"TOTAL R"

THERMAL PERFORMANCE CALCULATIONS

TO AS/NZS 4859.1:2002/Amdt 1 (Dec 2006)

The following calculations by James M Fricker Pty Ltd are based upon:

a) AS/NZS 4859.1:2002/Amdt 1 (Dec 2006) "Materials for the thermal insulation of buildings. Part 1: General criteria and technical provisions",

b) the Australian Institute of Refrigeration Air-conditioning & Heating (AIRAH) Handbook (2007 Edition), and (if necessary) the ASHRAE Fundamentals Handbook.

Results reported are for the **insulation path** only per the original AS/NZS 4859.1:2002 Clause 1.5.3.3 – *"Total thermal resistance - A total resistance associated with a material or a system or construction of materials, specified as a Total R, including surface film resistances"* to be in alignment with the BCA2011 Specification J1.3 examples.

R-values for parallel-faced air cavities were calculated using the Reflect-3 computer software that is based on Robinson and Powell data and research by Oakridge National Laboratory, USA. These calculations are iterative and only the converged results are shown. (Note that Reflect-3 calculations are limited to a maximum 100mm air gap.)

Total R-values are based on product in-service conditions in accordance with AS/NZS 4859.1:2002/Amdt 1 (Dec 2006) including the alteration of insulation material R for temperature, and derations of reflective foil emittances due to dust as noted. Where a cavity is sealed, it is assumed there is no dust and hence emittance is not derated.

The calculations have not yet been independently verified per requirements of AS/NZS 4859.1:2002/Amdt 1.

Each calculation result is subject to any specific notes and assumptions listed on the calculation.

If a construction differs from the described system, the thermal resistance may be different.

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16/1/2013

THERMAL INSULATION EVALUATION BY CALCULATION

150MM TILT SLAB WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

150mm concrete tilt slab, 31mm reflective unventilated air space, Polynum™ Big (Maxi), 31mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref

334w01	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-01	Outside air film	0.040	**12.00**	12.11	12.06	0.11	0.040	**36.00**	35.74	35.87	0.26	cavity		
	150mm concrete tilt slab	0.104	12.11	12.40	12.26	0.29	0.104	35.74	35.07	35.41	0.67			
	31mm reflective unventilated air space	***0.791***	12.40	14.62	13.51	2.22	***0.653***	35.07	30.86	32.97	4.21	0.87	**0.05**	31
	Polynum™ Big (Maxi)	0.177	14.62	15.12	14.87	0.50	0.177	30.86	29.72	30.29	1.14			
	31mm reflective unventilated air space	***0.846***	15.12	17.50	16.31	2.38	***0.710***	29.72	25.15	27.44	4.57	**0.03**	0.87	31
	10mm plasterboard	0.059	17.50	17.66	17.58	0.17	0.059	25.15	24.77	24.96	0.38			
	Indoor still air film (unreflective surface):	0.120	17.66	**18.00**	17.83	0.34	0.120	24.77	**24.00**	24.39	0.77			
	Total Thermal Resistance, R_{Ti} =	**2.14**	**winter**			6.00	**1.86**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.47**	W/(m².K)				**0.54**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.14**	**1.86**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.18**	**1.91**
Polynum™ Ultra	0.41	0.05	0.03	**2.37**	**2.10**
Polynum™ Super	0.13	0.05	0.03	**2.09**	**1.82**
PolyX-therm™	1.00	0.05	0.03	**2.96**	**2.69**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**

The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.

Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.

R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.

The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)

Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.

This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.

This report may not be reproduced except in full. Results may not be quoted without reference to the assumptions.

Calculated by James Fricker, F.AIRAH, M.IEAust, CPEng.

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Calculation date 16/01/2013
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D R A F T 16/1/2013

THERMAL INSULATION EVALUATION BY CALCULATION

150MM TILT SLAB WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

150mm concrete tilt slab, 40mm reflective unventilated air space, Polynum™ Big (Maxi), 40mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w011	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-01	Outside air film	0.040	**12.00**	12.11	12.06	0.11	0.040	**36.00**	35.74	35.87	0.26	cavity		
	150mm concrete tilt slab	0.104	12.11	12.41	12.26	0.30	0.104	35.74	35.05	35.39	0.69			
	40mm reflective unventilated air space	***0.775***	12.41	14.62	13.52	2.21	***0.634***	35.05	30.87	32.96	4.18	0.87	**0.05**	40
	Polynum™ Big (Maxi)	0.177	14.62	15.13	14.88	0.51	0.177	30.87	29.70	30.29	1.17			
	40mm reflective unventilated air space	***0.827***	15.13	17.49	16.31	2.36	***0.686***	29.70	25.18	27.44	4.52	**0.03**	0.87	40
	10mm plasterboard	0.059	17.49	17.66	17.57	0.17	0.059	25.18	24.79	24.99	0.39			
	Indoor still air film (unreflective surface):	0.120	17.66	**18.00**	17.83	0.34	0.120	24.79	**24.00**	24.40	0.79			
	Total Thermal Resistance, R_{Ti} =	**2.10**	**winter**			6.00	**1.82**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.48**	W/(m².K)				**0.55**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.10**	**1.82**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.15**	**1.86**
Polynum™ Ultra	0.41	0.05	0.03	**2.34**	**2.05**
Polynum™ Super	0.13	0.05	0.03	**2.06**	**1.77**
PolyX-therm™	1.00	0.05	0.03	**2.93**	**2.64**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

150MM TILT SLAB WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

150mm concrete tilt slab, 20mm reflective unventilated air space, Polynum™ Big (Maxi), 20mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w012	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-01	Outside air film	0.040	**12.00**	12.13	12.06	0.13	0.040	**36.00**	35.72	35.86	0.28	cavity		
	150mm concrete tilt slab	0.104	12.13	12.46	12.29	0.33	0.104	35.72	35.00	35.36	0.72			
	20mm reflective unventilated air space	***0.677***	12.46	14.60	13.53	2.14	***0.587***	35.00	30.92	32.96	4.08	0.87	**0.05**	20
	Polynum™ Big (Maxi)	0.177	14.60	15.16	14.88	0.56	0.177	30.92	29.69	30.31	1.23			
	20mm reflective unventilated air space	***0.718***	15.16	17.43	16.30	2.27	***0.641***	29.69	25.24	27.47	4.45	**0.03**	0.87	20
	10mm plasterboard	0.059	17.43	17.62	17.53	0.19	0.059	25.24	24.83	25.04	0.41			
	Indoor still air film (unreflective surface):	0.120	17.62	**18.00**	17.81	0.38	0.120	24.83	**24.00**	24.42	0.83			
	Total Thermal Resistance, R_{Ti} =	**1.90**	**winter**			6.00	**1.73**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.53**	W/(m².K)				**0.58**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**1.90**	**1.73**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**1.94**	**1.77**
Polynum™ Ultra	0.41	0.05	0.03	**2.13**	**1.96**
Polynum™ Super	0.13	0.05	0.03	**1.85**	**1.68**
PolyX-therm™	1.00	0.05	0.03	**2.72**	**2.55**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

200MM TILT SLAB WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

200mm concrete tilt slab, 31mm reflective unventilated air space, Polynum™ Big (Maxi), 31mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w02	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-02	Outside air film	0.040	**12.00**	12.11	12.06	0.11	0.040	**36.00**	35.75	35.87	0.25	cavity		
	200mm concrete tilt slab	0.139	12.11	12.49	12.30	0.38	0.139	35.75	34.87	35.31	0.87			
	31mm reflective unventilated air space	***0.793***	12.49	14.68	13.59	2.19	***0.656***	34.87	30.74	32.81	4.14	0.87	**0.05**	31
	Polynum™ Big (Maxi)	0.177	14.68	15.17	14.92	0.49	0.177	30.74	29.62	30.18	1.12			
	31mm reflective unventilated air space	***0.849***	15.17	17.51	16.34	2.34	***0.713***	29.62	25.13	27.37	4.49	**0.03**	0.87	31
	10mm plasterboard	0.059	17.51	17.67	17.59	0.16	0.059	25.13	24.76	24.94	0.37			
	Indoor still air film (unreflective surface):	0.120	17.67	**18.00**	17.83	0.33	0.120	24.76	**24.00**	24.38	0.76			
	Total Thermal Resistance, R_{Ti} =	**2.18**	**winter**			6.00	**1.90**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.46**	W/(m².K)				**0.53**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.18**	**1.90**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.22**	**1.95**
Polynum™ Ultra	0.41	0.05	0.03	**2.41**	**2.14**
Polynum™ Super	0.13	0.05	0.03	**2.13**	**1.86**
PolyX-therm™	1.00	0.05	0.03	**3.00**	**2.73**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

200MM TILT SLAB WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

200mm concrete tilt slab, 40mm reflective unventilated air space, Polynum™ Big (Maxi), 40mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w021	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-02	Outside air film	0.040	**12.00**	12.11	12.06	0.11	0.040	**36.00**	35.74	35.87	0.26	cavity		
	200mm concrete tilt slab	0.139	12.11	12.50	12.31	0.39	0.139	35.74	34.85	35.29	0.89			
	40mm reflective unventilated air space	***0.777***	12.50	14.68	13.59	2.18	***0.637***	34.85	30.74	32.79	4.11	0.87	**0.05**	40
	Polynum™ Big (Maxi)	0.177	14.68	15.17	14.93	0.50	0.177	30.74	29.60	30.17	1.14			
	40mm reflective unventilated air space	***0.830***	15.17	17.50	16.34	2.32	***0.689***	29.60	25.15	27.38	4.44	**0.03**	0.87	40
	10mm plasterboard	0.059	17.50	17.66	17.58	0.17	0.059	25.15	24.77	24.96	0.38			
	Indoor still air film (unreflective surface):	0.120	17.66	**18.00**	17.83	0.34	0.120	24.77	**24.00**	24.39	0.77			
	Total Thermal Resistance, R_{Ti} =	**2.14**	**winter**			6.00	**1.86**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.47**	W/(m².K)				**0.54**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.14**	**1.86**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.19**	**1.90**
Polynum™ Ultra	0.41	0.05	0.03	**2.37**	**2.09**
Polynum™ Super	0.13	0.05	0.03	**2.09**	**1.81**
PolyX-therm™	1.00	0.05	0.03	**2.96**	**2.68**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
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THERMAL INSULATION EVALUATION BY CALCULATION

