Jan 2019

WILHAMS

WILHAMS INSULATION FAR EAST SDN BHD

SoundPro®

Wil-Kool®

Acoustic and thermal insulation for roofs, walls and floors

Wil-Kool® and Wil-Kool® Plus are medium density multi-use insulation mats. They possess good thermal, fire and acoustic properties.

These versatile Wil-Kool® and Wil-Kool® Plus mats are suitable for insulation of roof spaces in domestic, commercial and industrial buildings. They are also useful for improving the acoustic performance of suspended ceilings and intermediate floors.

When installed between cladding or partition wall systems Wil-Kool® and Wil-Kool® Plus enhance the system performance.

Advantages

- Contributes to GBI requirements
- Aids MS 1525 compliance
- Non-combustible to EN 13501 Part 1
- Multi-application product
- Excellent thermal and acoustic properties
- CFC, HFC and HCFC free

Description

Facings

Wil-Kool® and Wil-Kool® Plus are available with a number of facing options upon request, which are:-

- Non-woven mineral black tissue
- Non-woven mineral white tissue
- Aluminium foil

Density

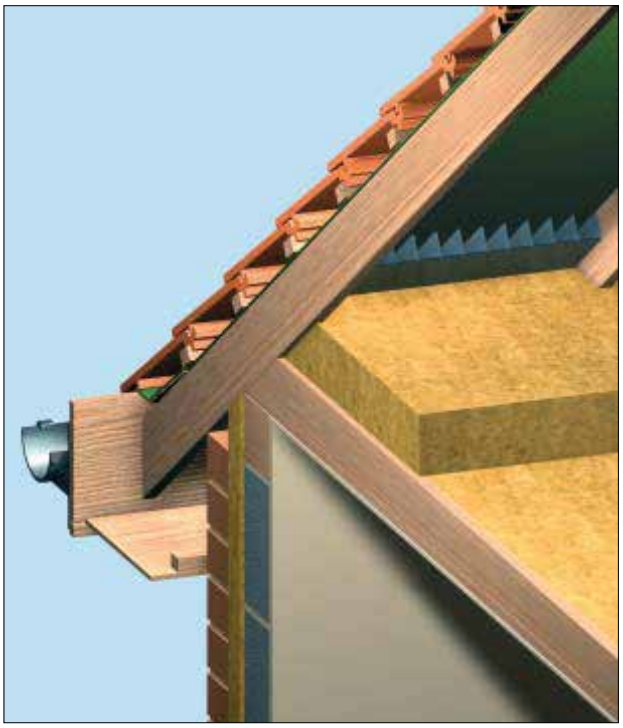
The nominal density of Wil-Kool® is 43kg/m³ and Wil-Kool® Plus is 64kg/m³ unless otherwise specified.

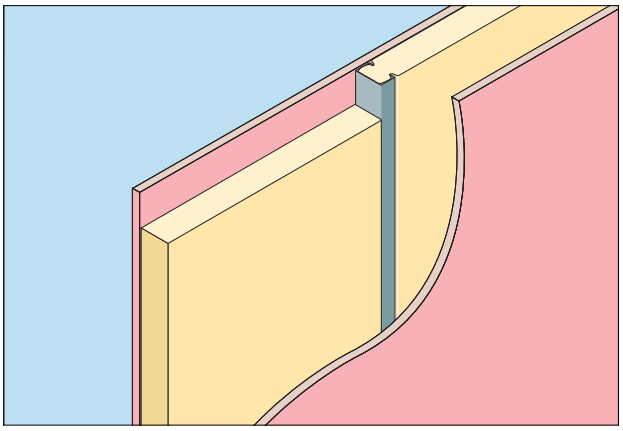
Standards and Approvals

Wil-Kool® and Wil-Kool® Plus comply fully with BS 5803 Part 1: 1985 'Specification for man-made mineral fibre thermal insulation mats'.

Environment

No CFCs, HPCs, or HCFCs are used in the manufacture of Wil-Kool® materials.





