

LABCO

We Shape the Future of Testing



This is LABCO



**We are an independent test laboratory,
operating for our customers worldwide.**

Accredited according to DIN EN ISO/IEC 17025.

Our history

Lab of origin in Brake:
As a development
lab for cables
and wires.

1978

2000

First Accreditation
by "DAkkS"

Founding
of LABCO

2003

2009

Enlargement of test scope
and equipment

Expansion of the lab
by moving to Loxstedt

2014

2022

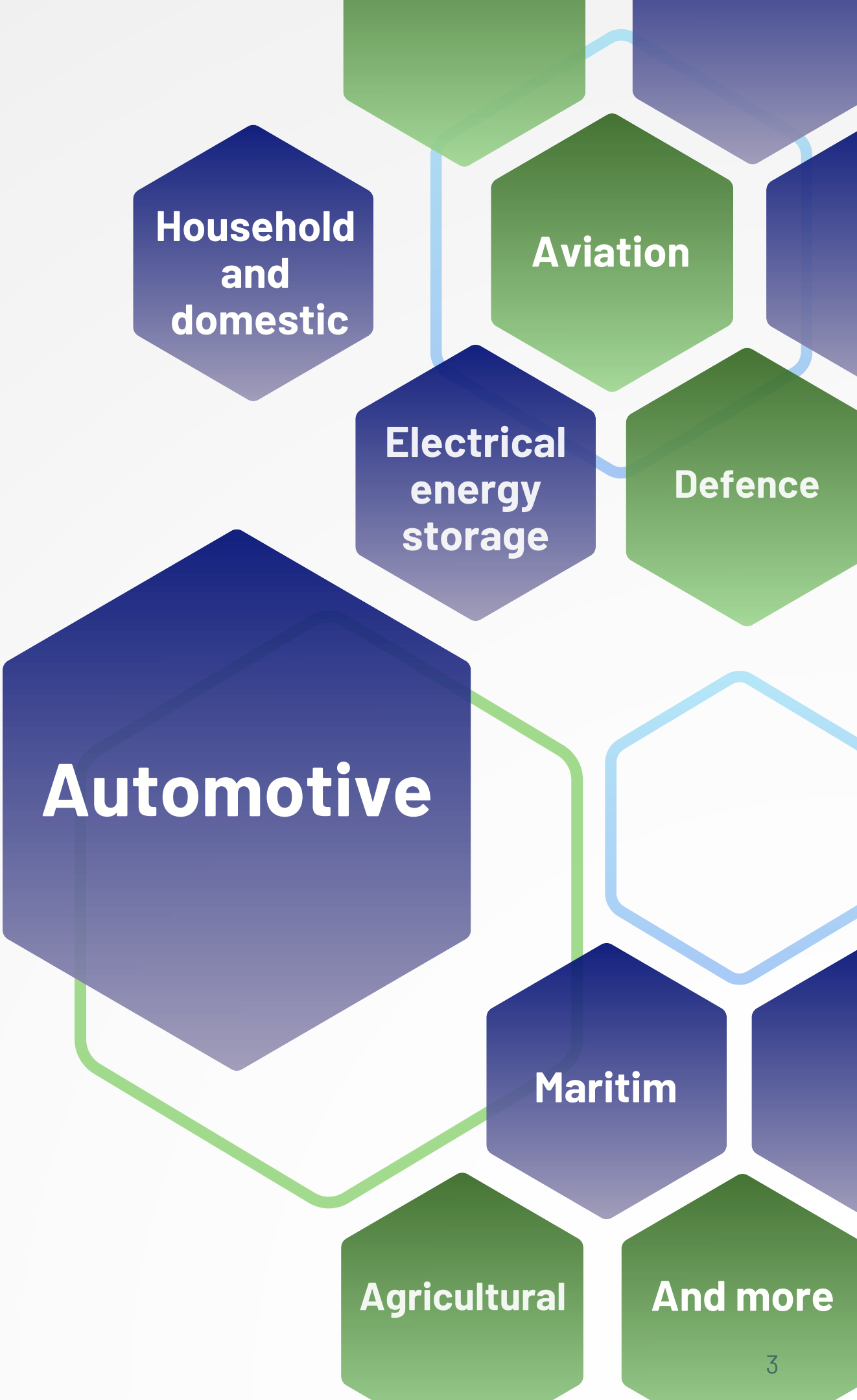
Opening of the
LABCO Battery
Test Centre

Foundation
of the
Joint Venture CVL

2024

Our business sectors

LABCO
Loxstedt-Stotel
"Loxpark"



Our accreditation

DIN EN ISO/IEC 17025



- Received in July 2000
- Includes >500 specifications
- Flexible accreditation for many tests
- Tests without accreditation / specification also possible



OEM recognition

OEMs worldwide appreciate our service as

Independent

Trustful

High-qualitative

Re-testing in OEM internal laboratories is not necessary. We have direct contact with many OEM development departments.



