Łukasiewicz
Automotive
Industry Institute

Tradition and modernity in the automotive industry

We are a research institute with more than 50 years of experience in the automotive industry. Since 2019, we have been part of the Łukasiewicz Research Network – one of the largest networks of scientific and research institutes in Europe. We carry out research and development work in the automotive field.

Main areas of activities:

- technologies for defence and state security;
- energy storage, including traction batteries;
- testing of vehicles and their components, including strength, electrical, durability and road testing
- electromagnetic compatibility of vehicles and electronic devices;
- vehicle automation and self-driving systems (research on and development of Advanced Driver Assistance Systems - ADAS);
- type approval and certification services;
- improvement of road safety and enhancement of vehicles;
- fuels/biofuels/renewable energy sources.

Strengths

- Modern research infrastructure
- Qualified staff
- Convenient time limits for order performance and R&D work
- Long-term experience in project implementation
- Confidentiality and security

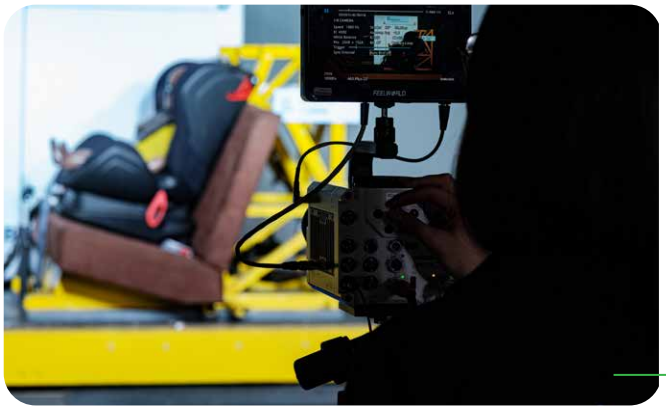
Research infrastructure

The research facilities of the Institute consist of a group of specialist and continuously upgraded laboratories and research groups which are unique in Poland.

The research work carried out at the Łukasiewicz Research Network – Automotive Industry Institute important for the development and improvement of innovation and competitiveness of the Polish industry.

Some of our test stations:

Stand for electromagnetic compatibility testing – EMC chamber



Dynamic and crash test stand

Crash test stand for testing barriers and supporting structures

Research platforms used to implement and test driving automation systems

Stand for testing resistance to vibration in varying ambient conditions – vibration exciter compatible with an environmental chamber

Dynamic stand for strength testing of structures of special-purpose vehicles and their equipment

Inertia dynamometers for testing brake discs, drums and lining

Type approval

We offer tests necessary to obtain:

- vehicle type-approval certificates;
- type-approval certificates for vehicle equipment or components;
- individual vehicle type approval.

AB 082

Group of Laboratories

We provide the above services for the following vehicle categories: **M**, **N**, **L**, **O**, **T**, **R** and **S**.

The Group of Laboratories and the Type-Approval Section are accredited by the Polish Centre for Accreditation with accreditation Nos. AB 082 and AK 021.

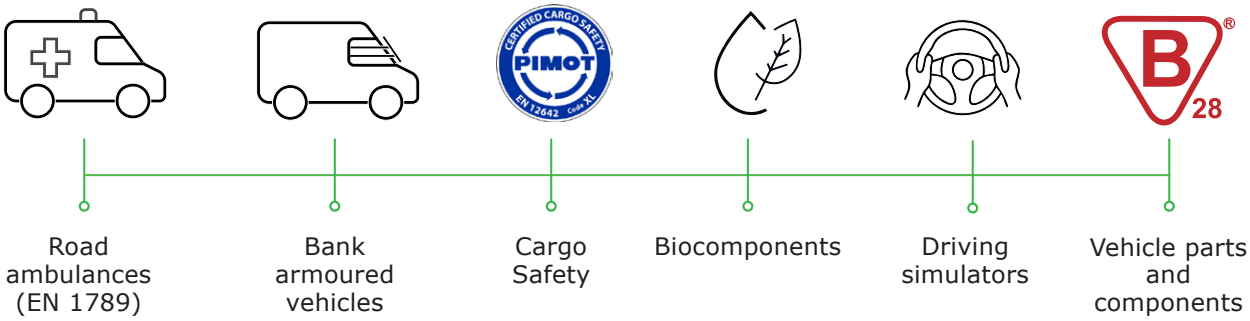
AK 021

Inspection Unit

Our services in the scope of production conformity checks supplement our research services for the purposes of obtaining type-approval certificates.

