

WE
OPTIMIZE
YOUR
BUILDING'S
COMFORT



DipA*e*

*With passion, every
difficulty becomes
a springboard
for increasingly
prestigious goals*



I believe that homes should be synonymous with well-being and comfort, and that the people's right to the best housing solution should prevail.

Bruno Zorzi

Bruno Zorzi

BOSE

I am pleased to confirm that Dr Bruno Zorzi, in the course of common professional activities, has demonstrated competence, seriousness and punctuality in carrying out the task entrusted. Excellent knowledge of acoustic science and strong interpersonal skills are the recognized qualities that make him a reliable support in the development of the various projects.

Paolo D'Innocenzo

CHANEL

We are pleased to confirm that in the development of recent activities concerning the acoustic analysis of machinery present in our stores, Dr. Bruno Zorzi has proved to be prepared, precise and punctual in analyzing our needs and in proposing solutions that have determined the correct technical solution to the project. He demonstrated knowledge of the acoustic subject and ability to manage relationships with all the other professionals involved in the project; this makes it a privileged interlocutor in future relations with our company.

Paolo Clerici

KNAUF

We have had the opportunity to work with Dr Bruno Zorzi and we can confirm that he is a professional trained both in thermal and acoustic physics, attentive to the laying process on site and able to work in a team in order to perfect the task assigned.

He knows well how to lay dry systems applied to both concrete and wood constructions and is able to operate independently in identifying the best quality / price solution.

Zamuner Edoardo

ALSTOM

We hereby confirm that we have been able to operate with the acoustic technical contribution of Dr. Zorzi. We found him prepared, available, capable and reliable person in carrying out the projects entrusted.

Fabio Gamberini

**AMAN
VENICE**

I am really pleased to state that Dr Bruno Zorzi, has always proved himself as a real professional, reliable and meticulous. He has been able to implement all situations in the best way, being accurate and precise in his tasks. He has never been superficial or vague. Actually he has always been able to solve different issues in our building and in particular he has been able to fix in the best and most careful way our noise pollution problems.

Andrea Moretti



Herr Ing. BRUNO ZORZI arbeitet seit 2016 mit der Agentur für Energie Südtirol - KlimaHaus zusammen. Er unterrichtet als Referent für unsere Kurse für Planer:

- Corso Principi di ottimizzazione del comfort acustico degli ambienti progettati
- Corso Consulente energetico CasaClima, modulo Acustica - progetto del fonoassorbimento

Er hat seine Aktivitäten immer mit höchster Professionalität und Kompetenz durchgeführt und dabei auch von den Teilnehmern ein hervorragendes Feedback erhalten. Ing. Zorzi ist auch in unserer Technikerliste für die Luftdichtheitsprüfung (Blower Door Test) von Gebäuden eingetragen.

Ulrich Santa

check our references in our website:
www.dipae.it

- Rubner Haus - Bolzano
- Area17 Architetti associati - Bolzano
- B+B Associati - Treviso
- Solarraum GmbH Srl - Bolzano
- R&S Engineering Srl - Padova
- BlowerDoor GmbH - Germania
- Commissione Europea - Varese

- Bureau Veritas Italia Spa - Milano
- CEV Spa - Treviso
- Rockfon Italia Spa - Milano
- Xella Italia Srl - Bergamo
- Fantoni Spa - Udine
- Setten Genesio - Treviso
- Cazzaro Costruzioni Srl - Padova

Building a beautiful house is relatively simple...

... what is difficult is building a house without hidden flaws in terms of noise, mould, heat dispersion, leaky doors and windows, infiltration, etc.

We inspect, test and certify the correct use of materials and perform instrumental tests to identify construction and installation defects.

We specialize and are experienced in thermics, acoustics and hygrothermics, and provide thorough valuations of pre-construction designs but can also work on existing buildings.