Our core test samples



Wires and cables

- High and low voltage single and multicore cables
- RF cables e. g. coaxial, LVDS, CAN Ethernet, Flexray
- Twisted cables

Connection systems

- High and low voltage terminals, connectors and housings
- RF terminals, connectors and housings
- Sockets and plugs: e. g. charging devices, trailer couplings

Protection systems

- Adhesive tapes
- Sleeves, hoses, tubes: e. g. smooth, braided, corrugated, heat-shrink
- Longitudinal wrapping systems

Batteries, interfaces and assemblies

- Batteries: cells, modules, packs
- Interfaces: e. g. fuse boxes, controllers, relays
- Assemblies: e. g. mountings, fixtures, fasteners

And more...

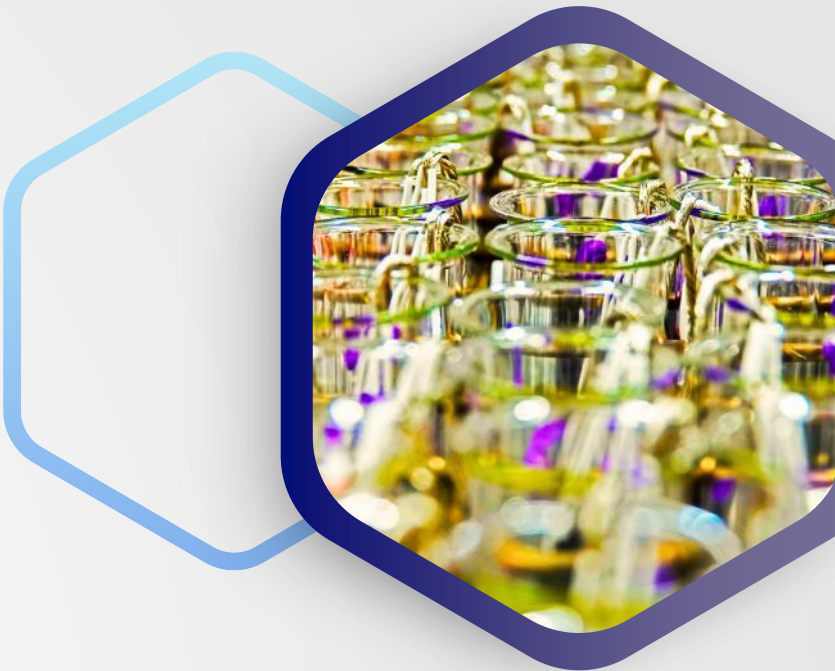
Our core test scope



Performance
Analyses

Electrical

Special or
Customised



Material
Analyses

Vibration

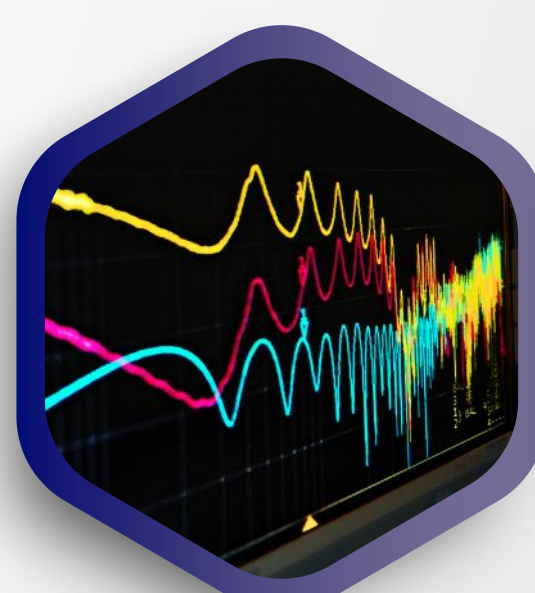
Environmental
Simulation

Mechanical

Chemical

Radio Frequency

And more...



