



LVS Liquid Agent System

LVS™ Wet Chemical Fire Suppression Systems – Generator Protection





Liquid Vehicle Fire Suppression System

WHY LVS?

- LVS is a proven cooling agent since the introduction in 1998 (Twin Agent Concept)
- Utilizes FM approved and tested hardware, no significant new hardware development
- Does not require a stainless steel agent tank
- Recognized “brand”
- Field proven agent





Extensive Fire Testing

- AS 5062 Fire Testing - March 2010
- Engine test stand initial tests Oct. 2010





LVS Liquid Agent Advantages

Liquid Only Advantages

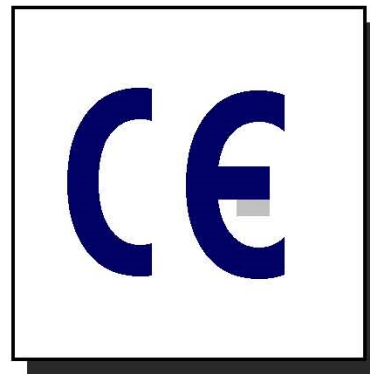
- Cooling capability
- Suppression by cooling and interrupting the chemical change reaction
- Mitigates Re-flash potential
- Quenching of Class A material
- Visibility with discharge
- Recharge ease
- Moisture irrelevance
- Securing capability
- Ease of design
- Simplified hose parameters





Approvals

LVS-5, 15, and 30 systems are FM approved (MSHA allowed), CE Marked and AS5062 compliant



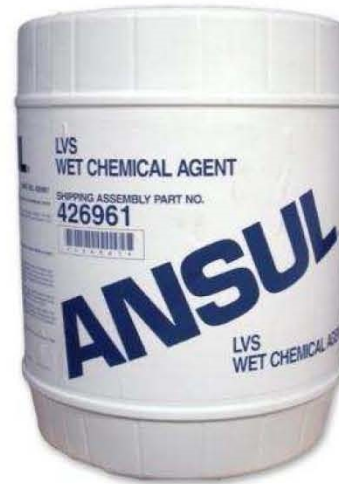


LVS Wet Chemical Agent

LVS

Wet Chemical Agent

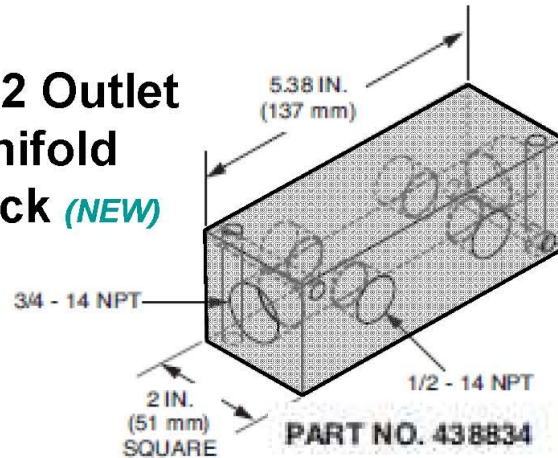
- Shipped in 5 gallon pails
- Can be stored in temperature down to -60°F (-51.1°C)
- Unique blend of organic and inorganic salts
- Shelf life of 25 years



