

Vibration Solutions for Building Services Equipment (HVAC)



» Efficient solutions for reducing noise and vibrations

» Professional support from planning to implementation

» Extensive product range for a wide variety of building services equipment applications



1 | What Getzner Offers

by getzner
sylomer®

by getzner
syloodyn®

by getzner
sylodamp®

by getzner
isotop®



At Getzner, solutions for minimising vibration and structure-borne noise have been at the centre of creativity for 50 years – for building services equipment as well as for the railway, construction and industry sectors.

The exceptional vibration-insulating effect of Getzner products is based on the unique properties of the polyurethane materials Sylomer®, Sylodyn® and Sylodamp®.

The product range for building services equipment consists of Getzner materials as well as the specially developed Isotop® products. Isotop® combines the material properties of PU elastomers with the advantages of steel springs or metal elements.

» *Getzner ensures a more peaceful environment, enhanced functionality and improved wellbeing.*

Getzner offers

- Extensive product range for different requirements
- Efficient, established and approved products
- Professional consultancy, saving time and money
- A holistic approach to relevant framework conditions – starting from the planning phase
- Quick implementation owing to expert calculation and manufacturing
- Product solutions offering the best possible cost-benefit ratio thanks to years of experience

2 | Applications





5 Pipes (page 12)

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6 Compressors (page 13)

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10 Transformers (page 17)

3 | Products for Outstanding Efficiency



Isotop®
SD, MSN



Isotop®
SD-BL, MSN-BL



Isotop®
DSD, DMSN



Isotop® DSD-BL,
DMSN-BL



Isotop®
MSN-DAMP



Isotop®
Compact



Isotop® DZE,
DZE Mini, DZE-BL



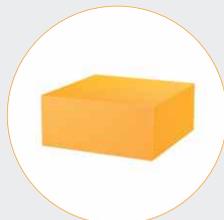
Isotop® MSN/Z,
SD/Z, MSN/Z-LC



Isotop® SE



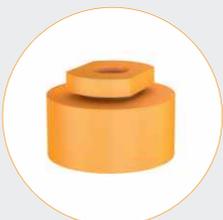
Isotop® SE-DE,
SE-DE Elevator



Sylomer®, Sylodyn® full-surface,
strip and point bearings



Isotop® ENI



Sylomer®
compressor
grommets CGR



Transformer pads
TR



Seismic machine
bearings SMM

Product benefits:

- Maintenance-free
- Very low settling behaviour and long service life
- Long life cycles
- Easily adapted to the local installation situation

