EIFFAGE

TESEO

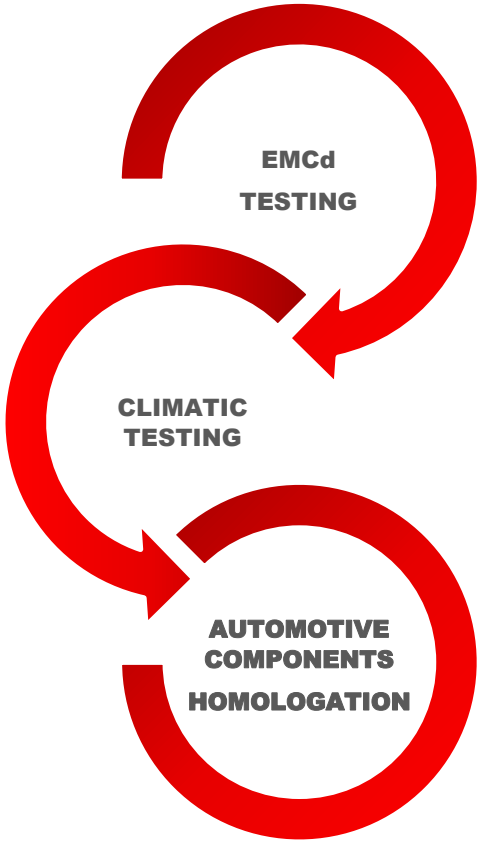
TESTING LABORATORY

Product Testing

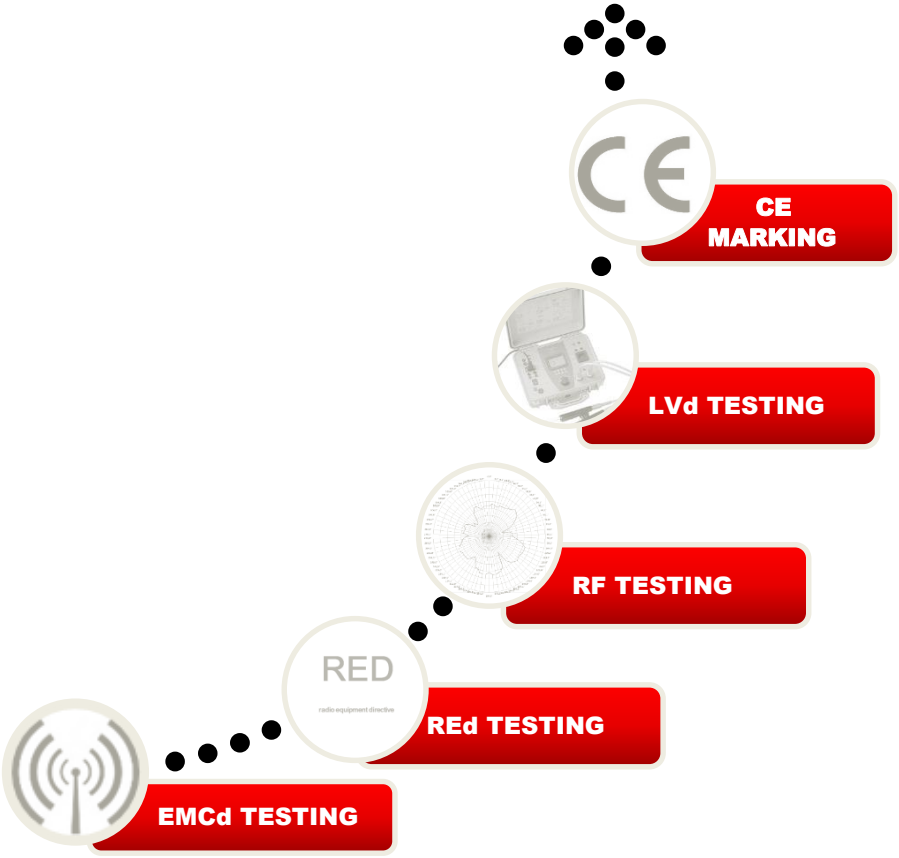
for any country homologation

TESTING LABORATORY

AUTOMOTIVE



CE MARKING



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EMCd TESTING

Electromagnetic Compatibility Directive 2014/30/UE

TESEO EMC LAB ACCREDITATION AND ACKNOWLEDGEMENT

Ministero dello Sviluppo Economico

Republic of San Marino
Authority for Homologation

APPRAISED TEST FACILITY

HOMOLOGATIONS – VALIDATION – TESTS

Our engineers are used with all the tests and measurements in RF and EMC fields which are necessary to obtain the homologation or the validation for your equipment or installations.