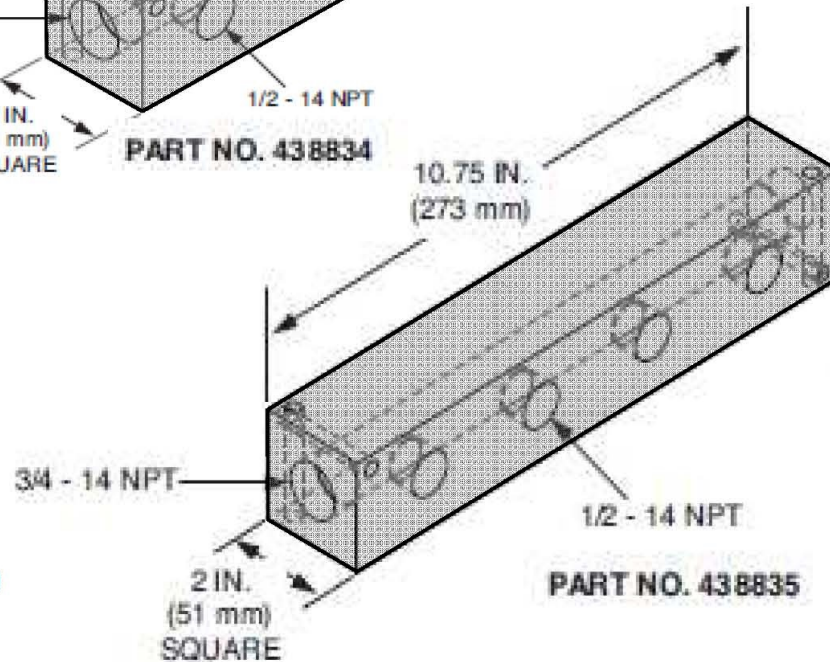


System Components

**2 x 2 Outlet
Manifold
Block (NEW)**



**4 Outlet
(1) Side
Manifold
Block (NEW)**



9.5 Nozzle



**Nozzle
Brackets**



System Design

LVS system:

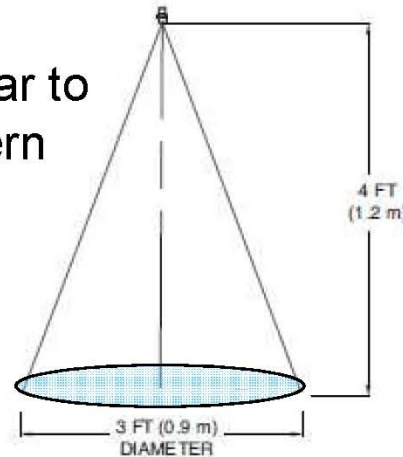
- Max of 20 nozzles on a LVS-30 Tank



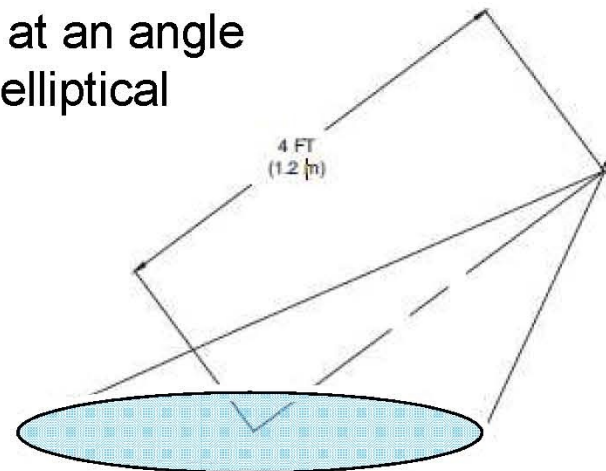


Nozzle Coverage

9.5 nozzle installed perpendicular to hazard results in a circular pattern 3 ft. (.9 m) dia. at 4 ft. (1.2 m)



9.5 nozzle discharging at an angle results in an extended elliptical coverage area.



9.5 Nozzle



Discharge Rate:
Approx. 1.5 gal/min





System Design

System Limitations: LVS-30

- Primary and secondary supply line - 3/4 in. hose.
- LVS-30 supply line must be split twice.
 - Primary and Secondary supply lines.
 - No nozzles allowed before splits.
 - Primary supply line split
 - ✓ Maximum nozzles on one side of $\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$ in. tee = 10.
 - ✓ Maximum unbalance on LVS-30 = 10 nozzles on one side, and 6 on the other (*See LVS-30 SPLIT NOZZLE UNBALANCE MATRIX*).
 - Secondary supply line split
 - ✓ Maximum nozzles on one side of $\frac{1}{2} \times \frac{1}{2} \times \frac{3}{4}$ in. reducing tee = 6.



