Kerkstoel Comfort Walls : Prefabricated insulated walls

Built on experience,
driven by innovation

2000+
KERKSTOEL

Kerkstoel Comfort Walls : insulation and construction insulation et stability combined.

Energy requirements become stricter and building in an energy-efficient way is the future. Kerkstoel Comfort Walls are the answer to the problem.

Why? Because Comfort Walls combine multiple benefits in one prefabricated element: Load resistance, durability, thermal inertia, plus thermal and acoustic insulation.

The inner and outer panel are connected with specially designed plastic fibre-reinforced connectors. Those connections are not subjected to corrosion and don't create thermal bridges. Furthermore, their load resistance is very similar to that of prefabricated concrete so they do not reduce the strength of the construction.
The type and thickness of the insulation material are determined by the required R or U value. The insulation material is pre-cut in the factory with the 'Iso-matic' robot. Every shape or dimension can be created with the highest precision, even with (round) openings or organic forms.

The space in between the interior and exterior panels is filled on site with concrete. This results in a massive interior concrete core, perfectly connected to the foundation and the walls and slabs underneath the Comfort Wall.

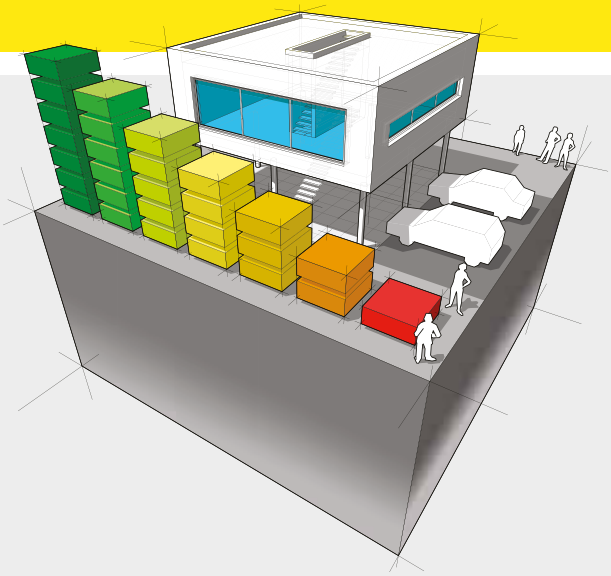
A broad spectrum of applications

The Kerkstoel Comfort Walls can be applied in multiple building types: offices, schools, hospitals, industrial and agricultural buildings and housing projects. The walls are used on the inside and outside for acoustical and thermal insulation of e.g. basements, staircases or for the construction of fire walls.

Iso-Matic, six axled cutting-arm robot

Comfort Walls consist of
(1) an exterior skin in reinforced concrete
(2) a layer of insulation material
(3) a void, to be cast on site with concrete
(4) an interior skin in reinforced concrete

Strengths & Advantages



Kerkstoel 2000 + wants to create additional value with smart innovation and its prefabricated products. By developing Comfort Walls, Kerkstoel wants to offer a solution to the demand for ecological and sustainable buildings and answer to the needs of the construction industry: freedom of design combined with a fast and high quality construction method.

In addition to the many advantages of the regular prefabricated double walls, the strengths of Comfort Walls are:

- Guaranteed quality of the insulation, placed in the factory
- A minimal amount of waste on site
- Less labour-intensive and safer
- Resistant to corrosion
- Facing in smooth industrial concrete, suited for spray plaster
- Possibility of slender constructions
- Mass law (acoustics) apply to double walls: High acoustic performance when combined to floating floors
- Structural, thermal insulation and acoustic requirementsare satisfied in one element.

