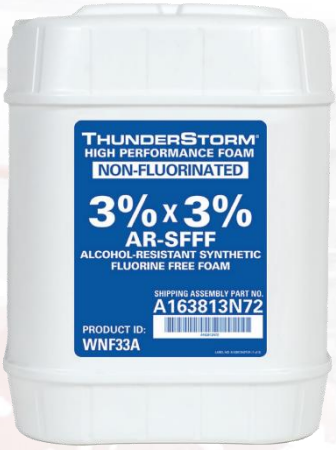
Foamax®
Fire fighting systems & equipment

Product Name	**THUNDERSTORM® WNF33A 3%x3% Non-Fluorinated Foam Concentrate**
Description	**Foam Concetrate type AR-SFFF**
Manufacturer	**Johnson Controls**
Revision	**2.0/2024**



ASK ABOUT THE PRODUCT

1. Features

- Designed, tested and demonstrated to provide excellent control and suppression of large hydrocarbon tank fires
- Designed in accordance with NFPA Standard 11 for low and medium-expansion foams
- Meets the requirements of 1,3, 4 parts of EN 1568:2018
- UL 162 listed as an alcohol-resistant synthetic fluorine free foam (AR-SFFF) concentrate for use on hydrocarbon and polar solvent fuel fires
- Passes UL 162 type III test protocol on hydrocarbons at the same 0.10 gpm/ft2 (4.1 Lpm/m2) design application rate as traditional AR-AFFF products with similar control times
  – Recommended minimum application rate of 0.16 gpm/ft2 (6.5 Lpm/m2) for fuel in-depth tank fires up to 150 ft (45.7 m) in diameter; for larger tank sizes please contact the FOAMAX® team directly for further guidance
  – Recommended minimum application rate of 0.10 gpm/ft2 (4.1 Lpm/m2) for spill fire applications
- Superior drain time compared to a high-quality AR-AFFF, with a longer lasting foam blanket for better burnback resistance and post-fire suppression
- Dry chemical agent compatible
- GreenScreen Certified™ Silver firefighting foam concentrate
- **Can be used with a 1% concentration for hydrocarbon fuel fires - Part 3 of EN 1568:2018.**

2. Description

THUNDERSTORM® WNF33A Foam Concentrate delivers exceptional firefighting performance, continuing the renowned heritage of **THUNDERSTORM** foams. WNF33A Foam Concentrate is a 3%x3% Alcohol Resistant Non-Fluorinated Foam Concentrate that provides excellent fire and vapor suppression for Class B, polar solvent and hydrocarbon fuel fires. This synthetic foam concentrate is intended for forceful or gentle firefighting applications at 3% solution on hydrocarbon fuels and gentle firefighting applications at 3% solution on polar solvent fuels. **THUNDERSTORM WNF33A** foam solution utilizes three suppression mechanisms intended for rapid fire knockdown and superior burnback resistance:

- The foam blanket has extended drain times to help block oxygen to the fuel and suppress fuel vapor
- On polar solvent fires, liquid drains from the foam blanket and forms a polymeric membrane which protects the foam from destruction by the polar fuel, suppresses vapors, and seals the fuel surface
- The water content of the foam solution produces a cooling effect for additional fire suppression

Typical physiochemical properties	
Appearance	Viscous yellow liquid
Density	1.12 ± 0.02 g/ml
pH	6.2 – 7.2
Refractive Index	1.3876 minimum
Viscosity*	2450 ± 250 cPs at 60 rpm
Viscosity*	3900 ± 500 cPs at 30 rpm
Freeze Point**	15.8 °F (-9 °C)
Storage and Operating Range	35 °F to 120 °F (2 °C to 49 °C)

*Brookfield LV Viscometer Spindle #4 Properties measured at 25°C (77°F)

** per EN 1568 protocol

THUNDERSTORM WNF33A Foam Concentrate is a non-Newtonian fluid that is both pseudoplastic and thixotropic; therefore, dynamic viscosity will decrease as shear increases.
THUNDERSTORM WNF33A concentrate is a non-fluorinated firefighting foam concentrate, meaning that it does not have any intentionally added PFAS chemistry and is produced in equipment that has not handled PFAS chemistry.
THUNDERSTORM WNF33A concentrate thus complies with Directives (EU) 2017/1000 on PFOA and 2019/1021 (EU POPs directive)

3. Application

THUNDERSTORM WNF33A Foam Concentrate is intended for use on both types of Class B fires: hydrocarbon fuels with low water solubility, such as crude oils, gasolines, diesel fuels, and aviation fuels; and polar solvent fuels with appreciable water solubility, such as methyl and ethyl alcohol, acetone, and methyl ethyl ketone. The concentrate has excellent wetting properties that can effectively combat Class A fires. It may also be used in conjunction with dry chemical agents to provide even greater fire suppression performance.