200MM TILT SLAB WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

200mm concrete tilt slab, 20mm reflective unventilated air space, Polynum™ Big (Maxi), 20mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w022	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-02	Outside air film	0.040	**12.00**	12.12	12.06	0.12	0.040	**36.00**	35.73	35.86	0.27	cavity		
	200mm concrete tilt slab	0.139	12.12	12.55	12.34	0.43	0.139	35.73	34.79	35.26	0.94			
	20mm reflective unventilated air space	***0.678***	12.55	14.66	13.61	2.11	***0.589***	34.79	30.79	32.79	4.00	0.87	**0.05**	20
	Polynum™ Big (Maxi)	0.177	14.66	15.21	14.93	0.55	0.177	30.79	29.58	30.18	1.20			
	20mm reflective unventilated air space	***0.719***	15.21	17.44	16.33	2.23	***0.643***	29.58	25.22	27.40	4.37	**0.03**	0.87	20
	10mm plasterboard	0.059	17.44	17.63	17.54	0.18	0.059	25.22	24.82	25.02	0.40			
	Indoor still air film (unreflective surface):	0.120	17.63	**18.00**	17.81	0.37	0.120	24.82	**24.00**	24.41	0.82			
	Total Thermal Resistance, R_{Ti} =	**1.93**	**winter**			6.00	**1.77**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.52**	W/(m².K)				**0.57**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**1.93**	**1.77**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**1.98**	**1.81**
Polynum™ Ultra	0.41	0.05	0.03	**2.16**	**2.00**
Polynum™ Super	0.13	0.05	0.03	**1.88**	**1.72**
PolyX-therm™	1.00	0.05	0.03	**2.75**	**2.59**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
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THERMAL INSULATION EVALUATION BY CALCULATION

190MM CONCRETE BLOCK WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

190mm concrete blockwork, 31mm reflective unventilated air space, Polynum™ Big (Maxi), 31mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w03	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-03	Outside air film	0.040	**12.00**	12.11	12.05	0.11	0.040	**36.00**	35.76	35.88	0.24	cavity		
	190mm concrete blockwork	0.200	12.11	12.64	12.37	0.53	0.200	35.76	34.54	35.15	1.21			
	31mm reflective unventilated air space	***0.796***	12.64	14.77	13.71	2.13	***0.661***	34.54	30.53	32.53	4.02	0.87	**0.05**	31
	Polynum™ Big (Maxi)	0.177	14.77	15.24	15.01	0.47	0.177	30.53	29.45	29.99	1.07			
	31mm reflective unventilated air space	***0.852***	15.24	17.52	16.38	2.28	***0.719***	29.45	25.09	27.27	4.36	**0.03**	0.87	31
	10mm plasterboard	0.059	17.52	17.68	17.60	0.16	0.059	25.09	24.73	24.91	0.36			
	Indoor still air film (unreflective surface):	0.120	17.68	**18.00**	17.84	0.32	0.120	24.73	**24.00**	24.36	0.73			
	Total Thermal Resistance, R_{Ti} =	**2.24**	**winter**			6.00	**1.98**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.45**	W/(m².K)				**0.51**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.24**	**1.98**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.29**	**2.02**
Polynum™ Ultra	0.41	0.05	0.03	**2.48**	**2.21**
Polynum™ Super	0.13	0.05	0.03	**2.20**	**1.93**
PolyX-therm™	1.00	0.05	0.03	**3.07**	**2.80**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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Client Ref:Polynum CCW-03
Calculation date 16/01/2013
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THERMAL INSULATION EVALUATION BY CALCULATION

190MM CONCRETE BLOCK WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

190mm concrete blockwork, 40mm reflective unventilated air space, Polynum™ Big (Maxi), 40mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w031	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-03	Outside air film	0.040	**12.00**	12.11	12.05	0.11	0.040	**36.00**	35.75	35.88	0.25	cavity		
	190mm concrete blockwork	0.200	12.11	12.65	12.38	0.54	0.200	35.75	34.51	35.13	1.24			
	40mm reflective unventilated air space	***0.780***	12.65	14.77	13.71	2.12	***0.642***	34.51	30.52	32.52	3.99	0.87	**0.05**	40
	Polynum™ Big (Maxi)	0.177	14.77	15.25	15.01	0.48	0.177	30.52	29.43	29.98	1.10			
	40mm reflective unventilated air space	***0.834***	15.25	17.51	16.38	2.26	***0.695***	29.43	25.11	27.27	4.32	**0.03**	0.87	40
	10mm plasterboard	0.059	17.51	17.67	17.59	0.16	0.059	25.11	24.74	24.93	0.37			
	Indoor still air film (unreflective surface):	0.120	17.67	**18.00**	17.84	0.33	0.120	24.74	**24.00**	24.37	0.74			
	Total Thermal Resistance, R_{Ti} =	**2.21**	**winter**			6.00	**1.93**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.45**	W/(m².K)				**0.52**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.21**	**1.93**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.25**	**1.98**
Polynum™ Ultra	0.41	0.05	0.03	**2.44**	**2.17**
Polynum™ Super	0.13	0.05	0.03	**2.16**	**1.89**
PolyX-therm™	1.00	0.05	0.03	**3.03**	**2.76**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**

The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.

Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.

R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.

The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)

Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.

This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.

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THERMAL INSULATION EVALUATION BY CALCULATION

190MM CONCRETE BLOCK WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

190mm concrete blockwork, 20mm reflective unventilated air space, Polynum™ Big (Maxi), 20mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w032	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-03	Outside air film	0.040	**12.00**	12.12	12.06	0.12	0.040	**36.00**	35.74	35.87	0.26	cavity		
	190mm concrete blockwork	0.200	12.12	12.72	12.42	0.60	0.200	35.74	34.43	35.08	1.31			
	20mm reflective unventilated air space	***0.679***	12.72	14.76	13.74	2.04	***0.592***	34.43	30.56	32.49	3.87	0.87	**0.05**	20
	Polynum™ Big (Maxi)	0.177	14.76	15.29	15.03	0.53	0.177	30.56	29.40	29.98	1.16			
	20mm reflective unventilated air space	***0.721***	15.29	17.46	16.38	2.17	***0.646***	29.40	25.17	27.28	4.23	**0.03**	0.87	20
	10mm plasterboard	0.059	17.46	17.64	17.55	0.18	0.059	25.17	24.79	24.98	0.39			
	Indoor still air film (unreflective surface):	0.120	17.64	**18.00**	17.82	0.36	0.120	24.79	**24.00**	24.39	0.79			
	Total Thermal Resistance, R_{Ti} =	**2.00**	**winter**			6.00	**1.83**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.50**	W/(m².K)				**0.55**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.00**	**1.83**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.04**	**1.88**
Polynum™ Ultra	0.41	0.05	0.03	**2.23**	**2.07**
Polynum™ Super	0.13	0.05	0.03	**1.95**	**1.79**
PolyX-therm™	1.00	0.05	0.03	**2.82**	**2.66**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

190MM CONCRETE BLOCK WALL, CAVITY, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

190mm concrete blockwork, 30mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref														
334w04	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-04	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.83	35.91	0.17	cavity		
	190mm concrete blockwork	0.200	12.08	12.48	12.28	0.40	0.200	35.83	34.95	35.39	0.87			
	30mm reflective unventilated air space	***0.822***	12.48	14.13	13.31	1.65	***0.697***	34.95	31.90	33.43	3.05	0.87	**0.05**	30
	Polynum™ Big (Maxi)	0.177	14.13	14.49	14.31	0.36	0.177	31.90	31.13	31.52	0.77			
	R1.5 bulk insulation	**1.568**	14.49	17.64	16.07	3.15	**1.452**	31.13	24.78	27.96	6.35			
	10mm plasterboard	0.059	17.64	17.76	17.70	0.12	0.059	24.78	24.52	24.65	0.26			
	Indoor still air film (unreflective surface):	0.120	17.76	**18.00**	17.88	0.24	0.120	24.52	**24.00**	24.26	0.52			
	Total Thermal Resistance, R_{Ti} =	**2.99**	**winter**			6.00	**2.74**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.33**	W/(m².K)				**0.36**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.99**	**2.74**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**3.03**	**2.79**
Polynum™ Ultra	0.41	0.05	0.03	**3.22**	**2.98**
Polynum™ Super	0.13	0.05	0.03	**2.94**	**2.70**
PolyX-therm™	1.00	0.05	0.03	**3.81**	**3.57**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

190MM CONCRETE BLOCK WALL, CAVITY, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

190mm concrete blockwork, 25mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref														
334w041	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-04	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.82	35.91	0.18	cavity		
	190mm concrete blockwork	0.200	12.08	12.49	12.29	0.41	0.200	35.82	34.94	35.38	0.88			
	25mm reflective unventilated air space	***0.783***	12.49	14.08	13.29	1.59	***0.666***	34.94	31.99	33.47	2.95	0.87	**0.05**	25
	Polynum™ Big (Maxi)	0.177	14.08	14.44	14.26	0.36	0.177	31.99	31.21	31.60	0.78			
	R1.5 bulk insulation	**1.568**	14.44	17.64	16.04	3.19	**1.451**	31.21	24.79	28.00	6.42			
	10mm plasterboard	0.059	17.64	17.76	17.70	0.12	0.059	24.79	24.53	24.66	0.26			
	Indoor still air film (unreflective surface):	0.120	17.76	**18.00**	17.88	0.24	0.120	24.53	**24.00**	24.27	0.53			
	Total Thermal Resistance, R_{Ti} =	**2.95**	**winter**			6.00	**2.71**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.34**	W/(m².K)				**0.37**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.95**	**2.71**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.99**	**2.76**
Polynum™ Ultra	0.41	0.05	0.03	**3.18**	**2.95**
Polynum™ Super	0.13	0.05	0.03	**2.90**	**2.67**
PolyX-therm™	1.00	0.05	0.03	**3.77**	**3.54**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

190MM CONCRETE BLOCK WALL, CAVITY, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

190mm concrete blockwork, 20mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref														
334w042	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-04	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.82	35.91	0.18	cavity		
	190mm concrete blockwork	0.200	12.08	12.50	12.29	0.42	0.200	35.82	34.92	35.37	0.90			
	20mm reflective unventilated air space	***0.694***	12.50	13.96	13.23	1.46	***0.609***	34.92	32.16	33.54	2.75	0.87	**0.05**	20
	Polynum™ Big (Maxi)	0.177	13.96	14.33	14.15	0.37	0.177	32.16	31.36	31.76	0.80			
	R1.5 bulk insulation	**1.568**	14.33	17.62	15.98	3.29	**1.450**	31.36	24.81	28.09	6.55			
	10mm plasterboard	0.059	17.62	17.75	17.69	0.12	0.059	24.81	24.54	24.68	0.27			
	Indoor still air film (unreflective surface):	0.120	17.75	**18.00**	17.87	0.25	0.120	24.54	**24.00**	24.27	0.54			
	Total Thermal Resistance, R_{Ti} =	**2.86**	**winter**			6.00	**2.66**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.35**	W/(m².K)				**0.38**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.86**	**2.66**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.90**	**2.70**
Polynum™ Ultra	0.41	0.05	0.03	**3.09**	**2.89**
Polynum™ Super	0.13	0.05	0.03	**2.81**	**2.61**
PolyX-therm™	1.00	0.05	0.03	**3.68**	**3.48**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**

The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.

Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.

Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)

R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.

The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)

Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.

This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.

