

# Building Acoustics

Effectively Protecting People  
from Unwanted Noise



» Sound control for a better  
quality of life and work

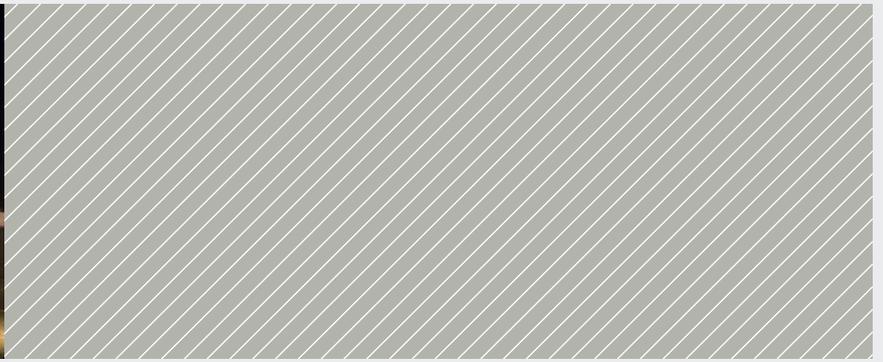
» Optimised product characteristics  
for audible reduction in noise

» A high degree of planning reliability  
thanks to proven effectiveness

**getzner**  
engineering a quiet future

# 1 | Noise and its Effects





Sound control solution from Getzner at the Oslo Opera House

» *Peace and quiet is a basic human need, especially in our fast-moving times.*

We all need peace and quiet

**Noise is a constant presence in our modern world and its negative effects can be felt throughout our environment. As a consequence, sound control is becoming ever-more important and taking a key role in the building and construction industry.**

The detrimental effects of noise in our day-to-day lives may be experienced in many different ways: It can bring about stress, concentration problems and even cause chronic illness. When people are able to withdraw from the world to a place where peace and quiet reigns, they are more attentive, more relaxed, more able to cope with the challenges of daily life and, evidence has shown, are more healthy.

#### Sources of noise in everyday life

Noise in buildings is produced by airborne noise or structure-borne stimuli. These stimuli are produced by people speaking, music, walking across floors or up and down stairs (impact noise) or through the operation of building service installations (wastewater systems, energy supply and heating systems, ventilation and air conditioning units, lifts, powered doors, etc.).

If suitable measures are not implemented, the sound may be transferred to adjoining rooms through the building structure causing noise nuisance.

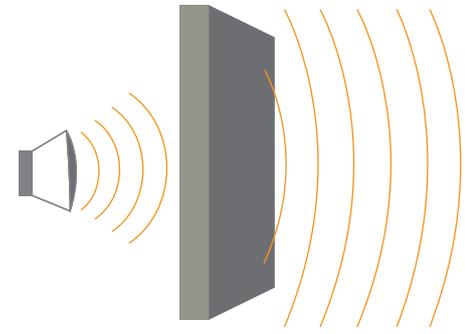
#### Sound control solutions from Getzner

Getzner has been offering specific solutions to isolate sound sources and prevent sound transmission for more than four decades. Applications range from elastic bearings on ventilation units to impact noise protection in buildings.



Sound control solutions from Getzner bring peace and quiet

## 2 | How Sound Transmission Works



Airborne noise

### Different types of sound transmission

#### **Airborne noise**

Noises, such as music or people speaking, cause the air to vibrate and these vibrations propagate in the form of waves, indirectly exciting components such as the walls and ceiling. These components then radiate noise that can be heard in adjoining rooms.

To determine the airborne noise insulation of a component, such as a wall or the ceiling, this excitation is generated deliberately.

#### **Structure-borne noise**

If vibrations are generated in the building structure itself - for example, due to water pipes in a wall, hammering or drilling or household appliances - this is referred to as structure-borne noise.

