

tradition. knowledge. responsibility.



ACCREDITED TESTING AND LABORATORY SERVICES

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EMC



LVD



RED



ENVIRONMENTAL



GAD

ACCREDITED LABORATORIES: HIGH VOLTAGE - NOISE AND VIBRATION - HIGH POWER - PHYSICAL AND CHEMICAL TESTING - MECHANICAL AND TECHNOLOGICAL TESTING - EMC AND SAFETY - CALIBRATION OF ELECTRICAL EQUIPMENT - ENVIRONMENTAL TESTING

Conformity requirements for electronic devices

Manufacturers must ensure compliance with all relevant Directives.

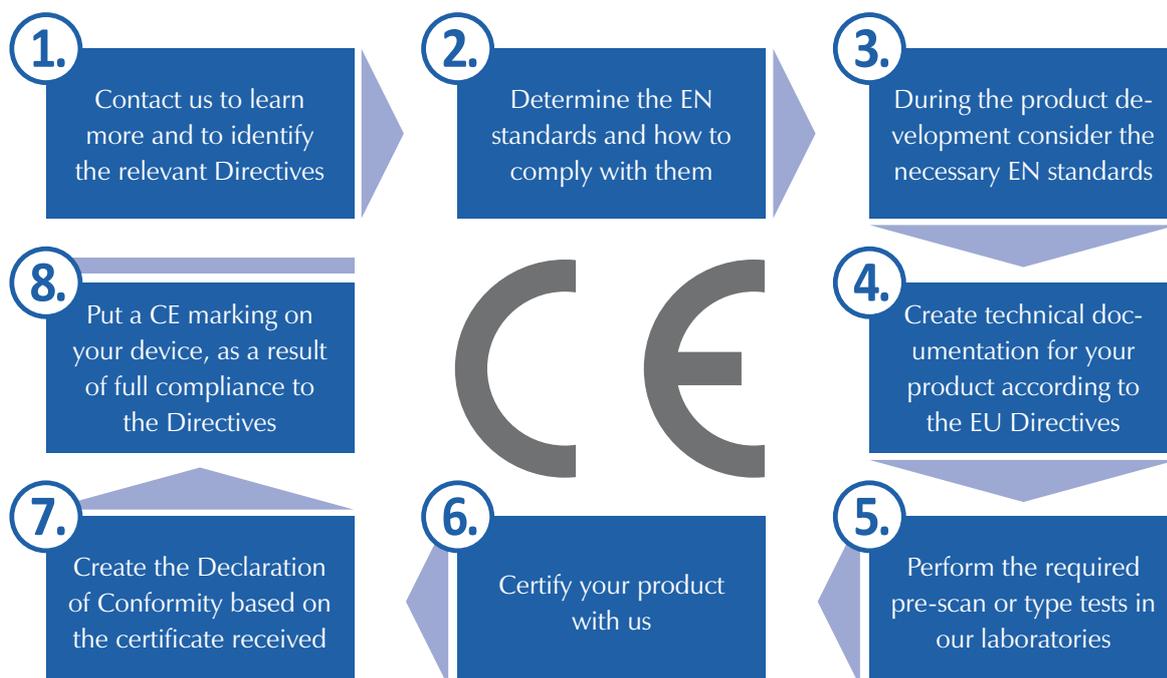
Conformity requirements are requested for all electronic devices that can be found on open markets across the globe. This includes specific standards for countries and regions. For the EU market, the conformity is regulated by the European Directives and standards. Therefore all electrical equipment sold on the EU market must prove that it has successfully passed testing in line with this regulation. Eventually, they are assigned CE mark (CE = *Conformité Européenne*), which stands for European health & safety product label.

The manufacturers that bring their products to the EU market are obligated to ensure their compliance with all the relevant Directives which includes well prepared technical documentation and testing reports according to the Harmonized Standards.

As a competent laboratory, we have extensive experience in areas like industrial and household appliances. Being a part of globally present KONČAR Group, we provide a wide range of services for industrial and commercial environments, measurement, maritime navigational equipment, IT equipment, household appliances etc.

