

# SOLUTION ROOF INSULATION FROM OUTSIDE

INSULATION OF PITCHED ROOFS AND FLAT ROOFS



**ISOCELL**

# INSULATION WORK IN PRACTICE



The old roof cladding is removed. The vapour barrier (e.g. FH FORTE) is laid above the rafters in so-called sub-top procedure and fixed at the side with laths or press-on strips. Airtight sealing is achieved with the AIRSTOP adhesive system.

## THE OPTIMUM SOLUTION IN RENOVATIONS

Subsequent insulation of sloping roofs above the cladding. Previously converted attic rooms can be insulated in this way without inconvenience to the residents.

This technique is also used in new constructions (e.g. in solid wood elements).





Old battens often do not provide enough space for today's insulation standards. In order to allow for the insulation thickness the battens are doubled.



After completion of the sub-roof the cellulose insulation is installed. Within the cavity the fibres become matted to form a compact, seamless insulation mat.



On previously tiled roofs only a few tiles need to be removed to make room for installation work.

## INSULATION OF FLAT ROOFS



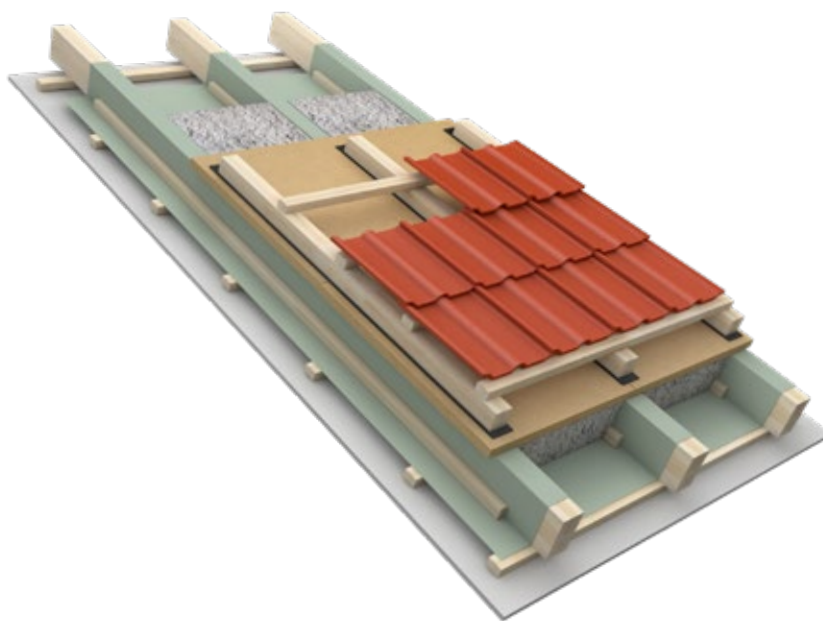
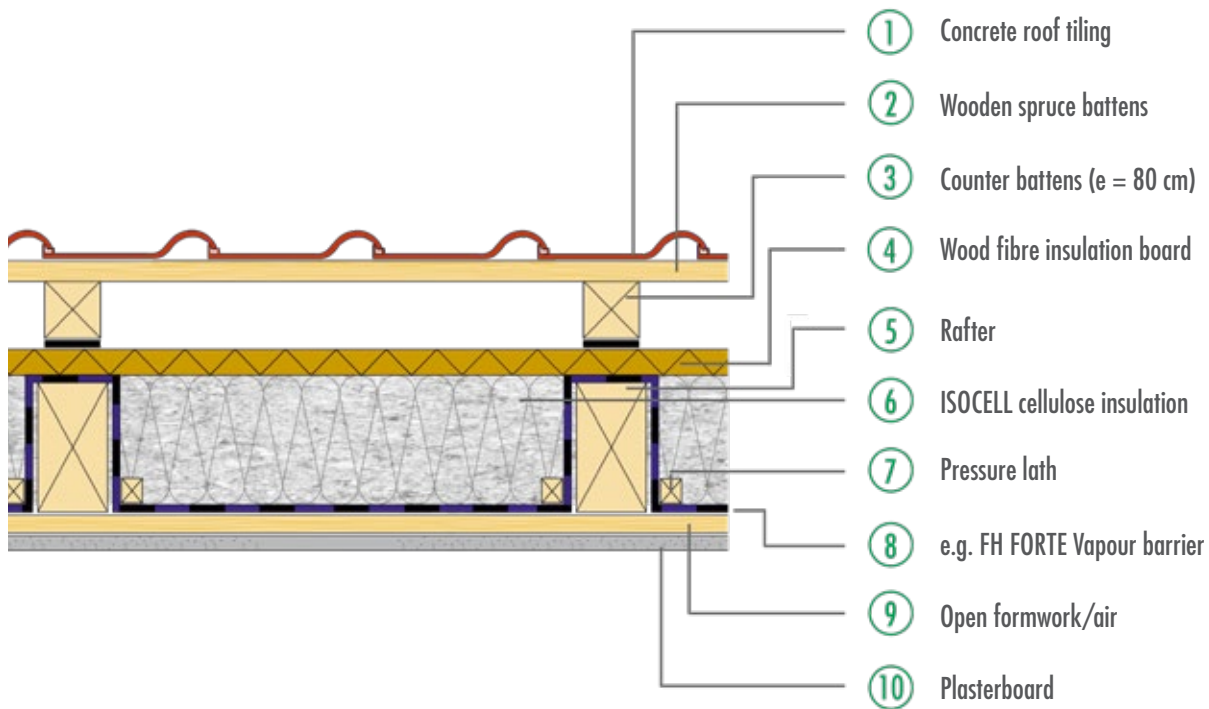
On many old residential buildings the upper ceilings of concrete are below a slightly sloping wooden construction as roof. Or these are so-called 'ERTEX roofs' in concrete. High loss of heat in winter and rapid heating-up in summer are inevitable.