Certification

For many years, we have been the certification body for automotive products, special-purpose vehicles – ambulances and bank armoured vehicles. We also offer certification of lorry driving simulators and quality certification of bio-components and fuels.



Road ambulances (EN 1789) | Bank armoured vehicles | Cargo Safety | Biocomponents | Driving simulators | Vehicle parts and components

AC 001

Product Certifying Unit

The Product Certification Body is accredited by the Polish Centre for Accreditation, No. AC 001. Certification services are also pursued in another area without accreditation in which we have technical competence.

CERTYFIKACJA ISO 9001

AC 215

Management Systems Unit

Additionally, we certify the compliance of management systems with the requirements of ISO 9001:2015.

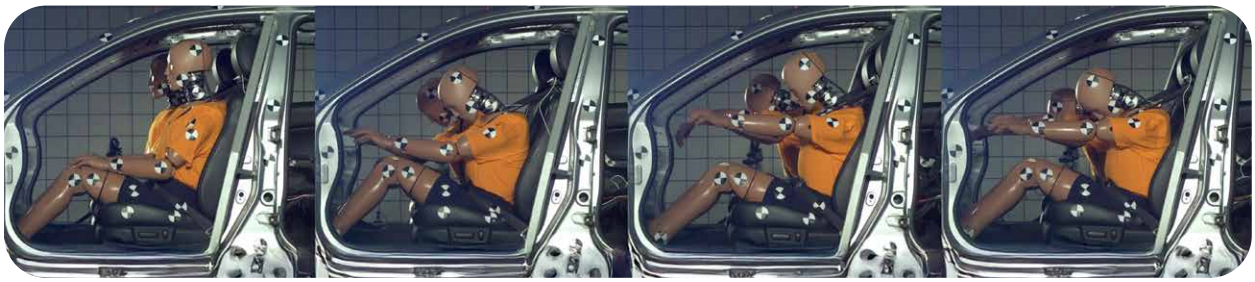
We also offer biomass certification to confirm compliance with the criteria for sustainable development.

Testing

Passive safety testing of vehicles and their equipment

We specialise in testing the passive safety of vehicles and their equipment. We have advanced equipment, including anthropomorphic dummies of Hybrid, Q and P series, intended for a biomechanical analysis of incidents, wireless data acquisition systems and advanced measurement tracks for measuring strength, speed and dynamic values, and high-speed cameras. Thanks to this, we can analyse dynamic phenomena precisely.

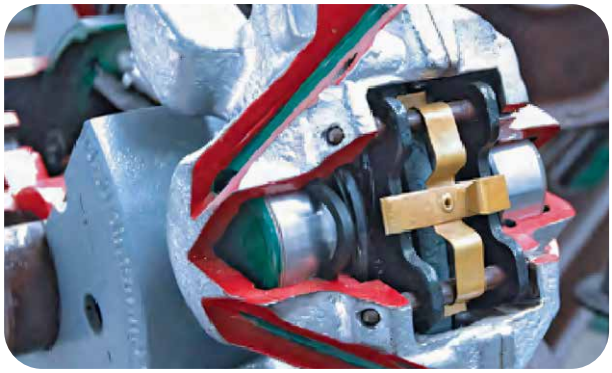
We carry out tests on stands for quasi-static and dynamic strength testing in a crash test hall and in a training ground. We perform tests in accordance with the requirements of such standards as UN Regulations, EU Regulations, standards, national and international regulations as well as individual requirements of our clients.




Łukasiewicz
PIMOT

Comprehensive testing of braking and steering systems

We carry out specialist road tests of braking and steering systems for a wide range of vehicles: from passenger cars, lorries, agricultural and forestry tractors to motorbikes and tricycles. As part of these tests, we verify compliance with regulations and international standards. Furthermore, we assess the performance of the systems in various operating conditions (including in the event of failure) and check the correct selection of components.



Testing of vehicles and their components for durability and reliability

We perform static, dynamic and fatigue tests of vehicle structures and vehicle components in accordance with applicable standards or client's individual requirements. We perform strength testing in the scope of compressive and tensile forces from 5 kN to 1,000 kN.