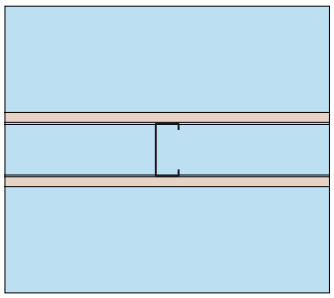
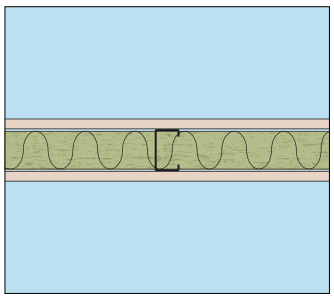
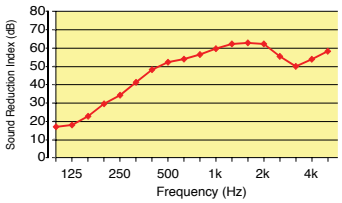
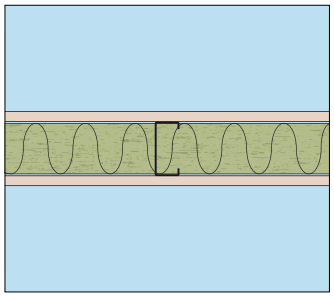
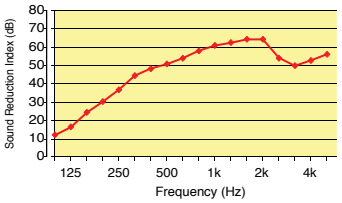
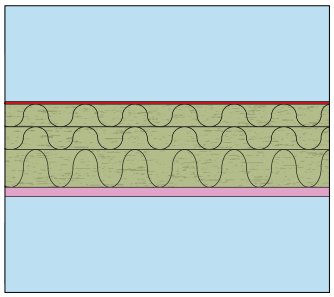
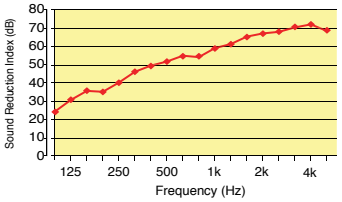
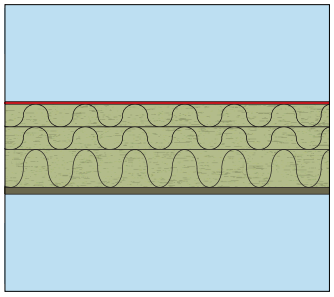
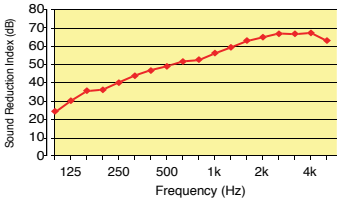
Construction: Gypsum board partition infilled with Wil-Kool® and Wil-Kool® Plus.

Performance and Properties

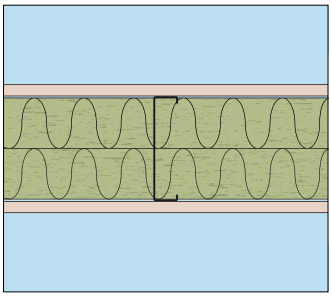
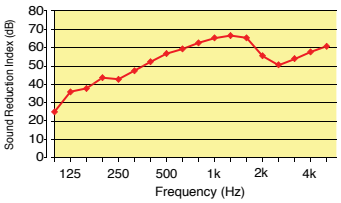
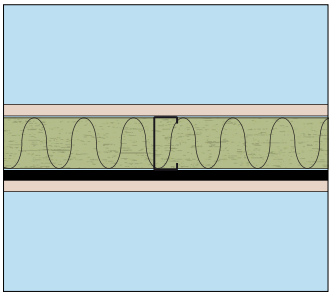
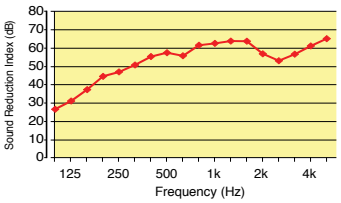
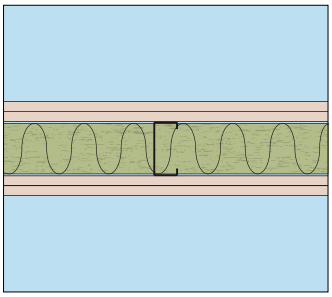
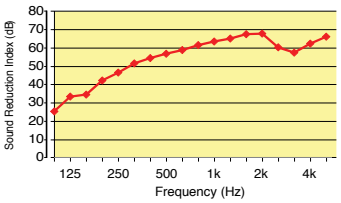
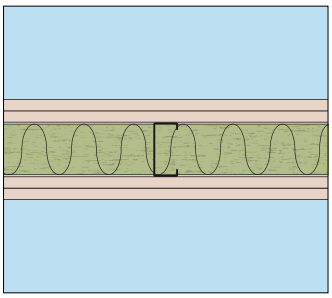
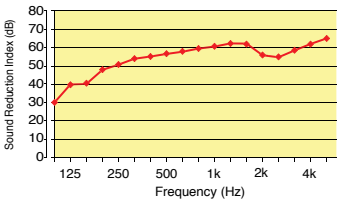
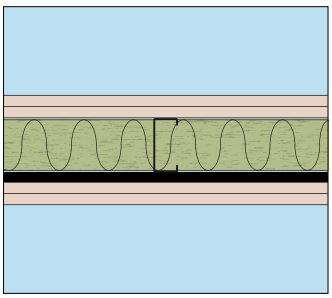
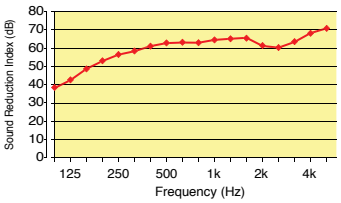
Acoustic

