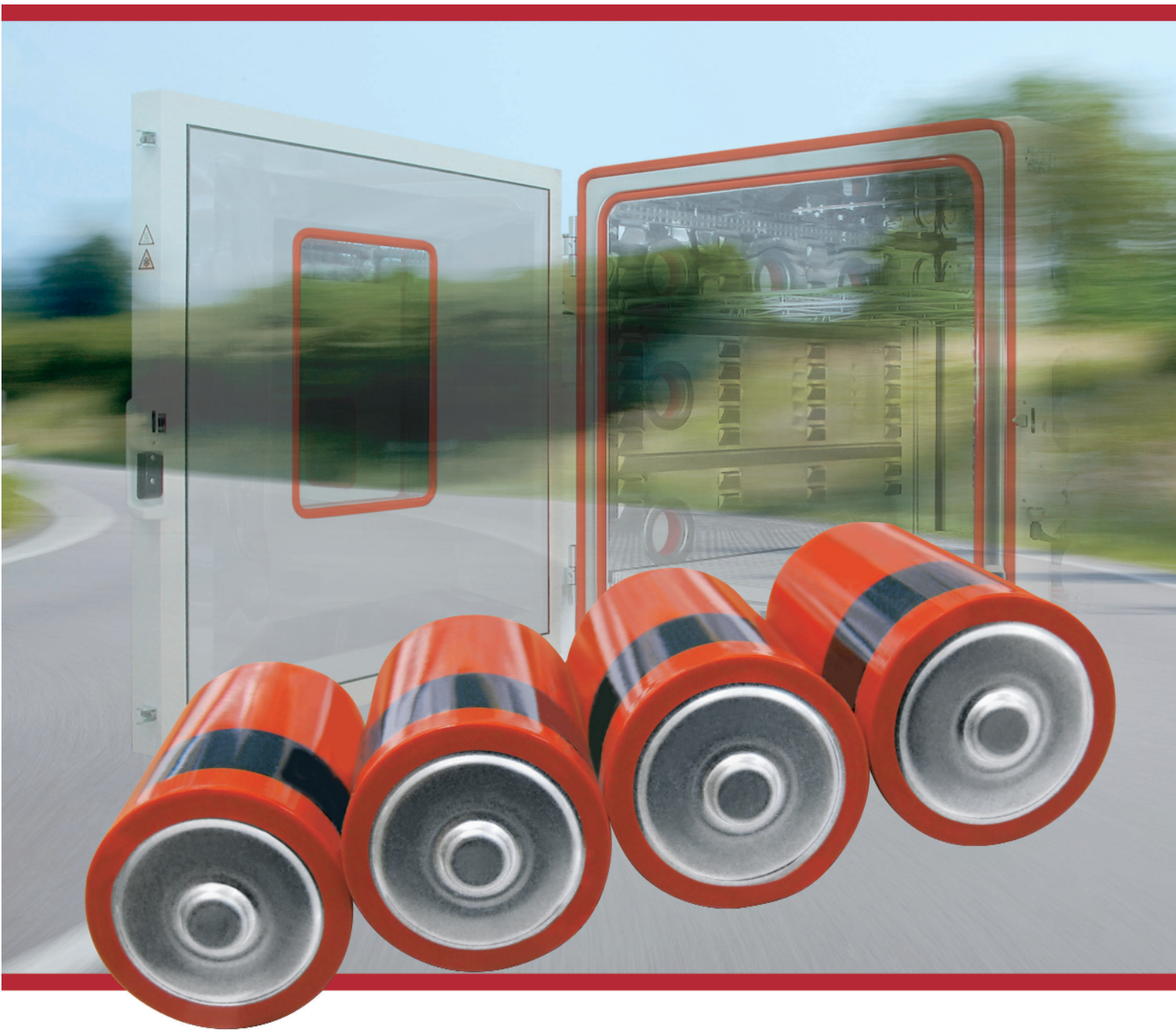
Maintaining Mobility

Vötsch Industrietechnik



Test systems for lithium batteries

The future needs new technologies ...

Mobile energy supply ...

An energy supply is crucial to tomorrow's mobility. The increasing price of energy sources (oil, gas etc.), as well as more stringent emission thresholds provide a key impetus in the search for future alternative energy sources.

Recent years have seen many developments in the lithium-based battery sector.

Lithium batteries have already made their debut in the telecommunications, video technology and IT sectors.

Further major steps are expected in the optimisation of lithium batteries.

In the automotive industry, the trend is shifting from the single combustion engine to the use of new technologies, e.g. hybrid or electric vehicles.
In future, electricity will play a far more prominent role in individual mobility than it does today.

Developers in the automotive industry are turning their attention to electric drives.
Advancements in battery technology are coming into their own in marketable electric vehicles.
The development departments at practically all automotive firms are convinced that vehicles will in future be driven by electric motors.

