

Ashgrid Roof Spacer

PRODUCT GUIDE

AVAILABLE WITH PRE-LOADED SCREWS



Minimum energy efficiency standards for commercial buildings are mandatory in the National Construction Code (NCC) 2016 Building Code of Australia (BCA) and insulation plays a key role in achieving these requirements. Section J1 of the BCA states that, where required, insulation must comply with AS/NZS4859.1 and be installed so that it **maintains its position and thickness.**

The Deemed to Satisfy provisions of Part J1 apply to building elements forming the envelope of a Class 2 to 9 building, where the envelope separates a conditioned space from the exterior or non-conditioned space of the building. Please note that this provision has specific exclusions relative to building classes for some BCA editions and the reader should consult Section J1.2 of the BCA for clarifications if in doubt.

To maintain its position and thickness, insulation relies upon the safety mesh to be correctly installed in a 'taut' manner in accordance with manufacturer's recommendations, Work Cover and OH&S Code of Practice guidelines. When installed correctly, taut safety mesh limits the available bulk insulation recovery space created between the underside of the roof sheet and safety mesh, thereby preventing insulation from maintaining its design thickness.

To comply with the BCA and the OH&S regulations, spacers must be used to provide enough bulk insulation recovery space between the roof sheet and the safety mesh **to create an air cavity for the insulation to maintain its thickness and position.**

1.2 Spacer height verse blanket thickness is critical

The combination of spacer height and blanket thickness is critical in achieving a compliant roof system to the BCA clause 'maintains its position and thickness'. To ensure the full recovery of the insulation to its certified design thickness, CSR Bradford Ashgrid Roof Spacer heights correspond to specific Anticon™ insulation blankets designed to meet the BCA Part J requirements.

If the incorrect spacer height or no spacer is selected for the insulation, the air cavity required for blanket recovery will not be sufficient and the thermal performance of the insulation will be downgraded. In the case of blanket insulation, reduced thickness recovery equates to reduced insulation material R-Value. It should be noted that AS/NZS4859.1 testing makes no allowance for any compression of insulation so it is critical that the combination of spacer and insulation blanket is reviewed to ensure compliance.

1.3 Compliance is simple with Ashgrid Spacers and Bradford Anticon insulation

Compliance is simple with the Ashgrid Spacer system and Bradford Anticon insulation – follow the 4 Deemed to Satisfy solution steps to select the right Ashgrid Spacer and insulation blanket combination for your project on the next page.

Bradford Ashgrid Spacers are modular and adaptable, making them the ideal choice for most projects, including applications in cyclonic regions.

- **BCA compliant** Total R-Value (R_{Σ}) systems for all climate zones using the broadest range of bracket heights on the market to ensure the closest match to insulation blanket thickness.

- **Cyclonic rated** for roofs in all cyclonic regions across the full range of bracket heights – complete roof assembly testing conducted in the James Cook University Cyclone Testing Station, an independent NATA accredited laboratory – *all trials and testing program were performed in accordance with the NATA and BCA Low-High-Low test requirements.*

Bradford Ashgrid Spacers also satisfies performance requirement for BCA Part 2.1.1. Structural stability and resistance to actions, and Part 3.10.1 High wind areas for the Northern Territory Deemed-To-Comply Standards Manual. Test carried out at James Cook University Cyclone Testing Station. Can satisfy wind up lift loads up to 9.8kPa, at spacer heights approved up to 150mm. For more details, please refer to DTCM drawing number M/657 on NT Building Advisory Committee website, www.bac.nt.gov.au

- **Modular** bracket-and-bar system means that brackets can be easily repositioned on site to suit roof/roof light requirements and additional brackets can be added at the end of a modified length.
- **Safe-Loc™** bar connection spigot to ensure fast, secure and safe bar joints which allow pre-assembly of bars as well as providing continuous load transfer throughout the bar run.
- **Compatible** with both pierce fixed and concealed fixed roofing systems without the need for end caps or plugs-Ashgrid bars have no holes or protrusions to interfere with roofing screws.

