

A man with a beard and blue eyes, wearing a blue vest over a dark shirt, is smiling and holding a large, rectangular sheet of brown sound insulation material. He is standing in a construction site with visible wooden framing and drywall. The background is slightly blurred, focusing attention on the man and the insulation material.

# SOUND INSULATION

Special Info 2021



TROCKENBAU  
**UNLIMITED**



*Use Knauf and its*

**QUIET**   

Drywalling clearly plays to its natural strengths in sound insulation.

If you know which construction delivers which values, how the connection details are implemented and which measures are used to provide simple improvements, you are on the safe side when it comes to sound insulation.

You can find some tips here for professional installation as well as practical basic knowledge.

## Knauf Diamant – Allrounder in drywalling

If, in addition to the increased sound insulation requirements, additional requirements are made, e.g. for fire resistance and robustness or if moderate rooms with moderately high humidity are to be created. The many talents of Knauf Diamant alone or in combined constructions together with the Knauf Silentboard are a real problem solver.

### Knauf Diamant properties

- › Universal application
- › Increased permissible wall heights due to high strength
- › High dowel load capacity
- › Robust surface
- › Flexurally ductile special gypsum core
- › For high level of sound insulation
- › Bendable (Knauf Diamant 12.5)

## Knauf Silentboard – Specialist for highest degree of sound insulation

Knauf Silentboard sound shield boards are used in all interior fitting areas as special sound insulation upgrading of drywalling systems. Thanks to its special core the board delivers the best values, particularly in the low frequency range.

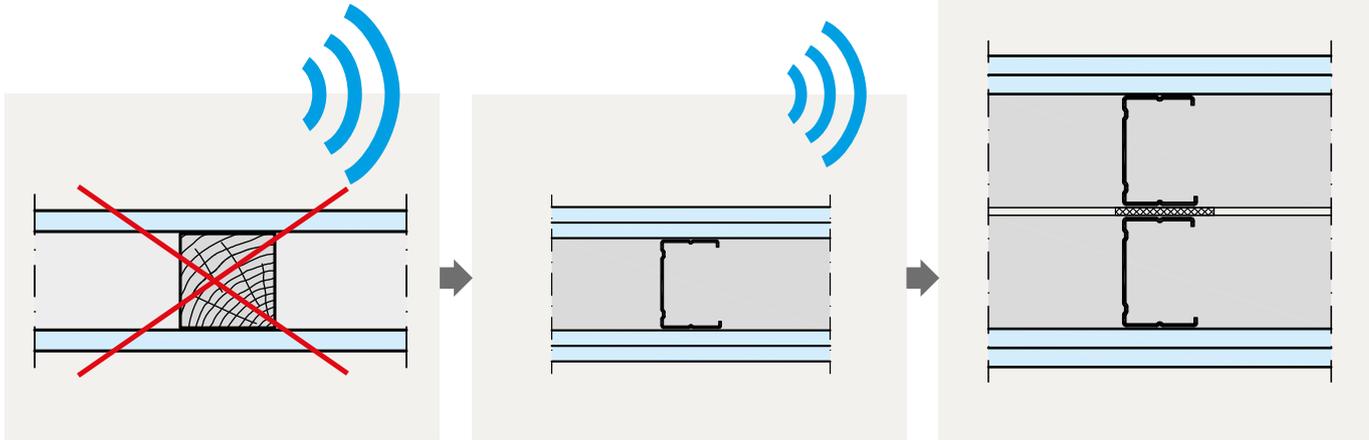
### Knauf Silentboard properties

- › Special gypsum core for highest degree of sound insulation
- › Very good performance at low frequency range
- › Easy application
- › Good coherence of structure when exposed to fire
- › Non-combustible
- › Bendable, folding with mitring



# WHAT MAKES WALLS QUIET?

The magic word for good sound insulation is decoupling – the lower the acoustic coupling of the wall elements, the higher the sound insulation of the system.



**1** Direct acoustic coupling  
with continuous wooden studs  
› **Poor sound insulation**

**2** Lower acoustical coupling  
with CW stud  
› **Good sound insulation**

**3** No acoustical coupling  
with dual stud profile  
› **Very good sound insulation**

# WHAT IS THE INFLUENCE OF FLANKING COMPONENTS?

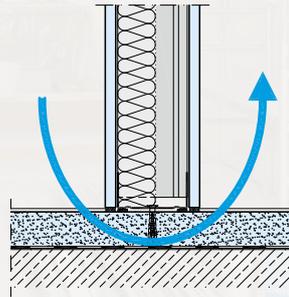
Sound insulation is not to be solely achieved by the separating components, but rather must take the sound transmission via flanking paths into consideration.

