

New Energy Carriers and related new fire risks for underground facilities – Possibilities for water mist fire fighting (SUVEREN Research Project)

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Keywords: passenger car, new energy carrier, design fire curve, car park, underground, water mist

Fires in confined spaces like underground car parks can lead to serious consequences but due to limited space it seems very likely that the number of underground metropolitan facilities will increase further. The technological development in automotive industry comes up with new vehicle designs that are based on new materials and energy sources. To reduce fuel consumption the curb weight is minimized by innovative material compositions. For example, many metallic parts have been replaced with materials that are combustibles like plastics and composites. These lead to higher fire loads per vehicle. An analysis of US vehicle data [1] shows that the parts of a vehicle, which are classified combustible material increased from 12.8 % (averaged from 1995-1999) to 16.1 % (average for 2010-2014) resulting in a total of 643.6 kg combustible materials during the latter period. Further technologies for providing driving by new energy carriers come with different fire loads as well. This all has increased the fire size of passenger cars in general.

New energy carriers do not only affect to the fire size and design fire curve, but also behave very differently when being fought with different fire suppression and extinguishing systems. This further challenges the industry, also water mist industry. German SUVEREN research project, funded by the German Federal Ministry of Education and Research (BMBF), has been studying the effect of NECs, especially in the context of underground facilities. This paper will discuss the effects of increased fire load, applicability of standards, challenges of NECs and how these could be answered by using water mist systems. Also SUVEREN research project and findings up to date are explained.