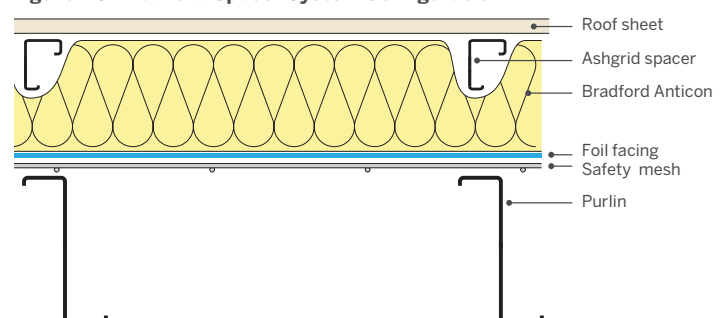
The Ashgrid spacer system is also approved for use with Sayfa single point roof anchor devices, tested to AS/NZS 5532:2013 Dynamic and 7.5kN Static Load Performance Testing for use at spacer heights up to 150mm, with minimum of 4 cladding sheets (with 2 sheets on either side of anchor) and 3 purlin bays (4 purlins) to form the surface of the roof, and 2 x 14G screws fasteners through roof sheet into Ashgrid bar. **Note:** Any 2 opposite holes can be used to attach to bar member. For more information, please contact your CSR Bradford representative.

- **Pre-assembled and pre-loaded** with brackets, 12-14x 38 Ashgrid screws to the brackets and fitted into a rubber retainer, to substantially reduce the installation time, as well as enhancing thermal break for project specific applications; saving both time and money.

The new pre-loaded screws assembly is suitable for all applications up to and including 2.5mm thick purlins, using only 4 screws per 1.2m length. When assessing costs, per lineal metre it requires fewer screws to assemble than any other competitor spacer product (non-cyclonic systems).

- **Extensively used** in Europe since its development in 1989, providing peace of mind for installers and specifiers.

Figure 1.3: Bradford Spacer System Configuration



2.0

How to select a deemed to satisfy solution

Step 1 – Determine the climate zone for your project

Step 2 – Determine the BCA compliance year for your project

Step 3 – Determine the DTS Total R-Value (R_T) target for the roof* using the table below

ROOF COLOUR		CLIMATE ZONES							
		1	2	3	4	5	6	7	8
Direction of heat flow		Inwards						Outwards	
BCA 2010	Very Light Roof [absorptance ≤ 0.5]	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.7}$	$R_{T4.8}$
	Light Roof [0.5 > absorptance ≤ 0.6]	$R_{T3.7}$	$R_{T3.7}$	$R_{T3.7}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.7}$	$R_{T4.8}$
	Dark Roof [absorptance > 0.6]	$R_{T4.2}$	$R_{T4.2}$	$R_{T4.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.7}$	$R_{T4.8}$
BCA 2011	Very Light Roof [absorptance ≤ 0.4]	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.7}$	$R_{T4.8}$
	Light Roof [0.4 > absorptance ≤ 0.6]	$R_{T3.7}$	$R_{T3.7}$	$R_{T3.7}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.7}$	$R_{T4.8}$
	Dark Roof [absorptance > 0.6]	$R_{T4.2}$	$R_{T4.2}$	$R_{T4.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.7}$	$R_{T4.8}$
BCA 2012 to 2016	Very Light Roof (absorptance ≤ 0.4)	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.2}$	$R_{T3.7}$	$R_{T4.8}$
	Light Roof (0.4 > absorptance ≤ 0.6)	$R_{T3.7}$	$R_{T3.7}$	$R_{T3.7}$	$R_{T3.7}$	$R_{T3.7}$	$R_{T3.2}$	$R_{T3.7}$	$R_{T4.8}$
	Dark Roof (absorptance > 0.6)	$R_{T4.2}$	$R_{T4.2}$	$R_{T4.2}$	$R_{T4.2}$	$R_{T4.2}$	$R_{T3.2}$	$R_{T3.7}$	$R_{T4.8}$

Step 4 – Select the required Bradford Ashgrid Spacer and Anticon blanket combination to comply

