# International exchange of experts

## Electrical vehicles: safety aspects and emergency response.

On the 29th of September, the first digital exchange of experts took place. The main focus of this session was the safety aspects and emergency response regarding incidents involving electric vehicles. It was also meant as a follow up of the real life exchange of experts in May 2019, at IFV (NL).

The first presentation was given by Roeland Bisschop from RI.SE. He presented insights from their most recent project on battery packs. In this project, they tested the effects of internal and external fire suppression in a battery pack which is in thermal runaway. An important conclusion from this research is that with a small amount of water with internal suppression, the propagation of the thermal runaway can be delayed and therefore the number of cells in the battery involved is reduced. He also presented the E-TOX project, in which full scale fire tests where held with several comparable electric and conventional vehicles. The results of this project are expected in the coming year.

The second presentation was from Markus Egelhaaf of DEKRA. Markus showed the participants several crash tests with electric vehicles, which where held to determine the impact of a crash on these vehicles and the battery packs. On of the findings of these tests was that the probability a battery pack goes into a thermal runaway and catches fire during a crash is relatively small. Markus also showed a video of a test in which a fognail was used to cool a battery pack. In the discussion that followed from the video the participants agreed that the effect of the use of a fognail is very much depended of the size and form of the battery pack. Before this can be used, information of where to place the fognail should be published in rescue sheets/information. His advise was not to puncture the battery pack in order to put water into the pack.

Marko Hassinen of the Emergency Services Academy Finland (ESAF) presented in the third presentation of the session the current projects the ESAF is working on. Marko talked about the tests they conducted with small li-ion batteries, in which they conducted measurements on the toxic emission that are released. Also they conducted large scale battery tests, in which they used different extinguishing agents. Marko discussed the issue of compartmentation of battery packs on ships and stressed the importance of ventilation of flammable gasses in ESS, as this can cause an explosion. Also, ESAF is conducting tests to determine the effectiveness of handheld li-ion extinguishers that are on the market nowadays.

The fourth presentation was from Johan van der Graaf and Ricardo Weewer from the Institute for Safety (IFV). Johan and Ricardo talked about the recent publication about electric vehicles in parking garages. In the presentation they gave an overview of this publication and talked about some examples of measurements owners of parking garages can take to safely park EV’s in the parking garages. Also Ricardo talked about firefighting in these underground parking lots and how this is related to the basic principles of firefighting. Ricardo stated that the fighting of fires in underground parking structures is always difficult, and when and EV is involved, the difficulty increases even more. Ricardo also presented a movie about the procedure how to deal with electrical vehicles form firefighters in NL

Tom van Esbroeck from the CTIF and Firefighting zone Centrum in Belgium presented the fifth and last presentation of the exchange of experts. Tom talked about process which lead to the standard rescue information as introduced by the CTIF. Tom stresses the importance that the rescue information should be received first hand from the car manufacturers. The stickers that are developed help first responders to quickly recognize hazards and act towards them. They are also working on a system in which first responders can receive smart data from vehicles involved in a crash about for example the type of propulsion. Also, the CTIF is working to extent the standard on rescue information to Energy Storage Systems. Tom also had a small cliffhanger on research that is going on in regard to hydrogen vehicles in road tunnels, of which more information will follow in the future.