With ISOCELL cellulose the empty space below the roof can easily be insulated at a later date. Complex and expensive roof renovation is not necessary. The costs for the insulation are recovered within a few years.

# SOLUTIONS IN DETAIL

## SIDE VIEW AND SECTION

### COVERING WITH WOOD FIBRE INSULATION BOARD



### GOOD TO KNOW

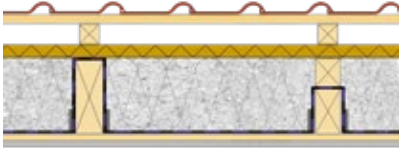
For correct installation of the underroof please note the regulations of the ZVDH (Central German Roofer Trade Association) and ÖNORM standards in Austria and the SIA regulations in Switzerland.

You can find exact details for planning and execution in our brochures.

# TECHINCAL DATA FOR

## THE CONSTRUCTION ELEMENT SHOWN

### COVERING WOOD FIBRE INSULATION BOARD



Building material	Thickness of layer (mm)	$\lambda$ (W/m K)	Fire classification (EN)
Concrete roof tiling or roof tile	50	0,7	A1
Wooden battens (spruce)	30	0,13	D
Counter battens	50	0,13	D
Wood fibre insulation board	60	0,045	E
Rafter	120	0,13	D
ISOCELL cellulose insulation	120	0,038 0,039 (D)	B-s2, d0
Vapour barrier	1	0,2	E
Open formwork/ Air	24	0,13	D
Plasterboard	15	0,21	A2

Insulation thickness (mm)	Insulation density (kg/m <sup>3</sup> )	GWP* (kg CO <sub>2</sub> äqv./m <sup>2</sup> ) Total set-up-of construction	PHI (Phase shift in hours)	U-value** (W/m <sup>2</sup> K)
120	46	-11,99	10,2	0,236
160	46	-17,29	11,6	0,198
180	48	-20,19	12,4	0,184
200	48	-22,86	13,2	0,171
220	48	-25,54	13,9	0,16
240	50	-28,55	14,8	0,15
260	50	-31,25	15,6	0,142
280	50	-33,95	16,3	0,134