4 | Product Finder

For more product details see product catalogue

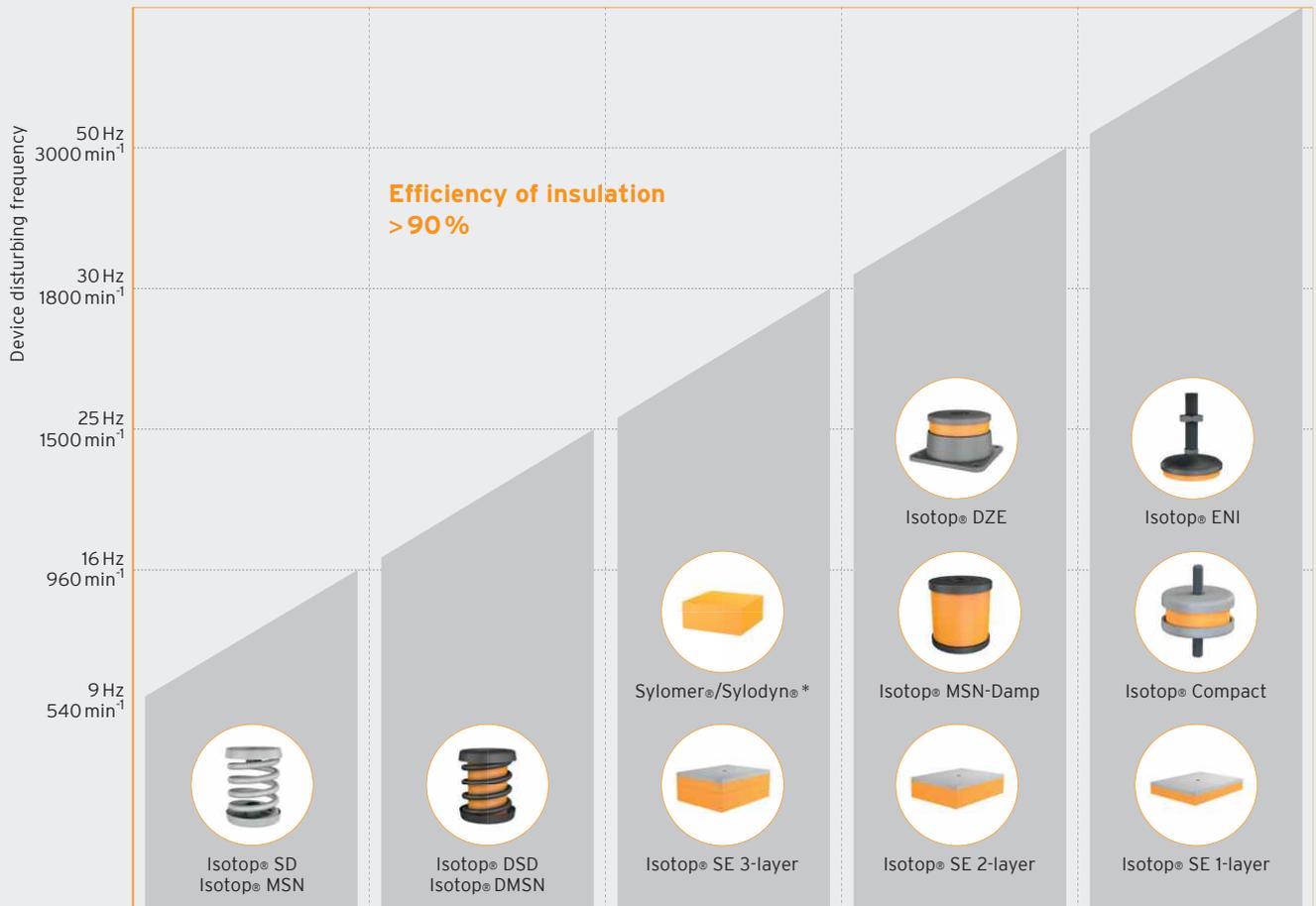
Thanks to its wide range of products, Getzner Werkstoffe is able to select bearings that are perfectly tailored to customer requirements.

Isotop® products are mainly used for low-frequency bearings and can be conveniently screwed together. They can be tailored in line with the disturbing frequency as required, from a frequency of 3 Hz.

- Mainly used for natural frequencies below 8 Hz
- Can be used for point loads from 2 kg to 5.5 t per element

Sylomer® and **Sylodyn®** are mainly used for full surface bearings with natural frequencies above approximately 7 Hz (disturbing frequencies from 25 Hz upwards). Ideally, Getzner HRB bearings are used for very high loads in the smallest spaces.

- Mainly used for natural frequencies above 7 Hz
- Load ranges from 1t/m² to 600t/m²
- Available in thicknesses from 3 mm to 50 mm



Requirements for isolation effect	High (e.g. hospitals, schools, office buildings, concert and theatre halls, etc.)		Medium (e.g. shopping centres, hotels, etc.)		Standard (e.g. industrial buildings, etc.)
Device disturbing frequency	9 Hz 540 min ⁻¹	16 Hz 960 min ⁻¹	25 Hz 1500 min ⁻¹	30 Hz 1800 min ⁻¹	50 Hz 3000 min ⁻¹
Min. vertical natural frequency	3 Hz	5 Hz	7 Hz	9 Hz	14 Hz

* Natural frequencies are dependent on thickness and geometry.

5 | Applications and Solutions



1 Air handling units (AHU)/Air conditioning

Modern air conditioning systems and air handling units (AHU) are usually installed in service rooms in the basement or on the roof. Depending on the surface conditions and design of the substructure, extensive structure-borne noise protection measures are required.

Elastic bearings made from Sylomer® are used as a standard measure and Isotop® SE or SE-DE elements for high point loads. For critical applications (hospitals, concert halls, theatres, etc.), the systems are mounted on spring assemblies (block elements).

