



COMMERCIAL ROOFING Insulation Product Selector



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Bradford[™] DesignSmart[™] FOR SMARTER SPECIFICATIONS

Bradford DesignSmart[™] has been developed to help architects, designers and specifiers select the right insulation products for their building projects.

DesignSmart[™] encompasses a range of tools and resources that will guide you through the requirements of the Building Code of Australia (BCA) and National Construction Code (NCC), help carry out design calculations quickly and easily and allow you to compare different insulation systems to meet and exceed the regulations.

DesignSmart also provides access to a wealth of resources including, data sheets, samples specifications, CAD files, MSDSs and expertise from our architectural specialists.

The DesignSmart[™] tools include:



Design Guides »

DesignSmart design guides contain all you need to know to meet the deemed to satisfy requirements of the BCA Section J for your specific building type.



Online Calculator »

The DesignSmart online calculator helps carry out complex calculations to allow you to quickly and easily design insulation systems for your project.



The DesignSmart product selectors provide comprehensive design information to assist with developing project specific specifications while meeting Section J requirements for specific applications.



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1.0 INTRODUCTION

Designing and selecting the right materials to meet Building Code and end user requirements is critical during the design phase of a project. With the introduction of amendments to the National Construction Code of Australia for 2012, CSR Bradford[™] has updated this Commercial Roofing manual to incorporate the latest changes to the Energy Efficiency provisions for Class 2-9 commercial buildings contained within the Building Code of Australia (BCA).

This manual provides guidance on:

- The building code energy efficiency provisions for commercial roofing insulation;
- How to meet and exceed these BCA requirements with CSR Bradford insulation products;
- Roof spacer products available to ensure insulation product recovery in accordance with the BCA regulations;
- Decorative and functional insulation blanket facing options to suit a broad range of applications.

In addition to this manual, the CSR Bradford online DesignSmart suite of resources provides access to a broad range of useful resources, check online at www.bradfordinsulation.com.au/designsmart

The Building Code represents the minimum level of insulation for good energy efficiency and performance of the building envelope. Given the relatively low capital cost of insulation, increasing roofing insulation R-Values during the design phase can decrease the air conditioning load, thus reducing project capital equipment costs as well as future running costs.

CSR Bradford recommends that a qualified Engineer be consulted when specifying insulation work for your project to ensure that the insulation specified will provide optimum energy efficiency and BCA compliance.

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green building council australia

Bradford Insulation is a member of the Green Building Council of Australia.

2.0 ROOFING DESIGN CONSIDERATIONS

2.1 The benefits of insulation

- Helps meet or exceed the BCA Energy Efficiency requirements by providing thermal insulation – by meeting these requirements your smart design helps reduce greenhouse gas emissions;
- Provide a more comfortable working environment for occupants by reducing heat flow in and out of the building;
- A better working environment, by reducing rain and other external noise and also by suppressing reflection of internal noise;
- A safer environment, as it reduces the possibility of fire spread in the event of a roof-space fire;
- Reduces the occurrence of condensation which minimises the risk of damage to roof sheeting and internal ceiling linings caused by condensation;
- Decreases building running costs, by reducing the load required to heat and cool the space and/or the size of the heating/cooling plant;
- Reduced 'metal creep' creaking noises which occur when there are sudden external temperature changes.

2.2 Designing for BCA Section J and Green Star

The Building Code of Australia (BCA) provides the minimum deemed to satisfy total thermal performance required for roofs. Insulation plays a major role in achieving these minimum values.

In Green Star buildings one of the highest factors that contribute to the achievement of Green Star points is energy improvement. The upgrade of passive insulation within a building can result in significant energy savings.

Regardless of the building achieving a Green Star rating or meeting Deemed-to-Satisfy provisions of the BCA, there is a strong case to increase specified insulation performance as the energy savings can quickly pay for the increase in capital costs.

2.3 Designing for condensation requirements

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.

CSR Bradford Anticon[™] has been developed specifically for the control of condensation and will dramatically reduce the chance of condensation occurring underneath metal roofs.