THUNDERSTORM WNF33A Foam Concentrate is well-suited for use in municipal and industrial response for spills and fuel-in-depth fires. It may be applied with either an aspirating or non-aspirating nozzle on both Type III applications as well as foam systems with Type II discharge devices. Examples of these applications include:

- Flammable liquid in-depth and spill fires
- Fuel and chemical storage tanks
- Industrial chemical and petroleum processing facilities
- Truck/rail loading and unloading facilities
- Flammable liquid containment areas

Fuel group	Concentration	Minimum Recommended Application Rate	
		Lpm/m²	Gpm/ft²
Type III Application[1] – UL Listed			
Hydrocarbons	3%	6,5	0,16
Type II Application[2] – Third Party Witnessed			
Hydrocarbons	3%	4,1	0,10
Type II Application[3] – UL Listed			
Hydrocarbons	3%	4,1	0,10
Ethanol (EtOH)	3%	4,1	0,10
Ketones	3%	6,9	0,17
E85	3%	4,1	0,10

Notes:
1. TYPE III DISCHARGE OUTLET – A device that delivers the foam directly onto the burning liquid as described in UL 162.
2. NFPA 11 allows a design rate of 0.10 gpm/ft2 (4.1 Lpm/m2) for spill fire applications. This product has been tested in accordance with UL 162 for use at this application rate.
3. TYPE II DISCHARGE OUTLET – A device that delivers foam onto the burning liquid and partially submerges the foam or produces restricted agitation of the surface as described in UL 162.
4. 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.

4. Foaming Properties

THUNDERSTORM WNF33A Foam Concentrate may be effectively applied using aspirating and non-aspirating discharge equipment at the correct dilution with fresh, salt, or hard water.

Typical foam characteristics*		
Water	Fresh	Salt
Proportioning Rate	3%	3%
Expansion Ratio	⩾9,22:1	⩾8,31:1
25% Drain Time (min:sec)	⩾64:00	⩾84:19
50% Drain Time (min:sec)	⩾80:00	⩾90:00

* per EN 1568-3 protocol

5. Proportioning

The recommended operational temperature range for **THUNDERSTORM WNF33A** Foam Concentrate is 35 °F to 120 °F (2 °C to 49 °C) per UL 162. This foam concentrate can be correctly proportioned using most conventional, properly calibrated, in-line proportioning equipment such as:

- Balanced and in-line balanced pressure pump proportioners
- Balanced pressure ratio flow controllers
- Around-the-pump type proportioners
- Fixed or portable in-line venturi type proportioners
- Handline nozzles with fixed eductor/pick-up tubes
- Self-educting nozzles

6. Storage and Handling

THUNDERSTORM WNF33A Foam Concentrate should be stored in the original supplied package (HDPE totes, drums, or pails). The concentrate should be maintained within the recommended operational temperature range.

Freezing of the product should be avoided, and in case of freezing, a sample should be sent to **FOAMAX** to determine the physicochemical properties and performance parameters of the concentrate. Once the concentrate is frozen, the manufacturer does not guarantee the maintenance of the declared performance parameters.

Factors that could negatively impact the foam concentrate's long-term effectiveness include but are not limited to temperature exposure and cycling, storage container characteristics, air exposure, evaporation, dilution, and contamination. The effective life of **THUNDERSTORM WNF33A** Foam Concentrate can be maximized through optimal storage conditions and proper handling.

THUNDERSTORM foam concentrates have demonstrated effective firefighting performance with contents stored in the original package under proper conditions for more than 10 years.

This product should not be mixed with other types of foam concentrates or other manufacturers' foam concentrates under any circumstances. The use of multiple, separately applied finished foam products for incident response is appropriate.

7. Inspection

THUNDERSTORM WNF33A Foam Concentrate should be inspected in accordance with NFPA 11, EN 13565-2, or other relevant standard. A representative concentrate sample should be sent to Johnson Controls Foam Analytical Services or other qualified laboratory for quality analysis per the applicable standard. An annual inspection and sample analysis is typically sufficient, unless the product has been exposed to unusual conditions.

8. ADDITIONAL APPLICATION – 1%

THUNDERSTORM WNF33A 3x3 has been additionally tested for application using a 1% concentration in the case of hydrocarbon fuel fires - Part 3 of the standard 1568:2018. The table below presents the test results for parameters of re-ignition resistance classes:

EN 1568:2018	Dosing	With usage	
		Simulated fresh water	*Simulated sea water*
3	1%	I A	I B
4 (Acetone)	3%	I A	I A
4 (Isopropanol)	3%	I C	II B

Typical properties of foam with a 1% concentration application:

TYPICAL FOAM PROPERTIES – DOSING: 1%		
Water	**Fresh**	**Salt**
Dosing ratio	1%	1%
Expansion ratio	⩾8,58:1	⩾9,66:1
25% Drain time (min:sec)	⩾33:53	⩾43:28
50% Drain time (min:sec)	⩾47:18	⩾56:02

* per EN 1568-3:2018 protocol

9. Ordering Information

If any foam product is discharged into the environment, efforts should be made to control, contain and collect the discharge for proper disposal, while following all applicable laws, regulations, and codes.

Part No.	Description	Shipping Weight
Pails A163822GY9	19 L	22.3 kg
A163822GYA	208 L	243.5 kg
Totes* A163822GYB	1003 L	1178.8 kg

* Totes are not UL approved packaging.

10. Certificates, Approvals

- **Certificates of Admittance CNBOP-PIB no 5155/2023**
- **PZH attestation no F.FT.60114.090.2023**
- GreenScreen Certified™ Silver
- UL162
- LASTFIRE