TECHNICAL BULLETIN

# Alcohol Resistant – Aqueous Film-Forming (AR-AFFF) and Alcohol Resistant – Synthetic Fluorine Free Foam (AR-SFFF) Concentrates

## Mineral Oil Recommendations

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tyco Fire Protection Products

## AR-AFFF and AR-SFFF Type Concentrates

Alcohol Resistant - Aqueous Film Forming Foam (AR-AFFF) and Alcohol Resistant – Synthetic Fluorine Free Foam (AR-SFFF) Concentrates as manufactured by Tyco Fire Protection Products are comprised of a mixture of water, solvents, hydrocarbons, and biogums. Additionally, unlike AR-SFFF firefighting foam concentrates, AR-AFFF's also contain fluorosurfactants. When mixed in the proper proportions, each component lends unique properties to the foams that enhance firefighting performance and create a product that is stable in long term storage. If left open to the environment for extended periods, as in an atmospheric foam storage tank, AR-AFFF and AR-SFFF products may experience water loss because of evaporation. This can cause a skin to form over the surface of the liquid or, in rare cases, cause the foam concentrate to stratify. Both conditions can decrease firefighting performance of a foam system.

To maximize the usable life of AR-AFFF and AR-SFFF foam concentrates, Tyco Fire Protection Products recommends that a thin layer of mineral oil (up to 1/4 in. [6 mm] thick) be applied to the surface of the foam concentrate when stored in fixed atmospheric storage containers. When applying mineral oil to the tank, avoid submerging the mineral oil into the foam concentrate to the extent possible. If it becomes necessary to recirculate an atmospheric storage tank filled with AR-AFFF or AR-SFFF foam concentrate and seal it with mineral oil, it is recommended that the return line from the recirculation pump be placed below the surface of the foam concentrate to avoid entrainment of mineral oil.

Mineral oil should not be used to seal atmospheric foam storage tanks subject to agitation or vibration, such as those found aboard ships or mobile fire apparatus. Agitation can cause the mineral oil to form an emulsion with the AR-AFFF or AR-SFFF foam concentrate that can affect the performance of the foam concentrate. These types of atmospheric tanks should be as full as possible when not in use to minimize the liquid surface area exposed and reduce the potential for evaporation and skin formation. AR-AFFF and AR-SFFF products manufactured by Tyco Fire Protection Products are not shipped from the factory sealed with mineral oil due to the potential for agitation in transit. In storage, factory containers should remain sealed until needed to prevent evaporative loss. Mineral oil should not be added to factory containers. In applications requiring factory containers be opened and staged near discharge equipment, contact Tyco Fire Protection Products Technical Services for storage recommendations.

Tyco Fire Protection Products recommends the use of Drakeol 35 mineral oil or an equivalent grade with a viscosity at 40 °C (104 °F) of 65.8 – 71.0 Cst. Mineral oil not conforming to this specification may be more susceptible to emulsification in AR-AFFF and AR-SFFF concentrates.

## AFFF and Other Foam Concentrates Types

Tyco Fire Protection Products does not recommend the use of mineral oil to seal atmospheric storage tanks containing any type of foam concentrate other than AR-AFFF and AR-SFFF.

## Foam Concentrate Inspection and Testing

All foam concentrates have a finite shelf life that can be affected by storage conditions. To help ensure they will function as designed while in service, Tyco Fire Protection Products recommends all foam concentrates not sealed in the original factory packaging be regularly inspected and tested by the manufacturer at least annually per NFPA 11 or NFPA 25 guidelines. When retrieving a foam sample from an atmospheric storage tank sealed with mineral oil, care should be taken not to contaminate the sample as this can lead to erroneous test results. Contact Tyco Fire Protection Products Customer Service for details on testing services offered by Tyco Fire Protection Products or to order a foam sampling kit.