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 in tropical and alpine climate zones where climate and moisture are more extreme. Even when buildings are not required to meet the BCA, insulation should still be considered to reduce the potential of condensation occurring in a building.

For applications in tropical climates CSR Bradford Anticon must be installed blanket side up and an additional foil layer, lapped and taped should be provided over the blanket against the roof sheeting. For more information on designing for tropical regions please contact your CSR Bradford representative.

2.4 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 (LW dB) by over 20% when compared against no insulation. Please refer to Section 6.3 and Table [6.3]for detailed information and always consult an Acoustic Engineer prior to finalising your project specification.

DESIGNSMARTTH **ONLINE CALCULATOR** Customised information at your fingertips

DesignSmart[™] places all the information you need for your specific project at your fingertips. The web based tools allow you to review the BCA for each class of building and help you design and specify the insulation products to meet the building's thermal and acoustic requirements

Best of all, **DesignSmart**[™] will email detailed design calculations, relevant product data sheets, MSDS and specifications to you to include in your project file, speeding up your design process.

Let DesignSmart[™] help you design smarter and faster. **Visit bradfordinsulation.com.au/designsmart**



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2.5 Designing to control fire risk & BAL

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 range of sarking and facing products that can meet the BCA Fire Hazard Properties are also available – please ensure that your Fire Engineer reviews all recommendations prior to installation. *Density up to 15.9kg/m³

2.6 Designing for 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.

2.7 Designing for agricultural use

CSR Bradford offers a range of products designed to resist the conditions found in agricultural use. CSR Bradford **Agricon[™]** is specially designed for areas which require washdown such as poultry and animal husbandry applications and is available in two colours: off white and forest green.

2.8 Designing for aesthetics

Use of the right facing material on your CSR Bradford Anticon can contribute to the interior aesthetic finish of your building. Our premium foil range and specialist range of decorative facings can ensure that you achieve the right finish. Contact CSR Bradford for further information or refer to the tables [4.1 & 4.2] on page 9 for more information.

2.9 Designing for indoor air quality

CSR Bradford Anticon Glasswool insulation has been tested in accordance with ASTM D5116 and found to have low Volatile Organic Content (VOC). This result is below the detection limit for the test method and indicates that the emissions can be considered insignificant.

2.10 Understanding R-Values & emissivity

As most CSR Bradford roofing insulation products combine a Glasswool base blanket with a facing, a very wide range of products is available. In order to select the right product combination for your application, CSR Bradford recommend that you determine the blanket thickness required to meet the thermal requirements of the project and then select the facing that provides the best level of performance or aesthetics for your particular application.

AS/NZS4859.1:2002 allows insulation manufacturers to present the performance of insulation either as a material value ($R_{\rm M}$) or a total R-Value ($R_{\rm T}$) for the application. In order to ensure proper product representation and accurate performance and cost comparison of products, it is important that the distinction between the two classifications is clear.

MATERIAL R-VALUE (R_M)

This is the raw performance of the base insulation material excluding the insulation contribution of any materials used in the construction of the building.

Note: $\mathsf{R}_{\scriptscriptstyle M}$ is directly proportional to the insulation material thickness

TOTAL R-VALUE (R_T)

This is the overall performance of the roofing system, including the base insulation material, contribution of materials used in the construction of the building, air spaces, air film resistances and emissivity of the insulation facing material.

Please note that as the emissivity of the facing material can influence the Total R-Value – this manual only represents R_{τ} values for reflective foil faced products. For all other facing materials (for example white) it is important that CSR Bradford is consulted early in the design phase to ensure that the base insulation material is adequately compensated for any reduction in overall performance.



B.O COMPLIANCE TO THE BCA

The BCA makes provisions for energy efficiency in conditioned spaces, sound insulation and fire protection for public buildings. These recognise that well insulated buildings that control heat and cold, along with good acoustic insulation are important elements of good building design.

