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NZBC H1 - Calculation Method

Client	Bhitani & Puri - Back
Address	24 Westmoor Blvd
	Rolleston

REFERENCE BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	113.71	3.30	34.46	
Roof Type 2	Trimed Insulation area	7.56	3.30	2.29	
Wall Type 1	70% Total Wall Area	83.26	2.00	41.63	
Wall Type 2		0.00	2.00	0.00	
Wall Type 3		0.00	2.00	0.00	
Floor	Concrete slab on ground	121.27	1.30	93.28	
Glazing (30%)	Double Glazed Windows	35.68	0.37	96.44	
Glazing (>30%)	Double Glazed Windows	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.37	0.00	
				268.11	TOTAL LOSS

Note: Total area of glazing (including Skylights) must be 50% or less than the total wall area

PROPOSED BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	113.71	3.37	33.74	
Roof Type 2	Trimed Insulation area	7.56	2.07	3.65	
Wall Type 1	Brick Cladding	67.77	2.21	30.67	
Wall Type 2	Linea Cladding	0.64	2.16	0.30	
Wall Type 3	Intertenancy Wall	15.41	2.02	7.63	
Wall Type 4	Insulated Garage Door	5.16	1.34	3.85	
Wall Type 5	Front Door	2.02	0.18	11.22	
Floor	Concrete slab on ground	121.27	1.46	83.06	
Glazing (30%)	Double Glazed Windows	27.94	0.30	93.13	
Glazing (>30%)	Double Glazed Windows	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.37	0.00	
				267.25	TOTAL LOSS

Trimmed Insulation Area: (90mm Rafter & R3.6 batts 180mm)

Roof Pitch	Cut Height	Cut Width	% of batt cut	New R Value
15	80	372	44.44%	1.6
20	87	255	48.33%	1.74
25	95	182	52.78%	1.9
30	105	130	58.33%	2.1

H1 Solution

305mm Slab using RibRaft® 220mm Brick veneer no foundation insulation

The minimum R-value for this zone is 1.6

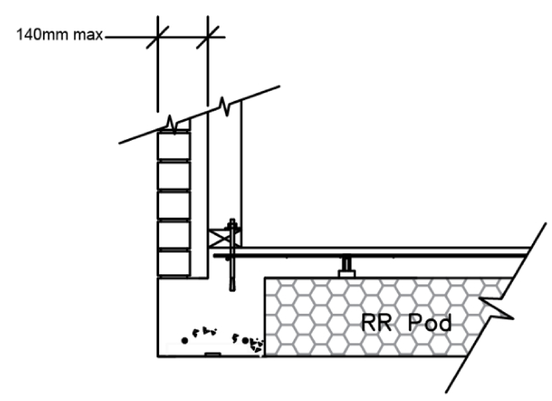
With a calculated A/P ratio of 2.4

The R-value for your selected solution is:

1.46

Exterior Area	121.27m²
Exterior Perimeter	48.45m
Embedded floor heating	No
Wall Width	90mm

For a full set of CAD drawings for RibRaft solutions, please refer to the Firth Resources web page
https://www.firth.co.nz/resources/drawings/
Check the RibRaft Foundations filter to show only relevant files.



8 220mm FIRTH RIBRAFT POLYPOD
BRICK VENEER
FIRTH RAFTMIX 20 OR 25MPa

Firth's H1 Online Solution Calculator uses the specification data entered by the user and applies the methodology, as described in the Building Code amendment H1 Energy Efficiency Acceptable Solution H1/AS1 - 5th Edition for all housing, and buildings (up to 300m²), to recommend concrete slab foundation insulation solutions using CodeMark certified Firth products and systems (only).

The recommended solution in this pdf document, can be used as part of a Building Consent application however, Firth accepts no liability for Building Code compliance or thermal performance of the house or building. Firth also accepts no liability through misrepresentation or improper use of the Firth H1 Online Solution Calculator to obtain or prove Building Code compliance.

Firth has worked to ensure the accuracy of the solution provided by its H1 Online Solution Calculator. Firth cannot guarantee the accuracy of the recommend solution under any other methodology than that described in H1/AS1 5th Edition.

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal planes" method, the same method as used in NZS4214:2006.

