OWNERS MANUAL

Contents

ENVIROTEC FIRE SYSTEMS

Introduction

The Envirotec system is designed for harsh climates and conditions such as mining.

The system is tested to Australian Standard AS5062 for both the components and fire performance.

The Envirotec fire suppression system is a conventional foam fire system which contains a measured volume of Fluorine Free Foam (AFFF) concentrate and potable water.

A detection system senses heat and activates the discharge valve. Nitrogen within the cylinder expands to discharge the foam agent into the discharge network. The foaming agent is released via the nozzles to suppress the fire.

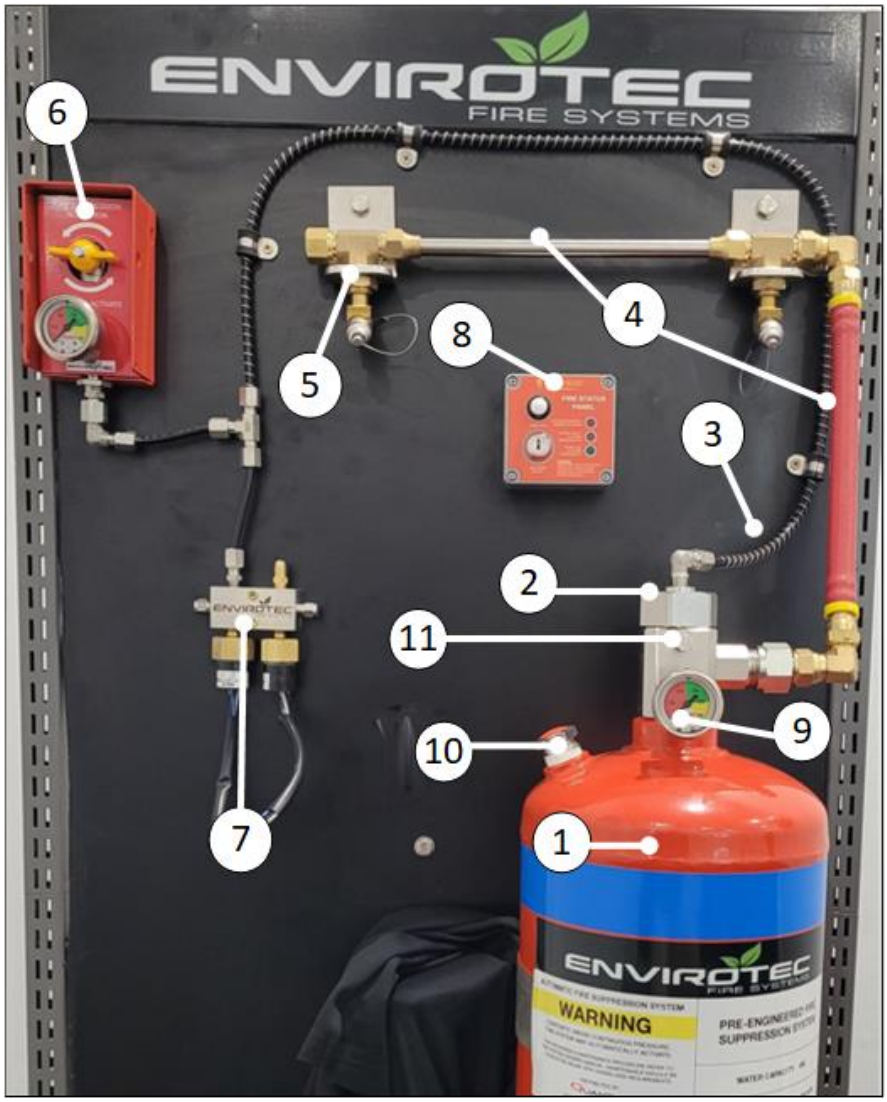
The system will activate automatically without the need for electricity due to the Loss of Pressure (LOP) style of detection. Manual activation points are available for installation at the operators location and external to the cabin.

Disclaimer

The information in this manual is intended as general information only. The information in this manual is for the use of Envirotech trained personnel. Envirotech take no responsibility for the for the use of such information by other parties.

System Components

Item	Description
1	Cylinder
2	Discharge Valve
3	Detection tube
4	Distribution network
5	Nozzle assembly
6	Manual Actuation point
7	Manifold with 200Kpa and 1200Kpa pressure switches
8	Alarm Panel
9	Pressure Gauge
10	Pressure Relief Valve
11	Schroeder valve for pressurising the system.



Functional Description

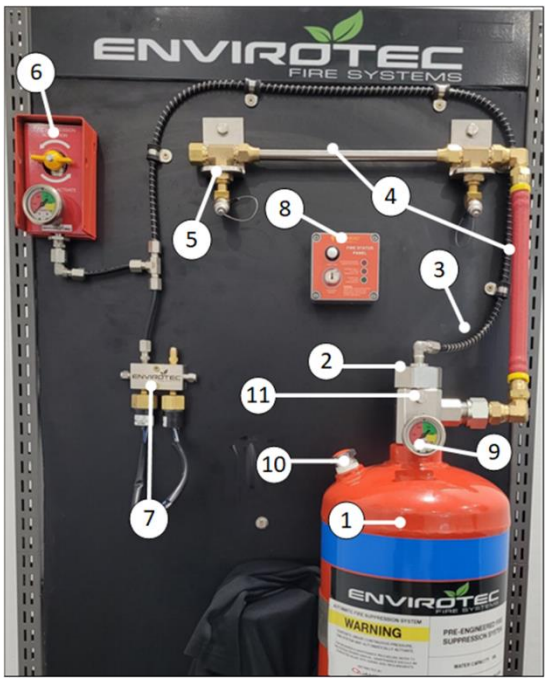
The agent cylinder (1) holds water, fluorine free foam and nitrogen in specific quantities (*see Table 1 – Filling volumes & Pressures*).

The Loss of Pressure detection tube (3) activates the fire system when the heat ruptures the Loss of Pressure tubing. The piston inside the Discharge Valve (2) moves upwards and releases the water and agent into the distribution network (4) releasing the mixture via the nozzles. The nozzle caps are released at the time of discharge.

The operator is provided with an indicator panel (8) to alert them to the status of the fire system. The fire system can be manually activated via the activation points (6).

Signals to the alarm panel for FAULT and ALARM conditions are provided by the pressure switches installed onto the manifold assembly (7).

The agent cylinder has a pressure relief valve (10) to reduce the risk of over pressurising the cylinder. Cylinder pressure is indicated by the pressure gauge (9).



Operation and Maintenance Risks

The Envirotec system is a listed system. Any use of non-genuine parts will void warranty, void compliance to AS5062 and potentially affect the function of the fire system.

i. The Envirotec fire system is a pressurised system which is activated pneumatically. Pressure may be contained within the cylinders, detection tube and actuation network.
ii. Only trained personnel shall install or maintain the system.
iii. In the event an engine shutdown option is installed, the operator shall be informed of the shutdown period and any DELAY functions.

Operation and Maintenance Procedures

Daily inspections

AS5062 prescribes a number of daily inspections to ensure the system is in an operable condition.

Notice: The tables in the *Inspect and Test Schedules* section of this manual provide additional detail.

Item #	Item	Action required and pass/fail requirement	Daily
1.1	Storage Container Pressure	Check all container pressure indicators are visible and read within normal range. (Operable range shall be no less than 90% of nominal charge pressure). Where there is no container, check that the system discharge indicator pressure indicator has not operated	√
1.2	Manual Actuators	a) Check that all release anti-tamper seals/pull pins are in place and secure b) Check that all actuators are secure, clean, undamaged and accessible	√ √

1.3	System control and indicating equipment where fitted	a) Check that all indicators show normal condition b) Check that all panels are secure, clean, undamaged and accessible	√ √

Manual Activation

The manual activation points will activate the fire system by releasing the pressure from the detection network. Manual activation is achieved by turning the yellow activation handle anti-clockwise which will also break the anti-tamper device.

