ISOCELL

SOLUTION: TIMBER FRAME WALL

TIMBER FRAME WALL WITH PLASTERED OR REAR-VENTILATED FACADE

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INSULATION WORK IN PRACTICE

Depending on the degree of prefabrication, timber frame walls are either already filled with the cellulose insulation in the factory or filled on-site. In the latter case the ISOCELL truck comes directly to the building site and brings along everything that is needed: the material and the injection machine.

INGENIOUS LIGHTWEIGHT CONSTRUCTION

- Rapid construction progress due to short drying times
- Gain in space through lean constructions, even with large insulation thicknesses
- Sustainable and climate-friendly from an ecological and economical point of view
- Advantages in the implementation of contemporary architecture

The cellulose is installed in the hollow spaces by means of pressure – without joints and free of wastage. The specialist operates here with special injection nozzles that enable him to work quickly and cleanly.

The cellulose fibres entangle inside in the structural element to form a compact, precisely-fitting insulation mat. Once the hollow spaces are completely filled, the injection holes are sealed airtight with the Airstop sealing plasters.

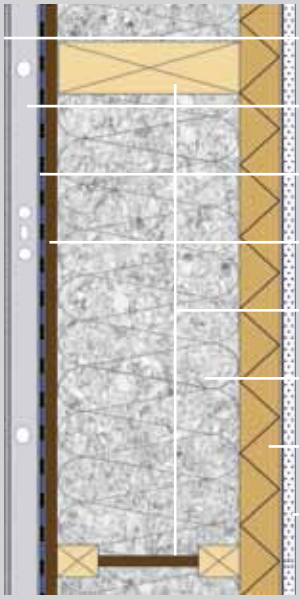
Cellulose insulation supports the air-tightness of the building envelope. In comparison measurements an air resistance twice that of fibre mats was measured.

TIMBER ELEMENT CONSTRUCTION

In modern timber construction buildings are erected in the minimum time with prefabricated elements. Wall and roof structures are manufactured in the factory, independent of the weather, and assembled at the building site. Isocell has developed the ISOBLOW big bag system for companies with a high degree of prefabrication. The cellulose is delivered in big bags of 270 kg and is filled into the timber frame elements using so-called lances.

SOLUTIONS IN DETAIL, PLAN VIEW AND SECTION

Timber frame wall with plastered facade



Gypsum fibreboard

Installation layer (lathing e = 62,5 cm)

Vapour barrier (z.B. AIRSTOP vapour barriers)

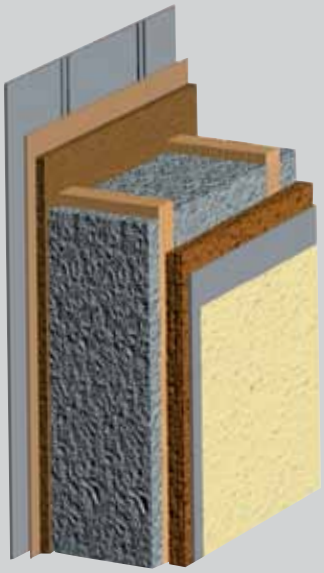
Chipboard

Variations: structural timber or double -T beam

ISOCELL cellulose insulation

Wood fibre insulating panel

Reinforced silicate plaster



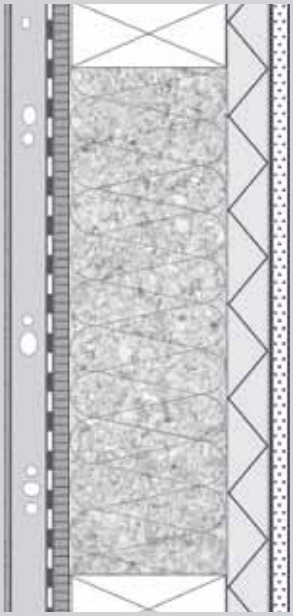
SOUND TEST FOR PASSIVE HOUSE WALL

400 mm double-T beam insulated with ISOCELL cellulose

Detail	Test object	Sound reducting index
	Outside: 400 mm timber wallboard, plastered; Inside: Installation layer 40 mm, OSB board and 2 x gypsum fibreboards á 12.5 mm on DIN rail;	R_w (C;C_{tr}) **58 (-1;-6)**
	Outside: 400 mm timber wallboard, plastered; Inside: Installation layer 40 mm, OSB board and 1 x gypsum fibreboard 12.5 mm on acoustic metal profile;	R_w (C;C_{tr}) **63 (-4;-8)**