The flanking components are “excited” and the sound waves are transmitted to the adjacent room where they are again transmitted in the form of airborne sound by the flanking components.

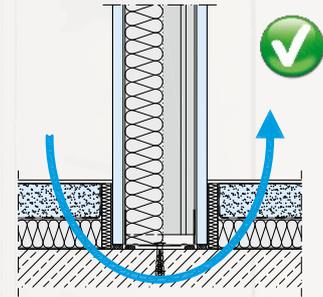
Appropriate detail design can considerably reduce the sound transmission via these paths.

## Floor connection

Low level of flanking sound insulation



High level of flanking sound insulation



## Good to know:

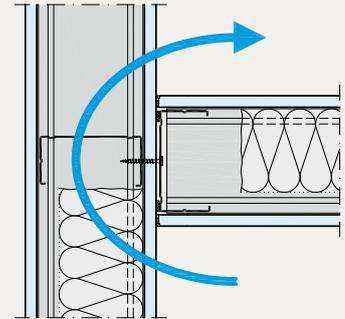
The sound insulation between rooms is only as good as its "weakest link in the chain"! This means: If, for example, one component of the customary 5 components\* is only rated at 35 dB, the room to room is generally  $\leq 35$  dB - even if a "high performance partition" rated at 60 dB has been installed!

\* separating component + 4 flanking components



## Connection to drywall partition

Low level of flanking sound insulation



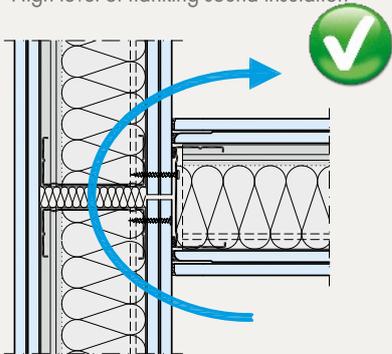
# CONNECTIONS TO WALL FOR OPTIMIZED FLANKING SOUND INSULATION

Sound transmission via adjacent “flanking” components is an undesired flanking path transmission. In case of walls the flanking

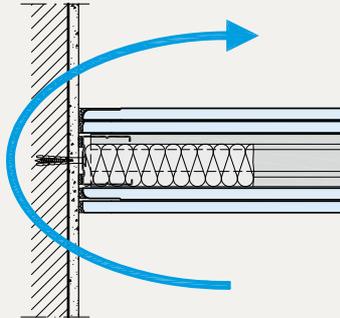
sound insulation can be increased by the corresponding design of the connections.

## Connection to solid wall

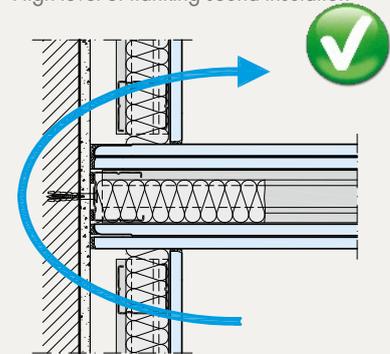
High level of flanking sound insulation



Low level of flanking sound insulation



High level of flanking sound insulation



# SOCKETS AND SWITCHES IN METAL STUD PARTITIONS

The influence on the sound insulation by the installation of sockets and switches in a metal stud partition depends on several factors:

- › Sound reduction index of the basis partition
- › Single side or opposite side installation
- › Insulation backing the sockets and switches
- › Design of the openings (custom-fit for cavity wall socket)
- › Type of cavity wall socket, switch and socket cladding

Scheme	Configuration	Effect
In case of walls with a sound reduction index of $58 < R_w \leq 78$ dB: e.g. W112.de; CW 100; 2x 12.5 mm Silentboard		
	Two double drill holes on both sides without cavity wall sockets and covers offset by two partition sections	Up to -4 dB
	Two double drill holes on both sides without cavity wall sockets and covers offset by one partition section	Up to -10 dB
	Two double drill holes on both sides without cavity wall sockets and covers directly opposite	Up to -20 dB
	Two double drill holes on both sides with commercially available cavity wall sockets and covers directly opposite	Up to -5 dB
	Two double drill holes on one side with commercially available cavity wall sockets and covers offset by two sections	Up to -3 dB

# INSTALLING CAVITY WALL SOCKETS FOR OPTIMUM SOUND INSULATION



When possible do not install sockets directly opposite one another on both wall sides.



