheeled loaders), and specialty vehicles (such as slag, pot and/or slab carriers, tunnel boring machines, and forestry vehicles). These types of equipment have large volumes of oils and hydraulic fluids under pressure.

With a break in a large hydraulic line, fuel can spray onto many surfaces, some possibly hot enough to cause ignition. With the large amount of fuels available, a variety of fires can occur, such as pressure, three dimensional, fuel-in-depth, and spill fires. LVS wet chemical can flow into hard to reach areas where flammable fuels may also have flowed into. The wet chemical solution causes two extinguishing mechanisms to take place:

- Forming a blanket over the fuel, which excludes oxygen
- The water content of the solution produces a cooling effect to the fuel and the surrounding surface areas. Cooling the surrounding surface areas also minimizes the chance for reflash.

### Features

- Rapid fire knockdown with dry chemical, effective cooling with wet chemical solution
- Rugged construction
- Low temperature operation
- Automatic fire detection and operation



---

## Description

The LVS Liquid Agent Fire Suppression System is designed to be installed with an ANSUL A-101 Dry Chemical system to create a twin agent system concept that is capable of quick fire knock-down, coupled with the cooling application of the LVS liquid agent. The system consists of both dry chemical and wet chemical. The dry chemical side of the system is the ANSUL LT-A-101 type system and the liquid agent side of the system consists of wet chemical tank(s) containing a premixed solution of LVS agent.

The LVS system includes both a 30 gallon (114 L) tank assembly and a smaller 15 gallon (57 L) tank assembly. Both assemblies supply LVS agent that is discharged through nozzles into areas that have the potential for fire reflash, due to the superheated nature of the equipment being protected (turbochargers being the No. 1 concern). LVS liquid agent provides a cooling application of liquid to superheated equipment after a fire has been detected and suppressed with the A-101 Dry Chemical system.

- The LVS system is designed to discharge for approximately 2 minutes.
- The LVS Fire Suppression System is designed for a temperature range of -40°F to 120°F (-40°C to 49°C).
- The LVS wet chemical can be stored at temperatures as low as -60°F (-51°C).

LVS system components consist of the following:

### Wet Chemical

LVS wet chemical is a unique blend of organic and inorganic salts, coupled with surface active agents. This blend provides a strong measure of freeze protection along with the foaming properties associated with conventional Class B liquid agents.

The wet chemical is shipped in 5 gallon (18.9 L) plastic containers.

## Tank

The LVS tank is constructed of steel, finished with a red corrosion resistant paint. The tank holds 30 gallons (114 L) or 15 gallons (57 L) of LVS wet chemical solution. A nitrogen cartridge equipped with a pneumatic actuator supplies the required expellant gas.

## Nozzles

The LVS nozzle is a non-aspirating nozzle, constructed of brass, with a rubber blow-off cap.

The LVS system allows the use of 3 or 4 nozzles on an LVS-15 tank, and 6 or 8 nozzles on an LVS-30 tank, depending on the application.

When cooling turbochargers, a minimum of two (2) nozzles must always be used for each turbocharger.

Two (2) nozzles from a 4 nozzle LVS-15 or 8 nozzle LVS-30 system may be utilized for turbochargers up to 10 in. in size (diameter of turbo housing). For turbochargers larger than 10 in., the maximum number of nozzles per tank must not exceed 3 nozzles with the LVS-15 tank and 6 nozzles with the LVS-30 tank.

In addition, all other areas that can become superheated to temperatures close to or in excess of 850°F (454°C) must also be considered. The maximum area of protection per nozzle depends on the distance the nozzle is from the hazard. At a distance of 2 ft. (0.6 m), the maximum area of protection per nozzle is 2.2 sq. ft. (0.2 sq. m). At a distance of 4 ft. (1.2 m), the maximum area of protection per nozzle is 8.6 sq. ft. (0.85 sq. m).

## Detection and Control

The detection and control system utilized with the LVS system is the ANSUL CHECKFIRE® SC-N Electric Detection and Actuation System. The system is composed of components which are combined to provide automatic fire detection and actuation. The system is particularly suited for protection of equipment that is subjected to extreme environmental and physical conditions.

---

## Specifications

### 1.0 General

#### 1.1 Requirements

- 1.1.1 The equipment shall be protected with a twin agent fire suppression system and an automatic detection system.
- 1.1.2 The fire detection suppression system shall consist of the following ANSUL components or approved equal:
  - LT-A-101 dry chemical fire suppression system
  - LVS liquid agent fire suppression system
  - CHECKFIRE SC-N detection and actuation system
- 1.1.3 As backup to the fire detection/suppression system, the equipment shall contain a minimum of two hand-portable fire extinguishers.
- 1.1.3.1 Each hand portable extinguisher shall be a RED LINE® cartridge-operated dry chemical extinguisher or approved equal.