We specialise in the testing of tow couplings and supporting structures of vehicles and machinery. Our offer also includes the determination of operating specifications of suspension components and assessment of conformity with standards and UN Regulations. Our tests and analyses allow us to verify design assumptions, which has a direct impact on the safety and durability of final products.

Tests of advanced driver assistance systems (ADAS)

We carry out research and development work (including in accordance with Euro NCAP, SAE, NHTSA or ISO standards) on, among other things:

- advanced emergency braking systems;
- lane departure warning systems;
- lane keeping assist system;
- critical steering;
- adaptive cruise control system;
- speed adaptation assistant.

We use world-class equipment in our tests, including steering robots, inertial-satellite systems, reference stations as well as pedestrian and cyclist dummies.

Designing and testing electric drives and energy storage for vehicles

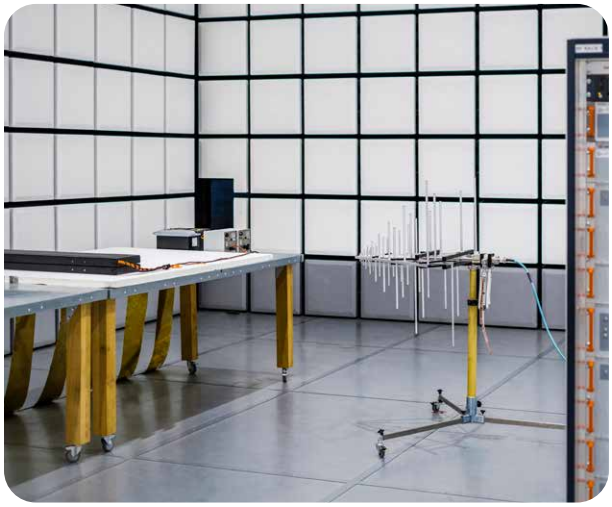
We carry out traction and energy simulations to enable the selection of drive system components for any type of vehicle. These components are tested in accordance with the standards applicable in the automotive industry. The designed drives are comprehensively tested on chassis dynamometers and electrochemical energy storage units are tested on proprietary test benches which reproduce their actual operation.

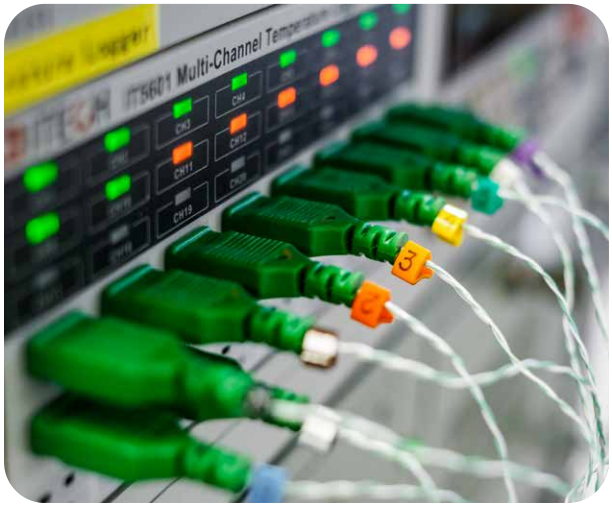
REESS traction batteries

We specialise in comprehensive testing of energy storage systems (REESS) used in electric and hybrid vehicles. Our services include verification of the safety, performance and durability of batteries in accordance with current standards.

The scope of testing includes:

- vibration tests;
- temperature tests;
- tests of mechanical vibrations;
- mechanical integrity tests;
- fire resistance tests;
- short-circuit resistance tests and insulation resistance measurements;
- electrical tests;
- electromagnetic compatibility (EMC).





Testing vehicles and their equipment for electromagnetic compatibility (EMC)

We carry out electromagnetic compatibility tests for a wide range of combustion engine and electric vehicles: from passenger cars, lorries and buses, agricultural and forestry tractors to motorbikes and tricycles, as well as the electrical and electronic devices used in these vehicles.

We have the capacity to perform comprehensive tests for objects up to 12 m long and weighing up to 50 t in the EMC chamber. We also test conducted and radiated phenomena.