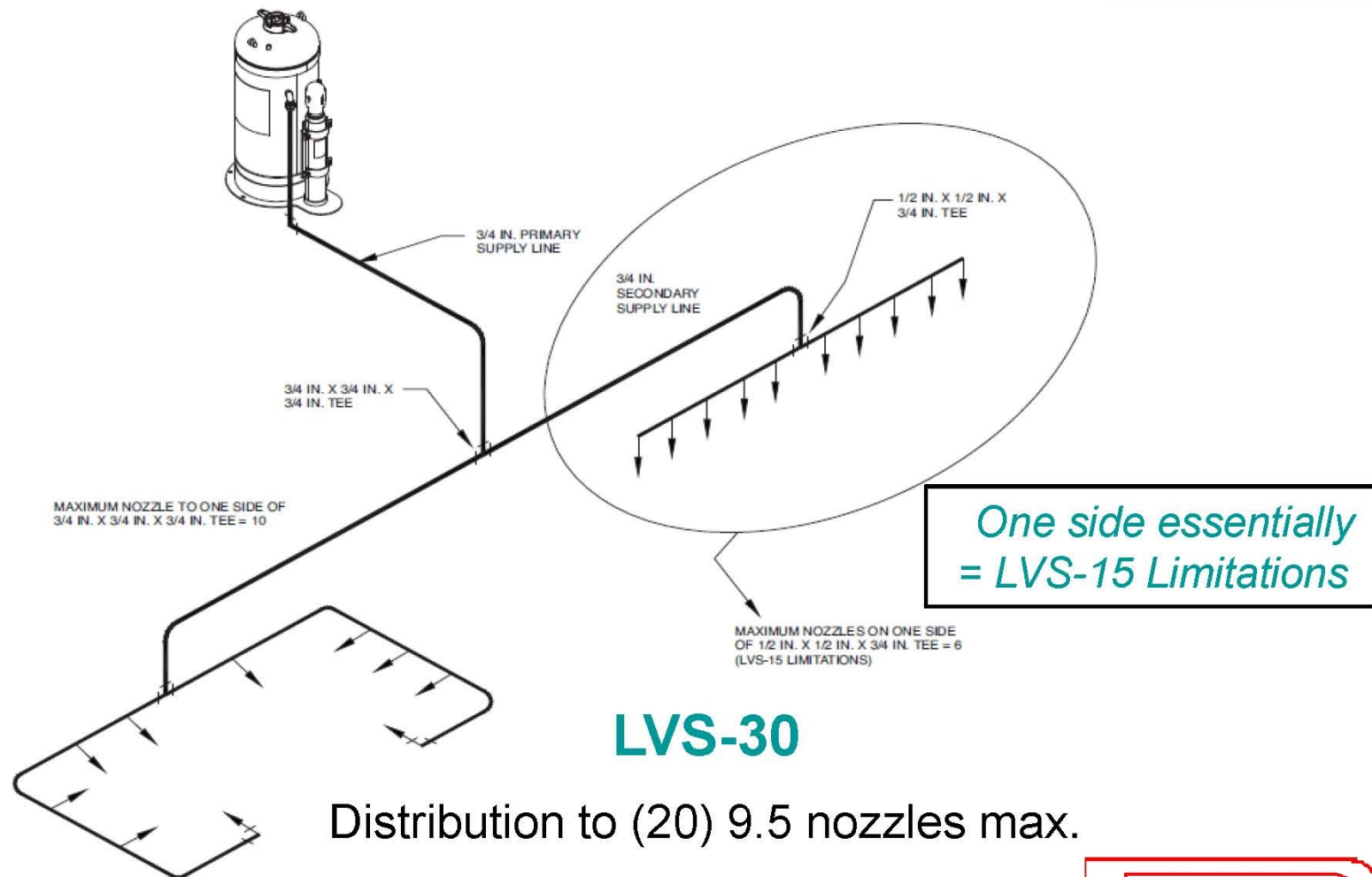
System Design

LVS-30 System

Number of Nozzles	Max of 20
Nozzle Type	9.5
Length of Supply line	225 ft. of ¾ and ½ inch hose
Max Elbows	16
Min. Agent Discharge time	60 seconds
Max. Nozzles per primary supply line split	10
Max. Nozzles per secondary supply line split	6