Further activities

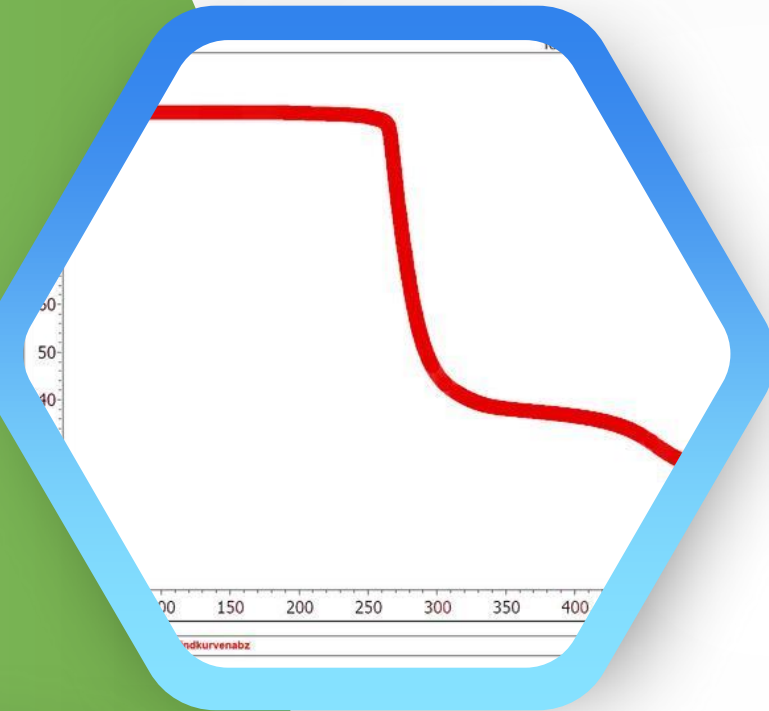


- Pre-development projects
- Competitive analysis
- Development of new tests
- Failure-cause analysis



- Over 20 years of membership in (inter-) national committees of specifications
- Contribution to important work groups in the German automotive industry

Material Analyses



- DSC
 - Differential scanning calorimetry
- TGA
 - Thermogravimetric analysis
- FTIR
 - Fourier-transform infrared spectrometer
- MFR/ MVR test equipment
 - Mass flow rate / Mass volume rate
- X-ray-fluorescencespectroscopy

Electrical



- Derating systems
- Electrical power supply and loads up to 3000 A
- Precision resistance measuring equipment into the $\mu\Omega$ range
- High resistance measuring equipment covering the T Ω range
- High voltage testing equipment up to 50 kV

Mechanical



- Tensile testing machines
- Bending cycle testing apparatus
- Impact testing equipment
- Abrasion test devices
- Motorised mandrels for winding tests

Chemical



- Extraction test equipment
- Equipment for different chemical tests, e. g. storage in
 - oil
 - fuels
 - battery acid
 - other fluids and chemicals

Microscopic



- Video microscope
- Stereo microscope
- Digital microscope with a magnification of 0 – 200x and a depth of focus of 4 cm
- Overhead-light microscope
- Fully automatic microscope equipment for cables and wires
- Micro-section laboratory for measuring crimp contacts
- 3D Optical Profilometer



Thermal and climatic



- > 40 climatic/temperature test cabinets and chambers up to 11,5 m³ test space
 - Temperature range: - 80 °C to + 250 °C
 - Humidity range: 10 % to 98 % RH
- Temperature shock chamber
- Tests under thermal/climatic profiles are possible, e. g. vibration tests
- > 100 ovens for ageing tests up to 1200 °C

Environmental simulation



- Laboratory for storing in environmental fluids, e. g. storage in salty fluids
- Salt spray chamber
- Ozone chamber
- Flame test apparatus
- IPX-chamber
- Water storage apparatus for hydrolysis



Radio frequency



- Network analysers (5 Hz to 26,5 GHz)
- Triaxial-measurement tubes (40 mm and 90 mm diameter)
- Line injection measurement equipment
- Extract of the measurement possibilities:
 - Return and insertion loss
 - Characteristic impedance
 - Determination of shielding effectiveness
 - Line symmetry

