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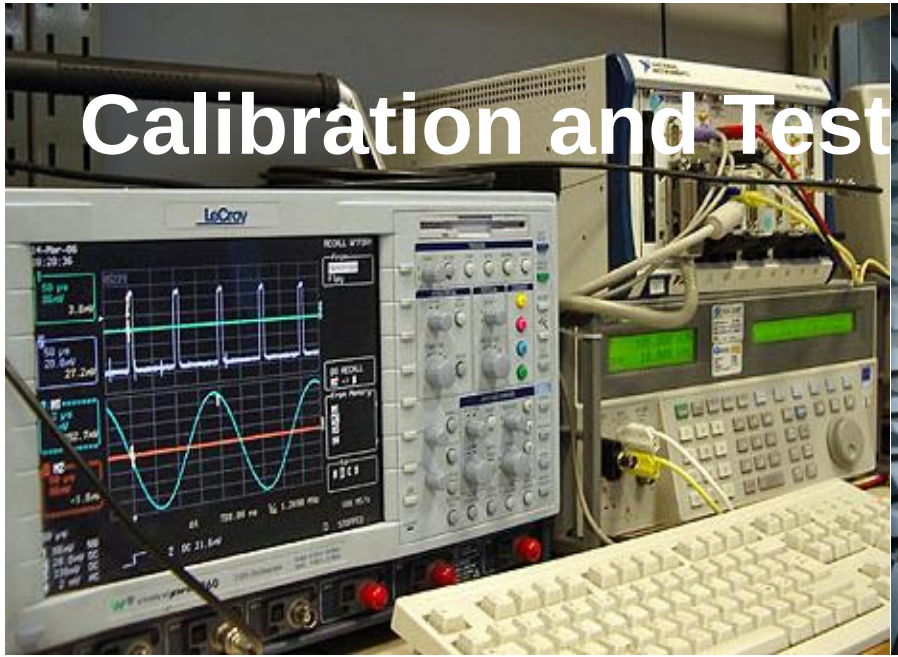

Calibration and Testing

Service book

Calibrations & metrology

CE marking

Radio Frequency testing Laboratories

EMC laboratories Maintenance & Validation

Thermal Cycles testing

International approvals

More service options

EIFFAGE TESEO

Calibrations & metrology

EIFFAGE TESEO

Calibration of mechanical and environmental quantities

Leveraging on EIFFAGE Group Resources and trusted National end International Partners, TESEO offers a full ISO 9001 and ISO 17025 Accredited calibration Service for mechanical and environmental measuring instruments, in order to serve the Customer's needs wit a 360° service.

ACCREDIA accredited calibrations UNI CEI EN ISO/IEC 17025:2018

Established in 1997, the TESEO metrological laboratory was accredited by the national metrological institute in 1998 for calibration of RF quantities, and in 2003 for electromagnetic field calibrations.
Equipped with two metrological rooms with different temperature-controlled levels, the accredited calibration centre is today able to perform calibrations and checks on most of key instruments for EMC applications.

Calibrations according to the UNI EN ISO 9001:2015 quality

Operating in ISO9001 and ISO17025 quality system, TESEO uses for its calibration activities first-line and second-line standards and validated calibration procedures allowing to perform calibrations and checks on measurement fields ranging from DC to 40GHz, for power levels up to 10kW and voltages over 30kV.

UNI CEI EN ISO/IEC 17025:2018 ILAC Signatory Accredited Calibrations

Further than accredited calibration performed in his accredited calibration laboratory, TESEO offers a wide range of accredited calibrations covering almost all the electric and electronic quantities, thanks to exclusive collaboration with national and international accedited partners.

On-Site Calibrations according to the UNI EN ISO 9001:2015

Thanks to a second-line standards equipment, TESEO can perform calibrations directly at customer's facility.Thanks to this service, the calibration process becomes more safe, avoiding to ship delicate equipment by courrier, faster, by booking exactly the days for calibrations, as well cheaper, especially for medium/large instrument stocks.

NATIONAL INSTRUMENTS calibrations

For years partner of national instruments as Alliance Member, TESEO extends the services on NI products with calibration and adjustment of boards and measurement - acquisition systems. The TESEO calibration laboratory is equipped with NI validated procedures for calibration and readjustment

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Electrical Quantities

Quantity	ISO 17025 Accredited	ISO 9001 Permanent Lab	ISO 9001 On-Site
AC and DC Voltage	✔	✔	✔
AC and DC Current	✔	✔	✔
Resistance	✔	✔	✔
Capacitance		✔	✔
Inductance		✔	✔
Time and Frequency	✔	✔	✔
Pulses and Transients	✔	✔	
Electrostatic Discharges	✔	✔	
Voltage/Current Ratio		✔	✔
Power Factor		✔	✔
LF Power	✔	✔	✔
HF and MW Power	✔	✔	✔
RF Attenuation	✔	✔	✔