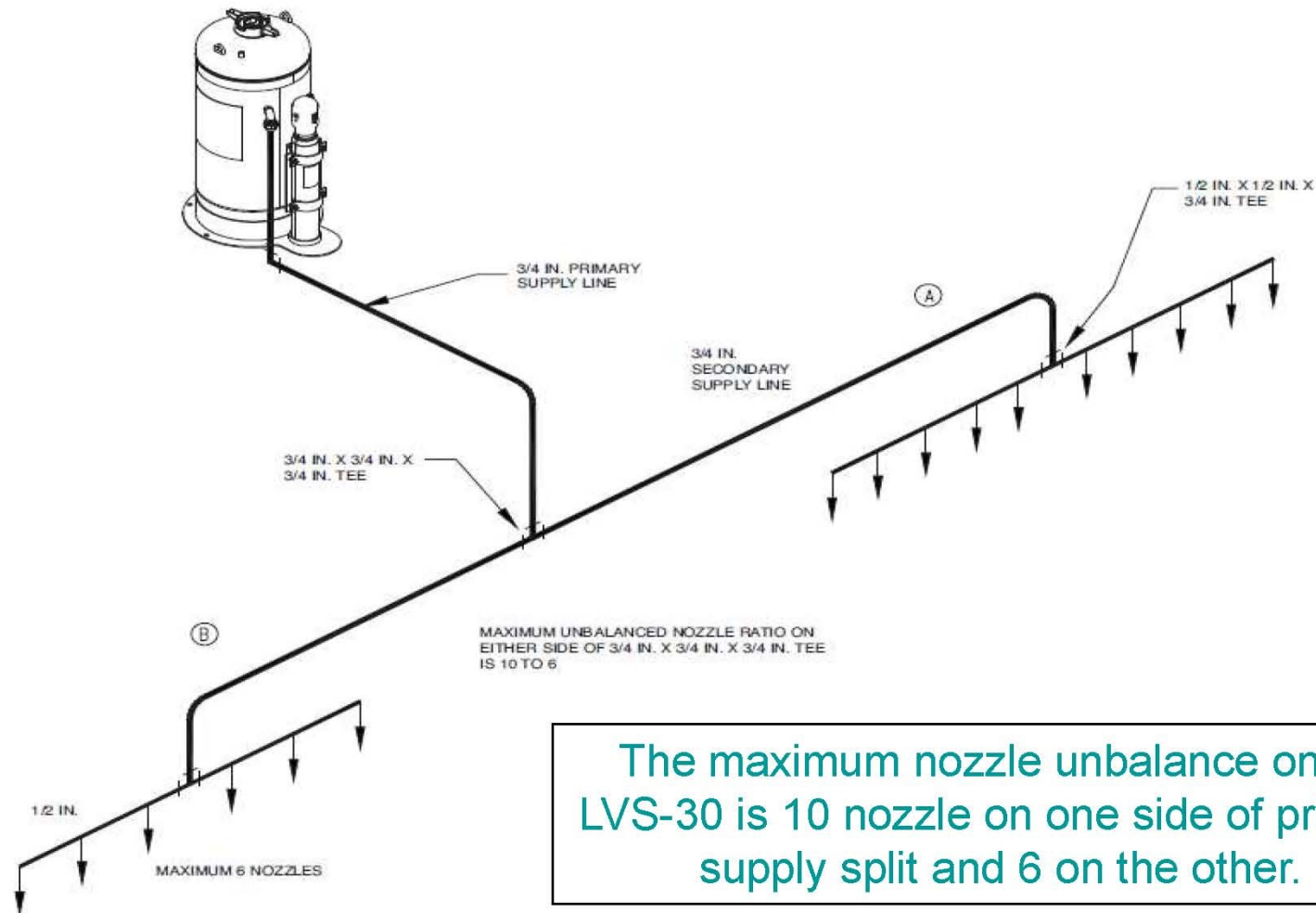


System Design





System Design



The maximum nozzle unbalance on an LVS-30 is 10 nozzle on one side of primary supply split and 6 on the other.