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THERMAL INSULATION EVALUATION BY CALCULATION

150MM TILT SLAB WALL, CAVITY, POLYNUM, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

150mm concrete tilt slab, 32mm reflective unventilated air space, Polynum™ Big (Maxi), 32mm reflective unventilated air space, Polynum™ Big (Maxi), 32mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w05	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-05	Outside air film	0.040	**12.00**	12.07	12.04	0.07	0.040	**36.00**	35.84	35.92	0.16	cavity		
	150mm concrete tilt slab	0.104	12.07	12.26	12.16	0.19	0.104	35.84	35.42	35.63	0.42			
	32mm reflective unventilated air space	***0.838***	12.26	13.75	13.00	1.49	***0.705***	35.42	32.56	33.99	2.85	0.87	**0.05**	32
	Polynum™ Big (Maxi)	0.177	13.75	14.07	13.91	0.32	0.177	32.56	31.85	32.21	0.72			
	32mm reflective unventilated air space	***0.948***	14.07	15.76	14.91	1.69	***0.805***	31.85	28.59	30.22	3.26	**0.03**	**0.05**	32
	Polynum™ Big (Maxi)	0.177	15.76	16.08	15.92	0.32	0.177	28.59	27.87	28.23	0.72			
	32mm reflective unventilated air space	***0.900***	16.08	17.68	16.88	1.61	***0.778***	27.87	24.72	26.30	3.15	**0.03**	0.87	32
	10mm plasterboard	0.059	17.68	17.79	17.73	0.11	0.059	24.72	24.49	24.61	0.24			
	Indoor still air film (unreflective surface):	0.120	17.79	**18.00**	17.89	0.21	0.120	24.49	**24.00**	24.24	0.49			
	Total Thermal Resistance, R_{Ti} =	**3.36**	**winter**			6.00	**2.96**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.30**	W/(m².K)				**0.34**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**3.36**	**2.96**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**3.41**	**3.01**
Polynum™ Ultra	0.41	0.05	0.03	**3.60**	**3.20**
Polynum™ Super	0.13	0.05	0.03	**3.32**	**2.92**
PolyX-therm™	1.00	0.05	0.03	**4.19**	**3.79**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
This report may not be reproduced except in full. Results may not be quoted without reference to the assumptions.
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Client Ref:Polynum CCW-05
Calculation date 16/01/2013
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THERMAL INSULATION EVALUATION BY CALCULATION

150MM TILT SLAB WALL, CAVITY, POLYNUM, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

150mm concrete tilt slab, 20mm reflective unventilated air space, Polynum™ Big (Maxi), 20mm reflective unventilated air space, Polynum™ Big (Maxi), 20mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w051	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-05	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.82	35.91	0.18	cavity		
	150mm concrete tilt slab	0.104	12.08	12.30	12.19	0.22	0.104	35.82	35.35	35.58	0.47			
	20mm reflective unventilated air space	***0.695***	12.30	13.75	13.02	1.45	***0.608***	35.35	32.60	33.97	2.75	0.87	**0.05**	20
	Polynum™ Big (Maxi)	0.177	13.75	14.12	13.93	0.37	0.177	32.60	31.79	32.19	0.80			
	20mm reflective unventilated air space	***0.773***	14.12	15.73	14.92	1.61	***0.693***	31.79	28.66	30.23	3.14	**0.03**	**0.05**	20
	Polynum™ Big (Maxi)	0.177	15.73	16.09	15.91	0.37	0.177	28.66	27.86	28.26	0.80			
	20mm reflective unventilated air space	***0.736***	16.09	17.63	16.86	1.53	***0.673***	27.86	24.81	26.33	3.05	**0.03**	0.87	20
	10mm plasterboard	0.059	17.63	17.75	17.69	0.12	0.059	24.81	24.54	24.68	0.27			
	Indoor still air film (unreflective surface):	0.120	17.75	**18.00**	17.88	0.25	0.120	24.54	**24.00**	24.27	0.54			
	Total Thermal Resistance, R_{Ti} =	**2.88**	**winter**			6.00	**2.65**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.35**	W/(m².K)				**0.38**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.88**	**2.65**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.92**	**2.70**
Polynum™ Ultra	0.41	0.05	0.03	**3.11**	**2.88**
Polynum™ Super	0.13	0.05	0.03	**2.83**	**2.60**
PolyX-therm™	1.00	0.05	0.03	**3.70**	**3.47**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

150MM TILT SLAB WALL, CAVITY, POLYNUM, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

150mm concrete tilt slab, 28mm reflective unventilated air space, Polynum™ Big (Maxi), 28mm reflective unventilated air space, Polynum™ Big (Maxi), 28mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w052	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-05	Outside air film	0.040	**12.00**	12.07	12.04	0.07	0.040	**36.00**	35.84	35.92	0.16	cavity		
	150mm concrete tilt slab	0.104	12.07	12.26	12.17	0.19	0.104	35.84	35.41	35.63	0.42			
	28mm reflective unventilated air space	***0.819***	12.26	13.75	13.01	1.49	***0.700***	35.41	32.57	33.99	2.85	0.87	**0.05**	28
	Polynum™ Big (Maxi)	0.177	13.75	14.08	13.91	0.32	0.177	32.57	31.85	32.21	0.72			
	28mm reflective unventilated air space	***0.924***	14.08	15.76	14.92	1.68	***0.801***	31.85	28.59	30.22	3.26	**0.03**	**0.05**	28
	Polynum™ Big (Maxi)	0.177	15.76	16.08	15.92	0.32	0.177	28.59	27.87	28.23	0.72			
	28mm reflective unventilated air space	***0.876***	16.08	17.67	16.88	1.59	***0.773***	27.87	24.73	26.30	3.14	**0.03**	0.87	28
	10mm plasterboard	0.059	17.67	17.78	17.73	0.11	0.059	24.73	24.49	24.61	0.24			
	Indoor still air film (unreflective surface):	0.120	17.78	**18.00**	17.89	0.22	0.120	24.49	**24.00**	24.24	0.49			
	Total Thermal Resistance, R_{Ti} =	**3.30**	**winter**			6.00	**2.95**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.30**	W/(m².K)				**0.34**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**3.30**	**2.95**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**3.34**	**2.99**
Polynum™ Ultra	0.41	0.05	0.03	**3.53**	**3.18**
Polynum™ Super	0.13	0.05	0.03	**3.25**	**2.90**
PolyX-therm™	1.00	0.05	0.03	**4.12**	**3.77**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

150MM TILT SLAB WALL, CAVITY, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

150mm concrete tilt slab, 30mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref														
334w06	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-06	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.82	35.91	0.18	cavity		
	150mm concrete tilt slab	0.104	12.08	12.30	12.19	0.22	0.104	35.82	35.35	35.58	0.47			
	30mm reflective unventilated air space	***0.819***	12.30	14.00	13.15	1.70	***0.692***	35.35	32.20	33.77	3.14	0.87	**0.05**	30
	Polynum™ Big (Maxi)	0.177	14.00	14.37	14.19	0.37	0.177	32.20	31.40	31.80	0.80			
	R1.5 bulk insulation	**1.568**	14.37	17.63	16.00	3.26	**1.450**	31.40	24.81	28.11	6.59			
	10mm plasterboard	0.059	17.63	17.75	17.69	0.12	0.059	24.81	24.54	24.68	0.27			
	Indoor still air film (unreflective surface):	0.120	17.75	**18.00**	17.88	0.25	0.120	24.54	**24.00**	24.27	0.54			
	Total Thermal Resistance, R_{Ti} =	**2.89**	**winter**			6.00	**2.64**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.35**	W/(m².K)				**0.38**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.89**	**2.64**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.93**	**2.69**
Polynum™ Ultra	0.41	0.05	0.03	**3.12**	**2.88**
Polynum™ Super	0.13	0.05	0.03	**2.84**	**2.60**
PolyX-therm™	1.00	0.05	0.03	**3.71**	**3.47**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

150MM TILT SLAB WALL, CAVITY, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

150mm concrete tilt slab, 25mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref														
334w061	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-06	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.82	35.91	0.18	cavity		
	150mm concrete tilt slab	0.104	12.08	12.30	12.19	0.22	0.104	35.82	35.34	35.58	0.48			
	25mm reflective unventilated air space	***0.781***	12.30	13.95	13.13	1.65	***0.662***	35.34	32.30	33.82	3.04	0.87	**0.05**	25
	Polynum™ Big (Maxi)	0.177	13.95	14.32	14.13	0.37	0.177	32.30	31.48	31.89	0.81			
	R1.5 bulk insulation	**1.569**	14.32	17.62	15.97	3.30	**1.450**	31.48	24.82	28.15	6.66			
	10mm plasterboard	0.059	17.62	17.75	17.69	0.12	0.059	24.82	24.55	24.69	0.27			
	Indoor still air film (unreflective surface):	0.120	17.75	**18.00**	17.87	0.25	0.120	24.55	**24.00**	24.28	0.55			
	Total Thermal Resistance, R_{Ti} =	**2.85**	**winter**			6.00	**2.61**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.35**	W/(m².K)				**0.38**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.85**	**2.61**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.89**	**2.66**
Polynum™ Ultra	0.41	0.05	0.03	**3.08**	**2.85**
Polynum™ Super	0.13	0.05	0.03	**2.80**	**2.57**
PolyX-therm™	1.00	0.05	0.03	**3.67**	**3.44**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**

The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.

Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.

Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)

R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.

The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)

Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.

This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.

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THERMAL INSULATION EVALUATION BY CALCULATION

150MM TILT SLAB WALL, CAVITY, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

150mm concrete tilt slab, 20mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref														
334w062	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
CCW-06	Outside air film	0.040	**12.00**	12.09	12.04	0.09	0.040	**36.00**	35.81	35.91	0.19	cavity		
	150mm concrete tilt slab	0.104	12.09	12.31	12.20	0.23	0.104	35.81	35.32	35.57	0.49			
	20mm reflective unventilated air space	***0.693***	12.31	13.82	13.07	1.51	***0.607***	35.32	32.48	33.90	2.85	0.87	**0.05**	20
	Polynum™ Big (Maxi)	0.177	13.82	14.20	14.01	0.38	0.177	32.48	31.64	32.06	0.83			
	R1.5 bulk insulation	**1.569**	14.20	17.61	15.91	3.41	**1.449**	31.64	24.84	28.24	6.80			
	10mm plasterboard	0.059	17.61	17.74	17.68	0.13	0.059	24.84	24.56	24.70	0.28			
	Indoor still air film (unreflective surface):	0.120	17.74	**18.00**	17.87	0.26	0.120	24.56	**24.00**	24.28	0.56			
	Total Thermal Resistance, R_{Ti} =	**2.76**	**winter**			6.00	**2.56**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.36**	W/(m².K)				**0.39**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.76**	**2.56**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.81**	**2.60**
Polynum™ Ultra	0.41	0.05	0.03	**3.00**	**2.79**
Polynum™ Super	0.13	0.05	0.03	**2.72**	**2.51**
PolyX-therm™	1.00	0.05	0.03	**3.59**	**3.38**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**

The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.

Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.

Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)

R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.

The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)

Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.

This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.

