



SILVARA I FIRE FIGHTING FOAM CLASS A, B

1. DESCRIPTION

Silvara I is a fluorine free and silicon free low viscosity Newtonian foam concentrate to extinguish hydrocarbon fuels fires and solids.

Silvara I is formulated with solvents, hydrocarbon surfactants and additives. Silvara I does not contain any type of organohalogen compound, it is easily biodegradable and responsible with the environment.

Silvara I forms resistant foam to isolate the fuel from the oxygen and extinguish the fire. Fire performance of Silvara I is similar to fluorine foam concentrates in hydrocarbon fuels fires. It is an alternative to the use of AFFF products.

It is suitable for use at 1% with fresh, sea or brackish water.

2. APPLICATION

Silvara I should be used in fresh, sea or brackish water to extinguish class B fires (hydrocarbons fuels).

It is not suitable to use on polar solvent fuels.

It is useful to combat class A fires (solids) due to its excellent wetting properties. Silvara I has been designed to obtain its optimal potential when it is used with CAFS.

It can be used on low, medium, or high expansion.

Application of Silvara I by foam achieves both excellent extinguishing and reignition times in hydrocarbon fuel fires. Silvara I can be used with any device (aspirating or non-aspirating) in the same way and with the same application rate than an AFFF foam concentrate, due to its ability to form a high quality, compact, fluid and oleophobic foam. As Silvara I does not contain any filmogen fluorosurfactant, it is impossible to get an aqueous film above the hydrocarbon. However, it is not necessary since even a thin layer of foam will be

enough to seal the fuel and avoid the evaporation and reignition.

3. DOSAGE

Silvara I can be easily proportioned using most conventional proportioning equipment such as: Balanced pressure pump and bladder tank proportioners, around the pump type and ventures proportioners, and handline nozzles with fixed induction/pickup tubes.

4. PHYSICAL PROPERTIES OF FOAM CONCENTRATE

Appearance	Amber liquid
Density, 20°C, g/cm ³	1,135 ± 0,01
pH, 20°C	8,0 ± 1,0
Kinematic Viscosity, 20°C mm ² .s ⁻¹	≤ 50
Freezing point	≤ -15° C

5. PROPERTIES OF FOAM SOLUTION

Surface tension, (1%, D.W.), mN/m	≤ 30
Low expansion index (1%, F.W.)	≥ 6
Drainage Time, 25%	≥ 3'
Medium expansion index (3%, F.W.)	≥ 100
High expansion index* (3%, F.W.)	≥ 300

*The values obtained depend on the type of generator used.

D.W.: Deionized water / F.W.: Fresh water

6. FIRE PERFORMANCE

Silvara I is certified by MPA DRESDEN according to the following standards:

- EN 1568-3:2018 (1%), Class IB (Fresh water) and Class IIIC (Sea water)
- EN 1568-1:2018 (3%, Fresh water)
- EN 1568-2:2018 (both 3% and 6%, Fresh Water)
- EN 1568-3:2018 Class I+A (at 3%) with diesel as fuel, (Fresh and Sea water)

Silvara I fulfils FM 5130 Sprinkler tests with Water Sprinklers K80 (1 bar, fuel: Heptane; 2 bars, fuel: E-10). Silvara I also fulfils the requirements of EN 1568-3:2018 at 3% with fresh and sea water.

7. COMPATIBILITY WITH OTHER CONCENTRATES

The NFPA standards (NFPA 412, Paragraph 214 and NFPA 11B, 1-5.2) prohibits the mixing of AFFF concentrates unless it has been determined that they are compatible.

VS FOCUM recommends the following compatibility test: Silvara products are considerate compatible in all proportions with the concentrates furnished by other manufacturers when the mixture of them, after having been aged 10 days at 65°C, maintain its properties of foamability and fire performance at least equal of the worst concentrate involved in the mixture and to use the higher induction rate and to the higher minimum usable temperature of the mixing concentrates.

8. COMPATIBILITY WITH MATERIALS

Silvara I is compatible with Standard Carbon Steel "black" pipe and pipe manufactured from various Stainless Steel (304 and 316) or Brass Compounds. Other recommended materials are Polyethylene and Aluminium. Avoid using galvanized pipes and fittings, it can cause corrosion.

9. SHELF LIFE

The factors affecting shelf life and stability for this foam concentrate are: wide temperature changes, handling procedures, extreme high or low temperatures and contamination by odd materials.

Its shelf life is about 20-25 years if the storage is in accordance with VS FOCUM's recommendations. According to NFPA 11 (12.6), samples of foam concentrates shall be sent to the manufacturer or qualified laboratory for quality condition testing at least annually when the foam is no longer in the original unopened container, and also when in different storage temperature range than the stipulated from VS FOCUM.

10. STORAGE AND HANDLING

Silvara concentrate should be stored in the original shipping container or in other special containers designed for this type of products (stainless steel or epoxy lined tanks).

Place the storage container in an area at temperatures between -13°C to 50°C.

If the product is frozen during storage or transportation, thawing will render the product completely usable. Mixing after freeze thaw cycle is recommended.

11. ENVIRONMENTAL AND TOXICOLOGICAL PROPERTIES

Aquatic Toxicity: Silvara I at concentration of use is "Relatively Harmless" for species as Daphnia, Fish and Algae. Silvara I has undergone Ecotoxicological Investigations.

Persistence and degradability: Silvara I does not contain persistent organic substances. Silvara I is a fluorine-free foam. Silvara I has a TOPA test (TOP – Total Oxidisable Precursor) and TOF (Total Organic Fluorine). Silvara I has a biodegradability at 7 days up to 93%, up to 99% at 14 days, and full 100% at 21 days, so Silvara I is a "Fully biodegradable" foam concentrate.

Sewage Treatment Plant Treatability: Silvara products are not particularly toxic to the microbial populations normally found in treatment plants. Compatible with the treatment plant's flora. Anti-foam agents may be used to reduce foaming in waste streams.

Nutrient Loading: An algal bloom is not expected as Silvara products contain no sources of nitrates or phosphates. Furthermore, it is extremely low in total organic carbon.

12. ORDERING INFORMATION

Silvara products are available in plastic Pail (20, 25 or 60 L), Drum (200 L), Container (1000 L) and Bulk.

