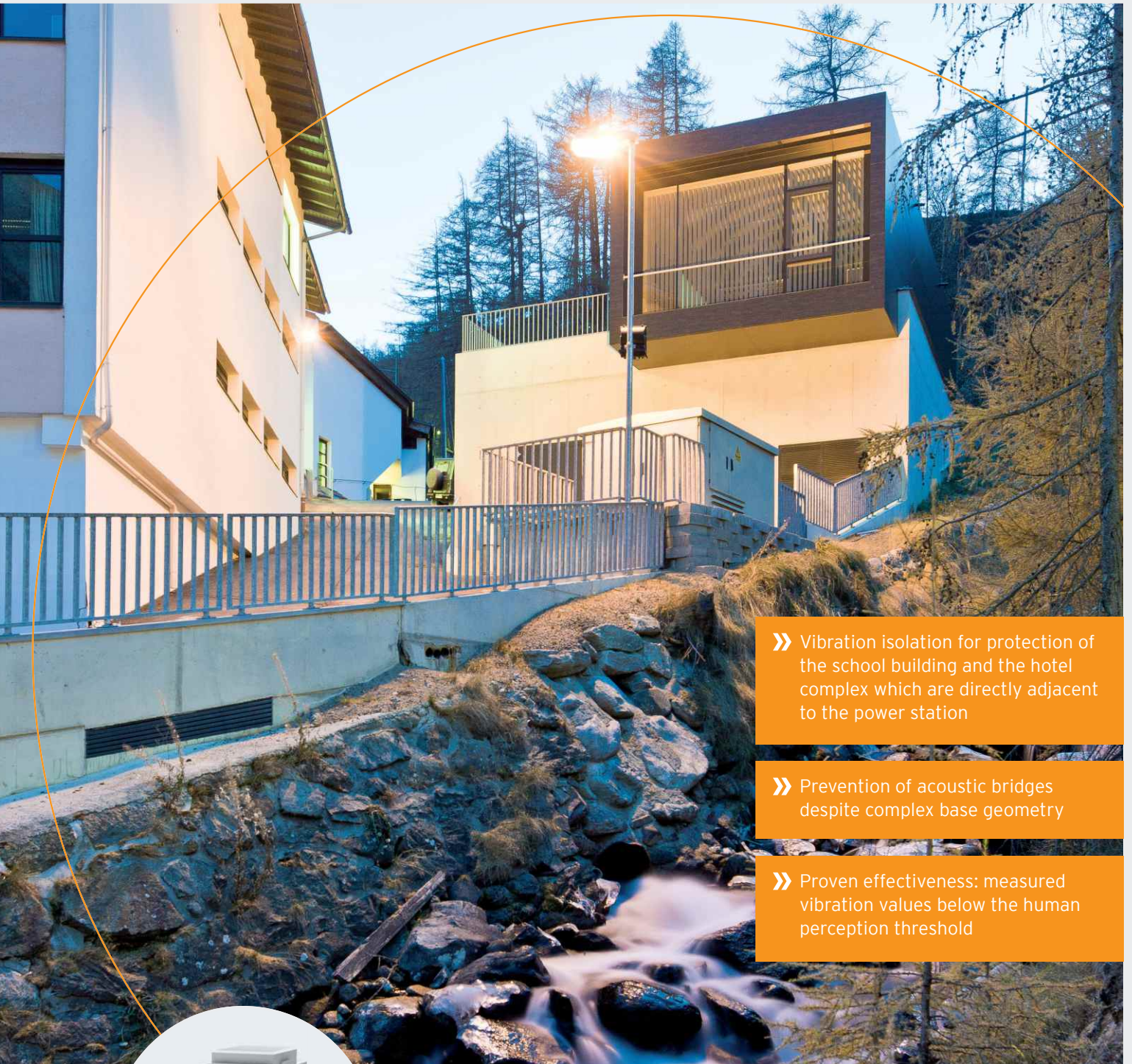


# Case Study

## Rettenbach Power Station in Sölden (AT)



» Vibration isolation for protection of the school building and the hotel complex which are directly adjacent to the power station

