



**DATA SHEET  
#NFC410**

**UNIVERSAL® PLUS  
3%-6% AR-AFFF  
Environmentally Responsible  
Foam Concentrate**

**Description**

Environmentally responsible Universal Plus is the next generation in Alcohol-Resistant Aqueous Film Forming Foams (AR-AFFFs). This new formulation demonstrates National Foam’s commitment to superior flexibility, firefighting performance, and environmental responsibility.

Universal Plus is used at 3% to extinguish hydrocarbon fires, and at 6% for polar-solvent (water-miscible) fires. It is suitable for use with foam compatible dry powder extinguishing agents.

Universal Plus is an AR-AFFF concentrate with a special biosynthesized polymer. This polymer is designed to fulfill two functions. The first is to form a protective membrane between the fuel and the foam as it contacts the water-miscible fuel, making extinguishment possible. The second function is to make the foam more stable and heat-resistant, resulting in better burnback resistance and sealability compared to conventional AFFFs. The unique state-of-the-art Universal Plus concentrate formulation is recognized by United States Patents 4,999,119 and 5,207,932.

**Applications**

Universal Plus is used in fire suppression systems and manual applications to fight the broadest range of class B fires. Typical applications include storage tanks, loading racks, docks, process areas, warehouses, spills, etc. Universal Plus can also be used as a wetting agent in combating class A fires.

**Typical Physical Properties**

Appearance .....	Amber-Colored Viscous Liquid
Specific Gravity @ 77°F (25°) .....	1.022
pH .....	8.2
Viscosity .....	2700 cps*
Minimum usable temperature .....	35°F (2°C)
Maximum usable temperature .....	120°F (49°C)

\*Brookfield #3 Spindle @ 30 rpm. Viscosity measured under different shear conditions will be different because of pseudoplastic rheology of this non-Newtonian product.

**Approvals and Listings**

- Underwriters Laboratories, Inc.
- Factory Mutual System

Universal Plus has successfully passed UL-162 7th Edition test criteria for use at 3% concentration on hydrocarbons and at 6% on polar solvents using both fresh and sea water. The UL listings include application through a variety of proportioning and foam-making devices. Consult National Foam for a complete list of these devices.

**Storage and Handling**

Universal Plus is ideally stored in its original shipping container or in tanks or other containers which have been designed for such foam storage. Recommended construction materials are stainless steel (Type 304L or 316), high density cross-linked polyethylene, or reinforced fiberglass polyester (isophthalic polyester resin) with a vinyl ester resin internal layer coating (50-100 mils).

Foam concentrates are subject to evaporation which accelerates when the product is exposed to air. Storage tanks should be sealed and fitted with a pressure vacuum vent to prevent free exchange of air. The recommended storage environment is within the UL-listed temperature range of 35°F to 120°F (2°C to 49°C).

It is recommended that Universal Plus not be mixed with any other type of foam concentrate in long-term storage. Such mixing could lead to chemical changes in the product and a possible reduction in or loss of its firefighting capability. Most expanded foams are compatible for side-by-side application during an incident.

**Shelf Life, Instection and Testing**

The shelf life of any foam concentrate is maximized by proper storage conditions and maintenance. Factors affecting shelf life are wide temperature changes, extreme high or low temperatures, evaporation, dilution, and contamination by foreign materials. Properly stored National Foam AR-AFFF foam concentrates have been tested and shown no significant loss of firefighting performance, even after 15 years.

Annual testing of all firefighting foams is recommended by the National Fire Protection Association (NFPA). National Foam provides a Technical Service Program to conduct such tests. Contact your National Foam representative for details.

**Environmental and Toxicological Information**

Universal Plus contains no ingredients reportable under the Superfund Amendments and Reauthorization Act (SARA) Title III, Section 313 of 40 CFR-372 or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as of July 1, 1995. Universal Plus is biodegradable. However, as with any substance, care should be taken to prevent discharge from entering ground water, surface water, or storm drains. With advance notice, Universal Plus can be treated by local biological sewage treatment systems. Since facilities vary widely by location, disposal or discharge of Universal Plus concentrate or foam solution should be made in accordance with federal, state and local regulations. The Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) of Universal Plus are as follows:

BOD<sub>5</sub> 68,800 mg/kg  
 COD 190,000 mg/kg

Results of tests for acute oral toxicity and primary skin irritation have proved negative. Repeated skin contact will remove oils from the skin and cause dryness. Universal Plus is a primary eye irritant, and contact with the eyes should be avoided. Users are advised to wear protective equipment. If Universal Plus enters the eyes, flush them well with water and seek immediate medical attention. For further details, see the Universal Plus Material Safety Data Sheet.

Underwriters Laboratories-Listed Type II Application Rates - Universal Plus			
Fuel Group	Specific Test Fuel	Proportioning %	UL-Listed Type II Application Rate gpm/ft <sup>2</sup> (l/m/m <sup>2</sup> )
ALCOHOLS	Isopropyl Alcohol	6	0.13 (5.3)
ETHANOL	Ethanol	6	0.10(4.1)
METHANOL	Methanol	6	0.10 (4.1)
KETONES	Acetone	6	0.13 (5.3)
METHYL ETHYL KETONE	Methy Ethyl Ketone	6	0.10 (4.1)
MTBE	Methyl Tertiary Butyl Ether	6	0.15 (6.1)
ESTERS	Normal Butyl Acetate	6	0.10 (4.1)

**Ordering Information**

CONTAINER	SHIPPING WEIGHT	PART NUMBER
<b>5-Gallon Pails</b> (19 litres)	46 lb. (20.9 kg)	2130-5340-6
<b>55-Gallon Drums</b> (208 litres)	494 lb. (225.0 kg)	2130-5481-6
<b>275-Gallon IBC Reusable Tote Tank</b> (1041 litres)	2512 lb. (1141.8 kg)	2130-5725-6
<b>Bulk</b>	8.59 lb./gal.(1.03 kg/l)	2130-5001-6

Palletizing of pails and drums is available upon request.

**SHIPPING CUBE**

5-Gallon Pail .....	1.13 cu. ft. (0.032 cu. m)
55-Gallon Drum .....	11.51 cu. ft. (0.326 cu. m)
275-Gallon IBC Tote Tank ....	51.11 cu. ft. (1.1061 cu. m)

This information is only a general guideline. The company reserves the right to change any portion of this information without notice. Terms and conditions of sale apply and are available on request.