Activation of the system manually will also initiate the indications or controls as governed by the alarm panel.

Notice: Due to the actuators ball valve design, there are no replaceable internal components or application of lubricants required during routine maintenance.

Manual actuator with anti-tamper tie

System activated Position

Automatic Activation

Automatic activation occurs when the detection tube is ruptured by heat. A pressure switch provides a signal to the indicator or control panel (when fitted) to alert the operator.

In the case of an indicator and control panel being installed, the machine may automatically shut down.

Alarm Panels

The Envirotec system consists of two pressure switches which provide an ALARM or FAULT condition.

When the pressure in the detection network drops below 1200Kpa, the fault pressure switch will change state. An amber FAULT indication will appear on the alarm panel which signifies low pressure in the cylinder.

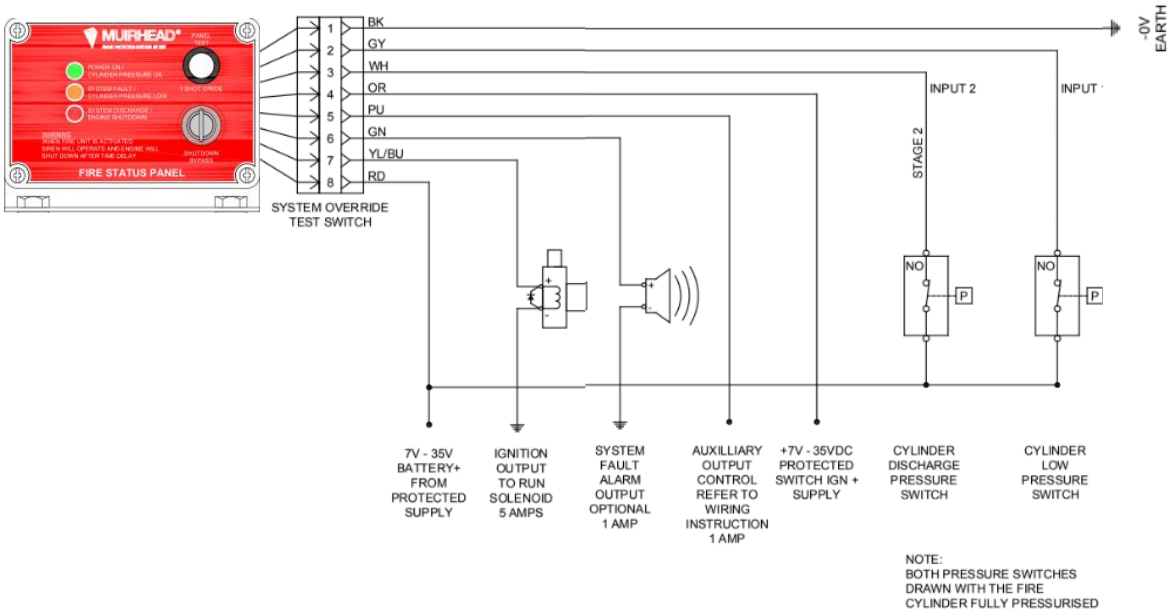
If the pressure reduces to below 200Kpa, the ALARM pressure switch will change state. A red ALARM indication will display on the alarm panel which signifies the detection tube has been ruptured by heat or a manual activation has occurred.

The Muirhead® Fire Status Panel

The Muirhead® Fire Status Panel is designed and built to the latest Australian Standards AS5062. The panel will monitor the status of the fire bottle from two pressure switch inputs. The low-pressure input warns the operator when the bottle pressure is below the desired KPA level

The shutdown pressure switch will trigger when the bottle has been discharged. It also has a key switch for override and push button for extended shutdown when activated

- Multi Voltage
- Solid State Technology
- Programmable shutdown
- One Shot Extension
- Key Swich Override
- IP65 Panel

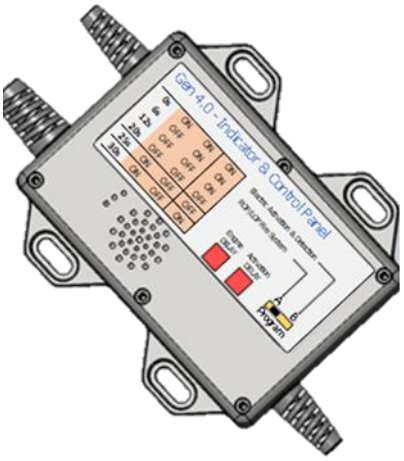


Notice: Refer to the OEM Alarm Panel Manual for installation guidelines

ENVIROTEC FIRE SYSTEMS

Gen 4.0 Control & Indicating button

The Generation 4 panel has a compact display, plus a separate intelligent control unit which contains the batteries, relays and electronics.



Intelligent Control unit

Control & Indicating button

The Control & Indicating button provides the operator with the status of the fire system and also has programable time switches for engine shut down and system activation.

a) *System Fault* – consists of an amber indication and intermittent audible alarm.
b) *Systems discharge* – consists of a latching red indication and continuous audible alarm.
c) *Power on* – consists of a green indication.

The multi-use button allows the operator to (1) Mute (2) Delay (3) Test (4) Reset (5) Engine shut-down override.

Press duration	Function	Comments
Momentarily	Mute	Panel is mute for a period of 5 minutes
Momentarily	Delay engine shutdown	This function is a one-time only delay
6 seconds	Test	The test function does not activate the fire system
6 seconds	Reset	The system will only reset once the faults are cleared.
11 seconds	Engine Override	This function de-energises the relay for 10 minutes.

The internal rechargeable battery provides 24-hour battery back-up in the case that primary power is disconnected.

Testing the alarm button (Program A):

a) Pressing the alarm button for 6 seconds will initiate the TEST sequence. This will replicate
    a. Alarm and fault conditions
    b. Count down the period for engine shutdown and energise the relay.
    c. This will not activate the system
b) Disconnecting the alarm pressure switch will result in a red flashing visual indication and a quickening tone as the countdown period is about to expire. The tone and red visual indication will then be latched.
c) Disconnecting the fault pressure switch will result in a yellow visual indication and periodic tone.

Testing the alarm button (Program B):

a) Pressing the alarm button for 6 seconds will initiate the TEST sequence. This will replicate
    a. Alarm and fault conditions
    b. Count down the period for engine shutdown and energise the relay.
    c. This will not activate the system

b) Providing a short circuit on the lineal heat detector circuit will result in a red flashing indication and a quickening tone as the countdown period is about to expire. The tone and red indication will then be latched. The fire system will automatically discharge unless the metron or solenoid has been disconnected.

Notice: Refer to the OEM Alarm Panel Manual for installation guidelines

Cylinder Filling Volumes, Pressure & Sizing

Table 1

Cylinder Size	Potable water	Fluorine Free Foam	Nitrogen pressure @ 20 Degrees C
ENVIROTEC 25L CYLINDER	19 (L)	500 (ml)	1800Kpa
ENVIROTEC 45L CYLINDER	34 (L)	1 (L)	1800Kpa
ENVIROTEC 65L CYLINDER	48.5 (L)	1.5 (L)	1800Kpa
ENVIROTEC 106L CYLINDER	80 (L)	2 (L)	1800Kpa

Notice: Use only Envirotec 1% SILVARA 1 F3 FOAM CONCENTRATE

Replacement Intervals

Part Number	Description	Listed Life
ENV 1015	ENVIROTEC Fluorine Free Foam	Maximum of 5 years
ENV 1009 - XX	HOSE WORK	Maximum of 5 years
ENV 1010	1/4" RED BURN TUBE - 175 DEG	Maximum of 5 Years
1200	PISTON AND SERVICE KIT	Maximum of 12 months

All components shall be viewed for condition and function at the periodic inspections.