In our laboratories or on customer site, we answer to the requirements of many regulations and standards; covering the following markets : automotive, marine, railroads, defence, telecommunication, electronics

CE MARKING

We carry all of the measurements and tests necessary to obtain the declaration of conformity of your products, machines (test benches,...) and production lines. Our tests include: Emission and Immunity tests, either Conducted, and Radiated, Electrostatic Discharges, Electrical Fast Transient / Burst and Surges, Voltage Dips, Short Interruptions and Voltage Variations, Harmonics and Flickers, Exposure to E and H Fields and Stress Measurements

MAJOR STANDARDS USED BY THE LABORATORY

EN 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, EN 61000-6-1, EN 61000-6-3, EN 55011, EN 55032, EN 61326-1, EN 55014-1, EN 60601-1-2, EN 55024

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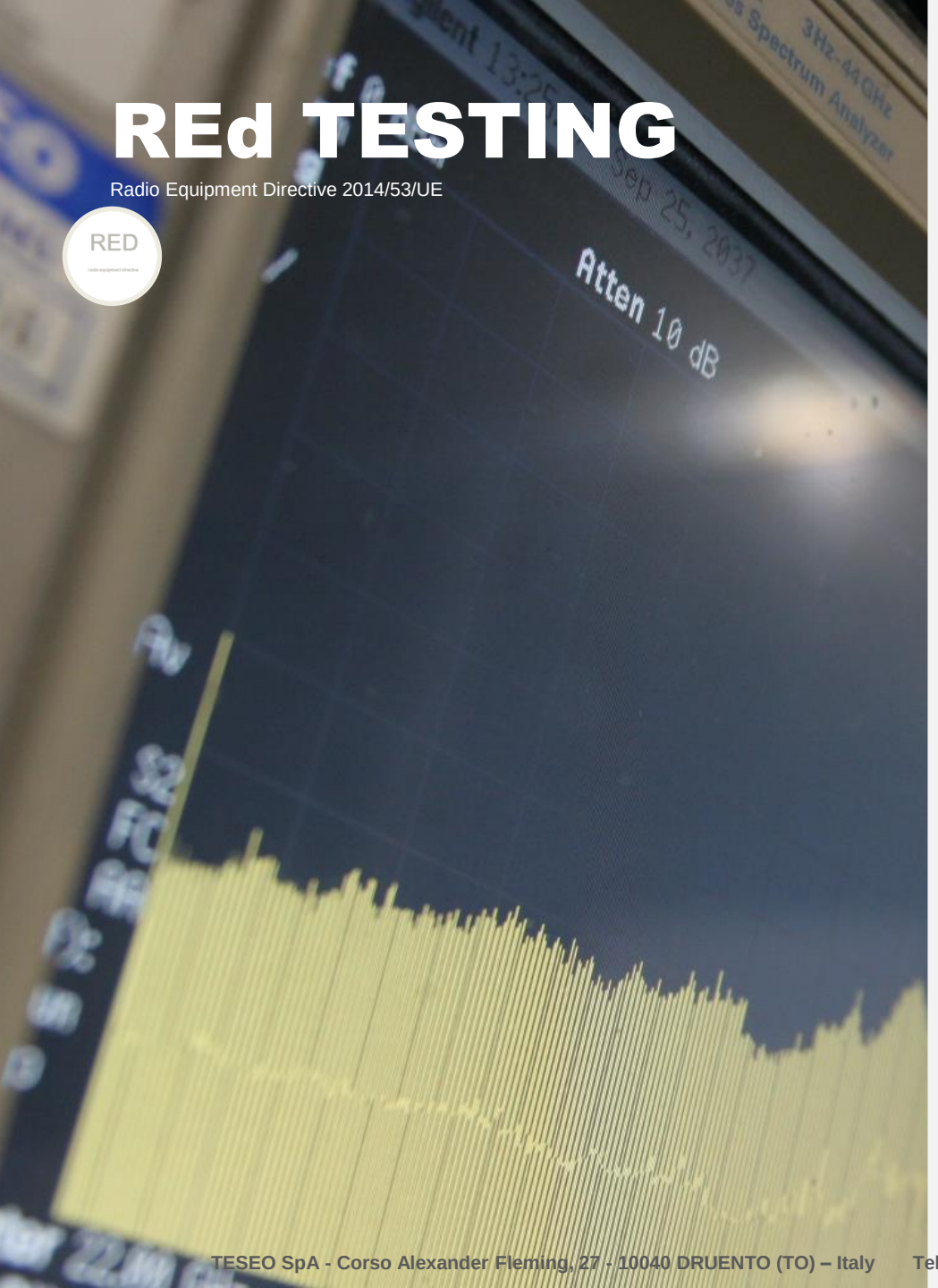