It is better to offset the sockets on both sides of the wall.



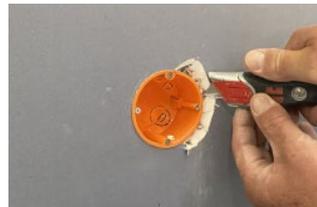
If installation directly opposite one another is unavoidable, special sound insulation sockets should be used. (e.g. Kaiser 9069-01)



As an alternative, the sound insulation can be implemented with a custom-made GK enclosure in combination with normal sockets.



Holes which have a rough appearance must be repaired



Bevel the rough edges ...



Prime ...



and fill appropriately

# DEFLECTION HEADS

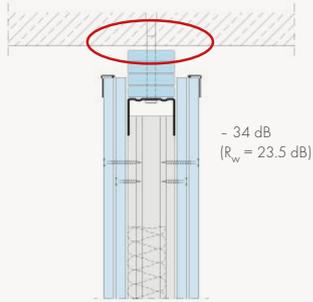
Good design influences the sound reduction index

In case of deflection heads with spacer board strips particular care must be taken when sealing the cladding to the connection. Leaks and improper sealing between the board strips and basic ceiling, on the joints between the board strips as well as between the cladding layers considerably impair the achievable sound reduction index.

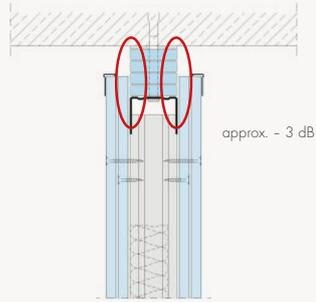


INCORRECT

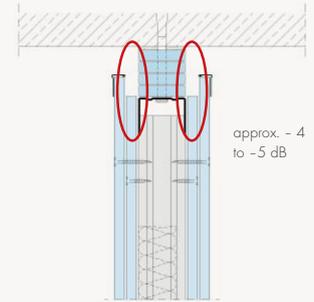
Upper connection to the board stack with 5 mm joint to the ceiling



Missing seal between board stack and cladding

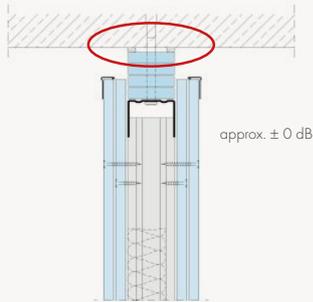


Missing seal between board stack and cladding

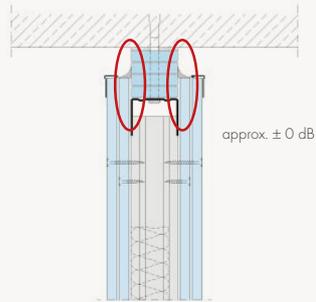


BUILDING SITE SOLUTION

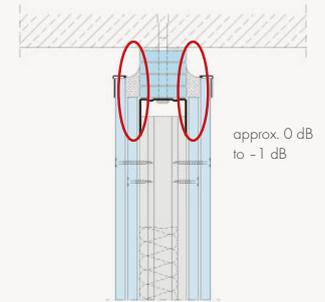
Spray fill of the joint, e.g. with acoustical sealant



Sealing of the connection edge between board stack and cladding, e.g. with acoustical sealant



Sealing of the connection edge between board stack and cladding, e.g. with acoustical sealant



# GOOD SOUND INSULATION WITH DECOUPLED DESIGN

Cladding or suspended ceilings with sound insulation requirements should be decoupled as far as is possible. Here the spacing between the suspended ceiling shell (cladding layer) and the solid ceiling must be at least 40 mm. Ideal decoupling is possible above all with free-spanning ceilings.



## 1 Nonius Hanger Top

As a suspender for larger suspension heights with decoupling element.



## 2 Damping Universal Brackets

For acoustically decoupled fastening of the frame of suspended ceilings. Cut or bend the damping universal bracket according to the required suspension height.