Please note that the following is a guide and CSR Bradford recommends that you work closely with your building surveyor/private certifier, fire engineering consultant and insurance provider early in the design phase of your building to ensure compliance where appropriate to your specific building type and project requirements.

To provide long term energy savings with a minimal increase in initial installation cost, CSR Bradford recommends an incremental increase in insulation performance above the BCA Section J Deemed-to-Satisfy minimum insulation levels. Increasing insulation levels will quickly pay dividends for building owners, representing a short term return on installation costs as the benefits of reduced energy costs can be passed on to building occupants and ultimately contribute to a reduction of greenhouse gases.

STEP A: Select the Climate Zone

The BCA specifies the minimum Deemed-to-Satisfy performance for a commercial roof dependent upon the climate zone the building is located in. Locate the correct climate zone for your building from the following map or go to the Australian Building Codes Board website for more detailed maps **www.abcb.gov.au**. Please note that compliance can be achieved via verification with an acceptable rating scheme or using the Deemed-to-Satisfy provisions in the BCA.

The CSR Bradford **DesignSmart** program has been developed specifically to help simplify the process of meeting the Deemed-to-Satisfy provisions of the BCA. Follow these simple steps to specify the right roofing insulation for your project.





Select the climate zone for your project location from the BCA map

B Determine the required thermal performance

Select the required roof system and note the minimum required insulation product

Cli	
	Zone 1 – Darwin, Townsville, Cairns
	Zone 2 – Brisbane, Gold Coast, Sunshine Coast
	Zone 3 – Alice Springs
	Zone 4 – Dubbo, Griffith
	Zone 5 – Sydney East of Parramatta, Adelaide, Perth
	Zone 6 – Melbourne, Sydney West of Parramatta
	Zone 7 – Hobart, Canberra
	Zone 8 – Alpine regions





STEP B: Select the Roof Colour

The BCA Section J energy efficiency provisions for commercial roofing vary depending on the roof colour. It is critical that the manufacturer's designated solar absorptance value for the building's selected roof colour is used in this step of the process.

IMPORTANT - Loss of ceiling insulation

BCA Table J1.3b – note that the BCA also sets out a requirement for adjustment of minimum R-Value to compensate for loss of ceiling insulation due to the presence of recessed light fittings and services. The following roofing insulation tables in this manual do not provide solutions where the loss of ceiling insulation exists – please refer to the BCA for further details and contact CSR Bradford for solutions.

3.1. Minimum Total System R-Value required

Using the relevant climate zone selected in step A, determine the solar absorptance & appropriate BCA compliant year for the project design. Using the table below correlate the three (3) variables to determine the minimum Total System R-Value required. Please note that the solar absorptance value range changes between 2010 & 2011.

ROOF COLOUR	CLI	MATE ZO	NES						
		1	2	3	4	5	6	7	8
Direction of hea	at flow			Inw	ards			Outw	/ards
	Very Light Roof [absorptance ≤ 0.5]	R _⊤ 3.2	R _⊤ 3.2	R _⊤ 3.2	R _⊤ 3.2	R ₇ 3.2	R _⊤ 3.2	R _⊤ 3.7	R ₇ 4.8
BCA 2010	Light Roof [0.5 > absorptance \leq 0.6]	R _⊤ 3.7	R _⊤ 3.7	R _⊺ 3.7	R _⊺ 3.2	R _⊺ 3.2	R _⊺ 3.2	R _⊺ 3.7	R ₁ 4.8
	Dark Roof [absorptance > 0.6]	R ₁ 4.2	R ₁ 4.2	R ₁ 4.2	R _⊺ 3.2	R _⊺ 3.2	R ₇ 3.2	R _⊺ 3.7	R ₁ 4.8
	Very Light Roof [absorptance ≤ 0.4]	R _⊤ 3.2	R _⊤ 3.7	R _⊤ 4.8					
BCA 2011	Light Roof [0.4 >absorptance ≤ 0.6]	R _⊺ 3.7	R _⊺ 3.7	R _⊺ 3.7	R _⊺ 3.2	R _⊺ 3.2	R _⊺ 3.2	R _⊺ 3.7	R _⊺ 4.8
	Dark Roof [absorptance > 0.6]	R _T 4.2	R _T 4.2	R _⊤ 4.2	R ₇ 3.2	R _⊤ 3.2	R ₇ 3.2	R _⊤ 3.7	R _⊤ 4.8
	Very Light Roof (absorptance ≤ 0.4)	R _⊤ 3.2	R _⊺ 3.7	R ₁ 4.8					
BCA 2012	Light Roof (0.4 > absorptance \leq 0.6)	R _⊺ 3.7	R _⊺ 3.2	R _⊺ 3.7	R ₁ 4.8				
	Dark Roof (absorptance > 0.6)	R _T 4.2	R _⊤ 4.2	R _T 4.2	R _T 4.2	R _T 4.2	R ₇ 3.2	R _⊤ 3.7	R _⊤ 4.8

