



**GreenStuf<sup>®</sup>**

Residential Insulation Guide







# GreenStuf®

Polyester Insulation

developed  
here  
made  
here  
for by **us**  
**us**  
and our **homes**



Proudly made in  
New Zealand.



## Over 45 years experience

Autex Industries Limited was established in Auckland in 1967 and proudly remains a privately owned New Zealand company. Ongoing investment in technology and innovation has allowed Autex to develop high performance products that lead the way in environmentally responsible manufacturing.

*Our quality polyester products are manufactured in Auckland and exported to over 24 countries around the world.*

Developed in New Zealand by Autex, all GreenStuf® products are manufactured using only 100% polyester fibre. Some products contain up to 85% recycled polyester fibre made from used PET plastics like drink bottles. GreenStuf® proudly contains the highest level of declared minimum recycled content of any insulation product available in New Zealand.

GreenStuf® insulation and other ‘friendly-fibre’ products are being used in hospitals, schools, offices and homes all over New Zealand and Australia. Considered one of the most commonly used fibres in the world, polyester is renowned for its safety, durability and performance.

Committed to best practices; GreenStuf® is proudly manufactured in New Zealand to exacting specifications under strict ISO 9001 and ISO 14001 certified Quality and Environmental Management Systems. It is also appraised by BRANZ (Building Research Association of New Zealand) to meet all requirements of the New Zealand Building Code.

*We are at the forefront of developing insulation products in response to an increasing demand for a user-friendly alternative to the common fibreglass insulation.*

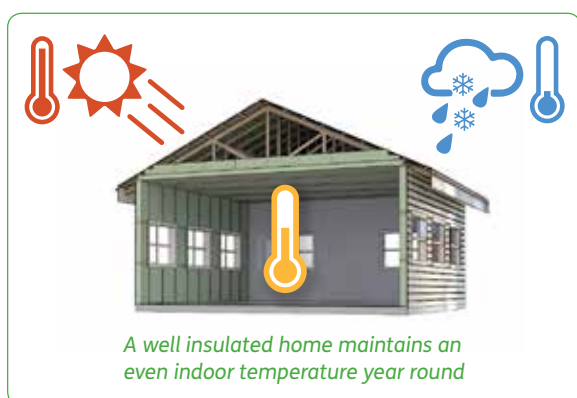


# An insulated home; warmer, drier, healthier and more economical

*Insulating your home is the most effective thing you can do to keep your home comfortable and healthy, and to save energy and money.*

A well insulated home provides year-round comfort; it is cooler in the summer and warmer in the winter. An insulated home is a drier, healthier home.

Around 35% of the energy used in the average New Zealand household goes on heating your home. If your home doesn't have adequate insulation, a lot of your energy spend is wasted as the heat escapes.



## How Insulation Works

Heat always flows from its source to surrounding cooler areas; insulation is designed to slow this heat transfer. The relative efficiency with which it does this is called the R-Value, with 'R' representing insulation's resistance to heat flow at a given thickness. The higher the R-Value, the more effective the insulation.

## Invest in Insulation

Insulation is one of your home's best defences against wasteful energy spending. Improving your home's building envelope, whilst keeping out the winter cold and the summer heat generates huge potential for financial savings.

The envelope is the sum total of everything that protects your home from the elements: paint, framing, insulation, windows, doors and bricks. Inadequate (or absent) wall, ceiling and floor insulation can lead to significant energy waste. A fully-insulated house needs about half the heating of an uninsulated house. So, paying a bit more for insulation when building your new home will save you money well into the future. By investing in insulation you are also reducing your overall environmental impact as your home requires less energy to heat or cool.

*Insulation conserves energy, increases comfort and saves money by keeping your hard earned heat inside your home.*

## An Insulated Home is a Healthy Home

Research studies in New Zealand have found a definite link between insulation and health. The Wellington School of Medicine and Health Sciences study (Published 1 March 2007) showed:

- A substantial drop in energy use when the houses were properly insulated.
- People in insulated houses reported their homes were 'significantly warmer' and drier.
- There was a considerable improvement in the self-reported health of those living in the insulated houses compared to those whose houses were not insulated.
- Adults and children in insulated houses reported visiting their GP less often, less hospital admissions for respiratory conditions and significantly less reported sick days.
- People living in insulated houses reported less visible mould inside their homes.



# GreenStuf® Polyester Insulation



## New Zealand Made

GreenStuf® products are made in New Zealand by Autex Industries under an ISO 14001 certified Environmental Management System. Manufactured using a low energy and zero waste production process, GreenStuf® is among the most environmentally friendly insulation solutions on the market.



## Durability Guaranteed

GreenStuf® will not deteriorate or break down over time and is backed by a 50 Year Durability Warranty.



## Environmental Choice

Initiated and endorsed by the New Zealand Government, Environmental Choice New Zealand (ECNZ) recognises genuine moves made by manufacturers to reduce the environmental impacts of their products. It provides a credible and independent guide for consumers who want to purchase products that are better for our environment.

Autex insulation proudly carries the ECNZ tick on appraised GreenStuf® products. For more information visit: [www.enviro-choice.org.nz](http://www.enviro-choice.org.nz)



## Independently Assessed

All GreenStuf® insulation product declarations have been independently assessed by EnviroSpec and are suitable for Living Building Challenge projects. GreenStuf® has also been verified as Green Star New Zealand compliant and Homestar compatible.

## GreenStuf® Insulation Life Cycle



## Recycled & Recyclable

All GreenStuf® insulation products are manufactured using only 100% polyester fibre. Polyester can be recycled and our GreenStuf® products contain a minimum of 45% recycled content from used and recycled PET plastics.

The thermal bonding process allows GreenStuf® insulation to be further recycled and used again. Autex will gladly recycle used, uncontaminated GreenStuf® and help keep it out of landfill.