I have recently implemented some changes to the way assemblies with multiple adjacent insulation layers such as truss roofs with a second layer of insulation are calculated. Check out the details here.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors
- Walls
- Roofs

Date: 03/03/2023

Element Name (optional) 2.21 m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity view detail

external surface 0.03

Cladding : generic - Brick 70mm
R-value: 0.06

Air Barrier : generic - Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal planes" method, the same method as used in NZS4214:2006.

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Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors
- Walls
- Roofs

Date: 31/05/2023

Element Name (optional) 2.16 m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity view detail

external surface 0.03

Cladding : James Hardie Linea weatherboard
R-value: 0.08

Air Barrier : generic - Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 600mm

Wall Frame Area: 16.2%	*Cavity Area: 83.8%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ◉
- Roofs ○

Date: 10/08/2023

Element Name (optional) **2.02** m²°C/W

Type: Wall: Timber Frame (direct fixed Cladding)

Timber Frame (direct fixed Cladding) view detail

external surface 0.03

Cladding : generic - None (facing inside air, i.e. internal bulkhead into roof space)
R-value: 0.09

Air Barrier : generic - none
R-value: 0.00

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4% *Cavity Area: 85.6%*

Framing :
R-value: 0.75

Insulation : 2.2

still Airgap: none
R-value: 0.00

Wall Lining : generic - double Layer gypsum Plasterboard 10mm+10mm
R-value: 0.09

internal surface 0.09

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DOMINATOR®

10 YEAR TOTAL CONFIDENCE WARRANTY

*Available for specific Door & Opener packages. Regular Servicing Required.

Dominator Insulated Garage Door R-Value 1.34 W/m²K

Background

The R-value is used in the building industry to specify the thermal rating of particular building products. This is defined as a **material resistance to the flow of heat**. It is expressed as the thickness of the material divided by the thermal conductivity (k).

R-values usually given in SI units, typically Kelvin square-meter per Watt ($K.m^2/W$). In the United States R-values are given in units of $h{\cdot}ft^2{\cdot}°$ F/Btu. The two R-value ratings can be easy confused because the designated units are not usually transcribed after the R-value in marketing information. According to the American Society of Heating, Refrigerating and Air-Conditioning Engineers, the conversion between imperial units and SI units of R-value is: 1 $h{\cdot}ft^2{\cdot}°$ F/Btu = 0.176110 $K{\cdot}m^2/W$.

The R-value can be determined by two different methods; manual calculation of the panels or testing the complete door system. Both methods can result in an entirely different value, therefore careful consideration needs to be made in interpreting the values correctly.

R-Value Calculation

The R-value of an individual panel can be achieved by manual calculation. DASMA (Door & Access Systems Manufacturing Association International) provide guidelines in determining the calculated R-value.

A Dominator Insulated panel has an exterior surface, interior surface, and an insulating core material. Also present is the insulating effect of air on a vertical surface, referred to as "air film". Each of these elements has a unique R-value (depending on the material) that are added together to create the overall R-Value of the panel. This is shown in figure 1.

For this exercise, we have used the manual calculation method as stated in DASMA Technical Data Sheet #163

Figure 1: Section of Dominator Insulated door

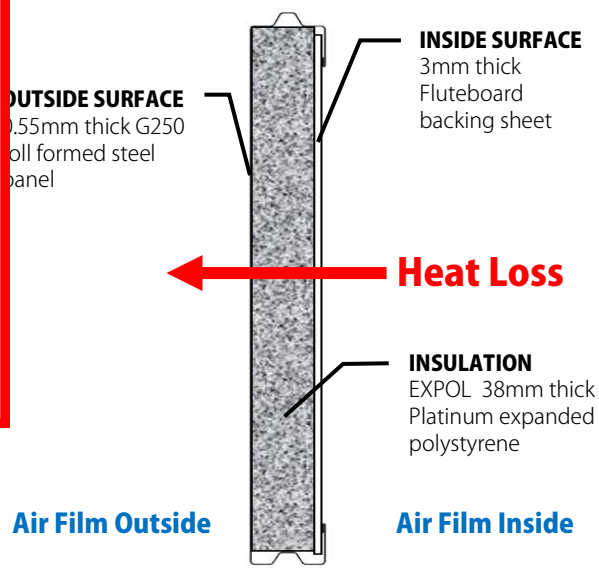

Table 1: R-value table

Property	Material Description	Thermal Conductivity –k (W/mK)	R-Value ($K.m^2/W$)
Air Film Outside	Moving Air – 15MPH, Non-reflective	-	0.0299
Outside Surface	0.55mm thick, G300 roll-formed steel panel	50.2	0.00001
Insulation	EXPOL 38mm thick, Platinum, M-Grade, expanded polystyrene	0.032	1.19
Inside Surface	3mm thick, Fluteboard backing sheet	0.22	0.0027
Air Film Inside	Still Air, vertical surface, Non-reflective	-	0.1197

