



WILLIAMS FIRE & HAZARD CONTROL[®]
THUNDERSTORM[®] WNF33A 3% x 3%
Non-Fluorinated AR-SFFF Foam Concentrate



The power behind **your mission**



Proven Performance. Powerful Protection.

Adding to the renowned WILLIAMS FIRE & HAZARD CONTROL® firefighting foam portfolio, THUNDERSTORM® WNF33A 3% x 3% Non-Fluorinated Foam Concentrate is designed to deliver exceptional firefighting performance on hydrocarbon and polar solvent fuel fires.

Formulated for Large Tank Fires

Introducing THUNDERSTORM WNF33A Foam Concentrate: a high-performance, non-fluorinated foam formulated to provide excellent control and extinguishment of large hydrocarbon tank fires. It's especially well-suited for use on fuel in-depth fires and sunken roof hazards that can occur at flammable liquid storage facilities, tank farms, refineries and petrochemical processing operations. In addition to providing exceptional response capability for fuel in-depth hazards, this non-fluorinated foam delivers effective firefighting on flammable liquid spills for municipal and industrial responses.

Designed in accordance with NFPA Standard 11 for low- and medium-expansion foams, THUNDERSTORM WNF33A Foam Concentrate is UL 162 listed as an alcohol-resistant synthetic fluorine-free foam (AR-SFFF). It provides excellent fire and vapor suppression on both types of Class B fires:

- **Hydrocarbon fuels** such as crude oils, gasolines, diesel and aviation fuels
- **Polar-solvent fuels** such as alcohols and ketones with appreciable water solubility

The No-Compromise, Non-Fluorinated Solution

- Effective control and suppression on hydrocarbon fuel fires at expansion ratios as low as 3 to 1
- Viscosity similar to legacy THUNDERSTORM AR-AFFF, enabling application with most standard response proportioning and discharge devices
- Long-lasting foam blanket for extended, post-extinguishment burn-back resistance and vapor suppression
- Flexible response with 3% proportioning in fresh, brackish or salt water



THUNDERSTORM WNF33A Foam Concentrate produces an effective, robust foam blanket at expansion ratios as low as 3:1 and can therefore be applied with either air-aspirating or non-air-aspirating nozzles. It can be correctly proportioned using most conventional, properly calibrated, in-line proportioning equipment and has a recommended operational temperature range of 35 °F to 120 °F (2 °C to 49 °C).

The foam concentrate can be used in conjunction with PKW™ Purple-K dry chemical agent to deliver dual firefighting performance.

To serve a wide range of response needs, THUNDERSTORM WNF33A Foam Concentrate is available in standard pail, drum and tote packaging, with bulk deliveries available upon special request in some regions.

Large Tank Fire Protection

Tank fire tests at the Industrial Rescue Instruction Systems Training Center in Beaumont, TX, USA, demonstrated the exceptional firefighting performance of THUNDERSTORM WNF33A Foam Concentrate on fuel in-depth fires. While NFPA 11 and UL 162 standards mandate a minimum foam application rate of 0.16 gpm/ft² for these types of fires, THUNDERSTORM WNF33A Foam was evaluated at half that rate, 0.08 gpm/ft² (3.26 lpm/m²), to challenge the fire suppression properties of the concentrate.

Tank Setup:

- 42-ft (12.8-m) diameter, 4-ft. (1.2-m) deep tank
- 1,385 ft² (128.7 m²) of surface area
- Fuel layer of E-III™ Industrial Grade Fire Training Fluid*, up to 1,250 gallons (4,732 liters) on a water substrate
- 30-second pre-burn

3% THUNDERSTORM WNF33A Foam:

- 0.08 gpm/ft² (3.26 lpm/m²) application rate
- ¾-inch (19-mm), low-head jet proportioner
- Non-air-aspirating, 110 gpm nozzle at 100 psi (416 lpm at 690 kPa)
- Foam expansion ratio between 3:1–4:1

Based on an average of four separate tank fire tests, control of the fire was established in less than two minutes, with full extinguishment achieved in under five minutes. The time required to reach fire control is comparable to that of legacy THUNDERSTORM foam concentrates on similar 42-ft tank tests and demonstrates the firefighting efficacy of the non-fluorinated WNF33A Foam Concentrate on fuel in-depth fires.

The foam's robust, long-lasting blanket also provides strong burnback resistance and post-fire suppression for flammable liquid fires.



Pre-burn



Control



Extinguishment

The non-fluorinated foam used in this test was captured and contained for disposal in accordance with applicable regulations. This test was conducted at a permitted facility.

THUNDERSTORM WNF33A AR-SFFF Compares Favorably to Legacy THUNDERSTORM Products

	Control Time
THUNDERSTORM F-601A AR-AFFF	1 min 45 sec
THUNDERSTORM F-601B AR-AFFF	2 min 40 sec
THUNDERSTORM W-813A AR-AFFF	2 min 55 sec
Non-Fluorinated THUNDERSTORM WNF33A AR-SFFF	1 min 49 sec

Historical results at 0.08 gpm/ft² application rate on E-III™ fuel fire in 42-ft diameter tank

*E-III™ Industrial Grade Fire Training Fluid is a trademark of Chevron Phillips Chemical Company LP

Demonstrated Performance

Historically, non-fluorinated foams have been challenged to deliver the performance of a traditional alcohol-resistant aqueous film-forming foam (AR-AFFF) for Class B fire and vapor suppression. But that's where THUNDERSTORM WNF33A Foam Concentrate earns its name, with performance tested and demonstrated to provide excellent control and suppression of large hydrocarbon tank fires similar to legacy THUNDERSTORM AR-AFFFs.

