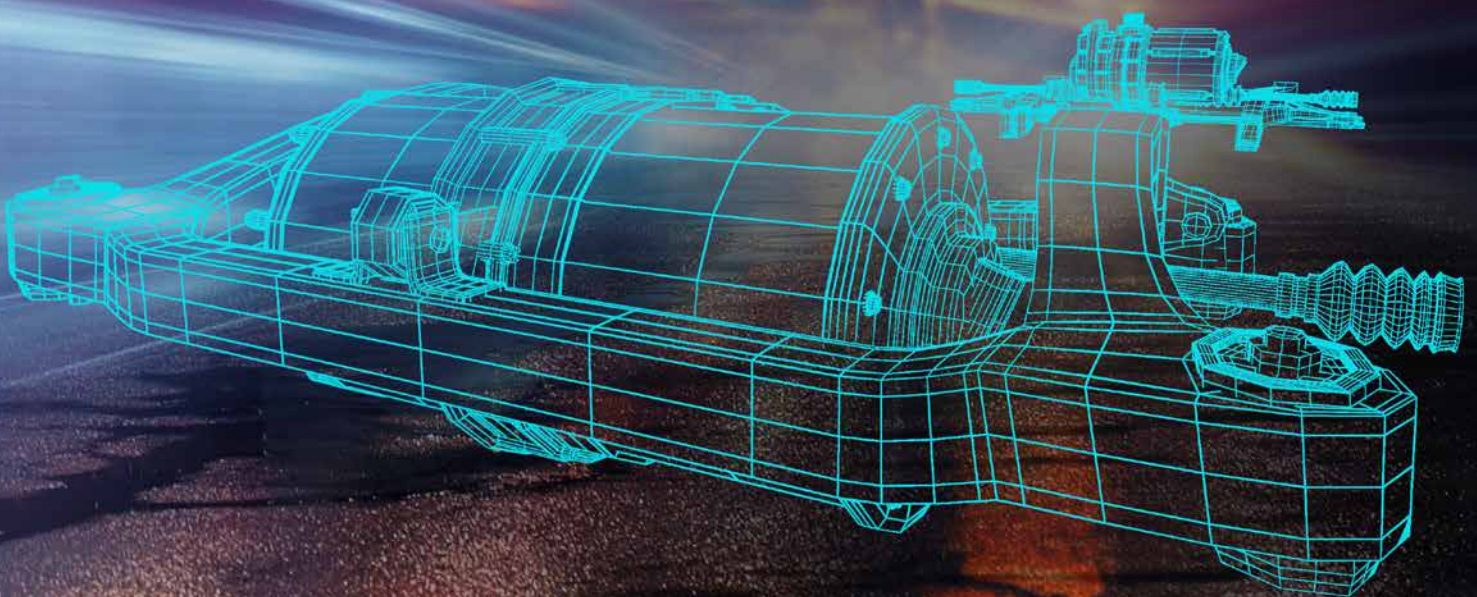


Environmental simulation

Modular test benches for environmental tests



Environmental simulation at ATESTEO

ATESTEO is the leading specialist in drivetrain testing for combustion engines, electric drive systems, and hybrid drive systems. With many locations right where the automotive industry develops transmissions, ATESTEO offers drivetrain testing services close to the customer. The simulation of environmental influences plays a large role during the development of automobiles. The earlier and more reliably components can be tested on the test bench for their behaviour in terms of temperature, humidity, and shock, the more powerful and durable the drivetrain will be.

Drivetrain optimisation through environmental simulation

The drivetrain of a vehicle is subject to a multitude of environmental influences throughout its service life. These influences characterise performance and service life; thus, their impact on the environment as well. With methods of environmental simulation, ATESTEO tests the interaction between the drivetrain and its environment. The aim of environmental simulation is to discover relationships between causes and effects and to qualify parts or components for given environmental conditions.

Test early — optimise early

Identify interactions between your drivetrain and its environment at the ATESTEO test bench! Recognising environmental factors at an early stage and incorporating the findings into the optimisation of your components is the aim of environmental simulation on the ATESTEO test bench. The tests are concerned with the effects of the environment on:

- Performance and functional behaviour of the test object.
- Long-term behaviour and service life of the test object.
- Reaction to the environment of the test object.

