



PFAS in Firefighting Foams for military uses

Exchange ECHA – 



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Fire is a serious threat to ships

- + Fire is a **serious threat** to ships in general.
- + Naval ships are designed to engage in combat. Battle damage must therefore be anticipated and **will almost always result in multiple major fires** threatening the life of the crew and the ship as a whole and can ultimately lead to a loss of the ship.
- + In addition to that Naval Ships carry high explosives and ammunitions in addition to fuel and pressurized gases which further **increase the threat**.
- + Ship and crew are expected to carry on with the mission nonetheless. The hostile threat will usually persist.



Fire Protection Measures (Examples)

- **Mobile fire fighting equipment** is provided for the crew who are in addition to their original military task responsible to extinguish fires in a combat situation.
- Complex **stationary fire fighting equipment** is permanently integrated into the ship in order to protect important components or systems.
 - stationary fire-extinguishing systems using a mix of AFFF^{*)} and seawater
 - high performance fire fighting systems to protect helicopter landing decks

- ! Currently, there is **no** adequate substitute for the used agent (AFFF) available.
- FFF typically require application rates 50% to 200% higher for comparable results

As a result, especially existing naval ships and new ships being under construction right now cannot be retrofitted short term.

^{*)} AFFF – aqueous film forming foam

Implementation technically possible?

- availability of **space and weight** for new equipment
- **complexity** of a warship – high density of integrated equipment and hazardous substances practically everywhere on the ship
- a technical concept requires research and is **specific to each ship** and requires **at least one year** of preparation provided a feasible concept is at all technically possible within the given constraints

If at all possible:

- raising the funds in a governmental system requires **at least two years** in advance of the actual works
- a retrofit will take **at least one year per ship** with **limited available docking capacity** – a total of at least 33 warships^{*)} (10+x auxiliary ships) would have to be considered and would have to be **coordinated throughout the fleet**

^{*)}



References

- European Commission DG Environment / European Chemicals Agency (ECHA), The use of PFAS and fluorine-free alternatives in fire-fighting foams, final report, Wood Environment and Infrastructure Solutions – June 2020
 - p 110: “one user in the oil/petrochemical sector suggests that **alternative foams need 30%-50% more volume** for the same performance”
- Gerard G. Back, John P. Farley, Evaluation of the fire protection effectiveness of fluorine free firefighting foams, NFPA research foundation final report, January 2020
 - “From an application rate perspective, the FFFs **typically required between 1.5 to 3 times the application rates** to produce comparable performance as the baseline AFFF for the range of parameters included in this assessment.”