



Mercedes-Benz

Press Information

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Mercedes-Benz opens most advanced light testing center in the automotive industry

- Newly opened: Europe's most advanced light testing center, designed for versatile use
- Robots at the wheel: Fully automated endurance testing on a demanding rough-road track
- 'Digital twin': All test modules can also be used digitally for preliminary simulations
- A world of testing in Immendingen: Over 30 modules across 53 mi (86 km) of simulated roads
- Animal helpers: sheep prevent shrub encroachment, llamas protect the herd
- 10-year anniversary: ground-breaking of unique development environment took place in 2015

Stuttgart/Immendingen – With the new, state-of-the-art light testing center, Mercedes-Benz once again expands the diverse testing capabilities of the Global Proving Ground Immendingen. At 443 ft (135 m) long and 26.2 ft (8 m) high, the new Light Testing Center ranks among the largest of its kind in the automotive industry. It enables detailed testing of headlight systems under constant, reproducible conditions – independent of time of day, weather or environmental influences.

A complete country road is authentically recreated spanning 443 ft (135 m). In addition, the asphalt mixture of the road surface was specially developed to replicate the reflective properties of an aged road as closely as possible. Up to five cars can be tested in parallel – including the simulation of oncoming traffic or vehicles ahead. Reflector posts can be deployed at the sides of the road in 65.6 ft (20 m) increments and pedestrian dummies can also be flexibly integrated. The investment in the light testing center amounts to 10.5 million euros, with two years of construction.

Automation meets resilience: Driverless Heide durability circuit

The Global Proving Ground Immendingen continues to set new standards across the industry with its high-tech testing facilities and advanced testing methods, including the automated Heide durability circuit. In this test, robots steer test vehicles completely autonomously along a rough-road track. The track's potholes, bumps and cobblestones strenuously test the chassis and body of vehicles.

The automation of this process increases the precision of driving maneuvers, reduces strain on human test drivers, enables 24/7 operation and significantly accelerates testing – all while maintaining the same level of stress on the cars. Depending on the type of vehicle, test cars must complete up to 3,728 mi (6,000 km) on this circuit, which is equivalent to 186,411 mi (300,000 km) of real-world driving. This means that 0.6 mi (1 km) on the Heide durability circuit is equivalent to 93 mi (150 km) of real-world driving on an extremely rough road, littered with deep potholes, among other imperfections. The grueling test module is named after the challenging rough-road track in the Lüneburg Heath that dates back to the 1950s.

Consistent digitization: more efficient, faster and more sustainable testing

As with all test modules at Immendingen, the Heide durability circuit also has a “digital twin.” The proving ground is digitally mapped down to the sub-millimeter level, and vehicles and loads are digitally mirrored. This data is used in preliminary simulations, serves as load spectra for test benches and thus enables test results to be quickly fed back to the development departments.

Today, digital testing is so precise that often many thousands of miles are driven digitally before the first physical test miles are driven on the test site. This means, for example, in chassis tuning for each new model series, more than 100 different variations are tested digitally. The most suitable variants are then installed on a prototype vehicle and tested physically in Immendingen.

"The Immendingen Test and Technology Center is the first digitized Mercedes-Benz proving ground – here, real and virtual vehicle testing merge seamlessly. By digitally mapping the proving ground, using automated test programs and employing state-of-the-art sensor technology, we are making vehicle development more efficient, faster and more sustainable than ever before."

Markus Schäfer, Member of the Board of Management of Mercedes-Benz Group AG, Chief Technology Officer, Development & Purchasing

The whole world in Immendingen: 53 miles of road across 1,285 acres (520 ha)

In 2015, Mercedes-Benz began building the unique development environment in Immendingen in Baden-Württemberg – designed to be reproducible, efficient and sustainable. Since then, approximately 30,000 test vehicles have covered more than 62 million miles (100 million km) – the equivalent of circling the Earth 2,500 times.