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DOMINATOR®

R-Value calculation – Individual Materials

Example calculation - Insulation

R-value = material thickness/ thermal conductivity

R-value = 0.038/ 0.032

Insulation Core R-value = 1.1875

R-Value calculation – Panel Assembly

Calculation – Panel Assembly

$R\text{-value}_{\text{Panel Assembly}} = R\text{-value}_{\text{air film outside}} + R\text{-value}_{\text{outside surface}} + R\text{-value}_{\text{Insulation}} + R\text{-value}_{\text{Inside Surface}} + R\text{-value}_{\text{air film inside}}$

$R\text{-value}_{\text{Panel Assembly}} = 0.0299 + 0.00001 + 1.1875 + 0.0027 + 0.1197$

$\textbf{Panel R-value}_{\text{calc Panel Assembly}} = 1.3398\ W/m^2K$

Summary

The calculated R-value for a Dominator Sectional insulated panel is R_{calc}=1.34 W/m^{2}K.

As a comparison this is 5X higher than Aluminium double-glazed windows*.

If you need any further information on our insulation product or have any questions, please do not hesitate to contact your local Dominator Dealer.

References

The American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Clopay Building Products Company – The True Value of Insulation.

DASMA - Technical Data Sheet #163 R-Value and U-Factor as Applied to A Residential or Commercial Garage Door.

2005 ASHRAE Handbook of fundamentals – Air film R-Values

Wikipedia – R-value (Insulation).

**Source: NZS:4218:2009 – Standard Aluminium Double Glazed window with 8mm spacer.*

Information Provided by Manufacturer

b&d group
Garage Doors & Secure Access Systems

46 Braeburn Drive, Hornby, Christchurch 8042
PO Box 24131 City East, Christchurch 8141
T 03 384 5145 www.bnd.co.nz

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Construction R-value Calculator

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Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Floors ○
Walls ○
Roofs ◉

Date: 10/08/2023

Element Name (optional) 3.37 m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling view detail

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :
90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 3.6

Roof Lining : generic - gypsum Plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: 113.7 Number of downlights: Clearance from lamp holder side [m]:

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Floors ○
Walls ○
Roofs ◉

Date: 10/08/2023

Element Name (optional) **2.07** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :
90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 1.9

Roof Lining : generic - gypsum Plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: 7.56 Number of downlights: Clearance from lamp holder side [m]:

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NZBC H1 - Calculation Method

Client	Bhitani & Puri - Front
Address	24 Westmoor Blvd
	Rolleston

REFERENCE BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	82.48	3.30	24.99	
Roof Type 2	Trimed Insulation area	5.46	3.30	1.65	
Wall Type 1	70% Total Wall Area	74.43	2.00	37.21	
Wall Type 2		0.00	2.00	0.00	
Wall Type 3		0.00	2.00	0.00	
Floor	Concrete slab on ground	87.94	1.30	67.65	
Glazing (30%)	Double Glazed Windows	31.90	0.37	86.21	
Glazing (>30%)	Double Glazed Windows	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.37	0.00	
				217.72	TOTAL LOSS

Note: Total area of glazing (including Skylights) must be 50% or less than the total wall area

PROPOSED BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	82.48	3.37	24.47	
Roof Type 2	Trimed Insulation area	5.46	2.07	2.64	
Wall Type 1	Brick Cladding	56.72	2.21	25.66	
Wall Type 2	Linea Cladding	8.69	2.16	4.02	
Wall Type 3	Intertenancy Wall	15.41	2.02	7.63	
Wall Type 4	Insulated Garage Door	5.16	1.34	3.85	
Wall Type 5	Front Door	2.02	0.18	11.22	
Floor	Concrete slab on ground	87.94	1.28	68.70	
Glazing (30%)	Double Glazed Windows	18.33	0.30	61.10	
Glazing (>30%)	Double Glazed Windows	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.37	0.00	
				209.30	TOTAL LOSS

Trimmed Insulation Area: (90mm Rafter & R3.6 batts 180mm)

