



# Siepel

Premium  
products  
and solutions



Antenna  
Measurement



Cyber Security  
& data protection



Electromagnetic  
Compatibility  
(EMC)



Measurement Services

[www.siepel.com](http://www.siepel.com)

# Siepel at your service

Founded in 1986, Siepel is an independent French manufacturer of premium shielding, absorbers and anechoic chambers continuously focusing on innovation. All products and services offered, either as a standard or customised design, from supplying components to turnkey deliveries, fulfill high-performances criteria for demanding customers. Siepel is a supplier of most international EMC and antenna test systems providers. Our goal is to offer affordable premium solutions for challenging fields such as space, aeronautics, defence, automotive, industry and radio / telecom.



## Test chambers

Siepel stands out through an optimised design of EMC chambers according to the type & size of equipment under test and the relevant standards; For leading antenna measurement systems providers, we supply anechoic chambers specifically adapted to Near / Far-field measurements including interfacing with test instrumentation.



### ANTENNA MEASUREMENT

- Near-Field / Far-Field / Compact Ranges
- IoT / 5G
- Radar Cross Section (RCS)
- HardWare-In-the-Loop (HWIL)
- Other microwaves radiated field measurements



### ELECTROMAGNETIC COMPATIBILITY (EMC)

- Pre-compliance or compliance testing of commercial products, automotive components, aeronautic and defence devices according to applicable standards.
- High-Intensity Radiated Field tests (HIRF)
- Reverberation chambers for generation of high E-field (CW & pulse)

## Secure enclosures

To protect data and sensitive meetings from eavesdropping and Intentional Electromagnetic Interference (IEMI), Siepel manufactures high-performances security rooms



### CYBER SECURITY & DATA PROTECTION

- Electromagnetic shielding protection of IT's & data centers: our professional skills are recognised through a France Cybersecurity Label obtained in 2016 for our high-performances Tempest shielded rooms.
- Secure meeting rooms providing the highest electromagnetic and acoustic protection
- Individual mobile shielding devices (pouches and secure boxes).
- In the field of security, we provide Tempest zoning measurements according to SDIP 27 and other security measurements on request. In 2017, an additional France Cybersecurity label was awarded to Siepel for our shielding effectiveness measurement.



## Services



### MEASUREMENTS

- *Siepel measurements* performs accredited measurements of shielded rooms & chambers, any brand or type worldwide according to ISO/IEC 17025 (accreditation 1-6220, scope available on [www.cofrac.fr](http://www.cofrac.fr)). Thanks to the ILAC / COFRAC agreement, our accredited measurements are recognised throughout the world.
- Siepel has internal skills and equipment to perform overall measurements related to EMC & antenna chambers.

### SUSTAINABILITY

- Siepel has the expertise to inspect and upkeep any shielded room / anechoic chamber, through preventive maintenance contracts or curative interventions.
- Siepel also offers complementary services regardless of the type or brand, such as refurbishment, upgrade of chambers to new standards or transfer of existing installations.



# Main milestones



**1986** - Creation of Siepel in France

**1988** - Introduction of secure power supply for Tempest application

**1990** - Elevating fully rotating dielectric turntable  
& ceiling mounted mobile antenna mast

**1991** - Introduction of multilayer broadband absorbers

**1992** - Acquisition of Alstom electromagnetic  
absorbers production unit

**1993** - Introduction of plastic painted absorbers

**1994** - Fully anechoic broadband RCS chamber

**1996** - Removable internal mounting for ferrite tiles

**2004** - Fully compliant 10-meter EMC chamber installed in India

**2007** - Design, manufacturing and commissioning of  
a 105-meter long HIRF fully anechoic chamber

**2008** - Large extension of production workshops

**2009** - Publication of the first technical handbook  
dedicated to reverberation chambers

**2014** - First EMC laboratory in Africa including  
test equipment and software

**2017** - ISO/IEC 17025 accreditation for *Siepel Measurements*

**2017** - Extension of absorbers production capacity

**2018** - Opening of Asia Pacific representation office

**2019** - National Cybersecurity silver award for new  
secure box, acoustic and RF cabinet

▼ **2020** - New coating & range of absorbers (SEA)

# Siepel assets

Siepel is characterised by its organisation and industrial site: a 10,000 m<sup>2</sup> spot in western France gathering technical and human resources. The workforce of 60+ employees in R&D, production, design office... is organised in project management mode to provide a high-quality support & reactivity until completion of our customers projects. This richness of versatile skills, and a strong experience worldwide allow Siepel to manage projects on a large scale, from portable items to large and complex facilities. Acting as prime bidder or sub-contractor, Siepel is used to interfacing with construction companies and systems suppliers.

