ANSUL® NFF-332 3%x3% Non-Fluorinated Foam Concentrate

Description

ANSUL® NFF-332 3%x3% is a 3x3 alcohol-resistant Non-Fluorinated Foam Concentrate (AR-SFFF) that provides superior fire and vapor suppression performance for Class B polar solvents and hydrocarbon fuel fires.

ANSUL® NFF-332 Non-Fluorinated Foam Concentrate meets the FM 5130 standard and has been specifically designed for use in fixed systems for sprinklers, as well as type II and type III discharge devices. This concentrate is FM approved with an extensive hardware package, including upright and pendant sprinklers, B1 nozzles, bladder tanks, proportioners, pourers, and handline foam nozzles.

ANSUL® NFF-332 is intended for forceful or gentle firefighting applications at 3% solution on hydrocarbon and polar solvent fuels in fresh, brackish, and salt water.

ANSUL® NFF-332 utilizes three suppression mechanisms designed for rapid fire knockdown and superior burnback resistance:

- **Foam blanket:** Extended drain times help block oxygen supply to the fuel and suppress fuel vapors.
- **Polymeric membrane formation:** On polar solvent fires, liquid from the foam blanket drains and forms a protective polymeric membrane, effectively sealing the fuel surface and suppressing vapors.
- **Cooling effect:** The water content in the foam solution provides a cooling action, enhancing overall fire suppression.

Table 1: Typical physiochemical properties

Property	Value
Appearance:	Viscous yellow liquid
Density:	1.13 ±0.02 g/ml at 77 °F (25 °C)
pH:	7.0 to 8.0
Refractive index:	1.3976 minimum
Viscosity*:	2500 ±500 cPs at 77 °F (25 °C) at 30 rpm
Viscosity**:	1500 ±500 cPs at 77 °F (25 °C) at 60 rpm
Viscosity***:	200/487 at 375/75 s-1 mPas at 68 °F (20 °C)
Freeze point***:	24 °F (-4 °C)
Storage and operating range:	35 °F to 120 °F (2 °C to 49 °C)
Notes: *Brookfield Spindle #4 at 30 rpm ** Brookfield Spindle #4 at 60 rpm ***In accordance with EN 1568:2018 protocol	

Table 2: FM Approved viscosity

Shear rate (1/s)	Viscosity (Cp)
5	2693
10	1640
20	1014
50	558
100	365
600	151

Note: Brookfield RST-CC rheometer with CCT-40 spindle

Approvals, listings, and standards

ANSUL® NFF-332 Non-Fluorinated Foam Concentrate is designed in accordance with National Fire Protection Association (NFPA) Standard 11 for low-, medium-, and high-expansion foam. The concentrate is approved, listed, qualified under, or meets the requirements of the following specifications and standards:

- FM Approvals – FM 5130
  - This concentrate is only FM Approved in conjunction with the specific proportioning equipment and discharge devices as shown in the Approval Guide (www.ApprovalGuide.com)
- EN 1568
  - Parts 1, 3, and 4
- GreenScreen Certified™ Silver firefighting foam concentrate

FM APPROVED

EN 1568

GREENSCREEN CERTIFIED SILVER

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 | Form No. AN-2025025

Johnson Controls

Application

ANSUL® NFF-332 Non-Fluorinated Foam Concentrate is intended for use on both types of Class B fires: hydrocarbon fuels with low water solubility, such as gasolines, diesel fuels, and aviation fuels; and polar solvent fuels with appreciable water solubility, such as methyl and ethyl alcohol, isopropyl alcohol, acetone, and esters.

ANSUL® NFF-332 is FM 5130 Approved on a large range of flammable liquids such as heptane, hexane, gasoline, kerosene (JET-A), ethanol, acetone, and isopropanol.

ANSUL® NFF-332 is FM 5130 Approved for use with upright and pendent 5.6 k (80), 8.0 k (115), 11.2 k (160), and K17 (240) sprinklers on hydrocarbon and polar fuels. This concentrate can be ideal for fixed and semi-fixed foam systems using sprinklers, nozzles, and other standard discharge devices for applications such as the following examples:

- Industrial chemical and petroleum processing facilities
- Fuel or chemical storage tanks
- Truck or rail loading and unloading facilities
- Flammable liquid containment areas
- Aircraft hangars
- Flammable liquid warehouse storage facilities
- Mobile equipment

ANSUL® NFF-332 Non-Fluorinated Foam 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.