#### **Impact noise**

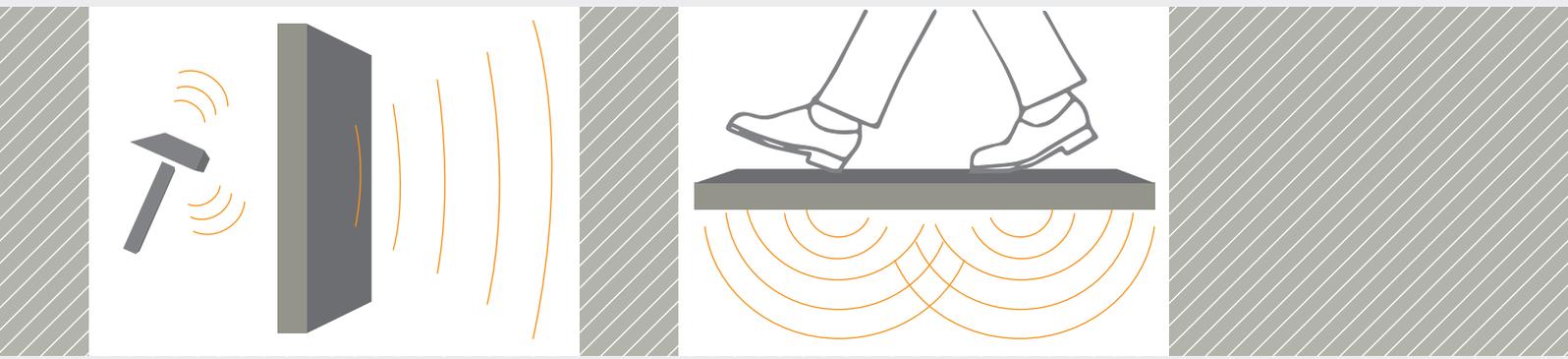
Impact noise is a special form of structure-borne noise, which is generated by walking, moving or dropping objects directly into the ceiling or stairs. Secondary airborne noise radiates into adjoining rooms.

To determine the impact noise insulation of a component, a standard hammer is used to deliberately excite the component.

#### **Transmission of sound through flanking elements**

Components must always be considered in combination with the building system. A proportion of the sound is transmitted through what are known as flanking components. Doors, shafts or ceiling ducts may act as transmission paths for sound. The perceived noise level always depends on the interaction of all transmission paths.





Structure-borne noise

Impact noise



### Sound control solutions from Getzner

Getzner develops and markets solutions to protect against structure-borne and impact noise and its transmission. The product range from the sound control experts is made up of Sylomer® and Sylodyn®, both of which are elastic, microcellular materials, and Isotop® products. The products and systems decouple floors, ceilings, walls, stairs and building service installations.

Getzner ensures that noise and vibrations do not freely propagate and makes a significant contribution to a better quality of living.

### Our solutions: Your benefits

- Targeted reduction in noise for a high standard of comfort
- Increased quality of life and work due to optimum insulation effect
- Sound control adds value to residential apartments and buildings
- Long-term, durable and pioneering soundproofing solutions
- A high degree of planning reliability thanks to proven effectiveness

# 3 | Product Overview

Overview of areas of application and products





Sylomer® and Sylodyn®  
PU materials

Isotop® spring isolator

- 1 Elastic bearing of building service installations
- 2 Floating floors
- 3 Elastic ceiling hangers
- 4 Elastic suspension of pipes
- 5 Elastic bearing of stairs and landings
- 6 Separation of adjacent components (flanking sound)



## Tried and tested materials and products

### Sylomer® & Sylodyn®

Our polyurethane materials Sylomer® and Sylodyn® developed in our own laboratories and manufactured in-house are suitable for universal use, deliver maximum isolation performance and have proven themselves time and again under a range of conditions in various installation locations. They are used as bearings for floors, stairs, landings, machine foundations, to decouple ceilings and as dry lining as well as in timber construction.

### Isotop® elements

Isotop® products are isolators that, depending on the requirements of the application, are produced in combination with Sylomer® and Sylodyn®. They are mainly used for low-frequency bearing of building service installations.