For more information on GreenStuf® recycling, contact Autex on Freephone 0800 428 839.



## Fire Safe

GreenStuf® insulation products exceed all of the New Zealand Building Code (NZBC) Early Fire Hazard requirements.

GreenStuf® is a self-extinguishing product as tested under AS1530.3 and ISO 9705. When exposed to a naked flame, GreenStuf® will simply melt away from the flame and self-extinguish. GreenStuf® has been tested and certified non-flammable and complies with the requirements of IEC 60695-11-5 (Downlight Fire Test Standard).

*We are so confident in the quality of manufacture and performance of our products that we offer a 50 year product durability warranty.*



## Chemical Free & Completely Safe

GreenStuf® has been classed as low VOC (volatile organic compound) which means the product has been tested to ensure it does not emit toxins during or post install. Some other insulation products commonly available in New Zealand are made with bonding agents which contain cancer causing chemicals, in particular formaldehyde.

The thermal bonding process we use on our products means the insulation material is self-supporting in walls and ceilings and won't break down over time. With polyester fibres that are not of a respirable size and no nasty chemicals, there are no special precautions for safely handling and installing GreenStuf® products.

All GreenStuf® products are non-irritant and non-toxic. That means no nasty itching, scratching or ongoing health risks. GreenStuf® is completely safe for everyone, including those living with asthma.



## BRANZ Appraised

GreenStuf® has been fully and independently appraised by The Building Research Association of New Zealand (BRANZ) to meet all requirements of the New Zealand Building Code, so you can specify and use GreenStuf® with confidence.



## Breathe Easy

GreenStuf® insulation has been independently assessed by Asthma New Zealand and accepted into their Breathe Easy programme.

GreenStuf® is recognised as a safe, non-toxic and non-allergenic insulation that reduces the triggers of respiratory illnesses.





**Warmth you can really feel™**  
in a home you'll love to live in.







# Insulating New Zealand Homes

We all desire a warm, quiet, comfortable home and choosing the right insulation will play a significant role in achieving this. Designing your home's ability to retain heat and make smart use of a clean, efficient heating system will make your home more cost-effective to run, and warmer and healthier to live in.

There are minimum requirements for insulation - but they are only a minimum. If you really want to improve your home's warmth and comfort, and lower your power bills, consider exceeding the minimum requirements. The more insulation you install, the more savings you'll see over time.

*Insulating your home is the single most effective thing you can do to keep your home warm and to save energy and money.*

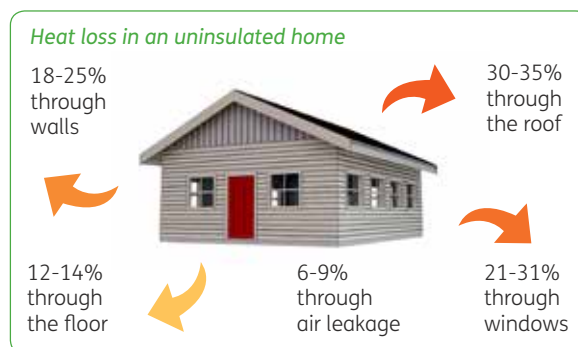
## R-Values

Used to rate the insulation of building materials and assembled walls, windows, floors and roofs. The higher the R-Value the better the insulation provided.

Technically speaking, the 'R' in R-Value means the resistance to heat flow, including conduction, convection and radiation. If you're comparing products, make sure it's tested to New Zealand standards as overseas R-Values are not comparable.

The minimum R-Values for NZ homes are listed in the table below. These show the overall R-Values for each part of the building, and are different to the R-Value of the insulation that is actually installed. For example, a timber-framed wall may need insulation with an R-Value of 2.2 to achieve an overall R-Value of 2.0 depending on the actual construction (the higher insulation R-Value offsets the lower R-Value of the timber framing).

We support the use of higher insulation levels in homes, and here's what we recommend:



| Application   | NZBC Minimum | "Better"                            | "Best Practice" Recommended         |
|---|--------------|-------------------------------------|-------------------------------------|
| <b>Area 1 - North Island (excluding Central Plateau area)</b> |              |                                     |                                     |
| Ceilings  | R2.9         | GreenStuf® R1.8 + R1.8 Double-Layer | GreenStuf® R2.2 + R2.2 Double-Layer |
| External Walls  | R1.9         | GreenStuf® R2.2 Wall                | GreenStuf® R2.5 Wall                |
| Under Floors  | Foil Barrier | GreenStuf® R1.5 Underfloor          | GreenStuf® R1.8 Underfloor          |
| Internal Walls  | Nil          | GreenStuf® Sound Solution           | GreenStuf® Sound Solution           |
| Between Floors  | Nil          | GreenStuf® Sound Solution           | GreenStuf® Sound Solution           |
| <b>Area 2 - South Island and Central Plateau area</b>         |              |                                     |                                     |
| Ceilings  | R3.3         | GreenStuf® R2.2 + R1.8 Double-Layer | GreenStuf® R3.2 + R2.2 Double-Layer |
| External Walls  | R2.0         | GreenStuf® R2.2 Wall                | GreenStuf® R2.5 Wall                |
| Under Floors  | Foil Barrier | GreenStuf® R1.5 Underfloor          | GreenStuf® R1.8 Underfloor          |
| Internal Walls  | Nil          | GreenStuf® Sound Solution           | GreenStuf® Sound Solution           |
| Between Floors  | Nil          | GreenStuf® Sound Solution           | GreenStuf® Sound Solution           |





## A well-insulated home delivers in many ways

**Insulate your pocket** - a fully insulated home needs about half the heating an uninsulated home requires.

**Insulate your ears** - insulation helps reduce noise levels in your home creating a quieter, more comfortable environment.

**Insulate your family's health** - a well-insulated home provides year-round comfort, a healthier environment and less risk of colds and other respiratory illnesses. Insulation helps to reduce condensation, dampness and mould.

