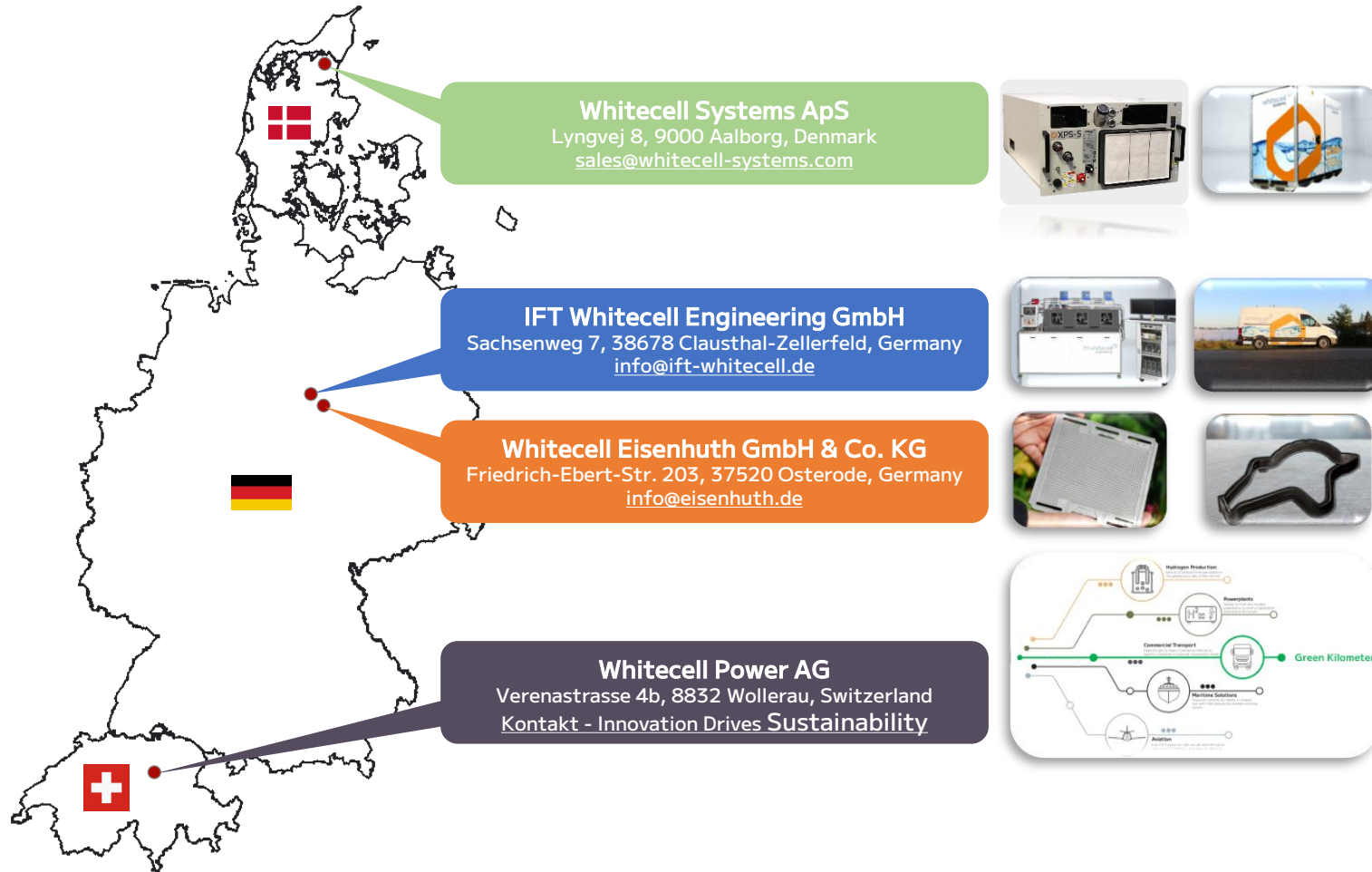




Clausthal-Zellerfeld



## Whitecell Group

A total of 140 employees,  
revenue approx. EUR 18 million (2025)

- ▶ **Whitecell Power AG:** Parent company.
- ▷ **Whitecell Systems:**  
Development and production of systems for the green methanol and hydrogen economy, and supplier of high-quality fuel cell and electrolyzer components.
- ▷ **IFT Whitecell Engineering:**  
Engineering and testing services for research and industry, offering development and testing expertise.
- ▷ **Whitecell Eisenhuth:**  
Production of components and stacks for fuel cells and electrolyzers, injection molding tools, small-series plastic, silicone & rubber parts, and 3D printing. Winner of multiple innovation awards in the fields of hydrogen and fuel cells.

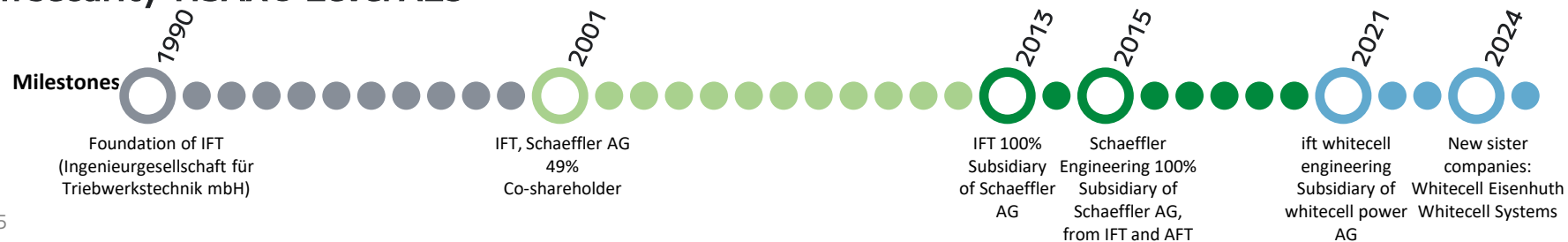
# Profile

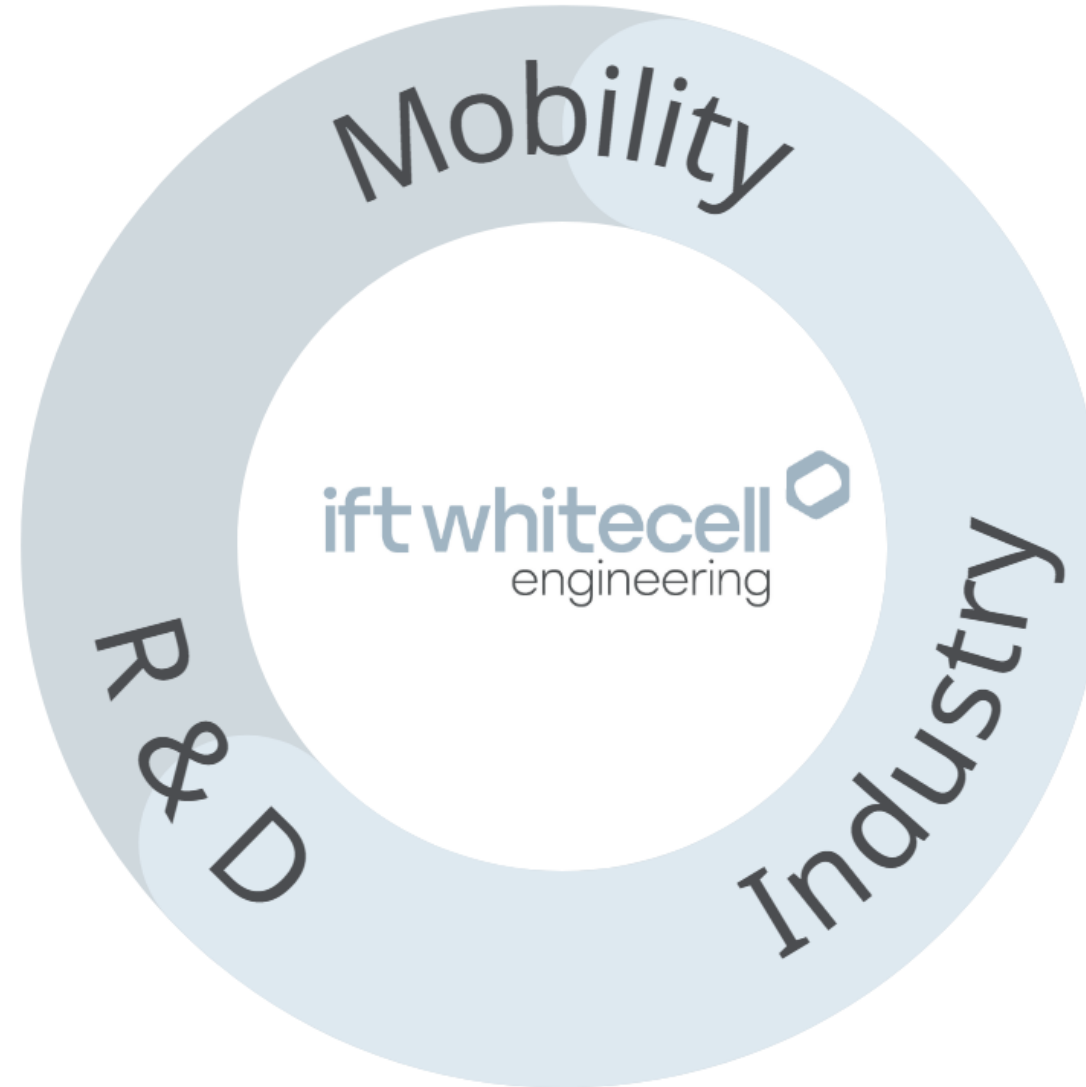
## Engineering:

- ▶ 49 Employees
- ▶ Total area: 13.079 m<sup>2</sup>
- ▶ 800 m<sup>2</sup> Test field with >45 Test cabins
- ▶ Engineering
- ▶ Functions test
- ▶ Endurance test
- ▶ Environmental tests
- ▶ Fatigue Strength tests
- ▶ Tribology
- ▶ Analysis
- ▶ Test Rig Construction

## Certified:

- ▶ DIN EN ISO 9001:2015
- ▶ Information security TISAX® Level AL3





# Examples of business areas

## Mobility:

- ▶ Internal combustion engines
- ▶ Fuel cells
- ▶ Electric motors
- ▶ Powertrains
- ▶ Components
- ▶ Assemblies
- ▶ ...

## Industry:

- ▶ Robotics
- ▶ Rail transport
- ▶ Shipping
- ▶ Defense
- ▶ Medical technology
- ▶ Mechanical engineering
- ▶ Energy
- ▶ ...

## R & D:

- ▶ Pre development
- ▶ Prototypes
- ▶ Samples
- ▶ Product improvement
- ▶ Analysis
- ▶ ...



