All in one

A major resource for the European automotive industry

SP Technical Research Institute of Sweden is northern Europe's largest one-stop resource for automotive manufacturers and also their sub-contractors. In addition to services such as technical evaluation and research, the Institute offers the certification of quality management systems, and the calibration of measuring equipment.

SP's main working areas range from advanced automotive electronics to fire-resistant cars and robust designs. The Institute's work often involves vehicle components. SP can carry out tests in accordance with various European and international standards, and has considerable experience of custom testing in accordance with vehicle manufacturers' specifications, such as from Scania or Volvo.

Increasingly complex needs

The Institute's extensive range of services and expertise meet the automotive industry's increasingly complex technical requirements. One clear trend currently in the sector is greater environmental awareness. Emissions and energy demands must be reduced. "Requirements for reduced carbon dioxide emissions are beyond question, and they are extending throughout the automotive industry," says Jan Jacobson, manager of SP's automotive activities.

Alternative motor fuels, such as biodiesel and biogas, present new challenges in respect of safety and the properties of materials. At the same time, new technologies create opportunities for lightweight designs and advanced safety systems.

"The biggest challenges currently facing the automotive industry are to reduce environmental impact, to improve safety, and to develop communication systems for use between vehicles," says Jacobson.

SP's services for the automotive industry

Robust designs

Demand for the longer life and improved safety of components and products makes it increasingly important to develop robust designs that can withstand surrounding conditions. Mechanical life and safety can be tested in SP's large mechanical lab. Environmental durability and the service life of components can be tested with regards to EMC, temperature, humidity, dust, mechanical shock, mechanical vibration, salt mist, sunlight, and corrosive environments.

ElecAutomotive electronics

systems provide the platform for almost all new functions in modern vehicles. SP can measure and calculate electromagnetic fields (EMC testing), working with everything from individual components to complete vehicles. In addition, the Institute offers functional safety evaluations and functional safety assessments of components. The technology of communication between vehicles, and between them and the roadside, is also a working area for development.

Electric vehicles

This technology presents new challenges and new technical risks. High electric voltages must be safely contained, both when repairing vehicles and when they are involved in traffic accidents. Electric motor drives must not cause high levels of interference, and battery systems must store sufficient energy for a long travel range. Electrical safety, fire risks, battery technology, and electrical interference (EMC) are areas of SP's work that are helping to solve the automotive industry's problems.

Noise and vibration

SP has been developing calculation models for traffic noise from vehicles, road surfaces, and driving habits for many years. The Institute also measures the noise experienced in traffic environments and in vehicles. Evaluating NVH – noise, vibration and harshness – is essential for the comfort of drivers and passengers. SP performs accredited measurements both in its acoustic laboratories and in the field.

Safety systems for vehicles

SP possesses extensive expertise and specialist knowledge of both passive safety systems, which provide protection when an accident is unavoidable, and active safety systems, which reduce the risk of an accident occurring and minimize its effects. The Institute develops testing methods, and innovation environments for new safety systems that can prevent many accidents from occurring. SP also performs a wide range of tests, evaluations, and investigations of the components that form part of passive safety systems.

Fires in vehicles

The choice of materials and the design of interior fittings affect the fire safety of cars and buses. Fires in goods vehicles can have serious consequences, particularly if they occur in tunnels, where a fire can spread to other vehicles. Vehicles generally carry some form of liquid fuel, and so it is important that fuel tanks are designed so that they remain intact and do not leak if exposed to fire. New fuels may present different fire risks. Electrically powered vehicles use high voltage, which can cause effects, such as persistent arcs, which in turn could ignite flammable materials.

Materials and components

SP's main expertise in automotive materials technology lies in the fields of metallic materials, polymer materials (plastics and rubber), vehicle paints, and other surface treatments. New legal requirements, coupled with the rapid rate of technical development, mean that materials technology is becoming increasingly important in the automotive industry. SP carries out research in close conjunction with the industry in areas including renewable materials and self-cleaning paints.

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