There is every sign of a boom in this area.
Lithium batteries have multiplied power storage potential and this makes them indispensable for hybrid and/or electric vehicles.

The recovery of braking energy through alternators with a potential energy saving is another initial and important step for CO_2 reduction.
The long-term goal is purely electrical driving, since this will eliminate vehicle emissions.

In all other applications too, the extremely good charging and discharging ability is gentle on resources and on the environment.

Yet - as "chic" as they may be, they also pose a certain risk.

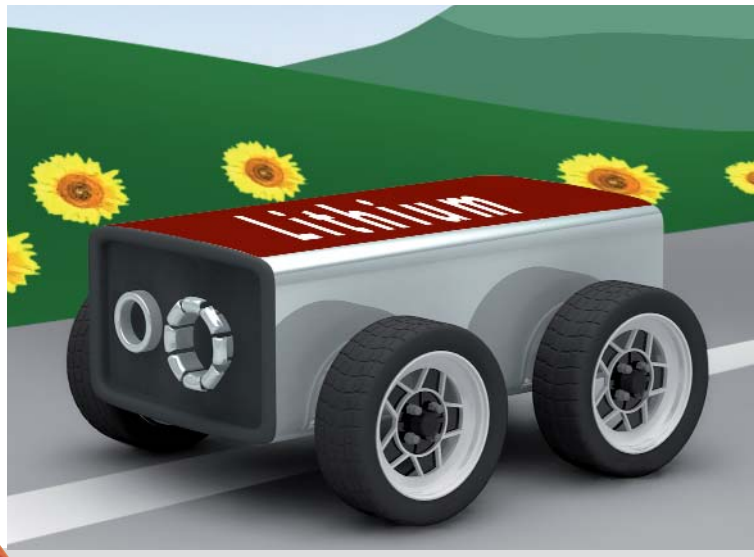
Energy density, lifespan, reliability and safety are just some of requirements that have to be fulfilled.
Certain environmental conditions such as heat or heavy vibrations can cause uncontrolled discharges (short circuit).

Risks ...

- **Mech./dyn. charges**
- **Chemical reactions**
- **Thermal charges**
- **Reactions to overcharge**
- **Reactions to fast charge**
- **Reactions to damage**

Since 2003, lithium batteries have had to be tested to special safety standards specified as binding.
Without this qualified test verification, these batteries cannot be brought onto the market.

The safety concepts required for this purpose can be combined with most Vötsch standard test systems.



... through innovative test systems

Temperature and humidity as well as the reproduction of extreme stress parameters, e.g. rapid temperature change, vibration, corrosive influences, air pollutants etc. can be realized in our equipment.

Our temperature and climatic test chambers are used as a basis for offering customised solutions using appropriate additional equipment.

Our **safety concepts** guarantee a no-risk operation of the climatic and mechanical / dynamic test systems. We offer practically everything for testing the energy storage facilities of the future.

Founded in Berlin in 1929, Vötsch has been manufacturing at its present location in Balingen-Frommern since 1944.

This is where we plan, design and construct the test systems and plants. These assure the quality and reliability of the final product in various industrial branches.

Since 1995 Vötsch is a member of the Schunk Group. Combined know-how is the basis for trailblazing developments.

Safety devices ...

Risk avoidance

In addition to our comprehensive range of standard safety equipment, we also offer safety concepts designed specifically for testing lithium batteries.

Only an all-encompassing safety concept guarantees safe plant operation.

An excerpt of potential safety concepts

- Additional safety temperature limiter
- Forced cooling of the chamber to +20 °C
- Compressed air purging at 10 x the ventilation rate
- Monitoring of the test chamber for rising concentration of CO_2
- Monitoring of the test chamber for rising concentration of H_2
- CO_2 inert gas purging with CO detection
- N_2 inerting without O_2 measurement
- N_2 inerting with O_2 measurement
- Pressure relieving of the test chamber via tested rupture membrane, reinforced test chamber, additional door interlocks
- Electro-mechanical door lock

... and their installation

Stress Screening
- Heavy-duty floor 500 kg
- H_2 gas measurement
- CO measuring instrument
- N_2 inerting instrument
- Overpressure rupture plate

Shock test chamber
- CO_2 inert gas purging
- H_2 gas measurement
- CO_2 measuring instrument
- CO measuring instrument

Climatic Test Chamber
- CO_2 inert gas purging
- H_2 gas measurement
- CO_2 measuring instrument
- CO measuring instrument

Temperature Chamber
- CO_2 inert gas purging with quick-release valve Hand/solenoid valve
- CO measuring instrument
- Safety temperature limiter

Vibration, Emission, Walk-in Chambers ...