## Testing of:

- ▶ Internal combustion engines, for example passenger cars, motorcycles, chainsaws, rail vehicles, ...
- ▶ Electric motors and power electronics
- ▶ Powertrains of all kinds
- ▶ Components and assemblies such as valve trains, control units, auxiliary units, control chains, belts
- ▶ Electromechanical actuators
- ▶ Hoses
- ▶ Cables, connectors, circuit boards
- ▶ Thermal management and cooling system components
- ▶ Pumps
- ▶ Hydraulic components
- ▶ Generators
- ▶ Solar trackers
- ▶ Gearboxes
- ▶ Power distributors
- ▶ Rotary actuators for robotics
- ▶ Clutches
- ▶ Bearings
- ▶ Lubricants
- ▶ Air conditioning compressors
- ▶ Bearings
- ▶ Fuel cells, for example for critical infrastructure, power plants, shipping, range extenders, energy storage systems
- ▶ Reformers
- ▶ Innovative electric vehicles
- ▶ And much more

Techniques

Services

Functional  
Test

Endurance Tests

Environment  
Tests

Tribology /  
Analysis

Engineering

Component Test Field

High Dynamic Drives

Radionuclide  
Technology

Engine Test Field

Powertrain Test Field

Environment Test Field

Wear & Friction  
Test Rigs

Material & Measuring  
Laboratory

Fatigue Strength Test  
Field



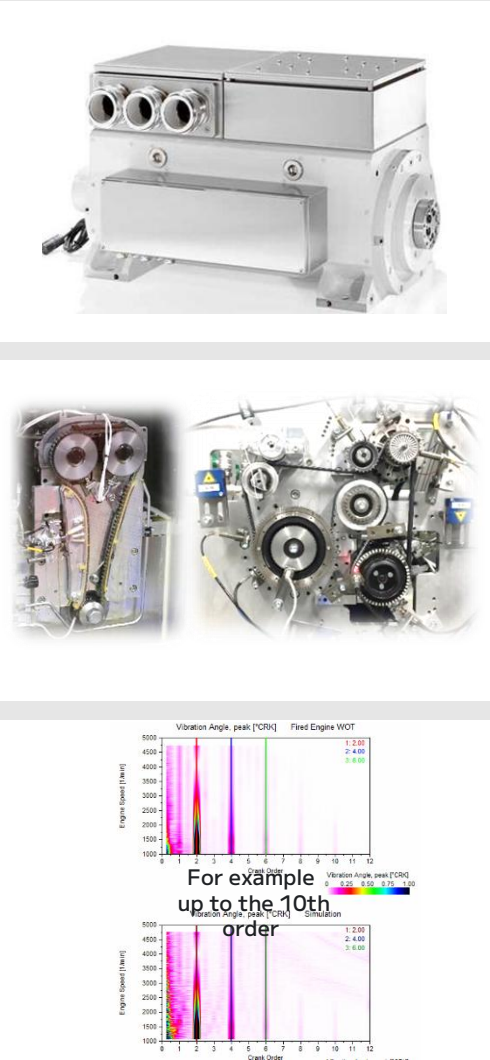
**Range of Services  
Testing & Engineering**

Techniques	Services	Functional Test	Endurance Tests	Environment Tests	Tribology / Analysis	Engineering
Component Test Field	TECHNIQUE					
High Dynamic Drives	Equipment			Infrastructure		
Radionuclide Technology	<ul style="list-style-type: none"><li>• 45 test cells</li><li>• 85 component test rigs</li><li>• Powered up to 100kW</li><li>• Speed up to 19.000 rpm</li><li>• Modular test rig concept</li><li>• 24/7 operation</li><li>• High dynamic rigs</li></ul>			<ul style="list-style-type: none"><li>• Cooling circuit -44°C</li><li>• Energy recovery</li><li>• Battery simulation 800V / 600A / 160kW</li><li>• Own test bench construction for special applications</li></ul>		
Engine Test Field						
Powertrain Test Field	SPECIAL FEATURES					
Environment Test Field	Load			Measuring		
Wear & Friction Test Rigs	<ul style="list-style-type: none"><li>• Medium contamination: dirt, soot, foaming, fuel, acid</li><li>• Thermal load: -40°C up to 160°C</li><li>• Mechatronic load: high-speed, speed gradient &gt; 10.000rpm/s</li><li>• Test environment like mechanical, electrical and hydraulic operation parameters (Virtual ICE)</li></ul>			<ul style="list-style-type: none"><li>• Mechanical, thermodynamic, hydraulic, acoustic, optical and electrical measurement</li><li>• Delta analyzer</li><li>• 10x ROTEC Measurements Systems for torsional vibrations, temperature, acceleration, velocity and sound</li><li>• Pre- and post-analysis</li><li>• Wear measurement via RNT</li><li>• Micro movement via laser, encoder, RNT</li></ul>		
Material & Measuring Laboratory						
Fatigue Strength Test Field						

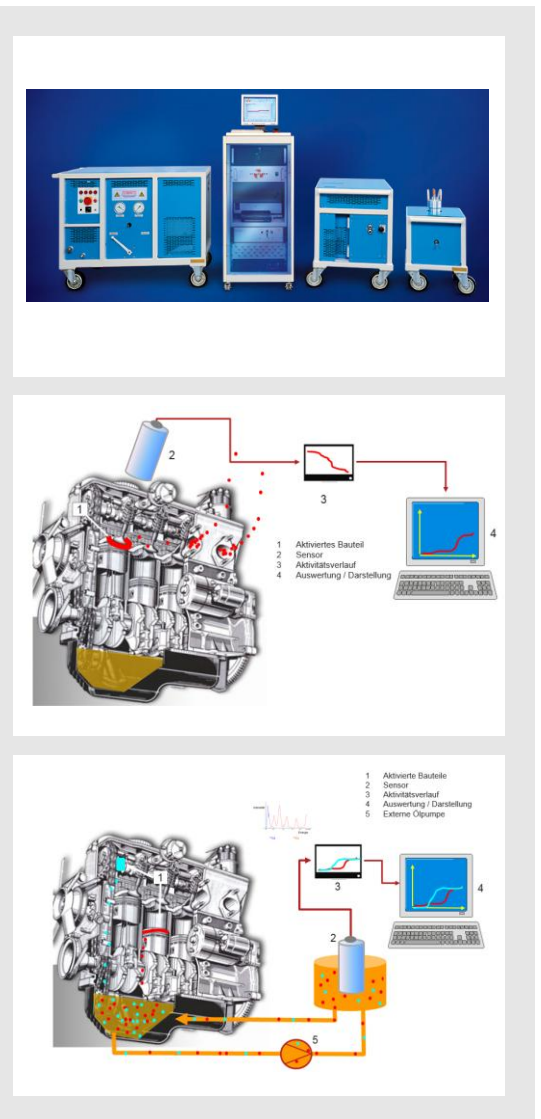




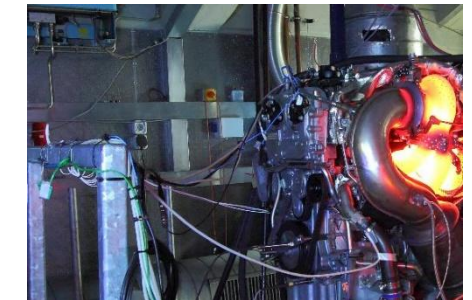
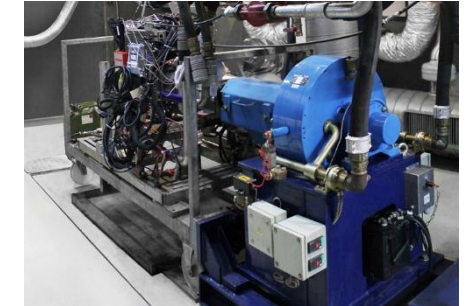
Techniques	Services	Functional Test	Endurance Tests	Environment Tests	Tribology / Analysis	Engineering
Component Test Field	TECHNIQUE					
High Dynamic Drives	Equipment		Infrastructure			
Radionuclide Technology	<ul style="list-style-type: none"><li>ETAS Inca</li><li>DiagRA</li><li>Vispiron Rotec</li><li>In-house developed programmable logic controller</li><li>MATLAB®</li></ul>		<ul style="list-style-type: none"><li>3 High Dynamic Drives up to 600 kW</li><li>+/- 1.200 Nm alternating torque</li><li>Vibration velocity: 1,8 mm/s</li><li>Very low rotor moment of inertia: 0.116 kgm²</li><li>Gradient up to 60.000 1/min/s</li><li>Rotational speed up to 10.000 1/min</li><li>Battery simulation 800 V / 600 A / 160 kW</li></ul>			
Engine Test Field	SPECIAL FEATURES					
Powertrain Test Field	Operations		Measuring			
Environment Test Field	<ul style="list-style-type: none"><li>Angle-synchronous signal reproduction</li><li>Full frequency spectrum &lt; 500 Hz</li><li>Adjustable Amplitudes (orders/frequencies)</li><li>Combined operation with fired engine</li><li>Reproduction of road surfaces/tyre types</li><li>Functional &amp; endurance tests</li><li>Full path open ECU</li></ul>		<ul style="list-style-type: none"><li>All physical measuring values</li><li>Dynamics (angle-/time-based)</li><li>NVH (acoustics &amp; vibration)</li><li>Torsional Vibration</li><li>Wear measurement via surface scan</li><li>Wear measurement via RNT</li><li>Delta Analyzer</li></ul>			
Wear & Friction Test Rigs						
Material & Measuring Laboratory						
Fatigue Strength Test Field						



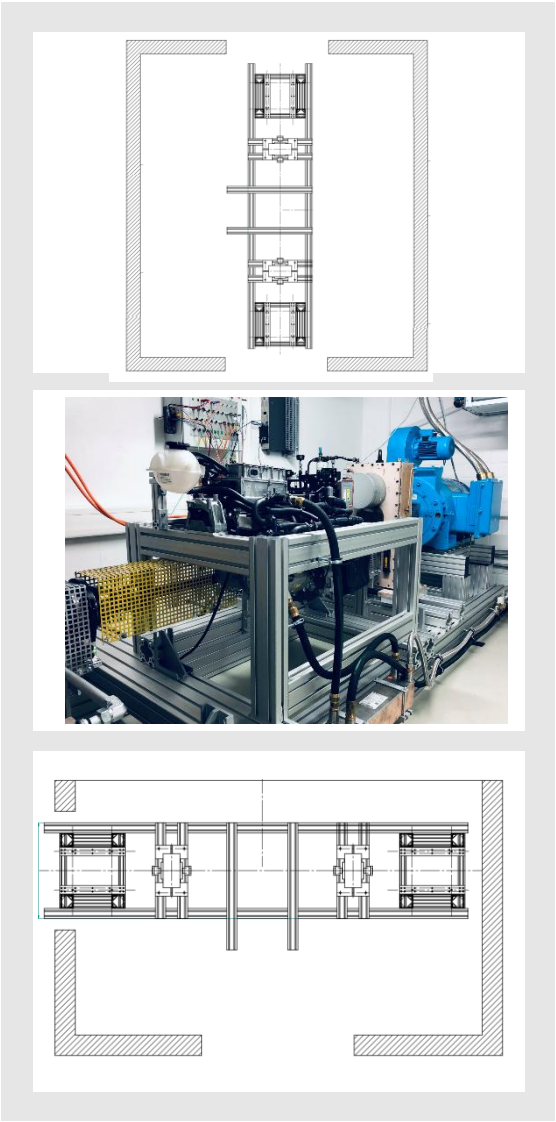
Techniques	Services	Functional Test	Endurance Tests	Environment Tests	Tribology / Analysis	Engineering
Component Test Field		TECHNIQUE				
High Dynamic Drives		Equipment		Infrastructure		
Radionuclide Technology		<ul style="list-style-type: none"><li>RNT handling permit for test field and measuring room</li><li>Manufacturer: Zyklotron AG Karlsruhe (ZAG)</li><li>Model: RTM 2000</li><li>3 x scintillation vendors 3 “x 3” NaJ (TI)</li><li>2 x measuring windows (Co-57 and Co-56, or comparable gamma energies)</li></ul>		<ul style="list-style-type: none"><li>Concentration measuring system (KMA), for measuring the wear particles in the oil flow</li><li>Filter measuring system (FMA), for measuring the particles separated in the oil filter</li><li>Reference measuring system (RMA), for referencing a known sample with short half-lives</li></ul>		
Engine Test Field		SPECIAL FEATURES				
Powertrain Test Field		Operations		Measuring		
Environment Test Field		<ul style="list-style-type: none"><li>Ferrous materials</li><li>Alloy metals, like Molybdenum, Tungsten, Vanadium, Non-Ferrous metals, e.g. Copper</li><li>Bearing metals, e.g. Lead, tin, zinc</li><li>Aluminium, if at least 5% copper is contained (activation takes place via the copper)</li><li>Titanium</li><li>Sintered metals, hard metals</li></ul>		<ul style="list-style-type: none"><li>Ceramic materials (Al<sub>2</sub>O<sub>3</sub>, SiC, Si<sub>3</sub>N<sub>4</sub>, ZrO<sub>2</sub>)</li><li>Plastics and lubricating varnishes, DLC coatings via storage of Be-7</li><li>Thin film differential measurement method (DMV)</li><li>Concentration measurement method (KMV)</li><li>Wear measurements in the Nm/h range</li><li>Motion measurements at optically inaccessible locations (piston ring rotation, floating bush rotation)</li></ul>		
Wear & Friction Test Rigs						
Material & Measuring Laboratory						
Fatigue Strength Test Field						



