



Rosenbauer develops its own extinguishing system for battery fires in electric vehicles



- Simple and efficient system that can be operated with standard firefighting equipment
- Minimal environmental impact and rapid emission elimination
- Development based on intensive basic research and scientifically assessed test series
- Market launch in spring 2021, following further fire tests and trials with lead clients

Mobility is changing rapidly. Vehicles with electric drives have become a common sight on our streets today, and will increasingly shape traffic in the future. However, this brings with it new challenges for fire departments: vehicle batteries that can ignite in the event of an accident or a technical fault. Drive batteries in electric cars have very high safety standards, but in the event of a rare system defect or accident, they can become a potential hazard that should not be underestimated. New, innovative extinguishing strategies and equipment are required to extinguish high-voltage energy storage devices quickly, safely and in an environmentally friendly manner.

Clear objectives

For Rosenbauer, development of an efficient battery fire extinguishing system was of the highest priority. Research into the topic of high-voltage battery fires has been ongoing since 2018, and the requirements for a corresponding extinguishing system have been defined as follows: first, it must be possible to extinguish as many battery variants as possible, such as those used in different vehicle types. Second, the emergency crews must not be exposed to excessive risk and must therefore be able to fight such a fire from a safe distance. Third, a highly efficient system is required, with which a rapid and sustained extinguishing success can be ensured, and the effects of which on the environment are kept as low as possible. In addition, the consumption of firefighting water should be kept to a minimum when fighting battery fires.

The extinguishing principle



We cannot reveal too much at this point, but the fighting of battery fires with the Rosenbauer extinguishing system differs fundamentally from all other previously employed approaches. And neither is the entire vehicle, including the burning battery, placed in a container and cooled with large amounts of water. This method would require up to 20,000 litres of water, which would then have to be disposed of separately. Battery fires are still being fought with equipment that can only be used close-up, which poses the risk of exposing the emergency crews to toxic smoke during firefighting operations.

With the Rosenbauer system, an operation proceeds as follows: after the situation has been investigated, the vehicle fire (tyres, cables, plastic parts, cargo, motor/drive, etc.) is first extinguished, because the battery does not always have to be on fire. Afterwards a check is made to see whether smoke or flames continue to escape from the vehicle floor or can be seen, and the temperature of the battery is measured with the thermal imaging camera. If a visual check and temperature measurement indicate an ongoing fire, the battery fire extinguishing system is deployed. It is positioned immediately next to the battery - usually directly below it - so that the extinguishing agent can be introduced into the battery in a targeted manner.

Use of standard firefighting equipment

Only once, while positioning the extinguisher, do the emergency crews go near the burning battery. Thus they are only exposed to heat and smoke for a very brief period. Handling the equipment is as simple as using a Z-proportioner for foam extinguishing operations. It is connected to C-hoses and operated via a normal pressure pump, which is installed in practically every fire fighting vehicle in the world, or a portable fire pump. The extinguishing system is activated remotely, and always at a safe distance from the burning vehicle.

The first step is to extinguish with water, because neither the reactive material nor the oxygen can be removed from the battery and therefore the only option is to continuously dissipate the heat. Depending on the storage capacity of the battery and the level to which the fire has developed, 1,000 to 4,000 litres of water will be sufficient to ensure a successful extinguishing operation. Subsequently, the battery has to be stabilised so that it doesn't "ignite" again. This is currently still being assessed in fire tests before the extinguishing system is delivered to the first lead clients at the end of the year, to be put through its paces in everyday operations.

Premise fulfilled

However, previous fire tests with different cell types and capacities of up to 120 kWh have already shown that the Rosenbauer battery fire extinguishing system is highly effective and meets the target assumptions. This was done on a strictly scientific basis: the batteries were opened, equipped with measuring technology (sensors) and over the entire duration of the experiment not only the temperature on the shell was measured, but also numerous data was obtained from the inside of the storage device. For example, the temperature curve at various points, the "thermal runaway" at certain extinguishing times, the voltage curve to clarify whether the extinguishing process could cause a electric shock as well as the final state of the battery fire extinguishing system after the successful extinguishing process.

Market launch 2021

The great advantage of the Rosenbauer battery fire extinguishing system: it is unbeatable in its simplicity, can be used immediately with the existing fleet by any fire department in the world. In addition, it can be retrofitted anywhere and does not require major investment. This is firefighting technology at its best.

The Rosenbauer Group

Rosenbauer is an international group and a reliable partner to fire services around the world. The company develops and produces vehicles, fire extinguishing systems, fire and safety equipment and digital solutions for professional, industrial, plant and volunteer fire services and systems for preventive firefighting. Rosenbauer is represented in approximately 120 countries by a sales and service network. With revenues of € 1,044.2 million and around 4,000 employees (as of December 31, 2020), the Group is the world's largest firefighting technology provider.