Inspect & Test Schedules

Notice: The Envirotec system shall be maintained in accordance with the current version of AS5062 and the Envirotec training modules for maintenance.

Inspection Schedule

Item #	Item	Action required and pass/fail requirement	Daily	Six-Monthly	Yearly
1.1	Storage Container Pressure	Check all container pressure indicators are visible and read within normal range. (Operable range shall be no less than 90% of nominal charge pressure). Where there is no container , check that the system discharge indicator pressure indicator has not operated	√	√	√
1.2	Manual Actuators	a) Check that all release anti-tamper seals/pull pins are in place and secure b) Check that all actuators are secure, clean, undamaged and accessible	√ √	√ √	√ √
1.3	System control and indicating equipment where fitted	a) Check that all indicators show normal condition b) Check that all panels are secure, clean, undamaged and accessible	√ √	√ √	√ √
1.4	Distribution System	a) Check nozzle caps are in place, if not, clean nozzle and replace caps b) Check nozzles are pointing at pre-determined aiming points c) Check distribution system - hoses, tube fittings and support brackets are intact and not damaged		√ √ √	√ √ √
1.5	Actuation System	a) Pneumatic actuation system (if fitted) Check hoses, tube, fittings and support brackets are intact and not damaged b) Electric actuation system (if fitted) Check wiring, connections and supports are intact and not damaged		√ √	√ √

1.6	Detection System	a) Pneumatic detection system (if fitted) Check detection hoses, tube, fittings and support brackets are intact and not damaged and are in position b) Electric detection system (if fitted) Check detectors, wiring, connections and supports are intact, not damaged and detectors are in position		√ √	√ √
1.7	Labels	Check manual release, system warning and instruction labels are securely in place, visible and legible		√	√
1.8	Labels	a) Check storage containers and valves are not damaged b) Check storage container and mounting bracket are secure c) Remove container and inspect mounting bracket and container for damage and condition d) Check storage container label is securely in place, visible and legible e) Check date of test or manufacture on storage container		√ √ √ 	√ √ √ √ √

Test Schedule

Item #	Item	Action required and pass/fail requirement	Six-Monthly	Yearly
2.1	Manual Actuators	a) Physically check that all actuators are secure, clean, undamaged and accessible b) Test operation c) Check contents of actuator cartridges (if fitted)	√ √ √	√ √ √
2.2	System control and indicating equipment where fitted	a) Test all indicators and audible alarms b) Physically check that all panels are secure c) Test battery capacity (if fitted)	√ √ √	√ √ √
2.4	Distribution System	Conduct clear passage test using dry nitrogen and physically check distribution system (ie that hoses, tube, fittings and bracket supports are secure)		√
2.5	Actuation System	a) Pneumatic actuation system (if fitted) 1) Test pneumatic circuits for leaks 2) Physically check hoses, tube, fittings and support brackets are secure b) Electric actuation system (if fitted) 1) Function test all actuation circuits 2) Check all wiring for earths 3) Physically check wiring, connections and supports are secure		 √ √ √ √ √
2.6	Detection System	a) Pneumatic detection system (if fitted) 1) Test pneumatic circuits for leaks 2) Check hoses, tube, fittings and supports are secure b) Electric detection system (if fitted) 1) Function test all detectors 2) Check all wiring for earths 3) Check wiring, connections and supports are secure		 √ √ √ √ √
2.7	Discharge Test	a) Conduct discharge test (Optional) and record results b) Check fire system nozzle area coverage		√ √
2.8	System interface and shutdown	Test all fire system activated equipment shutdown and record delay time		√

Preventative Maintenance Schedule

Item #	Item	Action required and pass/fail requirement	Six-Monthly	Yearly	Five Yearly
3.1	Detector sensing element with a listed lifetime	Replace any detector sensing element that will exceed its listed lifetime prior to the next scheduled maintenance		√	√
3.2	Pyrotechnic Actuators	Replace any actuator that will exceed its listed lifetime prior to the next scheduled maintenance		√	√
3.3	Mechanical Actuator	Service and lubricate all mechanical actuators in accordance with the manufacturer's recommendations		√	√
3.4	Nozzles	Remove all nozzle caps, clean nozzles and refit caps	√	√	√
3.5	Strainers, filters and check valves (where fitted)	Check and clean line strainers, filters and check for correct orientation of check valves			√
3.6	Container	a) Subject the container to a hydrostatic pressure test in accordance with AS2030.1 b) Replace container valve seats and seals at this time			√ √
3.7	Container vales	Service and lubricate In accordance with the manufacturer's recommendations during hydrostatic pressure test cycle		√	 √
3.8	Extinguishing agent	Foam ~~1) Pre-mix solution - replace~~ 2) Concentrate - REPLACE ~~3) Wet Chemical - analyse~~ ~~4) Powder - examine~~			√

Survey Schedule

Item #	Item	Action required and pass/fail requirement	Yearly	Five Yearly
4.1	Nozzle obstructions	Check for adequate clear space at nozzles and for obstructions likely to impede discharge	√	√
4.2	Nozzle orientations	Check nozzles are pointing at the pre-determined aiming points	√	√
4.3	Nozzle location and coverage	Check for the introduction of fixtures and bulkheads shielding nozzle discharge and the presence of unprotected hazard areas, particularly where a source of fuel and heat exists	√	√
4.4	Detector Coverage	Check for the presence of unprotected hazard areas, particularly where a source of fuel and heat exists	√	√
4.5	Operational conditions	Check that the detector response and extinguishing agent discharge or retention will not be adversely affected by such things as enclosure openings, ventilation airflows or high temperature protected areas	√	√
4.6	Environment al conditions	Check that the fire system and its components are suitable for the environmental conditions in which the machine is operating, for example, that components are suitable for underground mining and road gradient and slopes are within cylinder orientation limits	√	√

Parts Listings

Water Cylinders	
ENV 1002 - 16L	ENVIROTEC 16L CYLINDER
ENV 1002 - 25L	ENVIROTEC 25L CYLINDER
ENV 1002 - 45L	ENVIROTEC 45L CYLINDER
ENV 1002 - 65L	ENVIROTEC 65L CYLINDER
ENV 1002 - 106L	ENVIROTEC 106L CYLINDER
Water Cylinder Brackets	
ENV 1008-16/25L	ENVIROTEC 16/25L CYLINDER BRACKET
ENV 1008-45L	ENVIROTEC 45L CYLINDER BRACKET
ENV 1008-65L	ENVIROTEC 65L CYLINDER BRACKET
ENV 1008-106L	ENVIROTEC 106L CYLINDER BRACKET
Water Cylinder labels	
ENV 1017 - 16L	16L CYLINDER LABEL
ENV 1017 - 25L	25L CYLINDER LABEL
ENV 1017 - 45L	45L CYLINDER LABEL
ENV 1017 - 65L	65L CYLINDER LABEL
ENV 1017 - 106L	106L CYLINDER LABEL
Fluorine Free Foam	
ENV 1015	ENVIROTEC 0.3% F3 FOAM CONCENTRATE
Syphon Tubes	
ENV1001 -16	ENVIROTEC 16L SS SYPHON TUBE
ENV1002 -25	ENVIROTEC 25L SS SYPHON TUBE
ENV1001-35	ENVIROTEC 35L SS SYPHON TUBE
ENV1001-45	ENVIROTEC 45L SS SYPHON TUBE
ENV 1001-65	ENVIROTEC 65L SS SYPHON TUBE
ENV1001-88	ENVIROTEC 88L SS SYPHON TUBE
ENV1001-106	ENVIROTEC 106L SS SYPHON TUBE
Valve and Cylinder Components	
ENV1004	ENVIROTEC PRESSURE RELIEF VALVE
ENV1000	ENVIROTEC LOP VALVE
ENV 1012-1200KPA	1200 KPA PRESSURE SWITCH
ENV 1012-200KPA	200KPA PRESSURE SWITCH
2062	1/8NPT - 7/16 SCHRADER VALVE W CAP
ENV 1003	CYLINDER BUNG 1/4 FEMALE CENTRE THREAD
1200	PISTON AND SERVICE KIT
ENV 1007	40MM OIL FILLED GAUGE

