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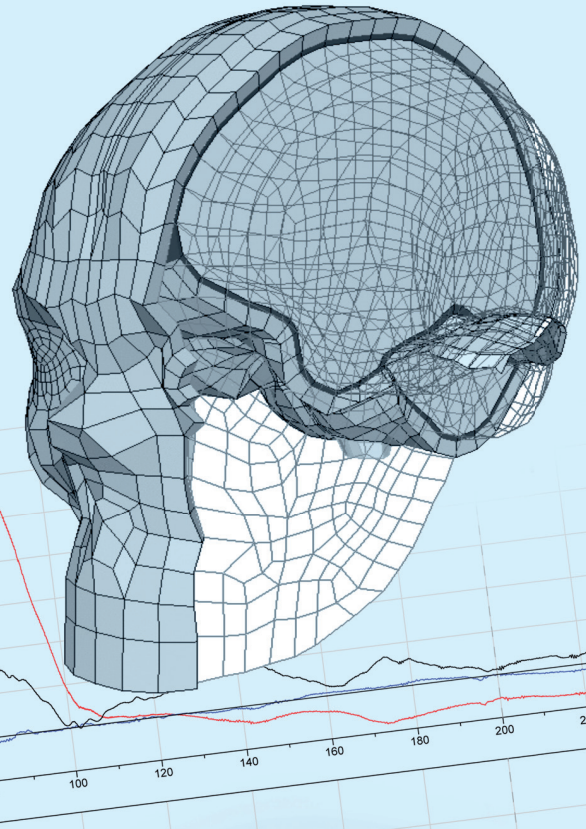
Measurement System Experts

XCrash Advanced HIC

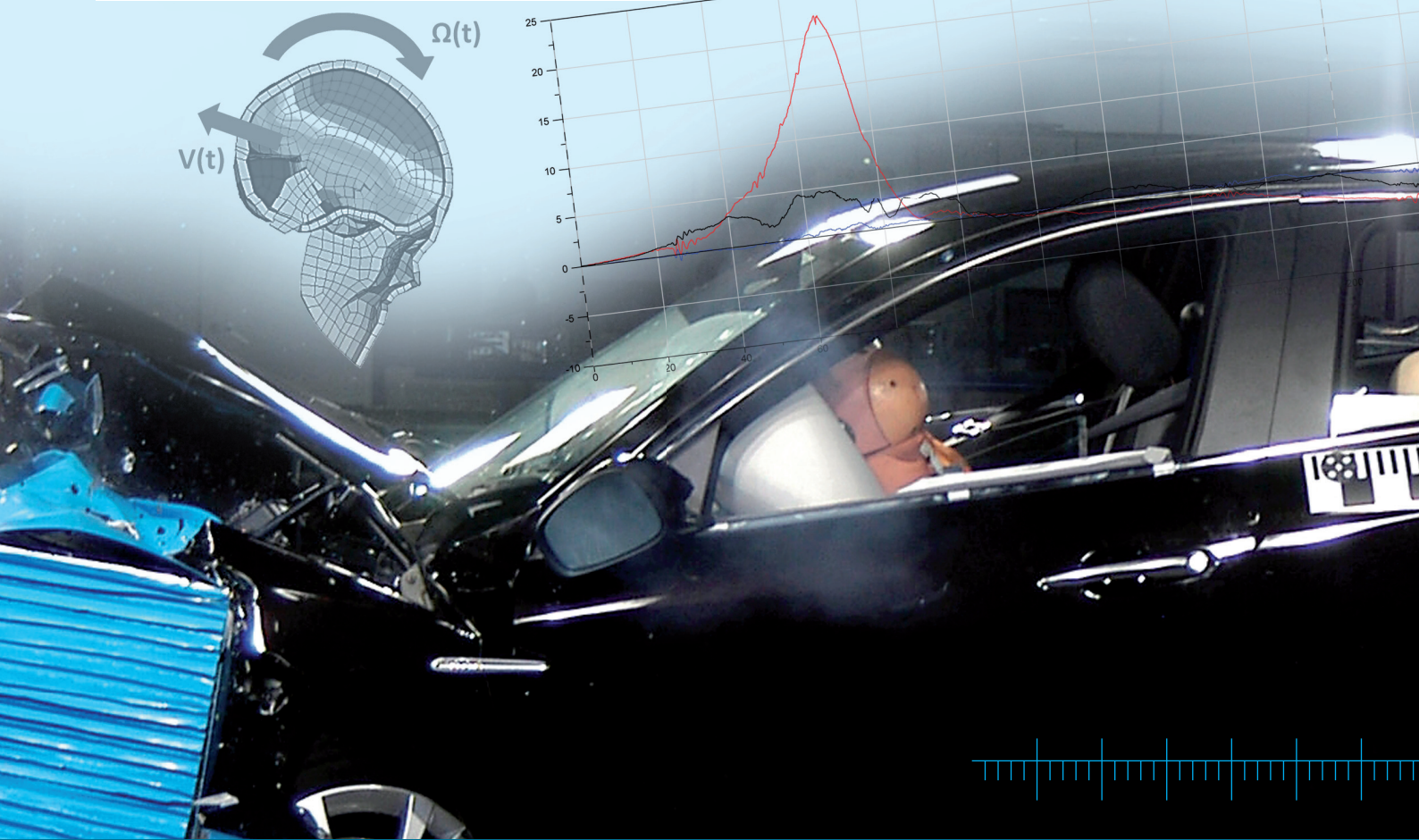
Option for Model-based Evaluation of Head Injury Risk

One central task in vehicle safety tests is to predict possible injuries to passengers. The standard measure for determining the risk of head injuries are the Head Injury Criterion (HIC) and the complementary Brain Injury Criterion (BrIC). For a more differentiated prediction, the analysis software X-Crash optionally offers the calculation function Advanced HIC based on the Strasbourg head model SUFEHM.