The incorporation of Wil-Kool® and Wil-Kool® Plus within suitably designed constructions can provide improved levels of sound reduction, as shown in the following build-ups.

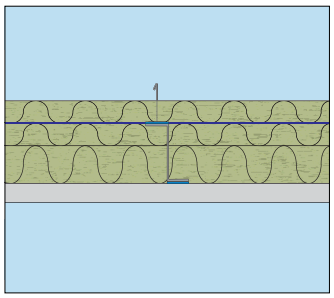
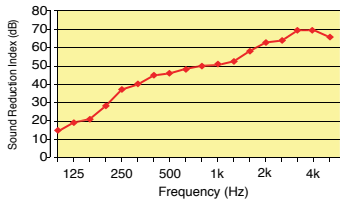
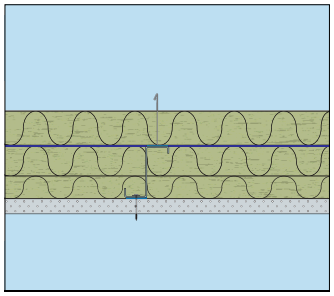
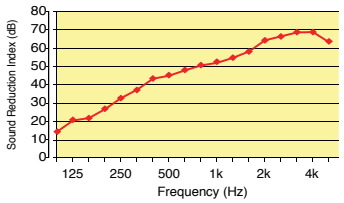
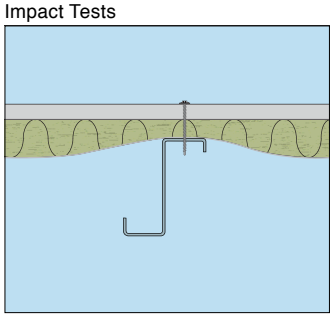
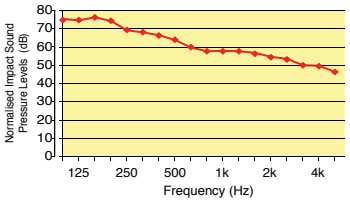
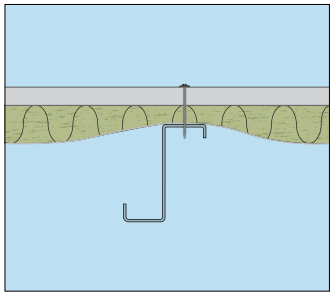
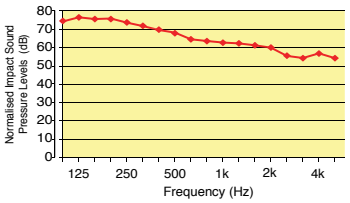
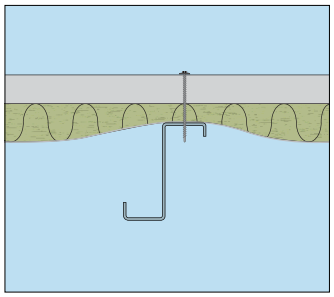
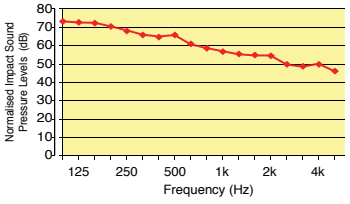
Acoustic Wall Structure

Wall Structure	Specification	Nominal System Thickness (mm)	Sound Test Type And Performance	Test Report Number Graph
Transmission Loss Tests				
	1) One layer of 12.5mm thick plasterboard (10kg/m²) both sides without insulation	95	R_w36 dB	
	1) 47mm thick Wil-Kool (infilled between 50mm wide metal studs) 2) One layer of 12.5mm thick plasterboard (10kg/m²) both sides	72	R_w43 dB	BTC 10192A 
	1) 67mm thick Wil-Kool (infilled between 70mm wide metal studs) 2) One layer of 12.5mm thick plasterboard (10kg/m²) both sides	95	R_w44 dB	BTC 10190A 
	1) 3mm thick aluminium composite panel 2) 30mm thick Wil-Kool 3) 30mm thick HardRock 60 4) 50mm thick Wil-Kool 5) 12mm thick gypsum board	125	R_w51 dB	UiTM 03WIFE11 TEST 2 
	1) 3mm thick aluminium composite panel 2) 30mm thick Wil-Kool 3) 30mm thick HardRock 60 4) 50mm thick Wil-Kool 5) 9mm thick cemboard	122	R_w53 dB	UiTM 03WIFE11 TEST 1 

