Test Benches and Environmental Simulations
When simulation becomes reality

Individually aligned to your situation, test benches from ENGIE Deutschland help you to shorten significantly the time required to develop new vehicle types or components, and to perform test series under reproducible conditions. For you this means lower costs, assured quality standards and improved plannability.

As good as the real thing.
Even if the well-trodden saying “the proof of the pudding is in the eating” seems somewhat antiquated in relation to modern automotive manufacturing, it is nonetheless still valid: Especially where excellent engineering performance and high-tech meet, not only are lengthy calculations and thinking undertaken, but also lots of tests are performed. Because important knowledge can only be acquired through practice – and thereby making them accessible to theory and innovation.

ENGIE Deutschland ensures the right test environment is available for this: With complete systems and modules exactly matched to your needs and requirements, we create reproducible situations, which are as good as real. We let it rain or snow, we expose your test vehicle or a specific component to sunlight or shake it vigorously. To be succinct: we have the know-how and the technology to provide you with all the important, global climate, road and test conditions.

Laboratory instead of on the road.
A vehicle must be tested “on the road” at some time – after all, that’s what it’s made for. But until then, each kilometre of road not driven on the road is a real cost and time saving. Move your road tests into your own reliable, reproducible and protected test facility environment, to reach your goal faster and more cost effectively.

Fully integrated for perfect simulation.
Only if every detail is right is the result also right. This means: ENGIE Deutschland offers all the necessary services for your entire test facility – from the conceptual design and planning to construction with instruction and training, maintenance of the test benches through to optimisation of existing systems – all from a single source. We naturally do this in close consultation with you, because we know:

Each test task has its very own solution.

ENGIE test facility services
• Conceptual design and planning
• System construction including instruction and training
• Test bench maintenance
• Optimisation of existing systems
• Installation of new and individually adapted single test benches and test facilities
• Supply of the data and test records

The right environment for precise data.
When we take care of your test facilities, you can expect precision: We install new single test benches as well as entire test facilities, each individually adapted to your situation. We work closely with your team of operators and your quality management staff, and our test bench supplies you with appropriate data and exact test records. This gives you the certainty of being able to identify defective or critical test pieces or products at any time.

Why ENGIE Test Benches and Environmental Simulations?
• More cost effective and faster product development
• Test results that are precise and reproducible at any time
• Comprehensive test options
• Perfected and individually adaptable system technology
• High system availability and flexibility
Corrosion chambers

are required to test the effectiveness of different coatings, seals, preservatives, paint coat thicknesses, materials and material pairings. To this end, de-icing salt, cold, damp heat (humidity) and heat are used to damage and age the material. Weakpoints are then identified and removed. The reproducible test results can also be compared with open air tests.

ENGIE Deutschland corrosion chambers have level threshold accessibility. A pitched roof is installed to avoid uncontrolled dripping onto the test piece. The inner shell is made of high-alloyed stainless steel and is corrosion resistant, is completely welded and is enclosed by an impervious outer envelope. Alternatively, different salts can be sprayed, or infrared systems installed, which damage the test piece with heat. It is also possible to allocate the relevant resources to test pieces automatically.

We design our corrosion chambers to your wishes and offer you complete solutions, from the project planning to the commissioning through to after-sales service.

Weathering chambers

are special climate chambers for ageing tests under the influence of artificial sunlight. The tests include the lightfastness of plastics, metals, complex components, coatings, paints and other materials under different irradiation intensities, radiation compositions and weather conditions.

In a weathering chamber, the whole vehicle contour is simultaneously irradiated with a spectrum similar to that of the sun. The adjustment and hinged mechanisms of the light source support frame enable adjustments to different vehicle types and contours.

ENGIE Deutschland uses symmetrical parabolic reflectors in weather test chambers, to achieve a large parallel radiation component. The combination of reflector, control gear and lamps enables particularly realistic simulation of beam path, spectrum and uniformity. This means that not only can test results be reproduced at any time, but they can also be precisely compared with measurements of the vehicle surface temperatures of outdoor weathering.
Altitude chambers are important, if test results in different locations are to be compared with each other. Under reproducible conditions such as ambient pressure, temperature and humidity, atmospheric fluctuations have no effect on the measurement results.