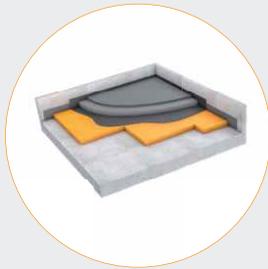
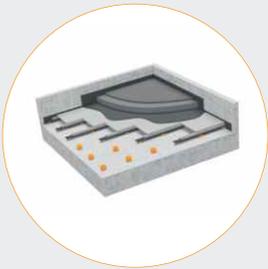
### Product benefits

- Long service life
- Maintenance-free
- Simple integration into the construction process
- Specifically designed to meet different building acoustics requirements

# 4 | Solutions in Detail

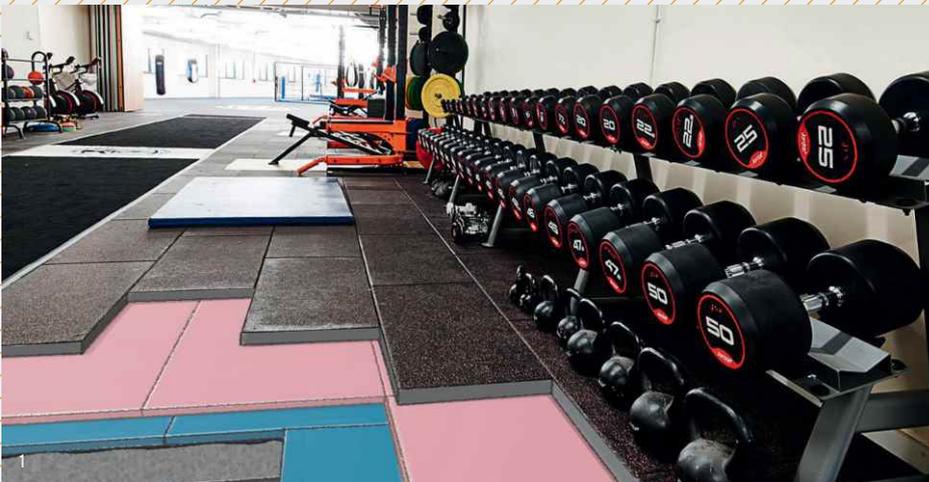


Using the Getzner Acoustic Floor Mat enables a rate of impact noise reduction of 33 dB



## Elastic bedding of floors

- Excellent impact noise insulation effect for all floor construction types (dry and wet screeds)
- Rate of impact noise reduction up to 33 dB
- Low installed height
- Full-surface or point bearings possible
- Quick and easy to install
- Stable material properties over entire service life
- Monitored quality
- Safety approved for planners and developers
- Free from softeners and pollutants
- Load capacity of up to 5 t/m<sup>2</sup>



- 1 Structure of an elastically decoupled floor in a fitness centre
- 2 Installation of dry panels directly on top of the Getzner Acoustic Floor Mat
- 3 Sylomer® discrete bearings in construction projects with demanding sound control requirements (theatre, opera, cinema, recording studios, etc.)
- 4 Acoustic Floor Mat product range



### Products:

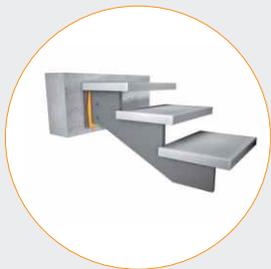
- Acoustic Floor Mat
- Acoustic Floor Blocks
- Sylomer®



Find out more at [www.getzner.com/floors](http://www.getzner.com/floors)

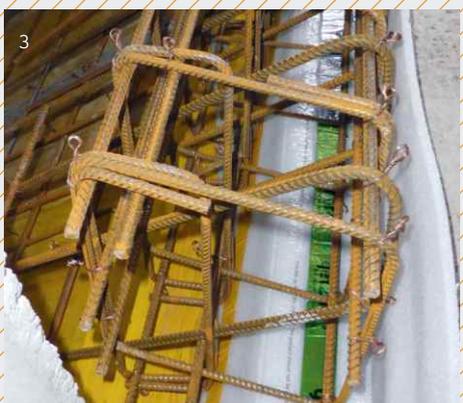


Easy to cut to size and adjust to the building conditions.