Application example:

Roof installation of air-handling units decoupled from structure-borne noise for the protection of meeting rooms and operating theatres

- Required natural frequency < 7 Hz
- Consideration of wind loads

Special feature: Height-adjustable design for offsetting the roof pitch

Solution: Isotop® DSD-BL 2 steel spring block elements with damping core and decoupled foot and top plate

Result: natural frequency of 4.8 Hz achieved, efficiency of insulation at 3,000 rpm (50 Hz) = 99%



Low-frequency bearing of an AHU on steel springs with an integrated damping core (Isotop® DSD-BL)

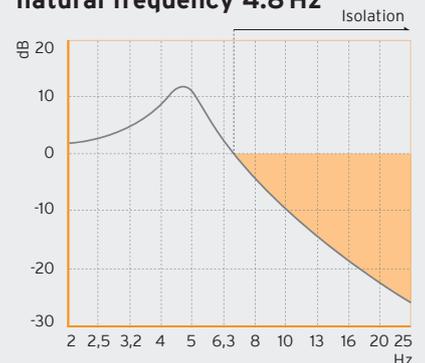


AC system next to office space decoupled with Isotop® SE



Bearing of an air-handling unit on Sylomer® strips

Insertion loss, natural frequency 4.8 Hz





2 Fans

Fans have moving masses with large acceleration values. Depending on the imbalance of the motor and impeller, a reduction in structure-borne noise is required.

Due to various operating points when starting and stopping, fans are isolated using springs.

Application example:

Elastic bearing of a directly driven fan with frequency converter

- Required natural frequency < 4 Hz
- Minimum installation height

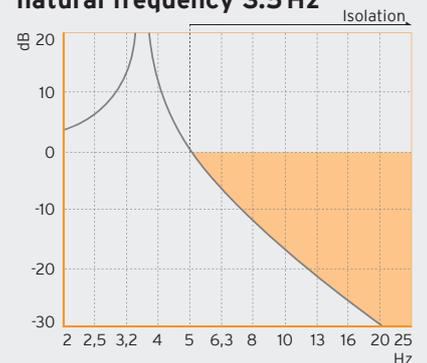
Solution: Isotop® SD with FP/K footplate

Result: natural frequency of 3.5 Hz achieved, efficiency of insulation at 1,000 rpm (16.7 Hz) = 95%

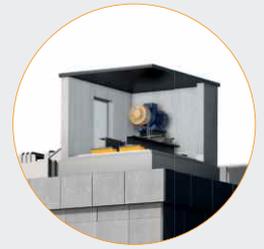


Reduction of structure-borne noise through bearing using Isotop® SD and MSN steel springs

Isolation curve, natural frequency 3.5 Hz



5 Applications and Solutions



3 Lift systems

The starting, stopping and general movement of the cabin generates vibrations that are transmitted to the structure of the building and perceived as structure-borne noise.

The bearing of the drive and cables in particular using Sylomer® and double elastic Isotop® SE-DE elements can achieve excellent decoupling results.

Solutions with Isotop® SE-DE meet the requirements of bearing class EL3 in accordance with VDI 2566.

» *Isolation elements that are too soft can impair the movement characteristics and the stopping accuracy of the lift car. It is therefore recommended that the natural frequency does not fall below 8 Hz and does not exceed 15 Hz.*



Double elastic bearing using Isotop® SE-DE, overhead drive



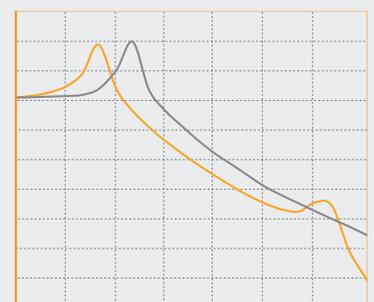
Double elastic bearing using Isotop® SE-DE, overhead cable guide



Decoupling of the drive using pre-stressed bearings made from Sylomer®



Double elastic element vs. single elastic element





4 Chillers and cooling towers

Chillers and cooling towers are usually installed on the roof. As this promotes structure-borne noise, the systems are isolated using Sylomer® or Isotop®.

Application example, chiller:

Roof installation of a refrigerating machine decoupled from structure-borne noise on an on-site steel structure
 – Required natural frequency <5 Hz

Solution: Isotop® SD-BL 2 steel spring block elements with pressure plate and footplate decoupled from structure-borne noise

Result: natural frequency of 3.5 Hz achieved, efficiency of insulation at 1,500 rpm (25 Hz) = 90%