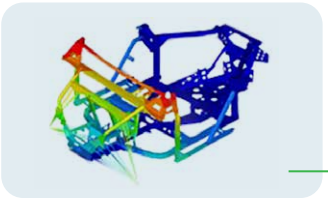
Tests of optional equipment and automotive accessories

We perform tests of vehicle equipment in terms of passenger safety and functionalities of extra accessories. The tests include child restraint systems, wheelchairs, cargo transport components (tie-down straps, roof racks and bicycle racks) and a broad range of electronic and electrical devices such as warning lights, alarms, immobilisers, GPS trackers or chargers for mobile devices.

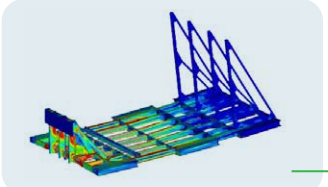
We also test automotive accessories such as towlines, drawbars or car jacks. We carry out research work in terms of static and dynamic strength testing, environmental testing, material and electrical, to provide comprehensive safety assessment and quality of vehicle equipment.

Numerical analyses

We perform strength calculations which enable the precise determination of the condition of both of the entire structures and its individual nodes as early as at the design stage. We offer support in the scope of static calculations, non-linear dynamic analyses, modal analyses, fatigue analyses, multi-body dynamics (MBD) simulations, crash-test analyses.



Analysis of the torsional stiffness of a vehicle frame



Dynamic analysis of a crash test trolley

Testing vehicles for defence and national security

We carry out factory and qualification tests of military vehicles, police vehicles and vehicles of other service as well as components of their equipment, in terms of strength and durability of their structure during long-term operation, traffic dynamics, capacity to overcome terrain obstacles, resistance to environmental factors, electromagnetic compatibility and other factors. We have the necessary licences and accreditations to test and certify products for the military and other uniformed services.

Akredytacja OiB JB
23/MON/2024

Akredytacja OiB JC
22/MON/2024

We participate in the evaluation of products referred to in the Act on the System of Conformity Assessment of Products Intended for the Purposes of Defence and National Security and we hold accreditation from the Ministry of Defence.

Testing road infrastructure in terms of safety

We perform specialist crash tests of road infrastructure, including road barriers, crash cushions and support structures for road equipment with regard to the level of their passive safety. Our testing ground is adapted for testing buried, cast and built infrastructure, and specialist equipment guarantees the highest quality of measurements.

Motor vehicle valuation

We prepare opinions, expert studies and tests in the field of automotive technology, reconstruction of road accidents and collisions, technical assessment of vehicles and assemblies as well as determination of repair costs for courts, public prosecutors' offices, police and other entities. We carry out audits in companies and public sector organisational units in the following areas: fuel and material management, the operating system and technical condition of the vehicle fleet as well as automotive servicing and production facilities.

Braking systems

We perform comprehensive tests of the effectiveness of braking systems with the use of specialised stands and during road tests. Our tests comply with UN Regulations Nos. 13, 13H, 78, 140 and international standards for vehicles of all categories. We also carry out tests of braking system components of all vehicle categories on inertia dynamometers. The scope of testing includes the requirements of UN Regulation 90, AK Master, ISO26865, ISO26866 and other documents.

Strength tests of vehicle structures and components

We carry out strength tests of complete vehicles and their components, e.g. seats, steering systems, interior fittings, special bodies (for example, medical equipment), child seats, wheelchairs, as well as dynamic and static tests of lorry bodies and components (e.g. RUPD) and load securing components. In addition, we are the only institution in Poland to have a crash test site for vehicles with a weight of up to 5 tonnes at a maximum speed of 80 km/h (with a deformable and non-deformable barrier), with the option of video recording from all sides of the site, including from below.

R&D projects and services

We carry out advanced research and development projects. Thanks to the combination of knowledge in different fields such as mechanical engineering, electronic engineering, artificial intelligence and vehicle programming, we create innovative solutions to the challenges of modern mobility.

We test the physical and chemical properties as well as performance characteristics of liquid fuels, including LPG, biofuels, biocomponents for compliance with the applicable quality requirements.

We offer comprehensive support at every stage of a research and development project – from concept and research to implementation.