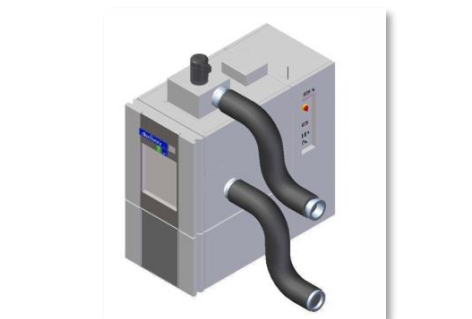
Techniques	Services	Functional Test	Endurance Tests	Environment Tests	Tribology / Analysis	Engineering
Component Test Field	TECHNIQUE					
High Dynamic Drives	Equipment			Infrastructure		
Radionuclide Technology	<ul style="list-style-type: none"><li>5 fired engine test rigs</li><li>450kW / 1.000Nm / 10.000rpm</li><li>Battery simulation 800V / 600A / 160kW</li><li>automation: SARA &amp; own system</li></ul>			<ul style="list-style-type: none"><li>Cooling chamber</li><li>Common/special fuel infrastructure</li><li>Battery simulation 800V / 600A / 160kW</li></ul>		
Engine Test Field	SPECIAL FEATURES					
Powertrain Test Field	Operations			Measuring		
Environment Test Field	<ul style="list-style-type: none"><li>Functional &amp; endurance tests</li><li>Thermodynamic test rigs</li><li>High dynamic Rigs</li><li>Full engine / motored engine (parts)</li></ul>			<ul style="list-style-type: none"><li>All physical measuring values</li><li>All dedicated process values (online/offline)</li><li>Dynamics (angle-/time-based)</li><li>NVH (acoustics &amp; vibration)</li><li>All relevant emissions</li><li>Delta analyzer</li><li>Torsional vibrations</li><li>Indicated pressure &amp; knock detection</li><li>Wear measurement via surface scan</li><li>Wear measurement via RNT</li></ul>		
Wear & Friction Test Rigs						
Material & Measuring Laboratory						
Fatigue Strength Test Field						



Techniques	Services	Functional Test	Endurance Tests	Environment Tests	Tribology / Analysis	Engineering
Component Test Field	TECHNIQUE					
High Dynamic Drives	Equipment			Infrastructure		
Radionuclide Technology	<ul style="list-style-type: none"><li>• 2 powertrain test rigs (2/3 EM)</li><li>• Power-range up to 2.250Nm / wheel</li><li>• Rig automation: SARA &amp; own system</li></ul>			<ul style="list-style-type: none"><li>• Cooling chamber</li><li>• Battery simulation 800V / 600A / 160kW</li></ul>		
Engine Test Field						
Powertrain Test Field	SPECIAL FEATURES					
Environment Test Field	Operations			Measuring		
Wear & Friction Test Rigs	<ul style="list-style-type: none"><li>• Functional &amp; endurance tests</li><li>• High dynamic rigs for engine simulation</li><li>• Driving Strategy</li><li>• Transmission calibration</li><li>• Powertrain validation</li><li>• Vehicle testing</li></ul>			<ul style="list-style-type: none"><li>• All physical measuring values</li><li>• All dedicated process values (online/offline)</li><li>• Dynamics (angle-/time-based)</li><li>• NVH (Acoustics &amp; Vibration)</li><li>• All relevant emissions</li><li>• Indicated pressure &amp; knock detection</li><li>• Wear measurement via surface scan</li><li>• Wear measurement via RNT</li><li>• Delta analyzer</li></ul>		
Material & Measuring Laboratory						
Fatigue Strength Test Field						

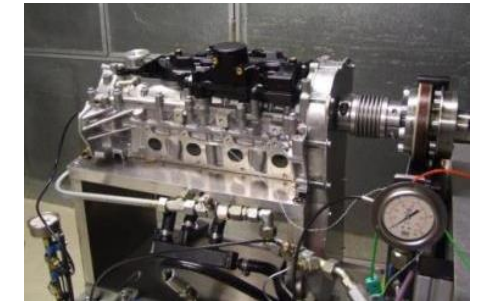


Techniques	Services	Functional Test	Endurance Tests	Environment Tests	Tribology / Analysis	Engineering
Component Test Field		TECHNIQUE				
High Dynamic Drives		Equipment		Infrastructure		
Radionuclide Technology		<ul style="list-style-type: none"><li>Climatic chambers -40° to 200°C</li><li>Coolant or oil temperature -40° to 135 °C</li><li>Independent control of ambient and medium</li><li>Humidity control 0...100%</li><li>Shaker up to 40 kN</li></ul>		<ul style="list-style-type: none"><li>Cooling circuit -44°C</li><li>Energy recovery</li><li>Battery simulation 800V / 600A / 160kW</li><li>Hydraulic power rail</li><li>Own test bench construction for special applications</li></ul>		
Engine Test Field						
Powertrain Test Field		SPECIAL FEATURES				
Environment Test Field		Operations		Measuring		
Wear & Friction Test Rigs		<ul style="list-style-type: none"><li>Control of various actuators (LIN,CAN,SENT...)</li><li>Functional &amp; endurance tests</li><li>LV124/VW80000</li><li>Vibration</li><li>Mechanical shock</li><li>Mechanical, electrical &amp; hydraulic misuse</li></ul>		<ul style="list-style-type: none"><li>All physical values</li><li>All simulated values</li><li>Simulation ⇄ Rig</li><li>All dedicated process values (online/offline)</li><li>Dynamics (angle-/time-based)</li><li>NVH (acoustics &amp; vibration)</li><li>Wear measurement via surface scan</li><li>Wear measurement via RNT</li></ul>		
Material & Measuring Laboratory						
Fatigue Strength Test Field						





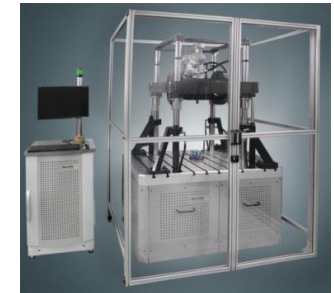
Techniques	Services	Functional Test	Endurance Tests	Environment Tests	Tribology / Analysis	Engineering
Component Test Field	TECHNIQUE					
High Dynamic Drives	Equipment			Infrastructure		
Radionuclide Technology	<ul style="list-style-type: none"><li>• 15 wear test rigs (rotational, translational)</li><li>• 1 tribometer MTM</li><li>• Online wear: RNT (Radio Nuclide Technology)</li><li>• High dynamic rotational friction rig</li><li>• Micro friction &amp; sealing rig</li></ul>			<ul style="list-style-type: none"><li>• &lt; 350 m² testing area for wear test &amp; friction</li><li>• High-resolution measuring technology &amp; data evaluation</li><li>• Own test bench construction for special applications</li><li>• Own photo labs, measuring rooms, materials laboratory...</li></ul>		
Engine Test Field	SPECIAL FEATURES					
Powertrain Test Field	Load			Measuring		
Environment Test Field	<ul style="list-style-type: none"><li>• Medium contamination: dirt, soot, foaming, fuel, acid</li><li>• Thermal load: -40°C up to 160°C</li><li>• Mechatronical load: High-speed, speed gradient &gt; 10.000rpm/s</li><li>• Test environment similar to mechanical, electrical and hydraulic operation parameters (Virtual ICE)</li></ul>			<ul style="list-style-type: none"><li>• All physical measuring values</li><li>• All simulated values</li><li>• Simulation ⇄ Rig</li><li>• All dedicated process values (online/offline)</li><li>• Dynamics (angle-/time-based)</li><li>• NVH (acoustics &amp; vibration)</li><li>• Wear measurement via surface scan</li><li>• Wear measurement via RNT</li></ul>		
Wear & Friction Test Rigs						
Material & Measuring Laboratory						
Fatigue Strength Test Field						