**Insulate New Zealand's future** - about a third of all the power we consume comes from burning coal, gas and oil, adding to greenhouse gases entering the atmosphere. Installing better insulation in our homes can help reduce future electricity demand and in turn, lower greenhouse gas emissions.

**Insulate first** - it's best to insulate when building a new home or during renovations before cavities are closed in. Well-made, good-quality insulation like GreenStuf® will do its job and remain effective for many, many years to come.

## Double-Layer insulation is best

There are several different types of ceiling insulation. Segments or Pads are the conventional format for insulation products. These are simply installed snug between ceiling joists. Because they don't cover the ceiling joists you lose heat through 'thermal bridging'.

Insulation blankets can help avoid thermal bridging as they are installed over the top of the ceiling joists providing complete coverage. Blanket insulation is supplied as rolls for easy and fast installation.

The best option is a double-layer of insulation. The first layer is installed between the ceiling joists with a second layer blanket installed over the top. Installed correctly, this will eliminate leakage and ensure your home stays warmer in winter and cooler in summer.

**Good**  
GreenStuf®  
Segment/Pad

**Best**  
GreenStuf®  
Double layer

**Better**  
GreenStuf®  
Blanket

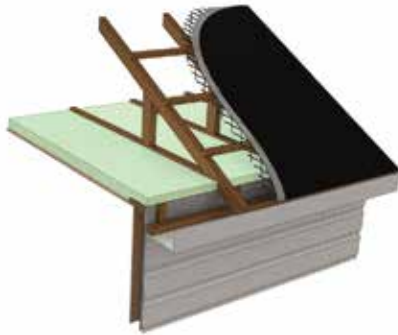


# Insulating Standard Construction Systems

## GreenStuf® Ceiling Pads and Roll Form

Most of a home's heat is lost though the roof so it's the most important place to insulate, and provides the best return on investment when increasing the R-Value beyond NZBC minimums.

GreenStuf® Ceiling Pads are supplied as pre-cut segments ideal for placing between joists/trusses. GreenStuf® Roll Form products are ideal for rolling out between joists or trusses and as a blanket. Roll Form is also ideal for double-layer installations to achieve optimal thermal performance. Both GreenStuf® Pads and Roll Form products are available in a range of BRANZ appraised performance options.

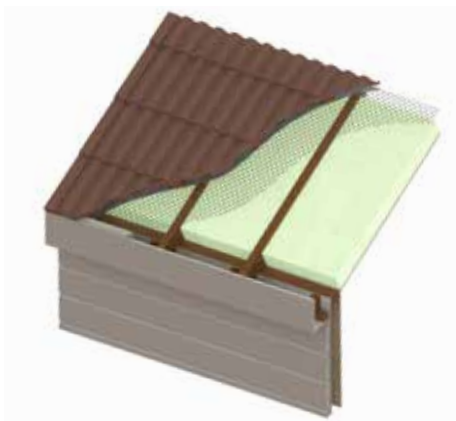


**Roof Construction:** Pitched Timber-Framed Roof with 90-140mm Ceiling Joist or Chord.  
Cladding: Profiled Metal or Concrete/Clay Tiles.

| GreenStuf® Insulation         | GreenStuf® Insulation R-Value |     |     |     |     |     |     |     |
|-------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|
| GreenStuf®                    | 2.9                           | 3.2 | 3.4 | 3.6 |     |     |     |     |
| GreenStuf® Double Layer       |                               |     |     |     | 3.5 | 3.8 | 4.2 | 5.2 |
| Framing Timber Size           | Total Construction R-Value    |     |     |     |     |     |     |     |
| Joist/Chord at 1200mm Centres | 2.9                           | 3.1 | 3.3 | 3.4 | 3.5 | 3.7 | 4.1 | 5.0 |
| Joist/Chord at 900mm Centres  | 2.8                           | 3.0 | 3.2 | 3.3 | 3.4 | 3.6 | 4.0 | 4.9 |
| Joist/Chord at 600mm Centres  | 2.7                           | 2.9 | 3.0 | 3.2 | 3.4 | 3.5 | 3.9 | 4.8 |

## GreenStuf® Skillion Roof Blanket

GreenStuf® Skillion Roof Blanket has been specifically designed to provide high thermal performance in a restricted space such as a Skillion Roof. GreenStuf® Skillion Roof Blanket comes in a range of performance options and is pre-cut to fit standard timber framing widths.



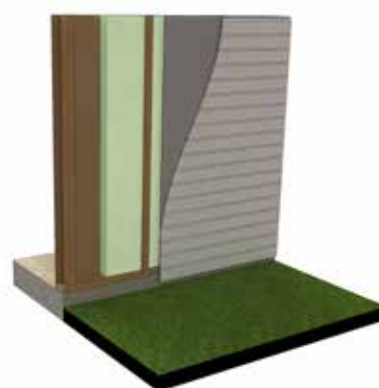
**Roof Construction:** Skillion Roof with 190mm Rafters and Battens.  
Cladding: Profiled Metal or Concrete/Clay Tiles.

| GreenStuf® Insulation            | GreenStuf® Insulation R-Value |     |     |     |
|----------------------------------|-------------------------------|-----|-----|-----|
| GreenStuf® Skillion Roof Blanket | 2.9                           | 3.2 | 3.4 | 3.6 |
| Framing Timber Size              | Total Construction R-Value    |     |     |     |
| Rafters at 1200mm Centres        | 3.1                           | 3.4 | 3.5 | 3.7 |
| Rafters at 900mm Centres         | 3.1                           | 3.3 | 3.4 | 3.7 |
| Rafters at 600mm Centres         | 3.0                           | 3.2 | 3.4 | 3.6 |