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THERMAL INSULATION EVALUATION BY CALCULATION

DOUBLE BRICK WALL WITH POLYNUM DIVIDING CAVITY, WITH PLASTERBOARD

110mm brickwork, 31mm reflective unventilated air space, Polynum™ Big (Maxi), 31mm reflective unventilated air space, 110mm brickwork, 10mm plasterboard

JMF Calc Ref														
334w07	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BCW-1.1	Outside air film	0.040	**12.00**	12.10	12.05	0.10	0.040	**36.00**	35.78	35.89	0.22	cavity		
& BCW-1.4	110mm brickwork	0.180	12.10	12.54	12.32	0.45	0.180	35.78	34.78	35.28	1.00			
	31mm reflective unventilated air space	***0.804***	12.54	14.54	13.54	1.99	***0.671***	34.78	31.04	32.91	3.73	0.87	**0.05**	31
	Polynum™ Big (Maxi)	0.177	14.54	14.97	14.76	0.44	0.177	31.04	30.06	30.55	0.98			
	31mm reflective unventilated air space	***0.863***	14.97	17.11	16.04	2.14	***0.730***	30.06	26.00	28.03	4.06	**0.03**	0.87	31
	110mm brickwork	0.180	17.11	17.56	17.33	0.45	***0.180***	26.00	25.00	25.50	1.00			
	10mm plasterboard	0.059	17.56	17.70	17.63	0.15	0.059	25.00	24.67	24.83	0.33			
	Indoor still air film (unreflective surface):	0.120	17.70	**18.00**	17.85	0.30	0.120	24.67	**24.00**	24.33	0.67			
	Total Thermal Resistance, R_{Ti} =	**2.42**	**winter**			6.00	**2.16**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.41**	W/(m².K)				**0.46**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.42**	**2.16**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.47**	**2.20**
Polynum™ Ultra	0.41	0.05	0.03	**2.66**	**2.39**
Polynum™ Super	0.13	0.05	0.03	**2.38**	**2.11**
PolyX-therm™	1.00	0.05	0.03	**3.25**	**2.98**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
For 90mm brickwork, subtract R0.06 from Total R.
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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Client Ref:Polynum BCW-1.1
Calculation date 16/01/2013
334_Bw.xls

D R A F T 16/1/2013

THERMAL INSULATION EVALUATION BY CALCULATION

DOUBLE BRICK WALL WITH POLYNUM DIVIDING CAVITY, WITH PLASTERBOARD

110mm brickwork, 35mm reflective unventilated air space, Polynum™ Big (Maxi), 25mm reflective unventilated air space, 110mm brickwork, 10mm plasterboard

JMF Calc Ref														
334w071	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BCW-1.1	Outside air film	0.040	**12.00**	12.10	12.05	0.10	0.040	**36.00**	35.78	35.89	0.22	cavity		
& BCW-1.4	110mm brickwork	0.180	12.10	12.56	12.33	0.45	0.180	35.78	34.77	35.27	1.01			
	35mm reflective unventilated air space	***0.801***	12.56	14.58	13.57	2.02	***0.665***	34.77	31.04	32.90	3.73	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	14.58	15.02	14.80	0.45	0.177	31.04	30.04	30.54	0.99			
	25mm reflective unventilated air space	***0.820***	15.02	17.09	16.06	2.07	***0.718***	30.04	26.01	28.03	4.03	**0.03**	0.87	25
	110mm brickwork	0.180	17.09	17.55	17.32	0.45	***0.180***	26.01	25.00	25.51	1.01			
	10mm plasterboard	0.059	17.55	17.70	17.62	0.15	0.059	25.00	24.67	24.84	0.33			
	Indoor still air film (unreflective surface):	0.120	17.70	**18.00**	17.85	0.30	0.120	24.67	**24.00**	24.34	0.67			
	Total Thermal Resistance, R_{Ti} =	**2.38**	**winter**			6.00	**2.14**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.42**	W/(m².K)				**0.47**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.38**	**2.14**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.42**	**2.18**
Polynum™ Ultra	0.41	0.05	0.03	**2.61**	**2.37**
Polynum™ Super	0.13	0.05	0.03	**2.33**	**2.09**
PolyX-therm™	1.00	0.05	0.03	**3.20**	**2.96**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
For 90mm brickwork, subtract R0.06 from Total R.
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

DOUBLE BRICK WALL WITH POLYNUM DIVIDING CAVITY, WITH PLASTERBOARD

110mm brickwork, 15mm reflective unventilated air space, Polynum™ Big (Maxi), 15mm reflective unventilated air space, 110mm brickwork, 10mm plasterboard

JMF Calc Ref														
334w072	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BCW-1.1	Outside air film	0.040	**12.00**	12.13	12.06	0.13	0.040	**36.00**	35.73	35.86	0.27	cavity		
& BCW-1.4	110mm brickwork	0.180	12.13	12.71	12.42	0.58	0.180	35.73	34.51	35.12	1.22			
	15mm reflective unventilated air space	***0.537***	12.71	14.45	13.58	1.74	***0.490***	34.51	31.20	32.86	3.31	0.87	**0.05**	15
	Polynum™ Big (Maxi)	0.177	14.45	15.02	14.73	0.57	0.177	31.20	30.01	30.61	1.20			
	15mm reflective unventilated air space	***0.564***	15.02	16.84	15.93	1.82	***0.530***	30.01	26.43	28.22	3.58	**0.03**	0.87	15
	110mm brickwork	0.180	16.84	17.42	17.13	0.58	***0.180***	26.43	25.21	25.82	1.22			
	10mm plasterboard	0.059	17.42	17.61	17.52	0.19	0.059	25.21	24.81	25.01	0.40			
	Indoor still air film (unreflective surface):	0.120	17.61	**18.00**	17.81	0.39	0.120	24.81	**24.00**	24.41	0.81			
	Total Thermal Resistance, R_{Ti} =	**1.86**	**winter**			6.00	**1.78**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.54**	W/(m².K)				**0.56**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**1.86**	**1.78**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**1.90**	**1.82**
Polynum™ Ultra	0.41	0.05	0.03	**2.09**	**2.01**
Polynum™ Super	0.13	0.05	0.03	**1.81**	**1.73**
PolyX-therm™	1.00	0.05	0.03	**2.68**	**2.60**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
For 90mm brickwork, subtract R0.06 from Total R.
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standarc
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THERMAL INSULATION EVALUATION BY CALCULATION

DOUBLE BRICK WALL WITH POLYNUM DIVIDING CAVITY

110mm brickwork, 30mm reflective unventilated air space, Polynum™ Big (Maxi), 30mm reflective unventilated air space, 110mm brickwork

JMF Calc Ref														
334w08	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BCW-1.2	Outside air film	0.040	**12.00**	12.10	12.05	0.10	0.040	**36.00**	35.77	35.89	0.23	cavity		
& BCW-1.3	110mm brickwork	0.180	12.10	12.56	12.33	0.46	0.180	35.77	34.74	35.25	1.03			
	30mm reflective unventilated air space	***0.799***	12.56	14.60	13.58	2.04	***0.668***	34.74	30.91	32.82	3.83	0.87	**0.05**	30
	Polynum™ Big (Maxi)	0.177	14.60	15.05	14.82	0.45	0.177	30.91	29.89	30.40	1.02			
	30mm reflective unventilated air space	***0.857***	15.05	17.23	16.14	2.19	***0.727***	29.89	25.72	27.81	4.17	**0.03**	0.87	30
	110mm brickwork	0.180	17.23	17.69	17.46	0.46	***0.180***	25.72	24.69	25.20	1.03			
	Indoor still air film (unreflective surface):	0.120	17.69	**18.00**	17.85	0.31	0.120	24.69	**24.00**	24.34	0.69			
	Total Thermal Resistance, R_{Ti} =	**2.35**	**winter**			6.00	**2.09**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.43**	W/(m².K)				**0.48**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.35**	**2.09**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.40**	**2.14**
Polynum™ Ultra	0.41	0.05	0.03	**2.59**	**2.32**
Polynum™ Super	0.13	0.05	0.03	**2.31**	**2.04**
PolyX-therm™	1.00	0.05	0.03	**3.18**	**2.91**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
For 90mm brickwork, subtract R0.06 from Total R.
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

DOUBLE BRICK WALL WITH POLYNUM DIVIDING CAVITY

110mm brickwork, 35mm reflective unventilated air space, Polynum™ Big (Maxi), 25mm reflective unventilated air space, 110mm brickwork

JMF Calc Ref														
334w081	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BCW-1.2	Outside air film	0.040	**12.00**	12.10	12.05	0.10	0.040	**36.00**	35.77	35.88	0.23	cavity		
& BCW-1.3	110mm brickwork	0.180	12.10	12.57	12.34	0.47	0.180	35.77	34.73	35.25	1.04			
	35mm reflective unventilated air space	***0.798***	12.57	14.64	13.61	2.07	***0.662***	34.73	30.90	32.81	3.83	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	14.64	15.10	14.87	0.46	0.177	30.90	29.87	30.39	1.02			
	25mm reflective unventilated air space	***0.818***	15.10	17.22	16.16	2.12	***0.715***	29.87	25.74	27.81	4.14	**0.03**	0.87	25
	110mm brickwork	0.180	17.22	17.69	17.46	0.47	***0.180***	25.74	24.69	25.22	1.04			
	Indoor still air film (unreflective surface):	0.120	17.69	**18.00**	17.84	0.31	0.120	24.69	**24.00**	24.35	0.69			
	Total Thermal Resistance, R_{Ti} =	**2.31**	**winter**			6.00	**2.07**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.43**	W/(m².K)				**0.48**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.31**	**2.07**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.36**	**2.12**
Polynum™ Ultra	0.41	0.05	0.03	**2.55**	**2.31**
Polynum™ Super	0.13	0.05	0.03	**2.27**	**2.03**
PolyX-therm™	1.00	0.05	0.03	**3.14**	**2.90**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
For 90mm brickwork, subtract R0.06 from Total R.
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
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THERMAL INSULATION EVALUATION BY CALCULATION

DOUBLE BRICK WALL WITH POLYNUM DIVIDING CAVITY

110mm brickwork, 15mm reflective unventilated air space, Polynum™ Big (Maxi), 15mm reflective unventilated air space, 110mm brickwork

JMF Calc Ref														
334w082	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BCW-1.2	Outside air film	0.040	**12.00**	12.13	12.07	0.13	0.040	**36.00**	35.72	35.86	0.28	cavity		
& BCW-1.3	110mm brickwork	0.180	12.13	12.73	12.43	0.60	0.180	35.72	34.46	35.09	1.26			
	15mm reflective unventilated air space	***0.537***	12.73	14.53	13.63	1.79	***0.489***	34.46	31.04	32.75	3.42	0.87	**0.05**	15
	Polynum™ Big (Maxi)	0.177	14.53	15.12	14.82	0.59	0.177	31.04	29.80	30.42	1.24			
	15mm reflective unventilated air space	***0.564***	15.12	17.00	16.06	1.88	***0.530***	29.80	26.10	27.95	3.70	**0.03**	0.87	15
	110mm brickwork	0.180	17.00	17.60	17.30	0.60	***0.180***	26.10	24.84	25.47	1.26			
	Indoor still air film (unreflective surface):	0.120	17.60	**18.00**	17.80	0.40	0.120	24.84	**24.00**	24.42	0.84			
	Total Thermal Resistance, R_{Ti} =	**1.80**	**winter**			6.00	**1.72**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.56**	W/(m².K)				**0.58**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**1.80**	**1.72**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**1.84**	**1.76**
Polynum™ Ultra	0.41	0.05	0.03	**2.03**	**1.95**
Polynum™ Super	0.13	0.05	0.03	**1.75**	**1.67**
PolyX-therm™	1.00	0.05	0.03	**2.62**	**2.54**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
For 90mm brickwork, subtract R0.06 from Total R.
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
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THERMAL INSULATION EVALUATION BY CALCULATION

