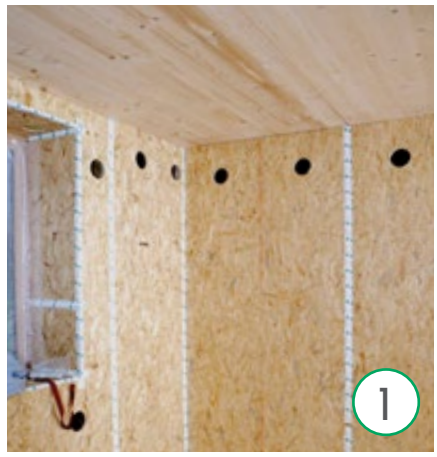
SOLUTION TIMBER FRAME WALL

TIMBER FRAME WALL WITH PLASTERED OR REAR-VENTILATED FACADE

ISOCELL

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 onsite.

In the latter case the ISOCELL truck comes directly to the building site and brings along everything that is needed. ISOCELL cellulose and the ISOCELL machine technology.

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 FLEX 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 CONSTRUCTION ELEMENT

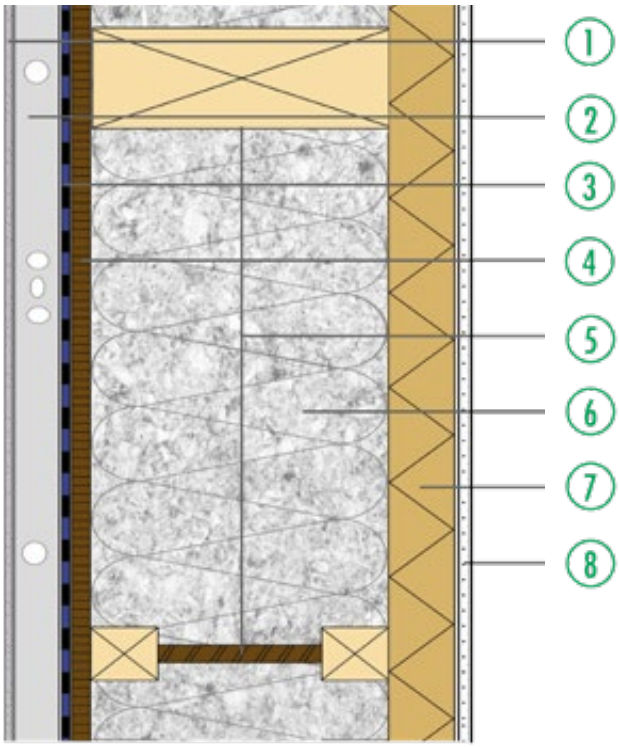
In modern timber construction buildings are erected in the minimum time with prefabricated elements. Wall and roof structures are manufactured in the factory, independent of the weather, and assembled at the building site.

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

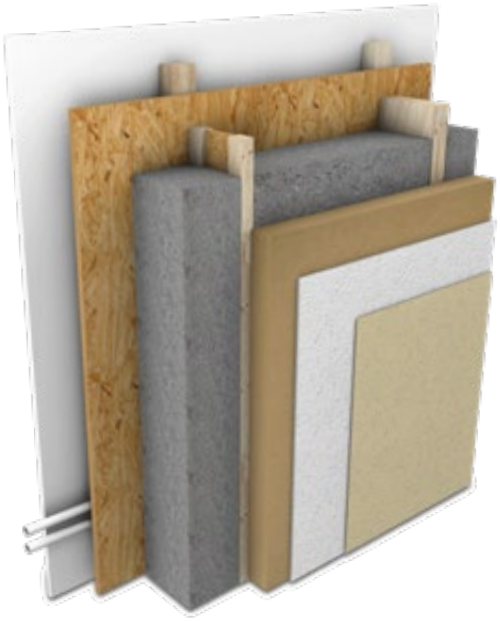
PLAN VIEW AND SECTION

TIMBER FRAME WALL WITH PLASTERED FACADE



1. Gypsum fibreboard
2. Installation layer (lathing e = 62,5 cm)
3. AIRSTOP SD18 Vapour barrier
4. OSB board
5. Variations: structural timber or double -T beam
6. ISOCELL cellulose insulation
7. Reinforced silicate plaster
8.

inside outside



SOUND TEST FOR PASSIVE HOUSE WALL

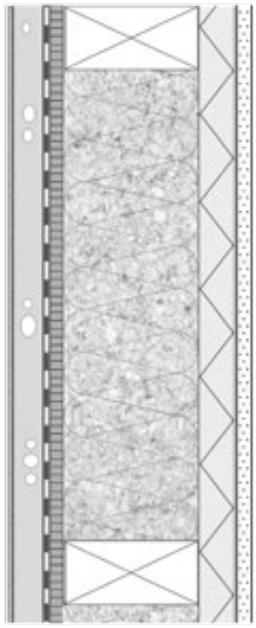
400 mm double-T beam insulated with ISOCELL cellulose

