

# BRADFORD ENVIRODUCT



# MAKING THE NEW BCA HVAC INSULATION REGULATIONS AS EASY AS



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## 1. INTRODUCTION

Designing and selecting the right materials to meet building code and end user requirements can be difficult. Bradford Insulation's DesignSmart Design Guides simplify codes and standards to make it easier for you to develop your specification, confident that it meets all the requirements.

With the introduction of the Building Code of Australia 2010 Energy Efficiency provisions for Class 2 - 9 commercial buildings (BCA), we are updating our Enviroduct offer to include new products and systems to meet the new BCA and beyond.

For HVAC applications outside Australia these energy efficiency building regulations provide an excellent guide to the minimum levels of insulation for good energy efficiency and performance of air conditioning and heating systems.

Increasing duct insulation R-Values can reduce the size of plant needed, thus reducing project capital cost.

This brochure provides information on:

- The new building code energy provisions for HVAC ductwork and pipework insulation
- How to meet and exceed these BCA requirements with Bradford Insulation products
- New R-rated products –AS/NZS4859.1 compliant
- Facing options for internal and external duct lagging

Note: In some climates and air conditioning applications the minimum BCA duct work insulation requirements for energy efficiency may be insufficient for either the optimum energy efficiency performance of the system or for control of condensation. Bradford Insulation recommends that a qualified mechanical services engineer be consulted when specifying duct insulation work for your project.