## Mounting of staircases and landings

- Proven rate of impact noise reduction of 31dB
- Bearing types for wood, steel and concrete steps
- Rapid installation due to flexible design
- Targeted load transmission
- Minimal settlement behaviour



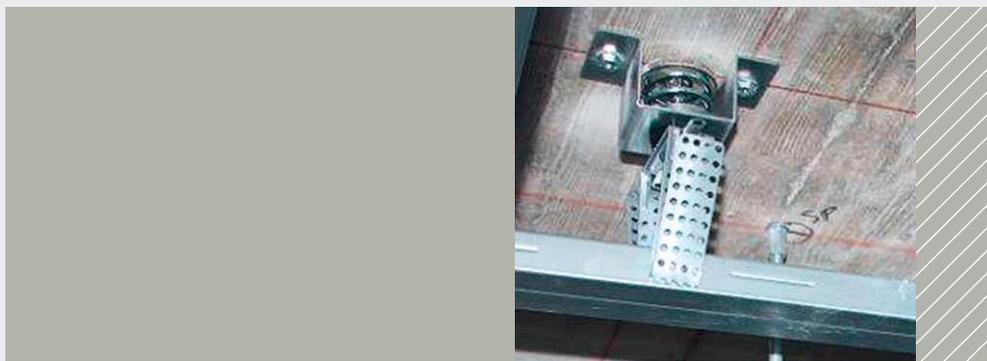
- 1 Stair base brackets made of Sylomer® are used on light-weight stairs to prevent the noise of people going up and down being transferred to adjoining apartments and causing noise nuisance.
- 2 The Getzner SB10 bearing for stairs is suitable both for use in precast
- 3 and in-situ concrete stairs.

### Products:

- Stair Bearing SB10
- Sylomer®



Find out more at  
[www.getzner.com/stairs](http://www.getzner.com/stairs)



Spring hangers for suspended ceilings with a low natural frequency



Dry lining decoupled with Sylomer® for high damping efficiency



### Decoupling of suspended ceilings and dry lining

- Noise reduction index that is 4 dB\* higher than standard attachment systems
- Effective even in the low frequency range 50 - 250 Hz
- Simple to install
- Minimal suspension height
- Suitable for all dry construction systems
- Allows for a reduction in the number of dry linings with the same damping efficiency
- Products for various load ranges

\* results from test report no. B0082-IN-CM-26-M57, B0082-IN-CM-26-M51



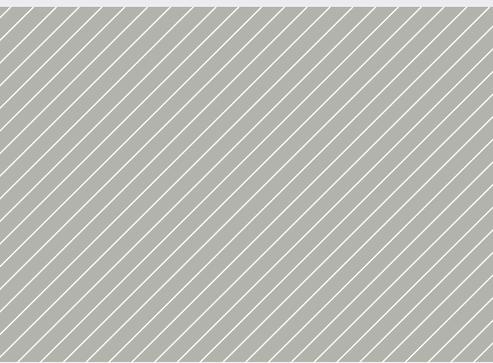
- 1 Greater noise reduction index for elastically decoupled ceilings
- 2 Suitable for renovation projects involving apartment ceilings and for new buildings, ranging from theatres to opera houses



- Products:**
- Acoustics+Sylomer®
  - Isotop®



Find out more at [www.getzner.com/interiors](http://www.getzner.com/interiors)



Air conditioning (AC) systems bedded on Isotop® SE elements.