Today's work is our future

They say about me

Mission



Acoustics

- p.09 » Building
- p.10 » Architectural
- p.12 » Environmental
- p.13 » Intensimetry
- p.14 » Voice Evacuation System testing
- p.15 » Beamforming
- p.16 » Sound power measurement
- p.17 » Vibrations

Thermics and thermohygrography

- p.18 » Thermography
- p.19 » Thermohygrography
- p.20 » Thermal flow measurement
- p.21 » 2D/3D FEM dynamic analysis
- p.22 » Blower door test
- p.23 » Fire protection test

Other services

- p.24 » Water infiltration detection
- p.25 » Utility location
- p.25 » Plumbing leak detection
- p.27 » Training courses

Acoustics

Sound insulation,
sound absorption,
knowledge of materials

Immensely passionate about acoustics in general, we are proud to work with all major international manufacturers of acoustics products. This cooperation has enabled us to acquire a high level of expertise on sound insulation and sound absorption techniques, as well as on material physics, which gives us an important advantage especially when dealing with civil and industrial building renovation projects.

sectors:

- » Building
- » Architectural
- » Environmental
- » Intensimetry
- » Voice Evacuation System testing
- » Beamforming
- » Sound power measurement
- » Vibrations

» Building acoustics

Building acoustics is an important aspect for property purchasers.

We rely on our thorough knowledge of the theories of propagation of different types of noise and of the physics of materials to guarantee desired levels of acoustic comfort.

On-site supervision and inspections are part of a process that enables us to ensure a high standard of quality during construction and certify the building through on-site instrumental tests upon completion.

We use the most advanced prediction software and tools for post-construction testing.

our services

- » Design of construction nodes and stratigraphies, on-site testing of passive acoustic requirements.
- » Acoustic upgrading of existing buildings.



» Architectural acoustics

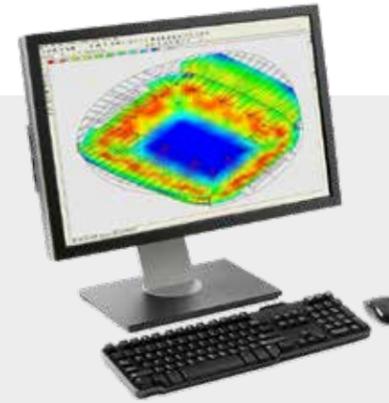
Architectural acoustics deals with the generation, propagation and reception of sound within closed environments.

The simplest yet most effective example is a restaurant that offers excellent food but is so noisy that customers eventually go elsewhere.

Calculation of the acoustic response of surfaces is usually done when constructing theatres, concert halls, gyms and churches, **but also homes and public buildings.**

our services

- » Design and on-site verification of acoustic requisites for buildings.
- » Reverberation time and Speech Transmission Index measurement.



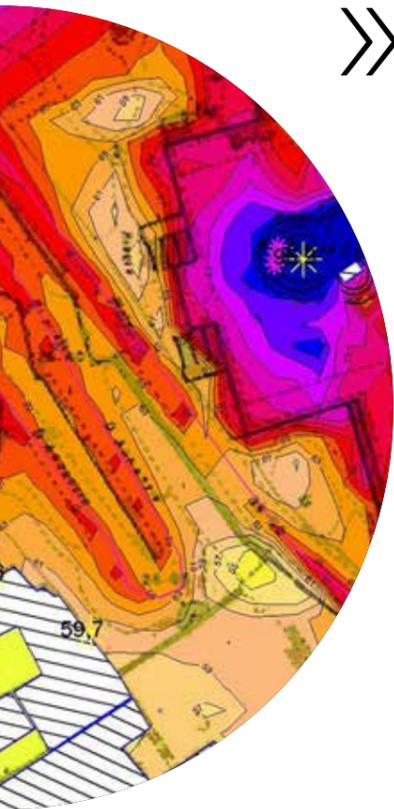
The benefits of using a Bose® Professional simulator.

We thank Bose® Professional for granting our company the honour of using its exclusive Auditor system. With Auditor system technology we can assess all acoustic parameters of an environment at the design stage, giving our clients the opportunity to evaluate various acoustic options and experience in advance what the actual sound performance of the finished building will be. With this high-fidelity system, which is calibrated through instrumental measurements carried out at the pre-construction phase, acoustic consultants and clients alike perceive the importance of the acoustic treatment of buildings, both residential and tertiary.



