

Łukasiewicz
Institute
of Aviation



**CHEMICAL
RESEARCH
LABORATORY
FOR SPACE
APPLICATION**

CHARACTERISTICS

Łukasiewicz – Institute of Aviation is a leading research and development unit in Poland and worldwide in the field of ecological rocket propulsion. Its primary areas of interest and specialization are environmentally friendly liquid and hybrid propulsion systems based on over 98% hydrogen peroxide, as well as innovative hypergolic fuels.



CAPABILITIES

- Research on fuels for new liquid, hybrid, and gel propulsion systems.
- Research on fuels that demonstrate hypergolic properties in contact with hydrogen peroxide (production, long-term storage, passivation, and compatibility studies).
- Research on the chemical durability of fuels containing catalytic and/or energetic additives.
- Research on the friction and impact sensitivity of the materials (for example: Materials compatibility researches with HTP).
- Investigation of physicochemical parameters useful for propulsion applications.
- Development of advanced low-smoke solid rocket propellant materials.
- Research on high-performance environmentally friendly fuels and oxidizers of a new generation.
- Development of catalysts for single-component propellant applications.
- Research on the chemical compatibility of different structural materials with working fluids.
- Development of fuel compositions that spontaneously react with hydrogen peroxide (hypergolic).
- Production of highly concentrated 98%+ hydrogen peroxide (HTP).
- Electrochemical testing.
- Thermal and instrumental analyses.

EQUIPMENT

Catalyst Laboratory:

Laboratory high temperature muffle furnace, FCF 22 SHM type.

Laboratory muffle-plate furnace.

Solid Fuel Laboratory:

Station for casting solid rocket propellant materials.

Synthesis Laboratory:

Vibratory sieve shaker, AS Control.

Planetary ball mill, PM 100.

Planetary mixer, Thinky.

Liquid Fuel Laboratory:

Liquid fuel distillation station.

Apparatus for determining the flash point.

Thermal Testing Laboratory:

Laboratory incubator, CLW 115 Smart.

Chiller, CHL6C Smart.

Binder MKF 115 climate chamber.

Analytical Laboratory:

Nicolet iS50 FT-IR spectrometer with built-in ATR.

UV/VIS spectrophotometer.

Ion chromatograph with autosampler.

Simultaneous thermal analyzer, STA.

Dynamic-Mechanical Analyzer, DMA.

Optical emission spectrometer, ICP-OES.

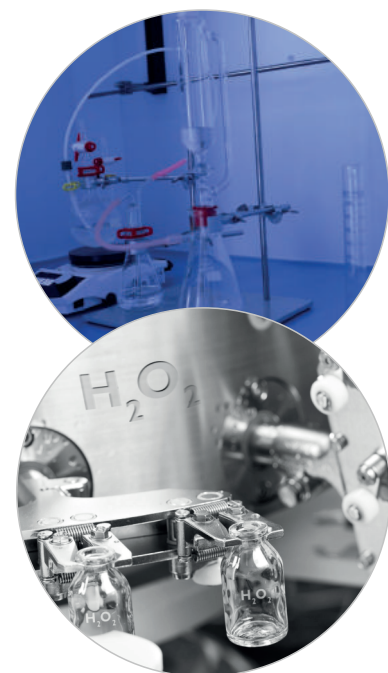
TOC analyzer with autosampler.

Karl Fischer coulometric titrator.

Gas chromatograph.

Gas pycnometer.

Rotational viscometer with thermostat.



The expenditure co-financed by the European Union with funds from the European Regional Development Fund under the Regional Operational Programme of the Mazovian Voivodeship 2014-2020.



The Łukasiewicz Research Network – Institute of Aviation offers a wide range of specialized research, engineering services and products. We provide comprehensive solutions, ranging from dedicated analyzes, simulations, engineering design, through the selection, testing and certification of materials and structures, to rapid prototyping and additive manufacturing.

al. Krakowska 110/114, 02-256 Warsaw, Poland
e-mail: info@ilot.lukasiewicz.gov.pl / www.ilot.lukasiewicz.gov.pl