REd TESTING

Radio Equipment Directive 2014/53/UE

RED

EIFFAGE TESEO

EFFECTIVE USE OF THE SPECTRUM

The use of radio modules must be certified, unless they are previously certified. For this type of device we analysis the spurious, that must be within the limits of the ETSI reference standards. For exemple:

- ETSI 300 328 for Wi-Fi and BLE
- ETSI 300 220 for 25MHz/1000 MHz

HUMAN EXPOSURE TO RADIOFREQUENCY

Defines simple criteria for verifying the compliance of EUTs with human exposure limits to electromagnetic fields. Here some example of Standards:

- EN 62479
- EN 62311

SAFETY TESTING

Here some example of Standards:

- IEC 60335-1
- IEC 61010-1
- IEC 62368-1

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RF TESTING

RadioFrequency Testing

RADIOFREQUENCY

Our measurements cover both broadband
(up to 40 GHz) and narrowband (up to 18 GHz) and can respond to all types of civil or military antennas (TV, radio, telephone, radar surveillance) .

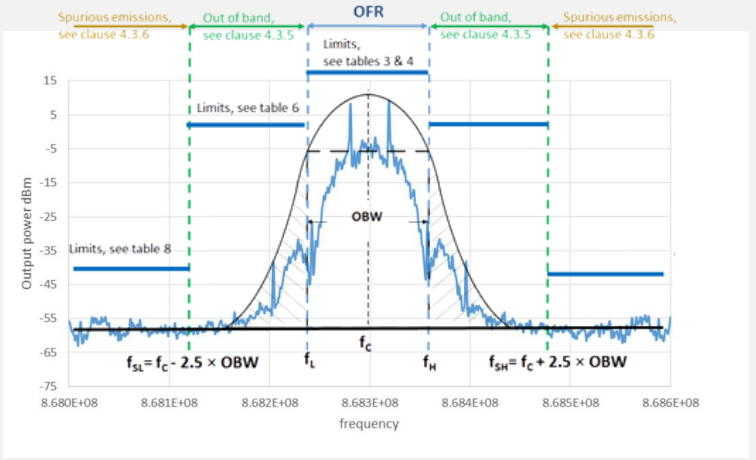
Our experts are able to advise and train you on the rules and methods of measurement.

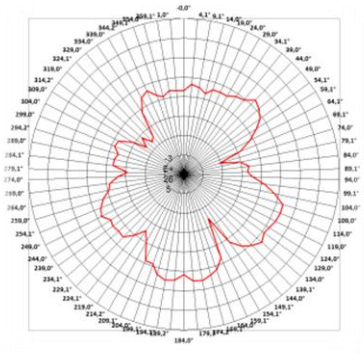
EFFECTIVE RADIATED POWER MEASUREMENT

Measurement according to ETSI Standards

- ETSI 300 220 (ISM Bands)
- ETSI 300 328 (Wi-Fi and Bluetooth)
- ETSI 301 511 (GSM Bands)
- ETSI 301 893 (5G Bands)
- ETSI 303413 (GPS)

