

MammothTM
MODERN INSULATION

AIRLAY INSULATION

Insitu Wall System Performance



THE IMPORTANCE OF INSITU PERFORMANCE

The New Zealand Building Code energy efficiency requirements are based on the system performance of building components rather than individual elements, such as insulation.

Laboratory tested R-value for insulation products is used in the BRANZ House Insulation Guide to determine the total R-value of the building element, such as wall, ceiling or floor. BRANZ House Insulation Guide states the following:

For any house construction, individual materials or components are combined to create a built system. However, the R-value of the built system (referred to as the construction R-value) is not the R-value of the single specific insulation material as is often commonly thought.

Instead, the construction R-value is a combination of the R-values of the individual components, including the effects of thermal bridging of the framing.

The laboratory tested R-value of wall insulation is not necessarily an accurate reflection on its 'real life' installed performance.

Any insulation should be designed for its intended purpose of application. That is particularly relevant to wall insulation that needs to have physical properties that enable it to be installed well.

In order to realise its true performance, wall insulation MUST:

- 1 Maintain its nominal thickness when installed** – folds and creases reduce R-value proportionate to the rate of compression
- 2 Be self-supporting without the use of mechanical fixings.** Wall insulation should not sag or slump over time therefore resulting in a significant reduction in its performance.
- 3 Be friction fitted** between dwangs and studs without any gaps in between. *“Gaps around the edge of wall insulation can reduce its effective R value by approximately 3% for every 1mm gap¹.”*

These three factors have proved to be a real challenge for traditional insulation materials.

¹ BRANZ House Insulation Guide



TEST METHODOLOGY AND RESULTS

Performance Assurance - Independently tested wall systems, featuring Mammoth™ Airlay insulation, outperformed construction (system) R-values in the BRANZ House Insulation Guide.

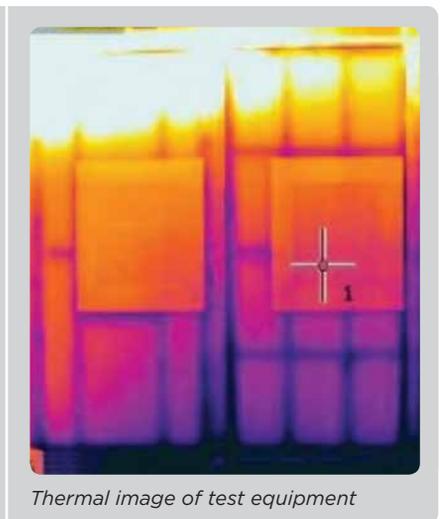
The independent testing of Mammoth Airlay insulation was conducted over the winter period: June - July 2014. Measurements were made using heat flux transducers and associated software developed and calibrated by New Zealand's leading building research laboratory.

Test walls were 1.2m wide by 2.4m high with 90mm deep timber framing. The walls were installed in a research building and had three different types of cavity cladding:

- Timber weatherboard
- 12mm plywood sheet
- Brick veneer



Test equipment



Thermal image of test equipment

System Performance Results

PEACE OF MIND - WHEN PERFORMING HI CALCULATIONS, SPECIFY MAMMOTH AIRLAY WALL INSULATION WITH CONFIDENCE, KNOWING THAT THE WALL CONSTRUCTION R-VALUE WILL OUTPERFORM THE CALCULATED AVERAGES FOR EQUIVALENT SYSTEMS.

