

ROOF SPACER SYSTEM



Designing for BCA Section J & Green Star

Minimum energy efficiency standards for commercial buildings are now mandatory in the Building Code of Australia (BCA) and insulation plays a key role in achieving these requirements. Improvements in insulation also contribute to reductions in energy use which is a critical factor in Green Star accreditation. Choosing the right insulation also offers additional benefits to the occupants through the control of condensation, dampening noise and controlling heat flow in & out of the building. Critical to this selection process is the consideration of inorganic fibrous insulation which is deemed to be non-combustible and does not increase the fuel load in the building.

To achieve the required BCA Section J thermal insulation values, it is critical that the interface between the roof system and the insulation be considered during the design phase. Key to this design consideration is allowing the correct amount of space under the roof sheet to ensure that the insulation can recover to its design thickness and provide its rated insulation value. Failure to provide sufficient space will result in compression of the insulation and degradation of its performance characteristics.

To ensure your projects meet the required levels of thermal performance, Bradford has introduced a Roof Spacer System in a range of sizes to suit all BCA building types and climate zones, including cyclonic regions. The Roof Spacer System raises the roof sheet above the purlin, creating a defined space between the safety mesh and the roof sheet for the insulation.

Cyclonic testing undertaken at James Cook University's wind tunnel, an independent NATA accredited laboratory. All trials and testing program were performed in accordance with the NATA and BCA Low-High-Low test requirements.

To ensure the full recovery of the insulation thickness, Bradford Roof Spacer System heights correspond to specifically developed Anticon insulation blankets designed to meet the BCA Section J requirements.

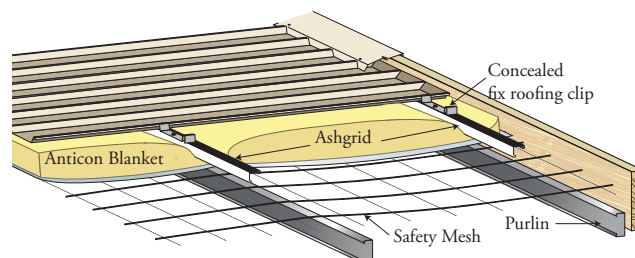


Figure 1. Use of Spacers

When combined in a system specified in this literature, the Bradford Roof Spacer System can ensure compliance to BCA Section J with a market accepted product supported by significant overseas R&D and successful application over many years.

Spacer System Overview – Ashgrid System

The Ashgrid Spacer System consists of galvanised bars and supporting brackets pre-assembled in one metre sections. The system features the innovative Safe-Loc™ bar connection, providing stability and peace of mind at the click of a tab. This prevents the Ashgrid bars from separating during the installation process, for precise gauging and quicker installation. Once engaged the bar ends cannot be accidentally separated though the joints can be 'unlocked' if the need arises.



Roof Spacer System Benefits – Ashgrid System

- Able to achieve BCA compliant Total R-Value (R_T) when used in conjunction with approved insulation blankets
- Rated for use in cyclonic regions across the full range of bracket heights (full wind tunnel test results available upon request)
- Supplied preassembled with brackets in one metre lengths for easy installation on site
- Available in a range of bracket heights to ensure the insulation recovers to its full design thickness in accordance with BCA specifications
- Safe-Loc™ spigots ensure fast, secure and safe bar joints, as well as providing continuous load transfer throughout the bar run
- High performance brackets with deeper ribs provide improved structural performance and can be easily repositioned on site to suit roof/roof light requirements
- Compatible with both pierce fixed and concealed fixed roofing systems without the need for end caps or plugs
- Extensively used in Europe providing peace of mind for installers and specifiers for many years