How to get CE mark for your product

We can assist you in the whole process. Our guidance will speed up your product launch!



Complementary activities

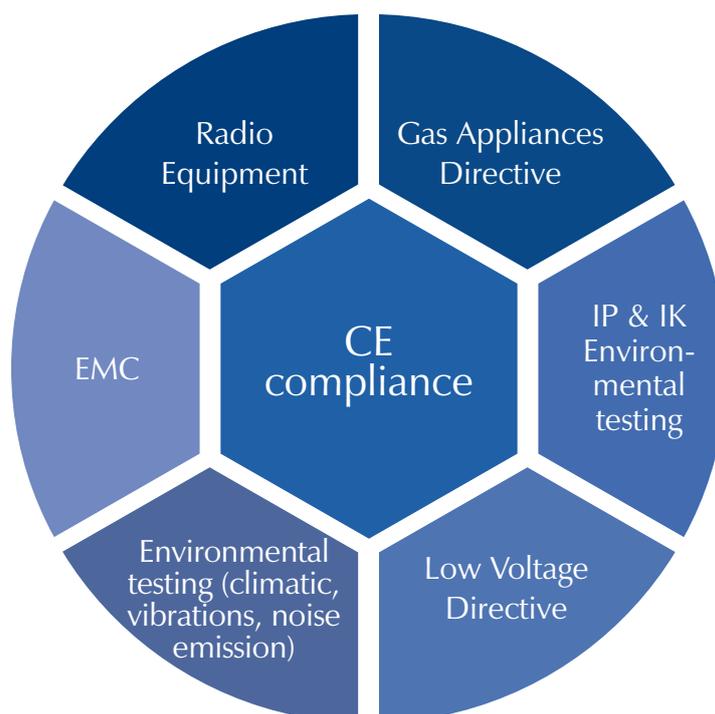
Certification of products inside the Institute.

Laboratory for EMC and Safety operates test laboratories which are accredited for the most of the basic test methods. The laboratory accreditations are in accordance with **ISO IEC/EN 17025 standard**. KONČAR Institute runs an independent certification department as a Notified Body number 2494 and provides certification in the following areas:

- » Electromagnetic Compatibility, legislation 2014/30/EU, formally accredited against **EN ISO/IEC 17025 - EN ISO/IEC 17065**
- » Radio Equipment, legislation 2014/53/EU, formally accredited against **EN ISO/IEC 17025 - EN ISO/IEC 17065**
- » 2009/142/EC (ex-90/396/EEC) Appliances burning gaseous fuels , formally accredited against **EN ISO/IEC 17025 - EN ISO/IEC 17065**
- » 2006/42/EC Machinery, formally accredited against - **EN ISO/IEC 17065**
- » 2014/68/EU Pressure equipment, formally accredited against - **EN ISO/IEC 17065**
- » 2000/14/EC Noise emission in the environment by equipment for use outdoors; formally accredited against - **EN ISO/IEC 17025-EN ISO/IEC 17065**

Accreditation and expertise

Testing according to the Harmonized Standards for broad areas.



Electromagnetic Compatibility (EMC)

A large number of electronic devices must comply with EMC Directive. We operate several test halls and offer a wide range of accredited tests.

Electromagnetic Compatibility (EMC) is a group of tests that limit disturbances produced by equipment and simulate test reaction of the equipment under the influence of disturbances. Limits and disturbances are simulated and specified for every device through harmonized standards.

EMC is usually divided into two theoretical aspects, **emission** and **immunity testing**. Emission measurement considers how many disturbances are produced by the equipment under test. Immunity shows how many disturbances can the tested equipment take and still work properly. Harmonized Standards show values based on where the equipment must be installed or to which family of products it belongs.



Accredited tests include a variety of fields such as residential and industrial environments, measurement equipment, maritime navigational equipment, household appliances, IT equipment, lamps etc.