Advanced HIC Evaluation

- Model-based determination of the head load for dummies
- State-of-the-art head finite element model
- Calculation based on the complex linear and rotational head loading over time
- Calculation of informative characteristic values
- Turnkey integration in X-Crash
- No expertise in finite element simulation is required

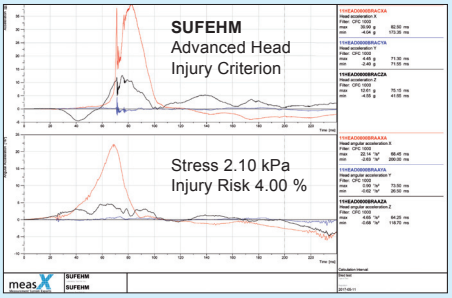


XCrash Advanced HIC

Option for Model-based Evaluation of Head Injury Risk

Model-based Evaluation

The HIC value is the standard way to indicate the risk of head injury. It is usually calculated from the integral of the crash-induced linear head accelerations over a standardized time interval.



The X-Crash function Advanced HIC calculates the risk of head injury based on the Strasbourg University FE Head Model (SUFEHM). This is currently the best finite element model of the human head and is used worldwide to calculate head injuries by means of simulation.

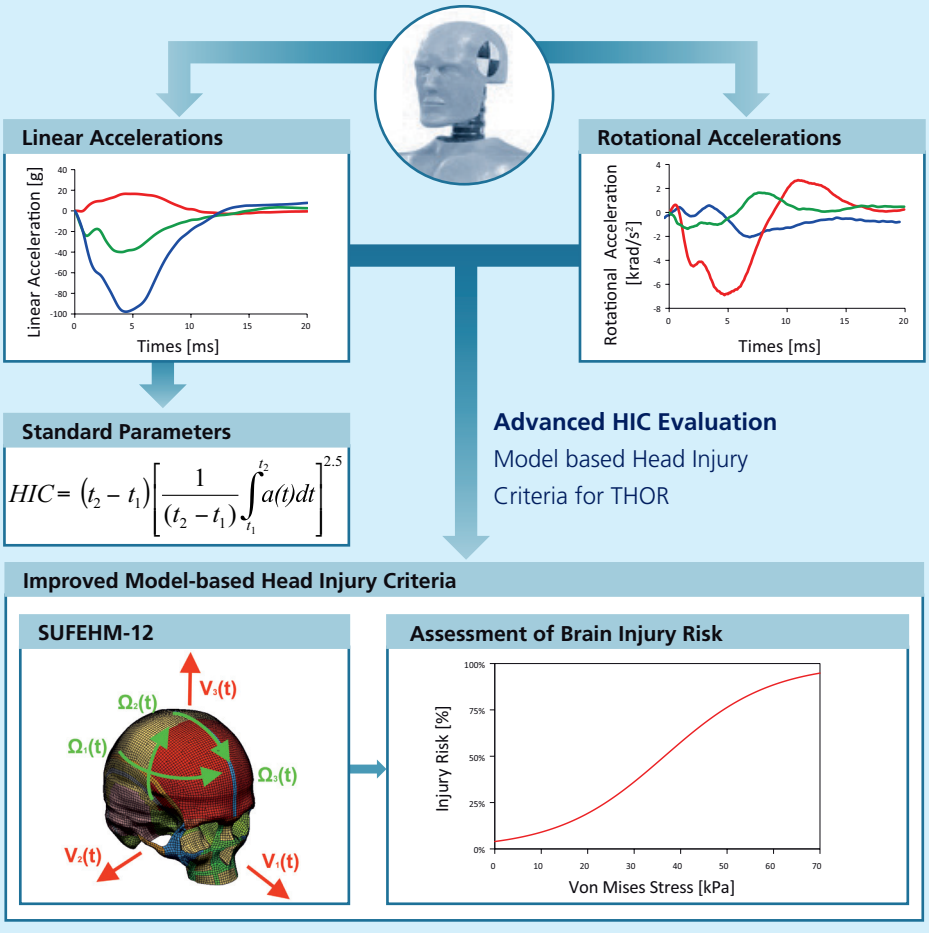
Ideal for THOR Dummies

The model-based Advanced HIC calculation can determine the injury risk for every head impact, which is characterized by six acceleration curves (3 translation, 3 rotation). These values can originate from a real test or from a multi-body simulation. Standardization organisations like the Euro NCAP are evaluating the model-based calculation method, which could become a binding standard in the future.

More Informative HIC Calculation

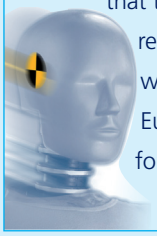
The Advanced HIC function supplies more precise data on potential damage to the head and brain than the conventional HIC and BrIC calculation:

- consideration of the direction of acceleration
- inclusion of rotational accelerations
- Consideration of combined linear and rotational acceleration versus time
- high realism
- calculation of load (kPa) and injury risk (%)



XCrash – Tests for Efficient Evaluation of Vehicle Safety

X-Crash is one of the world's leading software systems for the evaluation of crash tests, sled tests and component tests as well as for dummy certification (X-Crash ATD). As a turnkey system, X-Crash contains internationally applicable crash regulations and evaluation methods, meaning that test data can be analyzed reliably, consistently and in line with pertinent standards: The European evaluation program for new vehicles, Euro NCAP, also relies on X-Crash.



Would you like to find out more? **Just contact us!**

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