



TEST
NVZLU

TESTS, MEASUREMENTS, ANALYSIS
VIBRATION AND PRESSURE TESTS
ENVIRONMENTAL AND CORROSION TESTS



VIBRATION AND ENVIRONMENTAL TESTS

MECHANICAL RESISTANCE TESTS

VZLU TEST, a.s. provides a wide range of development, qualification and serial tests for products from variety of sectors. These are primarily tests focusing on mechanical and climatic resistance of products. The most requested tests include mechanical vibration tests, which are carried out on modern electrodynamic vibration and shock devices that enable the tests to be combined (vibration, shock, temperature, humidity).

» customers:

- testing for aviation sector
- general mechanical engineering
- automotive industry
- railway vehicles
- electronics and electrotechnics manufacturers
- space industry

ENVIRONMENTAL AND CORROSION TESTS OF PRODUCTS AND SURFACE TREATMENT

Complex environmental and corrosion tests of products and surface treatment in special-purpose chambers for testing systems and devices designated for operating at extreme conditions, such as humidity, heat, cold, etc. + thermal shocks tests, salt spraying and sulphur dioxide tests, cyclic combined tests (e.g. SWAAT), ozone, solar radiation, sand and dust tests, degree of protection provided by enclosure (IP Code) and other. VZLU testing laboratories also solve complex corrosion problems that negatively affect operating life of products.

» customers:

- companies involved in surface treatment of engineering products exposed to climatic effects
- manufacturers of systems or devices designated for operating at extreme conditions
- subassembly's suppliers for automotive and other fields
- electronics and electrotechnics manufacturers

EXTERNAL EFFECTS	TESTS	STANDARDS - EXAMPLES
CLIMATIC	cold	EN 60068-2-1
	heat	EN 60068-2-2
	thermal shock tests	EN 60068-2-14, DIN 40046
	damp heat (constant, cyclic)	EN 60068-2-30, EN 60068-2-38, EN 60068-2-78, PV1200
	simulated solar and UV radiation	EN 60068-2-5, EN ISO 11341
	high or low pressure	EN 60068-2-13, EN 60068-2-41
	degree of protection: - sand and dust - water, spray, rain	EN 60529, DIN 40050, EN 60034-5, EN 50102 EN 60068-2-68
CHEMICAL	corrosion tests: - humidity resistance tests - SO ₂ resistance tests - salt fog resistance tests (constant or cyclic), NSS, ASS, CASS, SWAAT, ...	EN ISO 9227, ISO 6988, EN 60068-2-52, EN ISO 6270-2, ASTM B117, ASTM G85, PV 1208, PV 1210, VDA 621-415
	ozone test	ISO 1431, JIS K6301, DIN 53509
MECHANICAL	vibration (sine, random, sine on random, ...)	EN 60068-2-6, EN 60068-2-64, EN 61373
	shocks and impacts	EN 60068-2-27
	constant acceleration	IEC 68-2-7
	combined tests heat/cold/humidity - vibration/shocks	IEC 68-2-50, IEC 68-2-51, IEC 68-2-53

MECHANICAL RESISTANCE TESTS

EQUIPMENT

<p>ELECTRODYNAMIC SHAKER WITH SLIP TABLE LDS V890 - LPT900 COMBO</p>	<ul style="list-style-type: none"> ● max. static load up to 700 kg ● usable frequency range 1 - 2300 Hz ● peak sine force 53.4 kN ● max. RMS random force 55.6 kN ● peak shock force 166.8 kN ● max. displacement amplitude 25.4 mm, max. velocity 1.6 m.s⁻¹, max. acceleration 392 m.s⁻² ● stray magnetic field < 2.0 mT 	<p>CLIMATIC CHAMBER CTS FOR COMBINED TESTS</p>	<ul style="list-style-type: none"> ● temperature -70 to +180°C ● relative humidity 10 to 95% ● temperature change rate 2°C.min⁻¹ ● dimensions (w/l/h) 1200×1050×1100 mm ● two holes for cabling ø12cm ● max. weight/bottom area 150 kg.m²
<p>ELECTRODYNAMIC SHAKER WITH SLIP TABLE TIRA S597/LS - 340</p>	<ul style="list-style-type: none"> ● max. static load 610 kg ● usable frequency range DC - 3000 Hz ● peak sine force 35 kN, peak shock force 70 kN ● max. displacement amplitude 25.4 mm ● max. velocity at vibration 1.8 m.s⁻¹, max. shock velocity 2.5 m.s⁻¹ ● max. acceleration at vibration 110 g, max. shock acceleration 220 g 	<p>CLIMATIC CHAMBER VÖTSCH VTV 7060-5 FOR VIBRATION-TEMPERATURE COMBINED TESTS</p>	<ul style="list-style-type: none"> ● temperature -70 to +180°C ● temperature change rate 5 K.min⁻¹ ● dimensions (w/l/h) 800×950×800 mm ● holes for cabling
<p>ELECTRODYNAMIC SHAKER WITH SLIP TABLE LDS V850 - 440 HBT 600 COMBO</p>	<ul style="list-style-type: none"> ● max. static load 350 kg ● usable frequency range DC - 3000 Hz ● peak sine force 22.2 kN ● max. RMS random force 22.2 kN ● halfsine peak bump force 66.7 kN ● max. velocity 2 m.s⁻¹, max. acceleration 60 g 	<p>VIBRATION CONTROL SYSTEM VR8500 AND VR8500-8</p>	<ul style="list-style-type: none"> ● 4 and 8 input channels for vibration control and test monitoring (Sine, Random Sine-random, Shock, FDR, Transient Capture)
		<p>VIBRATION CONTROL SYSTEM SD 2552B</p>	<ul style="list-style-type: none"> ● 8 input channels for vibration control and test monitoring (Random, Sine, Mixed-Mode, Classical Shock)
		<p>CENTRIFUGE SMK1</p>	<ul style="list-style-type: none"> ● weight of test object max 50 kg ● maximum dimensions of the test object 500 × 500 × 500 mm ● acceleration range from 0.5 to 25 g