Foaming properties

ANSUL® NFF-332 Non-Fluorinated Foam Concentrate may be effectively applied using most conventional foam discharge equipment at the correct dilution with fresh, salt, or hard water. ANSUL® NFF-332 requires low energy to foam. The foam solution may be effectively applied with conventional aspirating and non-aspirating discharge devices at the correct dilution with water. Air-aspirating discharge devices typically produce expansion ratios from 4:1 to 10:1, depending on the type of device and the flow rate. Non-air-aspirating devices, such as handline water fog/stream nozzles or standard sprinkler heads, typically produce expansion ratios from 2:1 to 4:1.

Table 3: Typical foam characteristics in accordance with the latest EN1568-3 protocol

Water	**Fresh**	**Salt**
Proportioning rate	3%	3%
Expansion ratio	9.4	8.6
25% drain time (min:sec)	79:00	59:00
50% drain time (min:sec)	106:00	79:00

Storage and handling

Store ANSUL® NFF-332 Non-Fluorinated Foam Concentrate in the original supplied package (totes, drums, or pails) or in the recommended foam system equipment as outlined in the Johnson Controls Technical Bulletin, Storage of Foam Concentrates. Maintain the concentrate within the recommended operational temperature range and avoid freezing the product. Factors that affect 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 ANSUL® NFF-332 can be maximized through optimal storage conditions and correct handling. ANSUL® foam concentrates have demonstrated effective firefighting performance with contents stored in the original package under correct 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.

Quality assurance and inspection

ANSUL® NFF-332 Non-Fluorinated Foam Concentrate is subject to stringent quality controls throughout production, from incoming raw materials and inspection to finished product testing.

ANSUL® NFF-332 Non-Fluorinated Foam Concentrate should be inspected periodically in accordance with NFPA 11, EN 13565-2, or other relevant standards. A representative concentrate sample should be sent to Johnson Controls Foam Analytical Services or other qualified laboratory for quality analysis in accordance with the applicable standard. An annual inspection and sample analysis is typically sufficient, unless the product has been exposed to unusual conditions.

ANSUL® NFF-332 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. ANSUL® NFF-332 complies with Directives (EU) 2017/1000 on PFOA and 2019/1021 (EU POPs directive), and EU2024/2462 on PFHxA.

ANSUL® NFF-332 has been subjected to OECD 301F testing and after 28 days is considered inherently biodegradable.

Proportioning and discharge devices

The recommended operational temperature range for ANSUL® NFF-332 Non-Fluorinated Foam Concentrate is 35 °F to 120 °F (2 °C to 49 °C) in accordance with FM 5130.

Table 4 lists the approved range of equipment validated for ANSUL® NFF-332 Non-Fluorinated Foam Concentrate against the FM 5130 standard.

Proportioning and discharge devices

Table 4: NFF-332 approved range of equipment (FM 5130)

Sprinklers	K5.6 (80)	Upright	TY3131 – TY3151 – TY315 – TY313
		Pendent	TY3231 – TY3251 – TY325 – TY323
	K8.0 (115)	Upright	TY4131 – TY4151
		Pendent	TY4231 – TY4251
	K11.2 (160)	Upright	TY5111 – TY5131 – TY5151 – TY5851 – TY5831
		Pendent	TY5211 – TY5231 – TY5251
	K17 (240)	Upright	TY7151
		Pendent	TY7251
Foam nozzles	B1 K3.0 (43)		
Foam pourers	FLR models 30 and 90		
Handline nozzle	HL models 60 to 95 and 120		
Proportioning equipment	Ratio flow controllers 2 in. up to 8 in.		
Proportioning equipment	Wide range proportioner TPW MK3 6 in. and 8 in.		
Bladder tanks	Vertical and horizontal all sizes		
Hydraulic foam valve	HCCV supervised models 1 in. up to 2 in.		

Ordering information

Table 5: Ordering information

	Description	**Shipping weight**
Part No.	**gal (L)**	**lb (kg)**
A16382TDYJ*	5 (19)	50 (23)
A16382V661**	5 (19)	50 (23)
A16382TDYK*	55 (208)	541 (246)
A16382V662**	55 (208)	541 (246)
A16382TDYL*	265 (1003)	2621 (1189)
A16382V663**	265 (1003)	2621 (1189)

Notes: *Manufactured in the United States of America
**Manufactured in Europe

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

Note: While NFF (also known as 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.

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