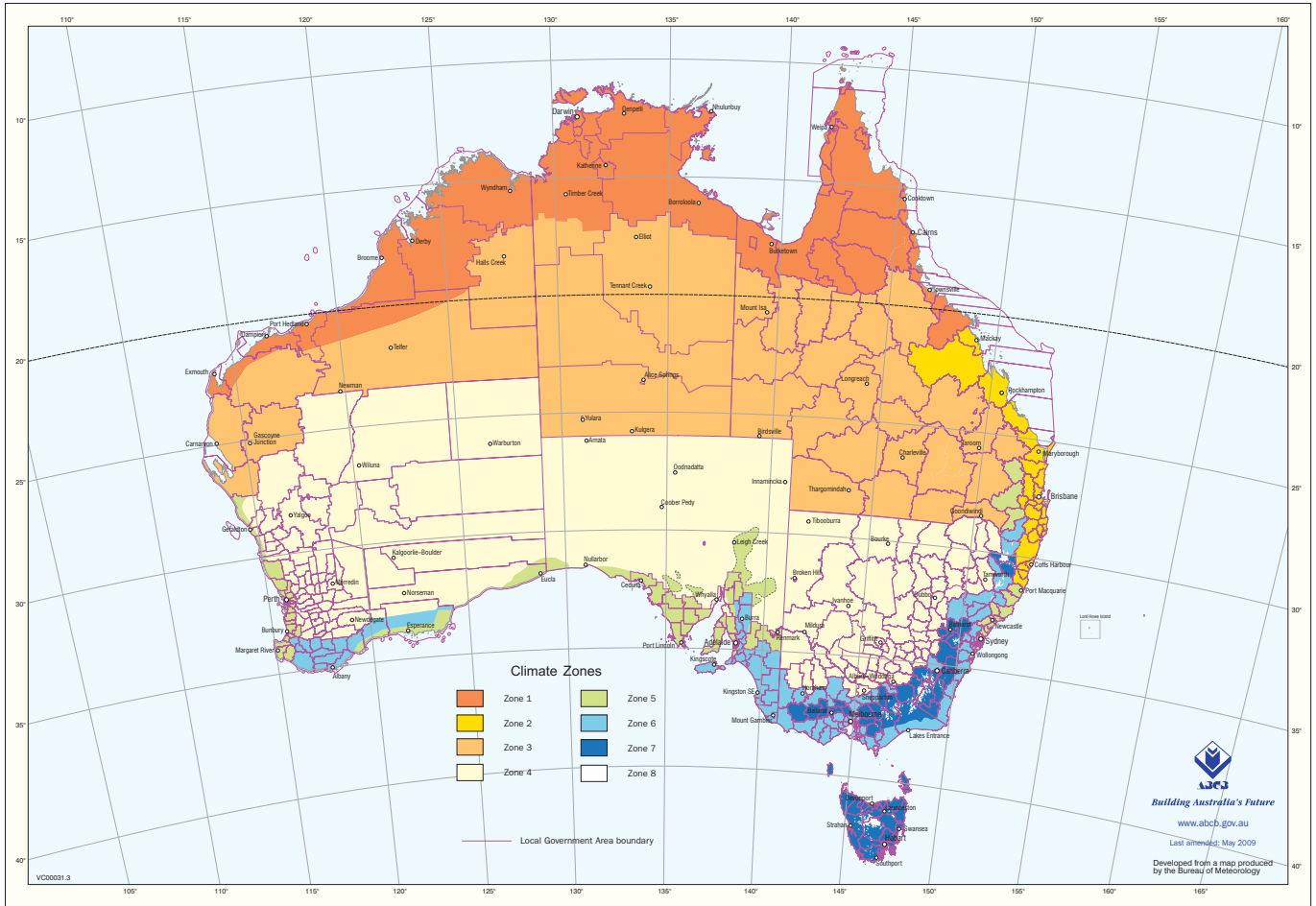


# 2. ENERGY EFFICIENCY (SECTION J) REGULATIONS

Follow these simple steps to specify the right HVAC insulation for your project

## Step A.

Determine which climate zone your project is in from the map below.



## Step B.

Look up the R-Value required for the type of air conditioning system and location of the duct from the table below (BCA Vol. 1 Spec. J5.2).

### 2.1. Minimum Required Material R-Value – Ductwork

Location and element	Minimum Total R-Value for ductwork							
	Climate Zone							
Location	1	2	3	4	5	6	7	8
Ductwork within a conditioned Space	R1.2	R1.2	R1.2	R1.0	R1.2	R1.0	R1.0	R1.6
Ductwork exposed to Sun	R3.0	R3.0	R3.0	R3.0	R3.0	R3.0	R3.0	R3.4
Ductwork in all other locations	R2.0	R2.0	R2.0	R2.0	R2.0	R2.0	R2.0	R2.4

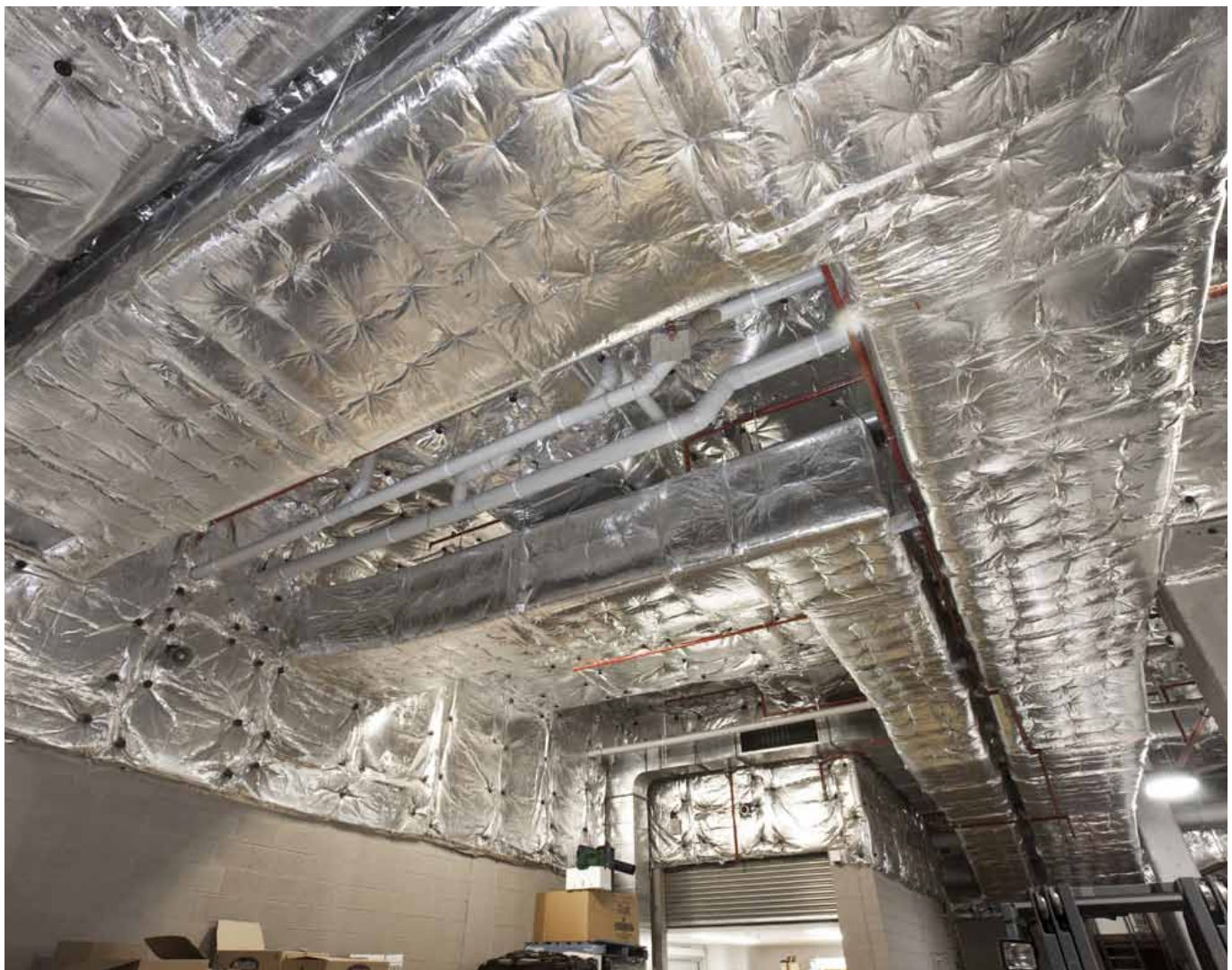
## Step C.