Open environmental chamber with test object

ATESTEO
Excellence in drivetrain testing

Environmental simulation at ATESTEO:

- High temperature test
- Thermal behaviour
- Alternating temperature test
- Low temperature test
- Humidity

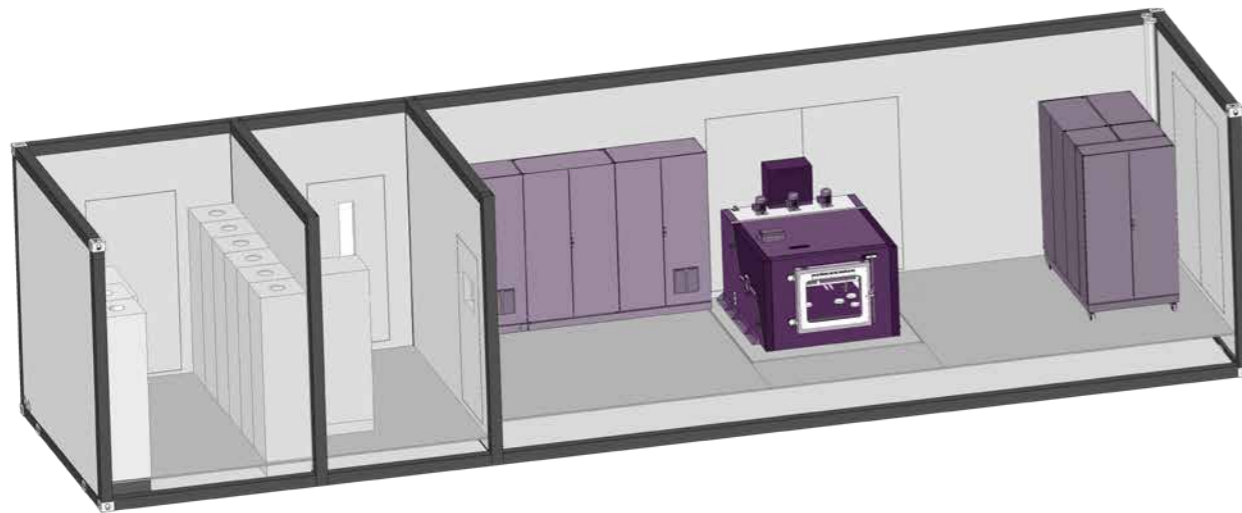
New environmental simulation test benches for all requirements

In addition to the existing classic stationary test benches, ATESTEO now offers new, modularly designed test benches for environmental simulation which are installed compactly in mobile units. In a total of eight different configurations, with one or two load machines and an

optional climate chamber, the new test benches for environmental simulation from ATESTEO can be adapted rapidly at any time to the respective testing needs of the customer. A battery simulator is added to the environmental simulation of electric and hybrid drive systems.

Modular concept – many possibilities

The new and innovative test benches for environmental simulation from ATESTEO are set up in a mobile unit according to the needs of the customer. This allows the testing chambers to be flexibly extended and connected to one another. At this time, up to eight modular test benches can be made available simultaneously for various environmental simulation scenarios or different test objects.



View of the ATESTEO modular climate chamber

Set-up of the modular ATESTEO environmental simulation test bench:

- Climate control unit for circulating air:
 - Two separate liquid coolant supply circuits
 - Separate climate box with two drive shaft outlets
 - Indirect temperature control of the test room
- Battery simulator for hybrid drives
- Cooling oil supply and conditioning
- Possibility of external drive of test objects and components
- Automation system PDES 5
- Test chamber 1: W x L x H: 1500 x 1550 x 1000 mm
- Test chamber 2: W x L x H: 1550 x 1700 x 1100 mm with GFK (glass-fibre) insert

Examples of customer-specific flexible solutions on the environmental simulation test bench:



Power protection
Idle measurements



Electric control cabinet
Control of temperature and humidity



Power measurement technology for hybrid drives
Measures power and voltage



Test bench for electric drive systems
Endurance test

Technical specifications of the ATESTEO modular environmental simulation test benches:

- Air conditioning
 - Temperature range: -40–160°C
 - 8 K/min on average with 200 kg test material
- Fluid conditioning
 - Temperature range: -35–135°C
- Humidity conditioning
 - Dew point temperature range: 5–88°C
 - Humidity range: 10–95% relative humidity
 - Temperature range: 10–95°C

Configurations for all drive types

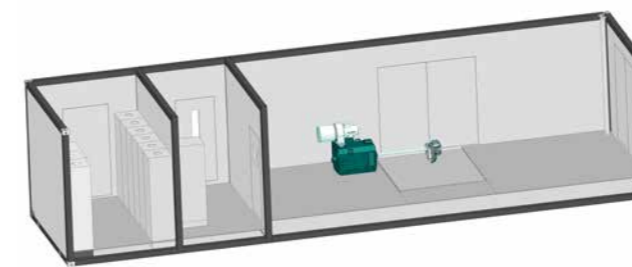
In eight different test bench configurations, automobile manufacturers and vehicle component developers can test interactions between the drivetrain and its environment.