Table 3.1



STEP C: Determine the minimum insulation required for the projects roofing system

From the table below, select the relevant roof system for the project and then correlate this roof system with the required Total R-Value (R_T) generated in Table 3.1 from the preceding step (shown along the top row).

displayed at the intersection of the roof system (x-axis) and Total R-Value (y-axis).

Note regarding emissivity: These R_{τ} values relate to Anticon products faced with light, medium or heavy duty reflective foils only. Please contact CSR Bradford for assistance in calculating R_{τ} values for Anticon faced with decorative facings or Agricon products.

The CSR Bradford Anticon Deemed-to-Satisfy solution is

3.2. Deemed-to-Satisfy Anticon Product Solutions

ROOFS	TARGET TOTAL R-VALUE,					
Deemed-to-Satisfy Total R-Value		R ₇ 3.2	R _r :	3.7	R ₇ 4.2	R _τ 4.8
Heat flow direction		Inwards	Inwards	Outwards	Inwards	Outwards
Pitched metal roof with flat ceiling R	0200 - use Spacers where app	propriate, refer S	ection 5			
100	Anticon Foil Faced Blanket	95	100HP	130	130	100HP
	Additional Bradford Gold Insulation	Nil	Nil	Nil	Nil	R1.5
Pitched metal roof with cathedral cei	ling below rafters (non ventila	ated) R0400 - us	se Spacers wher	re appropriate, r	efer Section 5	
minimum air gap	Anticon Foil Faced Blanket	75	95	130	130	100HP
100mm	Additional Bradford Gold Insulation	Nil	Nil	Nil	Nil	R1.5
Flat metal roof with plasterboard ceil	ing R0700 - use Spacers when	re appropriate, r	efer Section 5			
www.www.www.minimum	Anticon Foil Faced Blanket	55	75	130	95	100HP
100mm	Additional Bradford Gold Insulation	Nil	Nil	Nil	Nil	R1.5
Flat metal roof with no ceiling R0900	- use Spacers where appropri	iate, refer Sectio	on 5			
	Anticon Foil Faced Blanket	100HP	130	145	145	*
	Additional Bradford Gold Insulation	Nil	Nil	Nil	Nil	*
Flat metal roof with suspended ceiling	g R1000 - use Spacers where	appropriate, ref	er Section 5			
air gap	Anticon Foil Faced Blanket	55	75	130	95	100HP
< 600mm	Additional Bradford Gold Insulation	Nil	Nil	Nil	Nil	R1.5
Flat metal roof suspended ceiling ple	num return R1100 - use Spac	ers where appro	priate, refer Sec	ction 5		
	Anticon Foil Faced Blanket	140	145	145	*	*
	Additional Bradford Gold Insulation	Nil	Nil	Nil	*	*
Flat 150mm concrete roof with suspe	ended ceiling R1200 - use Hilt	i or Ramset pins	s where appropri	iate		
air gap	Anticon Foil Faced Blanket	55	75	130	95	100HP
< 600mm	Additional Bradford Gold Insulation	Nil	Nil	Nil	Nil	R1.5
Flat 150mm concrete roof with ceilin	g plenum return R1300 - use	Hilti or Ram <u>set i</u>	pins where appre	opriate		
	Anticon Foil Faced Blanket	140	145	140	*	*
	Additional Bradford Gold Insulation	Nil	Nil	Nil	*	*

