Fire Protection for Mobile and Transportable Equipment
AS 5062-2022 Summary

Rev 22.1

This is an extract from AS 5062-2022. The clause references are as per the Standard. This standard is based on a risk assessment for equipment. The outcome of the risk assessment determines what system if any is required. This document focuses on Condensed Aerosol Systems.

1.1 SCOPE - This Standard specifies fire risk management procedures and the minimum requirements for fire system for use on mobile and transportable equipment. This Standard is applicable Pre-Engineered systems, and includes the following industries and equipment:

(a) Mining, Forestry, Waste management, Construction, Railway, Agriculture, Defense, Ports.
(b) Buses, Four wheel drives, Road haulage, Motor homes, Forklifts, Road registered plant.

1.3.1 **Approved** – accepted by relevant authority.

1.3.3 **Competent person** - A person who has training, qualifications or experience, or a combination of these, the knowledge and skills enabling that person to perform the task required.

1.3.5.1 **Critical Defect** – defect that renders the system inoperative

1.3.23 **Relevant Authority** – agency authorized to issue determinations in respect of this standard**.**

2.1.1 Fire risk management shall be focused on prevention of fire in the first instance. Across the lifecycle of any equipment, the design shall aim to eliminate situations that can lead to a fire, considering fault conditions or occurrences of probable human error. The design shall establish the boundary conditions for the environments in which the equipment is designed to operate. The design shall also define the purpose and functions that the plant is designed to perform:

(a) normal operation;
(b) expected malfunction;
(c) reasonably foreseeable misuse; or
(d) reasonably foreseeable human error.

2.1.2 The fire risk assessment shall include:

(a) Fire Risk Assessment – Hazard identification, fire risk analysis, fire risk evaluation.
(b) Fire Risk Reduction.
(c) Fire Risk Monitoring and Review.

2.1.3.1 Risk Assessment shall be carried out when equipment is designed, prior to be placed in service, and following any variation in design of use which could affect the fire risk assessment.

2.1.3.2 Fire Risk Assessment

(a) Determine possible fire scenarios – What can happen? When and Where? Why and How?
(b) Quantify Risk Exposure likelihood and consequences.
(c) Prioritize fire risk – what risk needs to be addressed first.

2.1.4 Previous fire experiences on similar equipment shall be considered risk management process.

2.2 **Fire risk management process** shall be conducted by and involve competent persons. Such people as: Owner, Operator, Maintenance personnel, Manufacturer's representative, Supplier, Hirer, Insurer, specialist fire consultant. Consultation regarding the fire hazards identified and risk reduction methods taken **should** be undertaken with at least three of these parties. Min every 5 Years (Clause 2.7).

2.3 The fire risk management process shall be **fully documented** for the life of the equipment. Records shall be maintained, including hazard identification, risk analysis and risk evaluation; risk reduction methods; consultation; maintenance; incidents and safety statistics; and monitoring and review.

2.4.2.1 When assessing the fire hazard location, **all fuel sources shall be identified**, including: primary fuel sources such as flammable liquids and lubricant; materials of construction of the equipment; the product being processed or transported; and the surrounding environment.

2.4.2.3 **Properties of the fuels** and shall be considered, including: Ignitability, Flammability, Quantity and continuity

of supply, toxicity and combustion products, Environmental impact.

2.4.3 When assessing the fire hazard, the existence and quantity of fire supporting substances and the probability of their occurrence shall be determined.

2.4.4 In assessing the fire hazard, **all ignition sources** shall be identified, including:

(a) Heat energy - engines, exhaust systems, turbochargers, switches, electric motors, bearings and brakes.
(b) Electrical energy - switch gear, motors, transformers, batteries, lights, cables, loose contacts.
(c) Mechanical energy - welding and cutting, friction, overheating, impact, grinding.
(d) Chemical reaction - self-heating, self-ignition and runaway exothermic reaction.

2.4.5 **Potential fire hazard locations** associated with equipment shall be identified, including:

(a) Turbo chargers.
(b) Fuel systems, including piping, hoses, valves and injectors in close proximity to ignition sources.
(c) Cooling system, including hydraulics, engine and transmission.
(d) Exhaust systems.
(e) Hydraulics systems, including piping, hoses, pump and valves.
(f) Lubrication systems, including engine and transmission systems and grease systems.
(g) Braking systems, including retarders, park brakes and service brakes.
(h) Electrical systems, including alternators, generators, batteries, wiring and switch gear.
(i) Locations where combustible materials can accumulate, examples: engine valleys and wheel arches.
(j) Tires and filling compounds

2.4.6 **Operating environments** associated with the equipment including situations where the equipment fire will impact on the environment (for example, forests/bushfires). Fire hazards associated with the operating environment include combustible dust (for example, coal), combustible gases, timber, confined spaces, oil spills, fuel and waste dumps/depots, and temperature.

