

# ANSULITE® 3x3 LOW-VISCOSITY AR-AFFF CONCENTRATE

Data/Specifications



## DESCRIPTION

ANSULITE® 3x3 Low-Viscosity AR-AFFF (Alcohol-Resistant Aqueous Film-Forming Foam) Concentrate is formulated using a newly patented and proprietary technology. The foam concentrate has a dramatically reduced viscosity as compared to other listed polar-solvent type

- ▶ AR-AFFF concentrates on the market. This reduced viscosity enhances performance in all types of foam proportioning equipment including in-line eductors, balanced pressure systems, and built-in systems aboard CFR vehicles.

Additionally, the fire fighting performance of ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate is superior to other 3% foam concentrates. This includes the blended gasoline additive Methyl Tertiary Butyl Ether (MTBE) which is being used worldwide as an oxygenate to make gasoline cleaner burning.

ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate offers many distinct advantages for ease of use and represents a continued commitment to quality by improving the first agent listed by Underwriters Laboratories for use as a 3% concentrate on both polar solvent and hydrocarbon fuels.

ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate is formulated from special fluorochemical and hydrocarbon surfactants, a high molecular weight polymer, and solvents. It is transported and stored as a concentrate to provide ease of use and considerable savings in weight and volume.

It is intended for use as a 3% proportioned solution on both polar solvent and hydrocarbon fuels in fresh, salt or hard water. It may also be stored and used as a premixed solution in fresh water only.

There are three fire extinguishing mechanisms in effect when using ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate on either a conventional Class B hydrocarbon fuel such as gasoline, diesel fuel, etc., or a Class B polar solvent (water miscible fuel) such as methyl alcohol, acetone, etc. First, an aqueous film is formed in the case of a conventional hydrocarbon fuel, or a polymeric membrane in the case of a polar solvent fuel. This film or membrane forms a barrier to help prevent the release of fuel vapor. Second, regardless of the fuel type, a foam blanket is formed which excludes oxygen and from which drains the liquids that form the film or the polymeric membrane. Third, the water content of the foam produces a cooling effect.

### Typical Physiochemical Properties at 77 °F (25 °C)

|                                 |  |
|---------------------------------|--|
| ▶ Appearance                    | Colorless to Pale Yellow Gelled Liquid |
| Density                         | 1.020 g/ml ± 0.020                     |
| pH                              | 7.0 – 8.5                              |
| Refractive Index                | 1.3565 ± 0.0020                        |
| ▶ Surface Tension (3% Solution) | 18 ± 1 dynes/cm                        |
| Viscosity                       | 1500 ± 500 cps*                        |

\*Brookfield Viscometer Spindle #4, Speed 30

ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate is a non-Newtonian fluid that is both pseudoplastic and thixotropic. Because of these properties, dynamic viscosity will decrease as shear increases.

## APPLICATION

ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate is unique among the ANSULITE AFFF agents in that it can be used on either conventional Class B fuel or the polar solvent type Class B fuels. Its excellent wetting characteristics make it useful in combating Class A fires as well.

Because of the low energy required to make foam, it can be used with both aspirating and nonaspirating discharge devices.

To provide even greater fire protection capability, it may be used with dry chemical extinguishing agents without regard to the order of application. Due to the velocity of the dry chemical discharge, care must be taken not to submerge the polymeric membrane below the fuel surface.

A unique application for ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate is vapor mitigation for hazardous fuming compounds including fuming acids. Recent tests on oleum and chlorosulfonic acids conducted in conjunction with DuPont at a DOE testing facility in Nevada found the foam to be very effective when applied through medium expansion nozzles such as the ANSUL® Model KR-M2 and KR-M4. In addition, the concentrate is ideally suited for situations involving flammable liquid spills where prolonged vapor suppression is desirable in advance of the spill clean up.

## APPLICATION RATES

Application Rates using UL 162 Standard 50 ft<sup>2</sup> Fire Test on representative hydrocarbon and polar solvent fuels are listed below.

### U.L. Type II Application<sup>(1)</sup> – Polar Solvents

| Fuel Group                   | Concentration | Minimum Recommended Application Rate gpm/ft <sup>2</sup> | (Lpm/m <sup>2</sup> ) |
|------------------------------|---------------|--|-----------------------|
| <b>Alcohols</b>              |               |  |                       |
| Methanol (MeOH)              | 3%            | 0.10   | (4.1)                 |
| Ethanol (EtOH)               | 3%            | 0.10   | (4.1)                 |
| Isopropanol (IPA)            | 3%            | 0.15   | (6.1)                 |
| Tertiary Butyl Alcohol (TBA) | 3%            | 0.19   | (7.7)                 |

### Ketones

|                               |    |      |       |
|-------------------------------|----|------|-------|
| Methyl Ethyl Ketone (MEK)     | 3% | 0.10 | (4.1) |
| Acetone                       | 3% | 0.15 | (6.1) |
| Methyl Isobutyl Ketone (MIBK) | 3% | 0.15 | (6.1) |

### Amines

|                  |    |      |       |
|------------------|----|------|-------|
| Ethylene Diamene | 3% | 0.10 | (4.1) |
|------------------|----|------|-------|

### Ethers

|                                      |    |      |       |
|--------------------------------------|----|------|-------|
| Methyl Tertiary Butyl Ether (MTBE)   | 3% | 0.13 | (5.3) |
| MTBE Blended Gasoline <sup>(2)</sup> | 3% | 0.10 | (4.1) |
| Ethyl Tertiary Butyl Ether           | 3% | 0.14 | (5.7) |
| Tetrahydrofuran (THF)                | 3% | 0.20 | (8.2) |

### U.L. Type III Application<sup>(3)</sup> – Hydrocarbons

|         |    |      |       |
|---------|----|------|-------|
| Heptane | 3% | 0.10 | (4.1) |
|---------|----|------|-------|

(1) TYPE II DISCHARGE OUTLET – A device that delivers foam onto the burning liquid and partially submerges the foam or procedures restricted agitation of the surface as described in UL 162.