BOSE

Sophisticated
Acoustical
Analysis



» Environmental acoustics

Environmental acoustics deals with all issues relating to disturbance due to noise transmission from outdoor to indoor environments.

The purpose of environmental noise measurement, pursuant to the relevant regulations, is to verify whether the noise sources comply with the limits imposed. Where necessary, noise mitigation schemes are designed, accompanied by predictions to determine their feasibility and efficacy. In Italy this work is carried out by technicians registered on the National Roll of Acoustics Technicians.

our services

- » Predictive assessment and on-site noise emission measurement.
- » Industrial acoustics optimization projects



» Voice Evacuation System testing

Voice Evacuation Systems (VES) play evacuation and/or alert messages in the event of emergencies. They consist of three macro components, which must be certified according to EN-54 norms:

- a master panel
- loudspeakers
- wire conductors

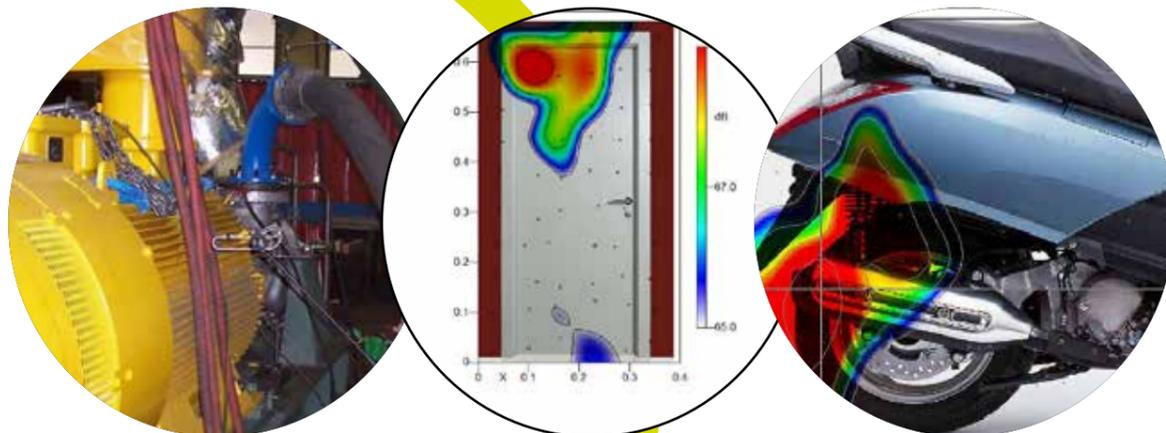
The ISO 7240-19 Standard requires that the acoustic performance of Voice Evacuation Systems be checked upon activation of the system as well as during periodic maintenance operations, with specific reference to their STIPA and reverberation time.



» Acoustic intensimetry

Where noise assessment requires localization of the noise problem or an understanding of how much a given element contributes to it, it analyzes the noise intensity vector; with the aid of a special tool consisting of two sound intensity probes it is possible to measure the amount of energy and split the area being assessed into segments according to a pre-set pattern. This produces a sound map with frequencies used to analyze the object and evaluate possible initiatives.

Acoustic intensimetry is very similar to acoustic imaging, as it shares the same main operating principles.



» Acoustic imaging

It has always been thought that sounds could only be heard: now they can also be seen.

A special technique known as 'acoustic beamforming' generates a real-time acoustic map that overlaps a representation of the sound source. With the beamforming map the acoustic characteristics of the photographic image become visible, showing the frequencies used to identify not only the sound source but also its pressure level. Acoustic beamforming is ideal for acoustic and diagnostic testing services that identify sources of disturbance.

We are happy to provide our clients with further information about this technology, through the videos on our website.



