

1. INTRODUCTION



Insulated Concrete Forms

Today, homebuyers expect to get more from their new home. They want beauty that's more than skin deep and a home that fits their lifestyle of course.

But they also want a home with solid, high quality construction, greater comfort and security, lower energy bills, and lower maintenance. There is the demand for a home that's healthier to live in and easier on the environment.

It's becoming harder and harder to meet these new expectations with the conventional building technology, so more and more builders and homebuyers around the world are turning to something new. A modern adaptation of a centuries-old technology using the most proven building material on earth. Concrete.

Insulated concrete formwork (ICF) gives you all the benefits that have made concrete the material of choice for home building world-wide: Solid, lasting construction that resists the ravages of fire, wind, and time. But ICF's do plain concrete one better - or rather, two better - by giving you two built-in layers of insulation.

History

Insulating concrete formwork (ICF) is the term to describe proprietary formwork for concrete that is left in place to become part of the building and provide astonishing levels of insulation. The formwork contains the reinforced concrete core to provide the structural capacity of the wall.

ICF construction has been used for some 40 years in Europe, where concrete residential construction is quite common. And in North America it has really taken off in the last 10-15 years. ICF's have been available in New Zealand since 1982 and during that time they have been increasingly used for both commercial and residential construction.

Dramatic Growth

When we consider the North American experience, the potential for ICF's in New Zealand is huge. The use of ICF's in the US residential market increased 21% in 2001, and accounted for 2.7% of all homes¹. In 2002 when last measured, approximately 65,000 homes were built in ICF's (there were less than 1,000 ICF homes built in 1992). There are now 89 different brands of ICF in North America and in some areas of Canada ICF's are used on over 50% of external residential walls. The increase is attributed to the solid construction, energy efficient properties and low maintenance offered by ICF's and homebuyers and designers realising that these options are now available.

¹ Ref: National Association of Home Builders (NAHB) and the Portland Cement Association

What is Ambionse?

Ambionse is the ICF manufactured by Styrobeck Plastics Ltd. The sides of the Ambionse block provide the completed wall with an R-value of R3.0. This layer of continuous insulation is also the substrate onto which linings and claddings can be fixed. The materials will never rot or decay and will provide total comfort for the occupier through inherent thermal and sound insulation qualities.

An Ambionse home has some sizeable advantages over a traditional New Zealand house. Greater energy efficiency. More peace & quiet. More day-to-day living comfort. All wrapped up in a solid, high-quality building package that gives an Ambionse home an utterly remarkable feel that really has to be experienced to be believed. As soon as you step inside, you can tell that an Ambionse home is not an ordinary house. It's not just beautiful, comfortable and quiet. You can feel that it's solid and built to last.

Ambionse Specification

There are four members of the Ambionse family: straight blocks, corner blocks, blank ends and sill blocks. The straight blocks are 1200mm long, and come in three widths: 190mm (190 Series), 250mm (250 Series) and 300mm (300 Series), all in 300mm high modules. The corner blocks are 600mm x 450mm in each direction respectively and 300mm high to match the straight blocks. The corner blocks are available in both left-hand and right-hand configurations. The 190 Series and 250 Series are available in both straight and corner blocks while the 300 Series is available only in the straight block.

The blank ends are used to finish off straight walls or at openings. These simply slide into the straight or corner blocks and suit all three Series. The sill block creates a rebate into which the windows can be fitted, and also creates a sloped sill. It is 250mm wide and can be trimmed to suit the width of the 190 Series wall.

Bridge holders are moulded into the 50mm thick sides of the Ambionse blocks. These holders serve two purposes - the first to provide a mechanical fixing point for internal linings and external finishings as required. The second is to strengthen the block in order to eliminate major concrete leakage. The polypropylene bridge (or spacer) between the two sides of the block fits into the holders creating a positive connection between the flanges on the outside to the concrete core of the wall.

