



DAS ORIGINAL UNGER
DIFFUTHERM®
Innovative Thermal Insulation Systems

Udi**SPEED**® SYSTEM

*The efficient wood-fibre insulation system
for timber-frame buildings*



WWW.UNGER-DIFFUTHERM.COM



Dear Reader,

we are very pleased to present our improved, render-bearer insulation system **UdiSPEED®**, made from environmentally-friendly wood fibres. This open-diffusion, vapour permeable system has been designed for modern timber-framed constructions and passive houses. **UdiSPEED®** is an extremely strong and stable insulation board that can be combined with efficient, cellulose or wood-fibre blow-in insulations. A special feature of **UdiSPEED®** is its long-term resistance to warping. This product is a result of a combination of research, development and experience.

Unger-Diffutherm is the only manufacturer to offer a comprehensive insulation system, including accessories such as fixings and finishing coatings, in which every aspect has been well thought through. You have made a wise choice in selecting this product! If you need any advice we will be pleased to help you. Please contact our specialist customer service team.

Best wishes from Bernd Unger and the team.

A modern timber-framed building incorporating efficient, fully vapour-permeable insulation in the building envelope is the first choice for healthy and environmentally-friendly house construction. The newly-developed, render-bearer, composite insulation system **UdiSPEED®** is the perfect example of a particularly long-lasting and cost-efficient system of the highest quality. The vapour-permeable system means the walls can 'breathe', thereby regulating the room climate, regardless of whether it is icy-cold or tropically warm outside.

- ➔ Warp free – long-term!
- ➔ Tongue and groove joints around the whole circumference
- ➔ Dense format for improved acoustic insulation and heat-shielding properties
- ➔ Fine, interlocking wood fibre structure bonded with natural lignin
- ➔ Grooved surface ensures a permanent equilibrium wood moisture level
- ➔ Minimal cutting waste
- ➔ Compatible with all **UdiPlaster systems**



Developed and manufactured in Germany

- patented surface technology
- produced according to the highest German standards



Ecological and health-promoting

- sustainable – made from natural, waste-wood
- Poses no health risks – no skin or lung irritation when installing
- moisture regulating
- protects the environment – made from renewable resources and recyclable



efficient

- for use in pre-fabricated constructions
- very cost-efficient variant compared to traditional insulation installations
- easy-to-use format with a slim insulation depth
- can be plastered on both sides and produces minimal cutting waste



tried and tested

- by the German Institute for Building Technology, Berlin with official approval as a complete system for timber constructions
- tested for fire resistance, weather resistance, long-term behaviour and insulating properties
- incorporates 25 years of experience in plasters/renders; manufacturing processes and the results of long-term applications
- special surface grooves ensure a stable equilibrium moisture level
- high compressive strength and edge stability



universal

- for all types of timber and timber-framed buildings
- for half-timbered buildings with timber sub-structures
- for masonry buildings with timber sub-structures
- wide range of insulation combinations in the voids is possible
- can be combined with all our proven system components and fine plaster systems from Unger-Diffutherm



top class moisture diffusion

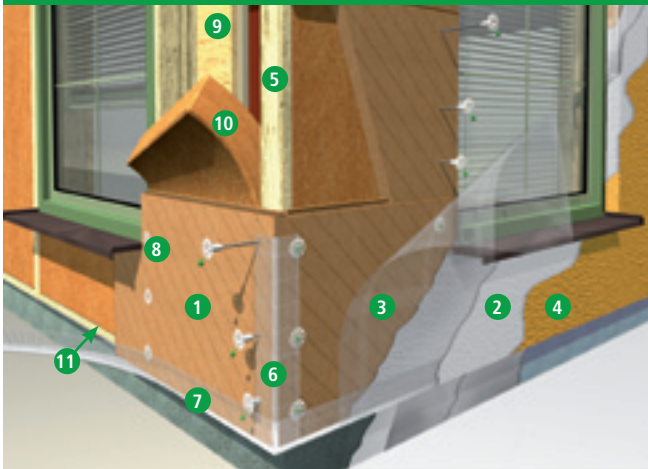
- the **UdiSPEED® SYSTEM** regulates the room climate and the moisture exchange between the interior and exterior naturally – without using diffusion-blocking membranes
- the vapour permeable design dispenses with the need for wood preservatives