#### 2.0 Products

2.1 The twin agent fire detection/suppression system shall be supplied as a pre-engineered package consisting of agent storage tanks, expellant gas cartridges/cylinders, discharge nozzles, agent distribution lines, control module, manual/automatic actuator, and thermal detection network. The control module shall respond to electrical input from the detection network and produce output to initiate alarm, vehicle shutdown, and fire suppression system actuation functions.

- 2.1.1 The control module power source shall be a replaceable lithium battery that will supply power for one year under normal operating conditions. The control module shall be programmable for alarm-to-shutdown and shutdown-to-discharge delays. The module cover shall contain audible and visual status indicators for power, alarm, detection, and release circuits.
- 2.1.2 The system shall provide both a manual and automatic means to pneumatically actuate the fire suppression systems.
- 2.1.3 The system shall provide heat detection using (linear detection wire) (spot detectors).

- 2.1.4 Agent storage shall consist of one or more steel pressure vessels each capable of being easily inspected for agent condition and fill level without requiring depressurisation.
- 2.1.5 Each dry chemical storage tank shall be pressurized from a separate steel nitrogen cartridge meeting DOT-3AA-1800 and Transport Canada specifications.
- 2.1.6 Each wet chemical storage tank shall be pressurized upon actuation from a separate steel nitrogen cylinder meeting either DOT 3AA-1800 or DOT-3AA-2015 and Transport Canada specifications.
- 2.1.7 The extinguishing (agents) (agent) shall be distributed through SAE 100R1 or SAE 100R5 minimum rated hydraulic hoses and brass nozzles that are permanently installed in the hazard areas. The nozzles shall employ blow-off caps that shall be easily displaced upon agent discharge.
- 2.1.8 The dry chemical extinguishing agent shall be monoammonium phosphate suitable for Class A, B, and C fires.
- 2.1.9 The wet chemical shall be a blend of inorganic salts suitable for Class A and B fires and is freeze protected to -60°F (-51°C).
- 2.1.10 The dry chemical system shall be capable of operating within a temperature range of -65 to 210°F (-54 to 99°C).
- 2.1.11 The liquid agent system shall be capable of operating within a temperature range of -40 to 120°F (-40 to 49°C).

2.2 The hand portable fire extinguisher shall consist of a mild steel pressure vessel capable of being easily inspected for agent condition and fill level without requiring depressurization. Upon operation, it shall be pressurized from a separate steel nitrogen cartridge meeting DOT 3A-2100 or 3E-1800 and Transport Canada specifications. The extinguishing agent shall be monoammonium phosphate dry chemical suitable for Class A, B, and C fires.

### Ordering Information

Part No.	Description
426959	LVS-30 Shipping Assembly Consisting of: <ul style="list-style-type: none"><li>- LVS-30 Tank</li><li>- 23 cu.ft. Nitrogen cartridge with pneumatic actuator</li><li>- Expellant Gas Hose</li><li>- (2) 1/4 in. Street Elbows</li></ul>
432486	LVS-15 Shipping Assembly Consisting of: <ul style="list-style-type: none"><li>- LVS-15 Tank</li><li>- LT-A-101-30 Nitrogen cartridge with pneumatic actuator</li><li>- Expellant Gas Hose</li><li>- (2) 1/4 in. Street Elbows</li></ul>
433325	9.5 1/2 in. Nozzle Assembly Consisting of: <ul style="list-style-type: none"><li>- Nozzle, with Blow-Off Cap</li><li>- "L" Mounting Bracket</li><li>- (2) Lockwashers</li></ul>
428404	Mounting Ring (for LVS-15)
428405	Mounting Ring (for LVS-30)
433294	9.5 1/2 in. Nozzle, with Blow-Off Cap (Single)
427531	LVS Wet Chemical, 5 Gallon Pail
428060	23 cu.ft. Nitrogen Cartridge (for LVS-30)
423491	LT-A-101-30 Nitrogen Cartridge (for LVS-15)
428363	Sealed Burst Disc Assembly Package (15 Discs)
427560	System Blow Down Kit
427109	Manual, Installation, Operation, Design, Maintenance and Recharge
53081	Owners Manual.