# DIRECTATTACK Foam Concentrate

## Application

- DIRECTATTACK foam agent fire suppression concentrate is designed specifically for use on Class A fuel fires including wood fires, paper fires, coal fires, structure fires, and rubber fires.
- Foam agent gives the fire fighter suppression capabilities, exposure protection, and increased safety.
- Although designed for Class A fires, foam agent can be effective on some Class B flammable liquid fires when applied by Medium-Expansion and High-Expansion devices.
- Foam agent can be used with aspirating and non-aspirating discharge devices, compressed air foam systems (CAFS), or dropped from fixed or rotary wing aircraft.

## Description

DIRECTATTACK foam agent concentrate is a Low, Medium, and High-Expansion Foam, Class A fire control foam concentrate formulated from specialty hydrocarbon surfactants, stabilizers, corrosion-inhibitors, and solvents. The foam agent solution has been proven effective on many deep-seated Class A fuel fires, such as tire fires, paper fires, coal fires, structure fires, and wild fires. The foam agent also provides superior cold weather performance.

DIRECTATTACK foam agent 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 periods of time. Because of the extremely low proportioning rate, the foam agent concentrate offers outstanding economy in concentrate storage space, cost (compared to conventional 3% and 6% foam agents), and water hauling requirements. For example, a 5 gal (19 L) pail of foam agent concentrate produces 500 gal (1,893 L) of fire control foam agent solution at 1% concentration and produces 5,000 gal (18,927 L) of foam agent solution at 0.1% concentration.

Fire suppression mechanisms and characteristics in effect when using DIRECTATTACK foam agent concentrate include:

- Reduction of the water surface tension provides the foam agent solution with superior wetting and penetrating characteristics. This helps make Class A fuels less combustible and allows the solution to penetrate past the char to help control deep seated fires.
- Extended drain time provides longer surface wetting, reducing the risk of ignition / re-ignition.
- Creation of a dense foam blanket which provides an insulating barrier between the fuel and air.
- Suppression of combustible vapors while cooling the fuel.
- Forms a brilliant white foam that reflects heat.
- High viscosity allows foam to cling to vertical surfaces for increased protection.


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Applicable suppression mechanisms and some properties of DIRECTATTACK foam agent solution depend on the type of foam delivery device used. The foam agent has a reduced environmental signature and does not have any EPA reportable contents.

DIRECTATTACK foam agent includes the following environmental qualities:

- Foam agent does not destroy or retard new forest growth.
- Foam agent will not harm fish or wildlife.
- Foam agent is biodegradable in soils, aquatic ecosystems, and sewage treatment facilities.

**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 |
| Flash point | > 200 °F (93.3 °C) |
| Pour point | 22 °F (–5.5 °C) |
| 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% foam agent solution | 27.20 dynes/cm |
| 0.6% foam agent solution | 26.80 dynes/cm |
| 1.0% foam agent solution | 26.60 dynes/cm |

**Note:** While NFF (also known as AR-SFFF) agents may be compatible with existing AFFF and/or NFF hardware, system contamination from fluorinated agents may exist if hardware and piping is not replaced upon conversion to non-fluorinated agents.

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 | Form No. CG-2015161-03

## Environmental and Health Information

**Biodegradability Test**

The DIRECTATTACK foam agent concentrate is readily biodegradable

**Mammalian Toxicity Tests**

| Type of Test | Toxicity Level |
|---|---|
| ■ Acute Oral Toxicity in Rats | |
| – Foam Agent Concentrate | $LD_{50}$ > 5050 mg/kg |
| – 1.0% Dilution | $LD_{50}$ > 5050 mg/kg |
| ■ Acute Dermal Toxicity in Rabbits | |
| – Foam Agent Concentrate | $LD_{50}$ > 2020 mg/kg |
| – 1.0% Dilution | $LD_{50}$ > 2020 mg/kg |

**Mammalian Irritation Tests**

| Type of Test | Irritation Level |
|---|---|
| ■ Primary Eye Irritation in Rabbits | |
| – Single-Wash Eyes | |
| ▪ Foam Agent Concentrate | Mildly irritating |
| ▪ 1.0% Dilution | Minimally irritating |
| – Double-Wash Eyes | |
| ▪ Foam Agent Concentrate | Minimally irritating |
| ▪ 1.0% Dilution | Practically non-irritating |
| ■ Primary Dermal Irritation in Rabbits | |
| – Foam Agent Concentrate | Non-irritating |
| – 1.0% Dilution | Non-irritating |

**Aquatic Toxicity Tests**

| Type of Test | Toxicity Level |
|---|---|
| ■ Fish | |
| – Rainbow Trout: Foam Agent Concentrate | 96 hour $LC_{50}$ = 56.6 mg/L |
| – Threespined Stickleback: Foam Agent Concentrate | 96 hour $LC_{50}$ = 7.3 mg/L |
| ■ Daphnids, Daphnia Magna: Foam Agent Concentrate | 48 hour $LC_{50}$ = 62.7 mg/L |

## Approvals and Listings

The performance of DIRECTATTACK foam agent 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

DIRECTATTACK foam agent concentrate can be proportioned using most conventional proportioning equipment.

**Typical proportioning rates for common applications**

| Application | Rate |
|---|---|
| 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% |
| Low-/Medium-Expansion Handlines | 0.3 to 1.0% |

## Storage and Handling

DIRECTATTACK foam agent concentrate should be 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 recommended storage temperature for foam agent concentrate is 30 °F to 120 °F (–1 °C to 49 °C).

If the product is frozen during storage or transportation, thawing will allow the foam agent concentrate to be used.

## Compatibility

Consult with Johnson Controls before mixing DIRECTATTACK foam agent concentrate with other manufacturer's products.

## Materials of Construction Compatibility

Tests have been performed with DIRECTATTACK foam agent verifying its compatibility with the steel, stainless steel, yellow brass, magnesium, and aluminum alloys found in aerial and ground-based firefighting equipment. The foam agent is also compatible with standard fire fighter turn out gear and hose material. The standard procedure for flushing with fresh water should be used with all equipment used with foam agent concentrate or foam agent solution.

## Ordering Information

Contact Johnson Controls regarding availability of bulk truckload deliveries.

| Part No. | Description | Approximate Shipping Weight | Cube |
|---|---|---|---|
| 720000 | Pail 5 gal (19 L) | 45 lb (20.4 kg) | 1.25 $ft^3$ (0.0353 $m^3$) |
| 720001 | Drum 55 gal (208 L) | 495 lb (224.5 kg) | 11.83 $ft^3$ (0.3350 $m^3$) |
| 720002 | Tote 265 gal (1000 L) | 2463 lb (1117 kg) | 50.05 $ft^3$ (1.42 $m^3$) |

Safety Data Sheet (SDS) available at www.chemguard.com.

**Note:** The converted metric values in this document are provided for dimensional reference only and do not reflect an actual measurement.