T-STORM® NFF 3x3 UL201 3%x3% Non-Fluorinated Foam Concentrate

Features

- Designed in accordance with NFPA Standard 11 for Low-, Medium-, and High-Expansion Foam
- UL162 listed as a synthetic alcohol resistant foam concentrate for use on hydrocarbon and polar solvent fuel fires
- Passes UL162 type III test protocol on hydrocarbons at the same design application rate (0.10 gpm/ft^2 (4.1 Lpm/m^2)) as traditional AR-AFFF products with similar control times
  - Recommended for use at 0.10 gpm/ft^2 (4.1 Lpm/m^2) for spill fire applications
- Effective control and suppression on hydrocarbon fuels
- Superior drain times to high-quality AR-AFFFs, delivering a longer lasting foam blanket for better burnback resistance and after the fire is suppressed.
- EN1568:2018 – Parts 3 and 4

Description

T-STORM® NFF 3x3 UL201 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.

T-STORM NFF 3x3 UL201 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.

T-STORM NFF 3x3 UL201 is defined as a non-fluorinated firefighting foam concentrate, produced in equipment free from the use of PFAS chemistry. Since this product is free from any intentionally added PFAS chemistry, and precautions have been used to avoid PFAS contamination, the concentrate inherently complies with Directives (EU) 2017/1000 on PFOA and 2019/1021 (EU POPs directive) as a non-fluorinated product.

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Typical physiochemical properties

Appearance	Viscous yellow liquid
Density	1.04 ± 0.02 g/ml
pH	7.0 - 8.0
Refractive Index	1.365 minimum
Viscosity*	1790 ± 250 cPs at 60 rpm
Viscosity*	2900 ± 500 cPs at 30 rpm
Freeze Point**	24 °F (-4 °C)
Storage and Operating Range	35 °F to 120 °F (2 °C to 49 °C)

*Brookfield Viscometer Spindle #4

**per new EN1568:2018 protocol

T-STORM NFF 3x3 UL201 Foam Concentrate is a non-Newtonian fluid that is both pseudoplastic and thixotropic. Due to these properties, dynamic viscosity will decrease as shear increases.

Application

T-STORM NFF 3x3 UL201 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.

T-STORM NFF 3x3 UL201 is well-suited for use in applications such as municipal and industrial response for spill and limited scale Type III hazards as well as foam systems with Type II discharge devices. Examples of these applications include:

- Industrial chemical and petroleum processing facilities
- Truck/rail loading and unloading facilities
- Flammable liquid containment areas
- Mobile equipment

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Application (Continued)

Application Rates

Fuel Group	Concentration	Minimum Recommended Application Rate gpm/ft^2	(Lpm/m^2)
Type III Application[1] – UL Listed			
Hydrocarbons	3%	0.16	(6.5)
E15	3%	0.17	(6.9)
Type III Application[2] – Third Party Witnessed			
Hydrocarbons	3%	0.10	(4.1)
Premium Gasoline	3%	0.16	(6.5)
Type II Application[3] – UL Listed			
Hydrocarbons	3%	0.10	(4.1)
Alcohols	3%	0.17	(6.9)
Ethanol (EtOH)	3%	0.10	(4.1)
Ketones	3%	0.17	(6.9)
E85	3%	0.15	(6.1)

(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/ft^2 (4.1 Lpm/m^2) 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.

Foaming Properties

T-STORM NFF 3x3 UL201 Foam Concentrate may be effectively applied using most conventional foam discharge equipment at the correct dilution with fresh, salt, or hard water.

Typical foam characteristics*

Water	Fresh	Salt
Proportioning Rate	3%	3%
Expansion Ratio	≥ 7:1	≥ 6:1
25% Drain Time (min:sec)	≥ 40:00	≥ 35:00
50% Drain Time (min:sec)	≥ 60:00	≥ 50:00

*per EN 1568-3: 2008 protocol

Proportioning

The recommended operational temperature range for T-STORM NFF 3x3 UL201 Foam Concentrate is 35 °F to 120 °F (2 °C to 49 °C) per UL162. 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 bladder tanks and ratio flow controllers
- Around-the-pump type proportioners
- Fixed or portable in-line venturi type proportioners
- Handline nozzles with fixed eductor/pick-up tubes

Storage and Handling

T-STORM NFF 3x3 UL201 Foam Concentrate should be stored in the original supplied package (HDPE totes, drums, or pails) or in the recommended foam system equipment as outlined in Johnson Controls Technical Bulletin *Storage of Foam Concentrates*. The concentrate should be maintained within the recommended operational temperature range. Freezing of the product should be avoided.

Factors affecting the foam concentrate's long-term effectiveness include temperature exposure and cycling, storage container characteristics, air exposure, evaporation, dilution, and contamination. The effective life of T-STORM NFF 3x3 UL201 can be maximized through optimal storage conditions and proper handling. T-STORM 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 manufacturer's foam concentrates under any circumstances. The use of multiple, separately applied finished foam products for incident response is appropriate.

Inspection

T-STORM NFF 3x3 UL201 Foam Concentrate should be inspected periodically 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.

Ordering Information

Part No.	Description	Shipping Weight
Pails		
453242	5 gal (19 L)	45 lb (20.4 kg)
Drums		
453244	55 gal (208 L)	495 lb (224.5 kg)
Totes*		
453246	265 gal (1003 L)	2463 lb (1117 kg)

* Totes are not UL approved packaging.

Safety Data Sheets (SDS) are available at www.williamsfire.com

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. Further information regarding the use, discharge, and disposal of firefighting foams can be found at www.williamsfire.com.

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