

# Once is enough for a foam transition

David Pronk and Kees Kappetijn of Kappetijn Safety Specialists develop an Assessment Guideline for cleaning of foam systems and foam tenders

**F**or decades, fluorinated extinguishing foam has been used in firefighting. At high hazard industry, large logistics buildings and operators of special infrastructure, large quantities of extinguishing foam are stored in stationary extinguishing systems and fi-fi-vehicles. In government and private fire brigades, the foam is mainly contained in foam fire-fighting vehicles and fire engines. For several years, it has been clear that the poly- and perfluoroalkyl substances (PFAS) in this extinguishing foam have harmful long-term effects on humans and the environment. Its use is now finite.

It is therefore right that industrial companies, infra-authorities and firefighting organisations are carrying out a foam transition: replacing the current, fluorine-containing firefighting foams with new, fluorine-free variants. Contamination of new fluorine-free foam with old residues must be prevented. Transition therefore also requires high-quality cleaning. The quality of this can now be guaranteed through certification, based on an Assessment Guideline.

## Problem statement

A careful foam transition is important because there will be a European total ban on the sale and use of fluorinated fire-fighting foams. Suppliers already communicated that they will stop providing old foams. The competent authority will oversee a careful foam transition.

A careful foam transition has a number of challenges. Fluorinated fire-fighting foam cannot be replaced by fluorine-free fire-fighting foam on any given day. In many cases, the fluorinated fire-fighting foam has been stored in a foam tank for many years. As a result, the foam tank, and perhaps other parts of the extinguishing system, is contaminated with PFAS. And PFAS accumulate not only in plants, animals and humans, but also in extinguishing systems, which are difficult to remove.

When fluorine-free extinguishing foam is stored in the extinguishing system, "old" PFAS are released from the extinguishing system over time. The PFAS mix with the new extinguishing foam. The result is that the fluorine-free firefighting foam is no longer fluorine-free and should no longer be used. The foam transition would then have to be carried out again. Proper cleaning by a professional service provider limits the chances of such re-contamination.

## Cleaning

You only want to do the foam transition once. Besides selecting and buying a new foam concentrate, appropriate to the scenarios and substances, parts of the extinguishing system may need to be modified or replaced. The old foam must be disposed of and changes must be incorporated into documentation such as company fire reports, operational plans and fire analyses. And all this in coordination with the competent authority, the insurance company and the companies fire chief.



Therefore, the foam transition must be carried out carefully and prevent residual PFAS from contaminating new, fluorine-free extinguishing foam. This is possible, by cleaning the extinguishing system. With an adequate cleaning process, residual PFAS can be removed.

As a customer, you want to know which cleaning process works. And whether the process is safe, and clean. You don't want to use a process that leads to PFAS lying around, resulting in environmental damage or health complaints. That is why you need a guarantee of quality. In a quality system, quality is demonstrated with a certificate. So there is a need for a certificate that works in a free market.



**THE FOAM TRANSITION MUST BE CARRIED OUT CAREFULLY AND PREVENT RESIDUAL PFAS FROM CONTAMINATING NEW, FLUORINE-FREE EXTINGUISHING FOAM. ”**

#### Assessment guideline

A certificate for cleaning processes of PFAS-containing extinguishing systems does not exist. But this has been changed. A project group consisting of cleaning organisations, the chemical industry, fire brigade, environmental department, laboratory and waste processor sat down together to develop a quality framework for cleaning processes. In this quality framework, careful cleaning is completed with a certificate.

The quality framework is also known as an Assessment Guideline or Branche Guideline (In Dutch: BRL). A BRL is developed by the market, accepted by the competent authority and assessed by an independent certification organisation. For the present BRL, KIWA is the organisation that supervises the organisations that perform their work according to the BRL.

The BRL sets frameworks, but does not fill in the cleaning process itself. The market itself can determine how rinsing and cleaning is done, how often rinsing takes place and what agents are used. So the cleaner determines the cleaning process. The BRL provides frameworks for the cleaning ▶



process so that the objective can be achieved: a safe, risk-resistant, cost-effective and high-quality cleaning process.

Kappetijn Safety Specialists started this process, together with Kenbri Fire Fighting and Arcadis when they repeatedly were asked by stakeholders in the market how to guarantee the quality of a cleaning project. Authorities were looking for an independent tool to trust, Kenbri and Arcadis were looking for an institute that could judge the quality standards they provide. KSS brought them to the table, with other stakeholders and coordinated the process towards an independent Assessment Guideline.



**WITH AN ADEQUATE CLEANING PROCESS, RESIDUAL PFAS CAN BE REMOVED.**



### High-quality cleaning

A solid cleaning process does not just include guidelines for cleaning. The entire cleaning process as worked out in the BRL consists of four parts. Frameworks are imposed on each of the parts. They are:

1. Scope and starting details (what must be cleaned);
2. Cleaning and execution (how is a cleaning-process professionally executed);



3. Sampling, monitoring and analysis (how can we monitor the cleaning to the required level);
4. Waste materials and disposal (how do we professionally dispose of the waste and residue).

First, frameworks are set for scope and start data. It is important to determine which parts of an extinguishing system will be cleaned. This can be the whole extinguishing system, but it can also be chosen to clean only the tank, for example when the extinguishing system has (almost) never been used and the foam has not left the tank. The objective must also be determined: what concentration values are used and which laws and regulations must be complied with?

Secondly, frameworks are set for the cleaning process. This mainly concerns the quality systems of the cleaner and environmental and health regulations, such as the use of personal protective equipment. The design of the cleaning process itself is not standardised; different processes are possible. Provider must work with a quality management system, but which one is mandatory. Customers can decide for themselves whether to use a high-quality, lengthy cleaning process, or a faster and perhaps more efficient process. But in all cases, it must be safe and effective.

Thirdly, frameworks are set for sampling and analysis. To determine whether, and demonstrate that, the limit or concentration values of PFAS have been reached, samples must be taken. Environmental and health regulations have also been drawn up for sampling, knowledge requirements for the operating operator and guidance for packaging, shipping and analysis of the samples.

Finally, frameworks are set for the storage, disposal, treatment and registration of waste. The aim of this issue is for the cleaner to be able to demonstrate that waste materials do not re-enter the environment, but are stored, transported and processed by authorised companies. To demonstrate this, records of waste should be kept. This is important because waste-processing capacity is very limited. There are only a few processors, not one in the Netherlands. Waste materials, such as rinse water, will always need to be stored for some time before it can be transported and processed. Cleaning companies should handle this carefully and ensure that these activities are covered in the company's license. ■



David Pronk



Kees Kappetijn