Specify the minimum recommended Bradford products to meet or exceed the BCA duct work requirements from the table below.

## 2.2. Recommended Minimum Insulation - Ductwork

BCA Minimum Material R-Value	Internal Ductliner			External Ductwrap		Flexible Duct	
	Product	Thickness		Product	Thickness	Product	Thickness
R1.0	Supertel	38mm	OR	Multitel/Flexitel	38mm	R1.0 Specitel	40mm
R1.2	Supertel	50mm	OR	Multitel/Flexitel	50mm	R1.5 Specitel	60mm
R1.6	Supertel	63mm	OR	Multitel/Flexitel	75mm	R1.8 Building Blanket	80mm
R2.0	Supertel	75mm	OR	Multitel/Flexitel	75mm	R2.0 Building Blanket	90mm
R2.4	Supertel	100mm	OR	Multitel/Flexitel	2 x 50mm	R2.5 Building Blanket	110mm
R3.0	Exetel	100mm				R3.0 Building Blanket	130mm
	Supertel	75mm	AND	Multitel/Flexitel	38mm		130mm
R3.4	Supertel	63mm	AND	Multitel/Flexitel	75mm	R3.6 Building Blanket	145mm
	Supertel	75mm	AND	Multitel/Flexitel	50mm		

The 2010 BCA Deemed to Satisfy requirements are based on the **Material R-Value** and not the Total R-Value as in previous versions of the BCA. Please ensure you use the Material R-Value (Rmat) when comparing alternate products.



## 2.3. Minimum Required Material R-Value – Pipework

The BCA also covers pipe insulation energy efficiency which in part require:

Location	Climate Zone							
	1	2	3	4	5	6	7	8
Heating water piping for systems of not more than 65kW <sub>heating</sub> capacity								
Located Internally	R1.0	R1.0	R1.0	R1.0	R1.0	R1.0	R1.0	R1.3
Enclosed wall space, sub-floor or roof space	R1.1	R1.1	R1.1	R1.1	R1.1	R1.1	R1.1	R1.4
Outside or unenclosed sub-floor or roof space	R1.2	R1.2	R1.2	R1.2	R1.2	R1.2	R1.2	R1.5
Heating water piping for systems of more than 65kW <sub>heating</sub> capacity								
Located Internally	R1.0	R1.0	R1.0	R1.0	R1.0	R1.0	R1.0	R1.7
Enclosed wall space, sub-floor or roof space	R1.1	R1.1	R1.1	R1.1	R1.1	R1.1	R1.1	R1.8
Outside or unenclosed sub-floor or roof space	R1.2	R1.2	R1.2	R1.5	R1.2	R1.5	R1.5	R1.9
Cooling water piping for systems of not more than 65kW <sub>r</sub> capacity								
Located Internally	R1.0	R1.0	R1.0	R0.6	R1.0	R0.6	R0.6	R0.6
Enclosed wall space, sub-floor or roof space	R1.1	R1.1	R1.1	R0.7	R1.1	R0.7	R0.7	R0.7
Outside or unenclosed sub-floor or roof space	R1.2	R1.2	R1.2	R0.8	R1.2	R0.8	R0.8	R0.8
Cooling water piping for systems of more than 65kW <sub>r</sub> capacity but not more than 250kW capacity								
Located Internally	R1.7	R1.7	R1.7	R1.3	R1.7	R1.3	R1.3	R1.0
Enclosed wall space, sub-floor or roof space	R1.8	R1.8	R1.8	R1.4	R1.8	R1.4	R1.4	R1.1
Outside or unenclosed sub-floor or roof space	R1.9	R1.9	R1.9	R1.5	R1.9	R1.5	R1.5	R1.2
Cooling water piping for systems of more than 250kW <sub>r</sub> capacity								
Located Internally	R2.0	R2.0	R2.0	R1.7	R2.0	R1.7	R1.7	R1.3
Enclosed wall space, sub-floor or roof space	R2.1	R2.1	R2.1	R1.8	R2.1	R1.8	R1.8	R1.4
Outside or unenclosed sub-floor or roof space	R2.2	R2.2	R2.2	R1.9	R2.2	R1.9	R1.9	R1.5
Refrigerant not more than 2°C								
Pipe nominal diameter								
15mm - 40mm	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3
50mm - 80mm	R1.7	R1.7	R1.7	R1.7	R1.7	R1.7	R1.7	R1.7
100mm - 125mm	R2.0	R2.0	R2.0	R2.0	R2.0	R2.0	R2.0	R2.0
150mm	R2.0	R2.0	R2.0	R2.0	R2.0	R2.0	R2.0	R2.0
200mm	R2.7	R2.7	R2.7	R2.7	R2.7	R2.7	R2.7	R2.7
Refrigerant more than 2°C but not more than 20°C (See Cooling Water tables above)								
Steam and condensate not more than 120°C								
Pipe nominal diameter								
15mm - 40mm	R1.0	R1.0	R1.0	R1.0	R1.0	R1.0	R1.0	R1.0
50mm - 80mm	R1.0	R1.0	R1.0	R1.0	R1.0	R1.0	R1.0	R1.0
100mm - 125mm	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3
150mm	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3
200mm	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3	R1.3
Steam more than 120°C								
Pipe nominal diameter								
15mm - 40mm	R1.5	R1.5	R1.5	R1.5	R1.5	R1.5	R1.5	R1.5
50mm - 80mm	R1.5	R1.5	R1.5	R1.5	R1.5	R1.5	R1.5	R1.5
100mm - 125mm	R1.5	R1.5	R1.5	R1.5	R1.5	R1.5	R1.5	R1.5
150mm	R1.8	R1.8	R1.8	R1.8	R1.8	R1.8	R1.8	R1.8
200mm	R2.1	R2.1	R2.1	R2.1	R2.1	R2.1	R2.1	R2.1