Table 3.2: BCA Deemed-to-Satisfy Anticon Product Solutions

*Contact CSR Bradford for a solution. For detailed system descriptions refer to ICANZ Insulation Handbook, Part 1 Thermal Performance or consult your nearest CSR Bradford representative. In some climates consideration must be given to the positioning of the vapour barrier and the level of insulation as the minimum BCA targets may not be adequate to provide the required condensation control.

4.0 PRODUCT APPLICATIONS & FACING SELECTION

Choosing the right product for your project is essential to ensure the proper performance and appearance. This section provides basic guidance on product selection, but if you are in doubt please contact CSR Bradford for expert advice specific to your project needs.

4.1 How to select the right product for your project

The CSR Bradford range of roofing insulation products can be used for a variety of applications. The following table provides guidance on some of the more popular product applications.

APPLICATION	RECOMMENDED PRODUCT AND FACING
Warehouse: Exposed roofs which need to look good and offer a medium level of tear resistance	CSR Bradford Anticon with medium or heavy duty foil
Bulky Goods Retail: Exposed roofs that require a premium finish and good light reflectance	CSR Bradford Building Blanket with Thermoplast 990 white facing laid separately or Anticon with heavy duty foil
Sporting & Halls: Exposed roofs that require a premium coloured finish and good light reflectance	CSR Bradford Building Blanket with Thermoplast 990 white facing laid separately
Farm Sheds: Exposed roofs in sheds used for housing poultry and livestock	CSR Bradford Agricon in either off-white or forest green
Car Parks: Exposed under-slab roof applications	CSR Bradford Building Blanket or Board faced with PUSF (Premium Under Soffit Foil)
Chilled Beam Applications: Exposed cooling beams partially visible inside a building	CSR Bradford Flexitel or Supertel faced with Ultraphon (Black)
Swimming Pools: Environments where condensation control is critical	Contact CSR Bradford for solutions
Exposed Roofs: Where aesthetics (visual appearance) is critical	CSR Bradford Building Blanket with Thermoplast 993 white sarking or Thermofoil 753 reflective sarking laid separately
Exposed Roofs: Where acoustics are critical	CSR Bradford Building Blanket with Thermofoil Perforated Foil (Note: This system is not suitable for condensation control) Contact CSR Bradford for alternative solutions
Exposed roofs: Where the insulation needs to blend into the background	CSR Bradford Anticon with Thermofoil Black (only suitable for non-aesthetic applications)
VENTILATION	
Heat Load: Roof spaces where excess heat loads need to be ventilated	Edmonds Hurricane [™] or ecopower [®] roof ventilators
Noxious Gases: Roof spaces where noxious gases need to be ventilated	Edmonds ecopower [®] roof ventilator

For project specific applications not listed above, please contact CSR Bradford for design specific advice on product suitability.

Table 4.1



4.2 Available facing materials for roofing blanket

Anticon and Roofing Blanket products are available in a range of facings as shown below. Please note that only facings that are vapour impermeable are suitable for condensation control. Note: Emissivity is the ability of a material to emit energy by radiation – the table below provides guidance to the degree that the facing material impacts the performance of the total system R-value (R_{γ}) of the insulation blanket and facing material.