Distribution Network	
ENV 1013-8W	1/4 INCH 8W NOZZLE
ENV 1013-16W	1/4 INCH 16W NOZZLE
ENV 1014	STAINLESS STEEL BLOW OFF CAP
ENV 1009 - 1/2	1/2" RFS FIRE SUPPRESSION HOSE
ENV 1009 - 3/4	3/4" RFS FIRE SUPPRESSION HOSE
ENV 1009 - 3/8	3/8" RFS FIRE SUPPRESSION HOSE
1025	1/4 BSPT M/F 90 DEG BRASS
1026	1/4 BSPT M/F 45 DEG BRASS
1030	1 1/16 BRASS FIELD ATTACH - 3/4HOSE
1031	3/4 BRASS FIELD ATT HOSE TAIL - 1/2 HOSE
1057	3/4 FLARE NUT FOR 1/2" STAINLESS
1058	1/2" STAINLESS TUBE - 1.5M LENGTH
1059	NOZZLE BRACKET - SUIT 1074
1060	3/4 MALE TEE - 1 1/16 M ON BRANCH
1063	3/4 JIC 90 DEG M/F ELBOW - BRASS
1064	1 1/16 JIC 90 DEG M/F ELBOW
1065	3/4 BRASS 45 DEG M/F ELBOW
1066	1 1/16 JIC M/F 45 DEG ELBOW
1067	3/4 JIC - 1/4 BSP BULKHEAD NOZZLE TEE
1069	3/4 JIC 90 DEG M/F ELBOW - BRASS
1070	1 1/16 JIC 90 DEG M/F ELBOW
1071	3/4 BRASS 45 DEG M/F ELBOW
1072	1 1/16 JIC M/F 45 DEG ELBOW
1074	3/4 JIC - 1/4 BSP BULKHEAD NOZZLE TEE
1076	3/4 JIC CAP
1091	1/4 BSPF TEE - MALE ON BRANCH

(add picture here)

Actuation Network & Components	
ENV 1010	1/4" RED BURN TUBE - 175 DEG
1000 – 1MBTK	1 METRE BURN TUBE KIT
1000 – 2MBTK	2 METRE BURN TUBE KIT
1000 – 3MBTK	3 METRE BURN TUBE KIT
1000 – 4MBTK	4 METRE BURN TUBE KIT
ENV 1009 - 3/16	3/16 RFS FIRE SUPPRESSION HOSE
2041	MANIFOLD – 6 PORT
1012A	7/16 FERRULE FOR JIC HOSE TAIL
1012B	7/16 JIC BRASS HOSE TAIL
1023	1/8NPT - 7/16 JIC ELBOW
ENV 1006	MANUAL ACTIVATION POINT - AS 5062
ENV 1007	40MM OIL FILLED GAUGE
Alarm Panels	
1300	ENGINE SHUTDOWN PANEL MUIRHEAD
AS5062-Gen4.0	Generation 4.0 Indicator & Control Panel

System Design & Installation

System design calculation

Calculating the risk is determined by the surface area of the risk. In this example the risk is the engine on a large machine.

If the engine is 1.5m (H) x 1mtr (W) x 2m (L) the total surface area to protect is determined as the size of the water spray cover required to encapsulate the risk.

1 x Top	(2m2)
2 x Ends	(1.5m2 + 1.5m2)
2 x Sides	(3m2 + 3m3)

In this example the total m2 is 11m2. The nozzle positions will be determined by the structure surrounding the engine, the items within the engine compartment and the unobstructed spray pattern of the nozzle to cover the risk.

As a minimum the nozzle count shall be 1 nozzle for each 0.8m2 risk area.

Calculation: 11m2 risk surface / 0.8 coverage per nozzle = 13.75 (nozzles)

For the example provided this allows for a 13.75 nozzle system (14 nozzles).

The goal of the design is to provide spray coverage of the risk by placing the nozzles at orientations which provide a discharge pattern covering the risk surface. A discharge test is the ultimate indication of spray pattern.

The discharge duration must also be considered as part of the risk assessment. The designer shall increase the cylinder size to meet the outcomes of the risk assessment. Consideration for additional nozzles should be provided where nozzle placements are not optimum due to placement or as witnessed during the discharge test.

Each cylinder size has limitations for the number of nozzles and distribution length. These must not be exceeded.

Notice: The risk assessment should consider the engine continuing to run after the fire suppression system has been activated. If the engine fan will adversely affect the performance of the fire suppression system, there should be consideration of the engine being automatically shut down.

Limitations of Use

A discharge test must be performed on the completion of the installation. The spray pattern, system sizing & components used shall be in accordance with this manual.

System discharge duration, risks protected, and engine shutdown periods shall be determined via a vehicle risk assessment.

Temperature	Cylinder orientation from vertical
0 – 60 Degrees Celsius	15 Degrees

Cylinder & Orientation	Cylinder (ltrs) (Water)	Nozzle count	Network Length (Max)	Discharge Duration (min)
25L	19ltrs	4	6m using a 1/2" feeder hose	1:00
45L	35ltrs	7	8m using a 1/2" feeder hose	1:14
65L	50ltrs	10	10m using a 1/2" feeder hose	1.28
106L	80ltrs	12	12m using a 3/4" feeder hose	1:36

Installation & Commissioning Check list

Item	Description	Check
1	Cylinder bracket is installed via the base of the bracket using the four mount locations and is tight and secure.	
2	All cylinder decals are installed and instructions visible	
3	Check water and foam fill volumes are correct for cylinder size.	
4	a) Check dip tube is connected to the valve and valve is securely mounted to the water cylinder. b) Check the fill plug is fitted with the correctly rated pressure relief valve. c) Pressurise cylinder with nitrogen to 1600Kpa at the Schrader valve on the top of the discharge valve	
5	Feeder hose from Valve to distribution network is securely fitted and sized correctly for the cylinder volume.	
6	Check the total length of distribution network does not exceed the limitations.	
7	The distribution network is designed as a ring main or a balanced system where a similar count of nozzles is fed by the feeder hose on each side of the tee connection.	
8	Check nozzle count is within specification	
9	Check for leaks in the detection network by using leak detection spray or a soapy water spray.	
10	Check alarm pressure switch and fault pressure switches are installed on the LOP detection network manifold block (fault pressure switch can also be installed on the valve)	
11	Check distribution network tight, secure and mounted appropriately with all nozzles correctly orientated and nozzle caps in position.	
12	Check detection network tight, secure, and mounted appropriately and the LOP detection provides for sufficient coverage of the risk	
13	Check alarm Panel cabling secure and mounted appropriately.	
14	a) Check at least one manual actuation point shall be within reach and clearly visible from the normal operating position. b) Check decals for the manual activation located adjacent to the manual activation point.	
15	a) Check external actuator is accessible from ground level and within the egress path of the operator. b) Check decals for the manual activation located adjacent to the manual activation point.	
16	If a Fire Indicator and Control panel is installed which may automatically shut the machine down or delay activation; a decal clearly showing the shutdown period, delay period and activation delay where applicable. The decal should be mounted adjacent to the panel.	
17	With the machine running, disconnect the FAULT pressure switch to witness a fault on the panel.	
18	With the machine running disconnect the ALARM pressure switch to witness an alarm indication on the panel and the engine shutdown (if applicable).	
19	Confirm shutdown period matches the time on the TIME DELAY decal.	
20	Reset all panels and open all viewing hatches.	