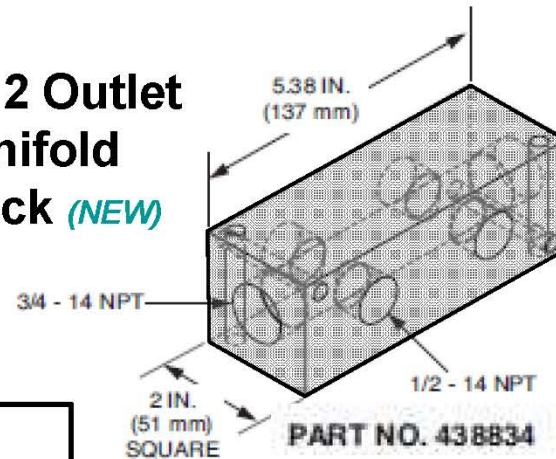


System Installation

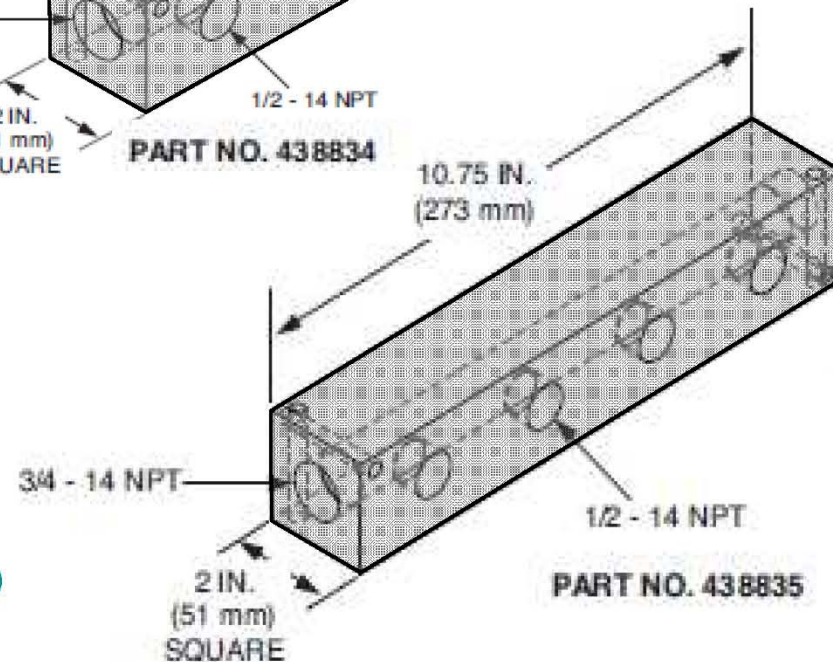
Manifold Distribution Blocks

- Max. nozzle per 1/2" outlet is 6.
- Total nozzles not to exceed Max. nozzles allowed per system.

**2 x 2 Outlet
Manifold
Block (NEW)**



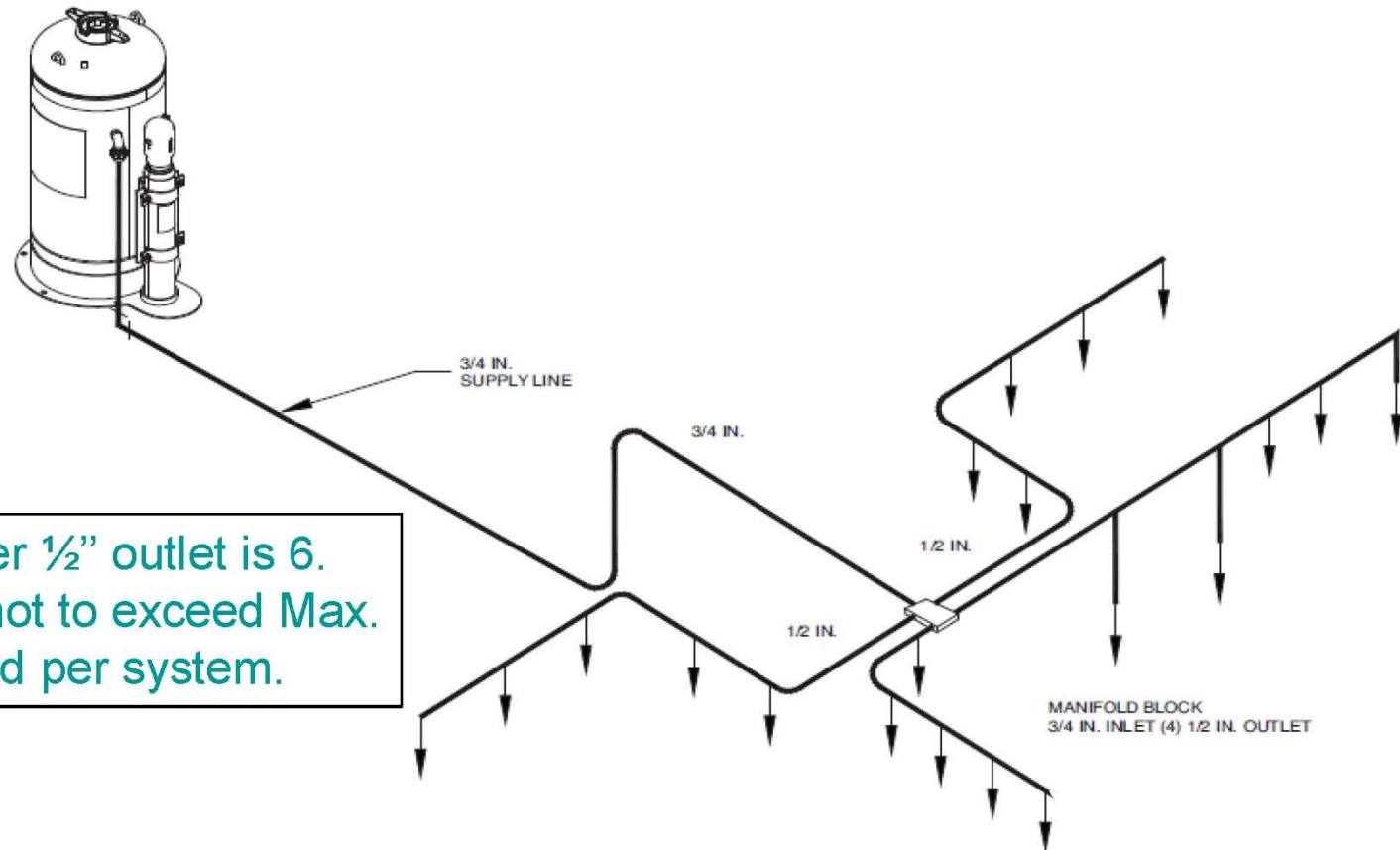
**4 Outlet
(1) Side
Manifold
Block (NEW)**