ENVIRONMENTAL AND CORROSION TESTS OF PRODUCTS AND SURFACE TREATMENT

EQUIPMENT

TEMPERATURE AND HUMIDITY - TEMPERATURE TESTS	<ul style="list-style-type: none"> climatic chambers Weiss Umwelttechnik, Vötsch Industrietechnik, CTS and Angelantoni capacity 160, 250, 570, 600, 1000, 1500 a 2500 dm³ temperature limit -80°C to +180°C relative humidity up to 98 % temperature change rate to 5 K.min⁻¹ computer-assisted control of chambers by SW SIMPATI, WinKratos and CTS 	OZONE TESTS	<ul style="list-style-type: none"> chamber for ozone tests Weiss Umwelttechnik (160 dm³) ozone generator and analyzer Anseros
THERMAL SHOCK TESTS	<ul style="list-style-type: none"> thermal shock chamber Weiss Umwelttechnik capacity 3x200 dm³ temperature limit -80 to +180°C 	DEGREES OF PROTECTION, DUST, WATER	<ul style="list-style-type: none"> degrees of protection - dust (talç) Weiss Umwelttechnik capacity cca 1000 dm³ degrees of protection - dust (SiO₂) PK - VZLU degrees of protection - water (swinging tube, falling water drop) PTL Dr. Grabenhorst, capacity cca 1000 dm³
SALT SPRAYING TESTS - SALT FOG	<ul style="list-style-type: none"> chambers Vötsch Industrietechnik, Gerb. Liebsch, Erichsen, Unique Electronics Limited for salt spraying tests and cyclic corrosion tests capacity 60, 450, 480, 2x1000 dm³ 	CHEMICAL ANALYSES OF METALLURGICAL MATERIALS	<ul style="list-style-type: none"> spektrometer OES BAIRD Foundrymate spectral analyses of Fe, Al and Cu based metals
CORROSION TESTS - SO ₂	<ul style="list-style-type: none"> corrosion chamber Gerb. Liebsch for tests in SO₂ atmosphere capacity 300 dm³ 	MEASURING AND EVALUATION OF PROTECTIVE COATINGS	<ul style="list-style-type: none"> colour shade - Spektrofotometer X-Rite SP60; colour-matching cabinet MATCHMASTER 425 MC dry film thickness - magnetic method and eddy currents; devices List Magnetik and Phynix Surfex adhesion - Multi-Cross Cutter Erichsen; automatical Scratch Hardness Tester 430P Erichsen hardness - FL-2000-H Heinrich Bareiss (acc. to Buchholz); pencil hardness test and equipment for Wolff-Wilborn test laboratory and metallographic microscopes and software
SIMULATED SOLAR AND UV RADIATION TESTS	<ul style="list-style-type: none"> chamber for solar radiation Weiss Umwelttechnik (testing area cca 600 x 600 mm, 300 - 3000 nm, 1.12 kW.m⁻²) chamber for UV radiation ATLAS (testing area 200 x 280 mm, 300-800 nm, to 765 W.m⁻²) 		
COLD/HEAT TESTS	<ul style="list-style-type: none"> chambers for cold/heat tests Memmert, EPS, WSU, Frigera, etc. 		

PRESSURE TESTS

HYDRAULIC AND LPG/CNG TESTS

The laboratory performs hydrostatic and hydrodynamic pressure tests, destructive hydraulic tests, homologation tests of systems and components for LPG and CNG alternative fuelling of cars, temperature and humidity tests and calibration of liquid and gas manometers.