Bearing of a chiller using Isotop® SD-BL 2



Recooler equipped with Sylomer® bearings as standard



Structurally-strong bearing of a cooling tower using Isotop® DZE

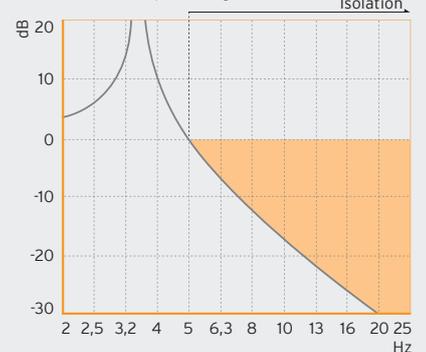
Application example, cooling tower:

Roof-mounted recooling
 – Required natural frequency <15 Hz
 – Linear support

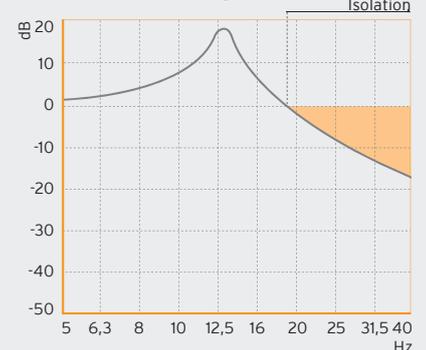
Solution: Elastic bearings made from Sylomer®

Result: natural frequency of 13.4 Hz achieved, efficiency of insulation at 3,000 rpm (50 Hz) >90%

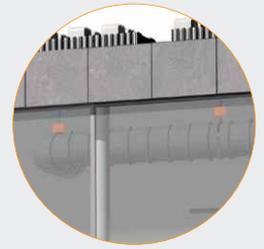
Isolation curve, natural frequency 3.5 Hz



Isolation curve, natural frequency 13.4 Hz



5 | Applications and Solutions



5 Pipes and peripheral devices

Pipes in building services equipment leading from or to energy sources (AC, CHP, etc.) generate structure-borne noise and must be considered as a whole when decoupling the system.

Application example:

Research institute, suspended pipes

– Required natural frequency guidelines from construction physicist ≤ 6 Hz

Solution: Isotop® SD/Z

Result: natural frequency of 4 Hz achieved, efficiency of insulation at 1,500 rpm (25 Hz) = 97.4%

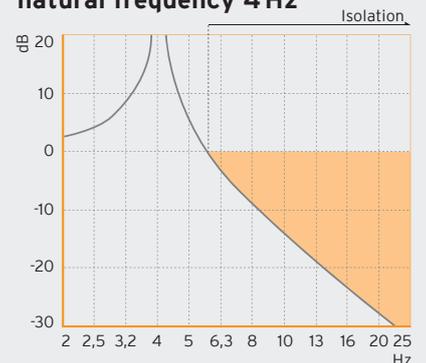


Pipes decoupled using Isotop® SD/Z



Bearing of an exhaust heat exchanger using Isotop® DSD-BL

Isolation curve, natural frequency 4 Hz





6 Compressors

Compressors are found as components in various systems such as heat pumps or AC units. The vibrations to be decoupled are mainly caused by the compression process of the refrigerant. Thanks to the wide Isotop® and Sylomer® product range, standard solutions can be selected for every requirement.

Application example:

Vibration decoupled bearing for a compressor and condensing unit in a heat pump

- Durable and maintenance-free
- Easy-fit installation
- Compact design

Solution: Isotop® MSN-DAMP

Result: natural frequency of 11.4 Hz achieved, efficiency of insulation at 3,000 rpm (50 Hz) >95%

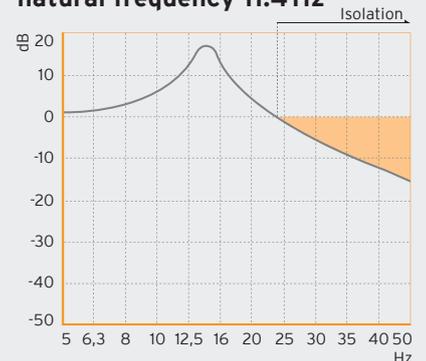


Bearing of the compressor unit on Isotop® MSN-DAMP



Bearing of compressors using Isotop® SD steel springs

Isolation curve, natural frequency 11.4 Hz



5 | Applications and Solutions



7 Heat pumps

Heat pumps generate high levels of structure-borne noise due to their compressors and moving masses. Entire heat pumps are isolated very efficiently using Isotop® steel springs - with or without dampers - or using Sylomer®/ Sylodyn®.