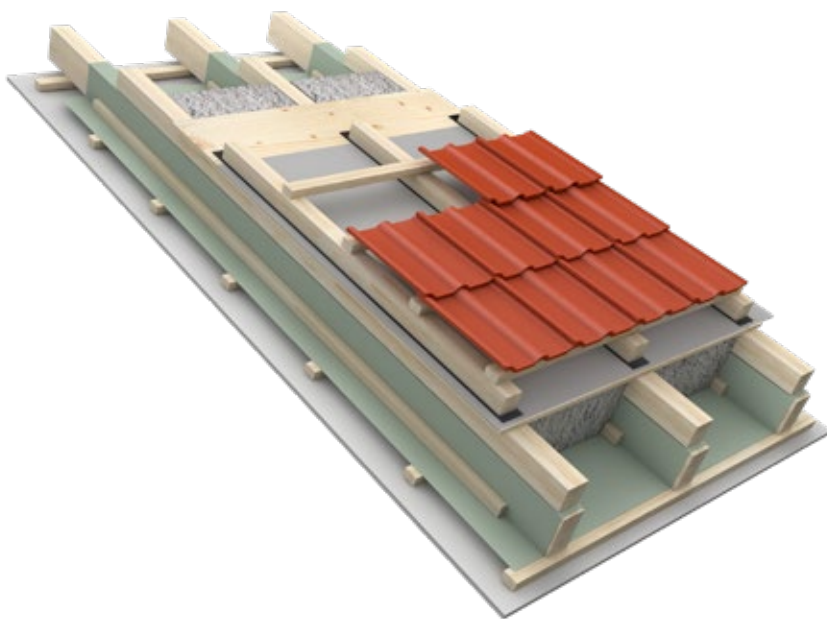
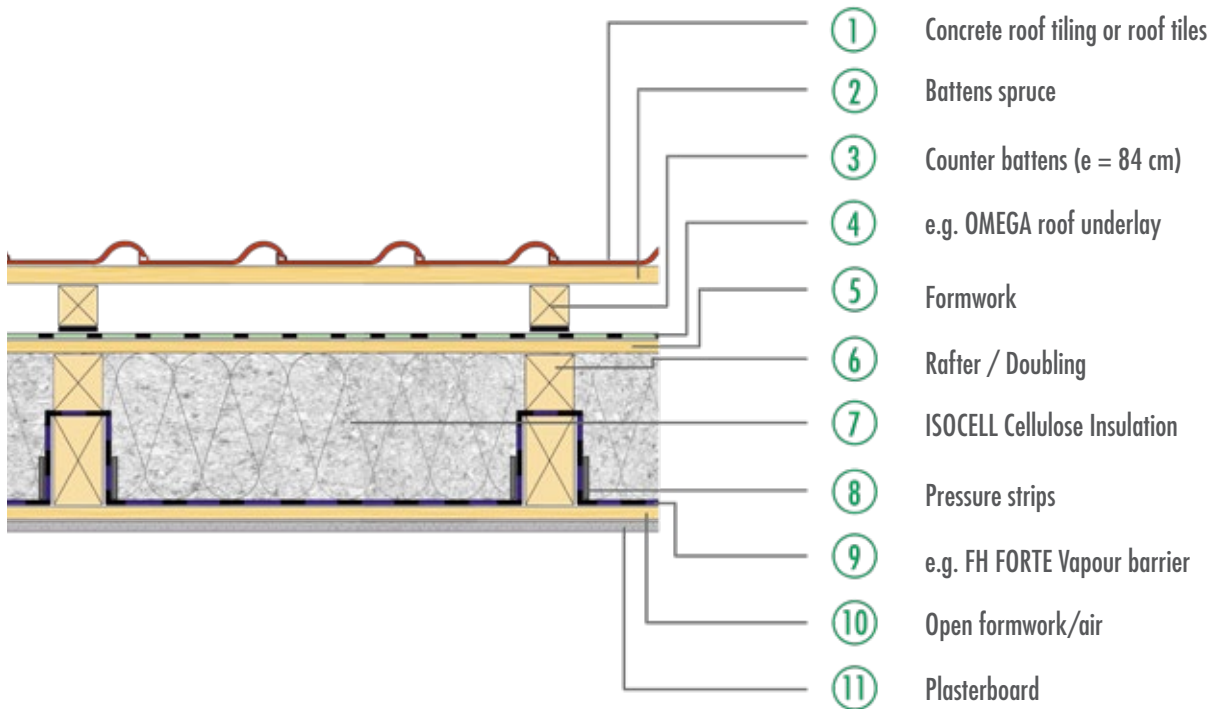
\* GWP Total (Global Warming Potential)