Sylomer® discrete bearings for a heat pump



### Elastic bedding of building service installations

- Natural frequencies of up to 3 Hz can be achieved
- Simple to install
- Elements for various installation heights and load ranges
- More than 40 years of experience working with lift builders and equipment manufacturers

#### Application areas:

- Air conditioning (AC) systems
- Combined heat and power plants (CHP plants)
- Heat pumps
- Water chillers
- Cooling towers
- Pumps
- Pipes
- Lifts



- 1 Structurally strong bearing of pumps with Isotop® DZE elements
- 2 Structure-borne noise protection for lifts: maintenance-free Isotop® SE-DE Elevator and Sylomer®
- 3 Decoupling of pipes using Isotop® ceiling hangers

#### Products:

- Isotop®
- Sylomer®
- Sylodyn®

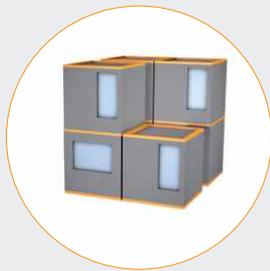
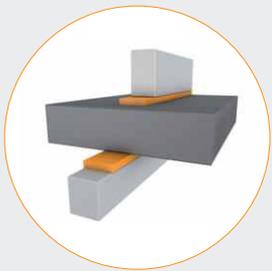


Find out more at [www.getzner.com/equipment](http://www.getzner.com/equipment)

# 4 | Solutions in Detail



Elastic flank decoupling  
in timber construction



## Sound control in timber construction

- 14 dB\* improvement in airborne and impact noise
- Low installed height
- Minimal settlement behaviour
- Effective decoupling of flanking components
- Approved materials and fasteners

\* results from test report no. 1228.60 - 1228.88



- 1 Sylodyn® linear support above and below the raw ceiling can bring improvements in the standard  $D'_{nTW}$  sound level and in the  $L'_{nTW}$  impact noise level of 14 dB\*.
- 2 Elastically decoupled screws and angle brackets prevent sound bridges forming.
- 3 Timber modules on Sylomer®



### Products:

- ABAI 105 angle brackets
- Sylodyn®



Find out more at  
[www.getzner.com/timber](http://www.getzner.com/timber)

# 5 | Calculation Expertise

» Getzner has developed a number of calculation tools to help when planning and implementing solutions.

## Expert advice and calculations

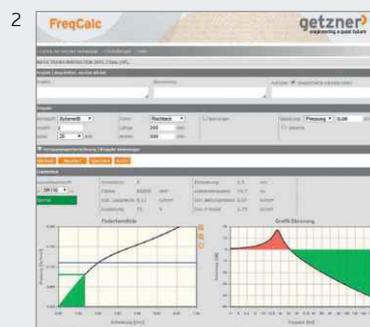
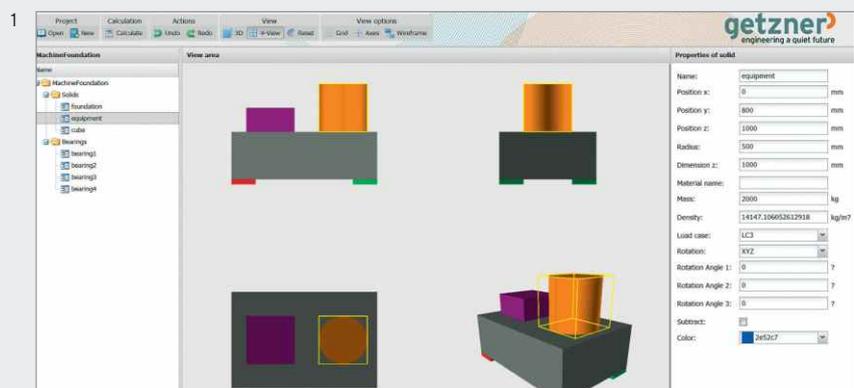
The experts at Getzner advise and support engineering consultancies, architects and construction physicists to develop specific solutions - even for the most challenging construction projects.

Getzner sound control solutions are tested on in-house and external test rigs to identify application options and to test their suitability in daily use. The results of these tests are then used to further develop and improve the product range.