FACING	DESCRIPTION EMISSIVITY		CONDENSATION CONTROL	AESTHETICS	ACOUSTICS (ASSUMES SAME BASE MATERIAL)
Foil facings – suitable for all system ap	plications				
Thermofoil Light Duty	An economical reflective foil	<i></i>	JJ	1	✓
Thermofoil Medium Duty	A stronger foil with additional crush resistance	<i></i>	JJ	JJ	—
Thermofoil Heavy Duty	Premium strength for a premium finish	<i></i>	JJ	<i> 」 」 」 」 」 」 」 」 」 </i>	
Acoustituff	Developed to provide a combination of acoustic performance & condensation control	JJJ	J J	1	JJ
Premium Under Soffit Foil (PUSF)	A premium looking foil with good condensation control	<i> 」 」 」 」 」 」 」 」 」 </i>	<i>JJ</i>	<i> 」 」 」 」 」 」 」 」 」 </i>	

Decorative facings – only suitable for R0900 systems and B1400 (with no ceiling)							
Thermoplast White Decorative Facing		A white decorative facing with medium level of reflectivity	1	J J J	<i> 」 」 」 」 」 」 」 」 」 </i>	—	
Thermofoil Black		Low reflectivity foil facing – non aesthetic, suitable for hidden applications only	NA	JJ	NA	_	
Perforated Foil		Available in Heavy Duty and Thermoplast white (Note: Not suitable as a vapour barrier)	1	NA	<u>ال</u>	J JJ	
Ultraphon		Premium woven glass facing (Note: Not suitable as a vapour barrier)	NA	NA	<i> 」 」 」 」 」 」 」 」 」 </i>	<i> </i>	



5.0 ROOF SPACER SYSTEMS

5.1 Code compliance using spacers

To ensure compliance with BCA Section J, insulation must be allowed sufficient space under the roof sheet to recover to its design thickness, other than where it is compressed between cladding and supporting members. This clause is to ensure that the performance of the insulation is not lost due to the compression of the insulation below the roof sheet and where required, CSR Bradford offers a number of solutions to satisfy this requirement.

5.2 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'. 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 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.

Additionally, 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 air space created between the underside of the roof sheet and safety mesh.

5.3 Ashgrid Spacer System

Bradford[®] **T**

The Bradford Ashgrid Spacer System attaches to the top face of the purlin and elevates the roof sheet to create space for the insulation. Available in a number of different bracket heights to suit the various insulation thicknesses, the Ashgrid Spacer System is also available in a fully tested (low-high-Low) cyclonic version. Refer to the Roof Spacer System Product Selector for detailed specifications.



Figure 5.3: Bradford Spacer System Configuration

Anticon product	R _{MAT}	Blanket thickness (mm)	Spacer height (mm)
Anticon 55	R1.3	60	40mm batten
Anticon 75	R1.8	80	60
Anticon 95	R2.3	100	80
Anticon 100HP	R2.5	100	80
Anticon 110	R2.5	110	110
Anticon 130	R3.0	130	110
Anticon 140	R3.3	140	120
Anticon 145	R3.6	145	120

Table 5.3: Spacer application range for Anticon insulation

Important Note: As Spacer Systems change the roofing structure, please check with your Structural Engineer that the spacer used is compatible with the roofing system design prior to construction.





5.4 SafeBridge® Roofing System

Unlike Roof Spacers, Safebridge[®] does not raise the height of the roof as it uses the depth of the purlins to provide a cavity for the insulation to recover to its design thickness. Through the development of a patented bridging system and keyway, Safebridge[®] allows the purlin bridging to be set at a predetermined height during the design phase. By designing in this 'cavity' for the insulation, Safebridge[®] retains attachment of the roof sheet to the purlins which ensures that this roof system is as flexible as the roof designer wants to be.

One of the key risk minimisation features of Safebridge[®] is that it allows assembly of the roof mesh from below the unprotected roof surface, ensuring workers remain in the safety of a scissor lift. To further minimise risk exposure, the system uses an innovative 'mesh trolley' to allow extremely fast roll-out of mesh along the length of the purlins, something that is simply not possible with traditional spacer systems.

The key safety benefits are:

- Creates a safer roof environment for workers during construction
- Code compliant with BCA/NCC Section J
- Uses the purlin space without elevating the overall roof or fascia height
- Suitable for cyclonic and non-cyclonic regions

For more information and project specific advice, please contact CSR Bradford early in the design process.