Other ETSI Standards





ANTENNA PATTERNS

Circular Antenna pattern measurements from 10 kHz to 18 GHz:

- Passive and Active antennas
- Wireless Transmitting equipment
- Pattern measurements in Semi-Anechoic and Fully-Anechoic environment
- 2D and 3D patterns measurements

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SITE VALIDATIONS

EMC & Antenna Test Range Applications

For maintenance or validation of anechoic and semi-anechoic rooms and outdoor test sites, we offer Accredited and ISO 9001 Validations, as per the following procedures:

ISO 9001 SITE VALIDATION

Performed by our experts, using ISO 17025 procedures

- SE (Shielding Effectiveness) from 10 kHz to 18 GHz according to EN 50147-1:1997 and IEEE 299
- NSA (Normalized Site Attenuation) from 30 MHz to 1 GHz according to CISPR 16-1-4 and ANSI C63.4a
- FSNSA (Free Space Normalized Site Attenuation) from 30 MHz to 1 GHz according to CISPR 16-1-4 and ANSI C63.4a
- SVSWR (Site Voltage Standing Wave Ratio) from 1 GHz to 18 GHz according to CISPR 16-1-4
- FU (Field Uniformity) from 26 MHz to 18 GHz according to IEC 61000-4-3 Ed. 3.2b

ACCREDITED SITE VALIDATION

Performed by our Accredited Partner

- SE (Shielding Effectiveness) from 10 kHz to 40 GHz according to EN 50147-1:1997 and IEEE 299
- NSIL (Normalised Site Insertion Loss) according to Draft Document CIS/A/1307A/CC of CISPR 16-1-4
- NSA (Normalized Site Attenuation) from 30 MHz to 1 GHz according to CISPR 16-1-4 and ANSI C63.4a
- FSNSA (Free Space Normalized Site Attenuation) from 30 MHz to 1 GHz according to CISPR 16-1-4 and ANSI C63.4a
- SVSWR (Site Voltage Standing Wave Ratio) from 1 GHz to 18 GHz according to CISPR 16-1-4
- TL (Transmission Loss Measurement from 18 GHz to 40 GHz (not standardized)
- FU (Field Uniformity) from 26 MHz to 40 GHz according to IEC 61000-4-3 Ed. 3.2b
- ALSE Validation from 150 kHz to 3 GHz, according to CISPR 25
- AN (Radiated Ambient Noise) from 10 kHz to 18 GHz, according CISPR 32
- TI (Table Influence) from 200 MHz to 18 GHz, according to CISPR 16-1-4
- Reverberation chamber validation from 80 MHz to 40 GHz according to IEC 61000-4-21
- FAR validation of the emission and immunity setup, from 30 MHz to 18 GHz according to IEC 61000-4-22
- Free Space VSWR Validation from 400 MHz to 40 GHz according to J.S. Hollis, T.J. Lyon, L. Clayton: “Microwave Antenna Measurement”, Scientific-Atlanta Inc. and ANSI/IEEE Std. 149

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LVd TESTING

Low Voltage Directive 2014/35/UE

TESTING

Our laboratory can provide this kind of services, which are increasingly requested of those who produce electronic devices. We have the necessary equipment and trained personnel to ensure that the relevant regulations are followed

LOW VOLTAGE DIRECTIVE

The LVD covers health and safety risks on electrical equipment operating with an input or output voltage of between:

- 50 and 1000 V for alternating current
- 75 and 1500 V for direct current applies to a wide range of electrical equipment for both consumer and professional usage, such as:
- Household appliances
- Cables
- Power supply units
- Laser equipment
- Certain components, e.g. fuses

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CE MARKING

Declaration of Conformity of the European community

TECHNICAL SUPPORT

Our staff will always be available to help you in every step of marking your product.

We will also be available to follow you in case you need other marking (FCC, ...)