DOUBLE BRICK WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

110mm brickwork, 50mm unreflective unventilated air space, 110mm brickwork, 29mm reflective unventilated air space, Polynum™ Super, 29mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w09	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BCW-1.5	Outside air film	0.040	**12.00**	12.09	12.05	0.09	0.040	**36.00**	35.80	35.90	0.20	cavity		
	110mm brickwork	0.180	12.09	12.50	12.30	0.41	0.180	35.80	34.88	35.34	0.92			
	50mm unreflective unventilated air space	***0.200***	12.50	12.96	12.73	0.46	***0.164***	34.88	34.04	34.46	0.84	0.87	0.87	50
	110mm brickwork	0.180	12.96	13.37	13.17	0.41	0.180	34.04	33.12	33.58	0.92			
	29mm reflective unventilated air space	***0.804***	13.37	15.21	14.29	1.84	***0.683***	33.12	29.62	31.37	3.49	0.87	**0.05**	29
	Polynum™ Super	0.177	15.21	15.61	15.41	0.40	0.177	29.62	28.72	29.17	0.90			
	29mm reflective unventilated air space	***0.865***	15.61	17.59	16.60	1.98	***0.744***	28.72	24.92	26.82	3.80	**0.03**	0.87	29
	10mm plasterboard	0.059	17.59	17.73	17.66	0.13	0.059	24.92	24.61	24.76	0.30			
	Indoor still air film (unreflective surface):	0.120	17.73	**18.00**	17.86	0.27	0.120	24.61	**24.00**	24.31	0.61			
	Total Thermal Resistance, R_{Ti} =	**2.62**	**winter**			6.00	**2.35**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.38**	W/(m².K)				**0.43**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.62**	**2.35**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.67**	**2.39**
Polynum™ Ultra	0.41	0.05	0.03	**2.86**	**2.58**
Polynum™ Super	0.13	0.05	0.03	**2.58**	**2.30**
PolyX-therm™	1.00	0.05	0.03	**3.45**	**3.17**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
For 90mm brickwork, subtract R0.06 from Total R.
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

DOUBLE BRICK WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

110mm brickwork, 50mm unreflective unventilated air space, 110mm brickwork, 20mm reflective unventilated air space, Polynum™ Super, 28mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w09	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BCW-1.5	Outside air film	0.040	**12.00**	12.10	12.05	0.10	0.040	**36.00**	35.79	35.89	0.21	cavity		
	110mm brickwork	0.180	12.10	12.53	12.31	0.43	0.180	35.79	34.83	35.31	0.95			
	50mm unreflective unventilated air space	***0.200***	12.53	13.01	12.77	0.48	***0.164***	34.83	33.96	34.40	0.87	0.87	0.87	50
	110mm brickwork	0.180	13.01	13.44	13.22	0.43	0.180	33.96	33.01	33.49	0.95			
	20mm reflective unventilated air space	***0.686***	13.44	15.09	14.27	1.65	***0.606***	33.01	29.80	31.40	3.21	0.87	**0.05**	20
	Polynum™ Super	0.177	15.09	15.52	15.30	0.43	0.177	29.80	28.86	29.33	0.94			
	28mm reflective unventilated air space	***0.854***	15.52	17.57	16.54	2.05	***0.738***	28.86	24.95	26.90	3.91	**0.03**	0.87	28
	10mm plasterboard	0.059	17.57	17.71	17.64	0.14	0.059	24.95	24.64	24.79	0.31			
	Indoor still air film (unreflective surface):	0.120	17.71	**18.00**	17.86	0.29	0.120	24.64	**24.00**	24.32	0.64			
	Total Thermal Resistance, R_{Ti} =	**2.50**	**winter**			6.00	**2.26**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.40**	W/(m².K)				**0.44**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.50**	**2.26**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.54**	**2.31**
Polynum™ Ultra	0.41	0.05	0.03	**2.73**	**2.50**
Polynum™ Super	0.13	0.05	0.03	**2.45**	**2.22**
PolyX-therm™	1.00	0.05	0.03	**3.32**	**3.09**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
For 90mm brickwork, subtract R0.06 from Total R.
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
This report may not be reproduced except in full. Results may not be quoted without reference to the assumptions.
Calculated by James Fricker, F.AIRAH, M.IEAust, CPEng.

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Client Ref:Polynum BCW-1.5
Calculation date 16/01/2013
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THERMAL INSULATION EVALUATION BY CALCULATION

DOUBLE BRICK WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

110mm brickwork, 50mm unreflective unventilated air space, 110mm brickwork, 15mm reflective unventilated air space, Polynum™ Super, 15mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w09	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BCW-1.5	Outside air film	0.040	**12.00**	12.12	12.06	0.12	0.040	**36.00**	35.75	35.88	0.25	cavity		
	110mm brickwork	0.180	12.12	12.64	12.38	0.53	0.180	35.75	34.65	35.20	1.11			
	50mm unreflective unventilated air space	***0.199***	12.64	13.22	12.93	0.58	***0.164***	34.65	33.63	34.14	1.01	0.87	0.87	50
	110mm brickwork	0.180	13.22	13.75	13.49	0.53	0.180	33.63	32.53	33.08	1.11			
	15mm reflective unventilated air space	***0.536***	13.75	15.31	14.53	1.57	***0.494***	32.53	29.48	31.00	3.04	0.87	**0.05**	15
	Polynum™ Super	0.177	15.31	15.83	15.57	0.52	0.177	29.48	28.39	28.94	1.09			
	15mm reflective unventilated air space	***0.564***	15.83	17.48	16.65	1.65	***0.534***	28.39	25.10	26.75	3.29	**0.03**	0.87	15
	10mm plasterboard	0.059	17.48	17.65	17.56	0.17	0.059	25.10	24.74	24.92	0.36			
	Indoor still air film (unreflective surface):	0.120	17.65	**18.00**	17.82	0.35	0.120	24.74	**24.00**	24.37	0.74			
	Total Thermal Resistance, R_{Ti} =	**2.05**	**winter**			6.00	**1.95**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.49**	W/(m².K)				**0.51**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.05**	**1.95**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.10**	**1.99**
Polynum™ Ultra	0.41	0.05	0.03	**2.29**	**2.18**
Polynum™ Super	0.13	0.05	0.03	**2.01**	**1.90**
PolyX-therm™	1.00	0.05	0.03	**2.88**	**2.77**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
For 90mm brickwork, subtract R0.06 from Total R.
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

BRICK VENEER WALL, POLYNUM, CAVITY, PLASTERBOARD

110mm brickwork, 29mm reflective unventilated air space, Polynum™ Big (Maxi), 90mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w10	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BVW-2.1	Outside air film	0.040	**12.00**	12.11	12.06	0.11	0.040	**36.00**	35.75	35.87	0.25	cavity		
	110mm brickwork	0.180	12.11	12.61	12.36	0.50	0.180	35.75	34.61	35.18	1.13			
	29mm reflective unventilated air space	***0.788***	12.61	14.79	13.70	2.18	***0.657***	34.61	30.47	32.54	4.14	0.87	**0.05**	29
	Polynum™ Big (Maxi)	0.177	14.79	15.28	15.03	0.49	0.177	30.47	29.35	29.91	1.12			
	90mm reflective unventilated air space	***0.803***	15.28	17.50	16.39	2.22	***0.670***	29.35	25.13	27.24	4.23	**0.03**	0.87	90
	10mm plasterboard	0.059	17.50	17.67	17.59	0.16	0.059	25.13	24.76	24.94	0.37			
	Indoor still air film (unreflective surface):	0.120	17.67	**18.00**	17.83	0.33	0.120	24.76	**24.00**	24.38	0.76			
	Total Thermal Resistance, R_{Ti} =	**2.17**	**winter**			6.00	**1.90**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.46**	W/(m².K)				**0.53**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.17**	**1.90**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.21**	**1.95**
Polynum™ Ultra	0.41	0.05	0.03	**2.40**	**2.14**
Polynum™ Super	0.13	0.05	0.03	**2.12**	**1.86**
PolyX-therm™	1.00	0.05	0.03	**2.99**	**2.73**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

BRICK VENEER WALL, POLYNUM, CAVITY, PLASTERBOARD

110mm brickwork, 35mm reflective unventilated air space, Polynum™ Big (Maxi), 90mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w10	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BVW-2.1	Outside air film	0.040	**12.00**	12.11	12.06	0.11	0.040	**36.00**	35.75	35.87	0.25	cavity		
	110mm brickwork	0.180	12.11	12.61	12.36	0.50	0.180	35.75	34.61	35.18	1.14			
	35mm reflective unventilated air space	***0.791***	12.61	14.79	13.70	2.19	***0.651***	34.61	30.49	32.55	4.12	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	14.79	15.28	15.04	0.49	0.177	30.49	29.37	29.93	1.12			
	90mm reflective unventilated air space	***0.804***	15.28	17.51	16.39	2.22	***0.670***	29.37	25.13	27.25	4.24	**0.03**	0.87	90
	10mm plasterboard	0.059	17.51	17.67	17.59	0.16	0.059	25.13	24.76	24.95	0.37			
	Indoor still air film (unreflective surface):	0.120	17.67	**18.00**	17.83	0.33	0.120	24.76	**24.00**	24.38	0.76			
	Total Thermal Resistance, R_{Ti} =	**2.17**	**winter**			6.00	**1.90**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.46**	W/(m².K)				**0.53**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.17**	**1.90**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.21**	**1.94**
Polynum™ Ultra	0.41	0.05	0.03	**2.40**	**2.13**
Polynum™ Super	0.13	0.05	0.03	**2.12**	**1.85**
PolyX-therm™	1.00	0.05	0.03	**2.99**	**2.72**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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Calculation date 16/01/2013
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THERMAL INSULATION EVALUATION BY CALCULATION