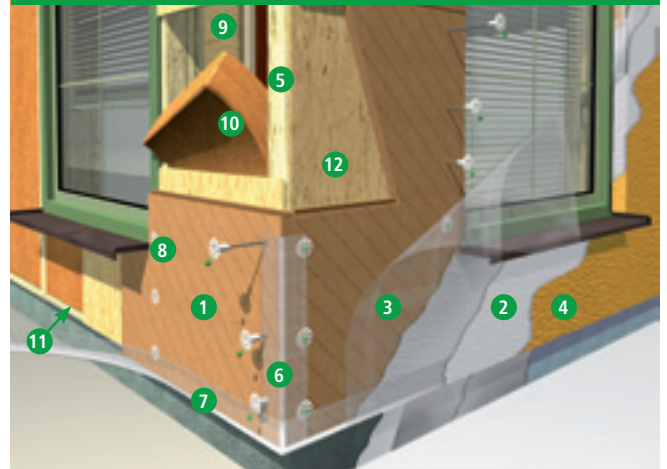
sound-proofing

- very high board density noticeably improves acoustic insulation levels
- ideal in combination with **UdiFLEX®** and **UdiCLIMATE®** in a sandwich construction

Wall construction – Directly cladded timber frame



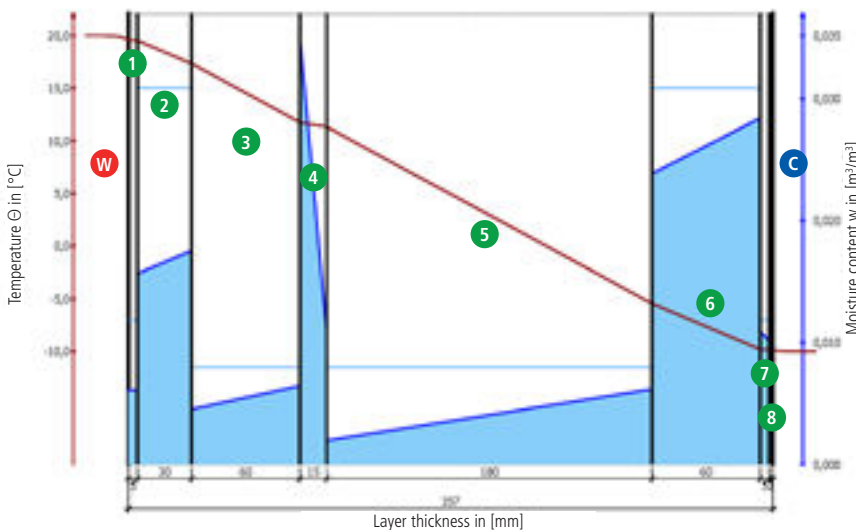
Wall construction – Timber frame with external OSB cladding



- | | |
|--|---|
| 1 UdiSPEED® SYSTEM 40 mm | 6 UdiREINFORCEMENT® Corner Protection Profile |
| 2 UdiFOUNDATION COAT® | 7 UdiBASE® Plinth-End Cap Profile |
| 3 UdiREINFORCEMENT® Strengthening Mesh | 8 UdiMONTAGE® Insulation fixing |
| 4 UdiPERL® Structured fine render | 9 Bracing area |
| 5 Timber studs | 10 Insulation e.g. UdiFLEX® |
| | 11 UdiJOINTING TAPE® |

The external cladding of a timber built construction must be permanently protected against the effects of the weather from the outside and condensation from the inside. With the UdiSPEED® SYSTEM the insulated façade is protected against driving rain using water-repelling UdiPERL® Plaster and still remains vapour permeable.

Temperature and moisture profiles



The red line shows the temperature progression from the inside to the outside

You have made the right choice with our externally rendered UdiSPEED® SYSTEM. Both of the construction types shown above are possible but we recommend the cheaper variant, without external OSB boards, as this type of construction has a superior level of vapour permeability.

Explanation of the temperature and moisture profiles

The 'moisture flow' within a directly cladded, timber frame construction can be shown by means of a structural analysis using the COND programme, developed by the Technical University, Dresden. This programme provides a simulation, based on measured values of the water absorption level, water storage capacity and the moisture transport of the construction in winter, for the building materials used.

The blue shaded blocks show the level of equilibrium moisture within the various materials. It is quite normal that the materials contain some moisture, especially in a vapour permeable construction. The light-blue, horizontal lines represent the critical level of moisture saturation for each of the materials. At this point condensation can form. Due to the high vapour permeability of the system it can be seen that this level is never reached in any of the construction layers. This ensures an optimum room climate and a long-lasting construction.