THUNDERSTORM WNF33A 3% \times 3% AR-SFFF Recommended Foam Application Rates

UL Test Performance

In addition to the UL 162 AR-SFFF test protocol under which it is listed, THUNDERSTORM WNF33A Foam Concentrate passed the much more challenging UL 162 Type III test protocol for an AR-AFFF.

The UL 162 AR-AFFF protocol utilizes a foam application test rate that is 33% less than the application rate of the AR-SFFF test.

An AR-AFFF with the same demonstrated performance as the THUNDERSTORM WNF33A Foam would have attained a minimum design application rate of 0.10 gpm/ft² (4.1 lpm/m²) for all Type III hydrocarbon fuel fires. However, as an AR-SFFF, the UL 162 standard requires a minimum listed design application rate of 0.16 gpm/ft² (6.5 lpm/m²).

Both NFPA 11 and UL 162 require a minimum design application rate of 0.16 gpm/ft² (6.5 lpm/m²) for all non-fluorinated foams on Type III hydrocarbon fuel in-depth fires. THUNDERSTORM WNF33A Foam has demonstrated an increased safety factor at this application rate with its confirmed success extinguishing Type III hydrocarbon fuel fires at the lower minimum application rate of an AR-AFFF.

THUNDERSTORM WNF33A Foam also performs well and is UL 162 listed for the suppression of ethanol, ketones, E85 and other polar solvent fuel fires.

UL 162 Test Protocol for Specific Fuel Fires		Minimum Design Rate gpm/ft ² (lpm/m ²)
Type III Application	Hydrocarbons	0.16 (6.5)
Type II Application	Hydrocarbons	0.10 (4.1)
	Ethanol	0.10 (4.1)
	Ketones	0.17 (6.9)
	E85 (85% Ethanol/ 15% Gasoline)	0.10 (4.1)
Type III Spill Fire Application*	Hydrocarbons	0.10 (4.1)

*NFPA 11 allows a design rate of 0.10 gpm/ft² (4.1 lpm/m²) for spill fire applications. This product has been tested and 3rd party witnessed in accordance with UL 162 for use at this application rate.



The large-volume Ambassador Monitor Trailer equipped with an automatic monitor brake can discharge water (as illustrated here) or THUNDERSTORM foam solution at flow rates up to 8,000 gpm (30,000 lpm) for large incident response.



From the Name You Trust

THUNDERSTORM WNF33A Firefighting Foam continues a proud, 70-year tradition of standard-setting fire protection. With firsthand experience gained through decades of fighting industrial fires, WILLIAMS FIRE & HAZARD CONTROL product development is at the forefront of fire suppression innovation. Widely recognized as the global leader in emergency industrial firefighting, the WILLIAMS FIRE & HAZARD CONTROL Response Team leads the industry in shaping response tactics and developing products to meet today's most challenging oil, gas, chemical and industrial fires.

THUNDERSTORM WNF33A Foam Concentrate builds on that tradition by delivering a high-performance, non-fluorinated solution for the control and extinguishment of large hydrocarbon tank fires. If it didn't, we wouldn't put the THUNDERSTORM name on it.

THUNDERSTORM WNF33A Foam delivers the best-in-class firefighting performance you need and expect, so you can respond to emergency incidents with confidence.

WILLIAMS FIRE & HAZARD CONTROL Services offer knowledgeable, proactive fire response support based on experience with more than 250 global incident events. Advanced, portable and system-based fire suppression services include:

- Worldwide Inventory of Foam Concentrate for Rapid Response
- Response Equipment Rentals
- Site Assessment/Pre-Planning
- Equipment Testing/Serviceing
- Response Personnel Training
- Incident Response Services



THUNDERSTORM WNF33A Firefighting Foam Concentrate is a **GreenScreen Certified™ Silver** formulation. As a non-fluorinated foam concentrate, it has no intentionally added PFAS chemistry, is produced in equipment that has not handled PFAS chemistry and inherently complies with Directives (EU) 2017/1000 on PFOA and 2019/1021 (EU POPs directive).

*The GreenScreen Certified Logo and word marks are certification marks of Clean Production Action, Inc.

About Johnson Controls

At Johnson Controls, we transform the environments where people live, work, learn and play. From optimizing building performance to improving safety and enhancing comfort, we drive the outcomes that matter most. We deliver our promise in industries such as healthcare, education, data centers and manufacturing. With a global team of 105,000 experts in more than 150 countries and over 130 years of innovation, we are the power behind our customers' mission. Our leading portfolio of building technology and solutions includes some of the most trusted names in the industry, such as WILLIAMS FIRE & HAZARD CONTROL[®], Tyco[®], YORK[®], Metasys[®], Ruskin[®], Titus[®], Frick[®], Penn[®], Sabroe[®], Simplex[®] and Grinnell[®].

For more information, contact your regional WILLIAMS FIRE & HAZARD CONTROL product representative or visit williamsfire.com.

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