Roof Pitch	Cut Height	Cut Width	% of batt cut	New R Value
15	80	372	44.44%	1.6
20	87	255	48.33%	1.74
25	95	182	52.78%	1.9
30	105	130	58.33%	2.1

H1 Solution

305mm Slab using RibRaft® 220mm Brick veneer no foundation insulation

The minimum R-value for this zone is 1.6

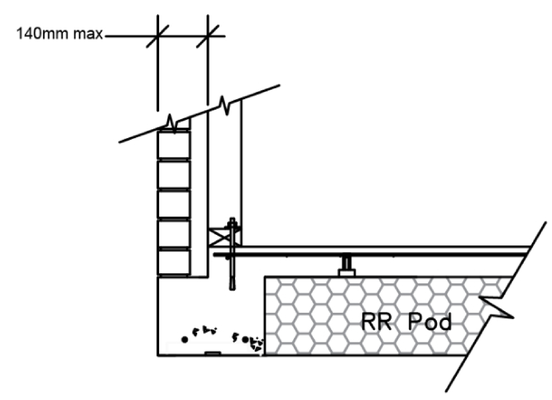
With a calculated A/P ratio of 1.9

The R-value for your selected solution is:

1.28

Exterior Area	87.94m²
Exterior Perimeter	43.31m
Embedded floor heating	No
Wall Width	90mm

For a full set of CAD drawings for RibRaft solutions, please refer to the Firth Resources web page
https://www.firth.co.nz/resources/drawings/
Check the RibRaft Foundations filter to show only relevant files.



8 220mm FIRTH RIBRAFT POLYPOD
BRICK VENEER
FIRTH RAFTMIX 20 OR 25MPa

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Construction R-value Calculator

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Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors
- Walls
- Roofs

Date: 03/03/2023

Element Name (optional) 2.21 m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity view detail

external surface 0.03

Cladding : generic - Brick 70mm
R-value: 0.06

Air Barrier : generic - Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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- Floors
- Walls
- Roofs

Date: 31/05/2023

Element Name (optional) 2.16 m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity view detail

external surface 0.03

Cladding : James Hardie Linea weatherboard
R-value: 0.08

Air Barrier : generic - Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 600mm

Wall Frame Area: 16.2%	*Cavity Area: 83.8%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ◉
- Roofs ○

Date: 10/08/2023

Element Name (optional) **2.02** m²°C/W

Type: Wall: Timber Frame (direct fixed Cladding)

Timber Frame (direct fixed Cladding) view detail

external surface 0.03

Cladding : generic - None (facing inside air, i.e. internal bulkhead into roof space)
R-value: 0.09

Air Barrier : generic - none
R-value: 0.00

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4% *Cavity Area: 85.6%*

Framing :
R-value: 0.75

Insulation : 2.2

still Airgap: none
R-value: 0.00

Wall Lining : generic - double Layer gypsum Plasterboard 10mm+10mm
R-value: 0.09

internal surface 0.09

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DOMINATOR®

10 YEAR TOTAL CONFIDENCE WARRANTY

*Available for specific Door & Opener packages. Regular Servicing Required.

Dominator Insulated Garage Door R-Value 1.34 W/m²K

Background

The R-value is used in the building industry to specify the thermal rating of particular building products. This is defined as a **material resistance to the flow of heat**. It is expressed as the thickness of the material divided by the thermal conductivity (k).

R-values usually given in SI units, typically Kelvin square-meter per Watt ($K.m^2/W$). In the United States R-values are given in units of $h{\cdot}ft^2{\cdot}°$ F/Btu. The two R-value ratings can be easy confused because the designated units are not usually transcribed after the R-value in marketing information. According to the American Society of Heating, Refrigerating and Air-Conditioning Engineers, the conversion between imperial units and SI units of R-value is: 1 $h{\cdot}ft^2{\cdot}°$ F/Btu = 0.176110 $K{\cdot}m^2/W$.

The R-value can be determined by two different methods; manual calculation of the panels or testing the complete door system. Both methods can result in an entirely different value, therefore careful consideration needs to be made in interpreting the values correctly.

R-Value Calculation

The R-value of an individual panel can be achieved by manual calculation. DASMA (Door & Access Systems Manufacturing Association International) provide guidelines in determining the calculated R-value.