Cost Comparison

Ambionse is a cost-effective choice for most residential construction applications. As concrete is a premium building material, the initial construction cost is likely to be higher, but the benefits of living in an Ambionse home will far outweigh any increase in cost. Plus due to the energy savings and low maintenance, an Ambionse home will have a much lower lifecycle cost compared to homes of other construction types.

Below is the summary of the costs ('paint to paint') developed from the Rawlinsons Construction Guide 2005. It is interesting to note where the square metre rate of Ambionse falls in relation to the perceived cheaper option of "Plastered Brick".

Construction Type	Price/m ²
70mm Clay Bricks on Timber	\$ 212.60
40mm Polystyrene with Texture Coating on Timber	\$ 226.00
90mm Clay Bricks on Timber	\$ 228.00
75mm Hebel Powerpanel on Timber	\$ 239.50
60mm Polystyrene with Texture Coating on Timber	\$ 245.00
190mm ICF Block Concrete Filled (Ambionse)	\$ 251.60
4.5mm Fibre Cement Sheeting & Plaster on Timber	\$ 254.50
70mm Clay Bricks & Plaster on Timber	\$ 262.75
Hebel 200mm Thermoblock	\$ 277.10
Conventional 20 Series Masonry Strapped & Lined	\$ 282.92
Hotbloc 20 Series Blocks with Insulating Plaster	\$ 302.40
Strapped & Lined 150mm Tilt Slab	\$ 302.92
150x25 Rusticated Cedar Weatherboards on Timber	\$ 306.75
180mm Nirvana Insulated Tilt-panel	\$ 347.30
235mm Thermomass Insulated Tilt-panel	\$ 372.30

Notes:

- Prices are based on national average rates from the Rawlinson NZ Construction Handbook 2005.
- The rates exclude GST and any freight to remote areas.
- The rates are for comparison purposes only and should not be used to form the basis of any quote.

Typical Applications

Ambionse has been used in many situations, but is most suited for retaining walls, particularly basements, general house construction, intertenancy walls and insulated swimming pools. It is a great option for a builder familiar only with timber who wants to build in concrete.

Block Properties 190 Series

Straight Block

Length	=	1200 mm
Height	=	300 mm
Width	=	190 mm
Unfilled Weight	=	750 g
Cavity width	=	90 mm
Concrete	=	0.038 m ³ per block (26 blocks/m ³) (0.11 m ³ per m ² of wall)
Installed	=	2.77 blocks/m ²
Assembled volume	=	0.072 m ³ per block
Volume unassembled	=	0.038 m ³ per block

Corner Block

Length	=	600 mm x 450 mm
Height	=	300 mm
Width	=	190 mm
Unfilled Weight	=	0.600 kg
Cavity width	=	90 mm
Concrete	=	0.031 m ³ per block



Block Properties 250 Series

Straight Block

Length	=	1200 mm
Height	=	300 mm
Width	=	250 mm
Unfilled Weight	=	800 g
Cavity width	=	150 mm
Concrete volume	=	0.056 m ³ per block (17 blocks/m ³) (0.155 m ³ per m ² of wall)
Installed	=	2.77 blocks/m ²
Assembled volume	=	0.092 m ³ per block
Volume unassembled	=	0.038 m ³ per block

Corner Block

Length	=	600 mm x 450 mm
Height	=	300 mm
Width	=	250 mm
Unfilled Weight	=	700 g
Cavity width	=	150 mm
Concrete volume	=	0.04 m ³ per block

Block Properties 300 Series

Straight Block

Length	=	1200 mm
Height	=	300 mm
Width	=	300 mm
Unfilled Weight	=	850 g
Cavity width	=	200 mm
Concrete volume	=	0.074 m ³ per block (13 blocks/m ³) (0.21 m ³ per m ² of wall)
Installed	=	2.77 blocks/m ²
Assembled volume	=	0.110 m ³ per block
Volume unassembled	=	0.038 m ³ per block