Design considerations

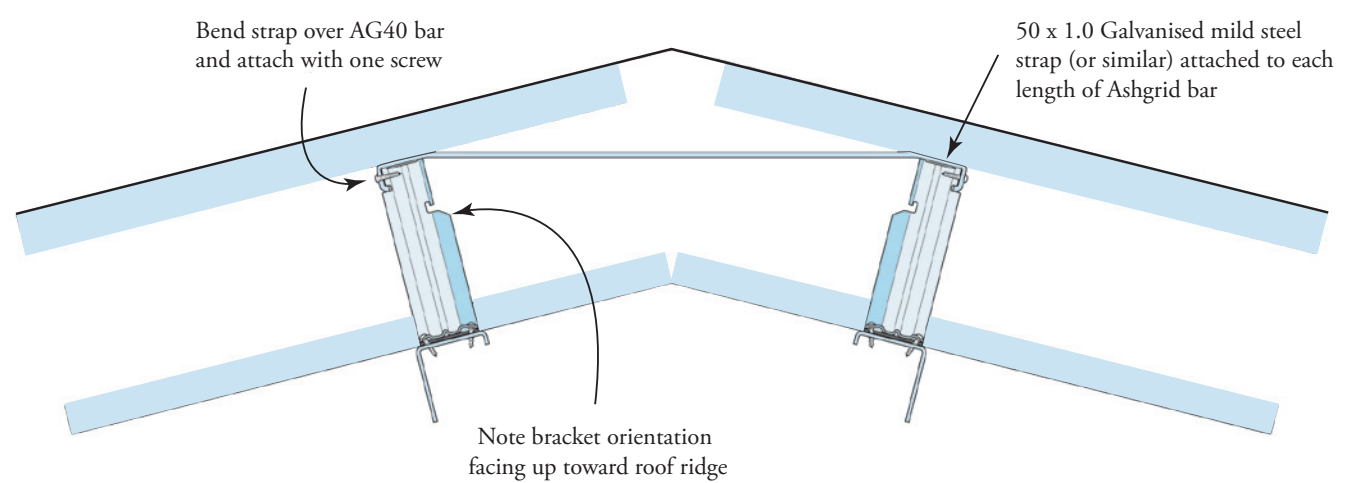


Figure 2. Design Considerations

- For roof pitches over 5 degrees in non-cyclonic regions and all roofs in cyclonic regions, Ashgrid requires the addition of a metal strap over the roof ridge line to secure the upper most Ashgrid bar to the corresponding bar on the opposite side of the ridge line, or a suitably designed structural member along the roof apex
 - For roof pitches over 5 degrees in cyclonic regions please consult with Bradford prior to specifying
 - Ashgrid Spacers are supplied assembled in 1000mm lengths with 12 lengths in a carton
 - Regardless of the bracket centre spacing specified in the Load Tables, provision must be made for a bracket to be placed within 100mm of the end of each row of Ashgrid bars
 - The Ashgrid brackets must always be orientated with the shorter edge facing the roof ridge (refer to figure 2 above)
- The Ashgrid Spacer System has been designed to provide optimum Total R-Values when used in conjunction with Bradford insulation products shown in this brochure.
 - All changes to the roof design should be reviewed by a qualified engineer prior to construction and the information contained in this brochure should only be used as a guide
 - No additional thermal break is required on the purlin as compression of the insulation blanket provides compliance to the minimum BCA specification

Table 1: Ashgrid Bar & Bracket System Dead Weights

	80mm	110mm	120mm
2 Bracket System	1.19kg	1.24kg	1.25kg
3 Bracket System	1.24kg	1.32kg	1.34kg

Bracket configuration

The diagrams below indicate the required placement of the brackets in accordance with the Load Table 2

	Ashgrid bracket centre spacing	Bracket configuration (Note: A bracket must always be placed within 100mm of each end of the total Ashgrid section)	Brackets per m
Cyclonic	0.33m		3
Non Cyclonic	0.50m		2

Please Note: Each row (ie each purlin run) of Ashgrid will require 1 additional bracket 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 ± 50mm.

