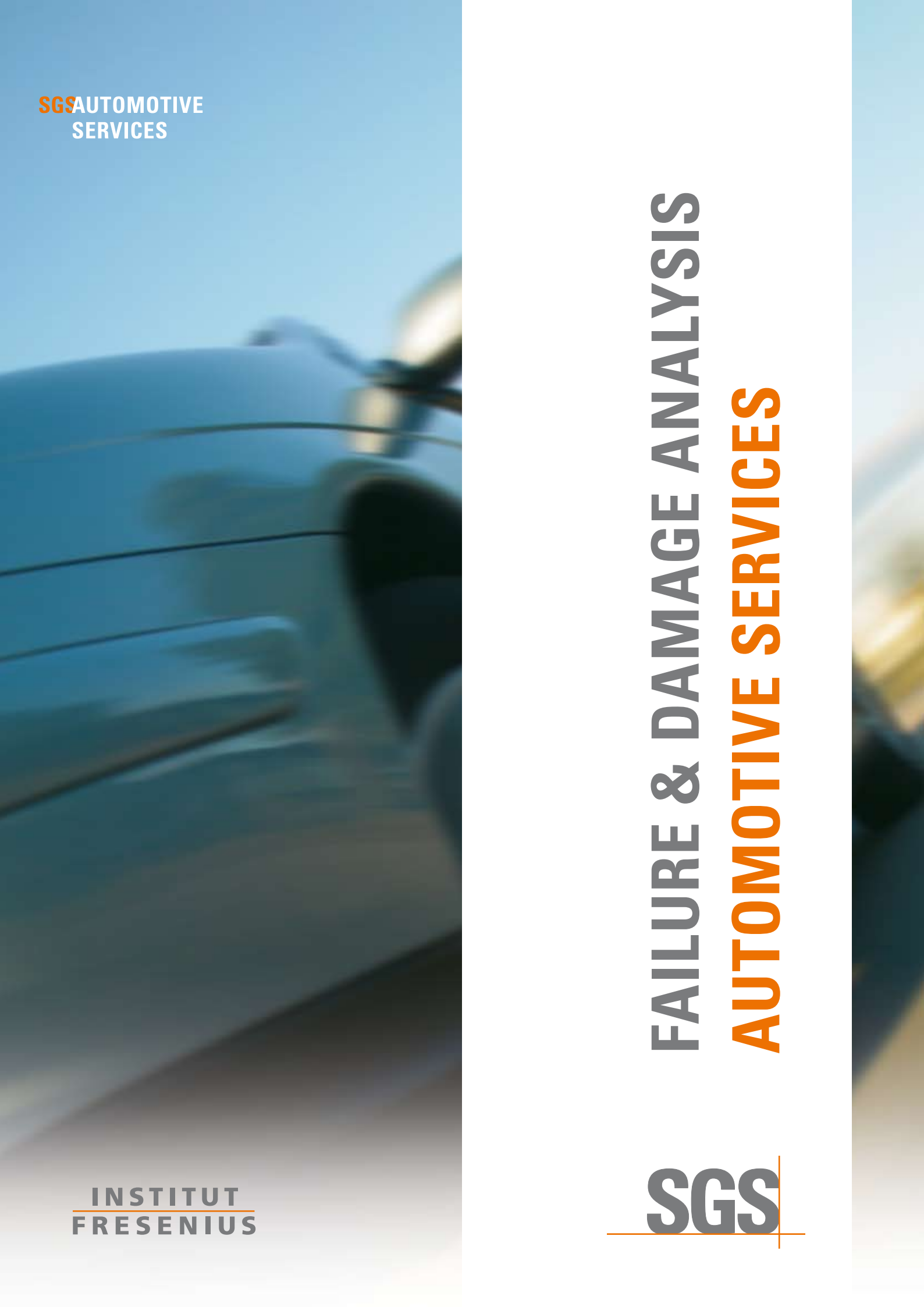


SGS AUTOMOTIVE SERVICES

FAILURE & DAMAGE ANALYSIS
AUTOMOTIVE SERVICES

INSTITUT FRESENIUS

SGS

In the automotive industry innovation and increasing quality requirements are very closely linked. Growing demands from the customers require a greater level of complexity and interaction of many different components. Development times are becoming shorter all the time. This all places increased demands on testing and analysis in the area of R&D, within the scope of quality assurance and also on failure and damage analysis. Savings in this area can result in expensive recall actions and damage the image of the company.

PREVENTION RATHER THAN RECALL

SGS INSTITUT FRESENIUS has developed and bundled extensive multi-disciplinary competencies for the automotive industry. For instance, in Dortmund we have developed methodical and functional expertise in many different fields for failure and damage analysis. Currently 22 employees, including 18 engineers and scientists, work on resolving complex technical problems.

From wheel nuts to sunroofs – over the years we have analysed many different defective parts and units and determined the causes for their failure. Recently, the focus has increasingly shifted towards electrical and electronic components. In addition to discovering the actual causes for the damage, our systematic analyses very often detect other latent faults or defects which could result in damage at a later point in time.