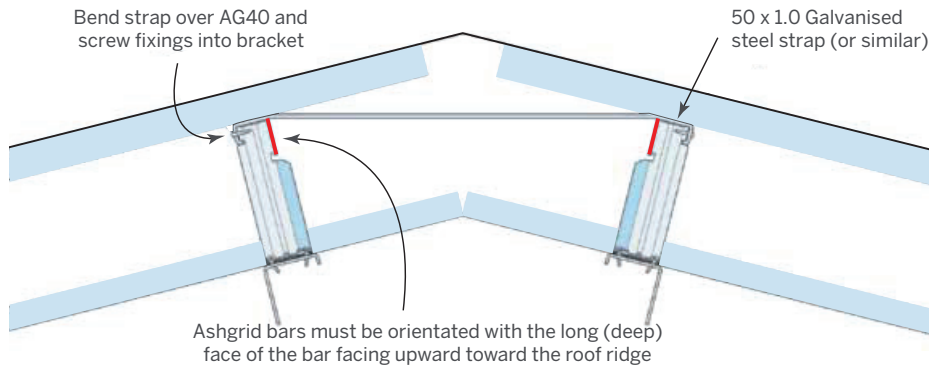
ANTICON BLANKET	SYSTEM PERFORMANCE TOTAL R-VALUE*		MATERIAL R-VALUE	BLANKET THICKNESS (mm)	SPACER HEIGHT (mm)	ASHGRID SPACER PART NUMBER	
	Winter R_T (Heat Flow Up)	Summer R_T (Heat Flow Down)				Non-Cyclonic	Cyclonic
Anticon 60	$R_{T1.6}$	$R_{T2.1}$	$R_{M1.3}$	60	N/A	Use 40mm Batten	Use 40mm Batten
Anticon 80	$R_{T2.2}$	$R_{T2.5}$	$R_{M1.8}$	80	60	124865	124869
Anticon 100	$R_{T2.7}$	$R_{T3.0}$	$R_{M2.3}$	100	80	124864	124868
Anticon 100HP	$R_{T2.9}$	$R_{T3.2}$	$R_{M2.5}$	100	80	124864	124868
Anticon 110	$R_{T2.9}$	$R_{T3.2}$	$R_{M2.5}$	110	80	124864	124868
Anticon 130	$R_{T3.4}$	$R_{T3.7}$	$R_{M3.0}$	130	110	124863	124867
Anticon 140	$R_{T3.7}$	$R_{T4.0}$	$R_{M3.3}$	140	120	124862	124866
Anticon 145	$R_{T4.1}$	$R_{T4.2}$	$R_{M3.6}$	145	120	124862	124866
Building Bkt 175	$R_{T4.7}$	$R_{T4.8}$	$R_{M4.2}$	175	150	130329	130330

* Total R-Value (R_T) performance based upon a non-ventilated R900 flat metal roof with no ceiling using a reflective foil facing



Structural design considerations - spacers

For detailed, project specific structural design information please contact CSR Bradford directly.



- Restraint of the Ashgrid Bars:** Depending upon the pitch of the roof and wind region of construction, the Ashgrid bars may require restraint along the apex of the roof structure. If required, a galvanised metal strap (50 x 1.0mm) must be attached to each Ashgrid bar positioned along the ridge line to secure the upper most bar to either the corresponding bar on the opposite side of the roof or a suitable structural building member on the apex of the roof.

Roof Pitch	WIND REGION	
	Non-Cyclonic	Cyclonic
Up to 5°	No strap	Strap required
Between 5° to 10°	Strap required	Strap required
Over 10°	Contact Bradford	Contact Bradford

Note: The above table applies to both mono pitched and equal pitched roof construction.

- Bar Orientation:** The Ashgrid bars **must** always be orientated with the longer face of the bar facing toward the roof ridge.

Important Note: All changes to the roof design to accommodate Spacers should be reviewed by a qualified engineer during the design phase. The information contained in this brochure should only be used as a guide.

- Purlin Spacing:** The load span table for the standard bracket spacing combinations are shown in Table [3.2]
- Bracket Spacing:** Regardless of the bracket centre spacing specified, provision must be made for a bracket to be placed within 100mm of the end of each row of Ashgrid bars – kits of additional brackets are available.
- Pre-Assembled Kits:** Ashgrid Spacers are supplied pre-assembled with brackets in 1200mm lengths with 12 lengths in a carton (14.4lm), as well as pre-loaded with 12-14 x 38 Ashgrid screws to the brackets and fitted tightly into a rubber retainer to ensure thermal break, as well as ease of installation.
- Optimum Thermal Performance:** The Ashgrid Spacer System has been designed to provide optimum Total R-Values when used in conjunction with the specified CSR Bradford insulation products shown in this brochure.
- Thermal Break:** No additional thermal break is required on the purlin as compression of the insulation blanket, as well as the rubber boot retainer for the pre-loaded screws, provides compliance to the minimum R0.2 BCA specification. However Bradford Thermal Break Tape can be applied on top of the Ashgrid bar to reduce thermal bridging further for tropical and alpine applications or for those projects with high internal humidity environments.

3.1 Bracket Configuration

The diagrams below indicate the required placement of the brackets in accordance with the load table shown in Section 3.2.