- | |
|---|
| W Warm side |
| 1 UdiFOUNDATION COAT® 5 mm |
| 2 UdiCLIMATE® 30 mm |
| 3 Service void insulated with UdiFLEX® 60 mm |
| 4 OSB board e.g. 18 mm |
| 5 Timber-frame construction insulated with UdiFLEX® |
| 6 Wood-fibre insulation board UdiSPEED® 60 mm |
| 7 UdiFOUNDATION COAT® 5 mm |
| 8 UdiSILANO® Fine render 2 mm |
| K Cold side |



Insulated and plaster-finished façade



**Insulate naturally.
The Original.**



More than fifty thousand families have insulated their houses using wood-fibre insulation systems from UNGER-DIFFUTHERM.

UNGER-DIFFUTHERM's many years of experience in the area of timber-frame construction have gone into the development of this innovative manufacturing process. The depth and range of our development work and the high level of material quality guarantee the reliability and durability of the UdiSPEED® SYSTEM render-bearer insulation system.

The secret is the combination of perfectly harmonious products. UdiSPEED® SYSTEM is scientifically tested and subject to continuous, strict quality control measures and examinations.

We have deliberately relocated the bracing area in timber-frame constructions to the warm side and have dispensed with use of additional vapour barriers.

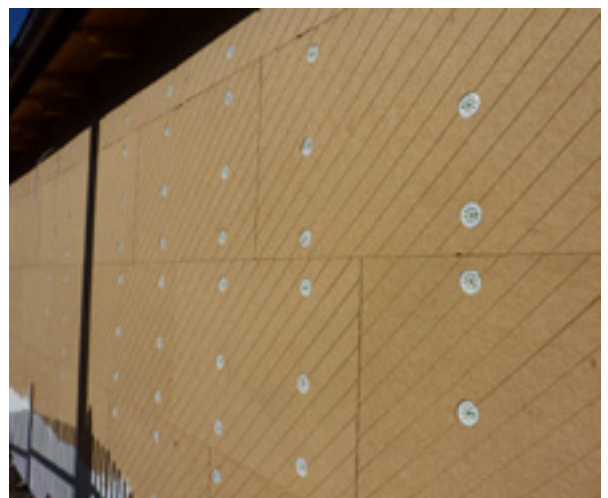
When renovating, the UdiSPEED® SYSTEM can be easily be installed onto pre-fabricated elements or in pre-fabricated houses with defective insulation. UNGER-DIFFUTHERM's flexible wood-fibre insulation UdiFLEX®, with a bulk density of 55 kg/m³, is ideal as a replacement for the defective insulation.

Our specially produced surface technology ensures a permanently warp-free surface structure of the finishing plaster coating for all UdiStructured Fine Plasters®.

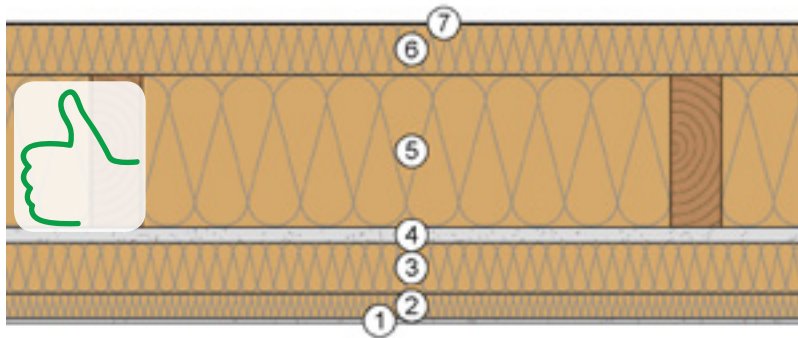
Modern, durable and vapour-permeable.
Timber-frame houses with UdiSPEED® SYSTEM.