For components such as the compressor or fan, Isotop® MSN-Damp, Isotop® Compact or the Sylomer® compressor grommet CGR are particularly suitable.

Application example:

- Vibration decoupled bearing of an air heat pump
- Required natural frequency < 5 Hz
- Compact design

Solution: Isotop® DSD with Isotop® FP/K footplate decoupled from structure-borne noise

Result: natural frequency of 4.8 Hz achieved, efficiency of insulation at 1,500 rpm (25 Hz) = 94%



Bearing of an industrial heat pump using Isotop® DSD and FP/K footplate with damping element



Bearing of an outdoor unit on the floor (foundation) using Isotop® MSN elements

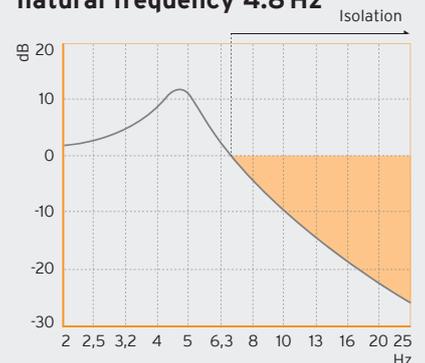


Elastic decoupling of an indoor unit with Sylomer® discrete bearing



Bearing of a suspended outdoor unit using Isotop® MSN elements

Insulation curve, natural frequency 4.8 Hz





8 Pumps

Pumps usually convey liquid media with different viscosities. Depending on the medium, pressure and conveying distance, extensive structure-borne noise insulation must be considered. Pumps are isolated very efficiently with structurally strong DZE elements or in combination with sufficient mass using Sylomer®/Sylyodyn®, sandwich elements or block elements.

Application example:

- Required natural frequency < 8 Hz
- Easy-fit installation

Solution: Isotop® DZE

Result: natural frequency of 7.5 Hz achieved, efficiency of insulation at 1,500 rpm (25 Hz) = 90%



Pump bearing with additional mass (foundation) on Isotop® SD block elements

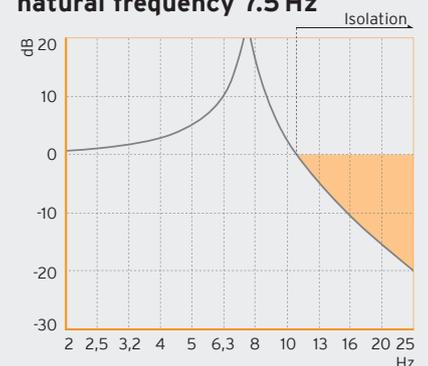


Decoupling of a pump with Sylomer® and Sylyodyn®



Pump bearings without additional mass (foundation) with Isotop® DZE

Isolation curve, natural frequency 7.5 Hz



5 Applications and Solutions



9 Combined heat and power plants (CHPs) and generators with a combustion engine

In addition to the emergency power supply, e.g. in hospitals, power generators with combustion engines are also used as combined heat and power plants for simultaneous heat recovery. These generate high levels of structure-borne noise due to their large, moving masses and accelerations. To prevent long-term damage to the shell of the building and avoid health hazards for individuals, elastic bearing of the systems is required.

Combined heat and power plants and emergency generators are usually isolated using spring assemblies with damper elements (Isotop® DSD-BL) or with Sylomer®/Sylodyn® strip or foundation bearings.

Application example:

- Required natural frequency < 6 Hz
- High amplitudes
- No space for additional mass (foundation) available

Solution: Isotop® DSD-BL 6 with footplate

Result: natural frequency of 5 Hz achieved, efficiency of insulation at 1,500 rpm (25 Hz) = 95%



Small combined heat and power plant decoupled with Isotop® DSD and FP/K footplate



Isotop® DSD-BL bearings

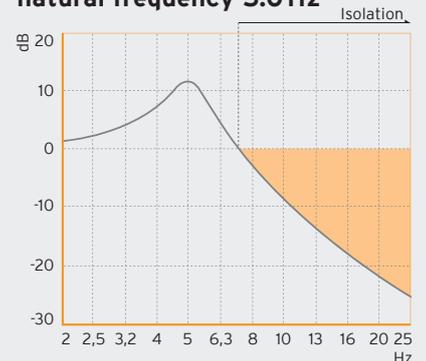


Isotop® DZE bearings for compensating high dynamic forces of very high amplitudes



Strip bearing on Sylodyn®

Isolation curve, natural frequency 5.0 Hz





10 Transformers

Structure-borne noise is transmitted from the transformer core via the contact surfaces (e.g. the rollers) into the foundation. The operation of transformers within buildings or in the immediate vicinity of buildings is therefore often perceived as unpleasant and disturbing in residential areas and workplaces.