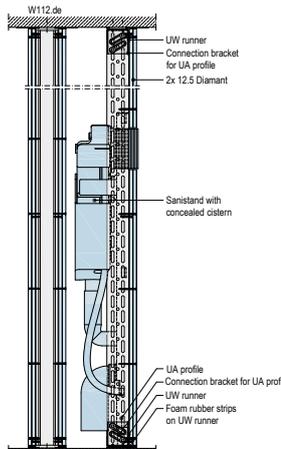
## 3 Resilient Channels

The punched holes in the flange area of the resilient channel provide the spring effect. It is very space-efficient due to the low thickness. A gap of at least 1 mm must remain between the beam and resilient channel.

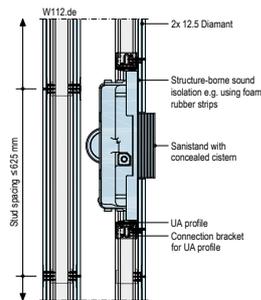
# CONSTRUCTION EXAMPLE: PARTIAL HEIGHT FRONT WALL INSTALLATIONS

Many manufacturers of sanitary installations have undertaken comprehensive testing with their own products. Tested systems offer additional planning reliability as well as concrete installation specifications.

Vertical section



Horizontal section





# SLIDING DOOR SYSTEM POCKET KIT SILENT

The sliding door system Pocket Kit Silent is used where there are sound insulation requirements (up to sound insulation class 2) and is the first sliding door with sound insulation that slides into the wall. The sliding doors are very space efficient as a result.



## Properties

- › Compliant with sound insulation class 2 acc. to VDI 3728
- › Finished wall thickness 150 mm
- › Single door leaf
- › Maximum door leaf height 2110 mm / width 735 to 1110 mm
- › Maximum door leaf weight 120 kg
- › Tested with sound insulated doors from Westag, Herholz and JELD-WEN



# EASYWIN<sup>®</sup> PLUS SILENCE – SOUND INSULATION WINDOW

Knauf prefabricated windows in monoblock construction are designed for sophisticated drywalling. The ready to install EasyWin<sup>®</sup> Plus Silence is reliable and can be installed flush even in walls where the surface is already completed. Sound insulation values up to 47 dB are possible, proof L 040-09.14

## Properties

- › High-quality, elegant, adaptable design
- › Can also be used in walls where the surface is already complete
- › Internal blinds (manual or electric) optional
- › 1 x 6 mm sound insulation glazing (clear glass) + 1 x 6 mm toughened glass (clear glass)
- › Can be installed in upright or transverse orientation
- › Cover frame width 35 mm, height 3.5 mm



# BRIO – THE REMODELLING TALENT FOR WOOD JOIST CEILINGS

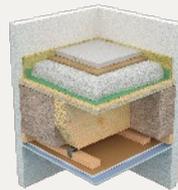


Wood joist ceilings often present a challenge in terms of sound insulation during remodelling. Required are: Low installation heights, dry application, rapid progress of the building phase and combination options with underfloor heating.

## Good to know:

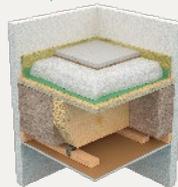
With certainty: Fire resistance and sound insulation included! Use the available proofs and certificates for all necessary construction tasks. We have tested the entire range of ceiling constructions, even in combination with fire resistance and sound insulation.

### WOOD JOIST CEILINGS (remodelling/new construction)



- › Brio 23 Pre-fab Screed, 23 mm
- › Wood fibre insulation board Knauf WF, 10 mm
- › Knauf Brio Schüttung dB, 60 mm (1,650 kg/m<sup>3</sup>)
- › Trickling protection, e.g. Knauf Schrenzlage
- › Wooden composite board, 22 mm, or floorboards
- › Wood joist ceiling, 240 mm, fully insulated with 240 mm Unifit T1135 U (Knauf Insulation)
- › Timber batten with Damping Universal Bracket, 60 mm
- › Silentboard, 12.5 mm
- › Diamant, 12.5 mm

### ATTIC (for interiors)



- › Brio 18 WF pre-fab floor screed, 28 mm (incl. laminated 10 mm wood soft fibre footfall sound insulation)
- › Dry bulk leveller PA, 20 – 100 mm (approx. 550 kg/m<sup>3</sup>)
- › Trickling protection, e.g. Knauf Schrenzlage
- › Wooden composite board or floorboards
- › Wood joist ceiling
- › Possibly a suspended ceiling