After we have determined the cause for the damage we often carry out further simulation tests to discover how the failure arose in the first place. On the one hand, this underpins the results of the damage analyses, and on the other, we gain additional information so that the defects can be eliminated and prevented in the long term.

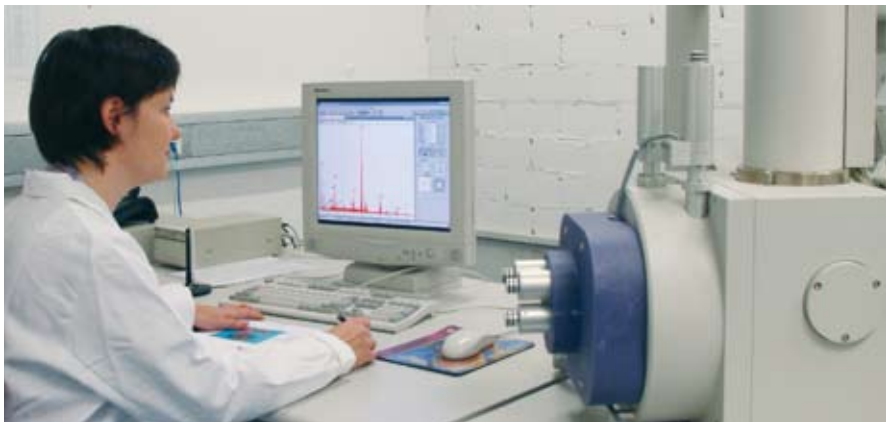
On the basis of our experience with damage analysis and simulation tests we believe that large-scale systematic and detailed testing and analysis of all components and units before they go into serial production would help prevent failures in the field and the associated recall actions.

Examples of components we have analysed assemblies/ units

Connection elements, different body parts, car interior materials, sunroofs, front axles, shock absorbers, bearings, drive shafts, fuel pumps, engine components, cooling systems, clutches, gear shifts, electronic throttle adjusters, ignition coils, fuel distributors, diesel injection pumps, diesel injection nozzles, lambda sensors, oil sensors, air flow sensors, catalytic converters, diesel soot filters, windscreens, window openers, door locks, steering locks, steering-angle sensors, electronic ignition keys, phones, rain sensors, airbags, auxiliary heating systems, intelligent battery contacts, actuators and sensors for seats and fuel cells, to name just a few.

Individual electrical/electronic components

Cables, crimps, welded, soldered and bonded joints, PCBs, plugs, switches, micro switches, relays, potentiometers, capacitors, resistors, inductances, transistors, diodes, circuits, sensors, to name just a few.



Specialisation

- Materials science
- Physics, chemistry, mineralogy, biology
- Surface engineering
- Surface analytics
- Electrical engineering, electronics
- Physical and chemical material analytics
- Damage simulation
- Mechanical engineering
- Materialography
- Testing technology
- Process engineering

OUR RANGE OF SERVICES

Failure and damage analysis of materials, components and systems

- Failure and damage analysis
- Cooperation in task forces
- Consulting, expert opinions and expert reports for legal proceedings
- Fault/damage simulation
- Expert research
- Cooperation in R&D projects
- Development and use of new inspection, testing and analysis methods

Tests and analyses

- Individual and routine investigations of materials, media and components in regard to chemical composition, structure, topography, coatings, surface chemistry/contamination, mechanical parameters, 3D dimensions, etc. according to standards and delivery specifications and also to non-standardised special methods.

Example: Since 2002 we have been authorised by DaimlerChrysler to carry out the following release measurements after tests for adhesives, metal sheet, lubricants, adhesive films, etc.

- T-Peel (VW PBL 662)
- Adhesive strength (VW PBL 659)
- Tensile-shear test (VW PBL 640)

We have all the latest relevant preparation, testing and analysis processes, including

- Materialographic preparations incl. thin-ground sections and micro-tome sections on all types of materials and components
- Practically all light-microscopic methods with incident light and transmitted light
- Environmental Scanning Electron Microscopy (ESEM) with Energy Dispersive X-Ray Analysis (EDX)
- Optical Emission Spectroscopy (OES)
- Glow Discharge Optical Emission Spectroscopy (GDOES)
- Time of Flight Secondary Ion Mass Spectroscopy (TOF-SIMS)
- Other surface analysis methods, such as AES and XPS
- Laser profilometry (UBM)
- X-ray diffraction (XRD)
- Infrared spectrometry (FT-IR, ATR and Micro-IR)
- High resolution 3D computer tomography and radioscopy
- Many different mechanical tests
- And many more

WITH MORE THAN 48,000 EMPLOYEES, SGS OPERATES A NETWORK OF MORE THAN 1,000 OFFICES AND LABORATORIES AROUND THE WORLD.

CONTACT

You can find information about other automotive subjects such as:

- Failure & Damage Analysis
- Car Interior Material Testing
- Oil, Gas & Chemicals
- Workshops/Trade & Sales
- Certification
- Transport containers and pallets
- SGS TÜV Saarland Occupational Safety Management North & South

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