

Technical Bulletin

NFTB290

FIREFIGHTING FOAM SYSTEM MATERIALS OF CONSTRUCTION GUIDANCE FOR SYNTHETIC FLUORINE FREE FOAM (SFFF)

Synthetic Fluorine Free Foam (SFFF) and Alcohol Resistant Synthetic Fluorine Free Foam (AR-SFFF) concentrates from National Foam are formulated to be compatible with most common metals and plastics used in firefighting equipment and foam systems. The guidance in this document is for the materials of construction utilized in foam systems in contact with SFFF and AR-SFFF concentrates manufactured by National Foam only.

Concentrate Storage Tanks

Concentrate storage tanks may be fabricated from the following materials:

- Stainless Steel: 316L and Duplex 2205 grades. Tanks with welded construction should have all joints treated to ensure consistent properties close to welds. While very slight pitting may occur, it should not affect tank or concentrate.
- Glass Reinforced Plastic (GRP): Fiberglass tanks with epoxy resin are suitable for concentrate storage except for installations involving pressure displacement.
- High Density Crosslinked Polyethylene (XDPE).
- High Density Polyethylene (HDPE).
- Polypropylene.

Ferrous metal ions can contaminate the foam concentrate leading to reduced

firefighting performance. Therefore, mild steel tanks are not recommended for storage of foam concentrates. The use of zinc, galvanized materials, and aluminum in storage tanks, pipework, and machinery that handle foam concentrates should be avoided. If concentrate is to be charged into an existing system with zinc or galvanized materials of construction, please contact National Foam for additional guidance.

Gaskets, seals, and bladders may be fabricated from most common elastomers such as:

- Fluoroelastomers, e.g., Viton
- Ethylene Propylene Diene Monomer (EPDM)
- Ethylene Propylene Rubber (EPR)
- Butyl rubber (modified isobutylene) such as Bucar
- Polysarbutyl MD551
- BunaN
- Nitrophenyl
- Nitrile Rubber (butadiene acrylonitrile copolymer)
- PTFE such as Teflon

Fittings in foam concentrate pumps and valves may be made from brass, bronze, and gunmetal. Dissimilar metals in contact with one another (eg. a stainless steel tank and a brass valve) will lead to electrolytic action. This will cause galvanic corrosion of the metals. Dissimilar metals

should either be avoided or a non-conductive gasketing material should be used in the joint.

The chemical properties of all components should be verified with the manufacturer to ensure they do not contain fluorochemicals that could leach into the fluorine free foam concentrate or solution.

Pipework

The same materials of construction guidance for storage tanks (previous section) also applies to piping in extended contact with foam concentrate and solution. Typical metal pipework materials such as copper, brass, bronze and stainless steel are satisfactory for concentrate and solution contact, subject to normal engineering criteria.

Tank inlet pipework should be located at the base of the tank to avoid excessive foaming during fill. Outlet pipework should be located above the base of the tank to mitigate clogging in the event of minor sediment in the tank.

Foam concentrate pipework systems should be designed to prevent water and other liquids from accidentally entering the tank and foam concentrate from accidentally escaping the tank. Foam concentrates are suitable for decanting into clean, dry containers. Agitation and air intrusion should be kept to a minimum if foam concentrate pumps are used.