



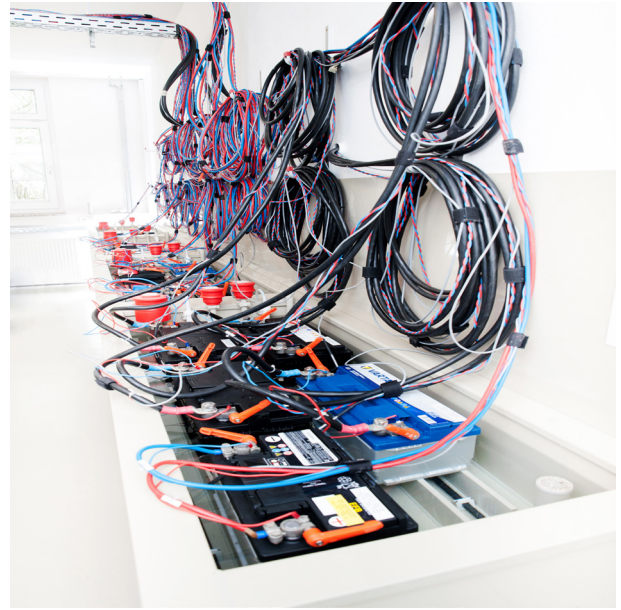
**HIGHLY MODERN TESTING LAB
FOR LEAD-ACID BATTERIES**

OUR HIGHLY MODERN BATTERY TESTING LAB



Know-how that convinces.

akkuteam is your dependable, competent and flexible partner for that constant assured supply of electrical energy without any interruption. We have extensive knowledge particularly in battery technology and analysis. This is what well-known battery and automobile manufacturers the world over have come to depend on. And this includes the Volkswagen Group – Europe's largest automobile manufacturer.



Our partnership with VW goes back many years. akkuteam has been working for the automobile group and its subsidiaries for over 20 years now. Along with numerous other services for VW, akkuteam also examines new starter batteries of the supplier battery manufacturers regarding those technical performance parameters prescribed in keeping with the VW75073 Group test standard.



The akkuteam battery testing lab, set up in 2010, meets the stipulations of the most recent technological standards. It is fitted out with a maximum safety power supply system which is unique in Europe. This enables us to ensure you to obtain precise test findings given without any power cuts. A total of 47 testing circuits are currently being used in our testing facility. In order to be prepared for a raised testing requirement level, our lab infrastructure has already been designed to raise efficiencies up to 90 testing circuits. Over the medium term, we will also be in a position to carry out performance tests in our testing lab for hybrid and electric vehicle drive batteries with lithium-ion technology.



We keep both our testing equipment and our service team's professional expertise up to the minute at all times. Cooperation with the Volkswagen Group quality control test laboratories, several premium battery manufacturers, well-known charging appliance manufacturers and a selected number of universities of technology provide us with the scope for exchanging findings and developing our technological knowledge.

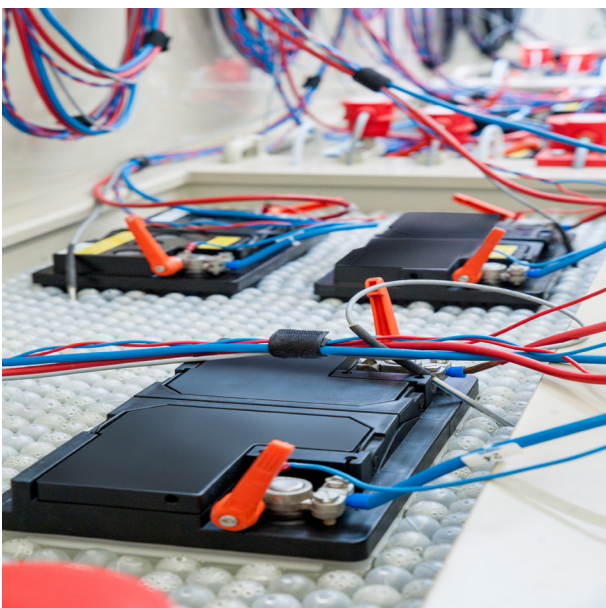
PROFESSIONAL EQUIPMENT FOR YOUR ANALYSES



