



Guidelines for fire extinguishing system for buses

Safety Regulation, valid as of 1 April 2020

The guidelines apply to new buses with seating capacity of 22 or more passengers registered for the first time after 1 June 2018.

Buses must use a fire extinguishing system which complies in all respects with at least the requirements of UNECE R107:06. The fire extinguishing system protects the engine and the additional heater compartment, which is located behind the driver.

This guideline does not apply to buses powered solely by electricity.

How does the new fire extinguishing system requirement differ from previous fire extinguishing system requirements?

The fire extinguishing system manufacturer performs a risk analysis on the bus's engine compartment and additional heater compartment. The manufacturer determines the amount of extinguishing agent and number of nozzles to be installed in the fire extinguishing system in accordance with the actual size of the bus's engine compartment and additional heater compartment. The specification is based on a risk analysis, the equipment manufacturer's test report and the scaling regulation UNECE R107.

In the risk analysis, the fire extinguishing system manufacturer takes account of at least the following aspects:

- Materials with a temperature of spontaneous combustion lower than hot surfaces in the compartment.
- Hoses and containers which contain flammable liquids or gases. If these are pressurised, this should be taken into account separately.
- Electrical components, wires and cables that may cause sparks and fires. For example, the starter and alternator, and main power cables to them are such.

On the basis of the analysis, the number of nozzles and amount of extinguishing agent in the fire extinguishing system may be increased. Compared with previous fire extinguishing systems, nozzles may be placed in new locations.

More functional fire extinguishing systems are obtained through risk analysis. The systems can detect a fire already in its initial stages.

A risk analysis is always documented.

How is fire safety in buses maintained along with that of the fire extinguishing system?

The customer's own maintenance and repair staff or the personnel of an authorised service centre are tasked with regularly checking that

- there are no leaks in the engine compartment and additional heater compartment;
- there are no abrasions in tubing or hoses
- electrical equipment and cable attachments and feed-throughs are in good condition
- the engine compartment and additional heater compartment are clean, as without combustible material there are no fires
- first extinguishing equipment is in good condition.

Fire risks must be taken into account more rigorously

Bus technology is developing continuously and this is bringing additional requirements which concern, for example, noise and exhaust emissions. Owing to technological development, the engine compartment's normal operating temperature rises to a high level, which means that the risk of fire increases. This is why it is important to equip buses with fire extinguishing systems which more effectively meet the requirements of the new bus technology.

On average, there is more than one bus fire a week in Finland. Fortunately, there have not been any fires leading to serious personal injuries. The issue nevertheless involves a public transport vehicle. Thus, there is always the risk of a major accident.

Pohjola Insurance has investigated bus fires for a number of years now. According to the statistics, over 60% of all bus fires occur in the engine compartment. This is supported by other studies conducted in the Nordic countries.

The new requirements for fire extinguishing systems are dealt with in UNECE R107, series of amendments from 06 onwards (UNECE R107:06). From the customer's perspective, these new requirements for fire extinguishing systems are better adapted to current technology and customer needs.

These guidelines do not apply to electric buses

Recommended fire extinguishing system equipment suppliers include:

- Oy Scannotec Ab – Fogmaker fire extinguishing systems
- Dafo Oy – Dafo fire extinguishing systems
- Teknosafe Oy - CEODEUX Extinguisher, Rotarex - fire extinguishing systems

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