## TECHNICAL FACILITIES:

### Absorbers workshop:

- Manufacturing of a wide range of absorbers including pyramidal for EMC and microwave / antenna measurement or high power. Other specific absorbing materials are available, such as narrowband, weatherproof, multilayer....
- Industrial process enabling production of large quantities associated to high performances.

### Shielding workshops:

- Production of panels & specific feedthroughs.
- High-performances doors: swinging, sliding, manual, automatic, from small to large dimensions (single, double and triple-leaf).

**In-house microwave test facility:** coaxial line, anechoic and reverberation chambers.

## IN-HOUSE TECHNICAL SKILLS:

**With highly qualified technicians, Siepel offers high-value engineering & production expertise**

**R&D:** research of leading-edge solutions, consideration of regulatory updates, new developments.

**Technical departments:** drawing office, project management, procurement, manufacturing, logistics, installation & support services.

**Siepel Measurements** accredited ISO/IEC 17025 (accreditation 1-6220, scope available on [www.cofrac.fr](http://www.cofrac.fr)):

for our customers, it guarantees the independence and impartiality of our measurement laboratory. We can test any brand of chamber wherever & provide an accredited report.

**Quality:** to deliver a high level of quality for products and services, Siepel implements a continuous improvement approach based on ISO9001 standard.



ACCREDITATION  
N° 1-6220

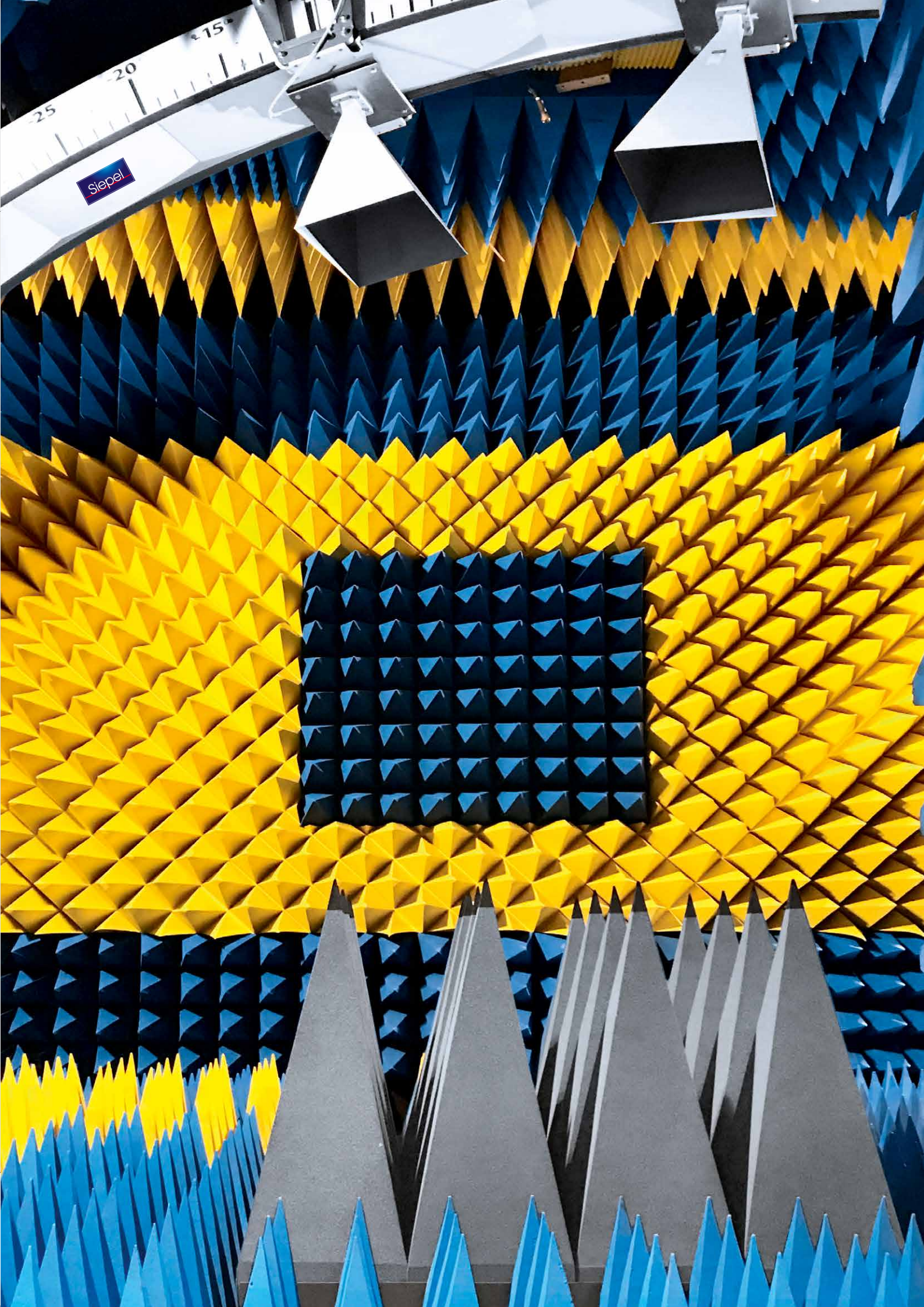
SCOPE AVAILABLE ON  
[WWW.COFRAC.FR](http://WWW.COFRAC.FR)