Load capacity tables

Table 2: Load span table for Ashgrid section, Non Cyclonic and Cyclonic

Spacing between purlin centres [m]	Direction of loading	Ashgrid bracket centres along bar [m]		
		Non Cyclonic	Cyclonic	
		0.5	0.33	0.5
		Loading in kPa		
0.3	Download	25.00	-	-
	Uplift	25.00	-	-
0.4	Download	18.75	-	-
	Uplift	18.75	-	-
0.5	Download	15.00	-	-
	Uplift	15.00	-	-
0.6	Download	12.50	9.83	8.62
	Uplift	12.50	9.83	8.62
0.7	Download	10.71	9.34	-
	Uplift	10.71	9.34	-
0.8	Download	9.38	8.86	-
	Uplift	9.38	8.86	-
0.9	Download	8.33	8.37	-
	Uplift	8.33	8.37	-
1	Download	7.50	7.88	-
	Uplift	7.50	7.88	-
1.1	Download	6.82	7.40	-
	Uplift	6.82	7.40	-
1.2	Download	6.25	6.91	-
	Uplift	6.25	6.91	-
1.3	Download	5.77	6.42	-
	Uplift	5.77	6.42	-
1.4	Download	5.36	5.93	-
	Uplift	5.36	5.93	-
1.5	Download	5.00	5.44	-
	Uplift	5.00	5.44	-
1.6	Download	4.69	4.95	-
	Uplift	4.69	4.95	-
1.7	Download	4.41	4.46	-
	Uplift	4.41	4.46	-
1.8	Download	4.17	3.97	-
	Uplift	4.17	3.97	-
1.9	Download	3.95	-	-
	Uplift	3.95	-	-
2	Download	3.75	-	-
	Uplift	3.75	-	-

Based on standard AG40 bar and roof up to 5° pitch.

Table 3: Bracket to purlin capacities

Screw Gauge	Purlin BMT					
	1	1.2	1.5	1.9	2.4	3
	Tensile Connection capacity [kN]					
#10g	2.24	2.55	2.94	3.72	4.70	5.88
#12g	2.52	2.86	3.30	4.19	5.29	6.61
#14g*	3.00	3.40	3.92	4.97	6.28	6.74

*Refer to Note 16

Notes:

1. All loadings are taken as Ultimate
2. Serviceability limit = span / 150
3. All wind loadings shown are ultimate including all relevant local pressure factors as appropriate (see AS/NZS 1170.2 :2002)
4. The loadings shown in Table 2, do not include self weight or lateral loading
5. The capacity of the AG40 bar has been calculated in accordance with AS/NZS 4600: 2005
6. The ultimate capacity of the AG40 bar to clip has been taken as 3.75kN (ie. 3.00 x 1.25)
7. The above strengths are based on 3 span continuous for strength and serviceability.
8. The fastener capacities have been assessed in accordance with AS/NZS 4600 :2005
9. Bracket based on 1.15 BMT, fy = 390 MPa, fu = 460 MPa
10. Screw dimensions are generally based on AS3566.1 : 2002
11. Purlin and roof sheeting capacities have not been analysed and should be verified by the Project Engineer.
12. Applicable to bracket heights up to 150mm
13. Up to a maximum roof pitch of 5 degrees

Cyclonic Only Notes (in addition to notes 1 to 13):

14. Cyclonic system capacity in accordance with James Cook University No. TS797 dated 08/12/2010. All testing in accordance with the BCA Low-High-Low testing regime
15. For cyclonic conditions min. purlin thickness is 1.5mm BMT
16. For cyclonic conditions all fasteners to be min #14g
17. Cyclonic system bracket spacings of 330mm
18. 3 brackets per 1.0m length of spacer bar note that one bracket must be positioned at the bar spigot connection

Custom Applications – Note:

1. 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 metre. Please contact your Bradford Sales Representative for further information.



