



Czech

Add value.  
Inspire trust.

## Computer-aided Services

Certification via simulation  
FEA calculations  
Functional safety  
CAD support

### TÜV SÜD

is a world-renowned company in the areas of consulting, testing, inspection, certification, type approval, and training in all sectors of industry and services. As an independent approval and testing organization we have been active in the automotive industry for more than a hundred years. Using our experience, we bring top-level innovative solutions.

#### Static Finite Element Analysis (FEA)

- Structural analysis of vehicle components
- Certification via simulation
- Optimization of weight and strength of mechanical structures and steel building structures
- Fixing of tanks for liquefied petroleum gas (LPG) and compressed natural gas (CNG)
- Strength calculations of protective cages for racing cars

#### Dynamic Finite Element Analysis (FEA)

- Certification via simulation
- Simulations of front and rear side impacts of vehicles

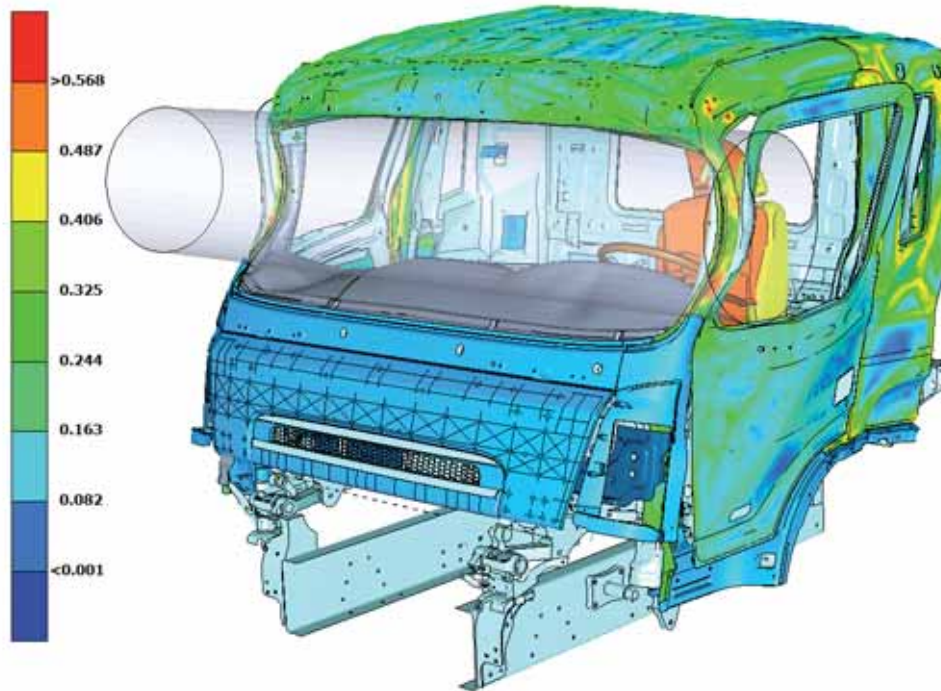
- Analyses of rear underrun protection devices
- Analyses of biomechanical load of passengers and pedestrians in an accident
- Analyses of behavior of child seats in an accident
- Stress analyses of bus structures in a rollover
- Design optimization for approval, construction and validation of FE-models
- Simulations of vehicles collision with road restraint systems according to EN 1317

#### Other Simulations

- Simulations of energy flows in an electric vehicle

#### Functional Safety

- Functional safety of vehicles according to ISO 26262
- Functional safety life cycle
- E/E/P systems risk analysis and assessment
- Functional safety concept
- Links of ISO 26262 to ECE and EC legislation
- Consultancy
- Training and certification



### Certification via simulation

- ECE R 14 - Stress analysis of seat belt anchorages
- ECE R 29 - Stress analysis of commercial vehicle cabs
- ECE R 58 - Rear underrun protection devices according to 70/221/EEC
- ECE R 66 - Strength of the superstructures of large passenger cars
- ECE R 67, ECE R 110 – Fixing of pressure vessels for LPG and CNG
- ECE R 111 – Rollover stability of tank vehicles
- 77/649/EEC – Drivers' view evaluated on a 3D CAD vehicle model
- 94/20/EC - Mechanical coupling devices for trailers
- 2001/85/EC - Lateral stability of buses
- ADR 2005 - Construction and connection points for ADR devices
- FIA 253 Appendix J - FIA certification for safety cages of racing cars

### Software

- PAM-CRASH, PAM-SAFE
- PAM-CRASH IMPLICIT
- ANSA
- SolidWorks
- SIMPACK
- DIAdem

### Your Business Benefits

- One-stop-shop for technical solutions (from testing, certification and technical processing to type approval)
- Tailor-made services driven by customer satisfaction
- TÜV SÜD. That means technical expertise, quality and safety
- Proven and efficient testing methods with easy repeatability
- Extra support services in the field of structure development

### Other Services

#### Multibody Systems

- Driving dynamics and vehicle stability
- Braking stability according to ECE R 13
- Manoeuvre avoidance according to ISO 3888-1
- Kinematic optimization of suspension mechanism
- Stability of buses according to 2001/85/EC

#### Design support

- Design of components and special devices
- Composite materials solution
- Visualization
- Development of manufacturing documentation