A Dominator Insulated panel has an exterior surface, interior surface, and an insulating core material. Also present is the insulating effect of air on a vertical surface, referred to as "air film". Each of these elements has a unique R-value (depending on the material) that are added together to create the overall R-Value of the panel. This is shown in figure 1.

For this exercise, we have used the manual calculation method as stated in DASMA Technical Data Sheet #163

Figure 1: Section of Dominator Insulated door

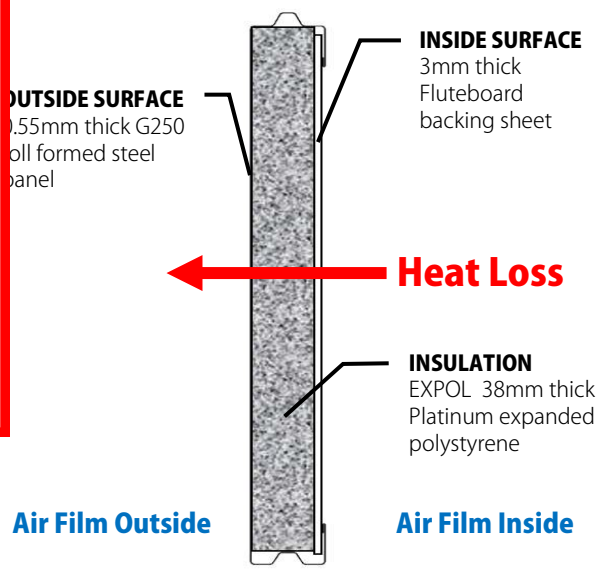

Table 1: R-value table

Property	Material Description	Thermal Conductivity –k (W/mK)	R-Value ($K.m^2/W$)
Air Film Outside	Moving Air – 15MPH, Non-reflective	-	0.0299
Outside Surface	0.55mm thick, G300 roll-formed steel panel	50.2	0.00001
Insulation	EXPOL 38mm thick, Platinum, M-Grade, expanded polystyrene	0.032	1.19
Inside Surface	3mm thick, Fluteboard backing sheet	0.22	0.0027
Air Film Inside	Still Air, vertical surface, Non-reflective	-	0.1197

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R-Value calculation – Individual Materials

Example calculation - Insulation

R-value = material thickness/ thermal conductivity

R-value = 0.038/ 0.032

Insulation Core R-value = 1.1875

R-Value calculation – Panel Assembly

Calculation – Panel Assembly

$R\text{-value}_{\text{Panel Assembly}} = R\text{-value}_{\text{air film outside}} + R\text{-value}_{\text{outside surface}} + R\text{-value}_{\text{Insulation}} + R\text{-value}_{\text{Inside Surface}} + R\text{-value}_{\text{air film inside}}$

$R\text{-value}_{\text{Panel Assembly}} = 0.0299 + 0.00001 + 1.1875 + 0.0027 + 0.1197$

$\textbf{Panel R-value}_{\text{calc Panel Assembly}} = 1.3398\ W/m^2K$

Summary

The calculated R-value for a Dominator Sectional insulated panel is R_{calc}=1.34 W/m^{2}K.

As a comparison this is 5X higher than Aluminium double-glazed windows*.

If you need any further information on our insulation product or have any questions, please do not hesitate to contact your local Dominator Dealer.

References

The American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Clopay Building Products Company – The True Value of Insulation.

DASMA - Technical Data Sheet #163 R-Value and U-Factor as Applied to A Residential or Commercial Garage Door.

2005 ASHRAE Handbook of fundamentals – Air film R-Values

Wikipedia – R-value (Insulation).

**Source: NZS:4218:2009 – Standard Aluminium Double Glazed window with 8mm spacer.*

Information Provided by Manufacturer

b&d group Garage Doors & Secure Access Systems

46 Braeburn Drive, Hornby, Christchurch 8042
PO Box 24131 City East, Christchurch 8141
T 03 384 5145 www.bnd.co.nz

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Floors ○
Walls ○
Roofs ◉

Date: 10/08/2023

Element Name (optional) **3.37** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :
90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 3.6

Roof Lining : generic - gypsum Plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: 82.48 Number of downlights: Clearance from lamp holder side [m]:

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Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Floors ○
Walls ○
Roofs ◉

Date: 10/08/2023

Element Name (optional) **2.07** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :
90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 1.9

Roof Lining : generic - gypsum Plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: 5.46 Number of downlights: Clearance from lamp holder side [m]:

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