## GreenStuf® Pads for External Walls

GreenStuf® Pads are designed for the thermal insulation of timber-framed buildings. They come as insulation segments pre-cut to fit standard timber-framing. Thermally bonded into shape, they are designed to be self-supporting in walls and require no stapling into place. GreenStuf® wall products are available in a range of performance options for both 90mm and 140mm framing.

| Wall Construction: Timber-Framed Cavity.<br>Cladding: Bevel-Backed Weatherboard. |                               |     |     |     |      |  |
|--|-------------------------------|-----|-----|-----|------|--|
| GreenStuf® Insulation  | GreenStuf® Insulation R-Value |     |     |     |      |  |
| GreenStuf®   | 2.0                           | 2.2 | 2.5 | 2.6 | 2.9* |  |
| Framing Timber Size (90mm)   | Total Construction R-Value    |     |     |     |      |  |
| Studs at 600mm and Dwargs at 800mm   | 1.9                           | 2.1 | 2.2 | -   | -    |  |
| Studs at 600mm and Dwargs at 600mm   | 1.9                           | 2.0 | 2.1 | -   | -    |  |
| Studs at 400mm and Dwargs at 800mm   | 1.9                           | 2.0 | 2.0 | -   | -    |  |
| Studs at 400mm and Dwargs at 600mm   | 1.8                           | 1.9 | 2.0 | -   | -    |  |
| Framing Timber Size (140mm)  | Total Construction R-Value    |     |     |     |      |  |
| Studs at 600mm and Dwargs at 800mm   | 2.1                           | 2.3 | 2.4 | 2.5 | 2.8  |  |
| Studs at 600mm and Dwargs at 600mm   | 2.1                           | 2.2 | 2.4 | 2.5 | 2.7  |  |
| Studs at 400mm and Dwargs at 800mm   | 2.1                           | 2.2 | 2.3 | 2.5 | 2.7  |  |
| Studs at 400mm and Dwargs at 600mm   | 2.1                           | 2.2 | 2.3 | 2.4 | 2.6  |  |



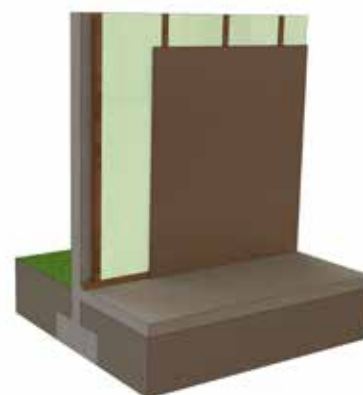
\*GreenStuf® R2.9 Skillion Roof Blanket - 115mm Nominal Thickness

## GreenStuf® Masonry Wall Blanket

GreenStuf® Masonry Wall Blanket is designed for the thermal and acoustic insulation of strapped and lined concrete and masonry walls. Installing GreenStuf® Masonry Wall Blanket within the internal wall construction will assist sound reduction through the wall by reducing the resonating noise inside the construction cavity.

GreenStuf® will not wick moisture through concrete or masonry wall, reducing the potential for mould and moisture damage. GreenStuf® Masonry Wall Blanket comes in a range of performance options and is pre-cut to fit standard timber strapping widths.

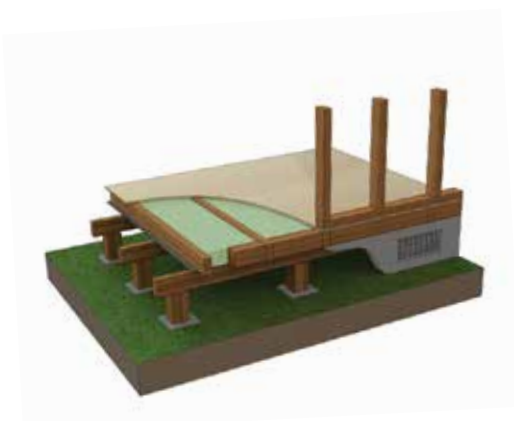
| Wall Construction: Strapped & Lined Concrete/Block.              |                               |     |     |     |     |     |
|--|-------------------------------|-----|-----|-----|-----|-----|
| GreenStuf® Insulation  | GreenStuf® Insulation R-Value |     |     |     |     |     |
| GreenStuf® Masonry Wall Blanket                                  | 0.5                           | 1.0 | 1.3 | 2.0 | 2.2 | 2.5 |
| Block Size & Strapping (45mm Strapping)                          | Total Construction R-Value    |     |     |     |     |     |
| 250 Series with 45mm Strapping at 600mm Centres                  | 0.8                           | 1.2 | 1.3 | -   | -   | -   |
| 200 Series with 45mm Strapping at 600mm Centres                  | 0.8                           | 1.1 | 1.2 | -   | -   | -   |
| 150 Series with 45mm Strapping at 600mm Centres                  | 0.7                           | 1.1 | 1.2 | -   | -   | -   |
| Block Size & Strapping (90mm Strapping)                          | Total Construction R-Value    |     |     |     |     |     |
| 250 Series with 90mm Studs at 600mm Centres and Dwargs at 1200mm | -                             | -   | -   | 1.9 | 2.1 | 2.2 |
| 150 Series with 90mm Studs at 600mm Centres and Dwargs at 1200mm | -                             | -   | -   | 1.9 | 2.0 | 2.1 |



## GreenStuf® Blanket Underfloor

GreenStuf® Blanket Underfloor is designed to provide thermal insulation under exposed joist floors of new and existing timber-framed buildings. GreenStuf® Underfloor reduces heat loss through floors and assists in reducing drafts caused through joints in the floorboards.