Typical emission measurements:

- » Conducted emission measurements
- » Radiated emission measurements
- » Power disturbance measurements
- » Current harmonic measurements (IEC EN 61000-3-2)
- » Flicker emission measurements (IEC EN 61000-3-3)

Typical immunity measurements:

- » ESD immunity testing (IEC EN 61000-4-2)
- » RF fields immunity testing (IEC EN 61000-4-3)
- » BURST immunity testing (IEC EN 61000-4-4)
- » SURGE immunity testing (IEC EN 61000-4-5)
- » Conducted immunity testing (IEC EN 61000-4-6)
- » Immunity to magnetic fields 50 Hz (IEC EN 61000-4-8)
- » Immunity to pulse magnetic fields (IEC EN 61000-4-9)
- » Immunity to power interruptions (IEC EN 61000-4-11)

Common standards offered as a technical solution for the customers:

IEC EN 61000-6-1	IEC EN 61000-6-2	IEC EN 61000-6-3	IEC EN 61000-6-4	IEC EN 61326-1	CISPR 22	CISPR 24	CISPR 32	CISPR 35	CISPR 11
CISPR 14-1	CISPR 14-2	CISPR 15	IEC EN 61547	IEC EN 61000-3-2	IEC EN 61000-3-3	EN 60945	ETSI EN 301 489-1	EN 50293	AND MORE

Low Voltage Directive (LVD)

The combination of our experienced personnel, checking procedures and a single test location assures safe devices for everyday usage.

Low Voltage (Safety of electrical equipment) tests simulate and evaluate safe usage of products by people or undeliberate contact with animals. Safety Requests of each device are standardized mostly via Harmonized Standards.

All devices using radio spectrum or higher voltages during the work need to comply with LVD. Special care should be taken when the manufacturer is constructing the devices which are used by children, older people, people with special needs, or anyone unaware of the danger caused by the usage of the electrical products.

Some of the products tested to LVD relate to IT equipment, measurement equipment, lamps, household appliances, etc.



Some of the most common tests include:

- » Input current, voltage and power measurements
- » Testing with various probes
- » Accessible parts under voltage
- » Heating measurements
- » Leakage current measurement
- » Electric strength testing
- » Stability and mechanical hazard testing
- » Glow-wire testing
- » Screw and connections checking
- » Mechanical strength testing
- » Electromagnetic fields exposure assessment
- » Risk assessment
- » Other relevant tests

Common standards offered as a technical solution for the customers:

IEC EN 60335-1

IEC EN 60950-1

EN 61010-1

EN 60598-1

Environmental testing

We work closely with customers to identify the most appropriate and most relevant test options.

Environmental tests usually include vibration and climatic tests, but can also include some other measurements, such as the measuring of noise emission levels, estimation of human exposure to vibrations, etc. Specific tests are often required for equipment that is going to be built at environmentally unfriendly locations such as marine applications, railway and power plant industries, or similar equipment.

Vibration services that can be offered by our laboratory are verifications of mechanical strength and the ability of the components to withstand specified severities of vibrations (sinusoidal, random, shock) according to the EN 60068-2-6, EN 60068-2-27, EN 60068-2-64 and more.

Together with the vibration service, we offer the following:

- » Declaration and verification of noise emission levels
- » Determination of sound power levels of noise sources using sound intensity
- » Determination of sound power levels of noise sources using sound pressure
- » Human exposure to hand-transmitted or whole body vibrations
- » Evaluation of machine vibrations (rotating or non-rotating parts).



Climatic services which can be offered are verifications of several extreme conditions, including the following:

- » Cold test,
- » Dry heat test,
- » Damp heat test,
- » Neutral salt spray test,
- » Water condensation.

