

thyssenkrupp focusing on further development of adaptive chassis technology

- Predictive semi-active damper systems setting standards in premium segment
- New damper concepts for e-mobility and autonomous driving
- First active damping system in production development

thyssenkrupp's chassis activities are focused on the further development of adaptive damper systems, a technology in which the vehicle's suspension adapts to different driving situations and road surfaces. These systems enable drivers to choose the kind of tuning they want, most of them offering settings such as "normal", "comfort" and "sport".

Predictive semi-active dampers setting standards in premium segment

Today's adaptive systems have position and acceleration sensors that continuously monitor all vehicle movements and automatically set the damper stiffness for each individual wheel based on road conditions and driving style. This is done by controlling one or more valves in the shock absorber to regulate the oil flow, changing the oil flow resistance during compression and rebound and thus smoothly adjusting damping forces within fractions of a second. As control systems of this kind use only the energy of the wheel movements to generate the forces needed to reduce body movement, they are referred to as semi-active systems.

The main advantages of electronically adjustable semi-active systems lie in the high degree of comfort and agility they offer and the infinite variability of the damping forces.

thyssenkrupp is already supplying this damping technology for numerous premium cars from German and international OEMs – including Daimler, AMG, BMW, Rolls-Royce, Mini, VW, Audi, Seat, Porsche, Jaguar/Land Rover, Fiat-Chrysler, Nissan and Aston Martin.

"Our development work is focused on making adaptive damping systems lighter, more energy efficient and less expensive so that they can also be used in the mid-size and compact car segments," says Dr. Karsten Kroos, CEO of thyssenkrupp's Components Technology business area.

New damper concepts for e-mobility and autonomous driving

The importance of adaptive dampers is also growing for electric-powered and increasingly autonomous vehicles, partly with a view to optimizing the overall energy consumption of the vehicle and partly to create more differentiated chassis properties that enable passengers

in self-driving cars to pursue other activities while on the road. Studies have shown that up to 40 percent of people riding in autonomous vehicles experience motion sickness if they concentrate on other things than actual driving for any length of time.

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First active damping system in production development

To this end thyssenkrupp is currently working with customers on the development of active damping systems. Unlike conventional passive or semi-active systems, active dampers generate targeted forces between the wheels and the body to proactively counter unpleasant vehicle movements such as pitch and roll. The damper no longer simply reacts, it adapts proactively to driving and road conditions and counters the forces acting on the chassis to provide an extremely smooth and comfortable ride. Production development of an active hydraulic damping system of this kind is currently underway.

In addition, thyssenkrupp's chassis experts are also working on feasibility and project studies into visual and sensory control systems to drive the system integration of semi-active and active electronic dampers in collaboration with customers.

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