(2) MTBE (17.8%)/Regular Unleaded Gasoline (82.2%) Blend

(3) TYPE III DISCHARGE OUTLET – A device that delivers the foam directly onto the burning liquid as described in UL 162.

## PERFORMANCE

**Fire Performance** – The fire performance of ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate is measured primarily against Underwriters Laboratories Standard 162.

**Foaming Properties** – When used with fresh, salt or hard water at the correct dilution with most conventional foam making equipment, the expansion will vary depending on the performance characteristics of the equipment. Aspirating discharge devices produce expansion ratios of 5:1 to 10:1 depending primarily on type of aspirating device and flow rate. Nonaspirating devices such as handline water fog/stream nozzles or standard sprinkler heads give expansion ratios of 2:1 to 4:1. Medium expansion discharge devices produce typical expansion ratios between 20:1 to 60:1 depending primarily upon type of device and operating conditions.

**Proportioning** – ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate can be easily proportioned (at the correct dilution) using most conventional proportioning equipment such as:

1. Balanced pressure and in-line balanced pressure pump proportioning equipment
2. Balanced pressure bladder tank proportioner
3. Around-the-pump proportioners
4. Fixed or portable (in-line) venturi proportioners
5. Handline nozzles with fixed induction/pickup tubes

The minimum and maximum usable temperature for ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate in this equipment is 35 °F (2 °C) to 120 °F (49 °C) respectively.

**Storage/Shelf Life** – When stored in the packaging supplied (polyethylene drums or pails) or in equipment recommended by the manufacturer and within the temperature limits specified, the shelf life of ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate is about 20-25 years. The factors affecting shelf life and stability for ANSULITE AFFF agents are discussed in detail in Ansul Technical Bulletin No. 54. Freezing of the product should be avoided. If, however, the product is frozen during transport or storage, it must be thawed and inspected for signs of separation. If separation has occurred, the product must be mechanically mixed until homogeneous.

When the concentrate is to be stored in an atmospheric storage tank, a 1/4 in. (6 mm) layer of mineral oil should be added to seal the concentrate and minimize the effects of evaporation.

**Compatibility** – Since ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate is a unique blend of surfactants, high molecular weight polymers, and solvents; it is recommended that ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate should not be mixed with any other foam concentrates. Consult Ansul Incorporated with any questions of compatibility.

**Materials of Construction Compatibility** – Tests have been performed with ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate verifying its compatibility with standard carbon steel “black” pipe and pipe manufactured from various stainless steel or brass compounds. Alternative pipe, plastic fittings, and valves may be used in some cases if acceptable to the customer and/or the authority having jurisdiction. Refer to Ansul Technical Bulletin No. 59, Form No. F-90109, addressing acceptable materials of construction for use with ANSUL foam concentrates.

Galvanized pipe and fittings must not be used in areas where undiluted concentrate will contact them since corrosion will result.

Please **first** consult Ansul Incorporated for specific guidelines concerning materials of construction.

**Inspection** – As with any fire extinguishing agent, ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate, whether in the concentrate or pre-mixed form, should be inspected periodically. NFPA 11 “Standard for Low Expansion Foam and Combined Agent Systems” requires that foam concentrate samples be submitted to the manufacturer or other qualified laboratory for quality condition testing at least annually. Contact ANSUL for further information on annual inspection.

ANSUL and ANSULITE are trademarks of Ansul Incorporated or its affiliates.

## APPROVALS AND LISTINGS

Underwriters Laboratories successfully tested ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate to the requirements contained in UL Standard 162, “Standard for Air-Foam Equipment and Liquid Concentrates.” To receive the UL listing, the following tests had to be performed successfully:

1. Foam Quality Tests
2. Class B Hydrocarbon Fuel Fire Tests
3. Class B Polar Solvent Fuel Fire Tests
4. Foam Identification Tests
5. Tests of Shipping Containers
6. Class B Hydrocarbon and Polar Solvent Fuel Sprinkler Tests (Standard type both upright and pendent)

Besides determining agent characteristics, Underwriters Laboratories lists ANSULITE 3x3 Low-Viscosity Concentrate for use with specific hardware components that also carry the UL listing. To obtain these listings, ANSUL selected various hardware components from the major U.S. manufacturers of foam hardware.

## ORDERING INFORMATION

ANSULITE 3x3 Low-Viscosity AR-AFFF Concentrate is available in pails, drums, totes, or bulk shipment.

|                 |  |
|-----------------|--|
| Part No. 416493 | 5 gallon pail  |
| Part No. 416495 | 55 gallon drum   |
| Part No. 429741 | 265 gallon tote  |
| Part No. 416607 | Bulk (contact ANSUL about domestic truckload delivery) |

Shipping Weight:

- 5 gal (19 L) pail – 45 lb (20.4 kg)
- 55 gal (208.2 L) drum – 495 lb (224.5 kg)
- 265 gal (1000 L) tote – 2465 lb (1118 kg)

Cube:

- 5 gal (19 L) pail – 1.25 ft<sup>3</sup> (0.0354 m<sup>3</sup>)
- 55 gal (208.2 L) drum – 11.83 ft<sup>3</sup> (0.3350 m<sup>3</sup>)
- 265 gal (1000 L) tote – 50.05 ft<sup>3</sup> (1.42 m<sup>3</sup>)



tyco

Ansul Incorporated  
Marinette, WI 54143-2542

715-735-7411  
www.ansul.com

Copyright ©2007 Ansul Incorporated  
Form No. F-9350-6