



Like the delightful breaking of waves on a nearly desert beach...

The fight against noise, in relation to the protection of workers and the preservation of environment in general, and the limitation of noise emissions in the sector of energy in particular make necessary actions of prevention and sometimes of reduction of nuisances.

The test of noisy equipments as well as the research and development in the matter of acoustics, and in particular the development of equipment sufficiently silenced or having a particular sound design, make use of specific testing rooms.

Acoustic comfort in buildings requires the implementation of appropriate construction systems.

ITS assists you in finding acoustic insulation solutions involving the design and the supply of soundproofing equipment and/or their turnkey installation.

Measurements, studies and works in the field of industrial soundproofing and sound insulation of buildings: all technologies and all services are marketed by ITS for an effective treatment (guaranteed results) of all the problems related to the creation of choice soundscapes, everywhere.

*Let's preserve
and beautify our
auditory environment
together.*



Engineering & software publishing, representation, linkage: the quality management system for the technical and commercial services of ITS in the field of acoustical insulation is certified as being in compliance with the requirements of standard ISO 9001.

I s o l a t i o n
Technologie Services

ITS

acoustique

3 route du Mont Cindre
F-69450 Saint Cyr
au Mont d'Or
Tel. +33(0) 952 36 35 31
contact@its-acoustique.fr
www.its-acoustique.fr



An offer of technologies and services for acoustic insulation

Fight against noise, acoustic comfort: ITS offers a wide range of technology solutions suitable for the challenges and the constraints of the main human activities impacting the soundscapes, being therefore possible fields of intervention for ITS in relation to original equipment manufacturers, general contractors, installers or final users.

ITS offers powerful solutions at a reasonable cost in response to all the needs in the matter of soundproofing (preventive or curative) by the means of equipment for which the quality of design and of execution meets the highest level of requirement.

In industry

ITS offers standard or tailor made soundproofing equipment. Related features such as disassembly / mobility of the walls or of subsets, visibility, ventilation, lighting, securities, fire protection ... are integrated to robust constructions with quality finishes ensuring a high durability.

Protection of workers against noise

ITS offers solutions by the means of ergonomic soundproofing equipment for an efficient fight against noise in the context of compliance with legislation or of improvement of working conditions.

ITS intervenes in all sectors of activity, particularly:

- paper industry, corrugated cardboard industry: corrugators, processing machines and printing machines, mills ...

- printing industry: rotary presses, extraction systems, crushers ...

- metal transformation industry: stamping presses, punching presses, lathes, milling machines, other machine tools ...and also: grinding boxes, deburring boxes...

- wood industry: debarking drums, planing machines, machining centers, special machines, grinders...

- industry of prefabrication in construction: concrete molding presses, concrete blocks presses, pavement borders presses, brick presses ...

Noise reduction at source: enclosures (acoustic hoods) for noisy machinery and equipment, soundproofing partitions meeting the production and maintenance constraints and sometimes also contributing to the limitation of other nuisances: dust, fogs, fumes, heat, laser radiation...



enclosure for a corrugator
(corrugated cardboard industry)



carterisation for a printing machine
(corrugated cardboard industry)



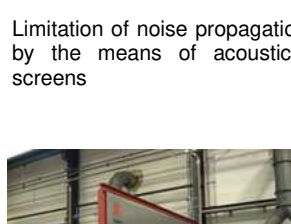
soundproofing partition for a rotary press
(printing industry)



enclosure for a stamping presses
line (automotive industry)



enclosure for a planing machine
(wood industry)



Acoustical screen between 2 grinding
boxes (aerodynamics industry)

And also: acoustics improvement (reduction of the reverberation) of working premises by implementation of suspended acoustical ceiling tiles and acoustic baffles, installation of acoustical wall panels contributing also to the improvement of the visual ambiance...