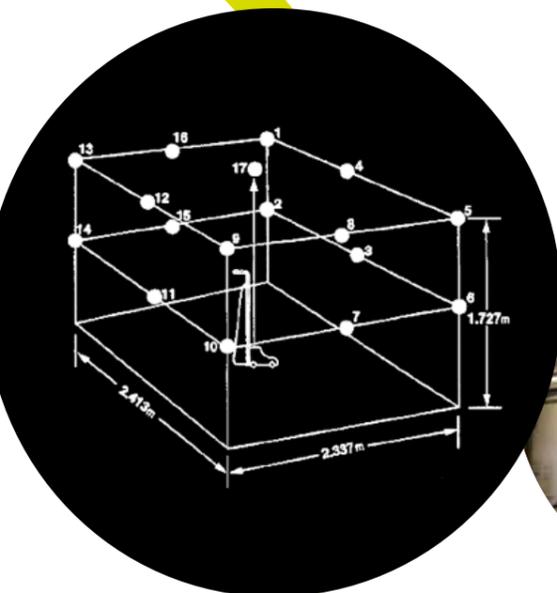
» Sound power measurement

Sound power, which is understood as the total energy emitted by a source per time unit, is a variable that characterizes the sound source and is not related to the environment where the sound is radiated. By measuring sound power it is possible not only to compare the noise levels of totally different machines, but also carry out a series of cascading assessments based on the actual position of the sound source.

When measuring the sound power of a machine during use, the following documents are usually referred to, based on the characteristics of the measurement environments:

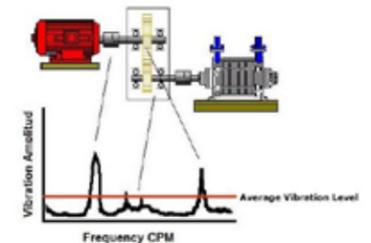
ISO 3744 (1994) 'Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering method in an essentially free field over a reflecting plane';

ISO/DIS 3746 (1992) "Acoustics - Determination of sound power levels of noise sources - Survey method employing an enveloping measurement surface over a reflecting plane".



» Vibrations

The problem of vibrations in buildings generated by the rotation of the internal components of air conditioning units is becoming increasingly evident. Often the choice of vibration dampers, if any, is a matter of routine that does not even take into account a correct analysis of disturbing frequencies and above all of the frequency of the resilient material itself. Hence the need to address the problem in a standardized way and using the right tools, so as to reach sure results and be able to improve the acoustic comfort of inhabited environments.



Thermography

Thermal investigations by certified thermographic operators

» Thermohygrometry

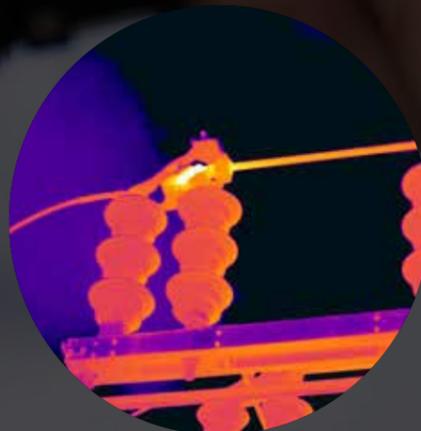
Household mould can be very harmful for the health of children and the elderly. It is first of all necessary to understand the source of the problem and compare thermohygrometric measurements with thermographic or finite element analyses, so that corrective actions can then be implemented.

The variation in conductivity is a function of the type of the material and the environment in which the material is located. Finally, it is important not to confuse the problem of mold with that of condensation, as it is well explained in ISO 13788.

When carrying out thermographic investigations, using the most appropriate tools is as important as having adequate knowledge of the subject. We use Flir® T6xx-series cameras, which offer outstanding resolution and image clarity. Our professional thermographers are Level 3 certified by Bureau Veritas® in compliance with ISO 9712.

sectors:

- » Building
- » Electric
- » Industrial
- » Veterinary



Thermohygrometry

» Thermal flow measurement

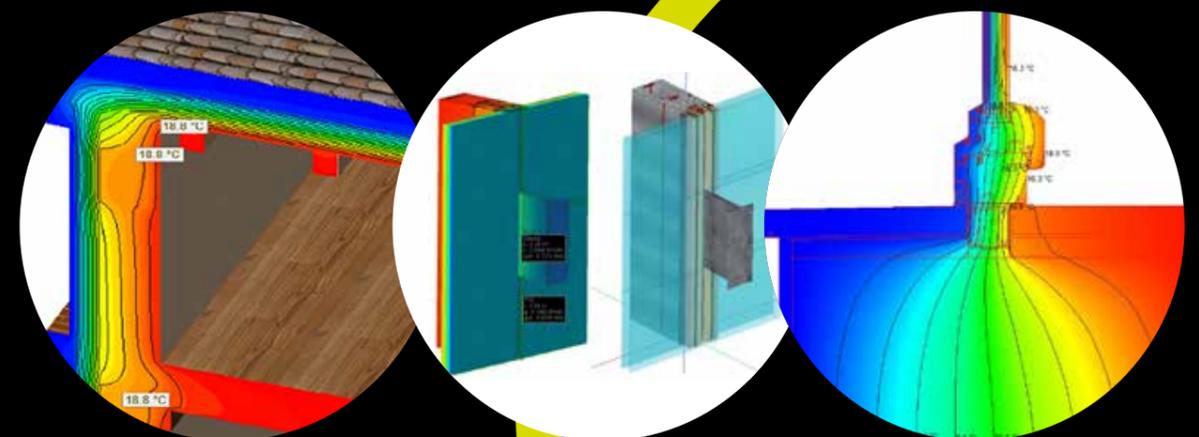
The Energy Rating is meant to guarantee the actual energy consumption of a building and therefore is considered a quality indicator. Unfortunately, sometimes there can be quite a significant gap between the calculated values and the actual ones. This gap can be identified by installing instruments that measure indoor-outdoor thermal flows along the perimeter of buildings. This technique, accompanied by a thermographic analysis carried out using state-of-the-art equipment, also becomes a fundamental tool for subsequent energy efficiency improvements to the building.



» 2D/3D FEM dynamic analysis

2D and 3D computerized dynamic analysis of the thermal behaviour of a partition. Pre- and post-construction analysis of construction nodes pursuant to EN ISO 13788 aimed at assessing the risk of mould and condensation problems.

This is the most advanced mathematical analysis method for assessing the thermal behaviour of a node. 3D models allow precise verification of the nodes and calculation of the ψ and χ heat transfer coefficients.



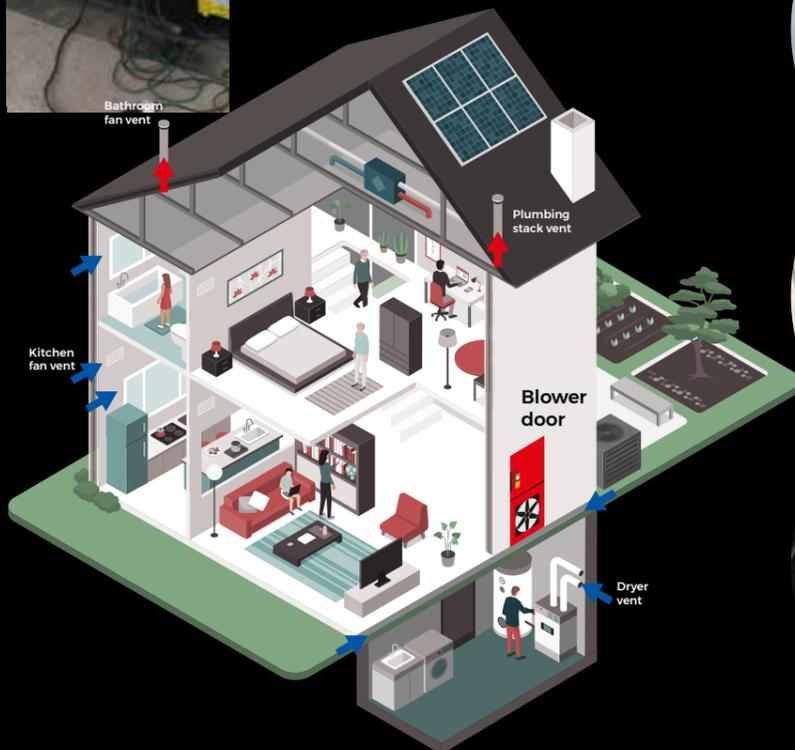
» Blower Door test



The test is a useful tool for checking that doors, windows and wooden roofs have been installed properly and thus provide thermal and acoustic comfort. Together with thermographic analyses, glycol smoke tests and anemometers, it is fundamental for identifying interstitial condensation points. It is also a compulsory test required by various European Energy Performance protocols.