Benefits compared to masonry buildings:

- Installation with significantly reduced drying times
- Space-saving due to slim wall constructions
- Healthy accommodation
- Dry construction technique
- Extremely energy efficient



Example of two different timber-frame wall constructions (Comparison of insulation materials)

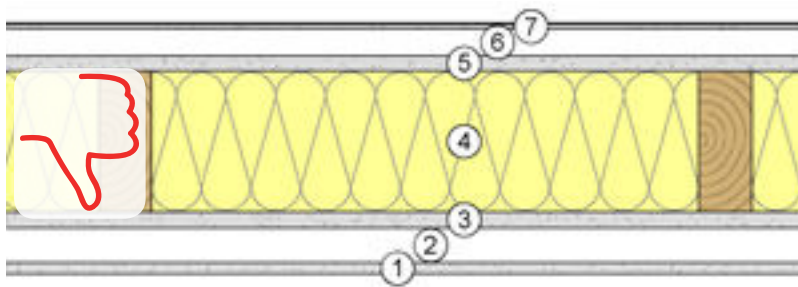


Exterior

- 7 8 mm **UdiFOUNDATION COAT®** with **UdiPERL®** Fine Plaster
- 6 40 mm **UdiSPEED®** wood-fibre insulation board
- 5 Timber frame insulated with 160 mm **UdiFLEX®**
- 4 18 mm wood-based board (e.g. OSB)
- 3 Service void insulated with 40 mm **UdiFLEX®**
- 2 30 mm **UdiCLIMATE®** Interior insulation board
- 1 4 mm **UdiFOUNDATION COAT®** with paint finish

Interior

U-Value: 0.131 W/ m²K Phase change: 18.8 h Amplitude attenuation: 113.6 Temperature-Amplitude-Ratio: 0.009
 Moisture protection (at room air: 20°C / 50%rh; Exterior air: -10°C / 80%rh; Surface temp.: 19.4 °C):
 Construction meets passive house standard. Construction meets the currently applicable EnEV 2009 standards (German energy efficiency regulations)
In this type of construction, at the conditions stated above, there is no condensation development.



Exterior

- 7 7 mm Plaster finishing coat
- 6 40 mm Hard foam insulation board, EPS 035
- 5 15 mm wood-based board (e.g. OSB)
- 4 Timber frame insulated with 160 mm mineral wool 035
- 3 15 mm wood-based board (e.g. OSB)
- 2 Service void insulated with 40 mm mineral wool 035
- 1 12.5 mm Fermacell fibre-reinforced plasterboard

Interior

U-Value: 0.157 W/ m²K Phase change: 12.8 h Amplitude attenuation: 37.6 Temperature-Amplitude-Ratio: 0.026
 Moisture protection (at room air: 20°C / 50%rh; Exterior air: -10°C / 80%rh; Surface temp.: 19.2 °C):
 During the 3-month winter thawing period condensation will develop in this construction. The condensate will need a minimum of 68 days to evaporate (at 12°C and a relative humidity of 70% - inside and outside). However, individual layers such as the mineral wool and the timber frame will become severely wetted. The construction is permanently vulnerable and must be protected with an interior vapour barrier. This will lead to deterioration of the room climate and the advantages of a timber construction are lost.



UdiSPEED® SYSTEM

On cold days its intrinsic properties keep you warm for longer

- high thermal storage capacity of 2100 J (kg K)
- excellent insulation values – even with a 6 cm insulation depth
- cosy thermal radiation without the heating system on maximum power

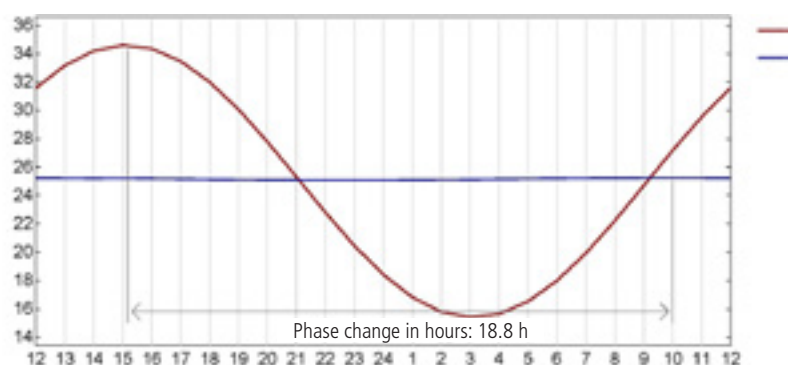


UdiSPEED® SYSTEM

Its thermal storage capacity keeps you cooler in the summer

- superior heat-shielding due to its high density of 270 kg/m³
- the external walls stay comfortably cool for longer
- energy-saving, as there is no need for additional air conditioning

Surface temperature change over the course of the day



Explanation:

The temperature difference is the difference between the maximum and minimum temperature of the wall surfaces during a day. The phase change denotes the time difference for the afternoon heat maximum to progress from the exterior to the interior of the construction - see the label on the graph. This should take place in the second half of the night-time period, ideally after 12 - 14 hours. The amplitude attenuation (damping) denotes the extent to which the thermal wave diminishes as it passes through the building element. This value should be as large as possible. The temperature-amplitude-ratio is the temperature difference of the inner surface divided by the temperature difference of the outer surface. The thermal storage capacity denotes the amount of energy required to raise the temperature of the building element by 1°C.