And also: workshop booths, soundproofed control rooms and soundproofed offices in all sectors of activity. All the features required for habitability can be integrated (visibility, heating, air conditioning, lighting, electricity, interior design...)



soundproofed workshop offices on 2 floors
(mechanical industry)



soundproofed control room
(corrugated paperboard industry)



the limitation of the exposition of workers
to noise (above: in chemical industry)
is a core business for ITS

Preservation of neighborhoods of industrial sites with respect to acoustic nuisances

ITS offers powerful solutions for the protection of environment in the context of compliance with legislation or of improvement of the quality of the acoustic environment.

Noise reduction at source: enclosures (acoustic hoods) for noisy machinery and equipment, meeting the production and maintenance constraints in all sectors of activity (thermal production and cooling systems, air conditioning systems, process equipment of all types, engines, compressors, fans, generator sets ...) and weather resistant.



enclosure for a fan (chemical industry)

Laggings of ducts and pipes for break out noise reduction (air inlets and outlets, thermal production and cooling systems, air conditioning systems, process equipment of all types, dust extraction systems, waste extraction systems: cyclones...)



lagging of an air outlet duct (pharmaceutical industry)

Air inlet or air outlet silenced systems in all sectors of activity (thermal production and cooling systems, air conditioning systems, process equipment of all types, dust extraction systems, waste extraction systems: cyclones, aerocondensers ...)



air outlet silenced system for an aerocondenser (pharmaceutical industry)



air outlet silenced system for a cyclone: under craning (corrugated cardboard industry)

Limitation of the propagation of noise by the means of acoustical screens



acoustical screen (paper industry)

and also:

Silencers for fluids at ambient pressure in all sectors of activity (thermal production and cooling systems, ventilation systems and air conditioning systems or processes of all types, including silencers for stacks, fumes extraction ducts...)

Discharge silencers for fluids under pressure (vents ...) in all sectors of activity for processes of all types

Exhaust silencers for internal combustion engines

Limitation of noise emissions in the sector of energy

ITS offers solutions in the context either of compliance to the legislation or of improvement of working conditions or of compliance with legislation or of improvement of the quality of the acoustic environment.

Noise reduction at source (indoor or outdoor): enclosures (soundproofing hoods or buildings) for gas turbines or steam turbines, for generators, compressors, generator sets, auxiliaries...



enclosure for a transformer



soundproofing buildings for gas turbines (3 units outdoor)



enclosure for a steam turbine and screen for a generator (indoor)



soundproofing building for a cogeneration unit

Acoustical screens for transformers



acoustical screen for a transformer

Air intake systems for gas turbines. Where applicable: comprehensive including silencers and filtration equipment.



air intake system for a gas turbine



ITS intervenes in the energy sector where the needs in terms of soundproofing are various (above: oil & gas production unit)

Complete envelopes or envelope elements of soundproofing buildings for power plants (acoustic insulation panels for walls and roofs, acoustic doors, ventilation silencers...), absorbing wall panels, acoustic ceiling...

All related features in connection with aerodynamics, fluid mechanics, thermal insulation, mechanical resistance ... are taken into account on the occasion of the design and of the execution of soundproofing equipment according to technical needs and regulatory requirements of each project.



air intake system for a gas turbine
(integrated to an enclosure:
soundproofing package)

Exhaust systems for gas turbines. Where applicable: comprehensive including silencers, stacks and accessories such as diverters, ducts, expansion joints ... and silencers for Heat Recovery Steam Generator (HRSG)

Exhaust silencers for internal combustion engines, discharge / vent silencer ...



exhaust silencers for heat engines



discharge / vent
silencer
(fluid depressurization)

In environment

ITS offers standard or tailor made soundproofing equipment: robust constructions ensuring high durability.

