SILVARA ZFK
FIRE FIGHTING FOAM CLASS A, B

1. DESCRIPTION

Silvara ZFK is fluorine free low viscosity newtonian foam concentrate to extinguish hydrocarbon fuels fires and solids.

Silvara ZFK is formulated with solvents, hydrocarbon surfactants and additives. Silvara ZFK doesn´t contain any type of organ halogen compound, it is easily biodegradable and responsible with the environment.

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

2. APPLICATION

Silvara ZFK should be used at 0,5% in water to extinguish class B fires (hydrocarbons fuels). It is not suitable to use on polar fuels.

It is useful to combat class A fires (solids) because its excellent wetting properties. Silvara ZFK has been designed to obtain its optimal potential when it is used with CAF's.

It should be used with aspirating discharge devices (foam chambers, nozzles,…) with low or medium expansion.

Application of Silvara ZFK by foam achieves excellent extinguishing and re-ignition times in hydrocarbon fuels fires. Obviously due to it is not a film forming foam, the application with fog/stream nozzles isn´t so effective as with AFFF foam concentrates.

3. DOSAGE

Silvara ZFK 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 hanline nozzles with fixed induction/pickup tubes.

Recommended concentrations to use are:

Class A (solids)	0,3%
Hydrocarbons, low expansion	0,5%
Hydrocarbons, medium expansion	1%
Aviation (querosene Jet A1)	1%

4. PHYSICAL PROPERTIES OF FOAM CONCENTRATE

Appearance	Amber liquid
Density, 20ºC, g/cm^3	1,092 ± 0,01
pH, 20ºC	8,0 ± 1,0
Viscosity, 375 s^{-1}, 20°C	≤ 50 mPa.s
Freezing point	≤ -17° C

5. PROPERTIES OF FOAM SOLUTION

Surface tension, mN/m (0,5%, deionized water)	≤ 30
Low expansion index (0,5%, fresh water)	≥ 7,5
Medium expansion index (1%, fresh water)	≥ 80

6. FIRE PERFORMANCE

Silvara ZFK is certified according standards:

- EN: 1568-1:2008 (1%).

- EN: 1568-3:2008 (0,5%) Class IB (fresh 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.

The MIL-F24385C standard provides a formalized method of compatibility

determination but the Freeze Protected AFFF fall outside the military specification.

vs FOCUM recommends the following 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 ZFK 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 Aluminum. 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. Annual testing of all firefighting foams is recommended by the National Fire Protection Association (NFPA).

10. STORAGE AND HANDLING

Silvara concentrate should be stored in the original shipping container or in an 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 –15°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: The aquatic life is not adversely affected when Silvara products are used neither sensitive species nor tolerant ones.

Persistence and degradability: Silvara ZFK does not contain persistent organic substances. Silvara ZFK is fluorine-free foam. Silvara ZFK has a TOPA test (TOP – Total Oxidisable Precursor). Silvara ZFK has a biodegradability at 14 days up to 99%, so it is an excellent biodegradable product.

Sewage Treatment Plant Treatability: As Silvara products have a low biological oxygen demand (BOD), treatment plants don´t need additional oxygen.

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. PACKAGING

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