System Design

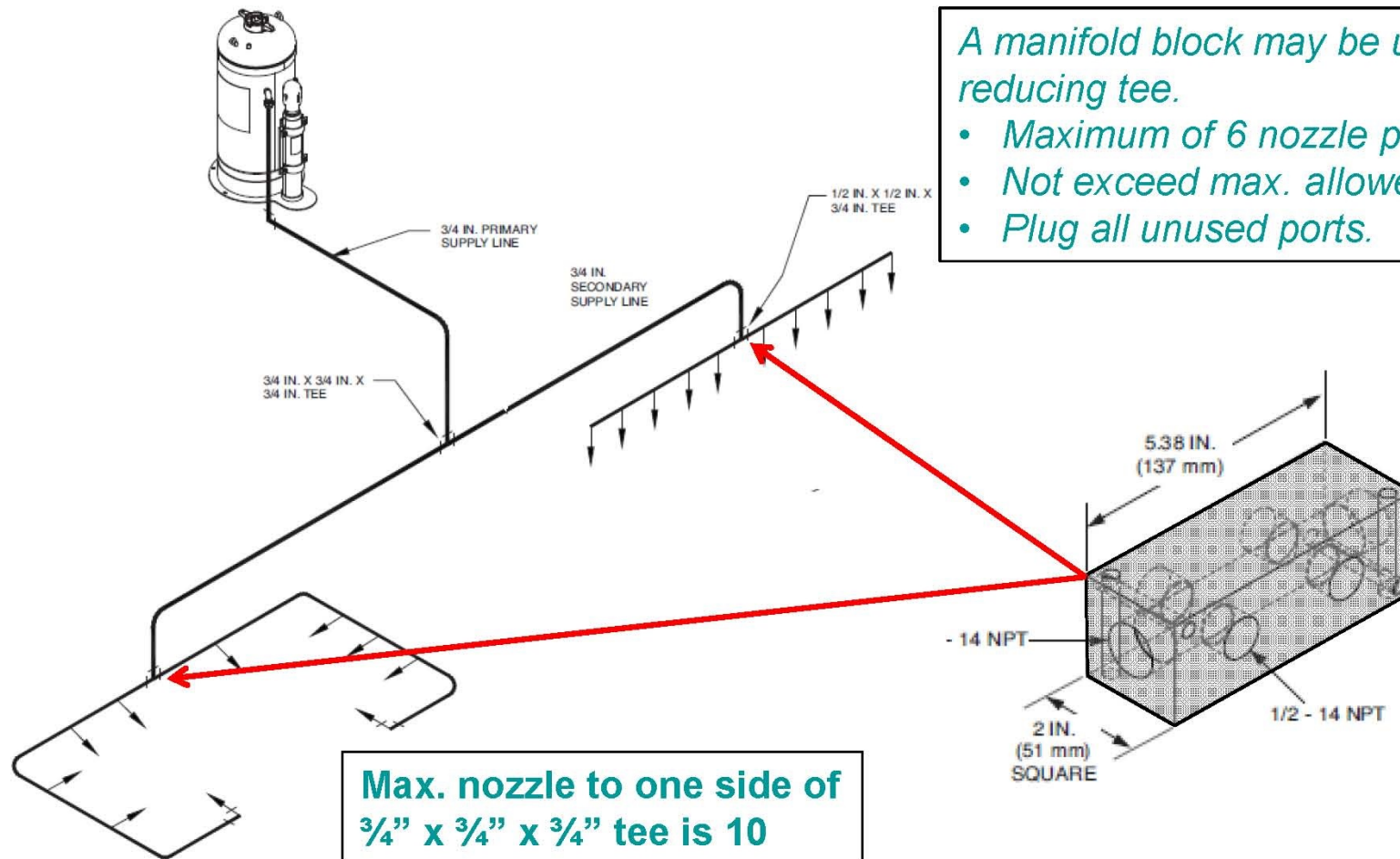
LVS-30 DISTRIBUTION TO 20 NOZZLES MAXIMUM (MANIFOLD BLOCK)