» Prevention of acoustic bridges despite complex base geometry

» Proven effectiveness: measured vibration values below the human perception threshold



# Elastic Mounting of Machine Foundations and Buildings



## Description of the project    The Getzner Solution

### Hydroelectric power station in Rettenbach

For sustainable energy production, Wasserkraft Sölden Gen.m.b.H has built a hydroelectric power station. The system uses the power of the Rettenbach, which flows through the borough, directly alongside the primary and secondary school, and also harnesses power from the Zwieselbach. The borough stipulated that the school activities must on no account be affected by turbine vibrations or noise resulting from the implementation of the hydroelectric power station.

The power station is directly adjacent to the school building which houses the local kindergarten. Access to an underground garage, which is connected to the school building, travels directly beneath the power station buildings. A luxury hotel is also located in the vicinity of the power station. These complex surrounding conditions placed particular demands on those responsible for the project in terms of vibration isolation. The different drops of the two rivers meant that two turbines had to be installed and therefore two sets of vibrations needed to be isolated.

### No vibration or acoustic transfer thanks to Sylomer®

Getzner is a vibration isolation specialist for machine foundations and buildings. Therefore the engineers, Ingenieurbüro Sprenger from Innsbruck, appointed Getzner in the initial project phase to develop a concept for vibration isolation of the power station. The Getzner engineers calculated the optimum natural frequency for the elastic mounting of the power station building on the basis of the disruptive frequency data from the turbine manufacturer. Getzner was responsible for the dimensioning of the elastic mounting and for the selection and laying of the materials .

#### Tailored concept - expert implementation

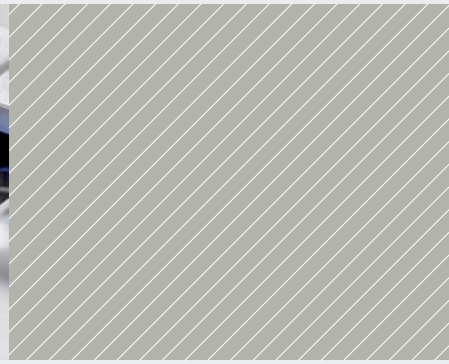
The power station building was erected on a full-surface vibration-isolating layer. The Sylomer® mats decouple the whole building from its surroundings, thus minimising vibration and noise to neighbouring building areas.

In addition, large-scale side installations decouple vibrations in the direction of the school building.

Despite the difficult conditions, the Getzner specialists fitted all the insulation material within three days. The compact architecture resulted in a complicated base geometry: Despite frequent variations in the substrate level, "acoustic bridges" were successfully avoided.

#### Getzner Performances: Materials, planning and implementation

- Calculation of material requirements
- Use of materials developed in-house
- Individual reconciliation of the solution
- Consultation support based on experience and expertise
- Expert implementation of the vibration solution
- Success monitored by test measurements



### Demonstrably effective vibration protection

Getzner Werkstoffe not only designs and manufactures materials for vibration reduction, it is also an experienced building consultant and supports companies in projects from planning to success monitoring. In the Rettenbach hydroelectric power station project, extensive vibration and acoustic measurements demonstrated the effectiveness of the implemented vibration solution: Both in the school rooms and outdoors, the measured vibration values lie below the human perception threshold. The decoupling of the power station from its surroundings prevents vibration and acoustic transfer to the adjacent school building and the neighbouring luxury hotel. Professional vibration protection therefore enables undisturbed use of neighbouring facilities.

### Feedback

“Getzner advised us in a highly competent manner while the power station was being built. The proximity of the power station to the school and hotel buildings made working conditions difficult. This made the company's extensive vibration insulation experience particularly valuable in this project. The fact that Getzner develops and also produces the materials in-house is a clear benefit.”