Kerkstoel Comfort Walls : Technical features

Kerkstoel Comfort Walls are the result of intensive research and development. Their design has been perfected over the years. The standard properties are listed below. Other dimensions and qualities are possible on demand. Please contact Kerkstoel 2000+ for more information

Concrete quality

Panels	C30/37
Core	C25/30 (minimal quality)

Steel quality

BENOR DE 500 BS, KOMO B500A,
ACAB – NF EN 10025

Dimensions

Length	min. 1,0 m – max. 9,0 m
Height	min. 1,0 m – max. 3,5 m
Panel thickness	min. 6 cm – max. 7,5 cm
Total wall thickness	25 cm, 30 cm, 36 cm, 40 cm en 45 cm

Concrete weight

± 300 kg/m² (2 panels of 6 cm)

External floating panel ?

In its basic execution form, the external panel of the Comfort Walls is supported by the foundation or structure underneath. It is also possible to build with a 'floating' outside panel that does not have to be supported. After an in-depth study of the project, special connectors will be provided to guarantee the stability of the walls.
Please contact Kerkstoel 2000+ for more information.

The insulation material

Basically, every type of insulation material can be used as long as it is compatible with concrete.

	EPS200	IKO Enertherm PIR	Kingspan Kooltherm K20
Thermal conductivity [W/mK]	0,034	0,022	0,02
Fire Resistant	neen	neen	ja
Absorbing humidity	neen	ja	ja
Available thickness [mm]	40 – 200	40 – 200	40 – 200
U-value in Comfort Walls [W/m²K]	0,69 – 0,17	0,48 – 0,11	0,44 – 0,10

Fire Resistance

Fire resistance requirements are becoming much more important in the design of a building. In the British Building Regulations (Approved document B) the minimal requirements for different building types are specified.

By dividing the building in different compartments (spaces in the building protected by other spaces with fire walls) fire spread can be prevented through the rest of the building.

Tests carried out by specialists have shown that fire walls can be executed with Kerkstoel Comfort Walls to meet the requirements for compartmentation

Sound resistance

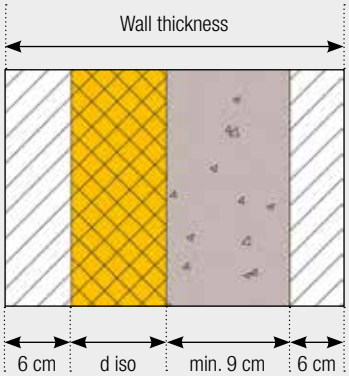
The acoustic insulation capacity of walls is based on the mass law, one of the major principles in building acoustics. The acoustic insulation of a wall improves with its mass.

Tests at the BBRI lab for acoustics in Limelette, Belgium have shown that the mass law is still valid for prefabricated insulated concrete walls. An airborne sound insulation value Rw (C ; Ctr) of 56.7 (-2 ;-4) dB has been measured on a wall of 22 cm thickness*.

**** Interior panel 6 cm, concrete core 6 cm, Insulation PIR 4 cm exterior panel 6 cm***

Thermal Calculations

The table below determines the insulation thickness necessary to attain a certain U-value. Please contact Kerkstoel 2000+ for the correct calculation of a specific project

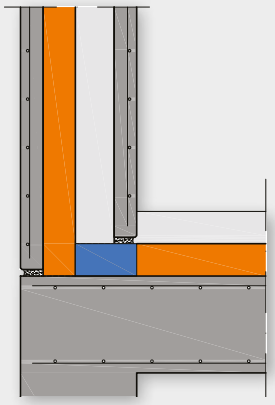


1. Insulation thickness d_{iso} required in a 36 cm wall.

	U-value of Comfort wall (W/m²K)				
	0,24	0,2	0,18	0,16	0,14
Insulation λ 0,034	14	16			
Insulation λ 0,02	8	10		12	14

Calculation for a wall with average dimensions of 4,0m long x 2,8 m high.
Distance in between connectors = 50 cm
λ value of concrete: 1,9 W/mK

2. Insulation thickness d_{iso} required in a 40 cm wall.



	U-value of Comfort wall (W/m²K)						
	0,24	0,2	0,18	0,16	0,14	0,12	0,11
Insulation λ 0,034	14	16	18				
Insulation λ 0,02	8	10	(11)	12	14	16	18