System R-values: 90mm Timber Framed - cavity, 14.5% ratio of frame to total area

Insulation R-value	Mammoth™ Airlay		BRANZ House Insulation Guide				
	R1.9	R2.0	R1.8	R2.0	R2.2	R2.4	R2.6
Construction R-value							
Brick Veneer Cladding	2.25	2.25	1.7	1.9	2.0	2.1	2.2
Weatherboard Cladding	2.15	2.20	1.9	2.0	2.1	2.2	2.3
Plywood Cladding	1.95	2.05	1.7	1.8	1.9	2.0	2.1

System R-values: 140mm Timber Framed - cavity, 14.5% ratio of frame to total area

Insulation R-value	Mammoth™ Airlay	BRANZ House Insulation Guide			
	R2.8	R2.6	R2.9	R3.2	R3.5
Construction R-value					
Brick Veneer Cladding	3.05	2.4	2.6	2.8	3.0
Weatherboard Cladding	2.85	2.6	2.8	2.9	3.1
Plywood Cladding	2.75	2.4	2.6	2.7	2.9

WHY WE TESTED OUR AIRLAY INSULATION

Mammoth™ Airlay insulation has unique properties which support superior installation and construction R-values.

It is easy to install as it is friction fitted between studs, joists and dwangs (nogs) creating a seamless, smooth fit without tucks, creases or gaps. This seamless fit is the ultimate way to insulate - it supports higher thermal performance across the system by retaining its nominal thickness. Friction fitted, Airlay insulation is made using a unique manufacturing process whereby the fibres are completely randomised rather than layered.

This provides for differing structural properties of the product, enabling it to support itself within a cavity by simply squeezing it in place. It is suitable for floors, walls and confined ceiling spaces:

- FLOOR :** There is no need for staples, removing the danger of electrocution
- WALL :** Friction fitted between studs and dwangs (nogs), without creases, gaps or tucks
- ROOF :** Designed for skillion (cathedral/Chapel) or low slope ceilings - where the roof and ceiling run in close parallel



Mammoth™ Airlay insulation vs Carded insulation



Airlay insulation - randomised fibres



Carded insulation - traditional layering

InsulPro Manufacturing has the only Airlay insulation manufacturing plant in Australasia which produces medium and high density thermal and acoustic insulation products. It is increasingly understood that friction fit polyester insulation products lend themselves to superior thermal performance, although this term is also used broadly across a wide range of product types.

The nature of insulation produced on the Airlay plant is different to traditional polyester or fibreglass insulation and so was believed to perform exceptionally well in wall and underfloor systems. To prove and document the performance of Mammoth™ Airlay insulation, New Zealand's leading building research laboratory was commissioned to undertake comprehensive independent insitu testing.

This document outlines the test methodology and results and will serve as supporting documentation for your specification of the tested Mammoth™ Airlay insulation products.

FROM WASTE TO WARMTH

Mammoth™ take fibre made from plastic bottles, which would otherwise be waste, and manufacture the fibre from the bottles into polyester insulation that creates warmer, healthier homes and buildings.



ENVIRONMENTAL CREDENTIALS

ENVIRONMENTAL CHOICE

FRICITION FIT AIRLAY PRODUCTS



Licence number 2510069
Thermal (resistive-type)
Building Insulants

R1.4 NOVAfloor

Mammoth™

- R2.6 Wall (2 layers of R1.3)
- R2.8 Wall (2 layers of R1.4)
- R1.8 Underfloor Multi Pad
- R1.9 Underfloor Multi Pad

Declare.

All Mammoth™ polyester insulation products have achieved the highest certification status under the Living Building Challenge's™ Declare programme and are the world's first polyester insulation products **Red List Free**.



WHAT IS RED LIST FREE?

The Living Building Challenge™ developed a Red-List of prohibited materials under the Declare programme, to provide transparency around building products. Declare is a 'nutrition label' for the international building industry and is a voluntary self-disclosure programme aiming for healthier and more ecological products in construction. Red List Free products are shown to be free from Declare's red list ingredients.

GREEN BUILDING COUNCIL

HOMESTAR & GREENSTAR



Homestar and Greenstar is New Zealand's environmental and energy efficiency rating for both new and existing homes. It's a voluntary rating system developed by BRANZ and the New Zealand Green Building Council (NZGBC).