- Max. nozzle per 1/2" outlet is 6.
- Total nozzles not to exceed Max. nozzles allowed per system.



Additional Manifold Options – LVS 30



A manifold block may be used in place of reducing tee.

- Maximum of 6 nozzle per 1/2" outlet
- Not exceed max. allowed per system.
- Plug all unused ports.

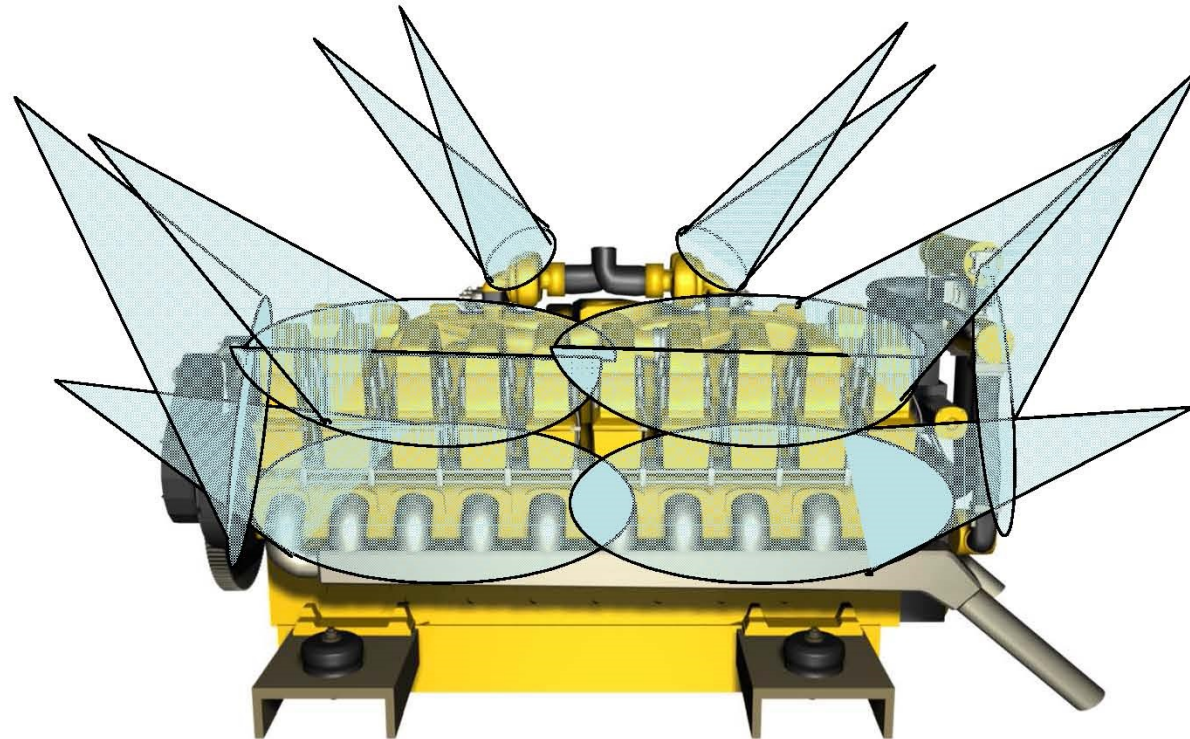


Engine Coverage

Turbo (2) x 2 noz. = 4
Screen Top of Engine
2 noz. Per side = 4
Screen Bottom of Engine
2 noz. Per side = 4
Screen Ends of Engine
1 noz. Per end = 2
Total nozzles = 14

