Johnson Controls

SKUM

3% SFFF ICAO-B Foam Concentrate (NFF-3B)

High-performance non-fluorinated firefighting foam

Class-leading, cross-functional performance

The firefighting industry is changing. The revolutionary new class of foam concentrate solutions includes non-fluorinated products for Class B hydrocarbon fuel fires.

Premium SFFF 3% non-fluorinated foam

SKUM® 3% SFFF ICAO-B is a Synthetic Fluorine Free Foam Concentrate (SFFF). It's specifically designed to be used at 3% in aircraft firefighting applications for suppressing and securing flammable aviation fuel spills and fires (Jet A, Jet A1, Kerosene).

Key applications

- Aircraft rescue and firefighting (ARFF) trucks
- Military air forces
- Heliports (helidecks)

SKUM 3% SFFF ICAO-B may also be used with our dry chemical agent Purple K for greater fire suppression performance.

Key features

- **Non-fluorinated firefighting foam concentrate:**
  No intentionally added PFAS chemistry
- **Superior fire suppression:**
  Effective on Class B hydrocarbon fuels, such as aviation fuels (Jet A, Jet A1, Kerosene), gasoline and diesel fuels
- **International Civil Aviation Organization (ICAO) certified:**
  Meets ICAO 9137-AN/898 – Level B
- **Airport-ready:**
  Perfect for use with existing aircraft rescue and firefighting (ARFF) trucks equipment, monitors, nozzles and rapid intervention vehicles (RIV)
- **Low-viscosity Newtonian:**
  Ensures easy induction and compatibility with existing airport crash vehicles
- **Versatile:**
  Works with most conventional air-aspirating and non-air-aspirating foam appliance devices
- **Dry chemical agent compatible per ICAO requirement:**
  Successfully tested on Jet A fuel with our Purple K Dry Chemical

Dry chemical powder compatibility

ICAO Airport Service Manual Doc 9137-AN/898 explicitly states that, "When selecting dry chemical powder for use with foam, care must be exercised to ensure compatibility".

An FAA test campaign and report from July 2022[1] demonstrated adverse reactions from most non-fluorinated foam over dry chemical application. Some of the adverse reactions caused an instant breakdown of the foam blanket.

Given this known issue, we took great extra care during development to ensure our SKUM 3% SFFF ICAO-B foam is fully compatible with our Purple K. Our ICAO-B non-fluorinated foam concentrate has been rigorously tested and successfully passed the MIL-PRF-32725 test protocol on Jet A fuel using Purple K, in accordance with ICAO requirements.

[1] Report number DOT/FAA/TC-22/23 Fluorine-Free Foam testing. This document is available to the U.S. public thought the National Technical Information Services (NTIS), Virginia

Foam expansion and compatibility with foam discharge equipment

Minimum foam expansion is a well-known challenge for non-fluorinated foams, as highlighted by the NFPA Research Foundation in January 2020[2]. The ICAO standard typically relies on a test nozzle that produces a foam expansion ratio of 8-9:1, which is much higher than what most ARFF equipment, such as roof turrets, low-attack bumper monitors, or handline nozzles, can achieve in real-world scenarios.

In contrast, our SKUM 3% SFFF ICAO-B foam has been specifically tested at a lower expansion ratio of 4:1, similar to what is delivered by common ARFF equipment. This rigorous testing at a realistic expansion ratio, combined with the ICAO test standard application rate, ensures that our foam performs effectively with both air-aspirating and non-air-aspirating discharge equipment. This makes our foam better suited for real-world firefighting conditions.

[2] Report number: FPRF-2020-01, Evaluation of the Fire Protection Effectiveness of Fluorine-Free Firefighting Foams, NFPA Research Foundation

Foam viscosity

Viscosity profile is a real challenge for dosing systems in the new era of non-fluorinated foams.

Airport Rescue Firefighing (ARFF) vehicle foam mixing systems have historically been designed worldwide for the use of fluorinated foams that have a Newtonian and fully liquid viscosity.

Built-in dosing equipment in ARFF vehicles like pump proportioning systems, around-the-pump proportioners or electronic dosing systems may not be designed to accommodate high-viscosity fluids as we see from most modern non-fluorinated foams.

To adress this challenge, SKUM 3% SFFF ICAO-B has been developed with the philosophy of having a similar viscosity to legacy AFFFs and FFFPs and is therefore compatible with existing dosing systems. Even at low temperatures, the viscosity increase of SKUM 3% SFFF ICAO-B is minimal.

Viscosity data:	4 cSt @ 20 °C (68 °F)	8 cSt @ 0 °C (32 °F)

NFF-3B is a GreenScreen Certified™ Silver formulation. As a non-fluorinated foam concentrate, it has no intentionally added PFAS chemistry, is produced in equipment that has not handled PFAS chemistry and inherently complies with Directives (EU) 2017/1000 on PFOA and 2019/1021 (EU POPs directive).

*GreenScreen Certified® is a registered trademark of Clean Production Action

References to non-fluorinated or fluorine free mean the foam does not contain intentionally added PFAS chemicals and is produced on equipment that does not process PFAS chemicals.

About Johnson Controls:

At Johnson Controls (NYSE:JCI), we transform the environments where people live, work, learn and play. As the global leader in smart, healthy and sustainable buildings, our mission is to reimagine the performance of buildings to serve people, places and the planet.

Building on a proud history of nearly 140 years of innovation, we deliver the blueprint of the future for industries such as healthcare, schools, data centers, airports, stadiums, manufacturing and beyond through OpenBlue, our comprehensive digital offering.

Today, with a global team of 100,000 experts in more than 150 countries, Johnson Controls offers the world's largest portfolio of building technology and software as well as service solutions from some of the most trusted names in the industry.

FS2412006