TECHNICAL DATA FOR THE STRUCTURAL ELEMENT ILLUSTATED

Timber frame wall with plastered facade



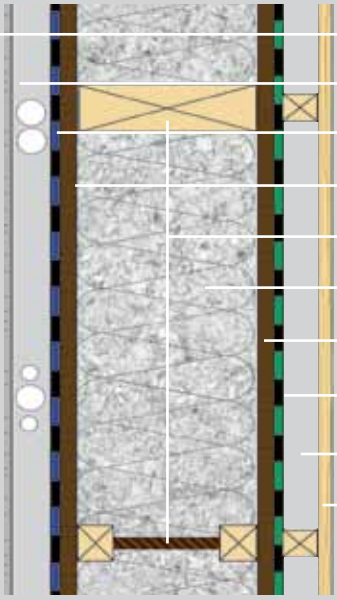
Building material	Layer thickness (mm)	λ (W/m K)	Fire class (EN)
Gypsum fibreboard	12,5	0,27	A2
Installation layer	40	0,13	D
Vapour barrier	1	0,2	E
Chipboard	16	0,13	D
ISOCELL cellulose insulation	160	0,039 0,040 (D)	B-s2,d0
Structural timber	160	0,13	D
Wood fibre insulating panel	60	0,05	E
Plaster base	10	0,8	A1
Reinforced silicate plaster	3	0,8	A1

Thickness of insulating material (mm)	Insulating material density (kg/m^3)	GWP * ($kg\ CO_2$ äqv./m^2) for overall structure	PHI (Phase shift in hours)	U-value ($W / m^2 K$)
160	50	-29,92	13,2	0,194
200	52	-34,60	14,9	0,167
240	54	-39,42	16,6	0,146
280	54	-43,91	18,1	0,130
320	58	-49,45	20,1	0,117
360	60	-54,67	22,0	0,107
400	60	-59,35	23,6	0,098

* Total GWP (Global Warming Potential)

SOLUTIONS IN DETAIL, PLAN VIEW AND SECTION

Timber frame with suspended facade



Gypsum fibreboard

Installation layer (lathing e = 62,5 cm)

Vapour barrier (z.B. FH fleece vapour barrier)

Chipboard

Variations: structural timber or double-T beam

ISOCELL cellulose insulation

Chipboard

Wind seal (z.B. OMEGA wind seal)

Rear ventilation, spruce lathing offset

Larch cladding

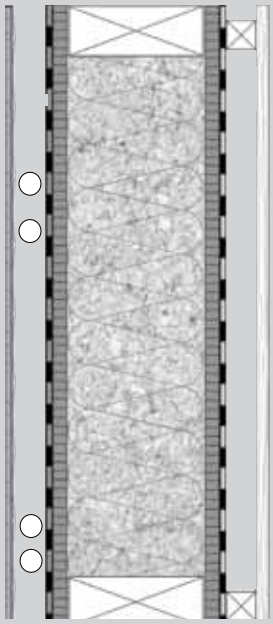
SOUND TEST FOR PASSIVE HOUSE WALL

400 mm double-T beam insulated with ISOCELL cellulose

Detail	Test object	Sound reducing index
	Outside: Timber wallboard 400 mm with rear-ventilated facade; Inside: Installation layer 40 mm, OSB board and 1 x gypsum fibreboard 12.5 mm;	R_w (C;C_{tr}) **46 (-2;-5)**
	Outside: Timber wallboard 400 mm with rear-ventilated facade; Inside: Installation layer 40 mm, OSB board and 1 x gypsum fibreboard 12.5 mm;	R_w (C;C_{tr}) **54 (-2;-7)**

TECHNICAL DATA FOR THE STRUCTURAL ELEMENT ILLUSTATED

Timber Frame with suspended facade



Building material	Layer thickness (mm)	λ (W/m K)	Fire class (EN)
Gypsum fibreboard	12,5	0,27	A2
Installation layer	40	0,13	B2
Vapour barrier	1	0,2	E
Chipboard	16	0,13	D
Structural timber	160	0,13	D
ISOCELL cellulose insulation	160	0,039 0,040 (D)	B-s2,d0
Chipboard	16	0,13	D
Wind seal	1	0,5	E
Spruce lathing offset	30	0,13	D
Larch cladding	24	0,15	D

Thickness of insulating material (mm)	Insulating material density (kg/m³)	GWP * (kg CO_2 äqv./m²) for overall structure	PHI (Phase shift in hours)	U-value (W / m² K)
160	50	-64,15	9,9	0,243
200	52	-68,83	11,5	0,202
240	54	-73,65	13,2	0,173
280	54	-78,14	14,7	0,152
320	58	-83,68	16,7	0,135
360	60	-88,89	18,7	0,121
400	60	-93,58	20,2	0,110

* Total GWP (Global Warming Potential)

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REFERENCES

Samermösl residential complex

The Samermösl housing complex is Austria's largest multi-storey timber-built passive house residential complex. In selecting the materials, the architect DI Simon Speigner from Thalgau opted to use products that were unobjectionable from the point of view of building ecology. Planners and contracting companies also trust in the high-quality products from Isocell in the implementation of the airtight layer.

Matador hall of residence for students

"The greatest challenge with this project was to realise a three-storey building with the same energy standard as a passive house", said the executive architect, Alexander Treichl. 'Matador' is Austria's first timber-built hall of residence for students that achieves its passive house quality and the pleasant living climate among other things thanks to the ISOCELL cellulose insulation.

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