\*\* U-Value (W/m<sup>2</sup>K) for ISOCELL Cellulose was calculated with  $\lambda = 0,039$  W/mK

# SOLUTIONS IN DETAIL

## SIDE VIEW AND SECTION

### COVERING WITH TIMBER FORMWORK AND ROOF UNDERLAY



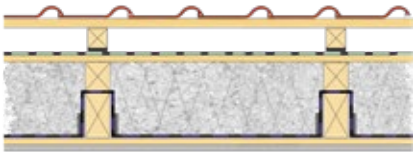
### ADVANTAGES

- Best thermal insulation values
- Excellent heat protection
- High soundproofing
- High fire protection
- Ecological insulation
- Adapts to all unevenness seamlessly and without waste

# TECHINCAL DATA

## FOR THE CONSTRUCTION ELEMENT SHOWN

### COVERING WITH TIMBER FORMWORK AND ROOF SHEETING



Building material	Layer thickness (mm)	$\lambda$ (W/m K)	Fire classification (EN)
Concrete roof tiling or roof tiles	50	0,7	A1
Wooden spruce battens	30	0,13	D
Counter battens (e = 84 cm)	50	0,13	D
OMEGA Roof underlay	1	0,5	E
Timber formwork spruce	24	0,13	D
ISOCELL cellulose insulation	220	0,038 0,039 (D)	B-s2, d0
Rafter / Doubling	220	0,13	D
Vapour barrier	1	0,2	E
Open formwork/air	24	0,13	D
Plasterboard	15	0,21	A2

Insulation thickness (mm)	Insulation density (kg/m <sup>3</sup> )	GWP* (kg CO <sub>2</sub> äqv./m <sup>2</sup> ) Total-set-up of construction	PHI (Phase shift in hours)	U-Value** (W/m <sup>2</sup> K)
220	48	-38,71	11,3	0,194
240	50	-41,71	12,2	0,179
260	50	-44,42	12,9	0,166
280	50	-47,12	13,7	0,156
300	52	-50,24	14,6	0,146
320	52	-52,97	15,4	0,138
340	52	-55,70	16,2	0,13

\* GWP Total (Global Warming Potential)

\*\* U-value (W/m<sup>2</sup>K) for ISOCELL Cellulose was calculated with  $\lambda = 0,039$  W/mK



# REFERENCES

## INSULATION OF FLAT ROOFS IN APARTMENT BUILDINGS



It is so straightforward to make a well-insulated building out of an energy waster. The roofing contractor opened the roof in various places. The company LKI from Nidda-Harb insulated the 600 m<sup>2</sup> roof area with 30 cm ISOCELL in just a short time.

## LOW ENERGY HOUSE IN TIMBER CONSTRUCTION



A low energy house in timber construction was erected in just over five months in Kuchl near Salzburg.

ISOCELL made a considerable contribution to this short construction time - the whole roof was insulated from the outside in 2 ½ hours.

The builder was delighted!

ISOCELL GmbH & Co KG

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