	ASHGRID BRACKET CENTRE SPACING	BRACKET CONFIGURATION (Note: A bracket must always be placed within 100mm from the end of the bar)	BRACKETS PER LENGTH
Cyclonic	300mm		4
Non-Cyclonic	600mm		2

Please Note: Each row (i.e. each purlin run) of Ashgrid bars must finish with a bracket within 100mm of the end of each row – if the pre-assembled bracket is not in the correct location, an additional bracket must be assembled on-site within 100mm of the end of each row. These brackets are not included in the standard assembly and need to be ordered separately - assembly tolerance ± 50 mm.

3.2 Load table - Cyclonic & Non-Cyclonic

SPACING BETWEEN PURLIN CENTRES	DIRECTION OF LOADING	ASHGRID BRACKET CENTRES ALONG BAR (m)			
		NON-CYCLONIC		CYCLONIC	
		0.3	0.6	0.3	0.6
		LOADING IN kPa			
0.6	Download	49.38	12.35	49.38	12.35
	Uplift	16.21	8.10	9.83	5.87
0.9	Download	32.92	8.23	32.92	8.23
	Uplift	10.80	5.40	7.82	3.91
1.2	Download	24.69	6.17	24.69	6.17
	Uplift	8.10	4.05	5.87	2.93
1.5	Download	19.75	4.94	19.75	4.94
	Uplift	6.48	3.24	4.69	2.35

Notes:

1. All loadings shown are ultimate strength limit and state design wind capacity.
2. Corresponding serviceability wind loads will produce a deflection of less than span/200.
3. The capacity of the AG40 bar has been calculated in accordance with AS/NZS4600:2005.
4. All screws to AS3566.1:2002.
5. The tables are valid to a roof pitch of 10 degrees from horizontal.
6. For non-cyclonic conditions the minimum purlin BMT is 1.2mm.
7. For cyclonic conditions the minimum purlin BMT is 1.5mm.
8. Calculations are based on the use of #12 gauge fixing screws, for metal framing only.
9. Minimum end and edge distances are 10D and 5D respectively (where D is shank diameter of screws) according to Table 4.8 in AS 1720.1:2010.
10. For timber purlin applications, minimum embedment depth is 53.4mm with minimum Type 17 screw length of 55mm. The timber is taken as F5 Australian Seasoned Pine in accordance with AS 1720.1:2010.
11. Satisfies performance requirement for Northern Territory Deemed-To-Comply Standards Manual, for wind up lift loads up to 9.8kPa, at spacer heights up to 150mm.
12. Load tables for timber purlin applications are available upon review of project specifics.

Custom Applications – Note:

In order to provide the most cost effective solution to a particular non-cyclonic application with reduced load requirements, Ashgrid can be configured on-site to use a reduced number of brackets per lineal metre. Please contact your CSR Bradford Sales Representative for further information.

3.3 Bar & bracket dead weights

During the design phase, consideration needs to be given to the additional weight that a spacer system adds to a roof structure. The table below shows the weight of the Ashgrid bar and bracket systems per lineal metre.

	BAR & BRACKET ASSEMBLY HEIGHT				
	60mm	80mm	110mm	120mm	150mm
Non-Cyclonic (2 Bracket)	1.21kg/lm	1.22kg/lm	1.26kg/lm	1.27kg/lm	1.34kg/lm
Cyclonic (4 Bracket)	1.40kg/lm	1.41kg/lm	1.44kg/lm	1.46kg/lm	1.47kg/lm

Table 3.3: Nominal weights

3.4 Roof sheet suitability

Consideration should be given to the roof sheet profile and BMT of the roof sheet given that the top face of the Ashgrid bar is only 40mm wide. It should be noted that Custom Orb or similar curved profiles of light duty BMT may be subject to compression if the roofing screws are overloaded during assembly or static/dynamic point loads are applied. It is recommended that advice is sought from the roof sheet manufacturer prior to specification and use.



Insulation design considerations

Anticon Roofing Blanket is designed to provide efficient acoustic and thermal insulation, as well as condensation control under metal deck, fibre cement and concrete roofs in residential or commercial applications. The name ‘Anticon’ reflects the **anti-condensation** properties of this product. For optimum thermal performance, the bright side of the Thermofoil is positioned in a downward direction adjacent to a still air space.

4.1 Designing for condensation control – cold climates or aquatic centres

Condensation can become a problem when warm, moist air from inside a building comes in contact with a colder metal roof. This can lead to rust damage of the roof sheeting and internal linings, as well as potential adverse health effects from mould and mildew.