### Specialised services from engineers

- Special calculation tools
- Bespoke, project-specific solutions
- Professional consultancy services from experienced specialists
- Skilled, efficient project management
- Network of established professional planners and engineers from external agencies

- 1 SweepCalc-Tool: design tool for objects with complex load distribution
- 2 FreqCalc-Tool: online calculation program for product design
- 3 TimberCalc-Tool: online calculation program for timber construction designs



Material type	Density	Modulus of elasticity	Modulus of rupture	Modulus of rupture parallel to grain	Modulus of rupture perpendicular to grain	Modulus of rupture parallel to grain	Modulus of rupture perpendicular to grain	Modulus of rupture parallel to grain	Modulus of rupture perpendicular to grain
1	1000	10000	100	100	100	100	100	100	100
2	1000	10000	100	100	100	100	100	100	100
3	1000	10000	100	100	100	100	100	100	100

## 6 | References

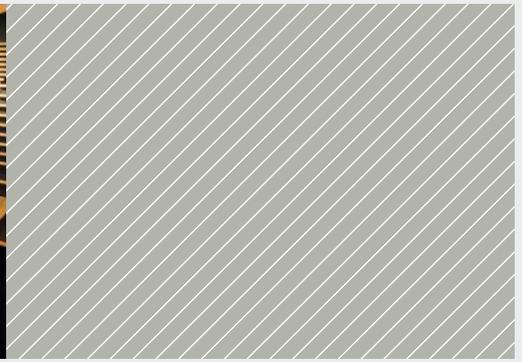




Porsche Museum, Stuttgart



Red Bull Music Academy, Tokyo



**>>** *Building acoustics solutions from Getzner are being used successfully all over the world.*

### Impact noise protection measures (extract)

- Cité Musicale de l'île Seguin (music venue), Boulogne-Billancourt, FR
- Berlin State Opera, DE
- Yash Raj Studio, Mumbai, IN
- JW Marriott - Juhu Beach Resort, Mumbai, IN
- Management School, Bordeaux, FR
- First Campus - atrium floor, Vienna, AT
- Hotel "Bayerischer Hof", Munich, DE
- Landeskrankenhaus Graz (hospital), AT
- Knorr Bremse (manufacturer of braking systems), Munich, DE
- Fitness studio, Tottenham Court Road, London, GB
- Gym, Covent Garden, London, GB
- Hotel Alte Post, Arzl, AT
- Police Headquarters Graz, AT
- Oslo Opera House, NO
- Warsaw Spire, Warsaw, PL

### Acoustic measures in dry construction (extract)

- Red Bull Music Academy, Tokyo, JP (box-in-box solutions)
- Courtyard Marriott, Mumbai, IN (box-in-box solutions)
- Swami Narayan Mandir, private prayer room, Mumbai, IN (box-in-box solutions)
- Paris Philharmonic Hall, FR
- Sunwerk Boulderhalle, decoupling of a climbing wall in Cologne, DE (dry lining)
- Caixa Forum, Zaragoza, ES (elastic ceiling hangers)
- Royal Olympic Hotel, GR (elastic ceiling hangers)
- Karate Training Hall, Tokyo, JP (elastic ceiling hangers)
- Sula Planet, Ibiza, ES (elastic ceiling hangers)
- Tama Art University, JP (elastic ceiling hangers)

### Building acoustics solutions in timber construction (extract)

- Kampa AG Innovation Centre, Aalen-Waldhausen, DE
- Nuremberg Riot Police, Nuremberg, DE
- Maschinenring office building, St. Johann im Pongau, AT
- Retirement home, Hallein, AT
- "Treet", 14-storey apartment building, Bergen, NO
- CROUS de Nantes, five four-storey student residences, Nantes, FR
- Rhein-Palais-Bonner-Bogen Quarter, Bonn, DE
- Mama Thresel, Hotel, Leogang, AT
- Morbach nursery, DE
- Neuendettelsau school of nursing, DE
- "Wohnen im Park" apartment building, Mondsee, AT

### Bearing for building services installations (extract)

- JW Marriott Hotel, Pune, IN
- Mercedes Museum Stuttgart, DE
- Brüder Grimm-Museum, Kassel, DE
- Porsche Museum Stuttgart, DE
- Oslo Opera House, NO
- Cologne Opera House, DE
- Airrail Center - Frankfurt Airport, DE

1 image source: Red Bull, Dan Wilton / [www.redbullcontentpool.com](http://www.redbullcontentpool.com)



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