Detail	Test object	Sound reducting index
	Outside: 400 mm timber wallboard, Wood fibre insulating panel plastered; Inside: OSB board and 2 x gypsum fibreboards á 12.5 mm on rail;	R_W ($C;C_{Tr}$) 58 (-1;-6)
	Outside: 400 mm timber wallboard, Wood fibre insulating panel plastered; Inside: OSB board, Installation layer 60mm, mineral wool, 1 x gypsum fibreboard 12.5 mm on steel channel;	R_W ($C;C_{Tr}$) 63 (-4;-12)

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	0,22	D
AIRSTOP SD18 Vapour barrier	1	0,2	E
OSB board	16	0,13	D
ISOCELL cellulose insulation	160	0,038 0,039 (D)	B-s2,d0
Structural timber	160	0,13	D
Wood fibre insulating panel	60	0,05	E
Plaster base	7	0,8	A1
Reinforced silicate plaster	3	0,8	A1

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	-29,92	13,2	0,19
200	52	-34,60	14,9	0,164
240	54	-39,42	16,6	0,144
280	54	-43,91	18,1	0,128
320	58	-49,45	20,1	0,116
360	60	-54,67	22,0	0,105
400	60	-59,35	23,6	0,097

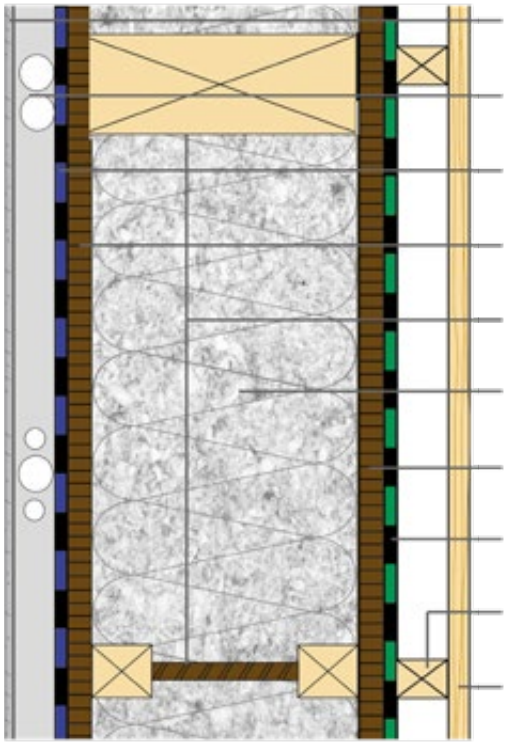
* GWP (Global Warming Potential)

** U-Value (W/m²K) was calculated with λ = 0,039 W/m²K and with an assumed wood content (structural timber) of 9,6%

SOLUTIONS IN DETAIL

PLAN VIEW AND SECTION

TIMBER FRAME WITH SUSPENDED FACADE



1. Gypsum fibreboard
2. Installation layer (lathing e = 62,5 cm)
3. Optional: AIRSTOP SD18 Vapour barrier
4. OSB board (sealed airtight)
5. Variations: structural timber or double-T beamr
6. ISOCELL cellulose insulation
7. Wood fibre insulating panel
8. Wind seal (e.g. OMEGA wind seal)
9. Rear ventilation, spruce lathing offset
10. Larch cladding

inside outside

SOUND TEST FOR PASSIVE HOUSE WALL

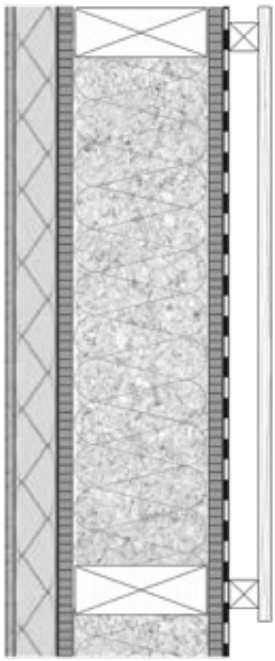
400 mm double-T beam insulated with ISOCELL cellulose

Detail	Test object	Sound reducing index
	Outside: Timber wallboard 400 mm with rear-ventilated facade; Inside: OSB board, Installation layer 47mm, 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: OSB board, 2 x gypsum fibreboard 12.5 mm;	R_W ($C;C_{Tr}$) 54 (-2;-7)

TECHNICAL DATA

FOR THE STRUCTURAL ELEMENT ILLUSTRATED

TIMBER FRAME WALL 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	0,22	B2
Optional: AIRSTOP SD18 Vapour barrier	1	0,2	E
OSB board (sealed airtight)	16	0,13	D
Structural timber	160	0,13	D
ISOCELL cellulose insulation	160	0,038 0,039 (D)	B-s2,d0
Wood fibreboard	16	0,13	D
OMEGA Wind seal	1	0,5	E
Spruce lathing offset	30	0,13	D
Larch cladding	24	0,15	D

Thickness of insulation material (mm)	Insulation 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	0,242
200	52	-68,83	11,5	0,201
240	54	-73,65	13,2	0,172
280	54	-78,14	14,7	0,15
320	58	-83,68	16,7	0,133
360	60	-88,89	18,7	0,12
400	60	-93,58	20,2	0,109

* GWP (Global Warming Potential)

** U-Value (W/m²K) was calculated with λ = 0,039 W/m²K and with an assumed wood content (structural timber) of 9,6%

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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