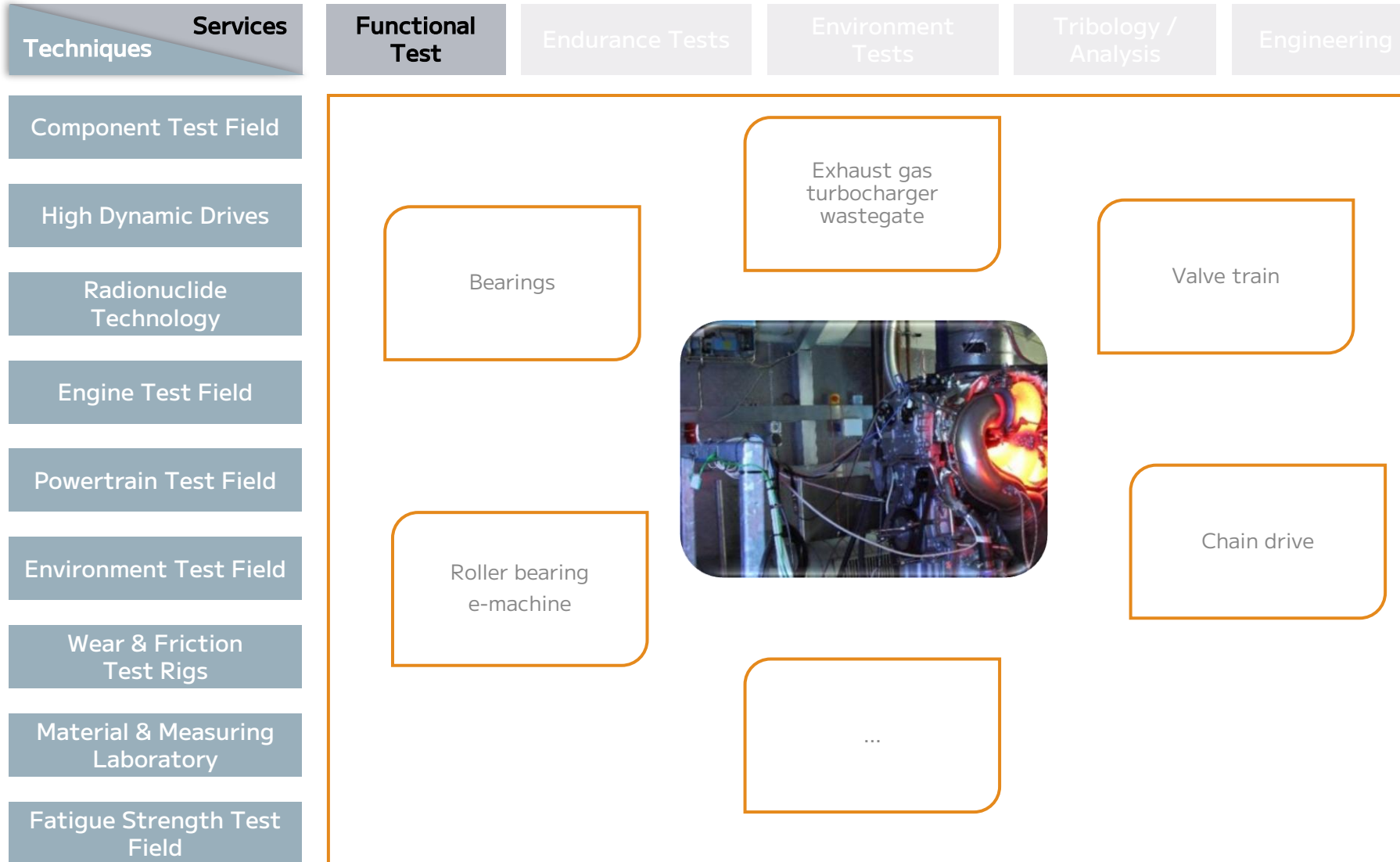


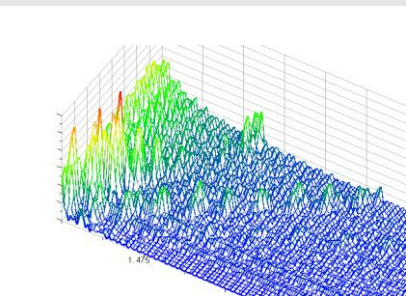
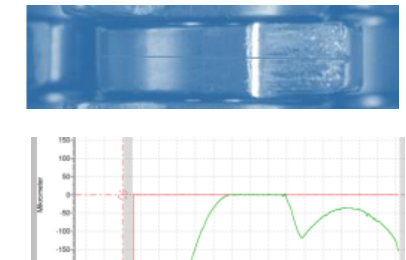
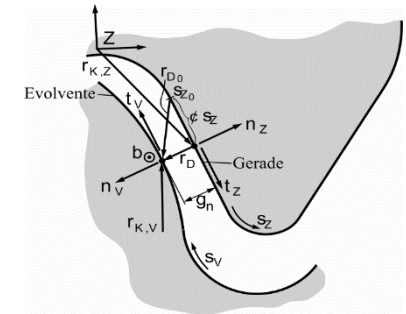
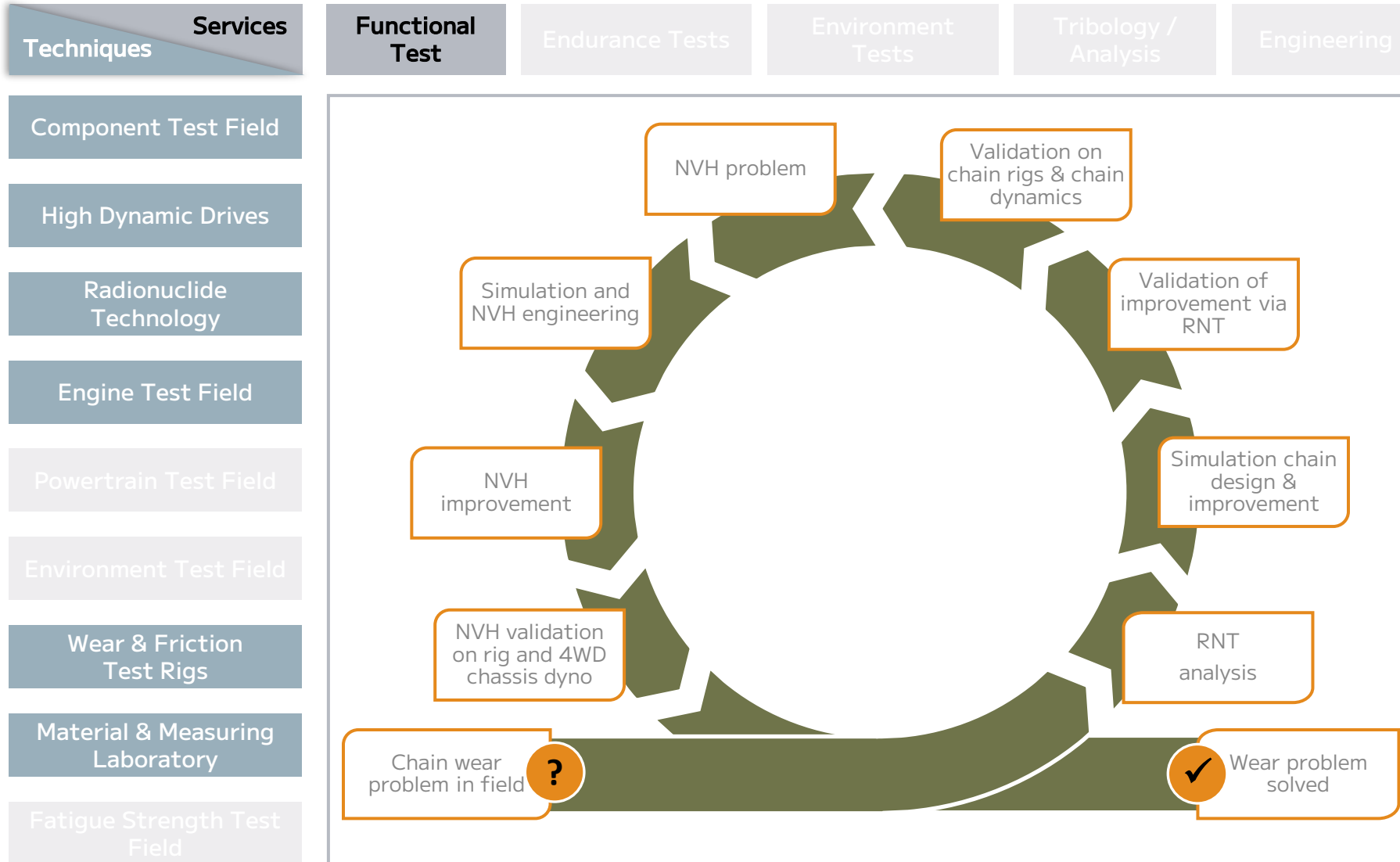
Techniques	Services	Functional Test	Endurance Tests	Environment Tests	Tribology / Analysis	Engineering
Component Test Field	TECHNIQUE					
High Dynamic Drives	Equipment			Infrastructure		
Radionuclide Technology	<ul style="list-style-type: none"><li>• 3D measuring machine, Roundness, Straightness, Roughness measurement</li><li>• Transmitted light measurement</li><li>• Photo microscopes</li><li>• Hardness measurement</li><li>• Material-laboratory-Microscope</li><li>• REM use on request</li></ul>			<ul style="list-style-type: none"><li>• Materials laboratory with chemistry suction cupboard</li><li>• Material Cutting Device</li><li>• Embed and Grind Device</li><li>• Photo laboratory</li></ul>		
Engine Test Field						
Powertrain Test Field	SPECIAL FEATURES					
Environment Test Field	Operations			Measuring		
Wear & Friction Test Rigs	<ul style="list-style-type: none"><li>• Return Part Analysis on individual components (timing chain, valve train, transmission ...) with system view and system understanding</li><li>• Approval for measurement on RNT parts available</li></ul>			<ul style="list-style-type: none"><li>• All physical measurements tactile and optical</li><li>• Material examination and assessment</li></ul>		
Material & Measuring Laboratory						
Fatigue Strength Test Field						



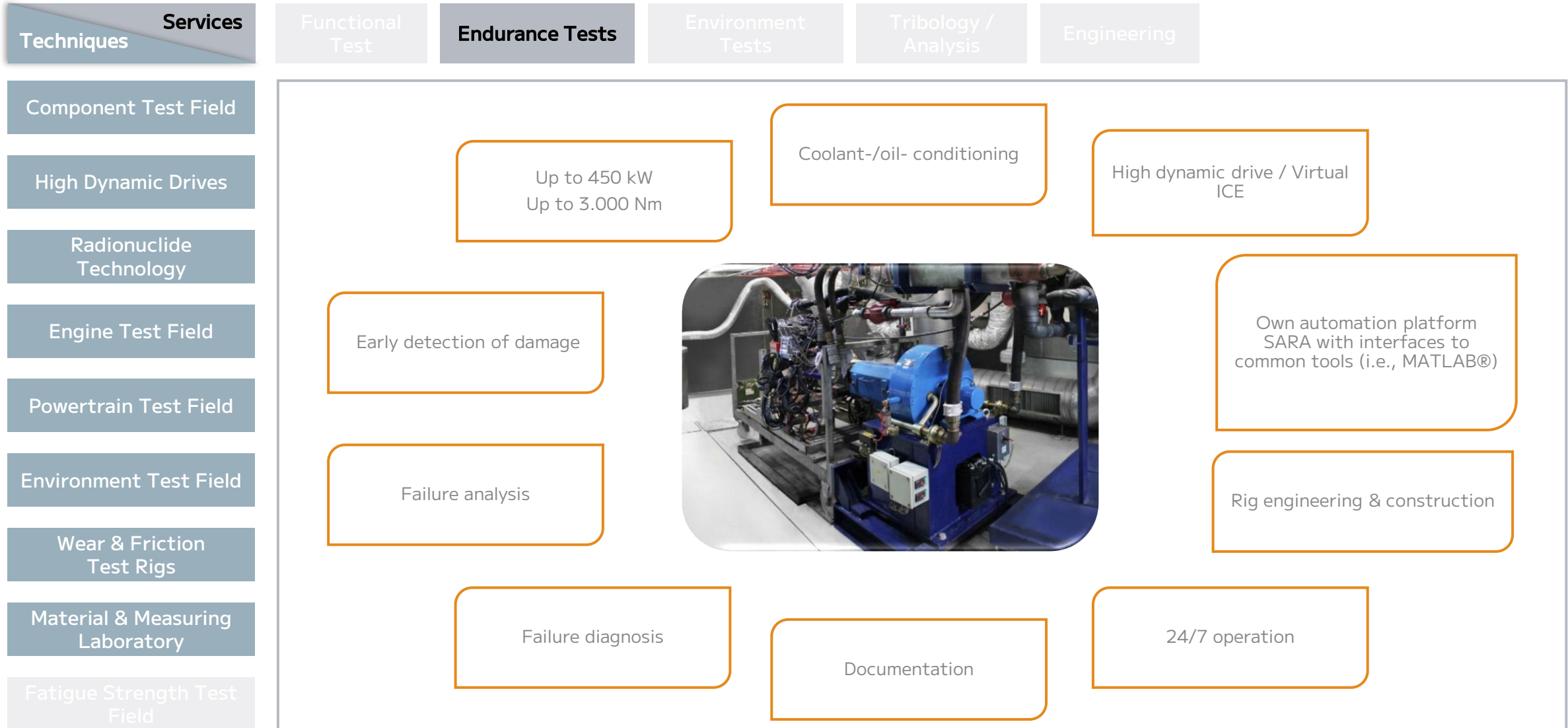
Techniques	Services	Functional Test	Endurance Tests	Environment Tests	Tribology / Analysis	Engineering
Component Test Field	TECHNIQUE					
High Dynamic Drives	Equipment			Infrastructure		
Radionuclide Technology	<ul style="list-style-type: none"><li>• Resonance pulsators up to 20 kN</li><li>• Resonance pulsators up to 100 kN</li><li>• Resonance magnetic test system up to 20 kN</li><li>• Hydraulic system up to 7 kN and 500 Hz</li><li>• Hydraulic system up to 20 kN and 150 Hz</li></ul>			<ul style="list-style-type: none"><li>• Own photo labs, measuring rooms, materials laboratory...</li></ul>		
Engine Test Field						
Powertrain Test Field	SPECIAL FEATURES					
Environment Test Field	Services for Automotive Customers			Measuring		
Wear & Friction Test Rigs	<ul style="list-style-type: none"><li>• Dynamic strength tests</li><li>• Service strength tests</li><li>• Crack detection and damage analysis</li><li>• Lifetime valuation</li><li>• Environmental simulation (-40 up to 160°C)</li></ul>			<ul style="list-style-type: none"><li>• All physical measurements tactile and optical</li><li>• Material examination and assessment</li></ul>		
Material & Measuring Laboratory						
Fatigue Strength Test Field						