## SALES ORGANISATION:

Siepel policy aims at being as close as possible to customers' needs from pre-sales to project completion. The sales department is organised with a team of several area managers supporting a network of 30 distributors / agents worldwide.

Asian customers are supported by our Asia-Pacific office providing sales and technical support at pre-sales and project management levels.





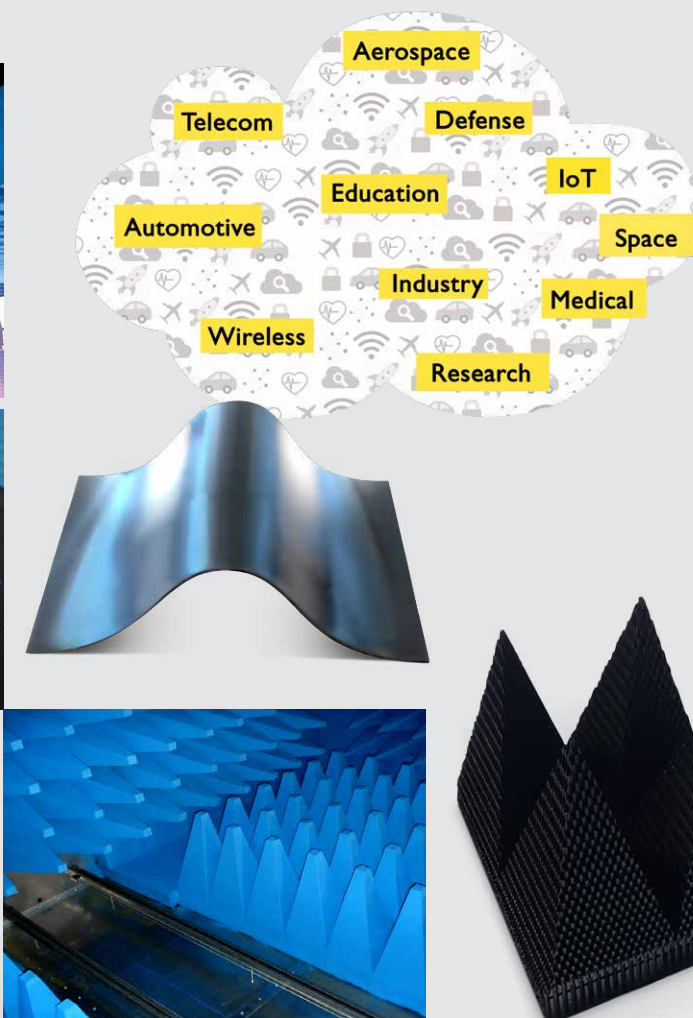
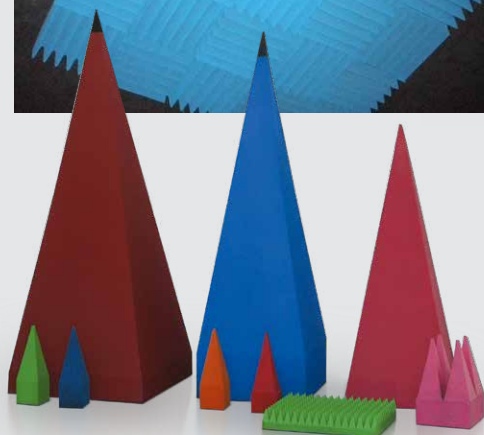