2.5.2.1 Fire risk analysis shall determine

(a) Health and safety of people in the vicinity.
(b) Property loss.
(c) Production loss.
(d) Environmental damage.

2.5.2.2 Fire effects shall be considered

(a) fire propagation;
(b) thermal radiation;
(c) products of combustion (for example smoke, toxic gases);
(d) escaping materials into the surrounding area (for example, pine forests); and
(e) fire effluent.

2.5.3 Operational conditions

(a) Operating environment, for example, road conditions, road gradients, equipment speeds.
(b) Time of day.
(c) Operator use/misuse, eg: brakes dragging and emergency brakes being used as service brakes.
(d) Wear and tear of components.
(e) Life cycle of components, eg: hoses deteriorating, hoses and electrical cables deteriorating.
(f) Equipment interaction, for example, refueling and collisions.
(g) Inexperienced operator(s).
(h) Human error – such as poor maintenance practices

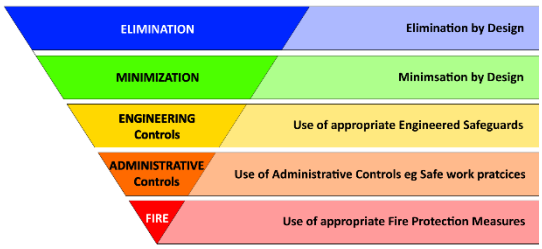
2.5.4 Fire risk analysis shall include analysis of existing controls, including:

(a) Paths of normal and emergency egress for personnel.
(b) Means of fire detection (for example, visual).
(c) Availability of portable extinguishers.

(d) Availability of fire-fighting personnel, external support and time to respond.
(e) Procedures and training of operator(s).

2.7 The fire risk management process shall be a continuous improvement process. It shall be monitored and reviewed: periodically at intervals **not exceeding five years**; whenever changes are made to the equipment that could affect the fire risk; whenever variations in use, condition or environment could change the fire risk potential; when there is a change of owner; and after fire accidents or incidents occur.

3.1.2 Risk Reduction Hierarchy



3.1.3 Introduction of further risk – When changes to equipment occur no addition risk should be introduced such as obstruction of access and egress, obstruction of vision, change which impact operating conditions.

3.2.2.2 **Surface temperatures** should be assessed for risk of ignition of a fire. Measurements should be taken for high surface temperature areas (Clause 3.2.10).

3.2.6 **Segregation of fuel and ignition sources** shall be considered as a design measure for fire risk reduction. Separating electrical cabling from hydraulic and fuel hoses. Routing of hydraulic and fuel hoses away from high-risk ignition sources such as the turbocharger and exhaust pipework.

3.2.9 **Egress** – impact of a fire on primary and secondary egress from machine.

3.4 The fire risk assessment will determine if fire protection system is required. The system to be designed in accordance with Section 6.

4.3 Signs and warning notices – shall be installed

4.3.2 **Sign -Action in the event of fire**

4.3.3 **Warning - Fire Protection** notice – including delay times, and isolation warning.

4.3.4 **Sign - Manual Actuation** instruction notice.

4.4 **FIRE EXTINGUISHERS** shall be selected and installed as required AS 2444. The installation of fire systems shall not eliminate the need for fire extinguishers. Extinguishers to be maintained as per AS 1851.

5.2.1 The fire protection system shall be one of the following:
(a) Fire alarm system with automatically operated suppression system.
(b) Fire alarm system with manually operated suppression system.
(c) Manually operated fire suppression system.
(d) Fire alarm system only.

5.2.2 Provide a means of visual indication confirming agent discharge, by indicator or LED

5.5 A **Detailed Fire System Specification** shall be developed to ensure that the system is correctly selected, designed to mitigate the identified fire risks of equipment. The following shall be provided:

(a) Make, model and type of machine.
(b) Operating environment/industry.
(c) Identification of the risk(s).
(d) Identification of the materials of construction that may contribute to growth of a fire.
(e) Identification of devices installed, changes to structures or materials.
(f) Power source and voltage.
(g) Preferred (if any) extinguishing agent.
(h) Preferred (if any) fire detection method.
(i) Equipment shutdown requirements, including ancillary systems and shutdown delay periods.
(j) Shutdown delay extension periods and number of permissible extension periods.
(k) Discharge delay.
(l) Effective discharge time.
(m) Location and type of audible and visual alarms.
(n) Location of manual control points.
(o) Environmental concerns and constraints.