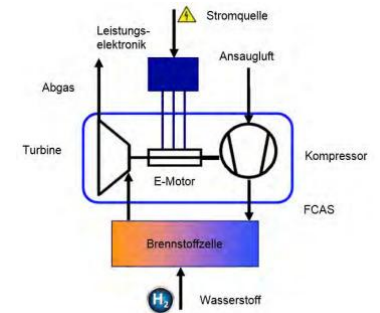
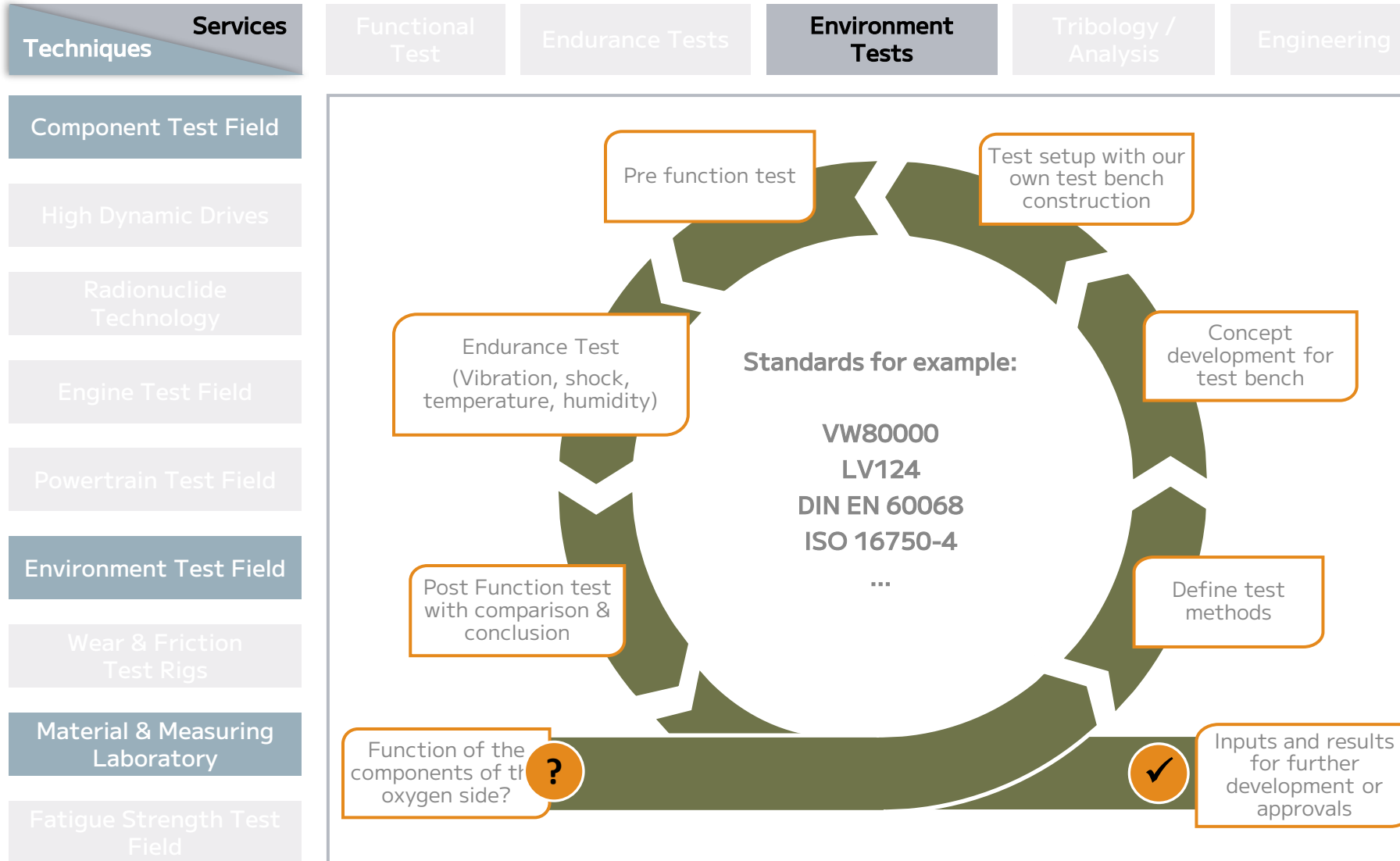




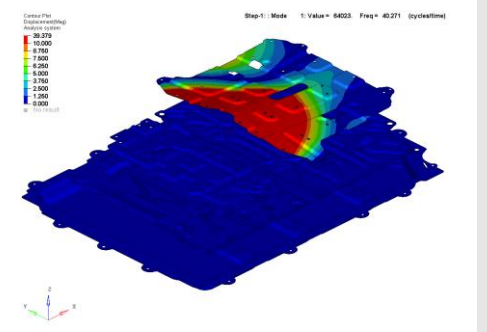
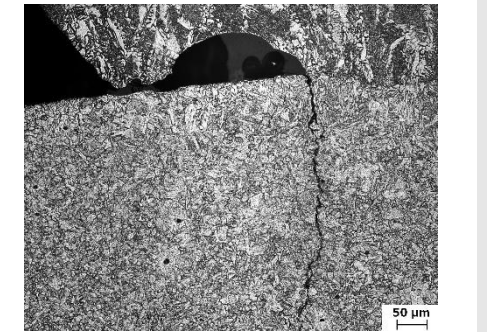
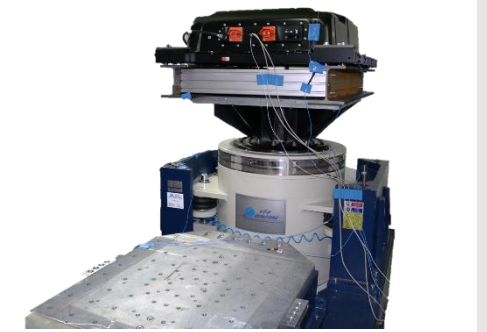
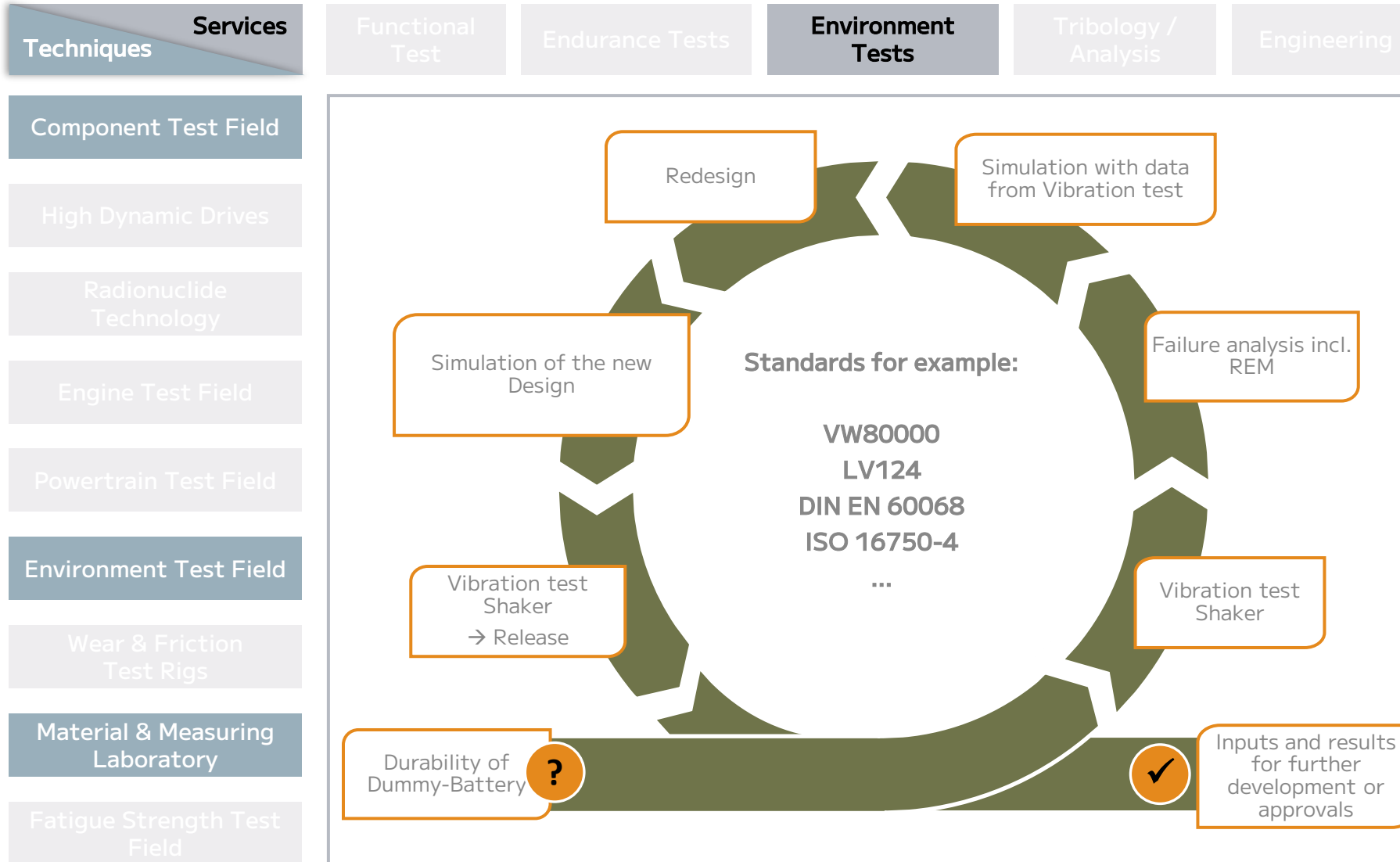