# Applications Fields & Products

	Antenna measurement	EMC	Cyber security
Siepel Electromagnetic Absorbers (SEA)	X	X	N/A
Anechoic chambers	X	X	N/A
Shielded rooms	X	X	X
Reverberation chambers	X	X	N/A
Secure rooms	N/A	N/A	X
Mini / mobile rooms	X	X	X
Measurement services	X	X	X
Supply of test equipment & software	X	X	N/A

See our website [www.siepel.com](http://www.siepel.com)

N/A : Not Applicable



# Siepel Electromagnetic Absorbers (SEA)

## A WIDE RANGE OF PREMIUM ABSORBERS DESIGNED AND MANUFACTURED IN-HOUSE

All below models are used in new facilities or for refurbishment & upgrade.

### For EMC chambers (EMI / EMS testing), 30 MHz to 110 GHz

**SEA-FE**, a series of ferrite tiles : flat absorbers used inside EMC anechoic chambers, from 30 MHz up to 1 GHz.

**SEA-HY & SEA-HYT**, a series of pyramidal and truncated absorbers designed to be installed over ferrite tiles to create hybrid EMC absorbers. Can be used over existing ferrites chambers.

**SEA-PM**, a series of broadband pyramidal absorbers dedicated to. testing automotive, aeronautic, space and defence equipment.

**SEA-PMT**, a series of truncated SEA-PM absorbers made to optimise the usable space inside anechoic chambers with a compliance to defence and aeronautic standards.

### For microwave & antenna measurement, 80 MHz to 110 GHz

**SEA-PM**, a series of high-performance broadband pyramidal absorbers adapted to fully anechoic chambers for antenna measurements, Radar Cross Section and compact ranges.

**SEA-HP**, a series of high-power pyramidal absorbers for areas subject to high power handling (up-to 20 kW/m<sup>2</sup> CW) they can withstand high temperatures resulting from the generation of high fields.

**SEA-WM**, a series of wedge-shape absorbers with increased efficiency at incidence angles above 50°, they drive they drive back the waves to significantly reduce reflections inside compact ranges and RCS chambers.

**SEA-WW**, a series of walkway absorbers used to create a pathway leading to and from the EUT in full anechoic chambers.

**SEA-3LM/SEA-5LM**, a series of 3 or 5-layer flat absorbers used to cover all metal surfaces masts and antenna bases. They reduce coupling effects between antennas and offer high absorption with thin thicknesses.

### For specific applications, 200 MHz to 24 GHz

**SEA-WP**, a series of sealed weatherproof absorbers used for outdoor applications between 200 MHz and 18 GHz.

**SEA-SI & SEA-PU**, a series of thin and flexible narrowband resonant absorbers made of elastomer resin and a magnetic load with indoor and outdoor environments. Both series can be tuned at any frequency between 1.5 and 24 GHz.

Contact us to discuss about your specific absorbers needs.

Detailed performances and characteristics for each series can be found on their dedicated datasheets.

## OUTSTANDING FEATURES

### Power handling

All pyramidal, truncated and wedge SEA series are able to withstand up to 2 kW/m<sup>2</sup> or 800V/m in CW mode. As for SEA-HP series, they can handle up to 20 kW/m<sup>2</sup> in CW!

### NEW

### Unique coating

Our LIV coating is a ground-breaking revolution in absorbers painting. It offers unrivalled brightness and softness combined with the best memory foam on the market.

It offers the chance to have a unique chamber with a wide color pallet to match your company colors. Our LIV solution will save you from using unreliable and fragile caps/tapers over the absorbers.