21	Provide a barrier around the machine and inform others of the impending discharge test.	
22	Manually activate the system from the cabin actuator. a) View discharge b) Record discharge duration c) Repeat if any adjustments are required to the system.	
23	Recharge and Commission the system.	
24	Complete a Certificate of Completion in line with the current version of AS5062	

MSDS

SAFETY DATA SHEET
According to Regulation 1907/2006/EC (REACH), 453/2010/EC, 830/2015 and 2020/878/EU

SILVARA I

FIRE FIGHTING FOAM CLASS A,B – 1%

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier:

Trade name: SILVARA I.

Substance/Mixture: Mixture.

1.2. Relevant identified uses of the substance or mixture and uses advised against:

Relevant uses: FFF Fluorine Free Foam Firefighting concentrate. For industrial and professionals use only. Dosage of use: 1% for use on Class A and B fires (hydrocarbon fires) using low expansion devices and 3% using medium and high expansion devices. At concentration recommended the product **IS NOT LISTED AS HAZARDOUS.**
Uses advised against: The product should not be used in ways other than those referred in relevant uses (see Section 7.3)

1.3. Details of the supplier of the safety data sheet:

Supplier/Manufacturer:

VS FOCUM, S.L.
Polígono Industrial Olloniego. Parcela B-17
C.P. 33660- Olloniego – Oviedo – Asturias (España)
Tlf: +34 985 30 71 45 / Fax: +34 985 16 86 39
info@vsfocum.com
www.vsfocum.com

E-mail competent person: info@vsfocum.com

1.4. Emergency telephone number:

+34 985 30 71 45 - Horario: 8:00 a 17:00 de Lunes a Viernes (excepto días festivos).

+34 620 80 86 17 – 24 horas. **02 4944 7700 (Australia Local supplier)**

AUSTRALIA: Call Poison Information Center with the MSDS of the product. PHONE: 1311 26.

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture.

Classification according to Regulation (CE) No. 1272/2008:

AUSTRALIA
LOCAL SUPPLIER: Fire Response Pty Ltd.
ADDRESS: UNIT 13, 26 OAKDALE ROAD GATESHEAD NSW 2290 - AUSTRALIA
TELEPHONE: 02 4944 7700
EMAIL:firemail@fireresponse.com.au

Foam concentrate 100%:

Class	Category	Hazard statements	Hazard Pictograms	Classification method
Eye Dam.	Category 1	H318 – Causes serious eye damage.	 GHS05	Calculation method

Dilution 1-3%:

This dilution is classified as not dangerous according to regulation (EC) 1272/2008 (CLP).

2.1.1. Main physicochemical properties: Not flammable. Not explosive. Not combustion (see Section 9)

2.1.2. Stability and reactivity: May react with strong oxidizers. Don't use containers, pipes or fittings galvanized steel. Avoid using the product on the fire of metals, electrically energized equipment and contact with materials that react with water. Avoid temperatures outside the range prescribed storage (see Section 10).

2.1.3. Toxicological information:
Skin contact: Non-irritating.
Eye contact: Causes serious eye damage.

2.2. Label Elements.

Labelling according to Regulation (EC) No. 1272/2008. The product is labelled according to the CLP regulation.

Hazard pictograms:


GHS05

Signal word: Danger

Hazardous ingredients:
(2-(2-butoxyethoxy)ethanol); Sulfuric acid, mono- C12-14 (even numbered)-alkyl esteres, compds. with triethanolamine; Hydroxide (carboxymethyl) dimethyl-3 - [(1-oxododecil) amino] propylammonium; 1-Propanaminium, N- (3-aminopropyl) -2-hydroxy-N, N-dimethyl-3-sulfo-, N- (C12-18 (also numbered) acyl) derivs., Hydroxides, internal salts

Hazard statements:

H318 – Causes serious eye damage.

Precautionary statements:

Prevention:

P280 – Wear protective gloves/protective clothing/eye protection/face protection.

Response:

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 - Immediately call a POISON CENTER or doctor/physician.

2.3. Others hazards:

Results of PBT and vPvB assessment: Substance does not meet the criteria for PBT or vPvB in accordance with Annex XIII of Regulation (EC) no. 1272/2008.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical characterization: Mixture of surfactants in aqueous solution.
Description: Mixture of the substances listed below.
Hazardous components:

Components	CAS EINECS REACH-No	Danger class CLP-Regulation (EC) 272/2008	Concentration range
(2-(2-butoxyethoxy)ethanol)	112-34-5 203-961-6 01-2119475104-44-xxxx	H319 Eye irrit., Cat. 2	10-15%
Sulfuric acid, mono-C12-14 (even numbered)-alkyl esters, compds. with triethanolamine	90583-18-9 292-216-9 01-2119970645-28-xxxx	H315 Skin irritat. Cat. 2 H318 Eye dam. Cat. 1 H412 Acute Tox. Cat 3	3-5%
Hydroxide (carboxymethyl) dimethyl-3 - [(1-oxododecil) amino] propylammonium	4292-10-8 224-292-6 01-2119487970-25-0000	H318 Eye dam. Cat. 1 H412 Acute Tox. Cat 3	1-3%
1-Propanaminium, N- (3-aminopropyl) -2-hydroxy-N, N-dimethyl-3-sulfo-, N- (C12-18 (also numbered) acyl) derivs., Hydroxides, internal salts	- 939-455-3 01-2119970901-34-xxxx	H318 Eye dam. Cat. 1 H411 Long-term (chronic) aquatic hazard, Category 2	1-3%

Other components: Anionic surfactant (<1%), Amphoteric surfactant (<1%), Polyether (<3%), Saccharides (<40%), corrosion inhibitor (<0,3%) and Water (<40%).

Additional information:
Silvara I does not contain any persistent organic chemicals such as fluorinated organic substances (PFAS) or siloxane (D4, D5 and D6).
For the wording of the listed risk phrases refer to section 16.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures.

If symptoms persist in case of doubt, seek medical advice with the MSDS of the product.

4.1.1. After Inhalation: Supply fresh air; consult a doctor in case of pain.
4.1.2. After Skin contact: Immediately wash with water and soap and rinse thoroughly. If skin irritation or allergic reaction continues, consult a doctor.
4.1.3. After Eyes contact: Protect unharmed eye. Rinse the eyes with open eyelids for 10-15 minutes with water. Then consult an eye specialist immediately.
4.1.4. After Swallowing: Rinse mouth with water. Spit liquid out again. Do not induce vomiting. Seek medical help.

4.2. Most important symptoms and effects, both acute and delayed.

Serious damage to eyes.