Altitude chambers are essentially made up of the following components: pressure resistant shell, insulated cell, dynamometer, supply engineering utilities and visualisation for specifying the setpoints and for graphic evaluation of the actual values.

Altitude chambers built by ENGIE Deutschland naturally fulfil all exhaust standardisation requirements (EPA/CARB and EU Directives). To this end, we install preconditioning rooms and a manoeuvring area – which also increases the effectiveness of the test procedure.

Conditioning units with altitude simulation

supply test benches such as climate or altitude chambers and engine test benches with prepared combustion air.

The drawn in external air is prepared by passing it through filters, fans, sorption dryers and precoolers and aftercoolers or heaters. This specially prepared air is then fed to the combustion engine directly or indirectly, i.e. in a test cell. If the connection to the combustion engine is direct, the air is humidified directly; in the indirect method a steam humidifier in the test cell provides the required humidity. In “test cell” mode (bypass mode) the surplus share of the combustion air is removed from the chamber with the exhaust.

We plan, design and install conditioning and ventilation systems according to the automotive industry requirements. The ventilation systems are used to supply combustion engines with combustion air at different pressures. The conditioning can take place directly at the test piece or via a test cell.
are used in the automotive industry, not only in research and development, but also in quality assurance and in the end-of-line area. From a gentle drizzle to a tropical rainstorm, any situation can be simulated. The vehicles are sprayed with different quantities of water from varying directions and are possibly tilted, to expose the bodywork and in this way to detect leaks or places in which the water accumulates.

Rain chambers have a high water throughput and consumption; efficient water treatment and filtering are therefore important. Because this is the only way to ensure a long water life cycle and the necessary water quality – including when the system is at a standstill.

We would be pleased to work with you to develop a complete continuous concept with preparation area, sprinkling test bench, drip/drain area, dryer and examination area, mobile operator control concept and safety matrix.
Temperature and climatic chambers

create reproducible environmental conditions that can be compared at any time: Test situations, from an Arctic winter to the glowing heat of a day in the desert can be realised in a short time. In this way, complete vehicles or individual components and industrial elements can be examined optimally.

Climatic chambers are essentially made up of an insulated cell, supply engineering utilities, visualisation for specifying the setpoints and graphic evaluation of the actual values. They can be combined with other test benches, e.g. roller test benches, to extend the area of use.

ENGIE Deutschland plans and builds temperature climate chambers of any size to match individual wishes and with all imaginable special installations. At the same time we naturally fulfil all specifications, guidelines, directives and laws – worldwide.

Dyno climatic test benches

enable developers to test the handling performance of a test vehicle or piece under all kinds of different climatic conditions. While the vehicle is fixed, rollers under the wheels simulate a driving situation.

A fully equipped dyno climatic test bench includes the simulation of temperature, pressure, sunshine, heatwind and driving speed. Supporting technical components include, among other things, electrical systems, gas detection systems and driver assistance monitors. The complex systems must be carefully matched with each other, so that test data specified, for example, by EU Directives, can be properly collected.

ENGIE Deutschland supplies high-quality automated systems for the conditioning of the chamber air and for extracting the exhaust gases caused by the test piece. Our services also include the software and hardware for recording and visualising all test data.
are used for the development and validation of individual components or whole cooling modules. In particular, the sophisticated thermal management of electric vehicles can be tested and improved under optimum conditions. Another important development goal is to optimise pressure losses in the test pieces.

The main components of a thermal management test bench are a cooling air circuit, a refrigerant module and a charge air module. Oil conditioning modules are used to test engine oil coolers and transmission oil coolers. A refrigeration circuit in the test bench supplies the condenser of the vehicle’s air conditioning system. All components can be measured thermodynamically, both individually and in combination as a cooling module.