### Clean-room conditions

All coated absorbers are classified ISO class 4 (ISO 14644-1).

### Fire rating

Absorbers are compliant with international fire retardant standards such as DIN 4102 class B2 / NRL 8093 tests 1,2,3, ISO 11925-2 class E.

### Warranty

Guaranteed reflectivity performances are given for a 25-year minimum lifetime.

### Environment

Siepel fulfills REACH directive by identifying with its suppliers any potential chemical Substances of Very High Concern (SVHC) as listed by the European Chemicals Agency (ECHA).

Siepel policy is to avoid the use of SVHC in its articles. As of today, Siepel Electromagnetic absorbers are free of SVHC.

RoHS directive is not applicable to our absorbers. However, we make sure that the items purchased by Siepel comply with this Directive.

# Shielding Solutions



## SHIELDED ROOMS

Siepel offers several types of high-performances shielding with a minimum effectiveness of at least 120 dB. The range includes modular-, copper foil-, welded steel shielding technologies for EMC, antenna measurement and data protection.

### Advantages:

- No limitation or constraints in terms of dimensions.
- Integration of all feedthroughs.
- Modular structure installed from inside: space saving.
- Forthcoming evolutions welcome: enlargement, moving...

An architectural flexible coating with an easy set-up is proposed for cyber security.

## HIGH-PERFORMANCE DOORS

Siepel manufactures any size, any type of shielded doors, one of the key parts of shielded enclosures. Our doors are suitable for a wide audience from a simple single-leaf personnel door to a complex and unique zero-sill triple-leaf door; Sold as separate items, these doors can be installed on any type of shielding.



## SHIELDED CABINETS & RACKS

As a shielding manufacturer, we offer a wide variety of tailor-made cabinets for EMC & antenna testing.

These shielded cabinets enable to isolate the equipment to be tested and can be fitted with various feedthroughs (window, data line, gloves, ...). These mini rooms are suitable for an unlimited number of applications such as IoT, 5G or mobile phone testing.

Siepel also proposes shielded and TEMPEST racks (19" and 22",...) to protect several equipment simultaneously in a shielded enclosure.

### Product Regulation compliancy

Siepel fulfills its environmental obligations as REACH and ROHS directives, as well as other applicable European directives and, if relevant, any other foreign regulations.

### Chamber compliancy verification

After the installation of your chamber and on a regular basis, *Siepel Measurements* can perform such a verification and proposes a wide selection of measurements, please refer to our datasheet for more details.

## ANECHOIC CHAMBERS

As a manufacturer of shielding & absorbers, **Siepel offers high-end performance anechoic chambers for antenna measurement and EMC** including all requested interfaces (HVAC, smoke detectors, fire extinguishing, gas analysers, etc).

For EMC chambers, we supply a ready-to-use test facility including associated instrumentation, turntable, dynamometer, antenna mast, CCTV. For more details, please refer to our brochure "How to choose a Siepel EMC anechoic chamber?".

Microwave and antenna measurement chambers:

- For Near-Field systems, we integrate scanners, positioners and instrumentation for planar, spherical, cylindrical systems.
- For Compact Range chambers (CATR), we supply and interface reflectors and positioners.
- For HWIL chambers, we collaborate with a third-party supplier to integrate target simulation systems & flight motion simulator.

## REVERBERATION CHAMBERS

A reverb chamber is a shielded metallic enclosure whose resonance conditions are modified in a random fashion with a stirrer. The multiple reflections of incident waves generate a high-field strength using constructive interference. The electromagnetic environment created by this mode-stirring is statistically isotropic and homogeneous on a full rotation of the stirrer.

Reverberation chambers allow to operate immunity and emission tests in compliance with all international EMC standards on automotive, military, aeronautics and civil fields.

**Siepel provides turnkey systems including software** (in French, English, Russian) **and test equipment.**

A reverberation chamber gives two main advantages and allows:

- Generation of high E-field for a limited cost with low / medium power amplifiers.
- Illumination of a device under test with electromagnetic radiation from any direction and polarization.