BRICK VENEER WALL, POLYNUM, CAVITY, PLASTERBOARD

110mm brickwork, 35mm reflective unventilated air space, Polynum™ Big (Maxi), 50mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w10	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BVW-2.1	Outside air film	0.040	**12.00**	12.11	12.06	0.11	0.040	**36.00**	35.75	35.87	0.25	cavity		
	110mm brickwork	0.180	12.11	12.61	12.36	0.50	0.180	35.75	34.61	35.18	1.14			
	35mm reflective unventilated air space	***0.790***	12.61	14.81	13.71	2.20	***0.651***	34.61	30.48	32.54	4.12	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	14.81	15.30	15.06	0.49	0.177	30.48	29.36	29.92	1.12			
	50mm reflective unventilated air space	***0.791***	15.30	17.50	16.40	2.20	***0.667***	29.36	25.13	27.25	4.23	**0.03**	0.87	50
	10mm plasterboard	0.059	17.50	17.67	17.58	0.16	0.059	25.13	24.76	24.95	0.37			
	Indoor still air film (unreflective surface):	0.120	17.67	**18.00**	17.83	0.33	0.120	24.76	**24.00**	24.38	0.76			
	Total Thermal Resistance, R_{Ti} =	**2.16**	**winter**			6.00	**1.89**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.46**	W/(m².K)				**0.53**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	Material R	e1	e2	R_{Ti} winter	R_{Ti} summer
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.16**	**1.89**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.20**	**1.94**
Polynum™ Ultra	0.41	0.05	0.03	**2.39**	**2.13**
Polynum™ Super	0.13	0.05	0.03	**2.11**	**1.85**
PolyX-therm™	1.00	0.05	0.03	**2.98**	**2.72**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

BRICK VENEER WALL, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

110mm brickwork, 30mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref															
334w11	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BVW-2.2	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.82	35.91	0.18	cavity		
	110mm brickwork	0.180	12.08	12.45	12.26	0.36	0.180	35.82	35.03	35.43	0.79			
	30mm reflective unventilated air space	***0.821***	12.45	14.11	13.28	1.66	***0.696***	35.03	31.96	33.50	3.07	0.87	**0.05**	30
	Polynum™ Big (Maxi)	0.177	14.11	14.47	14.29	0.36	0.177	31.96	31.18	31.57	0.78			
	R1.5 bulk insulation	**1.568**	14.47	17.64	16.05	3.17	**1.451**	31.18	24.79	27.99	6.39			
	10mm plasterboard	0.059	17.64	17.76	17.70	0.12	0.059	24.79	24.53	24.66	0.26			
	Indoor still air film (unreflective surface):	0.120	17.76	**18.00**	17.88	0.24	0.120	24.53	**24.00**	24.26	0.53			
	Total Thermal Resistance, R_{Ti} =	**2.97**	**winter**			6.00	**2.72**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.34**	W/(m².K)				**0.37**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.97**	**2.72**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**3.01**	**2.77**
Polynum™ Ultra	0.41	0.05	0.03	**3.20**	**2.96**
Polynum™ Super	0.13	0.05	0.03	**2.92**	**2.68**
PolyX-therm™	1.00	0.05	0.03	**3.79**	**3.55**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

BRICK VENEER WALL, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

110mm brickwork, 50mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref															
334w111	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BVW-2.2	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.82	35.91	0.18	cavity		
	110mm brickwork	0.180	12.08	12.45	12.27	0.37	0.180	35.82	35.01	35.42	0.81			
	50mm reflective unventilated air space	***0.772***	12.45	14.04	13.25	1.59	***0.653***	35.01	32.09	33.55	2.92	0.87	**0.05**	50
	Polynum™ Big (Maxi)	0.177	14.04	14.40	14.22	0.36	0.177	32.09	31.30	31.69	0.79			
	R1.5 bulk insulation	**1.568**	14.40	17.63	16.02	3.23	**1.451**	31.30	24.80	28.05	6.50			
	10mm plasterboard	0.059	17.63	17.75	17.69	0.12	0.059	24.80	24.54	24.67	0.26			
	Indoor still air film (unreflective surface):	0.120	17.75	**18.00**	17.88	0.25	0.120	24.54	**24.00**	24.27	0.54			
	Total Thermal Resistance, R_{Ti} =	**2.92**	**winter**			6.00	**2.68**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.34**	W/(m².K)				**0.37**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.92**	**2.68**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.96**	**2.72**
Polynum™ Ultra	0.41	0.05	0.03	**3.15**	**2.91**
Polynum™ Super	0.13	0.05	0.03	**2.87**	**2.63**
PolyX-therm™	1.00	0.05	0.03	**3.74**	**3.50**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
This report may not be reproduced except in full. Results may not be quoted without reference to the assumptions.
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Client Ref:Polynum BVW-2.2
Calculation date 16/01/2013
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THERMAL INSULATION EVALUATION BY CALCULATION

BRICK VENEER WALL, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

110mm brickwork, 35mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref														
334w112	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BVW-2.2	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.82	35.91	0.18	cavity		
	110mm brickwork	0.180	12.08	12.44	12.26	0.36	0.180	35.82	35.03	35.43	0.79			
	35mm reflective unventilated air space	***0.825***	12.44	14.11	13.28	1.67	***0.693***	35.03	31.97	33.50	3.06	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	14.11	14.47	14.29	0.36	0.177	31.97	31.19	31.58	0.78			
	R1.5 bulk insulation	**1.568**	14.47	17.64	16.05	3.17	**1.451**	31.19	24.79	27.99	6.40			
	10mm plasterboard	0.059	17.64	17.76	17.70	0.12	0.059	24.79	24.53	24.66	0.26			
	Indoor still air film (unreflective surface):	0.120	17.76	**18.00**	17.88	0.24	0.120	24.53	**24.00**	24.26	0.53			
	Total Thermal Resistance, R_{Ti} =	**2.97**	**winter**			6.00	**2.72**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.34**	W/(m².K)				**0.37**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.97**	**2.72**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**3.01**	**2.76**
Polynum™ Ultra	0.41	0.05	0.03	**3.20**	**2.95**
Polynum™ Super	0.13	0.05	0.03	**2.92**	**2.67**
PolyX-therm™	1.00	0.05	0.03	**3.79**	**3.54**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

BRICK VENEER WALL, POLYNUM, R2.5 BULK INSULATION, PLASTERBOARD

110mm brickwork, 30mm reflective unventilated air space, Polynum™ Big (Maxi), R2.5 bulk insulation, 10mm plasterboard

JMF Calc Ref															
334w12	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BVW-2.3	Outside air film	0.040	**12.00**	12.06	12.03	0.06	0.040	**36.00**	35.87	35.94	0.13	cavity		
	110mm brickwork	0.180	12.06	12.33	12.19	0.27	0.180	35.87	35.29	35.58	0.58			
	30mm reflective unventilated air space	***0.845***	12.33	13.58	12.95	1.26	***0.726***	35.29	32.94	34.12	2.35	0.87	**0.05**	30
	Polynum™ Big (Maxi)	0.177	13.58	13.85	13.71	0.26	0.177	32.94	32.37	32.66	0.57			
	R2.5 bulk insulation	**2.617**	13.85	17.73	15.79	3.89	**2.411**	32.37	24.58	28.47	7.79			
	10mm plasterboard	0.059	17.73	17.82	17.78	0.09	0.059	24.58	24.39	24.48	0.19			
	Indoor still air film (unreflective surface):	0.120	17.82	**18.00**	17.91	0.18	0.120	24.39	**24.00**	24.19	0.39			
	Total Thermal Resistance, R_{Ti} =	**4.04**	**winter**			6.00	**3.71**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.25**	W/(m².K)				**0.27**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**4.04**	**3.71**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**4.08**	**3.76**
Polynum™ Ultra	0.41	0.05	0.03	**4.27**	**3.95**
Polynum™ Super	0.13	0.05	0.03	**3.99**	**3.67**
PolyX-therm™	1.00	0.05	0.03	**4.86**	**4.54**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

BRICK VENEER WALL, POLYNUM, R2.5 BULK INSULATION, PLASTERBOARD

110mm brickwork, 50mm reflective unventilated air space, Polynum™ Big (Maxi), R2.5 bulk insulation, 10mm plasterboard

JMF Calc Ref															
334w121	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BVW-2.3	Outside air film	0.040	**12.00**	12.06	12.03	0.06	0.040	**36.00**	35.87	35.93	0.13	cavity		
	110mm brickwork	0.180	12.06	12.33	12.20	0.27	0.180	35.87	35.28	35.57	0.59			
	50mm reflective unventilated air space	***0.797***	12.33	13.53	12.93	1.20	***0.683***	35.28	33.05	34.16	2.23	0.87	**0.05**	50
	Polynum™ Big (Maxi)	0.177	13.53	13.80	13.66	0.27	0.177	33.05	32.47	32.76	0.58			
	R2.5 bulk insulation	**2.618**	13.80	17.73	15.76	3.94	**2.410**	32.47	24.59	28.53	7.88			
	10mm plasterboard	0.059	17.73	17.82	17.78	0.09	0.059	24.59	24.39	24.49	0.19			
	Indoor still air film (unreflective surface):	0.120	17.82	**18.00**	17.91	0.18	0.120	24.39	**24.00**	24.20	0.39			
	Total Thermal Resistance, R_{Ti} =	**3.99**	**winter**			6.00	**3.67**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.25**	W/(m².K)				**0.27**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**3.99**	**3.67**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**4.03**	**3.71**
Polynum™ Ultra	0.41	0.05	0.03	**4.22**	**3.90**
Polynum™ Super	0.13	0.05	0.03	**3.94**	**3.62**
PolyX-therm™	1.00	0.05	0.03	**4.81**	**4.49**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**

The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.

Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.

Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)

R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.

The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)

Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.

This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.

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THERMAL INSULATION EVALUATION BY CALCULATION

BRICK VENEER WALL, POLYNUM, R2.5 BULK INSULATION, PLASTERBOARD

110mm brickwork, 35mm reflective unventilated air space, Polynum™ Big (Maxi), R2.5 bulk insulation, 10mm plasterboard

JMF Calc Ref															
334w122	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BVW-2.3	Outside air film	0.040	**12.00**	12.06	12.03	0.06	0.040	**36.00**	35.87	35.94	0.13	cavity		
	110mm brickwork	0.180	12.06	12.33	12.19	0.27	0.180	35.87	35.29	35.58	0.58			
	35mm reflective unventilated air space	***0.854***	12.33	13.59	12.96	1.27	***0.726***	35.29	32.94	34.12	2.35	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	13.59	13.85	13.72	0.26	0.177	32.94	32.37	32.66	0.57			
	R2.5 bulk insulation	**2.617**	13.85	17.73	15.79	3.88	**2.411**	32.37	24.58	28.47	7.79			
	10mm plasterboard	0.059	17.73	17.82	17.78	0.09	0.059	24.58	24.39	24.48	0.19			
	Indoor still air film (unreflective surface):	0.120	17.82	**18.00**	17.91	0.18	0.120	24.39	**24.00**	24.19	0.39			
	Total Thermal Resistance, R_{Ti} =	**4.05**	**winter**			6.00	**3.71**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.25**	W/(m².K)				**0.27**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**4.05**	**3.71**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**4.09**	**3.76**
Polynum™ Ultra	0.41	0.05	0.03	**4.28**	**3.95**
Polynum™ Super	0.13	0.05	0.03	**4.00**	**3.67**
PolyX-therm™	1.00	0.05	0.03	**4.87**	**4.54**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

