

SUPDET: An Evaluation of the Firefighting Effectiveness of Fluorine Free Foams

The Fire Protection Research Foundation (FPRF) contracted Jensen Hughes to conduct an experimental program to assess the firefighting capabilities of fluorine free, Class B firefighting foams on fires involving hydrocarbon and alcohol fuels. The objectives of this study were to determine the fire extinguishment and burnback times for four fluorine free foams (FFFs) and one C6 AFFF formulation (for baseline) as a function of application rate (gpm/ft²) and foam discharge density (gal/ft²) for a range of test parameters including fuel type, water type and fuel temperature. The data provides a general characterization of the firefighting capabilities of FFFs as a “Technology” or a “Class” of foams for use in standards making decisions. The deliverables from this project are intended to provide guidance for foam system application standards (e.g., NFPA 11: Standard for Low-, Medium-, and High- Expansion Foam) and to identify any future research needed to further understand their capabilities and limitations.

The assessment was conducted as a blind study where the foams were given generic names and the manufactures of the foams are not identified. The approach consisted of conducting a parametric assessment of the critical variables that could affect the fire protection performance of new foam formulations using the UL 162 – Standard Foam Equipment and Liquid Concentrates as basis for the investigation.

The variables included the following:

- a) Two Discharge Types: UL Type II with polar solvents and UL Type III with other fuels;
- b) Five Foam Types: 1 AR-AFFF C6, 2 UL AR listed FFF and 2 UL listed hydrocarbon FFF;
- c) Three Fuel Types: Heptane, Gasoline (MIL SPEC) and Isopropyl Alcohol (IPA);
- d) Fuel Temperature: Ambient Temp 60° F (+/- 10°F) and High Temp. 85°F;
- e) Discharge densities: Up to three discharge densities;
- f) Two Water Types: Fresh water and salt water; and
- g) Foam Quality: upper/lower limits (worst case during actual assessments)

The presentation provided a high-level description of the findings and conclusions to date (90 tests complete, 60 tests remaining). The final report will include a detailed description of all of the tests, test results, data analysis and a lengthy discussion on the path forward. The final report will be posted on the NFPA Research Foundation website by the end of the calendar year.

www.nfpa.org/News-and-Research/Data-research-and-tools

The Jensen Hughes POC is Jerry Back
Phone: 443.313.9761 | Email: jback@jensenhughes.com

The NFPA FPRF POC is Sreenivasan Ranganathan
Phone: 617.984.7503 | Email: sranganathan@nfpa.org



RESEARCH FOUNDATION
RESEARCH FOR THE NFPA MISSION


JENSEN HUGHES
Advancing the Science of Safety