5.6 Listed Fire Protection Systems shall meet the requirements of this standard. **Condensed Aerosol Systems** require a declaration of **Maximum Leakage Area** for the design calculations.

5.11.1 The fire protection system shall remain **active in event of engine shutdown, electrical supply failure** or failure of any other system.

5.10.2 **Isolation -** a method of preventing the discharge of the system during equipment maintenance.

6.1.2 Fire protection systems shall be **designed by a competent** person.

6.1.3 The **fire system shall satisfy the requirements fire system specification.**

6.2.1 **DESIGN DOCUMENTATION** shall contain detail to enable evaluation of the system to protect the hazard as determined in the risk assessment. Including:

(a) General arrangement drawings showing the layout and detailing the location of major components.
(b) Details of—the area of coverage provided by the fire system design; configuration of the automatic and manual release; the functional sequence of events; interface with the equipment shutdowns.
(d) Description of system operating limitations such as temperature, slope and gradient.

6.2.2 **Specific design detail** - shall include the following information:

(a) Name of owner.
(b) Equipment identification.
(c) Agent storage—number, capacity and location of agent cylinders;
(d) Agent distribution—details of nozzles by type, size, orifice…
(e) Detection and control—type of detection;
(f) Actuation—methods of automatic and manual actuation.

6.4.2 **Quantity of Extinguishing Agent** may be adjusted to compensate for non-closable openings; forced ventilation; the free air volume of air receivers that may discharge into the protected area; altitude; other circumstances requiring agent quantity adjustment; and delayed plant shutdown.

6.5 **Equipment Shutdown systems** such as power supply, fuel and hydraulic system valves and pumps, which if left running could impair the efficiency of the fire protection system, shall be shut down upon system discharge unless otherwise required for safety. In such cases, an extended discharge and time delay on the equipment system shutdown shall be considered.

6.6 **AIR HANDLING systems** should be shut down prior to system discharge. Where necessary for air-handling systems serving the protected area to be kept operating, consideration shall be given to agent quantities, discharge rates and nozzle location to maintain the effective performance.

6.8 **Leakage Allowance** - openings shall be less than the maximum allowed in the listed design manual.

9.3 **MANUAL ACTUATION** points shall be located as determined by a risk assessment and shall be: coloured red; accessible; not adjacent to a fire hazard location; and clearly visible, accessible and identified.

9.4 **ELECTRICAL SYSTEMS and components** shall comply with the requirements of AS 4242, except where the regulatory authority requires compliance with AS 3000. Consideration shall be given to shielding for protection against radio interference. Electrical enclosures shall be rated to IP65.

9.7.3.1 **System control panels** for systems that rely on electrical detection or actuation of the fire system. All **circuits external to the panel shall be supervised**. The control panel shall:

(a) Rated to IP65, unless otherwise protected from exposure to adverse environmental conditions.
(b) Located at the operator's station and be visible and accessible during normal operating conditions. Where unable to locate the control panel at the operator's station, all indicators and controls shall be repeated at the operator's station.
(c) Equipment shut-down output; alarm/fault sounder; system isolate and reset function operable only through the use of tools, key or password.
(d) Have indications: *Power*-Green; *Fire alarm*-red visual and continuous audible; *Fault* - amber visual and

intermittent audible; *System isolated* - amber visual and intermittent audible; *System discharge* - red visual and continuous audible.

9.7.3.2 **Power supply for control panels** shall be provided from at least two separate power supplies:
(a) The primary power supply shall be capable provide power for all system functions.
(b) The secondary power supply shall be capable of supplying sufficient power to operate all functions after a standby period of 24 h. The secondary power supply shall be supervised and generate a fault condition when no longer able to meet this requirement.

9.7.4 **Marking - All indicators and controls** shall be labelled with their actual function name. A permanently attached nameplate shall be provided: Name of manufacturer, Drawing/serial number, Year of manufacture.

9.7.4 **Engine shutdown** where fitted, the control panel shall have with a red visual indication of shutdown signal.