Covering an area of 1,285 acres (520 ha), the proving ground in Immendingen combines more than 30 test modules with a total of 53 mi (86 km) of road-simulating tracks and 256 junctions. The grounds depict real-world driving environments in many ways: from complex city intersections to mountain passes with nearly 591 ft (180 m) of elevation change, from rough roads and cobblestones to highways and off-road tracks. There are routes that replicate the road conditions and road markings in European countries, as well as copies of roads and road markings from the U.S., China and Japan. Up to 400 vehicles can be on the roads at the same time in the various test programs. There are also special tracks with gradients ranging from 30 to 100 percent.

To test how vehicle sensors behave under low sun or particularly bright light sources, even on overcast days or at dusk, Immendingen features a so-called artificial sun. These high-performance mobile lights are otherwise used on Arctic ships for iceberg detection. In addition, heavy rain and spray can also be simulated using special systems.

One of the greatest advantages of the Global Proving Ground Immendingen is nearly all test requirements for real-world testing – apart from snow, ice and extreme heat – are consolidated at a single location. Approximately 80 percent of test drives previously carried out on public roads have now been relocated to the site. International testing activities have also been significantly reduced without compromising testing quality – an important measure to shorten development times, accelerate vehicle maturity and reduce the carbon footprint of development.

During peak weeks, an additional 2,100 Mercedes-Benz employees from other plants are onsite for testing along with the 250 dedicated employees.

Sheep are largely responsible for maintaining the landscape on the test site. As grazing animals, they prevent shrubs and trees from growing on the rough pasture and displacing the species-rich meadow landscape. Several llamas also reside on the test site and protect the sheep herd from foxes.

Mercedes-Benz has invested 200 million euros in the construction of the site on a former military base since the ground-breaking ceremony in 2015. Since its opening, an additional 200 million euros have been invested in the expansion of the site.

Key Facts: Immendingen Test and Technology Center

Employees, investments and testing areas

- Area of site: 2.2 mi² (5.8 km²)
- 53 mi (86 km) of road-simulating tracks and 256 junctions
- 400 million euro investment (including 200 million euro expansion of the site since its opening)
- More than 250 dedicated employees at the site
- Space for 2,100 additional employees from other locations to test the vehicles
- BERTHA test area: almost 1.1 million ft² (nearly 100,000 m²) in size
- City center module: 0.9 mi (1.5 km) of roads with a variety of junction scenarios for realistic testing of advanced driver assistance systems
- Mountain road with a gradient of up to 16 percent and serpentine curve radii, off-road tracks
- Tracks with gradients ranging from 30 to 100 percent.
- Three-lane oval circuit with high-banked curves

Infrastructure and security

- More than 100 charging stations for electric vehicles and 12 fuel pumps for combustion engine vehicles
- LTE-based proving ground management with collision warning system for test drivers
- Fully equipped fire department including own rescue service
- Immendingen site is only a one-hour drive from the Group headquarters in Stuttgart

Wildlife and nature conservation

- Proving ground and conservation areas act as refuges for endangered and specialized animal and plant species
- Includes many Red List species (e.g. grasshoppers, wild bees, birds, beavers, amphibians, etc.)
- Landscape conservation, including grazing by mouflons (wild sheep) and yaks (large breed of cattle)

Overall ecological effect

- Hundreds of acres of conservation and replacement measures
- Replacement forestation, forest conversion, forest refuges compensate for intrusions in forest areas
- Conservation, enhancement and new development of species-rich open land biotopes and special sites (e.g. dry embankments)
- Creation of numerous habitat elements (ponds, rock/deadwood piles, nesting boxes, sand lenses) for targeted promotion of protected species
- Collaboration with nature and environmental protection organizations as part of conservation measures

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About Mercedes-Benz USA

Mercedes-Benz USA (MBUSA), headquartered in Atlanta, is responsible for the distribution, marketing and customer service for all Mercedes-Benz products in the United States. MBUSA offers drivers the most diverse lineup in the luxury segment with 18 model lines ranging from the sporty GLA SUV to the flagship S-Class and the dynamic all-electric vehicles from Mercedes-Benz. MBUSA is also responsible for Mercedes-Benz Vans in

the U.S. More information on MBUSA and its products can be found at www.mbusa.com and www.mbvans.com. To learn more about all Mercedes-Benz entities in North America, visit group.mercedes-benz.com/northamerica.

Accredited journalists can visit our media site at media.mbusa.com.

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