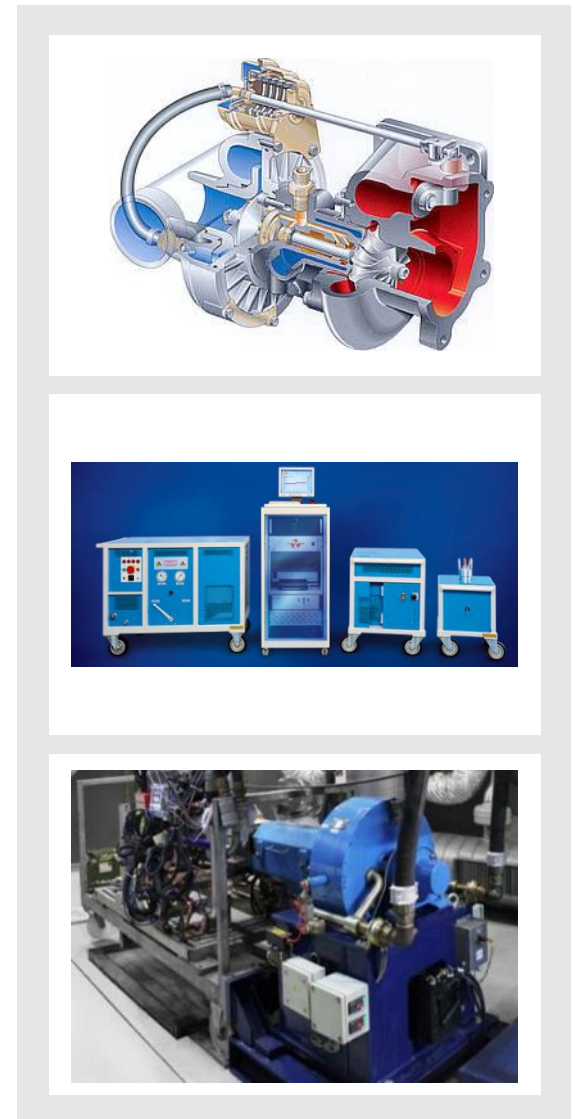
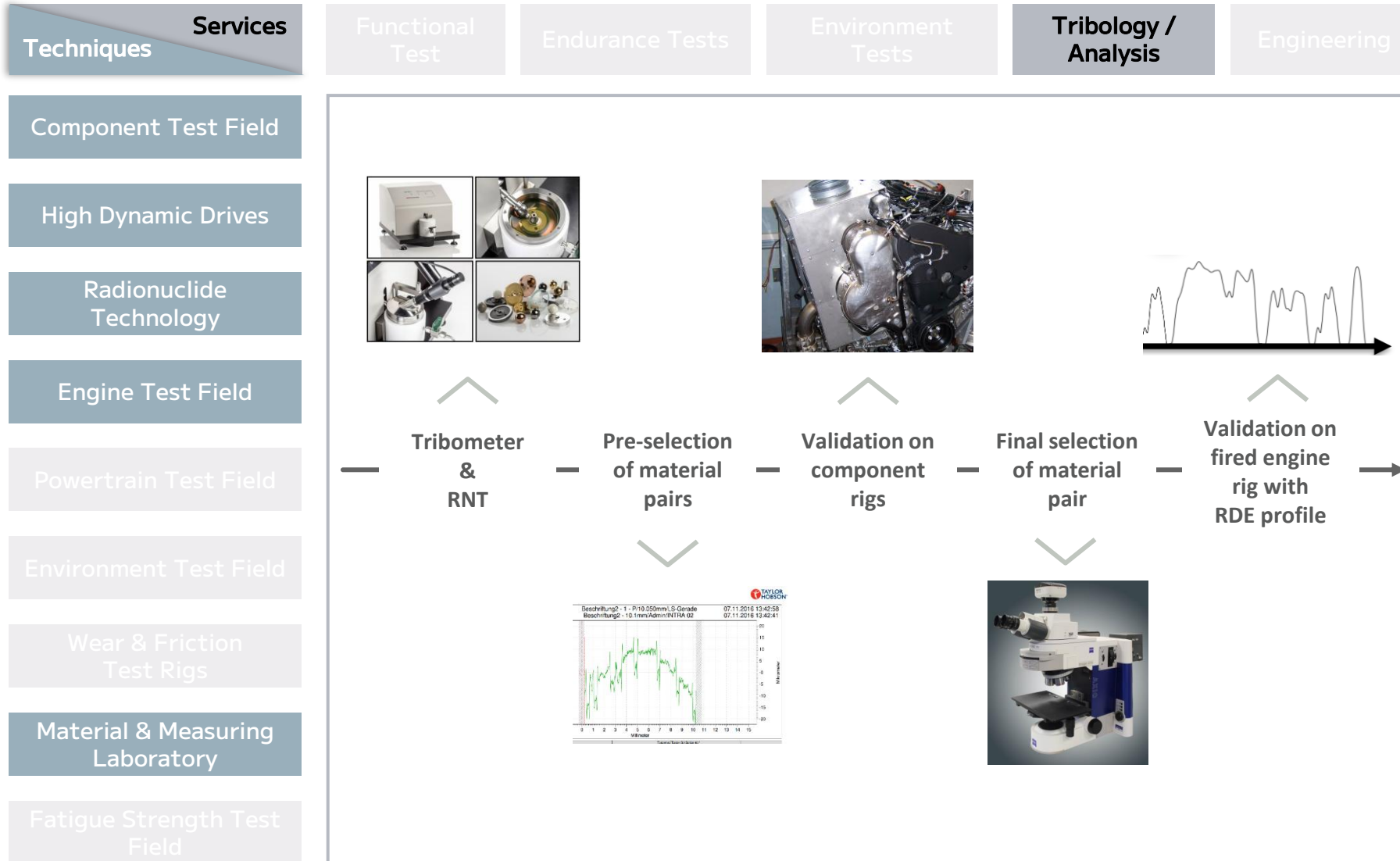


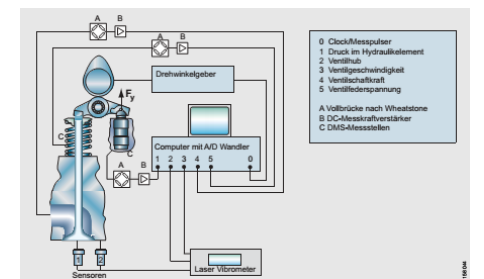
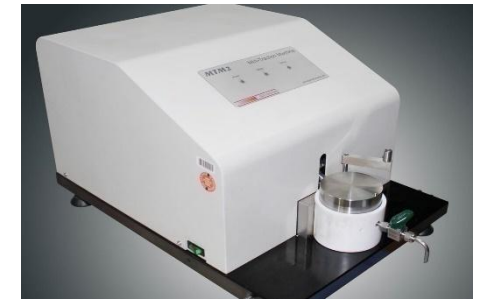
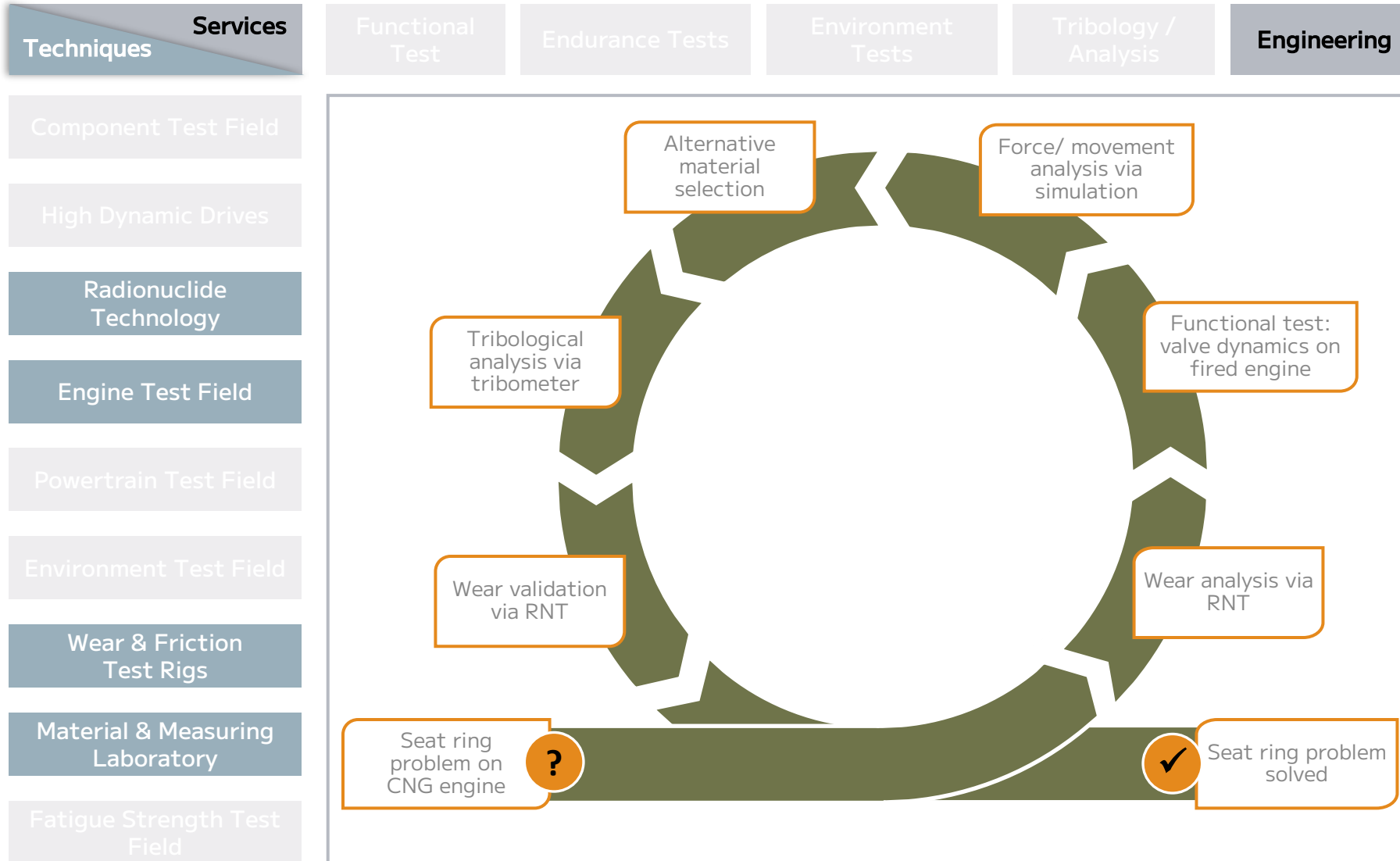
# Environment Test / Example: Oxygen Supply for Hydrogen Fuel Cell