Quantity	ISO 17025 Accredited	ISO 9001 Permanent Lab	ISO 9001 On-Site
Gain for Amplifiers		✔	✔
Harmonic Distortion		✔	✔
HF Impedance	✔	✔	✔
VSWR	✔	✔	✔
RF Group Delay		✔	✔
Antenna Factor	✔	✔	
Antenna Gain	✔	✔	
Electromagnetic Field	✔	✔	
Flux Density	✔	✔	
AM / FM Modulation		✔	✔
RF Current for Clamps	✔	✔	✔
Optical Power	✔	✔	
Optical Attenuation	✔	✔	

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CALIBRATION ACCREDIA

00137

Signatory of EA and ILAC Mutual Recognition Agreements

Mechanical and Environmental quantities

Quantity	ISO 17025 Accredited	ISO 9001 Permanent Lab	ISO 9001 On-Site
Temperature (Thermocouple)	✓	✓	
Temperature (Thermometric Chain)	✓	✓	
Humidity	✓	✓	
Dew Point	✓	✓	
Air Temperature	✓	✓	
Air Speed	✓	✓	
Pressure	✓	✓	
Flow Rate (Air, Liquid, Gas)	✓	✓	
Particle Quantity		✓	
Climatic Cell validation	✓	✓	✓
Toxic Gas Analysis		✓	
Thermo-Cameras		✓	

Quantity	ISO 17025 Accredited	ISO 9001 Permanent Lab	ISO 9001 On-Site
Torque	✓	✓	
Force	✓	✓	
Lenght and 2D dimensional	✓	✓	
3D dimensional	✓	✓	
Weight and Mass	✓	✓	✓
CNC validations			✓

We also leverage on International Partners

Austrian Accreditation

Federal Republic of Germany Accreditation Body

Dutch Accreditation Council

Slovenian Accreditation Body

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CE marking

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The Laboratories

TESEO S.p.A. is equipped in his facility in Druento (Turin) with a testing laboratory having a CISPR 16-1-4 compliant semi-anechoic chamber with internal dimensions of 9x6x6 meters, with door 2.1 meters high and 1.8 wide, equipped with a mast antenna and a turntable. Aside, a shielded room is available, as well circumscribed areas for LVD/Safety testing and Climatic Testing.
All tests will be performed using Laboratory equipment subject to management under Quality Standard according to the Company and Laboratory Certifications.

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

Homologation – 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

Major Standards managed by the Laboratories

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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EMC Testing Laboratory

Avionic	**RTCA DO 160**
	Section 18 (Audio Frequency Conducted Susceptibility)
	Section 19 (Induced Signal Susceptibility)
	Section 20 (Radiated and Conducted RF Susceptibility)
	Section 21 (Emission of Radio Frequency Energy)
Military	**MIL 461**
	CE102, conducted emissions, power leads.
	CE106, conducted emissions, antenna terminal.
	CS114, conducted susceptibility, bulk cable injection.
	CS118, personnel borne electrostatic discharge.
	RS103, radiated susceptibility, electric field

Automotive	**Immunity**
	ISO 11451-2
	ISO 11452-2
	ISO 11452-4
	ISO 11452-8
	ISO 11452-9
	Emissions
	CISPR 25
	Pulses
	ISO 7637-2
	ISO 7637-3
	ISO 10650-2
	ISO 10605
	Omologations
	ECE R10
	ECE R85
	ECE R97
	ECE R100
	ECE R116
	ECE R136

Industry and Medical	**Immunity**
	EN 61000-4-3
	EN 61000-4-6
	EN 61000-4-8
	EN 55014-2
	EN 60601
	Generic Standards 61000-6-1 & 61000-6-2
	Emissions
	EN 55014-1
	EN 55011
	EN 55015
	EN 55032
	EN 60601
	Generic Standards 61000-6-3 & 61000-6-4
	Pulses
	EN 61000-4-2
	EN 61000-4-4
	EN 61000-4-5
	EN 61000-4-11
	Harmonic / Flicker
	EN 61000-3-2
	EN 61000-3-3
Railway	**EN 50155**
Marine	**NAMUR NE21**

Other Standards and special specifications upon request and feasibility check

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RED Testing Laboratory

TELECOMMUNICATION RADIO DIRECTIVE

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 303 413 (GPS)
	Other ETSI STD Upon request