9.7.6 **Engine shutdown time delay** (Optional) may be provided before the end of the time delay period the audible alarm indication shall change to a rapid signal to alert the operator that shutdown is immanent.

9.7.7 **Engine shutdown override** (Optional) may be provided to enable the equipment to be energized for safety or maintenance purposes. The shutdown override shall be operable only by the use of tools, key or password.

10.1 **Fire system shall be commissioned** in accordance with the system manual. The commissioning shall demonstrate system integrity, functionality and compliance with system design documentation.

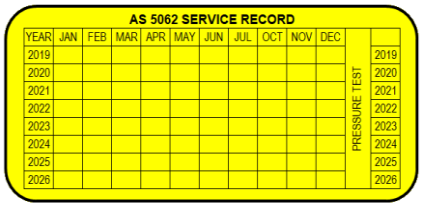
10.3 **Commissioning test** – must confirm operation of all fitted components.: Confirmation of coverage of selected hazards, Equipment shutdown delay time and sequence, Date of test.

10.4 **Completion Report** - Installer shall provide: Commissioning report, Certificate of completion, operating and maintenance instructions including as- installed drawings or schematics.

10.6 **Training** – All operators, supervisors and maintenance personnel shall be trained in the correct operation of the fire system. Operator refresher courses should be conducted on a regular basis.

11.1 **Maintenance** shall be carried out in accordance with the test and maintenance procedures detailed in the fire protection system manufacturer's listed manual.

11.3.1 Records shall be retained by the owner and shall include maintenance activities; defects; rectifications and by whom; and date conducted.



11.3.2 A service tag or label should be provided for each fire-protection system to record the last level of inspection, test and survey performed.

11.6.2 Critical defects shall be rectified as soon as practicable and shall be reported and confirmed in writing within 24 h. Equipment shall not be operated until the critical defects are rectified, unless alternative risk reduction measures are implemented. Non-critical defects shall be rectified as soon as practicable.

11.6.3 Design survey shall be undertaken to ensure the system will perform as it is intended. The survey shall include a check against baseline data, including the approved design for alterations, changes in use or operating environment, or other factors that could affect the fire system.

11.7 Routine Service Schedules

1. Six-monthly
2 Yearly
4 Five-yearly
5 Recharge after use

The figures shall be not less than 3 mm high, and the markings shall be such that the figures are legible. When a new service label is provided, the label shall be applied adjacent to the completed label so that the previous service history is not obscured.

FirePro. Reinventing Fire Suppression

CERTIFICATE OF COMPLETION & CONFORMITY

Rev 22.1

I/We (name of installer) **of** (company name) **hereby certify that we have completed a FirePro Condensed Aerosol Fire Suppression system in accordance with AS5062-2022, in accordance with the manufacturers design documentation.**

Name of Client :

Location of Equipment :

Description of Protected Area :(Machine Make/Model/Serial Number)

Protected Area	Agent Quantity	Number of Containers	Agent Application Density	Applicable Drawing(s)

Maximum Leakage Area – per Design Calculation _____m²

Shutdown installed _____ delay period for shutdown _____Seconds

Variations from this Standard previously agreed to by the authority having jurisdiction are attached (clause references and related variations included).

Completed by:

Name: _____ **Signature:** _____

Company: _____ **Date Completed:** _____

FirePro System Commissioning Mobile Plant

Rev 22.1

Risk: **Reference:**

This system has been installed in accordance with manufacturer's design documentation and AS5062

INSPECTION			
	Tasks		**Completed**
1.	**Location of FirePro Aerosol Generators**	• Ensure units are mounted in appropriate location(s). • Are the brackets securely mounted.	
2.	**Detection Systems**	• Installation of Detection is appropriate for the machine. • Detection is securely mounted. *NOTE : Detection may initiate fire suppression automatically.*	
3.	**Cabling requirements**	• Has fire rated and shielded cable used. • Cable separated from hydraulic hoses and electrical cables. • Cable fixings and cable path suitable (Conduit where necessary).	
4.	**Control Panel**	• Panel located in an appropriate location and is it securely mounted. • Power connection to the panel is suitable dedicated supply. • Backup battery installed.	
5.	**Signage and Alarms**	• Are appropriate signs / sounder strobes installed.	
6.	**Equipment Shutdown**	• Shutdown installed. • Shutdown delay in accordance with requirements.	
COMMISSIONING			
1.	**FIP Programming**	• Programming of Panel meets client/site requirements. • Check Panel for fault(s).	
2.	**Activation Testing**	• Activation testing to be performed in accordance with the procedures specific to the FIP installed. • Ensure FirePro Test Simulator Modules have activated • Ensure and Alarms have activated. • Ensure shut down have activated.	
3.	**Fault Monitoring**	• Disconnect cable from FirePro generator - fault should register on the FIP. Where multiple FirePro units are installed, this should done separately to test each unit. • Remove detector head from base - fault must register on FIP.	
4.	**Detection Testing**	• ENSURE the FirePro Test Simulator Modules installed for all FirePro Aerosol Generators. Place detectors into alarm. Ensure Visual/Aural Alarms have activated. Where multiple detectors are installed, each detector should be individually tested..	