Note: Piping to be insulated includes all flow and return piping, cold water supply piping within 500mm of the connection to the heating and cooling system and pressure relief piping within 500mm of the connection to the heating and cooling system. Tanks, vessels and heat exchangers must comply to BCA Vol 1 Spec. J5.4 - R-Values range from R1.3 - R2.5.

## 2.4. Recommended Minimum Insulation - Pipework

Bradford supplies glasswool, polystyrene foam and Armacell pipe insulation. Simply select which material best suits your application and read across from the pipe size to determine the required insulation thickness to meet the R-Value for your application. The Rmat values are calculated from the sectional pipe method calculation of AS4859.1. NOTE: Contact Bradford for availability & lead times of products. Please note that products can be nested if sizes are not available to meet project lead times.

Recommended minimum insulation thickness [mm] - Glasswool

Pipe			BCA Minimum Material R-Value															
Steel Pipe NB	Copper Pipe NB	OD	0.6	0.7	0.8	1.0	1.1	1.2	1.3	1.4	1.5	1.7	1.8	1.9	2.0	2.1	2.2	2.7
	15	12.7	25	25	25	25	25	25	25	25	25	38	38	38	38	38	38	50
	18	15.9	25	25	25	25	25	25	25	25	38	38	38	38	38	38	38	50
	20	19.1	25	25	25	25	25	25	25	38	38	38	38	38	38	38	38	50
	25	25.4	25	25	25	25	25	25	38	38	38	38	38	38	38	38	38	50
	32	31.8	25	25	25	25	25	38	38	38	38	38	38	38	38	38	50	50
	40	38.1	25	25	25	25	25	38	38	38	38	38	38	38	38	50	50	50
	45	44.5	25	25	25	25	38	38	38	38	38	38	38	50	50	50	50	63
	50	50.8	25	25	25	25	38	38	38	38	38	38	50	50	50	50	50	63
50		60.3	25	25	25	25	38	38	38	38	38	50	50	50	50	50	50	63
	65	63.5	25	25	25	25	38	38	38	38	38	50	50	50	50	50	50	63
	80	76.1	25	25	25	38	38	38	38	38	38	50	50	50	50	50	50	63
	90	88.9	25	25	25	38	38	38	38	38	38	50	50	50	50	50	63	63
	100	101.6	25	25	25	38	38	38	38	38	38	50	50	50	50	63	63	63
100		114.3	25	25	25	38	38	38	38	38	50	50	50	50	50	63	63	63
	125	127.0	25	25	25	38	38	38	38	38	50	50	50	50	50	63	63	75
	150	152.4	25	25	25	38	38	38	38	38	50	50	50	50	63	63	63	75
150		168.3	25	25	25	38	38	38	38	50	50	50	50	50	63	63	63	75
	175	177.8	25	25	25	38	38	38	38	50	50	50	50	63	63	63	63	75
	200	203.2	25	25	25	38	38	38	38	50	50	50	50	63	63	63	63	75
200		219.1	25	25	25	38	38	38	38	50	50	50	50	63	63	63	63	75
	225	228.6	25	25	25	38	38	38	38	50	50	50	50	63	63	63	63	75