Although the BCA does not currently consider condensation control, CSR Bradford Anticon will meet the energy efficiency requirements of the Building Code as well as control condensation in most climate zones. That said, additional care should be taken by ensuring the blanket selection is made based on a Material R-Value high enough to maintain the vapour barrier’s surface temperature above the dew point. This is an important consideration for those building projects in alpine climate zones where climate and moisture are more extreme and for buildings having high internal humidity such as aquatic centres. For these applications an additional layer of CSR Bradford Enviroseal™ ProctorWrap™ HT-R breather membrane is recommended to be laid over the Anticon Blanket and Ashgrid bar. **Note:** both the Anticon and Enviroseal ProctorWrap products must be lapped and taped at joins, penetrations and discontinuities. Please contact CSR Bradford project specific assistance.

4.2 Designing for tropical climates

For applications in tropical climates, CSR Bradford Anticon must be installed blanket face down and an additional foil layer, lapped and taped should be provided



over the blanket against the roof sheeting to act as a vapour barrier. For more information on designing for tropical regions please contact your CSR Bradford representative.

4.3 Designing for noise control

The bulk Glasswool insulation component of CSR Bradford Anticon against the roof metal not only reduces airborne noise, it also provides a damping effect to reduce impact noise such as rain. Rain noise predictions estimate that the addition of Anticon 145 directly under the roof sheet can reduce the rainfall sound power level (L_w dB) by over 20% when compared against no insulation. Please consult an Acoustic Engineer prior to finalising your project specification.

The table below shows the predicted reduction in the estimated overall rainfall sound power level (L_w) that can be achieved with the addition of Anticon directly below the metal roof sheet.

ROOF PROFILE	ESTIMATED PERFORMANCE Rainfall sound power level predictions L_w dB			
	NO INSULATION (dB)	ANTICON 60 (dB)	ANTICON 100HP (dB)	ANTICON 145 (dB)
Trimdek®	69	63	59	54
Klip-Lok®	67	61	57	52
Trimclad®	73	68	64	58
Custom Orb®	75	70	65	60
Six Rib	70	64	60	55

Notes and assumptions:

1. Calculations are based upon a roof area of 10m² with a roof sheet BMT of 0.48mm
2. No ceiling system is present
3. The insulation is allowed to recover to its design thickness
4. The insulation is sandwiched directly between the underside of the metal roof sheet and the building roof structure
5. Data is based upon ‘intense’ rainfall – additional information is available for other rainfall categories
6. The estimates above are intended to be equivalent to ISO140-3:1995

4.4 Control fire risk and BAL compliance

The CSR Bradford Anticon® bulk insulation blanket range is deemed non-combustible, making roof designs safer by not adding to the fuel load in the roof space. Anticon also provides additional ember protection in accordance with BAL construction guidelines. A standard range of sarking products that can meet the BAL flammability index of ≤5 are also available.

*Bulk insulation component with a density up to 15.9kg/m³.

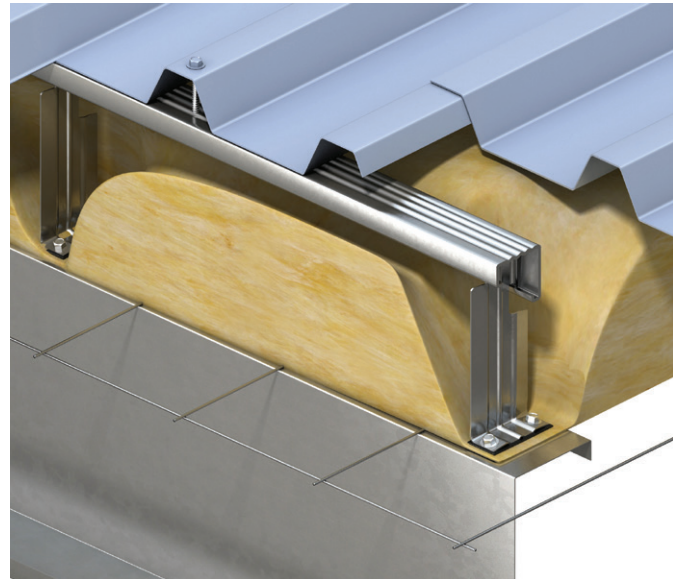
Important: Please ensure that your Fire Engineer reviews all recommendations prior to installation.

4.5 Sustainability

CSR Bradford Glasswool is manufactured from up to 65% recycled glass which is not suitable for recycling in other processes and would otherwise go to landfill.