# THE KNAUF SOUND INSULATION CALCULATOR: SIMPLE COMPLIANCE WITH ALL SPECIFICATIONS

The sound insulation calculator helps you to comply with all specifications and for the configuration of a solution for your project:

- › Tailor-made sound insulation in just six easy steps
- › Test of the requirements with every step
- › Consideration of the critical connections to walls, ceilings and floors
- › Clear representation of the results and the possible weakpoints in the room



Knauf Schallschutz-  
rechner sound insula-  
tion calculator

## Plan walls with Knauf – secure with the right system

Building type	Wall type	System	Comments
Residential construction	Room partition	<a href="#">W111 DIA70</a>	Particularly efficient wall, slim, residential building with standard equipment
		<a href="#">W112.de</a>	Wall with good sound insulation quality, slim, robust surface
	Party wall	<a href="#">W118.de</a>	Particularly efficient wall, slim, good sound insulation, anti-burglary protection RC 2
		<a href="#">W115.de</a>	Dual stud partition, robust surface, very good sound insulation
		<a href="#">W112.de + W626.de</a>	Metal stud partition with furring, multi-leaf cladding, high, very good sound insulation
	<a href="#">W119.de</a>	Sound insulation quality in premium residential construction, robust surface, anti-burglary protection RC3	
Schools / universities / sporting arenas	Class / class	<a href="#">W112.de</a>	Wall with good sound insulation quality, slim, robust surface
		<a href="#">W112.de + Adit</a>	Class rear wall, slim, robust surface, room acoustic properties
	Class/corridor	<a href="#">W112.de</a>	Partition with good sound insulation quality, robust surface
Hospital	Room / room	<a href="#">W112.de</a>	Wall with good sound insulation quality, slim, robust surface
		<a href="#">W118.de</a>	Wall with good sound insulation quality, slim, robust surface, cantilever load
	Room / corridor	<a href="#">W112.de</a>	Partition with good sound insulation quality, robust surface
	Room / bathroom	<a href="#">W112.de</a>	Wall with good sound insulation quality, slim, robust surface
		<a href="#">W118.de</a>	Wall with good sound insulation quality, slim, robust surface, cantilever load
	Patient care area	<a href="#">W384.de</a>	Partition between the wet zone and other rooms, stringent hygiene requirements
<a href="#">W382.de</a>		Partition between two wet areas, stringent hygiene requirements	
Hotel	Room / room	<a href="#">W112.de</a>	Wall with good sound insulation quality, slim, robust surface
		<a href="#">W118.de</a>	Wall with good sound insulation quality, slim, robust surface, cantilever load
	Room / corridor	<a href="#">W112.de</a>	Partition with good sound insulation quality, robust surface
	Room/bathroom	<a href="#">W112.de</a>	Wall with good sound insulation quality, slim, robust surface
	Wellness + kitchen	<a href="#">W384.de</a>	Partition between the wet zone and other rooms, stringent hygiene requirements
<a href="#">W382.de</a>		Partition between two wet areas, stringent hygiene requirements	
Office construction	Office partition	<a href="#">W112.de</a>	Wall with good sound insulation quality, slim, robust surface
		<a href="#">W112.de</a>	Partition between rooms with very confidential discussions
	Conference room	<a href="#">W112.de + Adit</a>	Wall with good sound insulation quality, slim, robust surface, room acoustic properties
Commercial / industrial construction	Separate fire compartments	<a href="#">W131.de</a>	Firewall quality, slim, certified deflection head
	Installations	<a href="#">W635.de</a>	Installation shaft wall with good sound insulation quality F90

**System guarantee:** The stated constructional and structural properties and characteristic building physics of Knauf systems in this brochure as well as in the Knauf documentation can solely be ensured with the exclusive use of Knauf system components or other products explicitly expressly recommended by Knauf. The exchange of system components results in the loss of the system guarantee.