Vibration

Shaker 1



Shaker 2



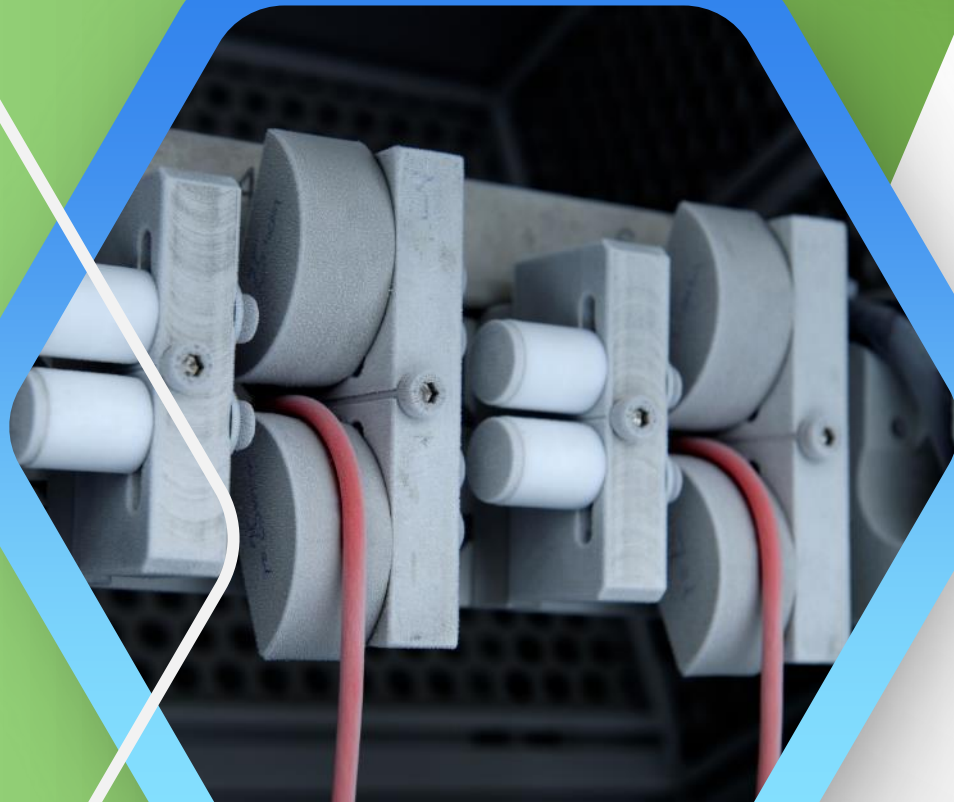
| | | |
|--|-------------------|-------------------|
| Nominal force sine / random / shock (kN) | 50 / 50 / 100 | 80 / 80 / 160 |
| Frequency range (Hz) | 5 to 2700 | 5 to 2500 |
| Smax (Peak to peak: sine / random + shock)(mm) | 36 / 50, 8 | 50,8 / 76,2 |
| Dimensions slip table and head expander (mm) | 600 x 600 | 600 x 600 |
| Test space of the climatic chamber (WxDxH in mm) | 1040 / 960 / 1080 | 1020 / 890 / 1120 |
| Temperature range (°C) | - 70 to 180 | - 70 to 180 |

Vibration



| | |
|--|---------------------------|
| Nominal force sine / random / shock (kN) | 300 / 270 / 900 |
| Frequency range (Hz) | 5 to 2700 |
| Smax (Peak to peak: sine / random + shock)(mm) | 63,5 / 63,5 / 76,2 |
| Dimensions slip table and head expander (mm) | 2100 x 2100 / 2100 x 1900 |
| Test space of the climatic chamber (WxDxH in mm) | 2500 / 3115 / 1500 |
| Temperature range (°C) | - 70 to 180 |

Special and customised



- Door slam trial apparatus
- Micro- and shore-hardness test equipment
- ABS-Simulation test equipment
- Slow-motion-test apparatus (up to 260 °C)
- Flexural strength (from -40 °C to 180 °C)

Battery cyclers



| Test equipment | Max. power simultaneous | Max. voltage per battery | Max. current per battery |
|----------------|-------------------------|--------------------------|--------------------------|
| Cell tester | 10, 8 kW | 6 V | 1500 A |
| Module tester | 64 kW | 60 V | 1200 A |
| Pack tester | 1100 kW | 1200 V | 4000 A |

Possible combinations:

- Climatic chambers
- Cooling systems
- Vibration test systems

Protected by our high-pressure water mist
extinguishing system

Thank you for your attention



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