ENGIE Deutschland supplies thermal management test benches for car and truck components. Visualisation of the system and test evaluation with all thermodynamic calculations are also included in our portfolio of products and services.
(SHED - sealed housing for evaporative determination) are used to examine the hydrocarbon evaporative emissions of vehicles or individual components in a gastight chamber at different temperatures. Because these hydrocarbon emissions have a large influence on the total emissions of a vehicle. By using optimally coordinated materials, almost zero emissions are achieved within the chamber (so-called PZEV-SHED = partial zero emission vehicle).

SHED test chambers are available in different sizes (micro, mini, full size), which can be combined with each other. In this way, for example, a complete fuel circuit can be tested. Additional options are tank heaters, fuelling ports (ORVR port) and pressure and temperature measurements.

The gastight SHED test chambers from ENGIE Deutschland enable test procedures according to all commonly used regulations and standards. With an additional RTU (Refuelling Tank Unit), the ambient conditions of a fuel dispenser can also be simulated and tested directly in the SHED test chamber. With the visualisation software and the corresponding terminal devices, all results of the tests can be documented and evaluated in accordance with the regulations (EPA, GB, CARB, EC, etc.).
Components for wind tunnels have been in the ENGIE Deutschland product portfolio for years.

Working in close cooperation with our partners, we supply high-quality components for your wind tunnel, including for:

- air conditioning/refrigeration (including the corresponding cold brine systems)
- fresh air treatment/exhaust intake
- sunlight simulation
- sprinkling
- snow simulation
- soiling (simulation of vehicles driving ahead)
Comprehensive customer service and repairs

You can reach us every day. Our service technicians are highly qualified and are completely equipped technically to ensure prompt troubleshooting or repair of your system. We can identify defective components quickly and supply an appropriate replacement or successor spare parts, or more efficient components.

Servicing, calibration, maintenance

Sensible maintenance intervals increase the availability of your systems and protect your investment – we plan with you and advise you about our preventive maintenance offer. Where any unplanned failure has a large effect on the end result, we can advise you individually on the basis of our experience. In this way we manage to keep the system failure time as short as possible.

Individual planning and design of test benches

ENGIE Deutschland has comprehensive technical know-how and many years of expertise in building particularly energy-efficient technical systems. Our specialists work in close consultation with you to develop test benches and facilities, which perfectly suit your requirements. We naturally support you not only during the planning phase, but are at your side during the entire life cycle of your system.

Energy management

Complex test facilities consume many resources. ENGIE Deutschland carries out the energy management of your systems, if you wish for the entire life cycle: from the determination of requirements, the planning and design and operation through to energy procurement, monitoring and billing.
Retrofitting, modification and modernisation – including of third party systems

We update your systems to state-of-the-art standards – quickly, competently and professionally. It does not matter whether the system was built by us or another supplier. We not only place importance on fulfilling all specifications, laws and standards, we also always have one eye on the state-of-the-art.

Remote maintenance system

Our systems are equipped with software that not only enables us to perform failure analysis if a fault occurs, but also allows real-time remote maintenance. In this way, together with you, we can access the system controls – without being on site. This saves time and costs. It is also possible for our service technicians to control your system directly via a second, secure connection, to remove faults.

Individual training programmes

We show you how to get the best out of your system. In a training course we start with a tour through the system, point out safety-related components and explain to you how you can reset them if necessary. We also explain, among other things, the individual circuits, the E&I concept and the operator interfaces.

By the way:

We not only test for and with you – we also subject ourselves to regular tests.


For more information, visit our website: engie-deutschland.de
ENGIE Deutschland GmbH is Europe’s leading brand for the efficient use of energies. We shape the technology, supply and management of buildings, facilities and processes so that all energies are used optimally – including the people who work with us. Our extensive technical expertise, close partnerships with our customers, our long tradition reaching back more than 100 years and the strength of the global ENGIE Group all combine to generate integrated solutions which make efficiency an everyday matter.

Any questions regarding ENGIE Test Benches and Environmental Simulations?

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