There is no tricky cutting or trimming to fit, so no mess and no fuss - simply staple into place between the joists without the need for clips or tape. GreenStuf® Underfloor comes in a range of thermal performance options and as rolls pre-cut to fit standard exposed timber joist floors.



| Floor Construction: Suspended Timber Floors (without lining) & Enclosed Sub-floor with Continuous Perimeter Wall. |                            |     |
|---|----------------------------|-----|
| GreenStuf® Insulation   | GreenStuf® R-Value         |     |
| GreenStuf® Blanket Underfloor   | 1.5                        | 1.8 |
| Framing Timber Size   | Total Construction R-Value |     |
| 290mm Joists at 600mm Centres   | 1.9                        | 2.1 |
| 290mm Joists at 400mm Centres   | 1.9                        | 2.2 |
| 190mm Joists at 600mm Centres   | 1.8                        | 2.1 |
| 190mm Joists at 400mm Centres   | 1.8                        | 2.1 |
| 140mm Joists at 600mm Centres   | 1.8                        | 2.1 |
| 140mm Joists at 400mm Centres   | 1.8                        | 2.1 |

### Simple Steps for Controlling Noise in your Home

- Identify rooms that need extra sound insulation to keep noise out (i.e. bedrooms, and office/study).
- Identify rooms that need extra sound insulation to keep noise in (i.e. home theatre rooms, ensuite and bathrooms, laundry and internal garages).
- Try to separate living areas from sleeping areas. Use hallways to help isolate home theatre rooms from living and sleeping areas.
- Make sure all joints in walls and ceilings are as airtight as possible. Plasterboard joints in walls and ceilings should be sealed with acoustic sealant as the plasterboard is being installed. Make sure power-points are not set back-to-back between rooms, and that recessed downlights are minimised downstairs - sound will easily travel through all these acoustic weak points.

## GreenStuf® Sound Solution Premium Acoustic Insulation

### Mid-floor | Internal Walls

GreenStuf® Sound Solution is designed for the acoustic insulation of timber-framed buildings. It reduces airborne sound, impact noise and noise transmission by controlling resonating noise inside the construction cavity.

Sound Solution is ideal for internal walls and mid-floor cavities and comes as insulation segments and rolls pre-cut to fit standard timber framing. The addition of Sound Solution in a standard timber-framed wall will reduce loud sounds on one side to a slight murmur on the other. Sound Solution is ideal for isolating bedrooms and bathrooms from living spaces. Sound Solution used in a mid-floor cavity will significantly reduce noise between upstairs and downstairs, including booming from foot fall.

**Mid-Floor Construction:** Standard Residential Construction using 140mm Timber Joists with a Metal Ceiling Batten System.

| Material                   | No fill in cavity | Sound Solution in cavity |
|----------------------------|-------------------|--------------------------|
| 10mm Standard Plasterboard | STC 38            | STC 44                   |
| 10mm Acoustic Plasterboard | STC 39            | STC 45                   |
| 13mm Standard Plasterboard | STC 40            | STC 46                   |
| 13mm Acoustic Plasterboard | STC 42            | STC 48                   |



**Internal Wall Construction:** Standard Residential Construction using 90mm Timber Framing.

| Material                   | No fill in cavity | Sound Solution in cavity |
|----------------------------|-------------------|--------------------------|
| 10mm Standard Plasterboard | STC 33            | STC 39                   |
| 10mm Acoustic Plasterboard | STC 37            | STC 44                   |
| 13mm Standard Plasterboard | STC 35            | STC 41                   |
| 13mm Acoustic Plasterboard | STC 38            | STC 45                   |



Acoustic privacy can be further increased by adding multiple layers of plasterboard or disconnecting the construction elements.

For more information or design assistance please contact your local Autex Representative on 0800 428 839.



## Acoustic Performance

The Sound Transmission Class (STC) rating of a wall or floor construction relates to the noise level reduction of sound from one side to the other. STC ratings are the industry recognised means of assessing acoustic performance of a construction system. The higher the STC number, the better the acoustic performance.

## STC Performance

| STC | What can be heard   |
|-----|---|
| 25  | Normal speech can be understood quite easily and distinctly                       |
| 30  | Loud speech can be understood fairly well, normal speech heard but not understood |
| 35  | Loud speech audible but not intelligible  |
| 40  | Onset of "privacy"  |
| 42  | Loud speech audible as a murmur   |
| 45  | Loud speech not audible   |
| 55  | Very loud sounds such as musical instruments or a stereo can be faintly heard     |
| 60+ | Superior soundproofing; most sounds inaudible                                     |









**GreenStuf**<sup>®</sup>  
Polyester Insulation

No itching, no scratching,  
just warmth you can really feel.

# Zero Energy House: Building for the future



*Jo Woods & Shay Brazier  
Owners, Engineers  
& GreenStuf® Installers.*

The Zero Energy House in Point Chevalier, Auckland is complete. Owners Jo Woods and Shay Brazier are enjoying the benefits of their unique and inspiring home that produces as much energy as they will consume. Energy is generated via solar panels and traded with an electricity retailer. The amount of electricity bought and sold each year balance out to achieve Zero Energy.

*The Zero Energy House building envelope (which includes framing, insulation and glazing) eliminates the need for heating or cooling.*

One of the main reasons behind their choice to build the Zero Energy House was the long-term cost of electricity, which is estimated to be between \$50,000 and \$80,000 over a 25-year mortgage term.

Creating a Zero Energy home is more cost effective than the accumulation of power bills and it means that they won't have to worry about fluctuating power prices in the future.

Achieving Zero Energy is made even easier by reducing energy demand. The average Auckland house consumes 35% of its energy in heating. Jo and Shay's house has been designed and built to eliminate the need for heating or cooling, which means they can generate about 35% less energy.

As well as designing for Zero Energy, Jo and Shay paid close attention to the products and materials used within their home. They selected products that are healthy to live with and are manufactured, used and disposed of with minimal environmental impact.

One of the most important materials for heat regulation and energy efficiency is insulation.