# Data protection Solutions



## SECURE ROOMS

Siepel designs and manufactures **secure enclosures with electromagnetic shielding and soundproofing dedicated to ensure confidentiality of sensitive meetings**. They also prevent IT & communication devices from **eavesdropping / recovery of compromising signals** (electromagnetic protection).

Secure rooms are intended for high-level decision-makers such as diplomats, Defence authorities, CEOs, ...

### Main advantages are:

- Dual protection: Electromagnetic shielding & acoustic insulation;
- Modular self-standing structure, independent from host building;
- Easy to install & remove;
- Office type finishing: pleasant lighting and friendly comfortable environment;
- Customisable dimensions;
- High reactivity thanks to Siepel in-house manufacturing.



## MOBILE ENCLOSURES

Highly confidential meetings can be threaten by mobile phones due to unexpected recording and transmission. Siepel presents a range of secure devices:

### Shielded pouches

A complete line of highest quality **shielded pouches enables the prevention of unwanted wireless in / out RF & Microwave emissions**: as soon as the device is inside the pouch, communications are no longer possible. They are used:

- **To secure handheld electronic devices** (laptops, tablets, smartphones, GPS) during sensitive meetings;
- **For all applications needing to stop the electronic devices communications in real time**, such as for Forensic purposes.

### Advantages:

- Lightweight and flexible, **daily use resistant**;
- **Several sizes available**, depending on device's dimensions.



### Secure Box

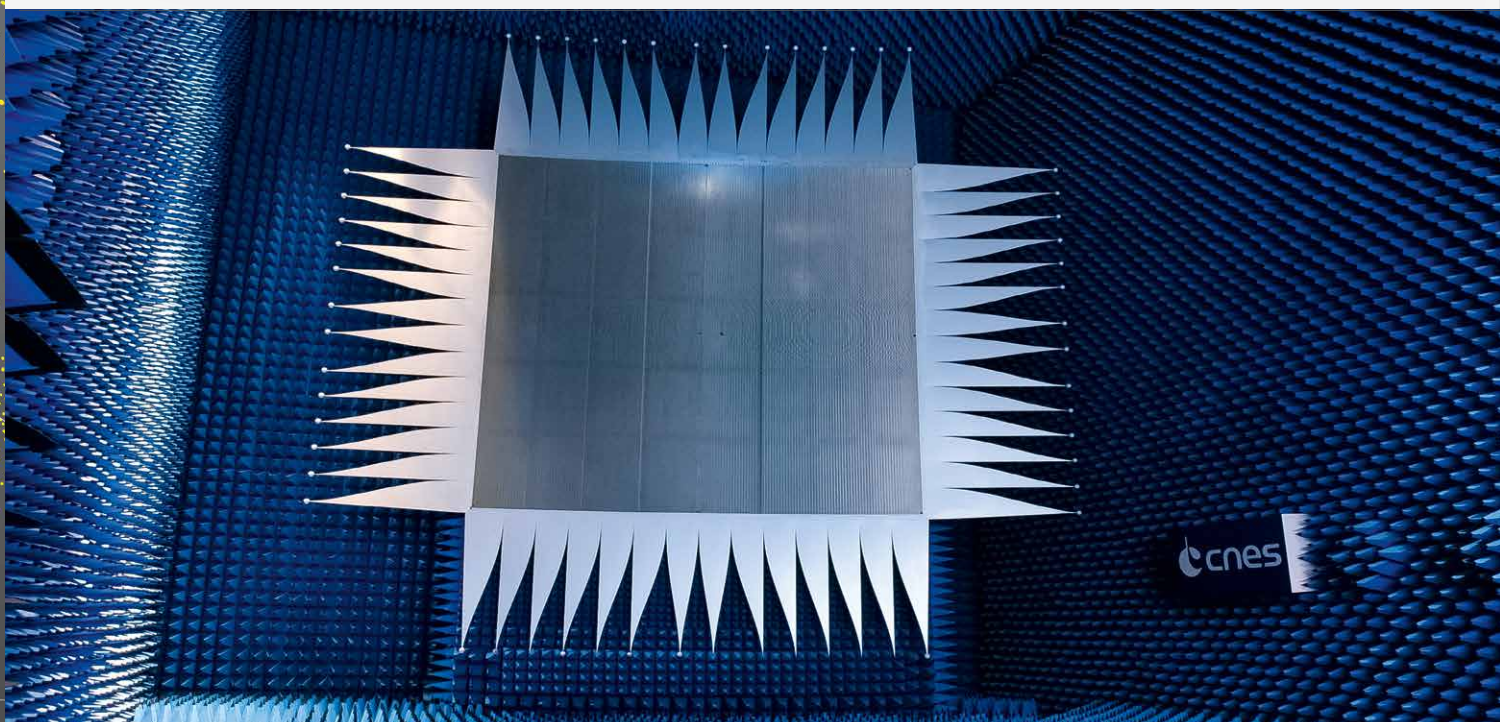
To prevent conversations recording and eavesdropping, Siepel offers a **high-performances secure box** which disconnects the device of GSM, Bluetooth and WIFI networks while making it impossible to record a conversation in the room.