» customers:

- Hydraulic component and system manufacturers
- Component for system LPG/CNG manufacturers
- Air conditioner for car manufacturers
- Pressure vessel, hose and tube manufacturers
- Manufacturers, vendors and users of pressure gauges

» equipment:

- Sources of hydraulic pressure up to 300 MPa
- Sources for pulsed pressure tests up to 50 MPa
- Climatic chamber for temperature and humidity test
- Etalons for calibration of pressure gauges

» we offer:

HYDRAULIC PRESSURE TESTS

- leakage tests and hydrostatic strength tests up to 300 MPa
- tests of heat exchangers, evaporators and condensers
- tests of pressure vessels
- tests of metallic and composite hydraulic components
- tests of hydraulic hoses
- tests of brake tubes

HYDRODYNAMIC PRESSURE TESTS

- pulsed pressure tests up to 50 MPa
- pulsed pressure tests of heat exchangers, evaporators and condensers
- pulsed pressure tests of pressure vessels
- pulsed pressure tests of metallic and composite hydraulic components
- pulsed pressure tests of hydraulic hoses
- pulsed pressure tests of brake tubes

TEMPERATURE AND HUMIDITY TESTS

- Instrument and facility tests under extreme temperatures (-70 up to +180°C) and a relative humidity from 10% to 95%, up to dimensions 1000 x 1000 x 2500 mm

CALIBRATION OF LIQUID AND GAS MANOMETERS

TESTS OF COMPONENTS FOR LPG/CNG SYSTEMS

- homologation tests of systems and components for LPG and CNG alternative fuelling of cars according to ECE Regulation No. 67, ECE Regulation No. 110 and standards ISO 15500

EQUIPMENT

STATIC PRESSURE TESTS	<ul style="list-style-type: none"> ● Source of hydraulic pressure up to 300 MPa ● Source of hydraulic pressure with armored case (w/h/d) 800 x 2100 x 400 mm up to 300 MPa ● Source of hydraulic pressure with armored case (w/h/d) 1200 x 2400 x 600 mm up to 25 MPa ● High pressure compressor Astra 160/E up to 33 MPa
DYNAMIC PRESSURE TESTS	<ul style="list-style-type: none"> ● Hydraulic aggregate Bosch-Rexroth with proportional pressure reducing valve (max. frequency 16 Hz) for pulsed pressure tests up to 30 MPa and a temperature up to +80°C ● Testing source for pulse load of hydraulic hoses up to 50 MPa and a temperature up to +95°C ● Hydraulic aggregate Bosch-Rexroth for pulsed pressure tests up to 3 MPa and a temperature up to +80°C ● Testing source to verify the reliability of gear and piston pumps for pressure up to 25 MPa and a temperature up to +90°C ● Testing source for pulse load of hydraulic components up to 25 MPa and a temperature up to +90°C
TEMPERATURE AND HUMIDITY TESTS	<ul style="list-style-type: none"> ● Climatic conditioning unit CTS with test chamber volume 2500 dm³ ● (w/h/d) 1000 x 2500 x 1000 mm, temperature range -70 up to 180°C ● relative humidity of 10 to 95 %, temperature change rate 4 K.min⁻¹ ● controlling and monitoring CID-PRO software
CALIBRATION OF MANOMETERS	<ul style="list-style-type: none"> ● Metrological department for calibrating pressure gauges the extent of -90 kPa to 100 MPa, etalons HBM with an accuracy of 0.05 %, measurement and data evaluation program WinMer
MEASUREMENT AND DATA ACQUISITION	<ul style="list-style-type: none"> ● Signal conditioning racks DEWETRON ● Data acquisition DAQCards National Instruments ● Pressure transducers GEMS Sensors and HBM ● Software LabVIEW and DEWESoft

STANDARDS

ČSN EN ISO 6803	Rubber or plastics hoses and hose assemblies - Hydraulic-pressure impulse test without flexing
ČSN EN ISO 1402	Rubber and plastic hoses and hose assemblies - Hydrostatic testing
ČSN 11 9008	Hydraulic fluid power - Testing
ECE Regulation No. 67.01	Uniform provisions concerning the approval of: I. Approval of specific equipment of vehicles of category M and N using liquefied petroleum gases in their propulsion system II. Approval of vehicles of category M and N fitted with specific equipment for the use of liquefied petroleum gases in their propulsion system with regard to the installation of such equipment
ECE Regulation No. 110	Uniform provisions concerning the approval of: I. Specific components of motor vehicles using compressed natural gas (CNG) in their propulsion system; II. Vehicles with regard to the installation of specific components of an approved type for the use of compressed natural gas (CNG) in their propulsion system
ISO 15500	Road vehicles - Compressed natural gas (CNG) fuel system components
ČSN EN 378-2	Refrigerating systems and heat pumps - Safety and environmental requirements - Parts 2: Design, construction, testing, marking and documentation
ČSN EN 13322-1	Transportable gas cylinders - Refillable welded steel gas cylinders - Design and construction - Part 1: Carbon steel
ČSN EN 13322-2	Transportable gas cylinders - Refillable welded steel gas cylinders - Design and construction - Part 2: Stainless steel
ISO 7241-2	Hydraulic fluid power - Quick-action couplings - Part 2: Test methods
ISO 4038	Road vehicles - Hydraulic braking systems - Simple flare pipes, tapped holes, male fittings and hose end fittings

VZLU TEST a.s. has implemented a quality management system; selected methods and tests are accredited by the Czech Accreditation Institute according to ČSN EN ISO/IEC 17025.



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