4.3 Indication of any immediate medical attention and special treatment needed.

In the case of doubt or when malaise symptoms persist, seek for medical attention.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media.

Have emergency facilities or elements of action according to the local legislation.
The product is not combustible and does not support any combustion.
Use Water, foam, carbon dioxide or dry chemical.

5.2. Special hazards arising from the substance or mixture.

The combustion or the thermal decomposition of the product can generate carbon dioxide or carbon monoxide. The exposure to combustion products can be dangerous for the health.

5.3. Advice for firefighters.

According the magnitude of the fire, it can be necessary the use of protection clothes for heat, independent respiratory equipment, gloves, protective goggles or facial mask and boots.
Additional information: Collect contaminated fire fighting water separately. It must not enter the sewage system.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures.

Wear individual safety protection. Particular danger of slipping on leaked/spilled product.

6.2. Environmental precautions.

Avoid the contamination of the soil, drainage systems and superficial or underground water.
In the case of seepage into the ground, into water course or sewage system, inform to the competent authorities according the local legislation.
In case of seepage into the ground inform responsible authorities.

6.3. Methods and material for containment and cleaning up.

Ensure adequate ventilation. Contain spill. Cover with absorbent material. Collect spilled material and place in a closed and identified container.

6.4. Reference to other sections.

See section 7 for information on safe handling.
See section 8 for information on personal protection equipment.
See section 13 for disposal information.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling.

Comply with current legislation regarding Occupational Health and Safety. Avoid contact with eyes, skin or clothing. Avoid ingestion or inhalation. Avoid spill of the product and maintain remote of water drainage systems. Wash the hands after each use.

7.2. Conditions for safe storage, including any incompatibilities.

Store in original container or tanks designed for product storage, avoiding its evaporation and contamination with strange material. Store at temperatures between -15° C and 50° C.
Unsuitable material: Galvanised steel. Store away from foodstuffs. Store away from feed.
Refer to national regulations for storing hazardous chemicals.

7.3. Specific end use(s).

FFF Fluorine Free Foam Firefighting concentrate. For industrial and professionals use only.
Dosage of use: 1% for use on Class A and B fires (hydrocarbon fires) using low expansion devices and 3% using medium and high expansion devices.
Observe handling instructions for preparing ready-to-use mixtures and for using the solutions.
Observe technical data sheet.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters.

Components with limit values that require monitoring at the workplace:
IOELV (European Union)

Components	CAS EINECS REACH-No	Long-term value	Short –term value
(2-(2-butoxyethoxy)ethanol)	112-34-5 203-961-6 01-2119475104-44-xxxx	10 ppm; 67 mg/m^3	15 ppm; 101 mg/m^3

8.2. Exposure controls.

The usual precautionary measures should be adhered to when handling chemicals.

Keep away from foodstuffs, beverages and feed.

Do not eat, drink, smoke or sniff while working.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Avoid contact with eyes and skin.

After skin contact, cleanse skin thoroughly.

After contact with eyes, rinse immediately.

8.2.1. Eye/face protection:
It is recommended to wear safety glasses with side shields and if risk of splashes and / or liquid projections use face shield (CE Category III).

8.2.2. Hand protection:
Chemical resistant gloves (EN 374) (CE Category II).

8.2.3. Body protection:
It is recommended to use work clothes (CE Marking Category I) and non-slip safety footwear (CE Marking category II).

8.2.4. Respiratory protection:

Under normal conditions of use respiration protection should not be required. It is recommended to have room well-ventilated.
If unintentional release of substance, exceed the occupational exposure limit value: In case of brief exposure or low pollution use a respiratory filter device. In case of intensive or longer exposure use a respiratory protective device that is independent of circulating air.
Short term filter device (EN 149):
Filter A-P2
Breathing Equipment is only to be used in order to handle the residual risk of short-term jobs if all other risk minimizing measures have been carried out. E.g. retention and/or local exhaust.

8.2.5. Environmental exposure controls:

Avoid spill of the product and the container to the environment (see Section 6). Handle according to the local normative and following good practice.

SECTION 9: PHISICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties.

Physical state: Liquid (Normal conditions of temperature and pressure – NTP – 20ºC/1atm)
Colour: Amber.
Odour: Characteristic.
Odour threshold: Not determined*.
Freezing point: ≤-15ºC (pressure 1atm).
Boiling range: 90-130°C (pressure 1atm).
Flammability: Mixture is not flammable.
Explosion limit: Not applicable*.
Flash point: Not applicable*.
Auto-ignition temperature: Mixture is not auto-ignition.
Decomposition temperature: Not determinate*.
pH-value: 8,0 ± 1,0 (20ºC)
Kinematic viscosity (mm^2/s): ≤50 (20ºC)
Solubility: 100% (20ºC).
Partition coefficient n/octanol/water: Not determinate*.
Vapour pressure: Not determinate*.
Relative density: 1,135 ± 0,01g/cm^3 (20ºC).
Relative vapour density: Not determinate*.

*Not relevant due to the nature of the product, not providing information characteristic of its hazardousness.

9.2. Other information: No further relevant information availed.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity:

It can react with strong oxidants.

10.2. Chemical stability:

Stable in common environmental conditions and in the above mentioned range of temperature during its storage and manipulation.

10.3. Possibility of hazardous reactions:

No dangerous reactions known.

10.4. Conditions to avoid:

Temperatures: <-15ºC, >+50ºC.

10.5. Incompatible materials:

Not use containers, pipes or accessories of galvanized steel. Avoid use of products on burning metals, electrically-energized equipment and contact with strong oxidants and water reactive materials.

10.6. Hazardous decomposition products:

No hazardous decomposition products if instructions for storage and handling are followed.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008: No toxicity data are available for the product itself regarding toxicological properties, symptoms related to the physical, chemical and toxicological characteristics, delayed and immediate effects or chronic effects from short and long-term exposure. (see Section 3 and 4).

Toxicological properties of the hazardous substances present in the mixture are:

Components	INGESTION OECD 401 LD50	SKIN EXPOSURE OECD 402 LD50	INHALATION IRT
(2-(2-butoxyethoxy)ethanol)	2410 mg/kg bw (rat)	2764 mg/kg bw (rabbit)	>29ppm/2hours
Sulfuric acid, mono-C12-14 (even numbered)-alkyl esters, compds. with triethanolamine	>5000 mg/kg (rat)	not available	not available
Hydroxide (carboxymethyl) dimethyl-3 - [(1-oxododecil) amino] propylammonium	>5000 mg/kg (rat)	>5000 mg/kg (rat)	not available
1-Propanaminium, N- (3-aminopropyl) -2-hydroxy-N, N-dimethyl-3-sulfo-, N-(C12-18 (also numbered) acyl) derivs., Hydroxides, internal salts	2950 mg/kg (rat)	>2000 mg/kg (rat)	not available

a) Acute toxicity: Based on available data, the classification criteria are not met. (Calculation method).

b) Skin corrosion/irritation: Based on available data, the classification criteria are not met. (Calculation method).

c) Serious eye damage/irritation: Based on available data, classified as "H318 - Causes serious eye damage" according to EC Regulation 1272/2008 (CLP). (Calculation method).

d) Respiratory or skin sensitization: Based on available data, the classification criteria are not met. (Calculation method).

e) Germ cell mutagenicity: Based on available data, the classification criteria are not met. (Calculation method).

f) Carcinogenicity: Based on available data, the classification criteria are not met. (Calculation method).

g) Reproductive toxicity: Data no available for the product itself. Based on available data, the classification criteria are not met. (Calculation method).

h) STOT-single exposure: Based on available data, the classification criteria are not met. (Calculation method).

i) STOT-repeated exposure: Based on available data, the classification criteria are not met. (Calculation method).

j) Aspiration hazard: Based on available data, the classification criteria are not met. (Calculation method).