Specify Recommended minimum insulation thickness [mm]- FR (Fire Retardent) Armaflex

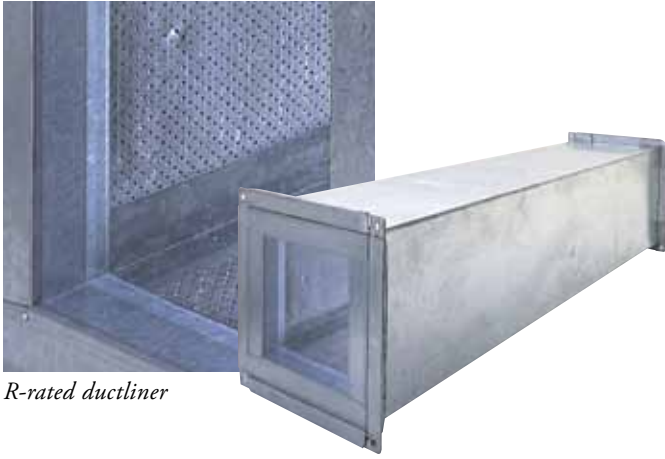
Pipe			BCA Minimum Material R-Value															
Steel Pipe NB	Copper Pipe NB	OD	0.6	0.7	0.8	1.0	1.1	1.2	1.3	1.4	1.5	1.7	1.8	1.9	2.0	2.1	2.2	2.7
	15	12.7	19	19	19	25	25	25	25	32	32	32	32	32	38	38	38	44
	18	15.9	19	19	19	25	25	25	25	32	32	32	38	38	38	38	38	44
	20	19.1	19	19	19	25	25	25	32	32	32	38	38	38	38	38	44	50
	25	25.4	19	19	19	25	25	32	32	32	32	38	38	38	44	44	44	50
	32	31.8	19	19	25	25	32	32	32	32	38	38	38	44	44	44	44	63
	40	38.1	19	19	25	25	32	32	32	38	38	38	44	44	44	50	50	63
	45	44.5	19	19	25	32	32	32	32	38	38	44	44	44	44	50	50	63
	50	50.8	19	25	25	32	32	32	38	38	38	44	44	44	50	50	50	63
50		60.3	19	25	25	32	32	32	38	38	38	44	44	50	50	50	63	63
	65	63.5	19	25	25	32	32	32	38	38	38	44	44	50	50	50	63	63
	80	76.1	19	25	25	32	32	38	38	38	44	44	50	50	50	63	63	63
	90	88.9	19	25	25	32	32	38	38	38	44	50	50	50	63	63	63	75
	100	101.6	19	25	25	32	32	38	38	44	44	50	50	50	63	63	63	75
100		114.3	19	25	25	32	32	38	38	44	44	50	50	63	63	63	63	75
	125	127.0	25	25	25	32	38	38	38	44	44	50	50	63	63	63	63	75
	150	152.4	25	25	32	32	38	38	44	44	44	50	63	63	63	63	63	75
150		168.3	25	25	32	32	38	38	44	44	50	50	63	63	63	63	63	75
	175	177.8	25	25	32	32	38	38	44	44	50	50	63	63	63	63	63	75
	200	203.2	25	25	32	32	38	38	44	44	50	63	63	63	63	63	63	75
200		219.1	25	25	32	32	38	38	44	44	50	63	63	63	63	63	75	84
	225	228.6	25	25	32	32	38	38	44	44	50	63	63	63	63	63	75	84