Technical set-up 12 volt range

- micro-processor controlled battery testing circuits for charging/discharging processes, 47 testing circuits, 0.005 – 300 amperes at 0 – 18 volts DC charging and 5 – 15 volts DC discharging, measuring rate 10 ms, 1 – 1500 amperes high-current discharging at 5 – 15 volts DC, measuring rate 10 ms, Digatron UBT system with central computer software
- temperature-controlled water baths 1 – 80°C, level-regulating, Kustan system
- temperature climate chamber -40°C to +80°C, programme-controlled temperature sequences with a +/- 1°C per minute rising rate, Vötsch system
- electro-mechanical vibration system (vibrating table), computer-assisted amplitude control, 10 – 35 Hz frequency and 1 – 8,1 g acceleration, Knauer system
- precision-weighing system with IT link 65 kg in 1.0 gram steps, calibrated, Sartorius system
- electronic density meters with temperature compensation, Anton Paar system

All the above and used measuring and testing equipment complies with the technical requirements of the Volkswagen VW75073 Group standard.



Technical set-up 80 volt range

- micro-processor controlled battery discharging circuits for 1 – 300 ampere discharging currents at 2 – 80 volts
- IU-controlled charging circuits with programmable characteristic courses with 1 – 200 amperes at 2 – 96 volts
- process monitoring for charging/discharging sequences, IT-assisted with up to 40 synchronous channels

CUSTOM CHECKS AND PROPER RESULTS

All tests are provided for you in keeping with the national (DIN), international, company and group standards. Our competent lab service team can also adjust testing operations to your individual requirements.

Field of application

As an independent battery testing lab for lead-acid batteries, we render performance analyses for:

- 12 volt enclosed starter batteries (liquid electrolyte filling, EFB and EFB+) and those which are sealed (AGM, Vlies, Gel)
- 12 volt enclosed and sealed batteries for stationary applications (OGi, OPzS, GroE, AGM, OPzV)
- 12 volt small traction batteries for electric vehicle drives (forklifters, lifting platforms, e-mobile vehicles) of the low-on-maintenance and maintenance-free types
- 2 – 80 volt traction batteries (PzS, PzV) for forklifters



RANGE OF SERVICES



12 volt range

- initial input measurement in acc. with various standards
- capacity check, cold start test, exhaustive discharge test
- static and dynamic current draw
- cycle test series with differentiated exhaustive discharges and temperature ranges
- water consumption examination, corrosion test
- inter-cell connector test
- start/stop testing
- internal resistance measurements
- durability under shaking load
- quality comparative measurements with delivery batches
- individual test sequences at the customer's request
- battery appraisal with documentation of the opened battery
- device test of 12 volt battery charger

Data transfer via Sharepoint and provision of your test results up to three months after the end of the tests in a certified online storage.

80 volt range

- capacity check with discharging currents up to 300 amperes K5
- cycle test series with differentiated exhaustive discharges and temperature ranges
- performance testing series with real current drain sequences
- discharging characteristic documentation with up to 40 single cell courses
- internal resistance measurements
- individual test sequences at the customer's request
- battery appraisal with documentation of the opened battery
- on-the-spot energy throughput analyses in the actual area of use

PROCESS RELIABILITY

Our tests are oriented to the test standards in force of DIN, the Volkswagen VW75073 Group standard and to customer-specific requirements. All sequences can be reproduced in a document form in keeping with Quality Management ISO 9001. For guaranteed fail-safe operations, our own uninterruptible power system (250 kVA) and a diesel generator (410 kVA) ensure our complete power supply is protected from any mains failure.

EFFICIENCY

In order to be ideally equipped to handle your individual requirements at any time, we regularly adapt our testing lab to reflect the latest technological standards.

All battery analysis testing operations are conducted in accordance with the national (DIN) and international specifications as well as the company and group standards, such as the Volkswagen VW75073 Group test standard (03/2020). There is no difficulty for us in adapting our processes to your requirements. Our lab is open around the clock every day in the year. Our lab's energy supply and ventilation technology has already been designed for an efficiency hike from 47 to 90 testing circuits. This means we can quickly adapt to any raised level of demand.



Delivery service

To ensure safe transport of the batteries to be tested to the exclusion of any incalculable external effects, we offer our own vehicles are available to our customers in Germany and the surrounding countries for collecting and returning these batteries. This is a cost-incurring service and is to be arranged on an individual basis.



Your Contact

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