Inspections all found to be compliant - Tests all completed.

Completed by :

Name: _____ **Signature:** _____

Company: _____ **Date Completed:** _____

Commissioning Documentation Requirements

In addition to this commissioning document, working documents shall be prepared by persons fully experienced in the design of this Fire Extinguishing System, in accordance with the requirements of AS 5062-2006. Working documents shall include at least the following items:

1. Drawings;
2. Type of aerosol generator(s) being used;
3. Description of occupancies and hazards to be protected against (risk assessment);
4. Specifications of aerosol generators used;
5. Equipment schedule or list of materials for each piece of equipment or device, including device name;
6. Manufacturer, model/part number, quantity and description;
7. FirePro System Design Calculation;
8. Description of fire detection, actuation and control systems.

Vehicle Hazard Analysis			Page ..... of .....
Job Description:	**Job Address:**	**Job Area:**	**Date:**

IMPORTANT : The requirements of Standards do not override the regulatory authorities or OH & S Legislation

Risk Assessment shall be carried out by competent personnel, such people include the Owner, Operator, Maintenance Personnel, Supplier, Insurer and other persons where applicable. The hazard analysis should be updated continuously at intervals (within 5 years) or when any changes are made to the equipment, the operating environment, the operator or if an incident, such as a fire or collision, occurs.

Type of Hazard	Class A		Class B		Class E		Class D	

Determine the possible fire scenarios. This includes: What can happen? When and where can it happen? Why and how can it happen? Examples of information that should be included in this section is fuel sources, ignition sources, normal operational conditions, foreseeable misuse and the effects of possible fires. In vehicles, areas in which possible fire scenarios can occur include but are not limited to;

Risk Area	Addressed by System
Turbo chargers	
Fuel systems (Incl. piping, hoses, pumps valves & injectors close to ignition sources)	
Cooling systems (including hydraulics, engine and transmission),	
Exhaust systems	
Hydraulics systems (including piping, hoses, pump and valves)	
Lubrication systems (including engine and transmission systems and grease systems)	
Braking systems (including retarders, park brakes and service brakes)	
Electrical systems (including alternators, generators, batteries, wiring and switch gear)	
Conveyor belts	
Areas where combustible materials can accumulate (including belly plates, engine valleys and wheel arches)	

Quantify the risk exposure by determining the likelihood and consequences of the fire scenarios. This shall take into account normal operating conditions as compared to intended operating conditions. This includes, poor maintenance practices, operator use/misuse, inexperienced operators, use of oils and greases, equipment interaction, wear and tear of components and the operating environment (for example; road conditions, equipment speeds or time of day). The analysis should include the following, where applicable;

- Health and safety of the operator / passengers
- Health and safety of people in the vicinity
- Production loss,
- Environmental damage.
- Property loss

Prioritize the possible fire risks based upon the likelihood of a fire event occurring and the potential damage caused. This should take into account factors including; the availability of firefighting equipment and personnel, egress points, means of fire detection and the availability and response time of external support. If the results of the evaluation indicate an unacceptable level of risk exists, then fire risk reduction measures should be undertaken.

What Can Happen? Determine the possible fire scenarios. Include When, Where and How it can happen. Include drawings/schematics.	**How likely is this to happen?** Quantify the risk exposure by determining the likelihood and consequences of the fire scenarios.	**Prioritise the possible fire risks.** What risk needs to be addressed first, and how? What existing controls are in place?

Fire System Design Specification	
Fire Fighting Agent	
Detection System	
Control System	
Shutdown Protocols	
Operating Limitations	

Hazard Analyst:		Hazard Analyst:		Site Supervisor:	
Position:		Position:		Position:	
Signature:		Signature:		Signature:	