Recommended minimum insulation thickness [mm] - Polystyrene SL Grade

Pipe			BCA Minimum Material R-Value															
Steel Pipe NB	Copper Pipe NB	OD	0.6	0.7	0.8	1.0	1.1	1.2	1.3	1.4	1.5	1.7	1.8	1.9	2.0	2.1	2.2	2.7
	15	12.7	25	25	25	25	25	25	38	38	38	38	38	38	38	38	50	50
	18	15.9	25	25	25	25	25	38	38	38	38	38	38	38	50	50	50	50
	20	19.1	25	25	25	25	38	38	38	38	38	38	38	50	50	50	50	63
	25	25.4	25	25	25	25	38	38	38	38	38	38	50	50	50	50	50	63
	32	31.8	25	25	25	38	38	38	38	38	38	50	50	50	50	50	50	63
	40	38.1	25	25	25	38	38	38	38	38	38	50	50	50	50	50	63	63
	45	44.5	25	25	25	38	38	38	38	38	50	50	50	50	50	63	63	63
	50	50.8	25	25	25	38	38	38	38	38	50	50	50	50	50	63	63	63
50		60.3	25	25	25	38	38	38	38	50	50	50	50	50	63	63	63	75
	65	63.5	25	25	25	38	38	38	38	50	50	50	50	63	63	63	63	75
	80	76.1	25	25	38	38	38	38	50	50	50	50	50	63	63	63	63	75
	90	88.9	25	25	38	38	38	38	50	50	50	50	63	63	63	63	63	75
	100	101.6	25	25	38	38	38	38	50	50	50	63	63	63	63	63	63	75
100		114.3	25	25	38	38	38	50	50	50	50	63	63	63	63	63	75	75
	125	127.0	25	25	38	38	38	50	50	50	50	63	63	63	63	63	75	100
	150	152.4	25	25	38	38	38	50	50	50	50	63	63	63	63	75	75	100
150		168.3	25	38	38	38	38	50	50	50	50	63	63	63	63	75	75	100
	175	177.8	25	38	38	38	38	50	50	50	50	63	63	63	75	75	75	100
	200	203.2	25	38	38	38	50	50	50	50	63	63	63	63	75	75	75	100
200		219.1	25	38	38	38	50	50	50	50	63	63	63	63	75	75	75	100
	225	228.6	25	38	38	38	50	50	50	50	63	63	63	63	75	75	75	100



### 3. INTERNAL DUCTLINERS



*R-rated ductliner*

Ducts are primarily insulated internally for noise absorption. Internal insulation is usually more cost effective than noise control via additional silencers or attenuators.

In addition to noise absorption, internal insulation will assist in compliance with the BCA insulation provisions. If there is no internal insulation then the duct must be lagged externally to comply with the BCA and achieve the required energy savings.

#### Bradford Supertel Ductliner

For economical performance, Bradford Supertel provides the perfect combination of thermal and acoustic insulation to meet all your ductlining needs. It is available in a full range of R Values to meet the BCA requirements.

#### Bradford Exetel Ductliner

Bradford Exetel has been specially developed to meet the higher material R-Values required by the BCA. This product is 100mm thick and will provide an R-Value of  $R_{MAT}$  3.0 for ductwork in exterior locations.

#### Bradford Ultratel Ductliner

The extra density of Bradford Ultratel further enhances the thermal and acoustic performance to provide a premium solution. Ultratel 25mm and Ultratel 50mm are recommended to meet most of your BCA requirements.

#### Bradford Fibertex

Bradford Fibertex Rockwool Ductliners offer a totally non-combustible (AS1530.1) industrial grade ductliner when combined with Ultraphon facing – ideal for high temperature applications.

#### Indoor Air Quality

Overseas testing has shown the use of glasswool ductliners does not contribute any detectable increase in airborne particles in room spaces. There is no OH&S or environmental advantage to lining ducts with polyester or polyethylene insulation. However duct cleanability is an important issue. Bradford Insulation's Enviroduct range will not support bacterial growth. In addition Bradford can also provide the latest USA and European product solutions with anti-fungal and anti-bacterial coatings for maximum Indoor Air Quality (IAQ).

All Bradford Glasswool and Rockwool HVAC products are made with FBS-1 Biosoluble fibres. They are safe to install and use for the life of the air conditioning system and provide excellent fire resistant properties.



## 4. ENVIRODUCT LINING OPTIONS

The market for internal lining of air conditioning systems to reduce annoying fan noise, has changed over the years.

Standard heavy duty perforated foil (HD Perf) facings or black glass tissues (BMF) have proven the most popular linings for noise absorption but issues of duct cleaning and indoor air quality have seen many specifiers searching for alternatives.

Bradford Insulation has developed a range of linings for internal duct insulation to meet these new market demands.



### Acoustituff

A tough lightweight foil vapour barrier, Acoustituff offers an excellent economical solution for foil lining of internal ducting insulation. Ideal for applications where a fully contained surface finish is required.

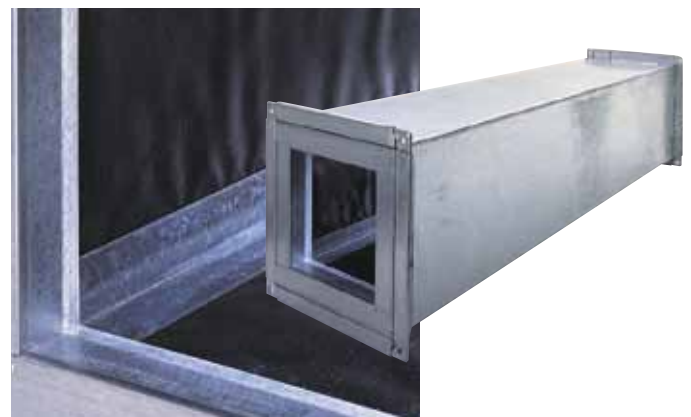
Acoustituff also eliminates the need to use expensive combinations of microfilms with perforated foil.