The Homestar rating scale goes from 1 (very poor) through to 10 (world class). Points are awarded in nine credit categories, with the most important category being Energy, Health and Comfort. High levels of insulation (i.e. above the minimum Building Code requirements) using products such as Mammoth™, will help homes achieve higher Homestar ratings.

All Mammoth™ products with Environmental Choice certification contribute to **Homestar and Greenstar accreditation**, as shown below:

HOMESTAR CREDIT	Max Points Available	Mammoth™ Insulation
EHC-6 Whole House Thermal Performance	12 points	Contribution to improved R-Values leading to a reduced required heating load in the cooler months.
EHC-7 Moisture Control	1.6 points	Contribution to improved R-Values leading to a reduction in condensation.
EHC-9 Sound Insulation	2 points	Contribution to improved sound insulation in ceilings and internal walls - when used as part of a whole wall system for sound insulation.
MAT-1 Materials Selection	9 points	Mammoth™ products that have attained ECNZ Certification (listed) all contribute to this credit.

GREEN STAR CREDIT	Max Points Available	Mammoth™ Insulation
MAT-5	1 point	This credit rewards the use of independently verified Environmentally preferable thermal insulation Products. All InsulPro products with ECNZ certification satisfy this credit. All Mammoth™ products are manufactured in the same manner as the ECNZ certified options. In accordance with the TC and CIR ruling published on the NZGBC website, the lower R-value versions of Mammoth™ thermal insulation may also contribute towards points.
EMI-3	1 point	This credit rewards the use of Insulation products that contain no Ozone Depleting Substances in their content or manufacture. InsulPro insulation satisfy these criteria.
IEQ-13	2 points	To encourage and recognise buildings that maintain internal noise levels at an appropriate level. Building Services Design: One point is awarded where noise from the building services does not exceed the level stipulated in the Green Star Technical Manual Overall Building including Building Services: One point is awarded where the noise level does not exceed level stipulated in the Green Star Technical Manual
ENE-1 & ENE-2	20 points	To encourage and recognise buildings that contain design features that help to minimise energy consumption and greenhouse gas emissions of the base building.



ABOUT MAMMOTH™

Mammoth™ modern insulation is a new generation of polyester insulation which helps create warmer, drier, healthier buildings.

SOFT & NON-ITCH - It won't irritate your skin when you touch it - in fact it is made from the same material that you find in many pillows and duvets.

EASY TO INSTALL - There is no need to cover up in overalls, masks and goggles to handle Mammoth™ insulation - unless you're avoiding dirt & spiders. It also comes in blanket or sections for ease of install.

NON-TOXIC - Our polyester fibres are free from insecticides and glues. Instead Mammoth™ polyester fibres are heat-bonded together, removing the requirement for chemical binders.

FRICTION FITTED - Our unique Mammoth™ Airlay insulation has a natural spring-back aspect which means it can be installed under-floor without the need for staples or strapping and in walls without gaps, tucks or creases.

RECYCLABLE - Mammoth™ insulation is manufactured in a near zero waste production process and is fully recyclable.

INSTALLER NETWORK - Mammoth™ insulation has a nationwide network of qualified Installers if you want a professional to install it in your building.

RECYCLED PLASTIC BOTTLES - Mammoth™ insulation is manufactured using fibres from recycled plastic bottles, so you can feel good about doing your bit to protect the environment and keep waste out of landfill.

MOISTURE RESISTANT - Should Mammoth™ polyester insulation get wet, once the water source ceases, it will dry and thermal performance will not be compromised.

THERMAL PERFORMANCE MAXIMISED - due to the manufacturing and design process, the installed product supports higher insitu thermal performance across a system.

ENERGY EFFICIENCY - Mammoth™ polyester insulation helps create a more energy efficient building; costing less to heat and cool.



HEALTHIER BUILDING - Choosing Mammoth™ polyester insulation helps reduce respiratory conditions as warmer homes are healthier homes.

A QUIETER SPACE - Superior insulation will also help to reduce noise to create a quieter indoor environment.