BRICK VENEER WALL, POLYNUM, CAVITY, POLYTHERM, PLASTERBOARD

110mm brickwork, 35mm reflective unventilated air space, Polynum™ Big (Maxi), 30mm reflective unventilated air space, PolyX-therm™, 10mm plasterboard

JMF Calc Ref														
334w13	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
BVW-2.4	Outside air film	0.040	**12.00**	12.07	12.04	0.07	0.040	**36.00**	35.84	35.92	0.16	cavity		
	110mm brickwork	0.180	12.07	12.39	12.23	0.32	0.180	35.84	35.13	35.49	0.71			
	35mm reflective unventilated air space	***0.837***	12.39	13.89	13.14	1.50	***0.705***	35.13	32.34	33.73	2.79	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	13.89	14.21	14.05	0.32	0.177	32.34	31.64	31.99	0.70			
	30mm reflective unventilated air space	***0.899***	14.21	15.82	15.01	1.61	***0.773***	31.64	28.58	30.11	3.06	**0.03**	0.87	30
	PolyX-therm™	**1.041**	15.82	17.68	16.75	1.86	**0.976**	28.58	24.71	26.64	3.87			
	10mm plasterboard	0.059	17.68	17.79	17.73	0.11	0.059	24.71	24.48	24.59	0.23			
	Indoor still air film (unreflective surface):	0.120	17.79	**18.00**	17.89	0.21	0.120	24.48	**24.00**	24.24	0.48			
	Total Thermal Resistance, R_{Ti} =	**3.35**	**winter**			6.00	**3.03**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.30**	W/(m².K)				**0.33**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**3.35**	**3.03**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**3.40**	**3.07**
Polynum™ Ultra	0.41	0.05	0.03	**3.59**	**3.26**
Polynum™ Super	0.13	0.05	0.03	**3.31**	**2.98**
PolyX-therm™	1.00	0.05	0.03	**4.18**	**3.85**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
PolyX-therm™ R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
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THERMAL INSULATION EVALUATION BY CALCULATION

100MM HEBEL™ WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

100mm Hebel™ wall, 35mm reflective unventilated air space, Polynum™ Big (Maxi), 90mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w14	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
HBW-3.1	Outside air film	0.040	**12.00**	12.09	12.05	0.09	0.040	**36.00**	35.80	35.90	0.20	cavity		
	100mm Hebel™ wall	0.630	12.09	13.51	12.80	1.42	0.630	35.80	32.67	34.24	3.13			
	35mm reflective unventilated air space	***0.811***	13.51	15.33	14.42	1.83	***0.684***	32.67	29.27	30.97	3.40	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	15.33	15.73	15.53	0.40	0.177	29.27	28.39	28.83	0.88			
	90mm reflective unventilated air space	***0.829***	15.73	17.60	16.66	1.87	***0.705***	28.39	24.89	26.64	3.50	**0.03**	0.87	90
	10mm plasterboard	0.059	17.60	17.73	17.66	0.13	0.059	24.89	24.60	24.74	0.29			
	Indoor still air film (unreflective surface):	0.120	17.73	**18.00**	17.86	0.27	0.120	24.60	**24.00**	24.30	0.60			
	Total Thermal Resistance, R_{Ti} =	**2.67**	**winter**			6.00	**2.41**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.38**	W/(m².K)				**0.41**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.67**	**2.41**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.71**	**2.46**
Polynum™ Ultra	0.41	0.05	0.03	**2.90**	**2.65**
Polynum™ Super	0.13	0.05	0.03	**2.62**	**2.37**
PolyX-therm™	1.00	0.05	0.03	**3.49**	**3.24**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
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D R A F T 16/1/2013

THERMAL INSULATION EVALUATION BY CALCULATION

100MM HEBEL™ WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

100mm Hebel™ wall, 35mm reflective unventilated air space, Polynum™ Big (Maxi), 50mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w141	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
HBW-3.1	Outside air film	0.040	**12.00**	12.09	12.05	0.09	0.040	**36.00**	35.80	35.90	0.20	cavity		
	100mm Hebel™ wall	0.630	12.09	13.52	12.80	1.43	0.630	35.80	32.66	34.23	3.14			
	35mm reflective unventilated air space	***0.811***	13.52	15.35	14.43	1.83	***0.684***	32.66	29.26	30.96	3.40	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	15.35	15.75	15.55	0.40	0.177	29.26	28.38	28.82	0.88			
	50mm reflective unventilated air space	***0.814***	15.75	17.59	16.67	1.84	***0.700***	28.38	24.89	26.63	3.49	**0.03**	0.87	50
	10mm plasterboard	0.059	17.59	17.73	17.66	0.13	0.059	24.89	24.60	24.74	0.29			
	Indoor still air film (unreflective surface):	0.120	17.73	**18.00**	17.86	0.27	0.120	24.60	**24.00**	24.30	0.60			
	Total Thermal Resistance, R_{Ti} =	**2.65**	winter			6.00	**2.41**	summer			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.38**	W/(m².K)				**0.41**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	Material R	e1	e2	R_{Ti} winter	R_{Ti} summer
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.65**	**2.41**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.69**	**2.45**
Polynum™ Ultra	0.41	0.05	0.03	**2.88**	**2.64**
Polynum™ Super	0.13	0.05	0.03	**2.60**	**2.36**
PolyX-therm™	1.00	0.05	0.03	**3.47**	**3.23**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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Calculated by James Fricker, F.AIRAH, M.IEAust, CPEng.

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Client Ref:Polynum HBW-3.1
Calculation date 16/01/2013
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THERMAL INSULATION EVALUATION BY CALCULATION

100MM HEBEL™ WALL, CAVITY, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

100mm Hebel™ wall, 35mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref														
334w15	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
HBW-3.2	Outside air film	0.040	**12.00**	12.07	12.04	0.07	0.040	**36.00**	35.85	35.92	0.15	cavity		
	100mm Hebel™ wall	0.630	12.07	13.17	12.62	1.10	0.630	35.85	33.49	34.67	2.36			
	35mm reflective unventilated air space	***0.837***	13.17	14.64	13.91	1.46	***0.714***	33.49	30.80	32.15	2.68	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	14.64	14.95	14.79	0.31	0.177	30.80	30.14	30.47	0.66			
	R1.5 bulk insulation	**1.565**	14.95	17.69	16.32	2.74	**1.457**	30.14	24.67	27.41	5.47			
	10mm plasterboard	0.059	17.69	17.79	17.74	0.10	0.059	24.67	24.45	24.56	0.22			
	Indoor still air film (unreflective surface):	0.120	17.79	**18.00**	17.89	0.21	0.120	24.45	**24.00**	24.23	0.45			
	Total Thermal Resistance, R_{Ti} =	**3.43**	**winter**			6.00	**3.20**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.29**	W/(m².K)				**0.31**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**3.43**	**3.20**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**3.47**	**3.24**
Polynum™ Ultra	0.41	0.05	0.03	**3.66**	**3.43**
Polynum™ Super	0.13	0.05	0.03	**3.38**	**3.15**
PolyX-therm™	1.00	0.05	0.03	**4.25**	**4.02**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**

The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.

Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.

Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)

R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.

The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)

Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.

This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.

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Client Ref:Polynum HBW-3.2
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THERMAL INSULATION EVALUATION BY CALCULATION

100MM HEBEL™ WALL, CAVITY, POLYNUM, R2.5 BULK INSULATION, PLASTERBOARD

100mm Hebel™ wall, 35mm reflective unventilated air space, Polynum™ Big (Maxi), R2.5 bulk insulation, 10mm plasterboard

JMF Calc Ref															
334w16	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
HBW-3.2	Outside air film	0.040	**12.00**	12.05	12.03	0.05	0.040	**36.00**	35.89	35.94	0.11	cavity		
	100mm Hebel™ wall	0.630	12.05	12.89	12.47	0.84	0.630	35.89	34.08	34.98	1.81			
	35mm reflective unventilated air space	***0.861***	12.89	14.04	13.47	1.15	***0.741***	34.08	31.96	33.02	2.12	0.87	**0.05**	35
	Polynum™ Big (Maxi)	0.177	14.04	14.28	14.16	0.24	0.177	31.96	31.45	31.70	0.51			
	R2.5 bulk insulation	**2.613**	14.28	17.76	16.02	3.48	**2.419**	31.45	24.51	27.98	6.94			
	10mm plasterboard	0.059	17.76	17.84	17.80	0.08	0.059	24.51	24.34	24.43	0.17			
	Indoor still air film (unreflective surface):	0.120	17.84	**18.00**	17.92	0.16	0.120	24.34	**24.00**	24.17	0.34			
	Total Thermal Resistance, R_{Ti} =	**4.50**	**winter**			6.00	**4.19**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.22**	W/(m².K)				**0.24**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**4.50**	**4.19**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**4.54**	**4.23**
Polynum™ Ultra	0.41	0.05	0.03	**4.73**	**4.42**
Polynum™ Super	0.13	0.05	0.03	**4.45**	**4.14**
PolyX-therm™	1.00	0.05	0.03	**5.32**	**5.01**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
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Calculation date 16/01/2013
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THERMAL INSULATION EVALUATION BY CALCULATION

METAL CLAD WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

Metal cladding, 40mm reflective unventilated air space, Polynum™ Big (Maxi), 40mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w17	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
MCW-4.1	Outside air film	0.040	**12.00**	12.12	12.06	0.12	0.040	**36.00**	35.72	35.86	0.28	cavity		
	Metal cladding	0.000	12.12	12.12	12.12	0.00	0.000	35.72	35.72	35.72	0.00			
	40mm reflective unventilated air space	***0.769***	12.12	14.45	13.28	2.33	***0.624***	35.72	31.30	33.51	4.42	0.87	**0.05**	40
	Polynum™ Big (Maxi)	0.177	14.45	14.98	14.71	0.54	0.177	31.30	30.05	30.67	1.25			
	40mm reflective unventilated air space	***0.820***	14.98	17.46	16.22	2.48	***0.675***	30.05	25.27	27.66	4.78	**0.03**	0.87	40
	10mm plasterboard	0.059	17.46	17.64	17.55	0.18	0.059	25.27	24.85	25.06	0.42			
	Indoor still air film (unreflective surface):	0.120	17.64	**18.00**	17.82	0.36	0.120	24.85	**24.00**	24.42	0.85			
	Total Thermal Resistance, R_{Ti} =	**1.98**	**winter**			6.00	**1.69**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.50**	W/(m².K)				**0.59**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**1.98**	**1.69**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.03**	**1.74**
Polynum™ Ultra	0.41	0.05	0.03	**2.22**	**1.93**
Polynum™ Super	0.13	0.05	0.03	**1.94**	**1.65**
PolyX-therm™	1.00	0.05	0.03	**2.81**	**2.52**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
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THERMAL INSULATION EVALUATION BY CALCULATION