Vibration Test Chamber
- CO_2 inert gas purging
- H_2 gas measurement
- CO measuring gas instrument

Walk-In Test Chamber
- H_2 gas measurement
- CO_2 measuring instrument
- Fire extinguisher on-site

Emission Test Chamber
- H_2 gas measurement
- CO_2 measuring instrument

Computer Integrated Control
Our test chambers are equipped with an integrated industrial computer system S!MPAC* with a 12" colour touch screen monitor to facilitate operation, monitoring and documentation. The Windows S!MCONTROL* software package provides maximum user comfort, transforming the test chamber into a communication wizard.

Control is governed by the 32bit I/O system with integrated soft PLC. A web server can place test and diagnosis information in the intranet via Ethernet if desired.

Online-Service
The units have an online service function, enabling our specialists to establish an online data link to the unit via internet or mobile telephone. The online link provides our experts with all the data they require.

Remote control and monitoring
Safe operation of the overall system requires the test cabinet to be reliably integrated. Enables, warning messages and fault signals are defined in a safety matrix with the customer and the safety officers.

Units can be reached and controlled from practically anywhere in the world by simply accessing the unit webserver in the intranet via the network or enabling in the internet.

Networking
Compatible with S!MPATI* software package

Technical Data
- Industrial PC
- Windows XP embedded
- Touch screen 800 x 600 pixel
- Multilingual software

Interfaces
- Ethernet 100/10 megabit
- RS 232
- USB for stick or printer

Customer inputs/outputs
- 4 potential-free outputs for test specimen control
- 4 inputs (24 V DC)

Options

Additional measuring technology
- Pt100
- Analog inputs 0-10 V, 4-20 mA
- Analog outputs 0-10 V

USB-Stick
- For external saving of programs and measuring data
- Adapter for integration into WLAN

S!MPATI*

Our software S!MPATI* dictates the optional operating parameters for system and test samples. This software, just like known Windows standards, can also be integrated into networks.

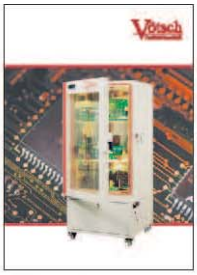
Operation of the test system is simple and time-saving. Integrated monitoring routines makes for more reliable system operation. The evaluation and documentation of test cycles as well as the integration of special measuring data guarantees a higher quality standard.

Example of a terminal

Further Detailed Brochures ...


Image Brochure
Vötsch

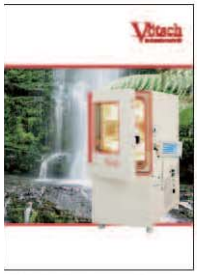

Minis ...
VT & VTM

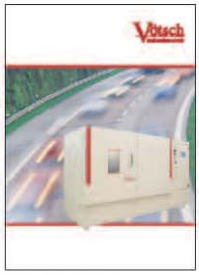

VT 3050
Temperature


Laboratory Scope
VT 4011 to VT 7021


VTL & VCL Equip-
ment for Laboratories


VT^3 & VC^3
Reproducible climate


Constant Climates
VC 0 ...

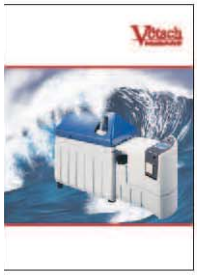

XXL Systems
for High Quality


High Speed ...
Stress VTS & VCS

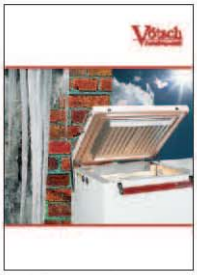

Vibration and more
VTV & VCV

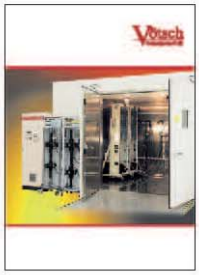

Lightning Speed
Shocktest Chambers


Splash Water System
VT 0800/S


Corrosion
Salt spray


Air Pollution
& Emission

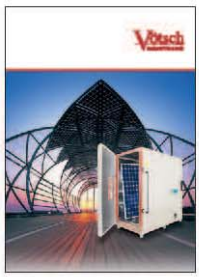

VLM Cabinet
VBT Cabinet


Walk-In
Chambers

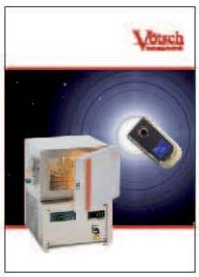
ATEX
Guidelines

Communication ...
Software SIMPATI

Guaranteed Safety
DKD / Calibration


Solar technology
in endurance testing


Testing Solutions for
Automotive Industry


EMC Minis
VT 4002 EMC

Vötsch Industrietechnik

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Umweltsimulation · Wärmetechnik

Environmental Simulation

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