Figure 5.4 SB-1: Safebridge System Configuration

Roof sheet Thermal break tape Metroll Safebridge® Purlin Bradford Anticon™SB Foil facing Safebridge® Mesh Safebridge® Bridge Bar

SafeBridge [®] design specific considerations					
Standard purlin spacing 610mm, 910mm, 1210mm, 1360mm					
Bridge bar spacing	Maximum 1500mm				

Table 5.4: Safebridge standard purlin spacing must be chosen at design phase

5.5 Installation under concrete slab roofs – Soffits

When fixing insulation to underside of slab, insulation is pinned to slab using plastic anchors such as Hilti X-IE6, Ramset or similar and insulation foil laps are taped. Unlike rigid foam panels, the compressibility of Glasswool allows the insulation to be cut and butted together to form neat joints around structural protrusions and service fixtures.

In determining this finish, note that the density of insulation plays a key role in the 'flatness' of the final finish of the installed surface, particularly after the application of the anchoring pins. The illustrations below provide a guide to the difference between densities but it is recommended that you consult with your CSR Bradford representative prior to making a final decision.



Figure 5.5.1: Underslab fixing - Supertel - Limited pillowing



Figure 5.5.2: Underslab fixing - Building blanket - some pillowing



5.0 TECHNICAL INFORMATION – INSULATION

The following tables outline the key technical information on CSR Bradford insulation products. Further information can be found on the product data sheets available from the CSR Bradford website **www.bradfordinsulation.com.au/designsmart**

6.1 Specifications

Product	Base blanket material R-Value	Thickness (mm)	Nominal length (m)	Nominal width (mm)	Nominal coverage per roll (m ²)	Nominal density (kg/m³)	Nominal pack weight ex-facing (kg)
Anticon™							
Anticon 55	R1.3	60	15	1200	18	9.8	11.88
Anticon 75	R1.8	80	15	1200	18	10.8	15.84
Anticon 95	R2.3	100	10	1200	12	11.9	13.2
Anticon 100HP	R2.5	100	10	1200	12	14.5	16.8
Anticon 110	R2.5	110	10	1200	12	11	14.52
Anticon 130	R3.0	130	10	1200	12	12	17.16
Anticon 140	R3.3	140	7.5	1200	9	13.5	21.02
Anticon 145	R3.6	145	7.5	1200	9	15.9	24.8
Agricon™							
Agricon	R1.5	75	15	1200	18	9	20.16

Note: Nominal Pack weight is based on Medium Duty foil facing, for information on pack weights for other facings contact CSR Bradford.

6.2 Fire performance

Where ceiling linings are to be designed for fire resistance the following table provides information on fire indices to AS/NZS1530.3 and group classifications to AS/NZS3837.

			AS/NZS3837			
Product	Facing	Ignitability	Spread of flame	Heat evolved	Smoke developed	Group classification
	Foil (MD & HD)	0	0	0	0-1	1
Building Blanket	White Thermoplast 990	0	0	0	0-1	1
Supertel	Ultraphon	0	0	0	3	1
Ultratel	Acoustituff	12	0	1	5	1
	Premium Underslab Facing	0	0	0	0-1	1

Table 6.2

Table 6.1

6.3 Acoustic performance

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.

	Estimated performance – Rainfall sound power level predictions, L _w dB								
Roof profile	No Insulation (dB)	Anticon 55 (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 & assumptions:

1. Calculations are based upon a roof area of $10m^2\,\text{with}$ 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 sandwiches 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

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Table 6.3

VENTILATION PRODUCTS

A well designed building ventilation system will contribute to improved productivity and a safer work environment. Adequate ventilation means stale, polluted or uncomfortably hot air is exchanged with fresh, external air, improving the quality and comfort of the internal environment for building occupants.

Ventilation can also help reduce energy usage, greenhouse gas emissions and assist in the control of condensation.