Common product standards requiring environmental tests:

IEC EN 60945 (Maritime navigation and radiocommunication equipment and systems)	DNV GL rules	Lloyd Register rules
Russian Maritime register of Shipping rules	RINA rules	Other relevant standards



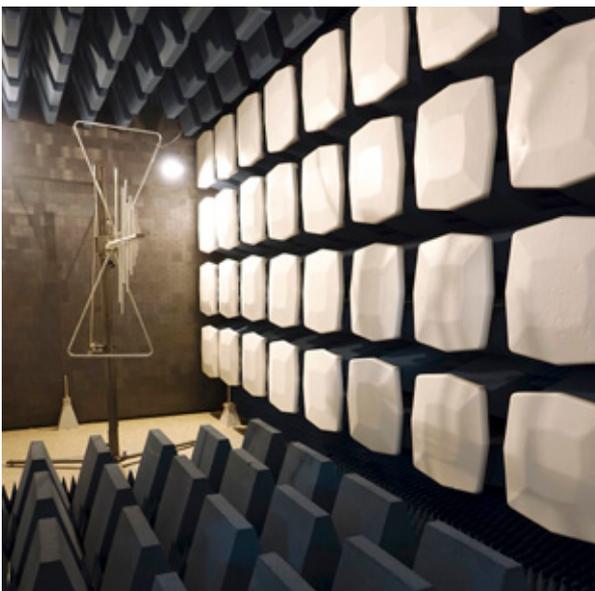
Radio equipment directive (RED)

All devices using the RF spectrum have to comply with Radio Equipment Directive.

RED (Radio Equipment Directive) considers frequency spectrum and rational usage of the dedicated frequencies. All devices using the RF spectrum (intentional radiators which are using the spectrum to communicate) are considered RED equipment.

The Directive refers to the communication with the host or other devices via specifically dedicated frequencies using ISM (Industrial, Scientific and Medical devices; communication procedures, e.g. RFID, Bluetooth, Wi-Fi, ZigBee, etc.). It is also necessary to consider specific RF bands which are used by the government or private stations, which require special permits from the authority.

All techniques and terms of testing are usually given by the standards, for different classes of the equipment. Some test methods require extreme environmental conditions (as defined by the applicant), to be combined with the measurements. Laboratory for EMC and Safety can meet all the requirements of environmental conditions during the requested tests. This allows us to use temperature chamber for extreme temperature conditions and voltage power supplies, to variate power of the equipment under test.



Most common test procedures which can be used for ISM equipment, are:

- » Frequency error and stability measurements
- » ERP, EIRP, Average or RF Output power measurements
- » Transient power measurements
- » Adjacent channel power measurements
- » Spurious emissions
- » Duty cycle measurements
- » Power spectral density
- » Adaptivity
- » Occupied channel bandwidth

Common standards applied during the equipment testing:

ETSI EN 300 220 series

ETSI EN 300 330 series

ETSI EN 300 328 series

ETSI EN 300 440 series

IP and IK protection

A large number of products needs to be properly marked as well as to communicate the application conditions to its users.

IP testing (Ingress Protection) gives the information about the level of protection against solid objects and liquids. Usually, IP rating has two numbers, 0 – 6 for solid objects, and 0 – 8 for liquids.

IK protection (Protection against mechanical impacts) gives the information about the level of protection against mechanical impacts. IK ratings are defined as the numbers from 0 – 10.

Certain devices must provide IP and IK information to the end users. This is the basis for clear guidelines regarding the application of the device. It is very important to apply the right solutions for the devices which are meant to be used outdoors or in extreme conditions. In our facilities, we test water and dust breach together with the mechanical impacts. Target areas can, therefore, include an unlimited number of applications, which are tested according to requirements of IEC 60529 and IEC 62262.



Common product standards which require this sort of tests are built in the applications such as:

- » Outdoor lighting devices
- » Controlling systems used for all applications (crossroads, railway applications, outdoor controlling systems, etc.)
- » Parts of motors, generators, rotors, transformers
- » All equipment that can work, or can be exposed to dust or water ingress
- » IEC EN 60945 (Maritime navigation and radiocommunication equipment and systems), DNV GL rules, Lloyd Register rules, Russian Maritime register of Shipping rules, RINA rules, etc.

Common product standards requiring environmental tests:

IEC 60529

IEC 62262

IEC EN 60945

Gas Appliance Directive (GAD)

Special safety of the end users is the scope of the Directive.