11.2. Information on other hazards: Mixture does not contain substances identified as endocrine disruptors.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity: Silvara I at concentration of use is **"Relatively Harmless"** (>1.000mg/l)

AQUATIC TOXICITY			
Test	**Silvara I concentrate EC_{50}**	**Silvara I 1% solution EC_{50}**	**Test information**
Acute fish toxicity	32,3mg/l, 96h	3.230mg/l, 96h	Zebrafish eggs (Danio rerio) Test according to OECD 236
Acute daphnia toxicity	>100mg/l, 48h	>10.000mg/l, 48h	Daphnia magna Test according to OECD 202
Acute algae toxicity	72,2mg/l, 72h (E_rC_{50})	7.220mg/l, 72h (E_rC_{50})	Desmodesmus subspicatus Test according to OECD 201

WASTEWATER ANALYSIS			
Test	**Silvara I concentrate**	**Silvara I 1% solution**	**Test information**
Chemical oxygen demand (COD)	740 000mg O_2/l	7400mg O_2/l	DIN 38409 (H41)
Biochemical oxygen demand at 5 days (BOD_5)	400 000mg O_2/l	4000mg O_2/l	DIN EN 1899 (H51)
Biochemical oxygen demand at 28 days (BOD_{28})	600 000mg O_2/l	6000mg O_2/l	DIN EN ISO 9408 (L22)

Test	Silvara I concentrate EC_{10}	Silvara I 1% solution EC_{10}	Test information
Acute fish toxicity	23,3mg/l, 96h	2330mg/l, 96h	Zebrafish eggs (Danio rerio) Test according to OECD 236
Acute daphnia toxicity	>100mg/l, 48h	>10000mg/l, 48h	Daphnia magna Test according to OECD 202
Acute algae toxicity	20mg/l, 72h (E_rC_{10})	2000mg/l, 72h (E_rC_{10})	Desmodesmus subspicatus Test according to OECD 201

LABORATORY: SYNLAB – GERMANY (Test report no.: ULE-19-0007990 – Date: 20.03.2019)

12.2. Persistence and degradability.

Silvara I does not contain persistent organic substances, 97% biodegradable in 14 days and 100% biodegradable in 21 days.

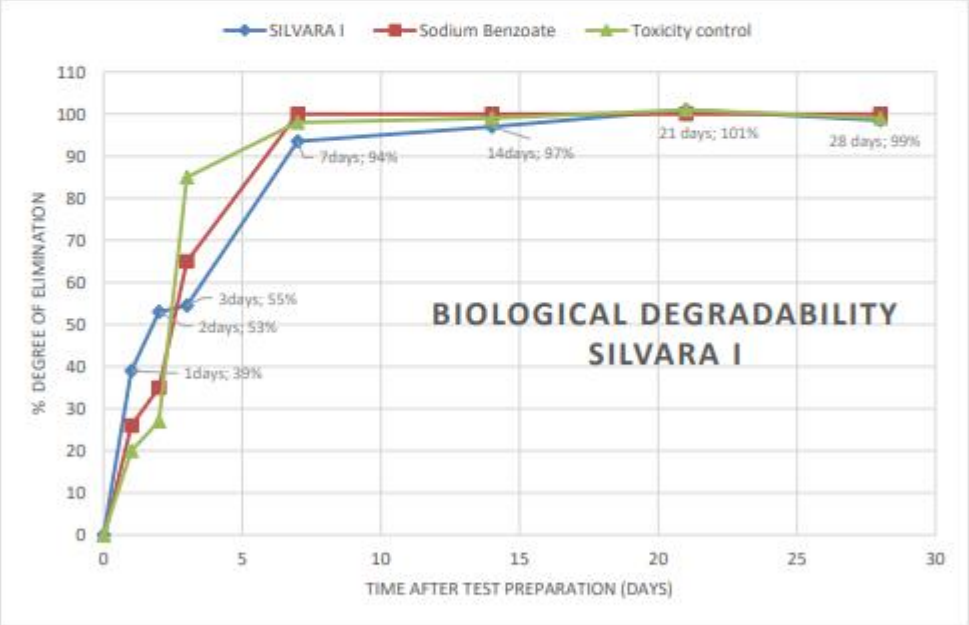
Silvara I is "Fully biodegradable".

Silvara I does not contain persistent organic substances.

Silvara I is Fluorine free and Siloxane free.

Biodegradability test according to EN ISO 9888 (L25) (Zahn-Wellens-Test)

Result: After 14 days, a degree of elimination of 97% and after 21 days, a degree of elimination of 100% was determinate using this approach.



LABORATORY: SYNLAB – GERMANY (Test report no.: ULE-19-0007990 – Date: 20.03.2019)

12.3. Bioaccumulative potential.

Data no available for the product itself.
No chronic toxicity effects are expected to results in long-term biopersistence, bioaccumulation, bioconcentration, biomagnification.

12.4. Mobility in soil.

Avoid the contamination of the soil and water: If surfactants mixture penetrate soil, it will be mobile and may contaminate groundwater and surface water.

12.5. Results of PBT and vPvB assessment.

Components of the mixture are not expected to be persistent, bioaccumulating nor toxic (PBT). Components of the mixture are not expected to be very persistent not very bioaccumulating (vPvB).

The organic components of this product are non-persistent biodegradable materials and it does not contain any fluorinated organic compounds or other persistent organic pollutants.

Silvara I is fluorine-free foam. TOP Assay results (TOP – Total Oxidizable Precursor):

TOP-A: Perfluoroalkyl Sulfonic Acids

Perfluorobutane sulfonic acid (PFBS) < 0,02*mg/Kg.
Perfluoropentane sulfonic acid (PFPeS) < 0,02*mg/Kg.
Perfluorohexane sulfonic acid (PFHxS) < 0,02*mg/Kg.
Perfluoroheptane sulfonic acid (PFHpS) < 0,02*mg/Kg.
Perfluorooctane sulfonic acid (PFOS) < 0,02*mg/Kg.
Perfluorodecane sulfonic acid (PFDS) < 0,02*mg/Kg.

TOP-B: Perfluoroalkyl Carboxylic Acids

Perfluorobutanoic acid (PFBA) < 0,1**mg/Kg.
Perfluoropentanoic acid (PFPeA) < 0,02*mg/Kg.
Perfluorohexanoic acid (PFHxA) < 0,02*mg/Kg.
Perfluoroheptanoic acid (PFHpA) < 0,02*mg/Kg.
Perfluorooctanoic acid (PFOA) < 0,02*mg/Kg.
Perfluorononanoic acid (PFNA) < 0,02*mg/Kg.
Perfluorodecanoic acid (PFDA) < 0,02*mg/Kg.
Perfluoroundecanoic acid (PFUnDA) < 0,02*mg/Kg.
Perfluorododecanoic acid (PFDoDA) < 0,02*mg/Kg.
Perfluorotridecanoic acid (PFTrDA) < 0,02*mg/Kg.
Perfluorotetradecanoic acid (PFTeDA) < 0,05***mg/Kg.

TOP-C: Perfluoroalkyl Sulfonamides

Perfluorooctane sulfonamide (FOSA) < 0,02*mg/Kg.
Methyl perfluorooctane sulfonamide (MeFOSA) < 0,02*mg/Kg.
N-Ethyl perfluorooctane sulfonamide (EtFOSA) < 0,05***mg/Kg.
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE) < 0,05***mg/Kg.
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE) < 0,05***mg/Kg.
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) < 0,02*mg/Kg.
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA) < 0,02*mg/Kg.

