



by Tyco Fire Suppression & Building Products

SILV-EX PLUS "CLASS A" FIRE CONTROL CONCENTRATE

Data/Specifications

FEATURES

SILV-EX PLUS is a low, medium, and high expansion, Class A foam concentrate formulated from specialty hydrocarbon surfactants, stabilizers, corrosion inhibitors and solvents. This formulation provides superior cold weather performance. The latest development in the *original* forest fire control concentrate, SILV-EX PLUS has been proven effective on many deep-seated Class A fires such as tire fires, paper fires, coal fires, structure fires, and wild fires.

SILV-EX PLUS foam concentrate can be proportioned from 0.1% to 1.0% in fresh, brackish or sea water. When used as a pre-mixed solution, only fresh or potable water should be used if the premix is to be stored over long time periods. Due to its extremely low proportioning rate, SILV-EX PLUS foam concentrate offers outstanding economy in concentrate storage space, cost (compared to conventional 3% and 6% foaming agents) and water hauling requirements.

Example:

How much SILV-EX PLUS concentrate is required to make 500 gallons (1893 L) of foam solution?

Final solution volume X concentration percentage = foam concentrate required

At 0.1% concentration:

$$500 \text{ gal (1893 L)} \times 0.001 = 0.5 \text{ gal (1.9 L) of concentrate}$$

At 0.6% concentration:

$$500 \text{ gal (1893 L)} \times 0.006 = 3 \text{ gal (11.4 L) of concentrate}$$

At 1.0% concentration:

$$500 \text{ gal (1893 L)} \times 0.01 = 5 \text{ gal (19 L) of concentrate}$$

Fire extinguishment mechanisms in effect when using SILV-EX PLUS "Class A" Fire Control Concentrate include:

- Reduction of the surface tension of water, which provides the SILV-EX PLUS solution with superior wetting and penetrating characteristics. This renders Class A fuels less combustible and allows the solution to penetrate past the char to control deep seated fires.
- Extended drain time provides longer surface wetting, reducing the risk of ignition/reignition.
- SILV-EX PLUS agent creates a foam blanket which provides an insulating barrier between the fuel and air.
- SILV-EX PLUS foam suppresses combustible vapors while cooling the fuel.

In addition, SILV-EX PLUS concentrate offers fire fighting characteristics:

- The brilliant white foam reflects heat.
- SILV-EX PLUS solution creates a dense foam blanket with excellent insulating properties.
- SILV-EX PLUS foam clings to vertical surfaces for structure protection.
- The wetting and penetrating characteristics of the SILV-EX PLUS solution reduce the combustibility of Class A fuels and makes water five times more effective.

Applicable extinguishment mechanisms and some properties of SILV-EX PLUS foam depend on the type of foam delivery device used. SILV-EX PLUS has a reduced environmental signature and does not have any EPA reportable contents. The solution does not destroy or retard new forest growth, and will not harm fish or wildlife; it is biodegradable in soils, aquatic ecosystems, and sewage treatment facilities.



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Typical Physiochemical Properties at 77 °F (25 °C)

Appearance Light Amber Clear Liquid

Density 1.010 g/ml ± 0.010

pH 7.0 – 8.5

Refractive Index 1.3660 ± 0.0035

Viscosity 12 ± 3 centistokes

For comparison purposes, the viscosity of 10W40 motor oil is 160 centistokes at 77 °F (25 °C) and 800 centistokes at 12 °F (–11.1 °C).

Surface Tension

Water 66 to 76 dynes/cm

0.1% SILV-EX PLUS solution 27.20 dynes/cm

0.6% SILV-EX PLUS solution 26.80 dynes/cm

1.0% SILV-EX PLUS solution 26.60 dynes/cm

Flash Point > 200 °F (93.3 °C)

Pour Point 22 °F (–5.5 °C)

APPLICATION

SILV-EX PLUS concentrate is designed specifically for use on Class A fuel fires including wood, paper, coal, and rubber. SILV-EX PLUS foam gives the fire fighter extinguishment capabilities, exposure protection, and increased safety.

Although designed for Class A fires, SILV-EX PLUS foam can be effective on some Class B flammable liquid fires when applied by medium and high expansion devices.

SILV-EX PLUS solution can be used with aspirating and non-aspirating discharge devices, compressed air foam systems (CAFS), or dropped from fixed or rotary wing aircraft.

