

## Press Release

DEKRA Accident Research cooperates with universities in France and Canada

# Research Findings: High Risk of Head Injuries in E-Scooter Accidents

- Simulation model developed on the basis of DEKRA crash test
- Head impact on the ground in almost every case – often severe
- Further studies on the effect of helmets to be conducted this year

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**The importance of e-scooters as a means of transport is increasing – and so is their share in accident statistics. In Germany, a total of 8,260 accidents with personal injury involving e-scooters were recorded by the police in 2022. Eleven people were killed and more than 1,200 were seriously injured. The head is particularly at risk in e-scooter accidents. This is the first result of a research project with DEKRA Accident Research and two universities.**

A simulation model was developed in the joint project with researchers from the Université Gustave Eiffel in Marseille (France) and the École de technologie supérieure in Montréal (Canada). “The project focused on validating this model on the basis of a DEKRA crash test”, explains Andreas Schäuble, a biomechanics expert at DEKRA Accident Research. “In the process, an e-scooter hit a curb – a common accident scenario in reality. It’s not for nothing that solo accidents without an accident opponent account for more than a third of all e-scooter accidents in the statistics.”

The simulation examined more than 160 individual crash scenarios that differed in initial speed, angle of impact with the curb, and the size of the person on the e-scooter, among other factors. The goal was to learn more about impact kinematics – what happens to the human body during and after an impact. “Based on this, the probability of injury can then be quantified”, explains the DEKRA expert.

The first result of the research: in falls such as those in the scenarios studied, the head is particularly at risk – in almost all cases there was an impact of the head on the ground with the risk of concussion. Ninety percent of the cases showed a risk of severe to very severe head injuries. At the same time, the impact speeds were within the range of testing specifications for bicycle helmets. “First of all, this suggests that a common bicycle helmet could provide effective protection for the head and either prevent or mitigate the injuries in the vast majority of scenarios studied”, Andreas Schäuble said.

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This is the starting point for further research. The three institutions involved have conducted another series of crash tests to investigate the protective effect of bicycle helmets. The evaluations are currently ongoing and are to be published before the end of the year.

The current research paper can be found online as an open-access article here: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4499244](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4499244).

### **Caption**

Basis for the simulation model on e-scooter accidents: Real-life sequence of a curb impact at the DEKRA Crash Test Center in Neumünster, Germany.

### **About DEKRA**

*DEKRA has been active in the field of safety for almost 100 years. Founded in 1925 in Berlin as Deutscher Kraftfahrzeug-Überwachungs-Verein e.V., it is today one of the world's leading expert organizations. DEKRA SE is a subsidiary of DEKRA e.V. and manages the Group's operating business. In 2022, DEKRA generated sales totaling nearly EUR 3.8 billion. The company currently employs almost 49,000 people in approximately 60 countries on five continents. With qualified and independent expert services, they work for safety on the road, at work and at home. These services range from vehicle inspection and expert appraisals to claims services, industrial and building inspections, advisory and training services, testing and certification of products and systems, also in the digital world, as well as temporary work. The vision for the company's 100<sup>th</sup> birthday in 2025 is that DEKRA will be the global partner for a safe, secure, and sustainable world. With a platinum rating from EcoVadis, DEKRA is now in the top one percent of sustainable businesses ranked.*