GAD (Gas Appliance Directive) represents a selective number of tests considering basic safety for equipment operating with gases. When not constructed carefully, they can be very dangerous for the end users and gases such as CO (carbon monoxide) need to be handled with special attention.

Devices powered by gas must be tested in accordance with the safety recommendations of the directives. These are crucial tests for all gas appliances to prove safety for the end users. Some of these appliances are used in everyday life and include household appliances as well as outdoor cooking and caterer appliances.

Laboratory for EMC and Safety can be tested against:

- » Impermeability of gas connectors
- » Mechanical and heat firmness
- » Heating load (Q_n – rated, Q_{min} – minimum value)
- » Quality of combustion
- » Rational energy usage
- » And more...



Laboratory can test equipment which is adapted to butane gas (G30), pressure 30 mbar; propane gas (G31), pressure 20 mbar; and natural gas (G20), pressure 20 mbar.

Our accredited tests include:

- » Barbecues and multi-purpose boiling burners for outdoor use
- » Independent hotplates – including those incorporated in the grills for outdoor use (EN 489, EN 497, EN 484)
- » Domestic cooking appliances burning gas (EN 30-1-1)
- » Gas appliances for catering equipment, according to the EN 203.

Common standards applied during the equipment testing:

EN 489

EN 497

EN 484

EN 30-1-1

Services aimed at high customer satisfaction



What makes us stand out from other laboratories

1

Speed

We do our best to adapt to the clients' needs and make sure that the testing time is optimized.

2

Expertise and knowledge

Our experts have more than 20 years of industrial experience with references from many areas.

3

Cost effectiveness

We offer our services at acceptable prices keeping the quality level.

4

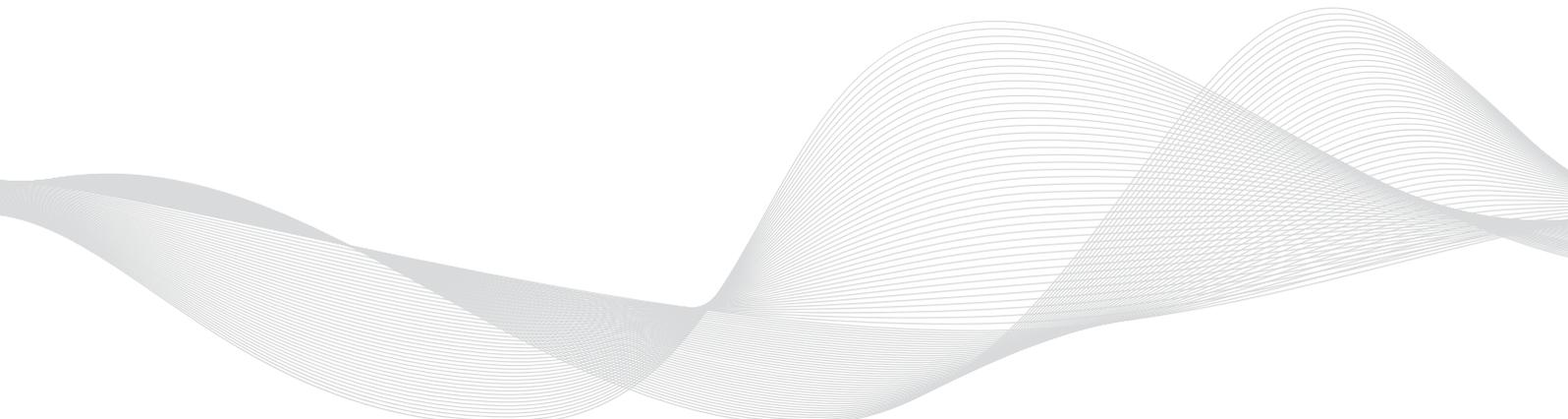
Response time

We guarantee to respond in max. 48 hours when we are contacted for quotations.

5

Single test location

All tests are performed at one location, which ensures quality and minimizes any delays.



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Contact us for more information!



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