Preservation of neighborhoods of infrastructures with respect to acoustic nuisances

ITS offers metallic noise barriers for limiting the impact of transportation infrastructures with respect to environment: a particular care is taken (by the means of the choice of aspect and of colors) for the integration of the soundproofing equipment in the landscape.



highway noise barrier



railway noise barrier

For testing rooms

ITS offers building envelope elements in all sectors of activity and also for universities, engineering schools, research institutions (acoustic insulation panels for floors, walls and roofs, acoustic doors, ventilation silencers ...), absorbing linings for floors, walls and roofs. Related features such as disassembly / mobility of the walls or of subsets, visibility, ventilation, lighting, securities, fire protection ... are integrated to robust constructions with quality finishes ensuring a high durability (constructions or retrofits).

Means of R & D in acoustics, of testing

Anechoic rooms and aero-acoustic wind tunnels in the context of R & D for acoustic comfort, test benches.



soundproofed test bench
(mechanical industry)

Material and construction systems for acoustic comfort

Devices for reverberation control of rooms (for sports or others despite tertiary, listening rooms ...)

and also: all products and soundproofing construction systems for floors, vertical partitions and roofs, acoustic doors, ventilation silencers... ; audiometric booths and cabins for musicians ; music rooms ; soundproofing devices for the noise reduction of domestic equipments (indoor or outdoor) ; vibration control systems



absorbing lining based on
wedges for an anechoic room
(electronic industry)



soundproofed test bench
(aviation industry)



absorbing lining
for the reduction of reverberation
in a sports facility



absorbing wall lining and acoustic
screens for the reduction of reverberation
in a school restaurant



absorbing lining based on compact
absorbers for an anechoic room
(automotive industry)



the design and the construction of
testing rooms (above: R&D in acoustics)
is a core business of ITS



absorbing lining for a
jury testing room
(automotive industry)



ITS intervenes with respect to the
quality of constructions for the compliance of
regulation in terms of acoustic comfort
(above: tertiary building)

A single partner for all your projects of acoustic insulation in a pick-and-mix manner

ITS offers:

- an approach of issues of fight against noise and of improvement of acoustic comfort based on the competence of structures having numerous references in all sectors of activity
- a support by a multidisciplinary team of experts to serve all your projects: from the design to the execution of soundproofing equipment either standard or tailor made
- a guarantee of a performance (when applicable: in situ) based on decades of experience
- insurance of the best quality at an affordable price

Depending on the context, ITS supports you through an offer of technologies and of services with a variable geometry, depending on the needs and on the wishes of customers.

Diagnosis of a situation in terms of acoustics ⁽⁰⁾

The diagnosis of a situation in terms of acoustic by ITS is based on a long experience of confrontation with issues having a wide variety (but occurring with some repetition) in relation to acoustic insulation.

This diagnosis may include examination of manufacturer drawings and data, or analysis of acoustic measurements made by others if they are already available: ITS can take over studies performed by control offices or engineering teams either specialised or not (ITS is not intended to compete with them) and particularly action plans performed by others. If needed ITS can perform (promptly) complementary sound records (possibly with spectral analysis) to quantify the noise emission of an equipment or characterize the performance of a construction. ITS can perform other statements and investigations on site (site conditions, accessibility, operating constraints, environment ...).

This task may necessitate the performance of acoustic measurements analysis reports (for measurements performed by ITS or not) or of acoustics calculation sheets: cf. beside.

From the diagnosis of a situation in terms of acoustic by ITS it results an exhaustive explanation of the data taken into account, as well as of various related constraints and a performance target in terms of acoustics appropriate to the considered situation for avoiding acoustic nuisance.



the on site diagnosis (above: in an industrial context) is often an important step of an approach of fight against noise

Acoustic measurement analysis reports, acoustics calculation sheets and sizing sheets of soundproofing equipment ⁽⁰⁾

The preparation of acoustic measurements analysis reports, of acoustics calculation sheets and of sizing sheets for soundproofing equipment can be performed by ITS either in accordance with some standards (French or international), or in accordance with the methods of engineering associations (French or international), or based on developments made in-house.

