

## Technical Bulletin

NFTB100

# Materials of Construction for Use with National Foam Synthetic Based AFFF, Alcohol Resistant AFFF, Fluorine Free and Alcohol Resistant Fluorine Free (Synthetic) Foam Concentrates

### General

Synthetic foam concentrates are based on hydrocarbon surfactants or synthetic foaming agents. Some, like Aqueous Film Forming Foam (AFFF) and Alcohol Resistant Aqueous Film Forming Foam (AR-AFFF) also contain special fluorinated surfactants to achieve film formation. Other versions of synthetic foam concentrates include those that rely on synthetic foaming agents, but do not contain fluorinated surfactants; these would include high expansion, Class A, Fluorine Free Foam (F3) and Alcohol Resistant Fluorine Free Foam (AR-F3 or Alcohol Resistant Synthetic) concentrates.

### Materials Recommended

NF recommends and lists the following materials of construction:

#### 1. Storage Tanks

Preferred Materials:

- High-density Cross-linked Polyethylene
- Fiberglass with isophthalic based polyester and an internal layer (50-100 mils minimum) of vinyl ester resin in contact with foam concentrate
- Stainless Steel - 304L or 316 grades (passivated after welding)

#### 2. Piping/Components (Foam Concentrates)

The choice of piping materials depends on the anticipated contact time with the foam concentrate.

For continuous and intermittent contact, selections can be made from the materials noted below.

- Brass or Bronze
- Stainless Steel - 304L or 316 grades (passivated if welded)
- High-density polyethylene
- PVC
- Fiberglass with isophthalic based polyester and an internal layer (50-100 mils minimum) of vinyl ester resin in contact with foam concentrate

**Note:** Galvanized steel storage tanks or piping should never be used to contain any foam concentrates.

#### 3. Piping/Components (Foam Solution)

Selections can be made from the materials noted below.

- Stainless Steel - 304L or 316 grades (passivated if welded)
- Brass or Bronze
- Copper or Copper/Nickel Alloys
- Carbon Steel\*
- Galvanized Steel\*\*
- Cement-lined Pipe
- PVC
- Fiberglass with isophthalic based polyester and an internal layer (50-100 mils minimum) of vinyl ester resin in contact with foam concentrate

\* Per NFPA 11, unprotected when discharge devices are closed to atmosphere

\*\* Per NFPA 11, galvanized steel can be used for foam solution piping. However, National Foam recommends that the piping should be flushed with water after each use. Galvanized steel must not be used for wet pipe systems as some foam concentrates may react with the galvanized coating

#### 4. Gaskets or Elastomers

- Viton® (fluoroelastomer)
- Buna-N (NBR – nitrile butadiene rubber, nitrile rubber)
- Teflon™ (PTFE, polytetrafluoroethylene)
- EPDM (Ethylene Propylene Diene Monomer)



#### CAUTION:

**Dissimilar metals in contact with one another can lead to electrolytic action that will cause galvanic corrosion of the metals. Dissimilar metal combinations that react galvanically should be avoided or a non-conducting gasket material should be used in the joint.**

#### Additional Recommendations

Before introducing foam concentrate into storage tanks or foam piping, make sure that components are thoroughly cleaned and allowed to dry. 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. Storage tanks should be kept full. In certain applications, contents may be covered with ¼ inch (3 mm) of National Foam Seal Oil to ensure prevention of air coming into contact with the concentrate. Refer to National Foam product data sheet NFC950 for further details. In the case of Fluorine Free foam concentrates, a layer of polypropylene or polyethylene hollow spheres may be floated on the surface of the foam concentrate to reduce evaporation.

It is recommended that foam concentrate piping should be maintained in a flooded state.