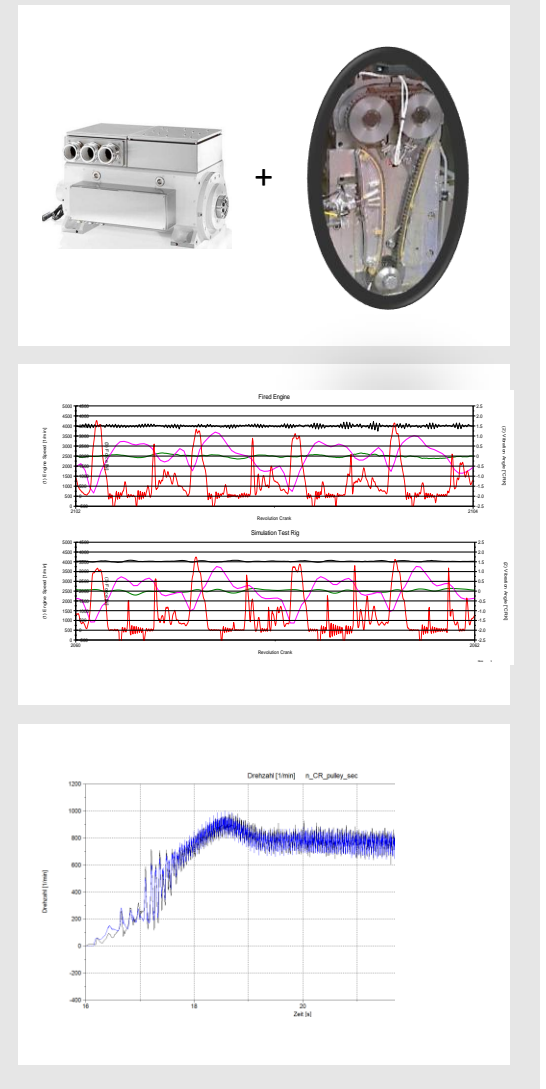
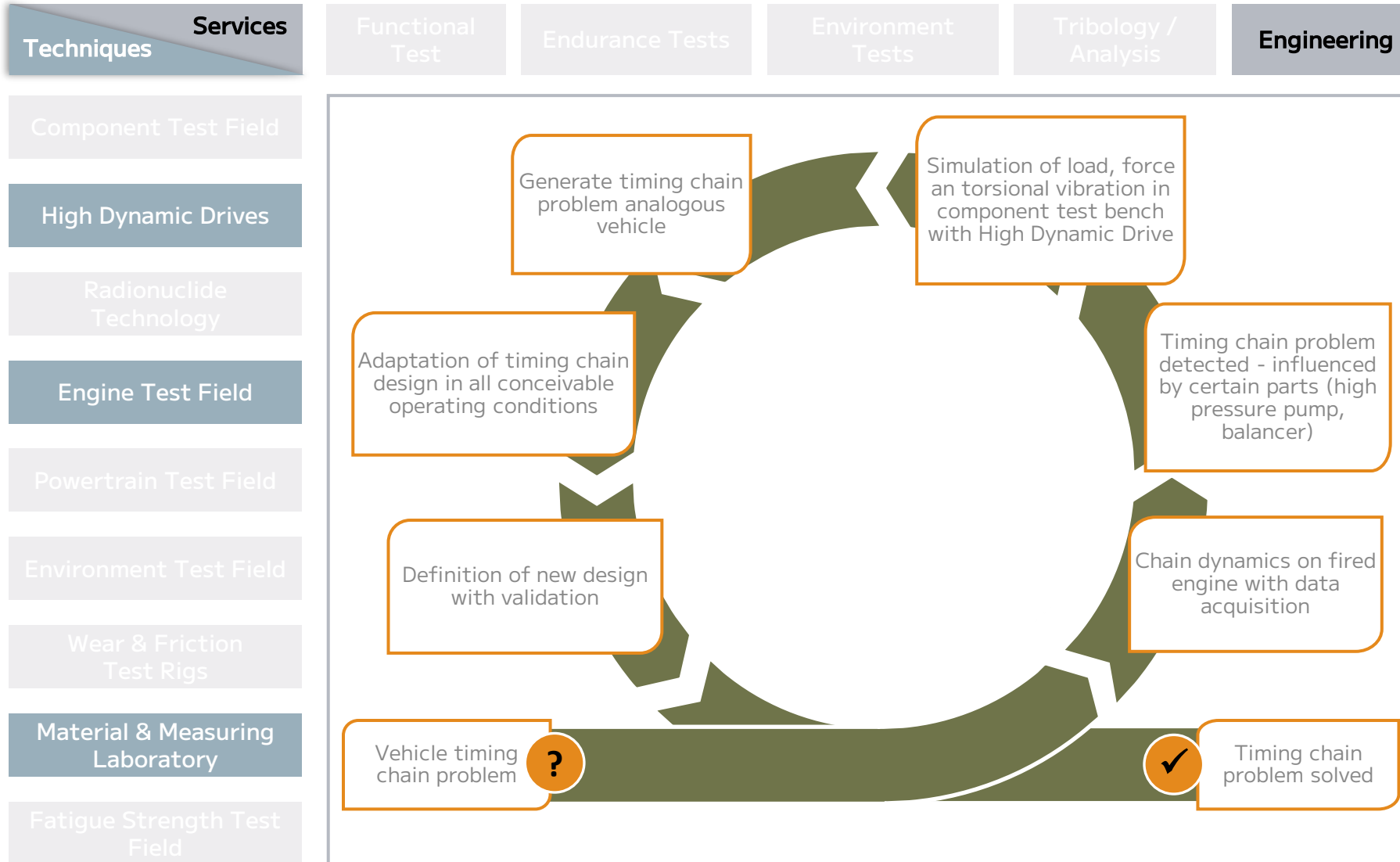
# Environment Test / Example: Vibration test Dummy Battery

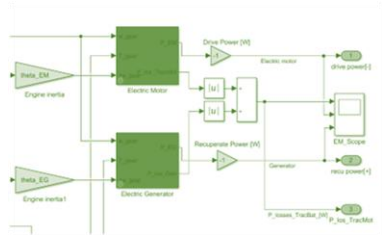
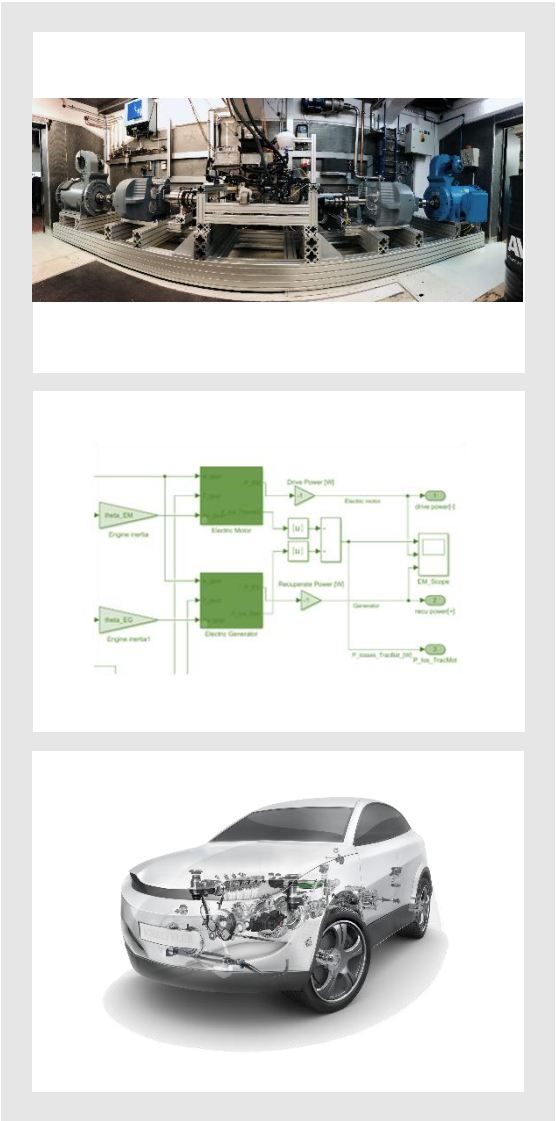
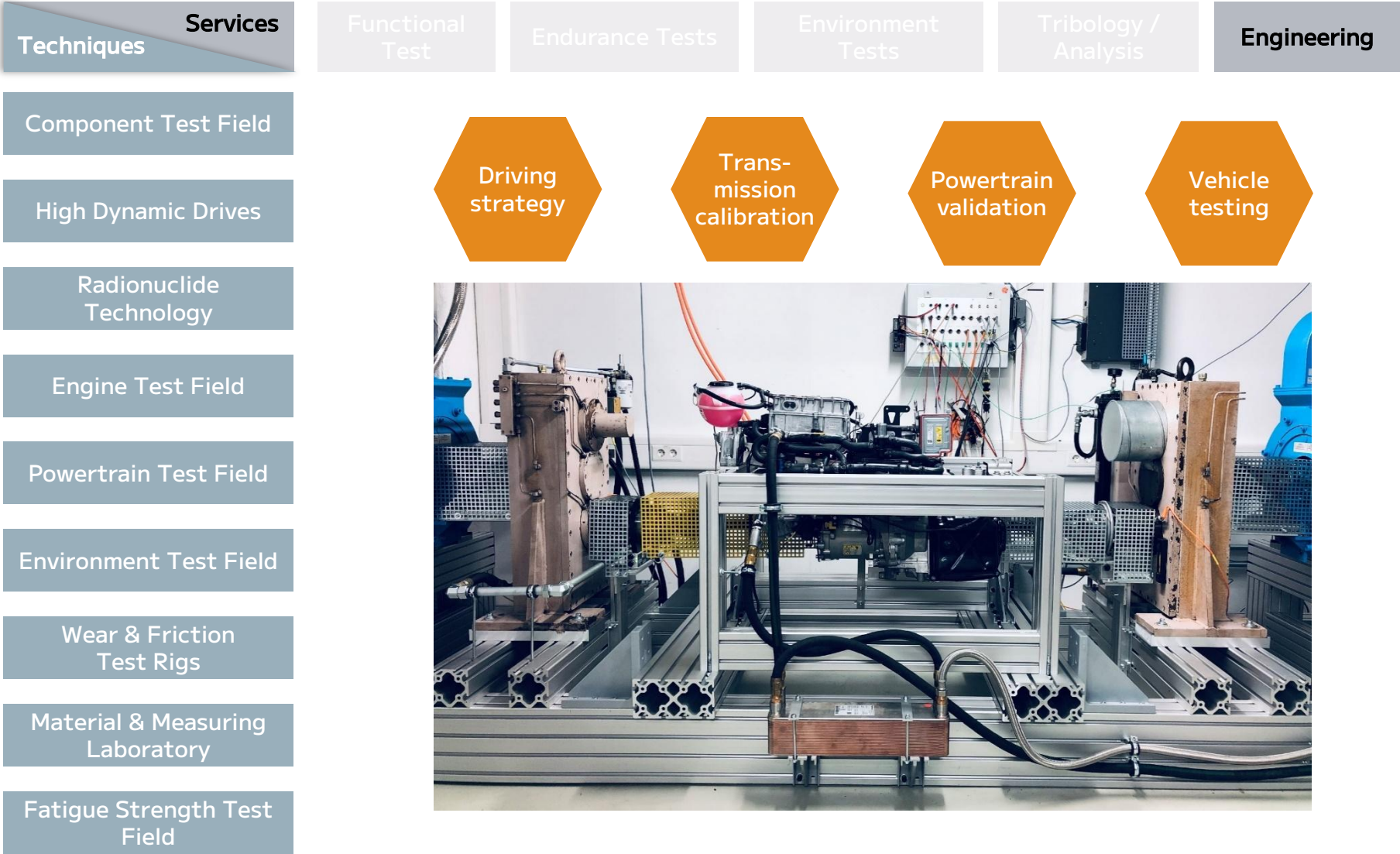