**A STUDIO**  
ARCHITECTS

Jo and Shay chose GreenStuf® insulation because:

- It's made from 100% polyester fibre, bonded using heat instead of traditional chemical binders. This makes it non-toxic, non-irritating, and non-allergenic, which is better both during installation and after they move in.
- It is extremely durable and comes with a 50 year product durability warranty.
- It is endorsed by Asthma New Zealand.
- It is made from a minimum of 45% recycled plastic bottles and is fully recyclable, meaning no waste.
- Because it's polyester, it doesn't need treatment during manufacturing to keep moisture out.
- There are no issues with wiring around it, compared with polystyrene insulation.

Maximising thermal and acoustic performance was a big part of their decision to use GreenStuf®, and because it's safe and easy to use, they could install it themselves with the help of friends and family. They used a clever double insulation layer of GreenStuf® R2.0 Wall Pads and R1.0 Masonry Wall Blanket in the walls. GreenStuf® R3.2 and R2.5 Thermal Roll Form was used in the ceiling as well as acoustic Sound Solution throughout.

*The insulation levels in the Zero Energy House will mean target temperatures are maintained primarily by energy from the sun, but also from day to day living (heat from occupants, and electrical loads such as lighting and cooking).*

## Zero Energy House

For more info visit: [www.zeroenergyhouse.co.nz](http://www.zeroenergyhouse.co.nz)

The Zero Energy House was designed by A Studio Architects - [www.astudio.net.nz](http://www.astudio.net.nz)

*We can help with the thermal design of your new home. Contact your local Autex Representative on 0800 428 839.*

## Timber Framing Design allows for Double Insulation layer

The wall framing in the Zero Energy House is a little different. The nogs between the studs have been removed and replaced with supporting battens that run along the inside of the wall.

Taking out the nogs allows insulation to be run uninterrupted the full height between the studs. With standard framing, panels of insulation would be placed between each nog. Timber is a 'thermal bridge' that allows heat to travel outwards from the house; removing the nogs reduces this thermal bridging, increasing the insulation properties of the walls.

This framing design also allows a second layer of insulation to be installed between the supporting battens. This not only provides a thicker overall insulation layer, it also lays insulation over the studs - which reduces the thermal bridging effect even more.

*“Insulation is critical to building performance and the health of homeowners. However, it's important to understand that the insulation required in the building code is a minimum specification; you can install much more than that.”*

At the Zero Energy House, the reduction in thermal bridging and use of double insulation layers have enabled Jo and Shay to achieve a 50% increase in insulation levels above minimum building code requirements. When they considered the cost of heating their home for 25 years, Jo and Shay felt a little more insulation was well worth it.



# Case Studies

## Awai Road home by Tony Biesiek

After numerous unsuccessful attempts with mainstream housing companies, the Stewart-Darlings turned to Imagine Building Design to make their dream four bedroom rural family home a reality. Cost effective, high performance products were a must and GreenStuf® was top of the list when it came to selecting the right insulation for this project.

Key design considerations were a courtyard style approach, view of Mt Egmont to the south and the expansive rural views to the north-east. Special attention was given to site position to balance the axial view towards the mountain whilst maintaining orientation to maximise solar gain during the cooler seasons. Thermal mass from the super insulated and beautiful polished concrete slab has been a core design and aesthetic feature. High performing GreenStuf® was essential when it came to retaining thermal energy within the building envelope.

Creating a quiet environment was also an important consideration, which meant choosing the right acoustic insulation. GreenStuf® Sound Solution was used in the purpose built media room which has acoustic walls, door and ceilings to ensure the isolation of sound into and out of the room.

Satisfied that GreenStuf® would ensure a warm and quiet home, the project was completed under budget and on time with the building performance exceeding client expectation.



*For the best thermal and acoustic design advice for your new home or renovation, contact your local Autex Representative on 0800 428 839.*





## Whareroa Getaway by Richard Furze Design

Nestled lakeside in the beautiful Whareroa Village on the western shores of Lake Taupo sits this stunning family holiday home. The clients have owned the land for some years and it's been the site of many family camping trips.

The challenge for Richard Furze (Richard Furze Design) was to design a family holiday home that would allow his clients the best use of the location in both summer and the vastly different climate of winter. While the sun brings in heat during the warmer months, winter temperatures plummet to below freezing, making it critical to design for efficient heating and cooling of the open-plan areas throughout the year.

The concrete floor and large north facing windows in the living areas help to heat the house during the day, while the double glazing and high-performance GreenStuf® insulation ensures that the house retains as much heat as possible on those gloomy winter days and nights. Conversely, in summer the double glazing and GreenStuf® insulation help reduce heat gain, so the owners can enjoy the extremes of four seasons outside from one comfortable, temperate environment inside.

Specifying the right insulation is critical in environments such as the one this holiday home endures. Equally important is the correct installation of insulation. Gaps and poor installation techniques can significantly affect the thermal performance of a home.

Autex worked closely with Richard Furze and the builder to ensure seamless supply and install of the GreenStuf® insulation to best practice standards. The overall result is an inviting family holiday home, designed and built to enjoy the bitter winters and the long, hot summers in total comfort.



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# Frequently Asked Questions

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## What is polyester?

Polyester is a synthetic fibre, made from polyethylene terephthalate (PET), the same material used to make plastic drink bottles. GreenStuf® contains a minimum of 45% recycled polyester fibre from previously used PET drink bottles, keeping them out of landfills. Our acoustic products can contain up to 85% recycled polyester fibre.

## Are there any chemicals used in the manufacture of GreenStuf®?

No, we use heat to bind the fibres that form the structure of GreenStuf®. Some manufacturers of fibreglass insulation still use formaldehyde based binders. Formaldehyde is a known and classified human carcinogen.

## What does 'R-Value' mean?

The R-Value of insulation is the industry standard measurement of thermal resistance. The higher the R-Value the greater the performance, meaning your home stays cooler in summer and warmer in winter.