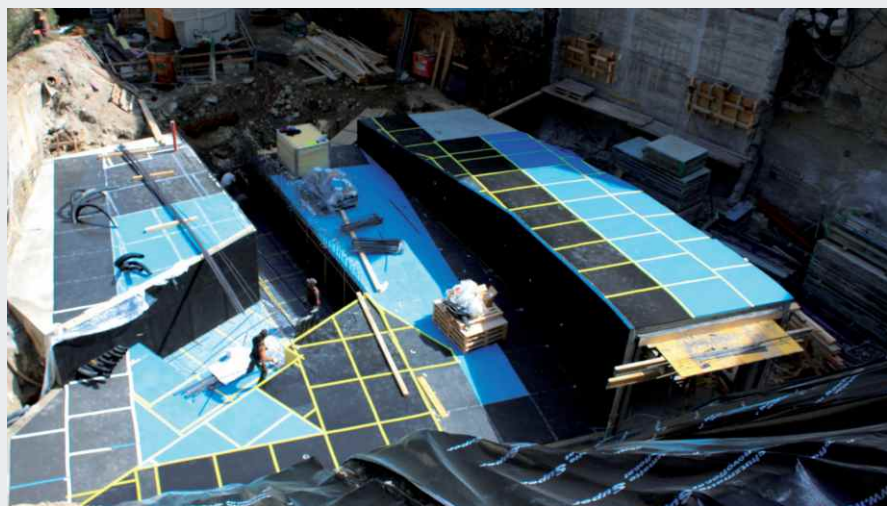
DI Thomas Sprenger,  
Ingenieurbüro Sprenger

### Measurement details

“The maximum vibration severity (KB-Fmax in accordance with DIN 4150-2) at full load of both turbines is 0.021 in the adjacent school and 0.045 in the outdoor area. This is far below the human perception threshold. Even in the underground garage, the maximum vibration severity (KB-Fmax in accordance with DIN 4150-2) is 0.011 which is considerably lower than the perceptible range. The structure-borne noise difference between the vibrations of the machine foundations and the measured values in the school is 33 dB. The structure-borne and airborne noise measurements therefore confirm the effectiveness of the technical vibration measures implemented in the Rettenbach power station.”

See measurement report, KW Rettenbach, DI Markus Heim, September 2010

Acoustic bridges were prevented despite difficult base geometry.





## Facts and figures at a glance

### Rettenbach hydroelectric power station

Client:	Wasserkraft Sölden Gen.m.b.H
Planning:	Engineers, Ingenieurbüro Sprenger, Aldrans
Executing	
Building firm:	Thurner Bau, Imst
Vibration isolation:	Getzner Werkstoffe GmbH
Solution:	Vibration isolation of the power station from the adjacent school and kindergarten building and hotel complexes with the use of Sylomer®
Installation date:	Autumn 2008
Completion:	Autumn 2009
Contract value:	EUR 63,000.00

### Getzner Werkstoffe GmbH

Foundation:	1969 (as a subsidiary of Getzner, Mutter & Cie)
Chief Executive Officer:	Ing. Jürgen Rainalter
Employees:	380
2016 turnover:	EUR 80.4 million
Business areas:	Railway, construction, industry
Headquarter:	Bürs (AT)
Locations:	Berlin (DE), Munich (DE), Stuttgart (DE), Lyon (FR), Amman (JO), Tokyo (JP), Pune (IN), Beijing (CN), Kunshan (CN), Charlotte (US)
Ratio of exports:	90 %

### Construction references (Extract)

- Skyline Vienna, Vienna (AT)
- Oslo Opera, Oslo (NO)
- Drachen-Center, Basle (CH)
- The Rushmore Building, New York (US)
- Bolshoi Theatre, Moscow (RU)
- Teatro Nacional de Catalunya, Barcelona (ES)
- Welfenhöfe, Munich (DE)
- Arnulfpark, Munich (DE)
- Vier Sonnen luxury residential complex, Moscow (RU)
- Füssener Straße and Keselstraße hydroelectric power stations, Kempten (DE)