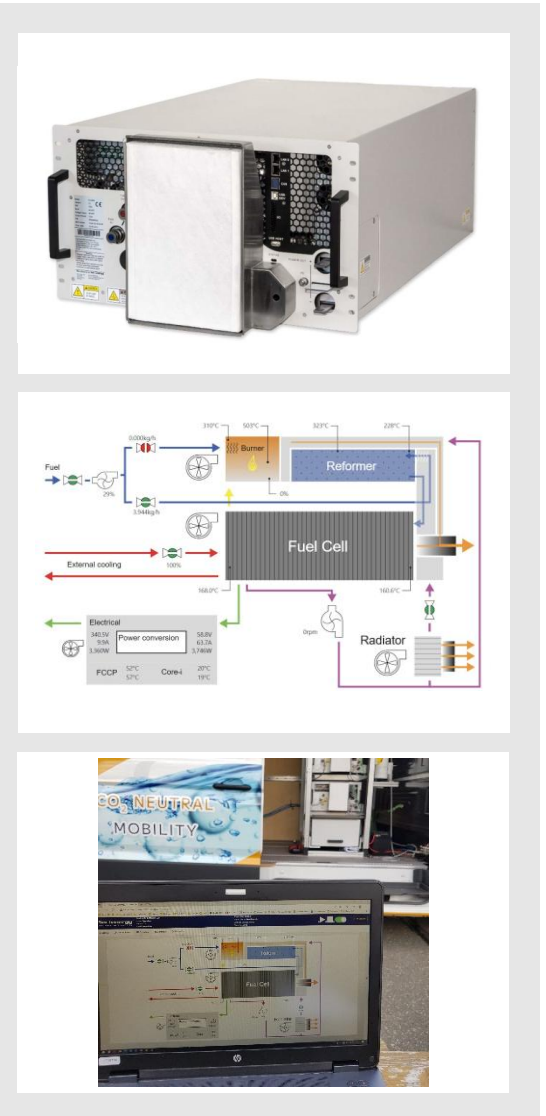
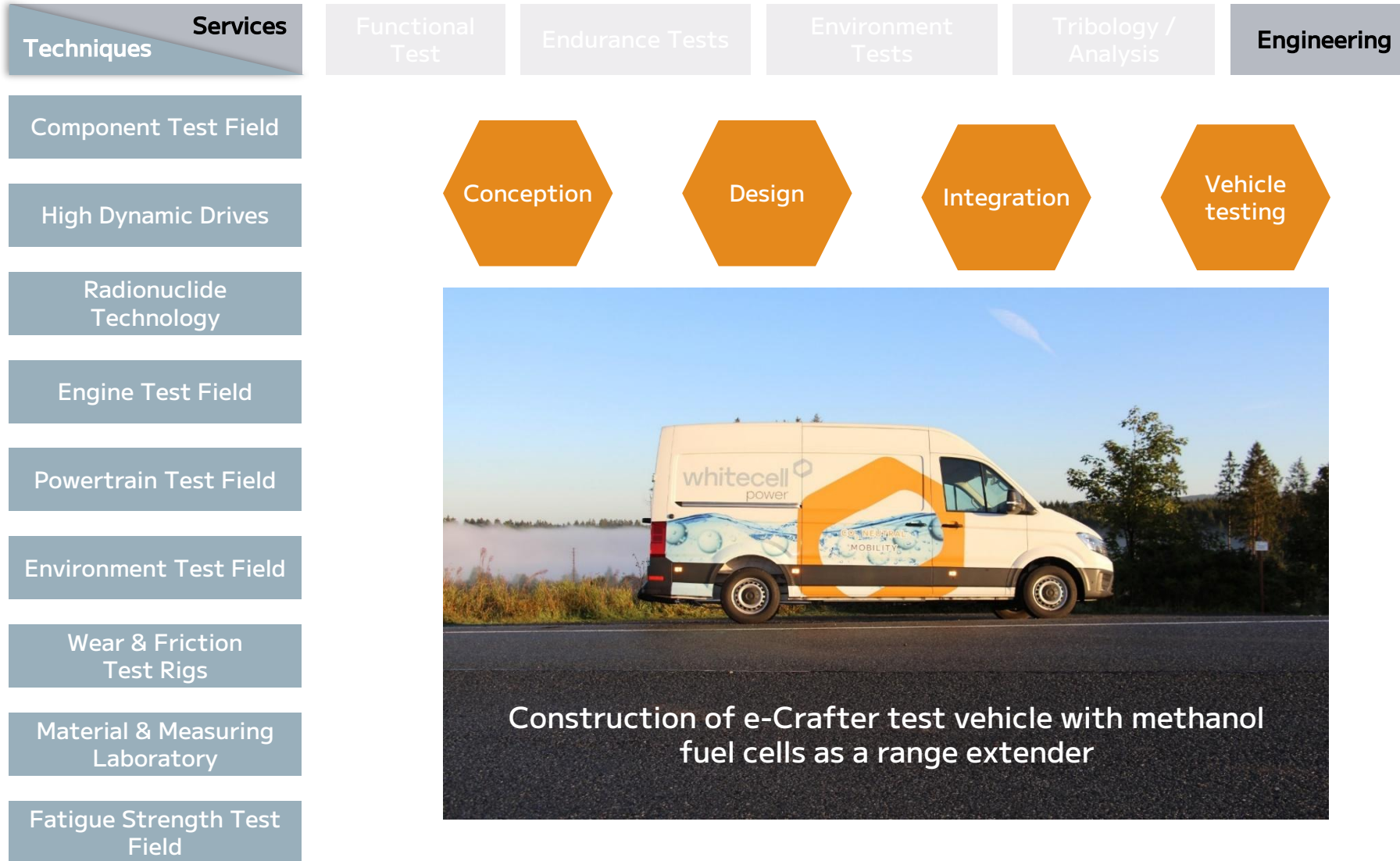




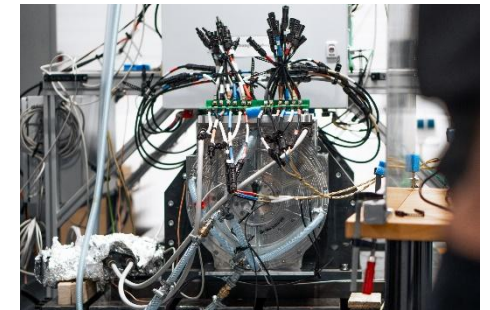
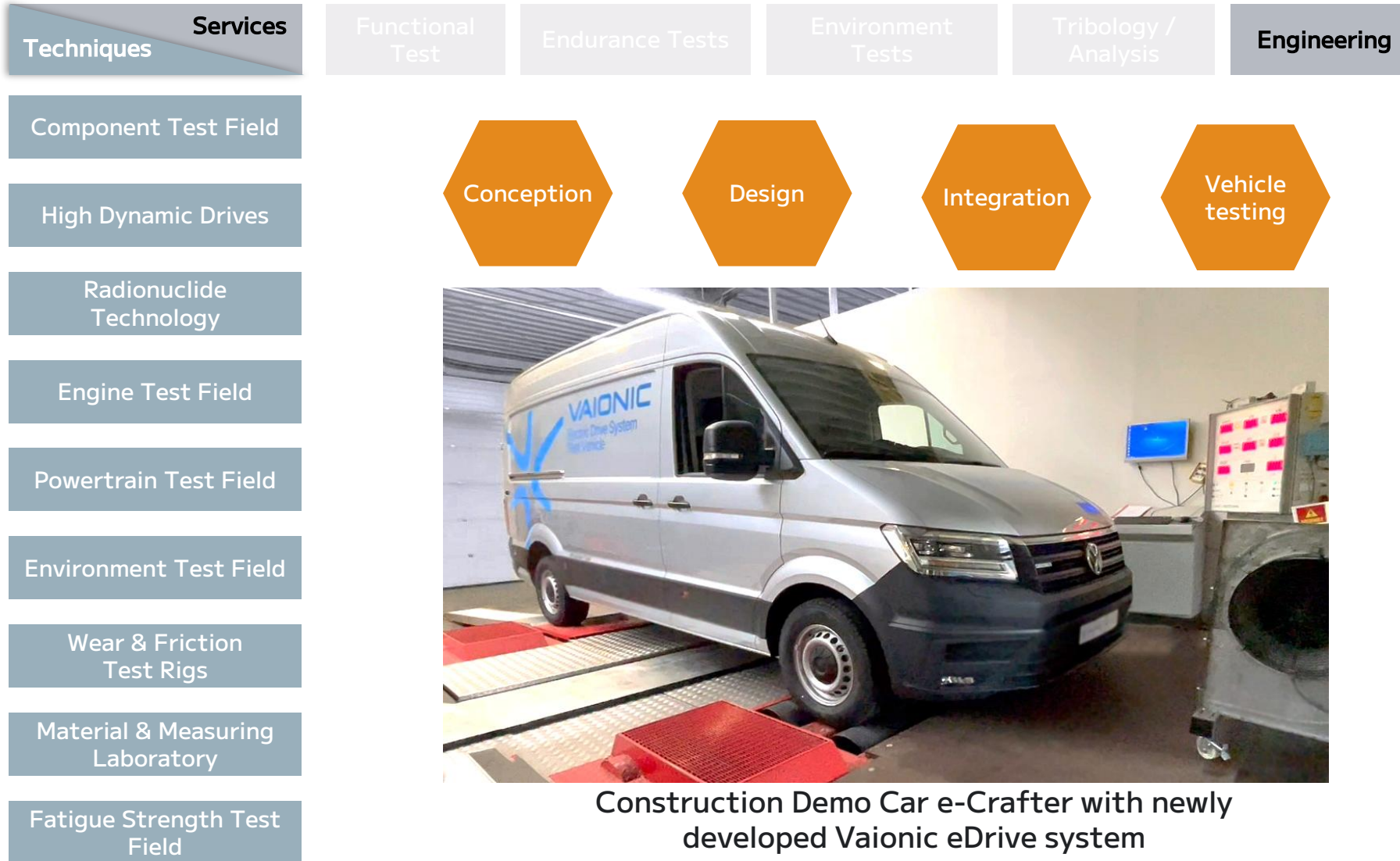














Component Test Field

High Dynamic Drives

Radionuclide  
Technology

Engine Test Field

Powertrain Test Field

Enviroment Test Field

Wear & Friction  
Test RigsMaterial & Measuring  
LaboratoryFatigue Strength Test  
Field

Prototypes

Design

Testing

Optimisation



Assembly of Whitecell Systems XGS-55 Generator with  
Methanol Fuel Cells





Thank you.

Contact:  
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