Design per wall side / frame	Wall thickness	Fire resistance	Intrusion protection	Sound insulation [R <sub>w</sub> ]	Max. height
1x 15 mm Diamant – CW70 (625 mm)	100 mm	F30	-	52.8 dB	4.65 m
2x 12.5 mm Diamant – CW75 (625 mm)	125 mm	F90	-	61.5 dB	7.00 m
25 mm Solid Board + 12.5 mm Diamant – CW75 (625 mm)	150 mm	F90	RC2	66.2 dB	7.00 m
2x 12.5 mm Diamant – 2x CW75 (625 mm)	205 mm	F90	-	72.2 dB	4.00 m
2x12.5 mm Diamant – CW75 (625 mm) + furring (screw fastened) 2x12.5 mm Diamant – CW50 (625 mm)	203 mm	F90	-	78.7 dB	7.00 m
2x 12.9 mm Diamant Steel – 2x CW75 (625 mm)	207 mm	F90	RC3	≥ 72 dB	4.00 m
2x 12.5 mm Diamant – CW75 (625 mm)	125 mm	F90	-	61.5 dB	7.00 m
2x 12.5 mm Diamant – CW75 (625 mm) + Adit on request	125 mm	F90	-	61.5 dB	7.00 m
2x 12.5 mm Diamant – CW100 (625 mm)	150 mm	F90	-	63.2 dB	7.00 m
2x 12.5 mm Diamant – CW75 (625 mm)	125 mm	F90	-	61.5 dB	7.00 m
12.5 mm Diamant + 12.9 mm Diamant Steel – CW75 (625 mm)	126 mm	F90	RC2	65.2 dB	7.00 m
2x 12.5 mm Diamant – CW100 (625 mm)	150 mm	F90	-	63.2 dB	7.00 m
2x 12.5 mm Diamant – CW75 (625 mm)	125 mm	F90	-	61.5 dB	7.00 m
12.5 mm Diamant + 12.9 mm Diamant Steel – CW75 (625 mm)	126 mm	F90	RC2	65.2 dB	7.00 m
2x 12.5 mm AQUAPANEL® Indoor + 2x 12.5 mm Diamant – CW75 (625 mm)	125 mm	F90	-	57.8 dB	3.00 m
2x 12.5 mm AQUAPANEL® Indoor – CW75 (625 mm)	125 mm	F90	-	57.2 dB	4.65 m
2x 12.5 mm Diamant – CW75 (625 mm)	125 mm	F90	-	61.5 dB	7.00 m
12.5 mm Diamant + 12.9 mm Diamant Steel – CW75 (625 mm)	126 mm	F90	RC2	65.2 dB	7.00 m
2x 12.5 mm Diamant – CW100 (625 mm)	150 mm	F90	-	63.2 dB	7.00 m
2x 12.5 mm Diamant – CW75 (625 mm)	125 mm	F90	-	61.5 dB	7.00 m
2x 12.5 mm AQUAPANEL® Indoor + 2x 12.5 mm Diamant – CW75 (625 mm)	125 mm	F90	-	57.8 dB	3.00 m
2x 12.5 mm AQUAPANEL® Indoor – CW75 (625 mm)	125 mm	F90	-	57.2 dB	4.65 m
2x 12.5 mm Diamant – CW75 (625 mm)	125 mm	F90	-	61.5 dB	7.00 m
12.5 mm Silentboard + 12.5 mm Diamant – CW75 (625 mm)	125 mm	F90	-	67.4 dB	7.00 m
2x 12.5 mm Diamant – CW75 (625 mm) + Adit on request	125 mm	F90	-	61.5 dB	7.00 m
2x 12.9 mm Diamant Steel – CW75 (312.5 mm)	127 mm	Ei90-M	-	63.2 dB	8.20 m
2x 15 mm Diamant + 12.5 mm GKF intermediate – UW100 (625 mm)	130 mm	F90	-	54 dB	5.00 m



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### KNAUF DIGITAL

Web, App or Social Media – Technical documentation, interactive animations, videos and lots more are available around the clock up-to-date and free-of-charge in the digital world of Knauf. Clicks that are really worthwhile!

- › [www.k-sentials.com](http://www.k-sentials.com)
- › [www.knauf.de](http://www.knauf.de)
- › [www.youtube.com/knauf](http://www.youtube.com/knauf)
- › [www.twitter.com/knauf\\_DE](http://www.twitter.com/knauf_DE)
- › [www.facebook.com/knaufDE](http://www.facebook.com/knaufDE)

## Further tips and information!

Know-how on the topic can be downloaded at [www.trockenbau-unlimited.de](http://www.trockenbau-unlimited.de)



And by video:  
[www.youtube.de/knauf](http://www.youtube.de/knauf)



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