Operational possibilities of the mobile ATESTEO test benches:

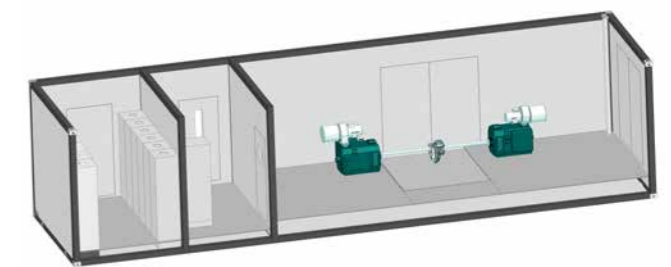
- Test bench with one output dyno
- Test bench with one output dyno and battery simulator
- Test bench with one output dyno, battery simulator and climate chamber
- Test bench with two output dynos
- Test bench with two output dynos and battery simulator
- Test bench with two output dynos, battery simulator and climate chamber
- Climate chamber
- Climate chamber with battery simulator



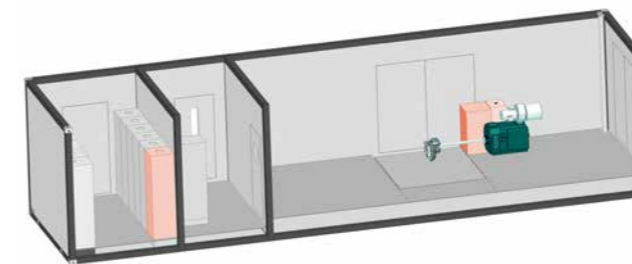
Configuration for a classic-stationary test bench



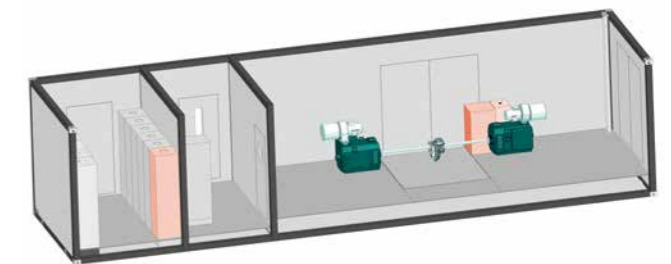
Test bench with one output dyno



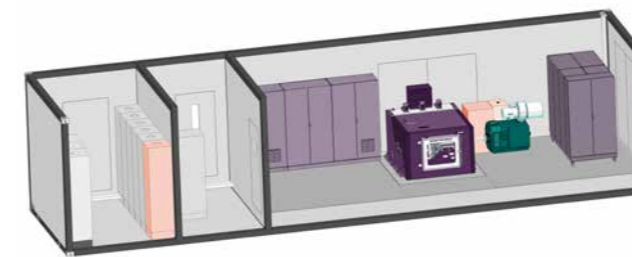
Test bench with two output dynos



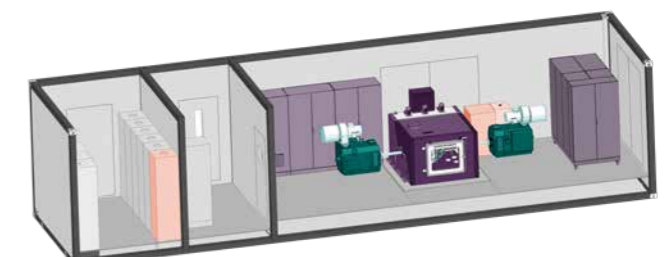
Test bench with one output dyno and battery simulator



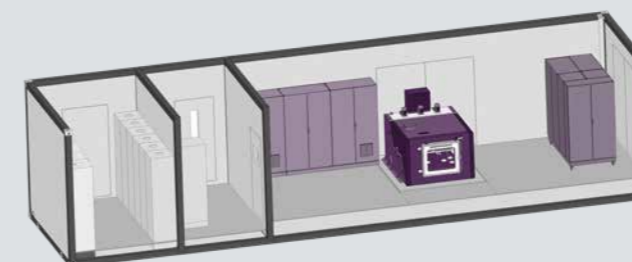
Test bench with two output dynos and battery simulator



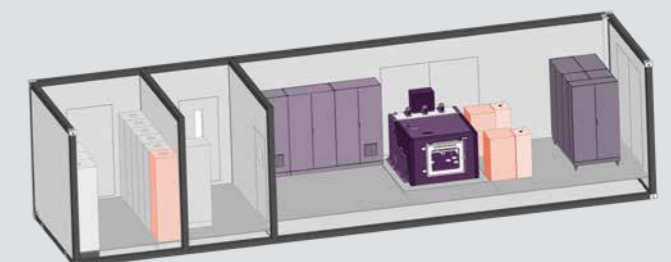
Test bench with one output dyno, battery simulator and climate chamber



Test bench with two output dynos, battery simulator and climate chamber



Climate chamber



Climate chamber with battery simulator



Excellence in drivetrain testing

Would you like to know more about the possibilities of the new mobile test bench units for environmental simulation from ATESTEO? Then call us at +49 561 510574-800 or send an email to environmental-simulation@atesteo.com. Your personal ATESTEO contact will be pleased to assist you.

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