Application example:

Vibration decoupled bearing of transformers with rollers
 – Compact design
 – High stability

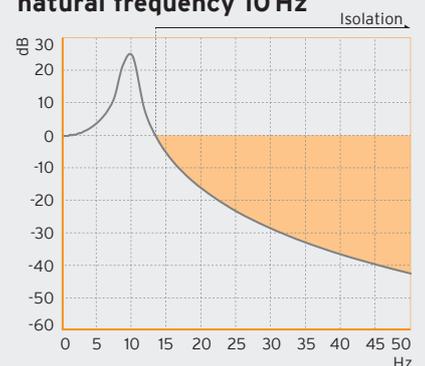
Solution: TR transformer pads

Result: natural frequency of 10 Hz achieved, efficiency of insulation at 3,000 rpm (50 Hz) = 95%



Vibration decoupled bearing of a distribution transformer with TR transformer pads

Isolation curve, natural frequency 10 Hz



6 | Service



In-house research and development



Calculations by experienced experts

Individuality creates efficiency

Individually tailored products as well as detailed installation plans and fitting instructions result in efficient solutions for reducing noise and vibrations in buildings.

Framework conditions for professional solutions

- Definition of all excitation forces
- Consideration of the effects of elastic bearing on the exciter and the object to be protected
- Universal procedure
- Compliance with legal requirements for structure-borne noise protection

Getzner develops custom solutions to meet stringent demands - for all industry sectors.

Holistic solution development

Getzner is on hand to assist with projects, from the planning stage right through to implementation. Production at its own sites allows the company to ensure that projects are completed promptly and on time. Our team of experts is also flexible and able to react quickly to change requests.

Smart from the start

The bearing of all equipment is planned according to customer requirements and structural conditions.

Setting up devices made easy

Getzner ascertains suitable measures for structure-borne noise insulation according to position and with an appropriate centre of gravity. What customers receive is a precise calculation, indicating the degree of isolation, damping



50 years of experience



Leader in innovation



Quality control



Advice and support

efficiency and natural frequency for the bearing of their system. A detailed CAD plan simplifies the installation of the products, thereby eliminating the possibility of incorrect mounting.

The result: effective vibration isolation as intended.

The following data is required in order to process enquiries

- Device or machine version (application description/drawing, etc.)
- Dimensions and weight of the machine or device
- Position of the support points and centre of gravity
- Required bearing type (full-surface, point or strip)
- Minimum disturbing frequency Hz/ U_{min} (if known)
- Static and dynamic device loads
- Information on the substructure (floor construction, steel frame, etc.)

Everything from a single source

- Advice
- Optimisation
- Calculation
- Vibration measurement
- Vibration isolation forecast
- Installation plans
- Installation supervision
- Prototype production
- Pilot series production
- Series production
- Quality label



Porsche Museum Stuttgart

Getzner develops advanced polyurethane materials and products for protection against vibration and noise in the rail, construction and industry sectors.



Worldwide availability

Extract of references from 50 years of experience in providing vibration protection solutions for building services equipment.

- Mercedes Museum Stuttgart (bearing of AC systems)
- Porsche Museum Stuttgart (bearing of AC systems)
- Jaguar Land Rover plant, Nitra, Slovakia (bearing of AC systems)
- Papastratos tobacco company, Greece (bearing of AC systems)
- Carl Zeiss Werk Oberkochen (bearing of AC systems)
- Messe Stuttgart (bearing of AC systems)
- The Squire Airport, Frankfurt (bearing of AC systems)
- Caritas Hospital, Bad Mergentheim (decoupling of CHPs, exhaust silencers and pipes)
- Congress and Cultural Centre Carmen-Würth-Forum Künzelsau (decoupling of a heat pump)
- Isfahan Metro, Iran (bearing of smoke extraction fans)
- Stuttgart State Library (isolation of lift systems)
- Schwabinger Tor, Munich (isolation of lift systems)

Further information:

- Product catalogue – Machine bearings for building services equipment
- Solutions for building services equipment www.getzner.com/HVAC
- Measurement reports on request

» *Solutions from Getzner are being used successfully all over the world.*