MARKING OF MEDICAL DEVICES

EMC tests according to:

- EN 60601-1-2

MARKING OF LED LAMPS

EMC tests according to:

- EN 55015
- EN 61547

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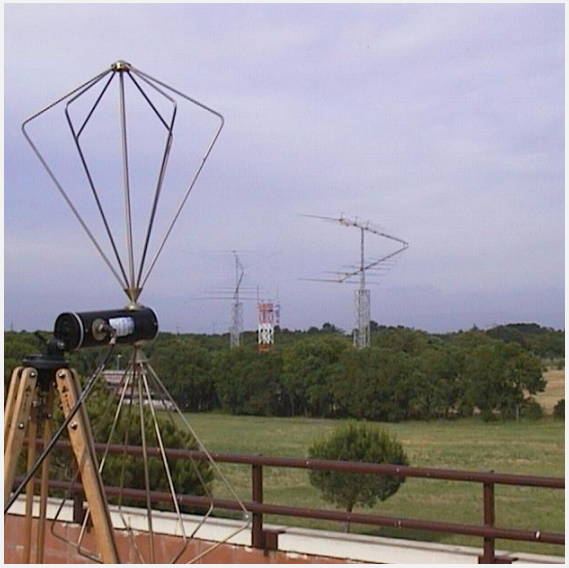
EMF MEASUREMENTS AND TEST ON SITE

Declaration of Conformity of the European community

Electromagnetic Fields Risk Analysis

measurement management for minimum health and safety requirements regarding the exposure of people and workers to the risks arising from electromagnetic fields

- Test on site and environmental monitoring activity of electromagnetic fields according to the international Directives
- Analysis of critical issues and implementation of the solution in the aim of mitigating disturbances



Tests on site for product homologation

Laboratory has the ability to perform tests to our customers, we have a mobile laboratory to certify customer products that are difficult to move like large machines and vehicles

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HOMOLOGATION AUTOMOTIVE COMPONENTS notification body

VCA and SAN MARINO TRANSPORTATION MINISTRY

AUTOMOTIVE TECHNICAL SERVICE

Notification Body

delegated authority of San Marino Transportation Ministry and qualified to perform the tests according to ECE regulations Vehicles, systems, components and technical units for vehicles.

- R10
- R85
- R97
- R100
- R116
- R136

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HOMOLOGATION AUTOMOTIVE COMPONENTS TUV APPROVED

AUTOMOTIVE TECHNICAL SERVICE

TUV sud - AUTOMOTIVE TECHNICAL SERVICE

Our laboratory has the correct and proper test facilities and trained staff to perform tests for TUV, according to the following test methods:

- Regulation R10.06 suppl.0
- Regulation R10.05 suppl.1
- Regulation R10.04 incl. Amend(s)
- Regulation R116
- Directive 97/24/EC Chapter 8
- Directive 2009/64/EC

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WORLD CERTIFICATION

WORLD CERTIFICATION

Leveraging on EIFFAGE Group global presence, TESEO can facilitate your export when you need a specific country homologation. Illustrative example are the quite known APAVE certification (France) or the FCC certification (USA) or the major northern Africa countries.

Contact us for any enqury about the country you need to homologate for your products.

CERTIFICATIONS SUPPORTED BY TESEO

apave Certification

FCC

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OTHER SERVICES AND SUPPORTS

CLIMATIC TEST CHAMBER

In our Climatic Chamber is possible to perform thermal cycles for RF and EMC validations.

- Temperature and Humidity controlled chamber
- 7/24 programmable thermal cycles
- EMC test for components validation at high & low temperatures
- From -40°C to +180°C capability
- From 5% to 100% HR capability
- 800 x 800 x 800 mm chamber dimensions

EXTREMELY LOW FREQUENCIES (ELF)

Measurements under extreme solicitation at Low Frequencies, fields beyond 10kV/m and 300 A/m at frequencies from 50 to 5000 Hz;

- Parallel plates
- Helmholtz coil

ENVIRONMENTAL MEASUREMENTS

We can perform environmental checks to verify the safety of your employees in electromagnetic fields in the workplace.

MORE MEASUREMENT CAPABILITIES

IFR measurement of Radome Panel up to 18GHz

Scattering Parameters measurements up to 18GHz

Pulsed Signals, ESD, Voltage interruptions, cranking, Oscillatory waves

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Product Testing for any country homologation

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