LVD – Low Voltage Directive

SAFETY TESTING

Safety	IEC 60335-1
	IEC 61010-1
	IEC 62638-1
	EN 60204-1
	EN 60950
	EN 50191

Human Exposure to RF fields

MEASUREMENTS

EMF / SAR	EN 62479
	EN 62311

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Radio Frequency Testing

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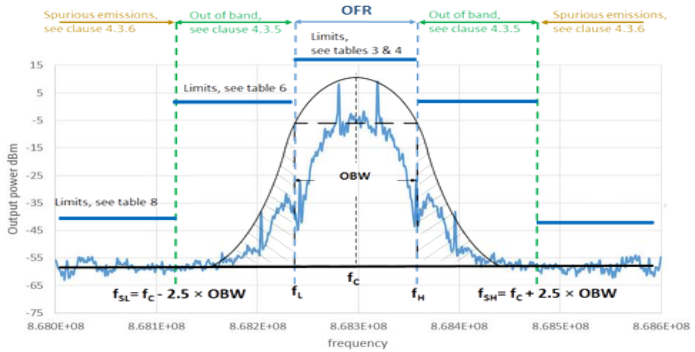
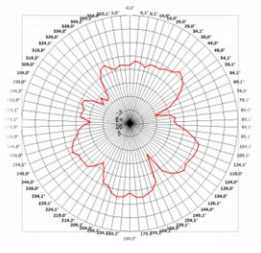
EFFECTIVE RADIATED POWER MEASUREMENT



ANTENNA PATTERNS

2D Pattern	Circular Antenna pattern measurements from 10 kHz to 18 GHz
	Passive and Active antennas
	Wireless Transmitting equipment
	Measurements in Semi-Anechoic and Fully-Anechoic environment



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.

EIFFAGE TESEO

EMC laboratories
Maintenance & Validation

EIFFAGE TESEO

Sites Validation

MAINTENANCE AND VALIDATION OF ANECHOIC AND SEMI-NAECHOC CHAMBERS, OPEN AREA TEST SITES

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 in collaboration with Accredited Partners

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

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

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

FAR validation of the emission and immunity setup, from 30 MHz to 18 GHz according to IEC 61000-4-22

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Thermal Cycles testing

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Climatic Tests

Standards	
	Temperature Tests
	MIL-STD 202 E, Met. 108 A
	MIL-STD 311 A, Part 112.1
	MIL-STD-810G Met. 502.2 & 501.2
	MIL-STD 883 C, Met. 1008.2
	MIL-E 5272, Test 4.2 & Met. 4.1
	DIN 40046 Test A & Test Nb
	IEC 68-2-1Test A, IEC 68-2-2, Test B, IEC 68-2-14 Nb
	BS 2011, Part 2, Test A & Test B & Part 2. Test Da
	Climatic Tests
	MIL-STD 202 E, Met. 103 B & Met 106 D
	MIL-STD 311 A, Part. 105.1
	MIL-STD 750 B, Met. 1021.1
	MIL-STD 810, Met. 507 Proc. 1-2-3
	MIL-STD 883 C, Met. 1004.4
	DIN 40046
	DIN 50014
	DIN 50016
	DIN/IEC 68-2-30 DB
	DIN/IEC 68-2-56
	IEC 68-2-3, Test Ca
	IEC 68-2-4
	IEC 68-2-38

Capabilities	
	Useful capacity: 557 litres
	Useful dimensions (WxDxH): 850x733x895 mm
	Temperature range: –40°C to+180°C
	Heating Speed: 4,5°C/min max
	Cooling speed: 4°C/min
	R.H. range: 10% to 98%

Testing	
	EMC test for components validation
	7/24 Thermal cycles
	Endurance
	Cranking
	Simulation

EIFFAGE TESEO

International approvals

EIFFAGE TESEO

EU and International Certifications

Export in any country regardless the specific homologation you may need.

Leveraging on EIFFAGE Group global presence, TESEO can facilitate you in obtaining most of the major homologation.

Illustrative example are APAVE certification (France) or the FCC certification (USA) or the major northern Africa countries.

CERTIFICATIONS SUPPORTED BY TESEO

apave Certification

CE

FC

EIFFAGE TESEO

More service options

EIFFAGE TESEO

Additional Services

get what you need

Easy Booking	Minimize your calibration or testing time with Easy Booking, reserve your our laboratory in a simple manner.
Fast Track Calibrations (24H turnaround)	When applicable, upon request we can grant the calibration time in maximum 24 hours (shipping time excluded)
Pick-Up and Delivery by our TESEO personnel	Let us manage your instruments pick-up and return delivery after calibration. Handling and transportation will be fully insured and performed exclusively by our personnel
Recall before expiry date	Forget about expiry dates, we will remind you the expiry calibration date of your equipment automatically.
Framework management contracts	Yearly or multi-yearly, optimize your operations management (costs and time) with a granted turn-around time

EMC Laboratories Start-Up	On-Site consulting and support for new EMC laboratories settle and start-up
EMC Testing Application Training	Dedicated on-the-job training for EMC operators, oriented to learning of Set-Up and execution of EMC test
Calibration Laboratories Start-Up	On-Site consulting and support for new Metrology and Calibration laboratories settle and start-up
Metrology Training	On-the-job training for Calibration Laboratory operators, oriented to understand how to perform and manage calibrations
ISO 17025 Training	ISO 17025 Standard training in collaboration with qualified Partners, and final issuance of recognized attendance & profit declaration

EIFFAGE TESEO

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ÉNERGIE SYSTÈMES