METAL CLAD WALL, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

Metal cladding, 25mm reflective unventilated air space, Polynum™ Big (Maxi), 25mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref														
334w171	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
MCW-4.1	Outside air film	0.040	**12.00**	12.12	12.06	0.12	0.040	**36.00**	35.72	35.86	0.28	cavity		
	Metal cladding	0.000	12.12	12.12	12.12	0.00	0.000	35.72	35.72	35.72	0.00			
	25mm reflective unventilated air space	***0.753***	12.12	14.44	13.28	2.32	***0.637***	35.72	31.29	33.51	4.43	0.87	**0.05**	25
	Polynum™ Big (Maxi)	0.177	14.44	14.98	14.71	0.54	0.177	31.29	30.06	30.68	1.23			
	25mm reflective unventilated air space	***0.801***	14.98	17.45	16.22	2.47	***0.693***	30.06	25.24	27.65	4.82	**0.03**	0.87	25
	10mm plasterboard	0.059	17.45	17.63	17.54	0.18	0.059	25.24	24.83	25.04	0.41			
	Indoor still air film (unreflective surface):	0.120	17.63	**18.00**	17.82	0.37	0.120	24.83	**24.00**	24.42	0.83			
	Total Thermal Resistance, R_{Ti} =	**1.95**	**winter**			6.00	**1.73**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.51**	W/(m².K)				**0.58**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**1.95**	**1.73**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**1.99**	**1.77**
Polynum™ Ultra	0.41	0.05	0.03	**2.18**	**1.96**
Polynum™ Super	0.13	0.05	0.03	**1.90**	**1.68**
PolyX-therm™	1.00	0.05	0.03	**2.77**	**2.55**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
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THERMAL INSULATION EVALUATION BY CALCULATION

METAL CLAD WALL, CAVITY, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

Metal cladding, 25mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref															
334w18	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
MCW-4.2	Outside air film	0.040	**12.00**	12.09	12.04	0.09	0.040	**36.00**	35.81	35.90	0.19	cavity		
	Metal cladding	0.000	12.09	12.09	12.09	0.00	0.000	35.81	35.81	35.81	0.00			
	25mm reflective unventilated air space	***0.779***	12.09	13.79	12.94	1.70	***0.658***	35.81	32.65	34.23	3.15	0.87	**0.05**	25
	Polynum™ Big (Maxi)	0.177	13.79	14.18	13.98	0.39	0.177	32.65	31.80	32.23	0.85			
	R1.5 bulk insulation	**1.569**	14.18	17.61	15.89	3.43	**1.448**	31.80	24.86	28.33	6.95			
	10mm plasterboard	0.059	17.61	17.74	17.67	0.13	0.059	24.86	24.58	24.72	0.28			
	Indoor still air film (unreflective surface):	0.120	17.74	**18.00**	17.87	0.26	0.120	24.58	**24.00**	24.29	0.58			
	Total Thermal Resistance, R_{Ti} =	**2.74**	**winter**			6.00	**2.50**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.36**	W/(m².K)				**0.40**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.74**	**2.50**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.79**	**2.55**
Polynum™ Ultra	0.41	0.05	0.03	**2.98**	**2.73**
Polynum™ Super	0.13	0.05	0.03	**2.70**	**2.45**
PolyX-therm™	1.00	0.05	0.03	**3.57**	**3.32**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
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THERMAL INSULATION EVALUATION BY CALCULATION

METAL CLAD WALL, CAVITY, POLYNUM, R1.5 BULK INSULATION, PLASTERBOARD

Metal cladding, 40mm reflective unventilated air space, Polynum™ Big (Maxi), R1.5 bulk insulation, 10mm plasterboard

JMF Calc Ref															
334w181	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
MCW-4.2	Outside air film	0.040	**12.00**	12.09	12.04	0.09	0.040	**36.00**	35.81	35.90	0.19	cavity		
	Metal cladding	0.000	12.09	12.09	12.09	0.00	0.000	35.81	35.81	35.81	0.00			
	40mm reflective unventilated air space	***0.806***	12.09	13.83	12.96	1.75	***0.671***	35.81	32.61	34.21	3.20	0.87	**0.05**	40
	Polynum™ Big (Maxi)	0.177	13.83	14.22	14.02	0.38	0.177	32.61	31.76	32.19	0.84			
	R1.5 bulk insulation	**1.569**	14.22	17.61	15.91	3.40	**1.448**	31.76	24.85	28.31	6.91			
	10mm plasterboard	0.059	17.61	17.74	17.68	0.13	0.059	24.85	24.57	24.71	0.28			
	Indoor still air film (unreflective surface):	0.120	17.74	**18.00**	17.87	0.26	0.120	24.57	**24.00**	24.29	0.57			
	Total Thermal Resistance, R_{Ti} =	**2.77**	**winter**			6.00	**2.52**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.36**	W/(m².K)				**0.40**	W/(m².K)					

SUMMARY FOR DIFFERENT PRODUCTS:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.77**	**2.52**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.82**	**2.56**
Polynum™ Ultra	0.41	0.05	0.03	**3.00**	**2.75**
Polynum™ Super	0.13	0.05	0.03	**2.72**	**2.47**
PolyX-therm™	1.00	0.05	0.03	**3.59**	**3.34**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
Bulk insulation R adjusted for temperature at 0.65%/K per AS/NZS 4859.1:2002/Amdt 1, Clause K3.1 (assumed as glasswool)
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
This report may not be reproduced except in full. Results may not be quoted without reference to the assumptions.
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Client Ref:Polynum MCW-4.2
Calculation date 16/01/2013
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D R A F T 16/1/2013

THERMAL INSULATION EVALUATION BY CALCULATION

METAL CLAD WALL, CAVITY, POLYNUM, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

Metal cladding, 40mm reflective unventilated air space, Polynum™ Big (Maxi), 40mm reflective unventilated air space, Polynum™ Big (Maxi), 16mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w19	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
MCW-4.3	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.81	35.91	0.19	cavity		
	Metal cladding	0.000	12.08	12.08	12.08	0.00	0.000	35.81	35.81	35.81	0.00			
	40mm reflective unventilated air space	***0.811***	12.08	13.76	12.92	1.68	***0.674***	35.81	32.68	34.25	3.13	0.87	**0.05**	40
	Polynum™ Big (Maxi) *	0.177	13.76	14.13	13.94	0.37	0.177	32.68	31.86	32.27	0.82			
	40mm reflective unventilated air space	***0.911***	14.13	16.01	15.07	1.88	***0.764***	31.86	28.31	30.09	3.55	**0.03**	**0.05**	40
	Polynum™ Big (Maxi)	0.177	16.01	16.38	16.20	0.37	0.177	28.31	27.49	27.90	0.82			
	16mm reflective unventilated air space	***0.605***	16.38	17.63	17.00	1.25	***0.572***	27.49	24.83	26.16	2.66	**0.03**	0.87	16
	10mm plasterboard	0.059	17.63	17.75	17.69	0.12	0.059	24.83	24.56	24.69	0.27			
	Indoor still air film (unreflective surface):	0.120	17.75	**18.00**	17.88	0.25	0.120	24.56	**24.00**	24.28	0.56			
	Total Thermal Resistance, R_{Ti} =	**2.90**	**winter**			6.00	**2.58**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.34**	W/(m².K)				**0.39**	W/(m².K)					

SUMMARY FOR DIFFERENT OUTER PRODUCTS*:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.90**	**2.58**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.94**	**2.63**
Polynum™ Ultra	0.41	0.05	0.03	**3.13**	**2.82**
Polynum™ Super	0.13	0.05	0.03	**2.85**	**2.54**
PolyX-therm™	1.00	0.05	0.03	**3.72**	**3.41**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.
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THERMAL INSULATION EVALUATION BY CALCULATION

METAL CLAD WALL, CAVITY, POLYNUM, CAVITY, POLYNUM, CAVITY, PLASTERBOARD

Metal cladding, 25mm reflective unventilated air space, Polynum™ Big (Maxi), 25mm reflective unventilated air space, Polynum™ Big (Maxi), 16mm reflective unventilated air space, 10mm plasterboard

JMF Calc Ref															
334w191	Wall element	m².K/W	°C out	°C in	°C avg	Δt	m².K/W	°C out	°C in	°C avg	Δt	e1	e2	mm
MCW-4.3	Outside air film	0.040	**12.00**	12.08	12.04	0.08	0.040	**36.00**	35.81	35.91	0.19	cavity		
	Metal cladding	0.000	12.08	12.08	12.08	0.00	0.000	35.81	35.81	35.81	0.00			
	25mm reflective unventilated air space	***0.782***	12.08	13.74	12.91	1.65	***0.659***	35.81	32.72	34.27	3.09	0.87	**0.05**	25
	Polynum™ Big (Maxi) *	0.177	13.74	14.11	13.93	0.37	0.177	32.72	31.89	32.30	0.83			
	25mm reflective unventilated air space	***0.877***	14.11	15.97	15.04	1.86	***0.754***	31.89	28.35	30.12	3.54	**0.03**	**0.05**	25
	Polynum™ Big (Maxi)	0.177	15.97	16.34	16.16	0.37	0.177	28.35	27.52	27.94	0.83			
	16mm reflective unventilated air space	***0.605***	16.34	17.62	16.98	1.28	***0.572***	27.52	24.84	26.18	2.68	**0.03**	0.87	16
	10mm plasterboard	0.059	17.62	17.75	17.68	0.12	0.059	24.84	24.56	24.70	0.28			
	Indoor still air film (unreflective surface):	0.120	17.75	**18.00**	17.87	0.25	0.120	24.56	**24.00**	24.28	0.56			
	Total Thermal Resistance, R_{Ti} =	**2.84**	**winter**			6.00	**2.56**	**summer**			12.00			
	Corresponding Total Conductance (U_{Ti}):		**0.35**	W/(m².K)				**0.39**	W/(m².K)					

SUMMARY FOR DIFFERENT OUTER PRODUCTS*:	**Material R**	**e1**	**e2**	**R_{Ti} winter**	**R_{Ti} summer**
Polynum™ Big (Maxi)	0.177	0.05	0.03	**2.84**	**2.56**
Polynum™ Multi - THERMAL BREAK	0.221	0.05	0.03	**2.88**	**2.60**
Polynum™ Ultra	0.41	0.05	0.03	**3.07**	**2.79**
Polynum™ Super	0.13	0.05	0.03	**2.79**	**2.51**
PolyX-therm™	1.00	0.05	0.03	**3.66**	**3.38**

NOTES: **Determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for Thermal insulation of buildings.**
The results are believed representative at the date of calculation, however the author reserves the right to revise calculations.
Polynum™ products assumed to have material thermal resistance and infrared emittances as stated.
R-values of parallel air spaces <101mm were estimated using Reflect3 software using infrared emittances e1 & e2 and stated air gap.
The calculations incorporate the dust assumptions of AS/NZS 4859.1:2002/Amdt 1 2006: Wall cavity, Clause K3.2 (e+0.0) (no dust on vertical surfaces)
Total Conductance (U) calculated by U=1/R Total R values include indoor and outdoor air films.
This computation is not compliant for labelling of insulation products to AS/NZS 4859.1:2002 without endorsement by a recognised laboratory per Section 4.3 of the standard.

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