Most of the software allowing acoustic predicting computation at ITS have been developed internally, which allows the integration of experience data complementing the best theoretical approaches of all times carefully selected in order to base the simulation models. ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾. Software from other internationally recognized publishers is also used for some calculations based on finite element method FEM (silencers) or ray tracing (sound propagation inside premises).

The preparation of acoustic measurements analysis reports by ITS allows (depending on the case) the characterization of the noise emission of an equipment or of an installation, the determination of the acoustic properties of a material or of a construction system, the quantification of the performance of a construction or of a room in terms of insulation.

The preparation of acoustics calculation sheets by ITS intervenes in the diagnosis of a situation in terms of acoustics, allows the definition of nuisance prevention means and the search for solutions in relation with the improvement of a situation in terms of acoustics.

The writing of sizing sheets by ITS allows the exhibition of evidences of the choices of soundproofing equipment (of those the implementation is compatible with the data taken

into account as well as related constraints and meets the objective of results in terms of acoustics) involving a selection of products and of construction systems having the performance the most appropriate for the considered situation.

Definition of the means of prevention of nuisance and search for solutions in relation to a situation in terms of acoustics ⁽⁰⁾

The definition of means of prevention of nuisance and the search for solutions in relation to a situation in terms of acoustics by ITS is based on the consideration of the technologies being the most appropriate to the considered situation, for an optimal choice of the means that should be considered depending on the context (in particular accounting if any related features of the equipment and acoustic insulation systems and the constraints and consequences of all types generated by their implementation).

From the definition of means of prevention of the nuisance and the search for solutions in relation to a situation in terms of acoustics by ITS it results the choice of soundproofing equipment.

Their performance is carefully studied to be sure to prevent acoustic disturbances (if it is a new installation) or to improve the existing situation (if it comes to a retrofit).

⁰ with respect to such missions performed on its own behalf, ITS has taken out an "overall designer" insurance including notably the operation civil liability insurance, the professional civil liability insurance, and the compulsory insurance of ten-year liability.

¹ in terms of acoustics essentially

² acoustic multilayered structures: partitions or absorbent linings and dissipative silencers: low or high temperature ...

³ enclosures, screens, laggings, suspended acoustical ceilings, wall claddings for reverberation treatment of rooms...

⁴ calculations of sound propagation indoor or outdoor, and between inside and outside of a building ...

Brokerage for the supply of soundproofing material and equipment (resp. soundproofing equipment installation / acoustic insulation work)



The experience of the human resource of ITS in the past 20 years has allowed to learn to know and appreciate in a positive way material producers and soundproofing equipment manufacturers (resp. contractors and installers) with which ITS has developed a partnership - often exclusive - in France.

To meet the needs of soundproofing materials and equipment (resp. of soundproofing equipment installation / acoustic insulation work) of its customers, ITS can offer (after the diagnosis of a situation in terms of acoustics and / or in the context of the search for solutions in relation to a situation in terms acoustics) products and construction systems often with an international reputation (resp. works performed by installers, either with an international reputation or having the flexibility of intervention conferred upon them by their proximity to the erection site) carefully selected by ITS for their relevance with respect to the considered objectives, to the guarantees offered in terms of quality of equipment and service and also for their reasonable price.

A guarantee of acoustic performance is issued for each delivery of soundproofing products or construction systems (resp. all installations of soundproofing equipment / all acoustic insulation works).

ITS then acts as a commercial agent, acting as a technical sales interface with the supplier (resp. the installer) - partner of ITS - who has all the qualifications and insurances required for the envisaged supplies (resp. works), who provide all the guarantees of compliance with the rules of Art which are of his specialties and who provides billing and after sale service.