### Ultraphon

A superb non-reflective acoustic lining offering superior broad band sound absorption. Ultraphon is strong, durable and also offers good cleanability.

Bradford Ultraphon Ductliner achieved 0.0.0.3 fire rating when tested to AS1530.3 and passed UL181. Widely specified in Europe for clean room applications such as hospitals and food preparation areas, Ultraphon is also ideal for use in silencers and other acoustic applications. Ultraphon is available in black.



### Maximum design velocity

Recommended maximum design velocities for duct linings are determined by testing straight duct with laminar air flows for nil surface erosion at extreme velocities of 36-40m/s (140km/hr) and then applying a safety factor of 0.4 bringing velocity to a base 16m/s. A correction factor is then applied to this for the facing type based on ASHRAE Air Friction Charts which brings maximum recommended design back up to the following:

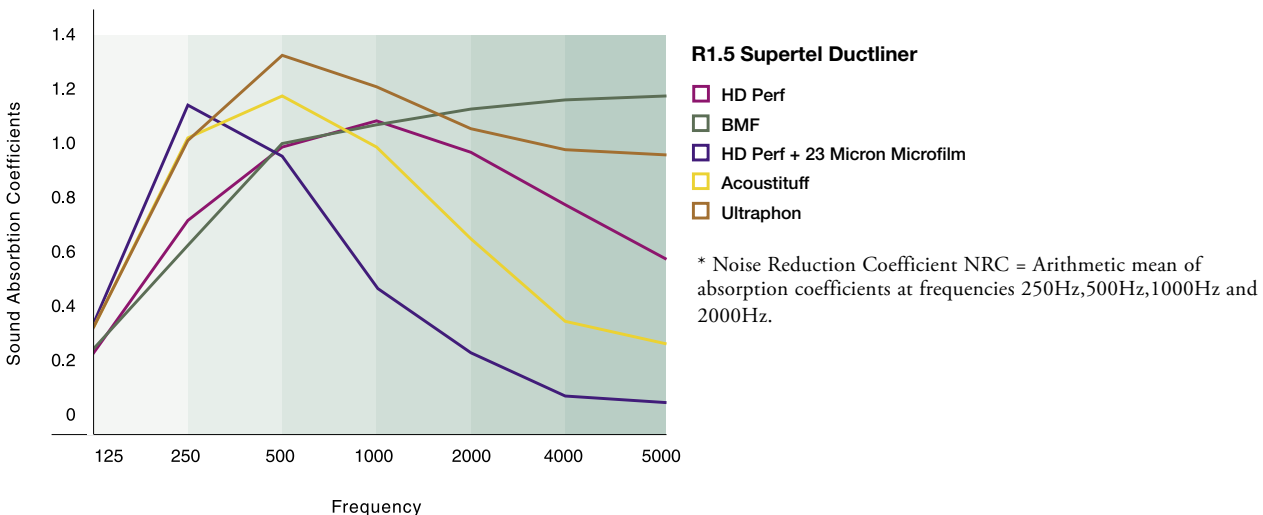
Heavy Duty Perforated Foil	18m/s
Black Matt Tissue	22m/s
Perforated Metal	23m/s
Ultraphon	26m/s
Acoustituff	30m/s

Maximum design velocities above are valid for ductliner insulation faced by Bradford Insulation and installed according to AS4254 and Bradford Insulation recommendations contained in our Air Conditioning Design Guide.