### Advantages:

- **Strong comprehensive electromagnetic and acoustic protection**;
- **Can host several communication devices**;
- **Easily movable**.



# Services



## MEASUREMENTS

Our dedicated independent department, *Siepel Measurements*, performs ISO/IEC 17025 accredited measurements upon request (accreditation 1-6220, scope available on [www.cofrac.fr](http://www.cofrac.fr)).

Thanks to the ILAC / COFRAC agreement, these accredited measurements are recognised worldwide. It covers the following measurements on shielded rooms & anechoic chambers:

- **Shielding effectiveness** (10 kHz - 40 GHz) in accordance with EN50147-1 standard;
- **Normalised site attenuation (NSA)** (30 MHz - 1 GHz) & **Site VSWR (S-VSWR)**, 1 GHz - 18 GHz in accordance with CISPR16-1-4;
- **Field uniformity (FU)** (26 MHz - 18 GHz) in accordance with IEC/ EN61000-4-3.

Beside above accredited measurements, *Siepel Measurements* has internal skills and equipment to perform overall measurements related to EMC, antenna measurement or Tempest zoning, CISPR25, DO160, EN61000-4-21, permittivity and permeability of materials.

In addition, our experienced engineers can share their huge knowledge with you during the tests.



ACCREDITATION  
N° 1-6220

SCOPE AVAILABLE ON  
[WWW.COFRAC.FR](http://WWW.COFRAC.FR)

## SUSTAINABILITY

Siepel offers various services throughout the lifetime of installations, such as:

- **Maintenance:** service on site or training for 1st level maintenance of chambers by the customer or a local company;
- **Refurbishment and upgrading** of existing installations, absorbers with new chamber guarantees;
- **Moving / transfer** of existing rooms and chambers.

## PROJECT MANAGEMENT & TECHNICAL ASSISTANCE



**Project management capabilities and relationships with test equipment suppliers (EMC, antenna testing, ...);**

All around the world, Siepel can act as general contractor or under project ownership assistance. When providing absorbers or shielded doors as separate parts, we include chamber design, installation drawings and support to the integrator.



# Customers Benefits

## VALUES

### Long-term customer support

- Assistance to preliminary design & project definition
- Transparency and dialogue for a strong and close customers relationship during all stages of your project
- Commitment to confidentiality by all employees involved, whenever required

### Company engagement in user satisfaction

- Continuous improvement policy for premium deliveries
- Commitment on performances guarantee
- Quality department involved throughout project management

Control of all steps in the project:

- **Project management**
- **Integrated manufacturing**
- **Design department**
- **Logistics: management capabilities worldwide**
- **Installation: constant control by experienced supervisors**
- **Factory acceptance tests (shielding & absorbers)**  
**& Site Acceptance Test capabilities**
- **Service support**

## ADVANTAGES

Siepel distinguishes itself by being the only manufacturer with a single and integrated site (France) enabling the design & manufacturing of high-quality products by an experienced staff. For our customers, it means an individual support during:

- Preparation of technical drawings related to the project configuration, Preliminary Design Review (PDR) and Critical Design Review (CDR)
- In-house manufacturing and installation by our skilled technicians
- Technical validation during Factory Acceptance Test (FAT) and Site Acceptance Test (SAT)

## Quality

Siepel aims to deliver a high level of quality for products and services. Thanks to an ISO9001 quality management system, Siepel continuously improves customer satisfaction and strives for excellence.



Siepel design office



# A network all around the world

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