Resources and means: 25 years of expertise in acoustic insulation

History

The human resource of ITS had over the last twenty years professional activities having led to participate in the development of structures in relation to acoustics / noise control engineering for which this human resource has (consequently) various know-how concerning physical principles and applications:

- design / selection / development of soundproofing products and systems, research and development ⁽¹⁾
- acoustic metrology (in-situ and in laboratory), studies, prescriptions, design, pricing, project management, engineering of constructions and turnkey erections (acoustic insulation), technical sales services in relation with soundproofing materials and equipments
- noise control engineering: calculations, design, sizing ⁽²⁾⁽³⁾⁽⁴⁾

Whereas some aspects of those different professional occupations held in the past by the human resource of ITS (always: in relation to acoustic insulation) are not currently fully included in the scope of the present activity of ITS because of its current mission and organization, they provide a background founding the multi-competence approach proposed today by ITS for all projects of fight against noise or of improvement of the acoustic comfort.

The human resource of ITS has a good overall knowledge of the field of passive acoustic insulation (at workplaces, in industry, in environment, in the energy sector, for testing rooms, in building) through the experience gained during the various positions held (sometimes using English and German) in companies with integrated engineering department, having led to be familiar with worlds as diverse as laboratory and field.

The human resource of ITS also has a fairly good knowledge of related areas of activity (aerodynamics, thermal insulation, construction) as well as various industrial processes and equipments.

This experience enables ITS to be able to successfully confront issues related to acoustic insulation of a high degree of technicality and manage related issues: technical and of all other types.

Passion above all

Do it with passion or not do it: this is the motto that the human resource of ITS has made its own.

The satisfaction of ITS customers depends on it.

R&D as spearhead

It is crucial for ITS to offer high-performance technologies and value-added services: this is the conviction of ITS Management.

In this context, ITS's human resource is continually committed to sustained Research and Development (R&D) activities in order to maintain and increase the status of its scientific and technical knowledge in relation to the development & the improvement of construction systems & of simulation software in the field of sound insulation.

Those simulation tools are useful for various phases of projects including: diagnosis of a situation in terms of acoustic, search for solutions in relation to a situation in terms of acoustics. They found the crucial phase of projects that is the performance of soundproofing equipment sizing sheets allowing the selection of products and construction systems optimized with respect to the data and constraints accounted and with respect to the goal in terms of acoustics.

The means of simulation of ITS are the basis of technological choices the most appropriate to the considered situation and base the acoustic guarantee that is attached to the supply of soundproofing equipment, their installation or the execution of acoustic insulation.

Their development or acquisition (as the case may be) and the training for their use by the human resource of ITS are performed with the greatest care, so that the best part can be drawn from their functionalities, in all the situations.



Like the delightful breaking of waves on a nearly desert beach...

ITS is a consulting office specialized in acoustics based near Lyon (France, Rhône Alpes area) whose range is national and can extend to neighboring countries.

With respect to actions against noise and improvement of acoustic comfort, ITS is equipped with measurement and simulation means to deal with the most common acoustic situations and other more complex in relation to soundproofing projects in the industry sector (workers protection, environmental preservation, energy, test rooms) or in the building sector.

ITS offers solutions carefully designed, diversified, optimized with respect to the issues of each project and whose results are guaranteed on the basis of engineering services (acoustics and related fields).

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Isolation
Technologie Services
ITS
— **acoustique**
3 route du Mont Cindre
F-69450 Saint Cyr
au Mont d'Or
Tel. +33(0) 952 36 35 31
contact@its-acoustique.fr
www.its-acoustique.fr

Engineering & software publishing: 25 years of expertise in acoustics

Measurement means

ITS is equipped with measurement means, which can be mobilized everywhere in France and in neighboring countries:

- sound pressure level measurements by frequency band (real-time spectral analysis), allowing the analysis of temporal evolutions of acoustic situations
- measurements of reverberation time of rooms, of the spatial sound decay in premises
- measurements of insulation from airborne noise between premises or with respect to outside.