Calculation for a wall with average dimensions of 4,0m long x 2,8 m high.
Distance in between connectors = 50 cm
λ value of concrete: 1,9 W/mK
λ value of insulation material: 0,02 W/mK

3. U value of Comfort wall W/m²K

Thickness of insulation [cm]	Wall thickness [cm]			
	30	36	40	45
4	0,45	0,45	0,44	0,44
6	0,30	0,30	0,30	0,30
8	0,23	0,23	0,23	0,23
10		0,19	0,19	0,19
12		0,16	0,16	0,16
14		0,14	0,14	0,14
16			0,13	0,13
18			0,11	0,11
20				0,10

Calculation for a wall with average dimensions of 4,0m long x 2,8 m high.
Distance in between connectors = 50 cm
λ value of concrete: 1,9 W/mK
λ value of insulation material: 0,02 W/mK

How do you install Kerkstoel Comfort walls?

Transport & manipulation

Please take into account following guidelines to prevent the Comfort Walls from being damaged:

- The Comfort Walls have to be transported and stored vertically
- Always make sure that the chains or cables are sufficiently long to guarantee an angle of 60°. Always pick up the element vertically and level.

Placing

- Three operatives are needed for assembly.
- Make sure that with the bringing in of a new element the elements already in position are not displaced or damaged.
- Gradually lower the element and push any protruding holding rods to the side.
- Place the element in line and up to the adjusting wedges. Make sure that the vertical joints are always perpendicular and +/- 2 cm wide as indicated on the plans. The position can still be corrected with a crow bar to set the positions with wedges afterwards.
- Fix each element with two props on one side. Screwed sleeves are provided in the walls. The holes to fix the props in the floor slab still have to be drilled.
- The crane hooks may only be removed after the elements have been fixed in place and checked.
- Now apply the joint and corner reinforcement.
- Do not forget to shutter the openings
- Fill the joints in between the insulation panels

Elaborate assembly advice are available on demand. Contact Kerkstoel 2000+. They can be consulted on the website as well.

Pouring the concrete – preparatory measures

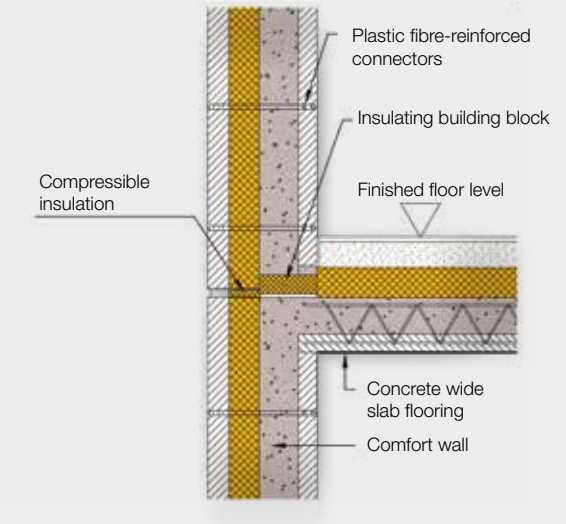
- Finish the joints as follows:
  - Horizontal joints must be propped up and formed if necessary.
  - Vertical joints must be formed if the joint is larger than 1 cm. To do this, use assembly foam.
- Reinforce corners using angle bars or wooden planks. Props can be used for T-joints.
- It is possible to place the wide slab before the walls are concreted. To do this, the walls must be assembled on a mortar bed or sufficiently wedged. The inner surface of the walls must be moistened before pouring the concrete.