When negative pressure is created in the building with the aid of an air fan, it is possible to identify all types of air infiltration caused by wrongly positioned sealing tapes or components.

Measurement of the air permeability of a building carried out in compliance with EN 9972 is followed by calculation of the building's energy use requirements.

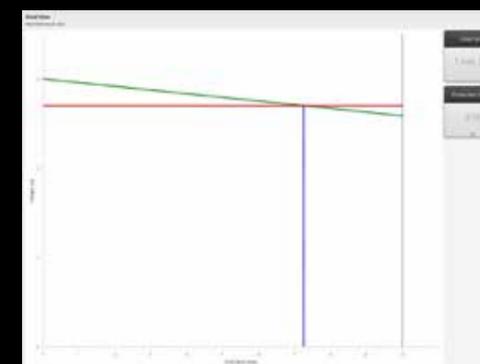
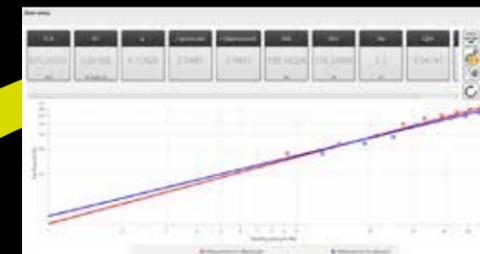


» Door Fan Test

Gaseous fire suppression systems discharge a predetermined quantity of a specific mixture inside a given space so as to achieve uniform extinguishing concentration; the quantity of product chosen depends on the size of the room and the concentration required to ensure successful fire suppression.

The air-tightness of the room where a gaseous fire suppression system is in place is an essential prerequisite for the efficiency of the fire suppression system itself. Air-tightness can be checked with the Door Fan Test in compliance with ISO 14520-1.

The test therefore checks the aptitude of the room to be protected to prevent the creation of an air flow through the boundary walls in the presence of a pressure gradient between inside and outside, obtaining a residence time of the extinguishing mixture in the volume which must comply with the minimum project limits.



Other Services

sectors:

- » Water infiltration detection
- » Utility location
- » Plumbing leak detection
- » Training courses



» Water infiltration detection

Precise identification of water infiltration points from sheaths . Testing of pressure system tightness.

Rainwater seeping through outer sheaths is one of the worst nightmares for constructors. Moreover, the presence of water inside building structures is dangerous because of the corrosive effect of mineral salts. Subject to a few simple conditions, with the trace gas method we can accurately identify the origin of water leaks, including those that are underground or under a floor. Consequently, the leak can be fixed definitively with minimal disruption.

» Utility location

Identifying underground utility mains with the help of a magnetic field is a non-invasive method that helps save on time and costs.

Passive and active location of utility mains, including pressurized ones, is much more effective and precise than destructive excavations, which are often unsuccessful and costly. This technique is particularly useful not only when looking for utility damage, but also as a preventive measure in order to avoid damage to underground pipes during garden excavations. Thanks to our technology we can locate and trace underground utility mains at any depth, ensuring accurate detection.

» Plumbing leak detection

Location of leaks from underground or chased pipes.

With our tools we can perform multiple tests before invasive excavation takes place.

The search is possible both for metallic pipes and polyethylene through Inert gas injection into the pipeline.