ITS noise generator



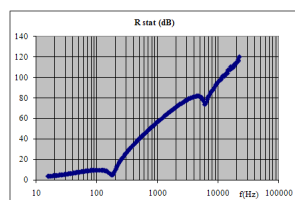
ITS sonometer

Simulation means developed in-house

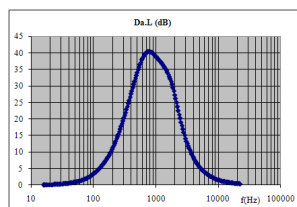
The old experience in the field of soundproofing in all sectors of activity has enabled the development of predicting acoustic calculation software capitalizing on the expertise of human resources of ITS.

These software programs allow the prediction of acoustic performance (absorption, transmission loss) of multilayered structures (partitions), for many applications in the field of soundproofing.

of sound absorption by the atmosphere, the simulation of the aerodynamic noise of control valves and jets (including: safety valves), of discharge parameters of fluid networks, of sound decay in confined spaces (including: open plan offices), thus covering most of the needs related to industrial and building acoustics.



simulations (above: sound reduction index of a double shell partition) are founding the choices of solutions



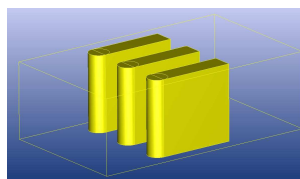
predictive acoustics (above: simulation of the propagation loss of a dissipative silencer with SILDIS[®]) is in the heart of the business of ITS

The publishing of such software, capitalizing on the know-how of the ITS human resource, is a major activity, the versatility and reliability of these sizing tools being improved, over time, to take into account the experience gained on the occasion of projects for which they are mobilized.

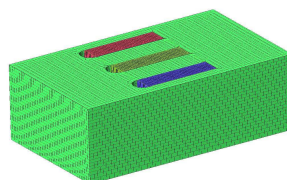
Means of simulation of recognized publishers

ITS is equipped with means of simulation of recognized publishers:

- for calculations based on finite elements methods FEM as necessary for the sizing of some silencers of complex geometry or for which it is desired to take into account phenomena that are difficult or impossible to model by analytical methods.



geometry modeling of a silencer for a calculation by finite elements (FEM)

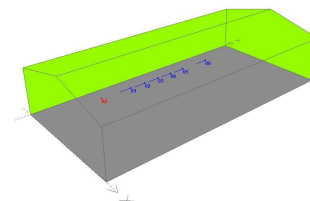


meshing of a model of a splitter silencer and of the transported fluid for finite element calculation (FEM)

- for (sound) ray-tracing useful for simulating the performance of a room e.g industrial (in terms of spatial sound decay) and the preparation of acoustic maps.

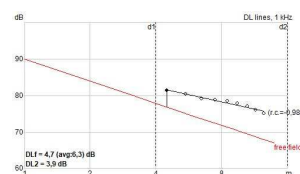
ITS can thus perform various engineering services in acoustics:

- predictive acoustics studies taking into account one or more sources of noise and receivers in a room



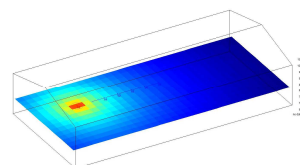
modeling of the geometry of a premise and of the positioning of a noise source and of receivers

- evaluation of the decay of the sound level by doubling distance from the source



spatial sound decay curve simulated for the evaluation of the sound pressure level spatial decay rate when doubling distance

- sound level prediction at different locations in a room (acoustic mapping)



acoustic mapping (noise map)

R&D and soundproofing projects

ITS 'engineering and software publishing activity, mainly in the fields of acoustics and aerodynamics, either as part of Research & Development (R & D) projects or as part of soundproofing projects directly in relation to the needs expressed by Customers, is in relation to the design, supply and, if applicable, the installation of sound insulation equipment in the context of actions to prevent or reduce noise nuisances

by the means of a personalized approach of supporting of customers (which does not replace that of project managers, control offices or architects with the contracting authority)..

Solutions for which efficiency is guaranteed because proven are provided by ITS to all issues related to the fight against noise.

⁵ Sound Impact Limitation: Design for Industrialized Solutions is a set of predictive acoustics software developed by Philippe Reynaud