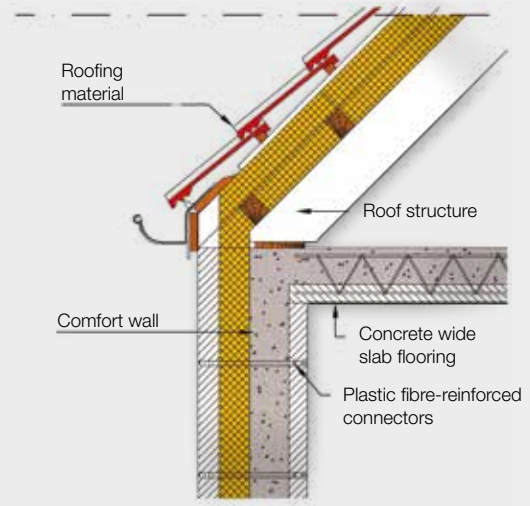
Important

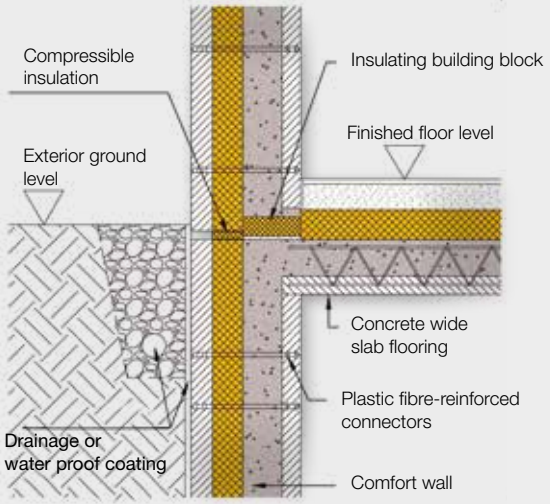
Neem bij het storten de geldende voorschriften (druk, snelheid, vakkundig trillen enz.) in acht:

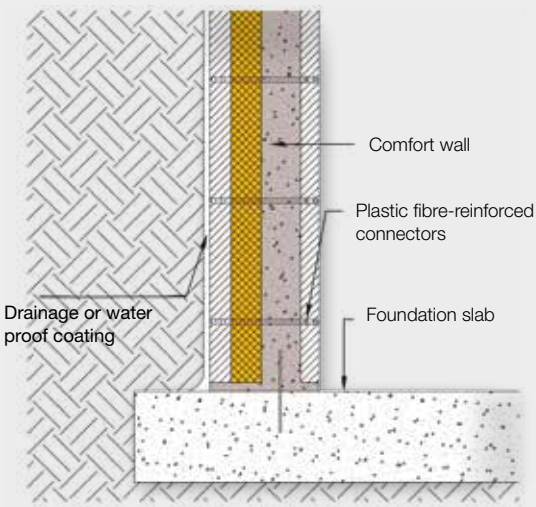
- The permissible concrete pressure must not exceed 30 kN/m^2.
- We advise you to vibrate for 60 % of the filling time.

Details

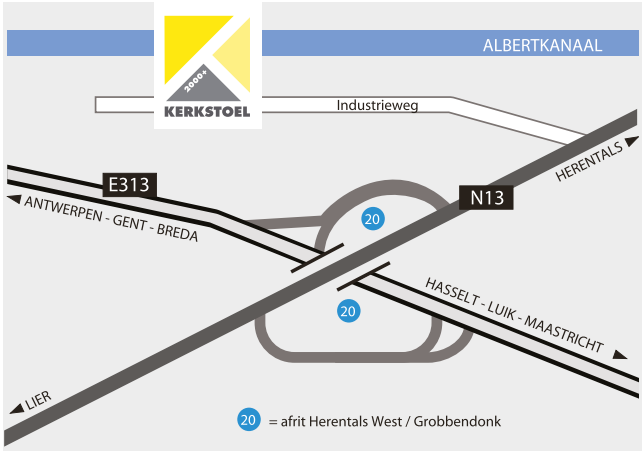








Double walls ■ Kerkstoel COMFORT walls ■ Floor slabs ■ Kerkstoel ACTIV floors ■ Floor slabs with polystyrene



Kerkstoel 2000+ complies with the highest quality standards.

NBN ISO 9001 BCCA · BENOR 245 · BENOR 245 · K2188 · K23140

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