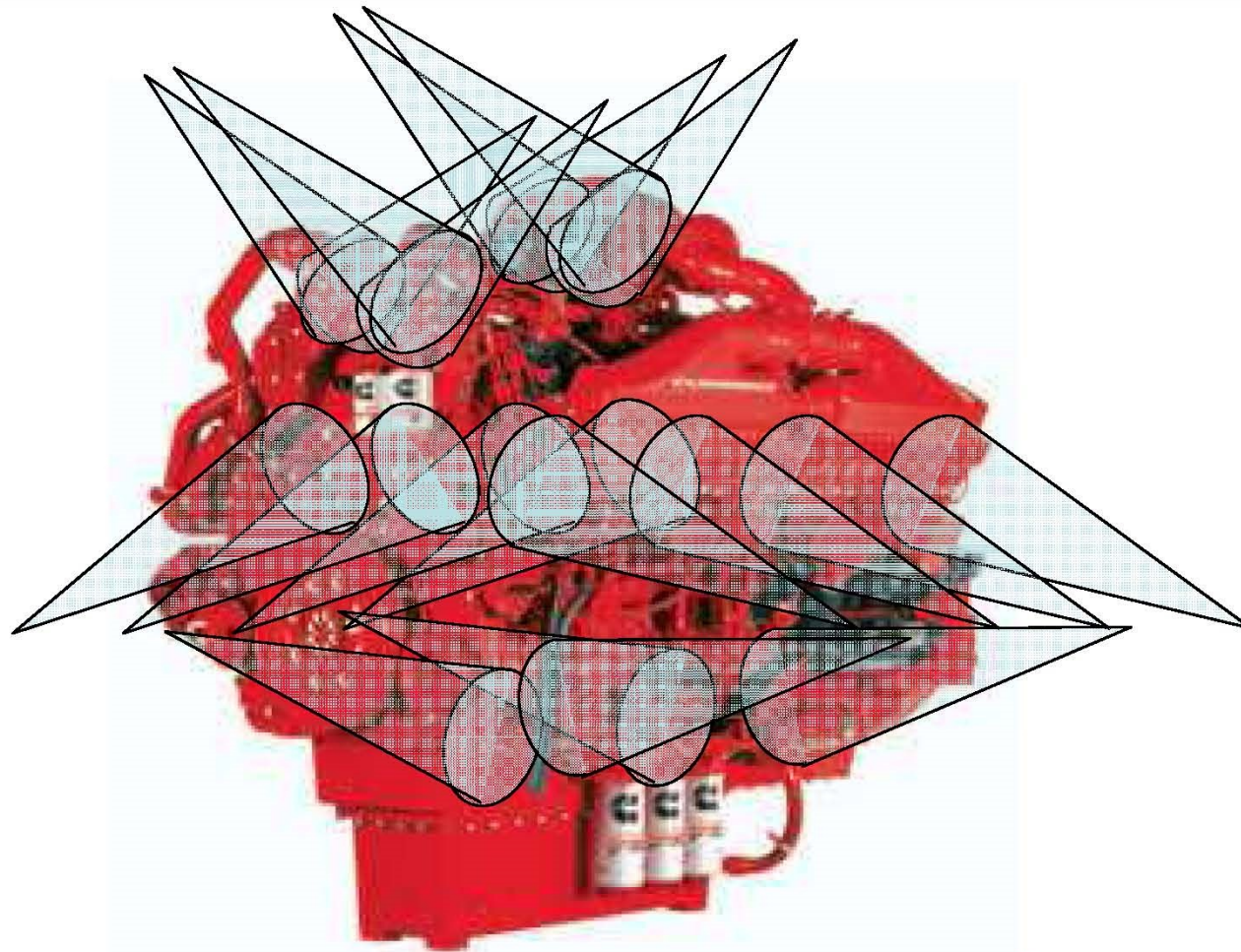
LVS 30 = 20 nozzles

Capability of 6 additional
nozzle to protect other
hazard areas.





Example - Nozzle Layout



Example - Nozzle Layout