MADE TO LAST - If installed correctly and adequately protected Mammoth™ Insulation will perform for at least 50 years* giving you confidence of your home's on-going energy efficiency & health.

MADE IN NEW ZEALAND - Mammoth™ insulation is manufactured in our two New Zealand plants, one in East Tamaki Auckland and the other in Milton.

* Terms and conditions apply

PRODUCT RANGE



CEILING

WALL

UNDERFLOOR

	BRANZ Appraised Appraisal No.797 (2012) Appraisal No.802 (2014)	ENVIRONMENTAL BUILDING INSULATION	PRODUCT R-VALUE	PACK SIZES			
				NOMINAL THICKNESS (mm)	DIMENSIONS (mm)	PIECES PER PACK	TOTAL AREA (m ²)
CEILING BLANKET	✓		R1.8	115	870x11495	1	10.00
	✓		R2.9	185	870x8620	1	7.50
	✓		R3.2	200	870x8620	1	7.50
	✓	✓	R3.6	225	870x7470	1	6.50
	✓	✓	R4.0	240	870x5750	1	5.00
SKILLION ROOF SECTIONS Friction fit airlay insulation	✓		R2.9	115	560X1200	3	2.02
	✓			115	860X1200	5	5.16
	✓		R3.2	165	570X1200	5	3.42
	✓			165	870X1200	4	4.18
WALL SECTIONS Friction fit airlay insulation (does not apply to R2.5)	✓		R2.0	90	360x760	9	2.46
	✓			90	560x760	6	2.55
	✓		R2.2	90	360x760	9	2.46
	✓			90	560x760	6	2.55
	✓	✓	R2.5	90	360x760	9	2.46
	✓	✓		90	560x760	6	2.55
	✓		R2.8	140	360x760	18	4.92
	✓			140	560x760	12	5.10
WALL BLANKET	✓		R2.2	90	360x9870	2	7.11
	✓			90	560x10800	1	6.05
	✓	✓	R2.6	140	380x8550	4	13.00
	✓	✓		140	580x7470	3	13.00
MASONRY WALL BLANKET MASONRY WALL SECTIONS Friction fit airlay insulation			R1.0	45	580x12930	2	15.00
			R1.3	45	360x2400	9	7.78
				45	560x2400	6	8.06
MAMMOTH™ MULTI SECTIONS Also suitable for ceilings & walls Friction fit airlay insulation	✓	✓	R1.9	90	370x800	8	2.37
	✓	✓		90	370x1140	16	6.75
	✓	✓		90	425x800	8	2.72
	✓	✓		90	425x1140	16	7.75
	✓	✓		90	475x800	7	2.66
	✓	✓		90	475x1140	14	7.58
	✓	✓		90	580x800	6	2.78
	✓	✓		90	580x1140	12	7.93
MAMMOTH™ UNDERFLOOR BLANKET		✓	R1.5	100	450x11111	4	20.00
		✓		100	510x13070	3	20.00
		✓		100	600x11110	3	20.00
		✓	R1.8	115	450x11111	4	20.00
		✓		115	510x13070	3	20.00
		✓		115	600x11110	3	20.00
MAMMOTH™ ACOUSTIC BLANKET			900 (gms/m ²)	90	580x11495	2	13.33
MAMMOTH™ ACOUSTIC SECTION Friction fit airlay insulation			1000 (gms/m ²)	80	560x760	7	2.98

For the latest product specifications and installation guidelines, please refer to mammoth.co.nz
Product information current at time of printing.

Mammoth™ 100% polyester insulation products are proudly manufactured in New Zealand by InsulPro Manufacturing Ltd.
Products with data in red are manufactured on New Zealand's only Airly Insulation plant.



InsulPro





Mammoth™ Airbay Insulation - May 2016



Licence number 2510069
Thermal (resistive-type)
Building Insulants
Applies to certain Mammoth products

Declare.



Product information
current at time of print.



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