## Why is GreenStuf® more expensive than fibreglass?

Put simply - you get what you pay for. The raw material, chemicals and processes used to manufacture fibreglass are reflected in the price. However that cheaper material comes at a big cost to performance, health and the environment.

The raw materials and manufacturing process used to produce GreenStuf® considers much more than just price. GreenStuf® is about quality and value. GreenStuf® will not deteriorate or break down over time and is backed by a 50 Year Product Durability Warranty. GreenStuf® is also completely safe for you, your family and our environment.

## Can I install insulation myself?

Yes, installing GreenStuf® is easy. Installation instructions are included with all of our products. Easy to follow ceiling and underfloor installation videos are also available online.

## Is there an installation service for Autex Insulation?

Yes, we can arrange installation through a local supplier. Please call us on 0800 428 839.

## Why should I choose to use GreenStuf®?

Quite simply because we are the best choice. GreenStuf® is safe for you and our environment. GreenStuf® does not contain chemical additives and will never pose a future health risk to you or our planet.

All Autex Insulation products contain already recycled fibre, and remain fully recyclable.

GreenStuf® is non-irritant, non-toxic and non-allergenic and the fibres are not of a respirable size (i.e. cannot be breathed into your lungs) so they are safe for people living with asthma.

GreenStuf® will never break down or reduce its performance over time. We think that if you're insulating, do it once and do it right.

GreenStuf® is manufactured in New Zealand by Autex, a 100% New Zealand owned and operated family company.

# Residential Insulation Product List

0800 428 839

[www.greenstuf.co.nz](http://www.greenstuf.co.nz)



| PRODUCT R-VALUE     | NEW ZEALAND GREENBUILDING | BRANZ Approved<br>Approved to AS/NZS 5039:2009 | DIMENSIONS (mm) |          | NOMINAL THICKNESS (mm) | COVERAGE PER PACK   | ROLLS/PADS PER PACK |
|---------------------|---------------------------|--|-----------------|----------|------------------------|---------------------|---------------------|
|                     |                           |  | WIDTH           | LENGTH   |                        |                     |                     |
| R2.0 HANDY PACK     |                           | ✓  | 560mm           | 760mm    | 90mm                   | 3.40m <sup>2</sup>  | 8                   |
| R2.0 WALL PADS      |                           | ✓  | 360mm           | 1,160mm  | 90mm                   | 8.35m <sup>2</sup>  | 20                  |
|                     |                           |  | 560mm           | 1,160mm  |                        |                     |                     |
| R2.2 WALL PADS      |                           | ✓  | 360mm           | 1,160mm  | 90mm                   | 7.52m <sup>2</sup>  | 18                  |
|                     |                           |  | 560mm           | 1,160mm  |                        |                     |                     |
| R2.5 WALL PADS      |                           | ✓  | 360mm           | 1,160mm  | 90mm                   | 5.01m <sup>2</sup>  | 12                  |
| R2.4 WALL ROLL FORM | ✓                         | ✓  | 560mm           | 1,160mm  | 90mm                   | 6.50m <sup>2</sup>  | 10                  |
| R2.6 WALL ROLL FORM | ✓                         | ✓  | 870mm           | 11,500mm | 140mm                  | 20.00m <sup>2</sup> | 2                   |
| R2.9 SRB            |                           | ✓  | 870mm           | 9,770mm  | 140mm                  | 17.00m <sup>2</sup> | 2                   |
|                     |                           |  | 870mm           | 2,400mm  |                        |                     |                     |
|                     |                           |  | 870mm           | 2,400mm  | 115mm                  | 8.35m <sup>2</sup>  | 4                   |

## GreenStuf. Underfloor Insulation

| PRODUCT R-VALUE | NEW ZEALAND GREENBUILDING | BRANZ Approved<br>Approved to AS/NZS 5039:2009 | DIMENSIONS (mm) |          | NOMINAL THICKNESS (mm) | COVERAGE PER PACK   | ROLLS/PADS PER PACK |
|-----------------|---------------------------|--|-----------------|----------|------------------------|---------------------|---------------------|
|                 |                           |  | WIDTH           | LENGTH   |                        |                     |                     |
| R1.5 UNDERFLOOR |                           | ✓  | 450mm           | 8,900mm  | 100mm                  | 20.00m <sup>2</sup> | 5                   |
|                 |                           |  | 500mm           | 10,000mm |                        |                     |                     |
|                 |                           |  | 600mm           | 8,340mm  |                        |                     |                     |
| R1.8 UNDERFLOOR |                           | ✓  | 450mm           | 7,780mm  | 100mm                  | 17.50m <sup>2</sup> | 4                   |
|                 |                           |  | 500mm           | 8,750mm  |                        |                     |                     |
|                 |                           |  | 600mm           | 7,290mm  |                        |                     |                     |

## GreenStuf. Skillion Roof Blanket

| PRODUCT R-VALUE | NEW ZEALAND GREENBUILDING | BRANZ Approved<br>Approved to AS/NZS 5039:2009 | DIMENSIONS (mm) |         | NOMINAL THICKNESS (mm) | COVERAGE PER PACK  | ROLLS/PADS PER PACK |
|-----------------|---------------------------|--|-----------------|---------|------------------------|--------------------|---------------------|
|                 |                           |  | WIDTH           | LENGTH  |                        |                    |                     |
| R2.9 SRB        |                           | ✓  | 870mm           | 2,400mm | 115mm                  | 8.35m <sup>2</sup> | 4                   |
| R3.2 SRB        |                           | ✓  | 870mm           | 2,400mm | 165mm                  | 8.35m <sup>2</sup> | 4                   |
| R3.4 SRB        |                           | ✓  | 870mm           | 2,400mm | 165mm                  | 8.35m <sup>2</sup> | 4                   |
| R3.6 SRB        |                           |  | 870mm           | 2,400mm | 165mm                  | 8.35m <sup>2</sup> | 4                   |