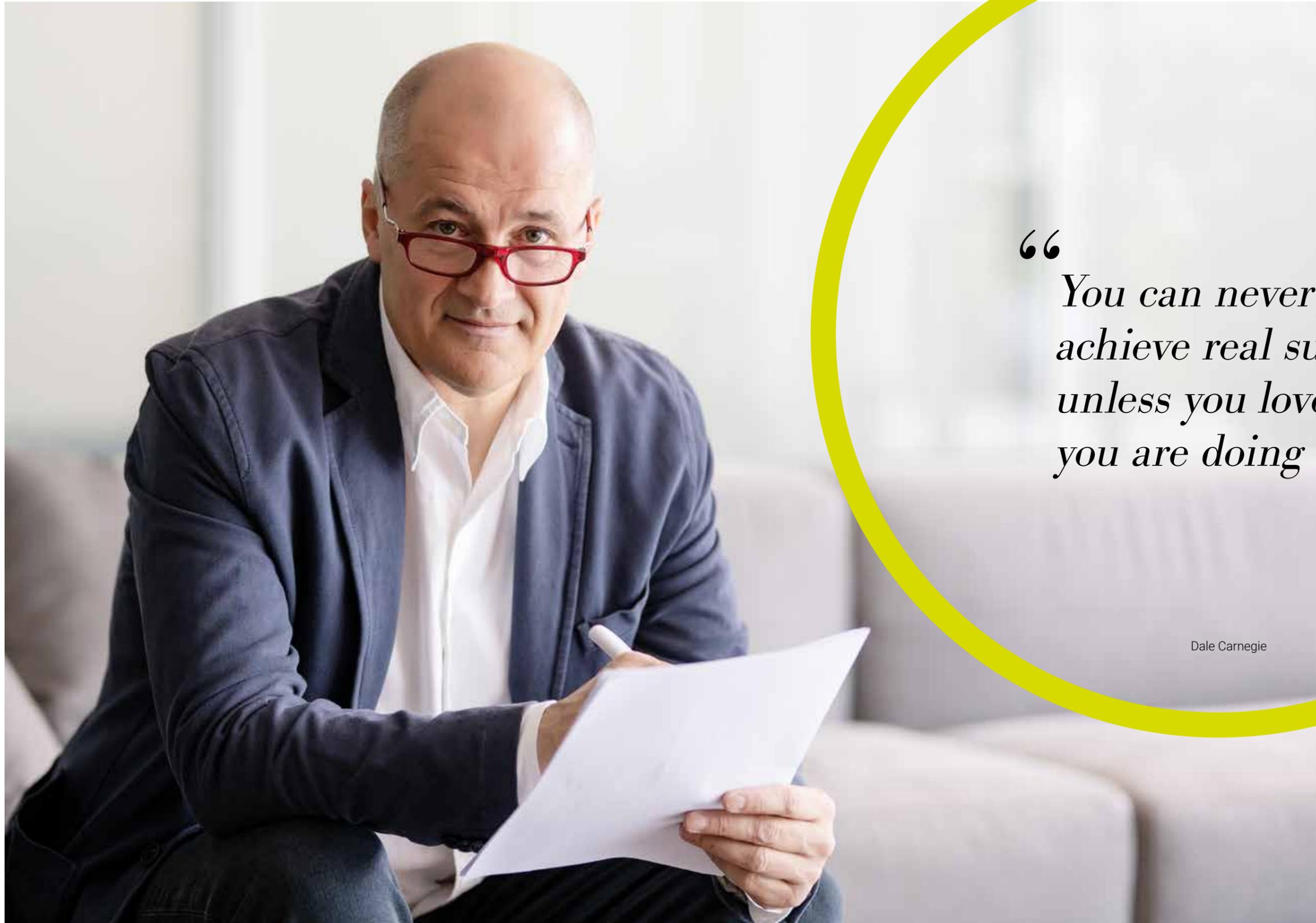


» Training courses

We also organize training courses on various topics, also for major companies operating in the construction trade. The service is also provided to enhance the skills of our customers' workers.

- » **Thermography**
UNI EN ISO 9712, level 1 and 2
- » **Upgrading of buildings' thermal performance**
Construction nodes
- » **Building acoustics**
Design - On-site technical tests
- » **Architectural acoustics**
Reverberation times - Acoustic parameters

Vibrational modes, room layout design, practical and electro-acoustic auralization



“
*You can never
achieve real success
unless you love what
you are doing*”

Dale Carnegie



WE OPTIMIZE YOUR BUILDING'S COMFORT

www.dipae.it
www.dipae.de



DipA*e*

Dip.A. sas di Bruno Zorzi &C
31015 Conegliano TV – Italia
Tel +39 329 6705172
P.Iva IT04276990266
info@dipae.it - www.dipae.it

Z&F GmbH
81669 München - D
Tel +49 152 21097150
USt-ID-Nr DE323191944
info@dipae.de - www.dipae.de

EN