ENVIRONMENTAL AND HEALTH INFORMATION

1. Biodegradability Test – the concentrate is readily biodegradable
2. Mammalian Toxicity Tests
 - a. Acute Oral Toxicity in Rats
 - i. Concentrate: LD₅₀ > 5050 mg/Kg
 - ii. 1.0% Dilution: LD₅₀ > 5050 mg/Kg
 - b. Acute Dermal Toxicity in Rabbits
 - i. Concentrate: LD₅₀ > 2020 mg/Kg
 - ii. 1.0% Dilution: LD₅₀ > 2020 mg/Kg

ENVIRONMENTAL AND HEALTH INFORMATION (Continued)

3. Mammalian Irritation Tests
 - a. Primary Eye Irritation in Rabbits
 - i. Single-Wash Eyes
 1. Concentrate: mildly irritating
 2. 1.0% Dilution: minimally irritating
 - ii. Double-Wash Eyes
 1. Concentrate: minimally irritating
 2. 1.0% Dilution: practically non-irritating
 - b. Primary Dermal Irritation in Rabbits
 - i. Concentrate: non-irritating
 - ii. 1.0% Dilution: non-irritating
4. Aquatic Toxicity Tests
 - a. Fish:
 - i. Rainbow Trout: Concentrate:
96 hour LC₅₀ = 56.6 mg/L
 - ii. Threespined Stickleback: Concentrate:
96 hour LC₅₀ = 7.31 mg/L
 - b. Daphnids, Daphnia Magna: Concentrate:
48 hour LC₅₀ = 62.7 mg/L

PERFORMANCE

Standards/Specifications – The performance of SILV-EX PLUS concentrate is measured against and/or is on the approved list of the following:

- NFPA 1150 – Foam Chemicals for Fire in Class A Fuels
- Canadair Corporation – Approved for use in the CL-215 and CL-415 Aircraft and foam metering systems
- USDA Forest Service Specification 307a – Fire Suppressant Foam for Wildland Firefighting

Foaming Properties – When used with fresh, sea or brackish water at the correct proportioning rate, the expansion will vary depending on the performance characteristics of the foam making equipment.

Proportioning – SILV-EX PLUS concentrate can be proportioned using most conventional proportioning equipment such as:

- Flow-Mix™ Model 500 foam proportioner
- Hypro FoamPro™ injection system
- Balanced pressure pump or bladder tank fixed sprinkler system
- In-line fixed or portable venturi type proportioners (eductors)

TYPICAL PROPORTIONING RATES FOR COMMON APPLICATIONS:

Fixed Wing Aircraft	0.6% to 0.7%
Rotary Wing Aircraft	0.2% to 0.5%
Air Aspirating Devices	0.2% to 1.0%
Non-Air Aspirating Devices	0.5% to 1.0%
Compressed Air Foam Systems (CAFS)	0.1% to 0.3%

ANSUL Handline Nozzles

HL-60 Low Expansion	0.3% to 1.0%
HL-95 Low Expansion	0.3% to 1.0%
KR-S2 Low Expansion	0.3% to 1.0%
KR-M2 Medium Expansion	0.3% to 1.0%
KR-S/M2 Dual Expansion	0.3% to 1.0%

Flow-Mix is a registered trademark of Robwen Inc., Los Angeles, CA.

Hypro and FoamPro are registered trademarks of the HyPro Corporation, New Brighton, MN.

Storage/Shelf Life – When stored in the original packaging supplied (polyethylene drums or pails) or in equipment recommended by the manufacturer as part of the foam system and within the temperature limits specified, the shelf life of SILV-EX PLUS concentrate is normally about 20-25 years. The recommended storage temperature for SILV-EX PLUS concentrate is 30 °F (–1 °C) to 120 °F (49 °C).

If the product is frozen during storage or transportation, thawing will render the concentrate completely usable and ready for proportioning.

Compatibility – Because of the many products available, consult with ANSUL before mixing SILV-EX PLUS concentrate with other manufacturer's products.

Materials of Construction Compatibility – Tests have been performed with SILV-EX PLUS concentrate verifying its compatibility with the steel, stainless steel, yellow brass, magnesium and aluminum alloys found in aerial and ground-based fire fighting equipment. SILV-EX PLUS is also compatible with standard fire fighter turn out gear and hose material.

Packaging – SILV-EX PLUS concentrate is packaged in opaque white 5 gallon (19 L) plastic (polyethylene) containers with 2 3/4 in. (6.9 cm) capped openings. 55 gallon (208 L) drum size is blue polyethylene with sealed 2 1/4 in. (5.7 cm) closures. All containers are marked "SILV-EX PLUS Class A Fire Control Concentrate."

Equipment Clean-up – The standard procedure of flushing with fresh water should be used with all equipment used with SILV-EX PLUS concentrate or foam solution.

Additional Information – Request the following ANSUL Forms:

- MSDS Sheet – F-2009065

ORDERING INFORMATION

SILV-EX PLUS concentrate is available in the following sizes:

Part No.	Size	Shipping Weight	Cube
434467	5 gallon (19 L)	45 lb (20.4 kg)	1.25 ft ³ (0.0353 m ³)
434469	55 gallon (208 L)	495 lb (224.5 kg)	11.83 ft ³ (0.3350 m ³)
▶ 434471	265 gallon (1003 L)	2465 lb (1118 kg)	50.05 ft ³ (1.42 m ³)
434463	Bulk (contact ANSUL about domestic truckload delivery)		