CSR Bradford has undertaken an audit of our Glasswool and reflective foil laminate insulation manufacturing processes referencing the US EPA List of Ozone Depleting Substances (Class 1 and Class 2). The audit found that no ozone depleting substances are involved in either the manufacture or composition of these products. Our conclusion is that CSR Bradford's Glasswool and Reflective foil laminates have an Ozone Depleting Potential of zero.

CSR Bradford recognises that, as an insulation supplier we have a significant role to play in the passive reduction of energy use in our world.



5.0

Ashgrid Technical Specifications

Bradford™
spacer systems

Ashgrid Bar (AG40)

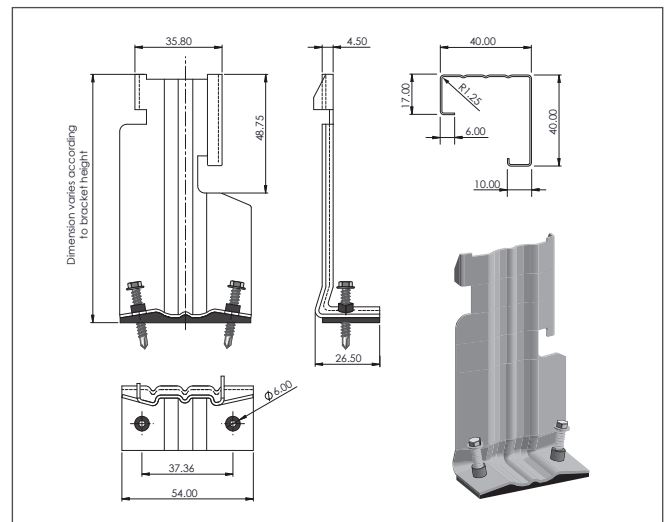
- Manufactured from 1.25mm thick high yield galvanised steel to S390GD + Z275NA-C
- Coil to EN 10147:2000. Minimum yield: 390N/mm² and minimum tensile: 460N/mm²
- Supplied in lengths of 1.2m incorporating spigot end for easy on-site construction.

Ashgrid Bracket

- Manufactured from 1.6mm thick galvanised steel FEPO2G + Z275 BS EN 10142
- Supplied with a 3mm EPDM base thermal insulator pad
- Each bracket requires 2 (pre-loaded) fixing screws through the pre-drilled holes.

Pre-loaded Ashgrid screws

- Screws are corrosion resistant coated to meet AS3566 Class 4 specifications



Download CAD file drawings and installation instructions at:

www.bradfordinsulation.com.au/designsmart





6.0 Specifications

	PART	BRACKET	BAR AND BRACKET	TO SUIT	BAR	METRES OF BAR	BAR	CARTON SIZE	CARTON
	Number	Height	Configuration	Anticon Blanket	Qty	Pack (lm)	Weight (kg)	W x D x L (mm)	Weight (kg)
Non-Cyclonic	130329	150mm	2 brackets per 1200mm bar	Building Bkt 175	12	14.4	1.7	268 x 201 x 1250	21.3
	124862	120mm	2 brackets per 1200mm bar	140/145	12	14.4	1.5	268 x 160 x 1250	17.9
	124863	110mm	2 brackets per 1200mm bar	130	12	14.4	1.5	268 x 160 x 1250	17.7
	124864	80mm	2 brackets per 1200mm bar	100/100HP/110	12	14.4	1.4	268 x 130 x 1250	17.2
	124865	60mm	2 brackets per 1200mm bar	80	12	14.4	1.4	268 x 130 x 1250	17.0
Cyclonic	130330	150mm	4 brackets per 1200mm bar	Building Bkt 175	12	14.4	1.8	268 x 201 x 1250	22.1
	124866	120mm	4 brackets per 1200mm bar	140/145	12	14.4	1.6	268 x 160 x 1250	20.0
	124867	110mm	4 brackets per 1200mm bar	130	12	14.4	1.6	268 x 160 x 1250	19.6
	124868	80mm	4 brackets per 1200mm bar	100/100HP/110	12	14.4	1.5	268 x 130 x 1250	18.5
	124869	60mm	4 brackets per 1200mm bar	80	12	14.4	1.5	268 x 130 x 1250	18.0

Cyclonic tested at the NATA approved James Cook University Wind Cyclone Testing Station using a Low High Low test regime.

For more information call **1300 850 305** or visit **www.bradfordinsulation.com.au**



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