Insulate naturally.
The Original.

UdiFLEX® flexible, wood-fibre void insulation

Optional UdiPERL® Colour Paints with the 'lotus' cleansing effect

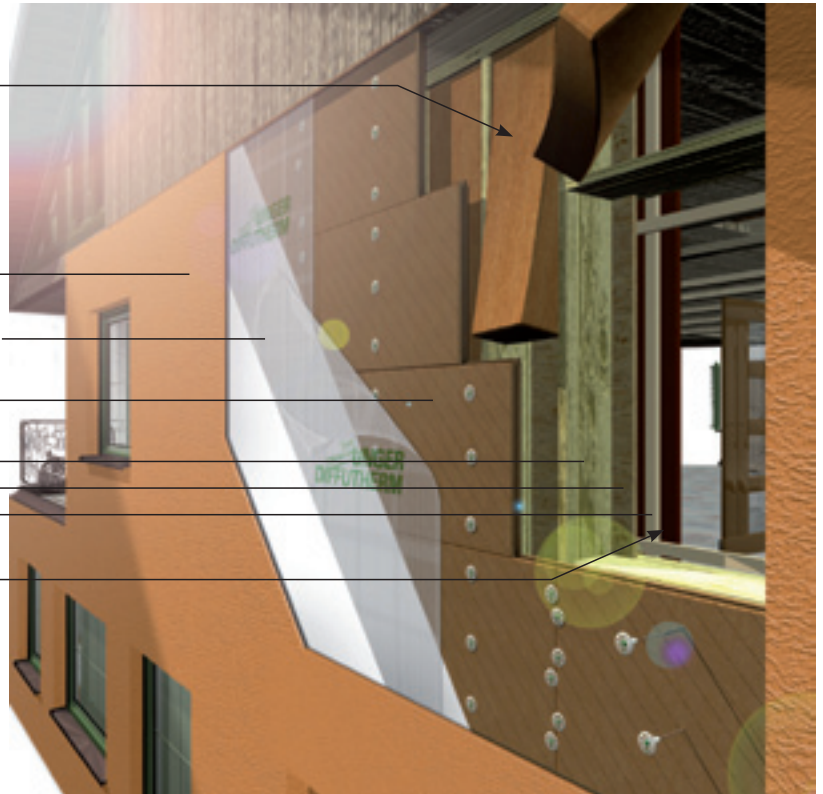
UdiPERL® Fine Render/Plaster

UdiFOUNDATION COAT® with strengthening mesh

UdiSPEED® Wood-Fibre Insulation Board

Timber frame
OSB board (bracing)
Service void

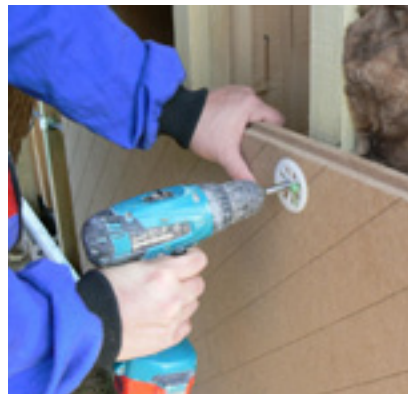
Internal cladding with
UdiCLIMATE® Building Slabs



Installation instructions UdiSPEED® SYSTEM

Insulation board installation

The insulation boards are installed directly on to the timber substrate and laid with off-set joints. They are affixed using 3 UNGER-DIFFUTHERM SYSTEM adjustable screw fixings per timber stud. Alternatively, using a time-saving, compressed-air gun, wide-back staples can be employed. These should be spaced 12 cm apart. The layer provides a wind-tight envelope around the whole external timber wall. The lower edge is sealed using our Plinth-End Cap Profile. This ensures that no moisture can rise into insulation layer.