# 5. SOUND ABSORPTION

## Sound Absorption (AS1045:1988) Frequency (Hz)

Product	Thickness (mm)	125	250	500	1000	2000	4000	5000	NRC
<b>Supertel 25mm R<sub>MAT</sub> 0.8 Ductliner</b>									
• Thermofoil HD Perf	25	0.12	0.28	0.68	0.94	1.09	0.85	0.75	0.75
• BMF	25	0.07	0.26	0.65	0.93	1.04	1.03	1.00	0.72
• Acoustituff	25	0.14	0.45	0.99	0.97	0.55	0.29	0.25	0.74
• Ultraphon	25	0.10	0.39	0.79	1.00	1.05	1.00	0.95	0.81
<b>Supertel 38mm R<sub>MAT</sub> 1.1 Ductliner</b>									
• Thermofoil HD perf	38	0.13	0.43	0.89	1.02	0.89	0.82	0.82	0.80
• Ultraphon	38	0.14	0.45	0.96	1.00	0.96	0.93	0.94	0.84
• Acoustituff	38	0.28	0.53	1.08	0.88	0.47	0.25	0.19	0.74
<b>Supertel 50mm R<sub>MAT</sub> 1.5 Ductliner</b>									
• Thermofoil HD Perf	50	0.23	0.71	0.99	1.09	0.97	0.78	0.59	0.94
• BMF	50	0.24	0.62	1.00	1.07	1.12	1.15	1.17	0.95
• HD Perf & Microfilm	50	0.32	1.14	0.94	0.48	0.22	0.06	0.03	0.70
• Acoustituff	50	0.33	1.01	1.17	0.99	0.64	0.34	0.28	0.95
• Ultraphon	50	0.30	1.01	1.31	1.20	1.05	0.97	0.95	1.14
<b>Supertel 75mm R<sub>MAT</sub> 2.2 Ductliner</b>									
• Thermofoil HD Perf	75	0.52	1.02	1.15	1.07	1.02	0.90	0.83	1.06
<b>Ultratel 25mm R<sub>MAT</sub> 0.8 Premium Ductliner</b>									
• Thermofoil HD Perf	25	0.12	0.31	0.81	1.09	1.09	0.91	0.89	0.83
• BMF	25	0.08	0.30	0.71	0.99	1.07	1.08	1.16	0.77
• Acoustituff	25	0.05	0.55	0.65	0.90	0.70	0.50	0.50	0.70
<b>Ultratel 50mm R<sub>MAT</sub> 1.5 Premium Ductliner</b>									
• BMF	50	0.25	0.70	1.13	1.13	1.12	1.12	1.12	1.01
• Acoustituff	50	0.30	0.75	0.90	0.85	0.65	0.50	0.60	0.79
<b>Ultratel 75mm R<sub>MAT</sub> 2.3 Premium Ductliner</b>									
• Thermofoil HD Perf	75	0.69	1.19	1.15	1.09	1.03	0.92	0.90	1.11
<b>Fibertex Rockwool 25mm R<sub>MAT</sub> 0.7 Non-Combustible R4 Ductliner</b>									
• Thermofoil HD Perf	25	0.14	0.38	0.87	1.07	1.06	0.90	0.79	0.85
• BMF	25	0.15	0.33	0.74	0.94	1.03	1.04	0.98	0.76
<b>Fibertex Rockwool 50mm R<sub>MAT</sub> 1.5 Non-Combustible R4 Ductliner</b>									
• Thermofoil HD Perf	50	0.31	0.83	1.16	0.99	0.90	0.78	0.73	0.97
• BMF	50	0.36	0.76	1.19	1.09	1.03	1.04	0.90	1.01



## 6. EXTERNAL DUCT INSULATION

For the external insulation of metal ducts to comply with the BCA requirements, Bradford has developed a range of ductwrap solutions.

### Bradford Multitel

An economical solution, Multitel is available in a range of R-Values to suit the requirements of the BCA for different applications and climate zones.

### Bradford Flexitel

For a premium finish, the added density of Flexitel produces a more resilient ductwrap. Ideally suited to areas where the duct work may be visible.

### Ductwrap Facings

In addition to high strength Bradford Thermofoil Heavy Duty, a range of other facings are available including Medium Duty Thermofoil and Acoustituff.

### Flexible duct

For the insulation of flexible duct, Bradford Insulation has developed Specitel to provide the optimum combination of thermal performance and thickness that results in a thinner, more economical and lighter duct with excellent fire properties compared to polyester. Insist on Bradford Glasswool in your flexible duct for best performance.



## 7. HEALTH AND SAFETY

Glasswool and rockwool insulation products are excellent insulation materials and are fully safe to use under all conditions. Both 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.

Bradford glasswool and rockwool products are manufactured using the latest FBS-1 technology and are not classified as hazardous according to the criteria of the ASCC (Formerly NOHSC) guidelines.

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](http://www.bradfordinsulation.com.au).

## 8. PRODUCT WARRANTY

CSR Building Products Limited warrants Bradford™ Insulation products to be free of defects in materials and manufacture. Bradford foil faced products should not come into contact with water or used in an unusual outside application or alkaline environment, Contact Bradford for further details. For full product warranty details please refer to the Bradford website.

## 9. BRADFORD DESIGNSMART

For further specification assistance, visit the DesignSmart section of our website which includes full details or regulations, specification calculators, product brochures, data sheets, MSDSs and much more to make your job even easier.

Visit [www.bradfordinsulation.com.au](http://www.bradfordinsulation.com.au) or contact your Bradford representative on 1300 850 305.

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