## GreenStuf. Masonry Wall Blanket

| PRODUCT R-VALUE | NEW ZEALAND GREENBUILDING | BRANZ Approved<br>Approved to AS/NZS 5039:2009 | DIMENSIONS (mm) |          | NOMINAL THICKNESS (mm) | COVERAGE PER PACK   | ROLLS/PADS PER PACK |
|-----------------|---------------------------|--|-----------------|----------|------------------------|---------------------|---------------------|
|                 |                           |  | WIDTH           | LENGTH   |                        |                     |                     |
| R0.5 MWB        |                           | ✓  | 590mm           | 25,420mm | 20mm                   | 30.00m <sup>2</sup> | 2                   |
| R1.0 MWB        |                           | ✓  | 580mm           | 12,930mm | 45mm                   | 30.00m <sup>2</sup> | 4                   |
| R1.3 MWB        |                           | ✓  | 580mm           | 2,400mm  | 45mm                   | 8.35m <sup>2</sup>  | 6                   |

## GreenStuf. Sound Solution® (Acoustic Insulation)

| PRODUCT R-VALUE   | NEW ZEALAND GREENBUILDING | BRANZ Approved<br>Approved to AS/NZS 5039:2009 | DIMENSIONS (mm) |          | NOMINAL THICKNESS (mm) | COVERAGE PER PACK   | ROLLS/PADS PER PACK |
|-------------------|---------------------------|--|-----------------|----------|------------------------|---------------------|---------------------|
|                   |                           |  | WIDTH           | LENGTH   |                        |                     |                     |
| R1.8 SS PADS      |                           |  | 580mm           | 1,160mm  | 90mm                   | 11.40m <sup>2</sup> | 17                  |
| R1.8 SS ROLL FORM |                           |  | 430mm           | 11,630mm | 90mm                   | 25.00m <sup>2</sup> | 5                   |
|                   |                           |  | 580mm           | 10,780mm |                        |                     |                     |

## GreenStuf. Ceiling Insulation

| PRODUCT R-VALUE        | NEW ZEALAND GREENBUILDING | BRANZ Approved<br>Approved to AS/NZS 5039:2009 | DIMENSIONS (mm) |          | NOMINAL THICKNESS (mm) | COVERAGE PER PACK   | ROLLS/PADS PER PACK |
|------------------------|---------------------------|--|-----------------|----------|------------------------|---------------------|---------------------|
|                        |                           |  | WIDTH           | LENGTH   |                        |                     |                     |
| R2.9 CEILING PADS      |                           | ✓  | 430mm           | 1,220mm  | 175mm                  | 6.82m <sup>2</sup>  | 13                  |
| R3.2 CEILING PADS      |                           | ✓  | 430mm           | 1,220mm  | 180mm                  | 6.82m <sup>2</sup>  | 13                  |
| R3.4 CEILING PADS      | ✓                         | ✓  | 430mm           | 1,220mm  | 190mm                  | 5.25m <sup>2</sup>  | 10                  |
| R1.5 CEILING ROLL FORM |                           | ✓  | 870mm           | 14,400mm | 100mm                  | 25.00m <sup>2</sup> | 2                   |
|                        |                           |  | 580mm           | 10,780mm |                        |                     |                     |
| R1.8 CEILING ROLL FORM |                           | ✓  | 870mm           | 14,370mm | 100mm                  | 25.00m <sup>2</sup> | 2                   |
|                        |                           |  | 580mm           | 8,620mm  |                        |                     |                     |
| R2.2 CEILING ROLL FORM |                           | ✓  | 870mm           | 11,500mm | 150mm                  | 20.00m <sup>2</sup> | 2                   |
|                        |                           |  | 870mm           | 11,500mm |                        |                     |                     |
| R2.4 CEILING ROLL FORM |                           | ✓  | 870mm           | 11,500mm | 140mm                  | 20.00m <sup>2</sup> | 2                   |
|                        |                           |  | 580mm           | 8,620mm  |                        |                     |                     |
| R2.6 CEILING ROLL FORM |                           | ✓  | 870mm           | 9,770mm  | 140mm                  | 17.00m <sup>2</sup> | 2                   |
|                        |                           |  | 580mm           | 7,300mm  |                        |                     |                     |
| R2.9 CEILING ROLL FORM |                           | ✓  | 870mm           | 9,770mm  | 185mm                  | 17.00m <sup>2</sup> | 2                   |
|                        |                           |  | 580mm           | 7,300mm  |                        |                     |                     |
| R3.2 CEILING ROLL FORM |                           | ✓  | 870mm           | 9,770mm  | 190mm                  | 17.00m <sup>2</sup> | 2                   |
|                        |                           |  | 580mm           | 7,300mm  |                        |                     |                     |
| R3.4 CEILING ROLL FORM |                           | ✓  | 870mm           | 7,300mm  | 200mm                  | 17.00m <sup>2</sup> | 2                   |
|                        |                           |  | 870mm           | 7,470mm  |                        |                     |                     |
| R3.6 CEILING ROLL FORM |                           | ✓  | 870mm           | 8,050mm  | 210mm                  | 14.00m <sup>2</sup> | 2                   |

## GreenStuf. Eco Wrap

| PRODUCT R-VALUE | NEW ZEALAND GREENBUILDING | BRANZ Approved<br>Approved to AS/NZS 5039:2009 | DIMENSIONS (mm) |         | NOMINAL THICKNESS (mm) | COVERAGE PER PACK  | ROLLS/PADS PER PACK |
|-----------------|---------------------------|--|-----------------|---------|------------------------|--------------------|---------------------|
|                 |                           |  | WIDTH           | LENGTH  |                        |                    |                     |
| R1.2 ECO WRAP   |                           |  | 1,200mm         | 3,000mm | 50mm                   | 3.60m <sup>2</sup> | 1                   |



**AUTEX**



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