Reinforcement layer

The system is then coated with a layer of our mineral-based UdiFOUNDATION COAT®. This increases the stability of the system and provides additional protection from the weather. A layer of UdiREINFORCEMENT® Strengthening Mesh is then bedded-in to this specially developed foundation coat. Coverage: approx. 7 kg/ m².



Finishing coat

After priming the reinforcement layer using UdiPERL® Render Primer, the high-performance finishing plaster UdiPERL® is applied. Alternatively, you may wish to choose from the following plaster systems:

UdiSIKATO® - silicate-based finishing plaster

UdiSILANO® - silicon-based finishing plaster

UdiMIRALO® - mineral-based finishing plaster

UdiORGATO® - organic finishing plaster

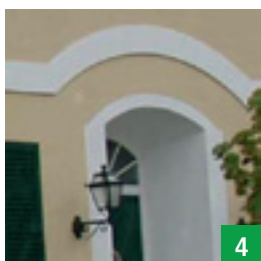
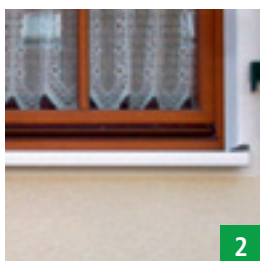
Technical Data – UdiSPEED® Wood-fibre insulation board

	Applications	According to DIN V 4108 – 10: DI, WAB, WAP, WH, WI, WTR	
	Identification code	WF - EN 13171 - T% - DS (70,90)2 - CS10/Y)150 - TR30 - WS1,0 - MU5	
	System Approval	Timber constructions Z-33.47-1026	
	Components	Coniferous wood Max. 0.5 % Paraffin Max. 2 % PVAc (For bonding the insulation layers – above 40 mm thickness)	
	Technical data	Thermal conductivity	
	Design value λ		0.050 W/mK
	Declared value λ_D		0.048 W/mK
	Vapour diffusion resistance μ		5
	Condensation retention capacity		ca. 20 % of own weight
	Specific enthalpy capacity c		2100 J/kg/K
	Apparent density		ca. 270 kg/m ³
	Euro class DIN EN 13501-1		E
Dimensions	Format	1,300 x 790 mm	
	Coverage	1,290 x 780 mm	
		Tongue and groove around the whole circumference	
		Supplied insulation thicknesses: 40 and 60 mm	

Our detailed catalogue and further installation information can be found on www.unger-diffutherm.de/en/service or give us a call on +49 (0) 371 815 640.

Choice of additional extras

- | | |
|--|--|
| <p>1 UdiPROTECT-E-SMOG® SHIELDING SYSTEM
For highly effective shielding against dangerous electro-smog</p> <p>2 UdiWINDOW SILL® SYSTEM
High-tech aluminium in a wide range of colours</p> <p>3 UdiPERL® plus COLOUR SYSTEM
Colour-fast and clean façades with the self-cleaning effect</p> | <p>4 Façade profile: Set a stylish accent
Authenticity for historic façades</p> <p>5 Traditional brickwork look
And the greatest possible functionality is achieved with mineral brick slips</p> |
|--|--|



OUR SYSTEM RANGE:

For roof and interior construction:

UdiCLIMATE[®] SYSTEM

The interior insulation system with integrated climate chambers

UdiSTONE[®] SYSTEM

Ecological insulation blocks for partition wall construction

UdiFLEX[®] SYSTEM

Flexible planning with a flexible insulation to meet the highest of demands

UdiTOP[®] SYSTEM

The complete program for your roof

UdiSTEP[®] SYSTEM

Wood-fibre, floor insulation

For external walls:

UdiRECO[®] SYSTEM

External thermal insulation composite system with intelligent levelling compensation

UdiFRONT[®] SYSTEM

External thermal insulation composite system with a 15 year guarantee

UdiSPEED[®] SYSTEM

The efficient insulation system for pre-fabricated, timber-frame buildings

For interior insulation:

UdiIN[®] SYSTEM

Interior insulation system with a 15 year guarantee

UdiIN RECO[®] SYSTEM

The interior insulation system – specially designed for uneven surfaces

UdiIN 2CM[®] SYSTEM

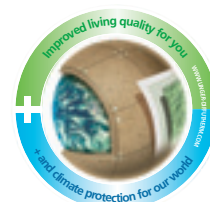
The quick and slim internal insulation system

Our specialist merchants are always happy to advise you:

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Environmentally-friendly, innovative,
insulation systems

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REFERENCE BUILDING SELECTION