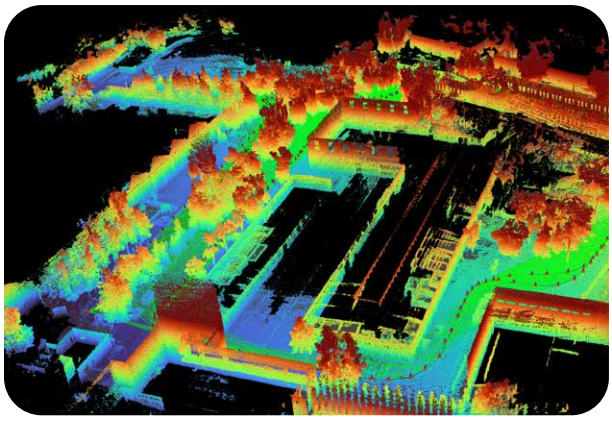
We carry out projects in the following fields:

Automotive

Defence and security

Smart City

Industry



Biofuels

Biomass

LCA

Authorisations and certificates

Our laboratories and bodies responsible for conformity assessment operate in accordance with international standards to ensure the highest standards of quality and reliability of services.

We have competence in the automotive industry as a technical service in collaboration with authorities which issue type approvals.

PCA
Polskie Centrum Akredytacji
WZORCOWANIE
AP 025
Calibrating Laboratory

We have the necessary authorisations to carry out tests and production conformity checks under the EU and UN approval system.

We also hold an Industrial Security Certificate awarded by the Internal Security Agency. We provide protection of classified information with Secret and Confidential, NATO Secret, EU Secret clauses.

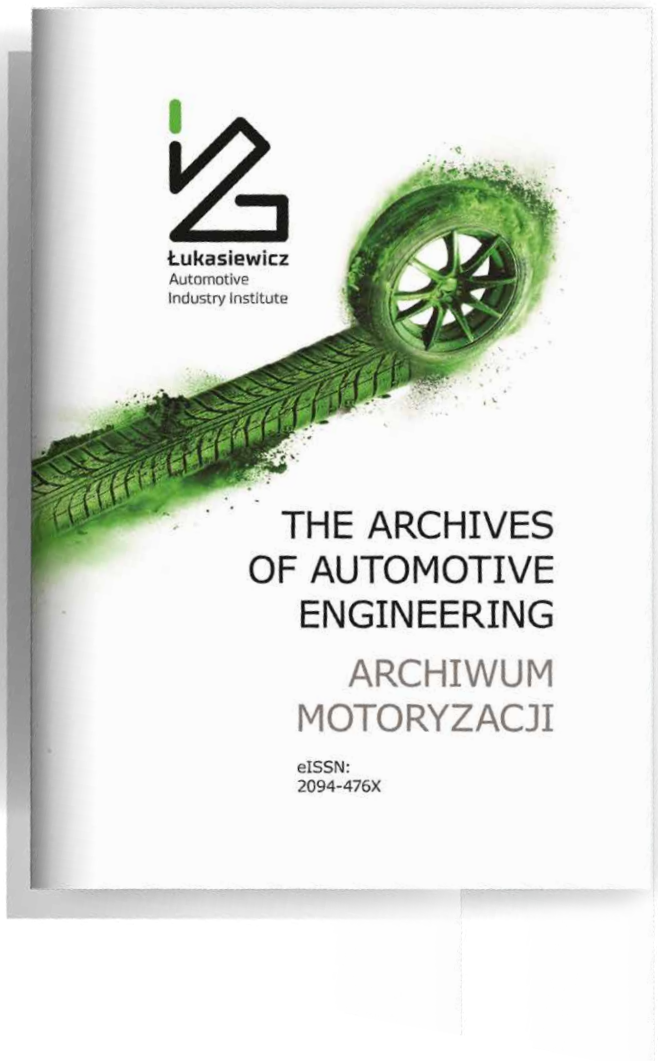
Furthermore, we provide services for the purposes of national defence. We have a NATO Commercial and Government Entity Code (NCAGE Code) assigned to business entities under the NATO Codification System (NCS).

We are authorised by the Central Office of Measures to re-validate vehicle exhaust gas analysers.

The Archives of Automotive Engineering

A peer-reviewed scientific journal with a well-established position on the Polish publishing market, published continuously since 1996. For over two decades, it has been publishing high-quality scientific articles in the fields of automotive engineering and vehicle technology, creating an important space for dialogue between the academic community and industrial practice.

The quarterly serves as a highly regarded platform for the exchange of knowledge and experience among researchers and experts in the automotive industry. The journal's high scholarly standard is confirmed by its inclusion in the prestigious international Scopus database.



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