Table 4: Screw pullout capacities

BMT	fy (MPa)	fu (MPa)
1.0	550	550
1.2	450	520
1.5 [#]	450	480
1.9 [#]	450	480
2.4 [#]	450	480
3.0 [#]	450	480

Note: Each bracket requires two screws

[#]Refer to Note 15

Bradford Insulation Product Range to Suit the Ashgrid Spacer System

Table 5: Anticon Product Range

Anticon Product	Material Value R_{MAT}	Blanket Thickness [mm]	Bracket height [mm]	Ashgrid Part No.	
				Non Cyclonic	Cyclonic
Anticon 55	R1.3	60	N/A	Refer to Thermodeck 35mm	N/A
Anticon 75	R1.8	80	80	93685	106654
Anticon 95	R2.3	100	80	93685	106654
Anticon 100HP	R2.5	100	80	93685	106654
Anticon 110	R2.5	110	110	100502	106655
Anticon 130	R3.0	130	110	100502	106655
Anticon 140	R3.3	140	120	100502	106656
Anticon 145	R3.6	145	120	100502	106656

Note: for total roof performance (R_T) refer to Bradford Insulation

Insulation Specification – Anticon

Anticon Roofing Blanket is designed to provide efficient thermal insulation and 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, bright side of the Thermofoil is positioned in a downward direction adjacent to a still air space. Anticon is designed to reduce rain and aircraft noise and can also substantially reduce reverberant noise within the building. For tropical climate zones an additional layer of Thermofoil 733 is recommended to be laid over the Anticon blanket and Ashgrid bar.

Benefits of Anticon

- Lightweight insulation blanket that reduces the overall building energy use
- Available in a range of thicknesses to meet BCA energy efficiency provisions
- Helps prevent condensation and reduce rain noise
- Available in a range of functional and decorative facings: Foil / Black / White
- Bio-soluble fibres are non-combustible



Material Specifications

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 1m incorporating spigot end for easy on-site construction.

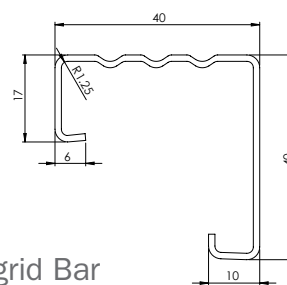


Figure 3. Ashgrid Bar

Note: All dimensions in mm

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 fixing screws through the pre-drilled holes.

Download CAD file drawings and installation instructions at: www.bradfordinsulation.com.au

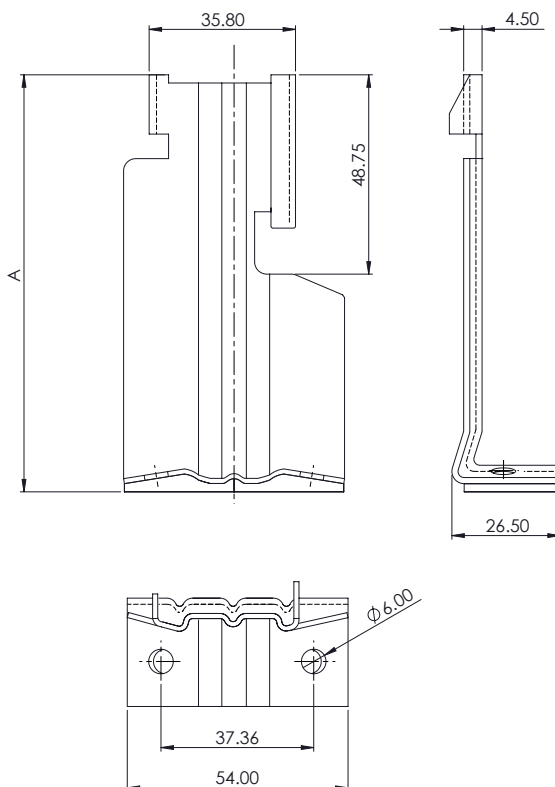


Figure 4. Ashgrid Bracket

Note: All dimensions in mm

A = Bracket height 80/110/120mm

For further details and technical enquiries

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