

## Case Study

# Solid Timber Apartment Building by Meickl, St. Johann in Tirol (AT)



» Airborne and impact noise insulation in a multi-storey timber construction

» Sound insulation without decoupled shells improves indoor environment quality

» Compliance with sound insulation requirements demonstrated by conducting measurements on the completed building



# Airborne and Impact Noise Protection for a Solid Timber Apartment Building

## Description of the project

In 2011 the timber construction and carpentry company Raimund Meickl GmbH constructed a modern apartment building with solid wooden panels to passive building standard.

A top-quality indoor environment requires effective protection from airborne and impact noise. Sound insulation within the building is just as essential as sound insulation against noise from outside. The construction company contacted Getzner, a specialist in vibration insulation, for help in minimising sound transmission. The result was an outstanding sound insulation solution.



Elastic angle bracket  
ABAI 105

## The Getzner solution

Getzner offers a comprehensive vibration isolation solution which minimises sound transmission in a multi-storey solid timber construction.

In addition to designing an elastically suspended ceiling, the flanking components and fasteners were also elastically decoupled. A high-quality ceiling construction significantly reduces direct sound transmission. Sound transmission via the flanking components then becomes the key factor. Getzner decoupled all the joints between the walls and ceilings using the high-tech material Sylodyn® in order to overcome sound transmission by this route. To prevent sound bridges, the specially developed ABAI 105 elastic angle brackets from Simpson Strong Tie® were used in conjunction with decoupled screws. This elastic fastening system optimally separates the building components - without affecting the load-bearing capacity of the structure or increasing sound transmission.

### Simple installation

Before installation, Getzner experts calculated which types of Sylodyn® should be placed in which positions in order to achieve optimum vibration isolation. They also provided clear installation plans and insertion aids to ensure that the elastic angle

brackets were positioned correctly. Expert on-site supervision of the installation work completed the integrated realisation of the Getzner solution.

### Excellent sound insulation without impairing climate control

In addition to the outstanding sound insulation values achieved with the vibration isolation system, the solid timber walls - some of which are of display quality and some clad with plastered wood-fibre boards - also help to improve the quality of the indoor environment and therefore to increase the value of the entire building. "Our solution to vibration isolation makes it possible to work on the walls without using decoupled shells. This guarantees that the climate control effect of the solid timber walls will be maintained," reports Hendrik Reichelt, Product Manager at Getzner.

### Measurement methods and values prove Getzner expertise

A two-stage measurement method at the building itself and reference values from the "Ceiling structures for multi-storey timber construction" research project conducted by Holzforschung Austria prove the effectiveness of the Getzner solution. "The various sound measurements clearly



Excellent sound insulation values were achieved by decoupling the flanking components

demonstrate that excellent sound insulation levels can be achieved by decoupling all the flanking components", explains Lothar Säly, Project Manager at Getzner.

### Know-how: sound measurements during the construction project

Two independent sets of measurements were taken at different times in order to confirm the effectiveness of the solution in this construction project:

- The first set of sound measurements without a suspended, decoupled ceiling gave a weighted apparent sound reduction index  $R'_w$  of 59 dB and a weighted normalised impact sound pressure level  $L'_{n,w}$  of 46 dB. Transmission via secondary sound paths was also investigated in this first set of measurements: the sound transmission paths via the ceiling ( $D_d$ ) are 10 dB higher than the flanking transmission paths ( $F_f$  and  $D_f$ ).
- The second set of sound measurements in the completed building with a suspended ceiling gave a weighted apparent sound reduction index  $R'_w$  of 73 dB and a weighted normalised impact sound pressure level  $L'_{n,w}$  of 32 dB.

The test report confirms the effectiveness of the system:

» *These sound insulation values are the best I have ever measured in a timber construction.* «

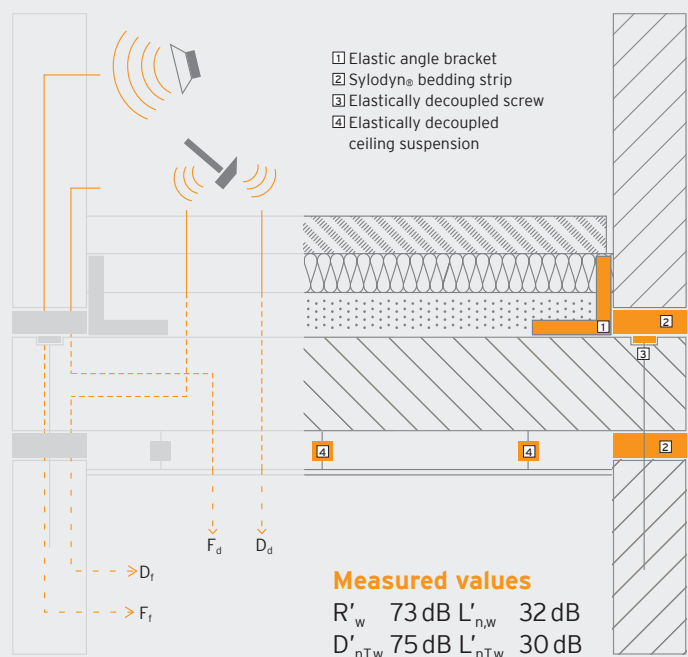
Hans-Peter Buschbacher, ssih consulting engineers, sound measurement

## Feedback

### What does the client say about the project?

"All the insulation systems interact perfectly. This project provides the construction sector with real evidence that results obtained by Holzforschung Austria can also be implemented in practice," says Martin Meickl of the timber construction and carpentry company Raimund Meickl GmbH.

### Consistent decoupling of all sound transmission paths





## Facts and figures at a glance

### Solid timber apartment building by Meickl, St. Johann in Tirol (AT)

Key facts:	Multi-storey passive building with three residential units
Location:	St. Johann in Tirol, Austria
Client:	Raimund Meickl GmbH & Co KG
Solution:	Elastic decoupling of joints between wall and ceiling using Sylodyn®, elastically decoupled ceiling suspension using Sylodyn®, elastic fasteners
Products used:	Sylodyn® strips Elastic angle bracket ABAI 105 from Simpson Strong Tie® Elastically decoupled screws
Realisation:	2011/2012

### Getzner Werkstoffe GmbH

Foundation:	1969 (as a subsidiary of Getzner, Mutter & Cie)
Chief Executive Officer:	Ing. Jürgen Rainalter
Employees:	420
2017 turnover:	EUR 95.2 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:	94 %

### Construction references (extract)

- Hallein/AT, retirement home, elastic decoupling of modular wood construction elements, 2012
- Atnau/CH, multi-family building, elastic decoupling of wall and ceiling elements, 2010
- Munich/DE, Pariserstraße, elastic decoupling of wall and ceiling elements, 2009
- Växjö/SE, Portvaktén (passive building), elastic decoupling of wall and ceiling elements, 2008/2009
- New York/USA, System 3, elastic mounting of a residential module for an exhibition at the Museum of Modern Art, 2008