The Edmonds commercial ventilation range consists of the naturally (wind) powered Hurricane[™] and the hybrid powered ecopower[®], as well as custom bases & ventilator dampers.

7.1 Hurricane[™]

Edmonds Hurricane ventilators are designed to be powered naturally by wind & rising hot air. As a result, the performance is dependent on favourable weather conditions. The standard Hurricane is available in a wide range of sizes from 100mm to 900mm. They are constructed from corrosion resistant aluminium and feature a double row bearing system. Edmonds Hurricane Vents are covered by a 15 year warranty. The total Hurricane range includes ventilators suitable for:

- Normal building ventilation, primarily excess heat;
- Buildings and structures with high levels of moisture or humidity;
- Buildings with hostile or highly corrosive internal environments.
- Available for bushfire zones up to BAL40.

7.2 Ecopower®

The Edmonds ecopower[®] has been designed to overcome the limitations of natural ventilators in situations of little or no wind. The ecopower incorporates a highly efficient electrically commutating (EC) motor built into the ventilator turbine. This design allows the ecopower to operate as a natural ventilator or be switched to powered mode to deliver high levels of ventilation equivalent to that of a powered fan but with substantially lower levels power consumption and noise, as the table below shows. Edmonds ecopower offers the following unique benefits:

- High efficiency ventilation at all times with low energy costs;
- Suitable for use in harsh or noxious gas environments;
- Light weight Edmonds vertical vane vent technology for higher performance*.

	300mm Axial fan	ecopower 400	Change	450mm Axial fan	ecopower 600	Change	630mm Axial fan	ecopower 900	Change
Exhaust Rate [m ³ /hr]	2160	2400	11% higher	4280	4280		9000	10000	11% higher
Power [W]	160	68	63% lower	480	116	76% lower	1000	260	76% lower
Noise @ 3m [dB(A)]	55	46	9 dB(A) Iower	60	49	11 dB(A) lower	60	45.5	14.5dB(A) lower

*Flow coefficient tests performed under AS4740:2000

The ecopower EP900 has the ability to operate at variable speed levels depending on the temperature near the ventilator. As the temperature increases the ventilator increases in speed. This means the ventilator will operate at maximum efficiency with minimal power consumption. To allow complete control of your buildings ventilation system, manual and electric dampers are available to suit both the Hurricane & ecopower ventilator ranges.







Table 7.0

8.0 ACCESSORIES

CSR Bradford stocks a broad range of accessories to enable roofing contractors to get all they need to do the job from a single supplier. For a comprehensive list of products and pricing refer to CSR Bradford price list or contact your local Bradford distributor.

PRODUCT		DESCRIPTION	
Safety Mesh		Available in a range of widths, lengths & colours	
Ashgrid Spacer System	h	Bracket heights available 60/80/110/120mm	
Safebridge		Unique roofing system, available exclusively from Bradford	
Reinforced Foil Tape		Suitable for taping foil overlap & patching to maintain the condensation barrier	
Thermal Break Tape	0	Essential to create R0.2 thermal break	
			Table 8 (

HEALTH AND SAFETY

Glasswool insulation products are excellent insulation materials and are safe to use under all conditions. Insulation materials have been in worldwide use for over 70 years, and during that time their manufacture and use have been extensively monitored and researched.

CSR Bradford Glasswool products are manufactured using the latest FBS-1 bio-soluble technology. Detailed information on health & safety is contained in the MSDS & ICANZ (Insulation Council of Australian & New Zealand) literature available from our website: **www.bradfordinsulation.com.au**.



CSR Building Products Limited warrants CSR Bradford[™] products to be free of defects in materials and manufacture. CSR Bradford[™] bulk insulation and foil faced products should not come into contact with water or be used in external applications or alkaline environments. Contact CSR Bradford[™] for further Warranty details or refer to the Product or Project specific Warranty where applicable. For full Product Warranty details please refer to our website.

For more information call 1300 887 160 or visit www.bradfordinsulation.com.au



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