TOP-D: Fluorotelomer Sulfonic Acids

4:2 Fluorotelomer sulfonic acid (4:2 FTS) < 0,05***mg/Kg.
6:2 Fluorotelomer sulfonic acid (6:2 FTS) < 0,05***mg/Kg.
8:2 Fluorotelomer sulfonic acid (8:2 FTS) < 0,05***mg/Kg.
10:2 Fluorotelomer sulfonic acid (10:2 FTS) < 0,05***mg/Kg.

TOP-P: PFAS Sums

Sum of PFHxS and PFOS < 0,02*mg/Kg.

Sum of TOP C7-C14 as fluorine < 0,02*mg/Kg.

*LOR (Limit of reporting) = 0,02mg/Kg.
**LOR (Limit of reporting) = 0,1mg/Kg.
***LOR (Limit of reporting) = 0,05mg/Kg.
(Laboratory: ALS ENVIROMENTAL (Environmental Division Sydney) Date: 20-November-2018)

TOF Test
Total Organic Fluorine (TOF)<50mg/Kg*
*LOR (Limit of reporting) = 50mg/Kg
(Laboratory: ALS ENVIROMENTAL (Environmental Division Sydney) Date: 25-June-2020)

12.6. Endocrine disrupting properties.
Data no available for the product itself.

The substances contained in this mixture are not identified as endocrine disrupters. No adverse effects on the environment caused by endocrine disrupting properties shall be provided.

12.7. Others adverse effects.

Where possible prevent the release of foam and firewater to waterways.

The very rapid biodegradation and high Biochemical oxygen demand have the potential to deplete dissolved oxygen levels in waterways leading to acute oxygen stress and possible impacts on aquatic life, especially in enclosed waterways.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods.

Recommendations:

If a spill occurs: Contain spill. Cover with absorbent material. Collect spilled material and place in a closed and identified container.

In the case of a great spill, it can create copious quantities of foam: inform to the competent authorities according the local legislation.

Must not be disposed of together with household garbage. Do not allow product to reach sewage system unless authorised by agreement with the wastewater treatment plant operator. Must be recycled or disposed of according to the applicable regulations. Waste has to be classified according to the European Waste catalogue based on the identification of the waste generating source.

Wastewaters may also be able to be treated on site to biodegrade (if local authority waste regulations allow) by holding in ponds and/or irrigation to ground according to quantity and contaminants other than foam.

EWC waste code: 160305 organic wastes containing dangerous substances.

Uncleaned packagings:

Recommendation: Disposal must be made according to official regulations.

Recomendaded cleansing agent: Water; if necessary, with cleansing agents.

SECTION 14: TRANSPORT INFORMATION

This mixture is not regulated for transport:

- **ADR (Road):** Non-dangerous.
- **RID (Railway):** Non-dangerous.
- **IMDG (Sea):** Non-dangerous.
- **IATA (Airplane):** Non-dangerous.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.

Regulation (EC) No 1272/2008 (CLP).

Regulation (EC) No 1000/2017 (PFOA).

Regulation (EC) 2019/1021 (Persistent organic pollutants - Perfluorooctane sulfonic acid and its derivatives (PFOS) C8F17SO2X (X = OH, Metal salt (O-M+), halide, amide, and other derivatives including polymers.

Commission Delegated Regulation (EU) 2020/784 of 8 April 2020 amending Annex I to Regulation (EU) 2019/1021 of the European Parliament and of the Council as regards the listing of perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds.

VS Focum firefighting foams are in compliance with the European Regulation 2019/1021/EC of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutant modified by Commission Delegated Regulation (EU) 2020/784 of 8 April 2020.

VS Focum firefighting foams are in compliance European Regulation 1000/2017/EC of 13 June 2017 amending Annex XVII to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) as regards perfluorooctanoic acid (PFOA), its salts and PFOA-related substances. Must comply with local legislation on occupational risk prevention and environment.

Must comply with local legislation on occupational risk prevention and environment.

AICS (Australian Inventory of Chemical Substances

Australian HVICL (High Volume Industrial Chemicals List)

National Occupational Health and Safety

Commision (NOHSC) Approved Criteria for Classifying Hazardous Substances

NICNAS Priority Existing Chemical (PEC)

NPI (National Pollutant Inventory)

Silvara I does not contain any fluorinated organic substances and complies with the Queensland Firefighting Foam Policy fluorine-free foam limits.

Silvara I foam characteristics are compliant with the Queensland Policy for non-persistent foams.

Silvara I is Fluorine free and Siloxane free.

15.2. Chemical safety assessment.

A Chemical Safety Assessment has not been carried out.

SECTION 16: OTHER INFORMATION

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 (CLP):

H318 – Eye Dam. 1: Calculation method.

16.1. Revisions.

Current Version: 12.A (Australia).
Replaces version dated: 04/11/2020.
Revision date: 18/05/2021
Changes: Sections 1, 2, 3, 7, 12 and 16.

16.2. Legislation on Safety materials sheets.

This Safety Data Sheet has been developed according at Regulation (EC) No 1907/2006, 453/2010/EC, 830/2015/EC and 2020/878/UE.

16.3. Relevant phrases:

H315 – Causes skin irritation.

H318 – Causes serious eye damage.

H319 – Causes serious eye irritation.

H411 - Toxic to aquatic life with long lasting effects.

H412 - Harmful to aquatic life with long lasting effects.

16.4. Abbreviations and acronyms
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
RID: Regulations Concerning the International Transport of Dangerous Goods by Rail.
IMDG: International Maritime Code for Dangerous Goods.
IATA: International Air Transport Association.
UFI: Unique Formula Identifier.

16.5. Sources

http://echa.europa.eu
http://eur-lex.europa.eu
Minimal training is recommended in the prevention of occupational hazards to personnel who will handle this product, in order to facilitate the understanding and interpretation of this safety data sheet and product labeling.

Certifications

Standard	Description	Listing Agency
AS5062-2016	Fire Suppression for Transportable Machinery	Global Mark (Pending)

Fault Matrix

Item	Description	Resolution
1	Pressure is reducing over time, or the pressure is low.	1. Charge the system to the correct operating pressure. 2. Apply leak detection fluid to every connector and component on the loss of pressure network, actuators, valve components and cylinder components. 3. The leaking of nitrogen is generally a result of damaged components or the installation. 4. Tighten or replace any leaking components.
2	Gauge is indicating the lower end of the green section in the morning and then increasing to the mid-section of the green in the day.	Temperature has a relationship with pressure. The colder the temperature the lower the pressure and the higher the temperature the higher the pressure. The pressures provided in this manual are based on the system being charged with nitrogen at 20 Degrees Celsius.
3	Alarm panel has an intermittent FAULT or ALARM indication	Most cases for intermittent faults are a result of: a) Pressure is at the low end of the scale (FAULT) b) A failed pressure switch c) Poor terminations of cables and connecting pins d) Wiring loom is damaged (1) Check if pressure is at the low end of the scale. If low, recharge and conduct a leak test. (2) Disconnect the pressure switch from the wiring loom and place a multi-meter (using the continuity test) across the N/O terminals while the system is pressurised. The result should be 0ohms or a beep indicating a closed circuit. If the circuit is open the pressure switch required replacing. (3) Trace the cable from the pressure switch back to the alarm panel. Shake and gently pull at the loom and plugs to initiate a fault due to a loose or bad connection. If an intermittent fault or alarm appears, replace the loom.