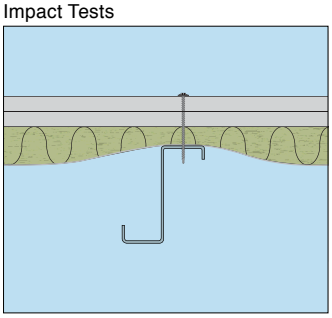
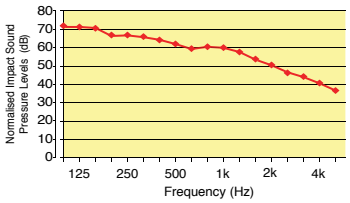
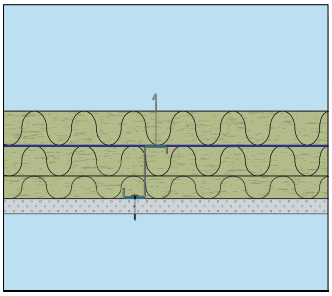
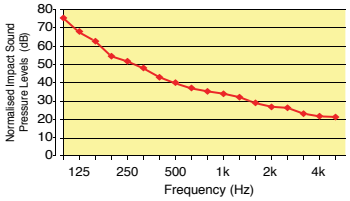
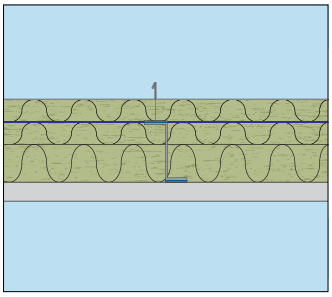
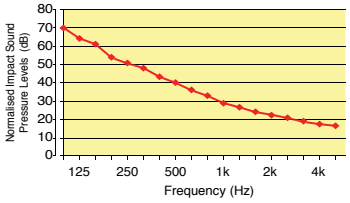
Acoustic Wall Structure

Wall Structure	Specification	Nominal System Thickness (mm)	Sound Test Type And Performance	Test Report Number Graph
Transmission Loss Tests				
	1. Two layers of 67mm thick Wil-Kool (infilled between 146mm wide metal studs) 2. One layer of 15mm thick fire rated plasterboard (12kg/m²) both sides	176	R_w53 dB	BTC 10193A 
	1) 15mm thick plasterboard (13kg/m²) 2) 67mm thick Wil-Kool (infilled between 70mm wide metal studs) 3) 15mm thick plasterboard (13kg/m²) fixed to resilient bar	97	R_w54 dB	BTC 10189A 
	1) 67mm thick Wil-Kool (infilled between 70mm wide metal studs) 2) Two layers of 12.5mm thick plasterboard (16kg/m²) both sides	117	R_w55 dB	BTC 10191A 
	1) 67mm thick Wil-Kool (infilled between 70mm wide metal studs) 2) Two layers of 15mm thick plasterboard (26kg/m²) both sides with staggered joints	132	R_w57 dB	BTC 10183A 
	1) Two layers of 15mm thick plasterboard (26kg/m²) sound resisting 2) 67mm thick Wil-Kool (infilled between 70mm wide metal studs) 3) Two layers of 15mm thick plasterboard (26kg/m²) fixed to resilient bar 4) Both sides with staggered joints	143	R_w63 dB	BTC 10187A 

Acoustic Roof Structure

Roof Structure	Specification	Nominal System Thickness (mm)	Sound Test Type And Performance	Test Report Number Graph
Transmission Loss Tests				
	1) 0.42mm thick lower deck layer 2) 50mm thick Wil-Kool (bridged by 0.8mm 60 x 70 x 60mm Z purlin at 900mm centres, with 6mm neoprene pads either side at screw points) 3) 30mm thick HardRock 60 (bridged by 0.8mm 60 x 70 x 60mm Z purlin at 900mm centres, with 6mm neoprene pads either side at screw points) 4) Vapour barrier 5) 30mm thick Wil-Kool 6) 0.6mm BST, standing seam steel deck	151	R_w 44 dB	UiTM 02WIFE11 TEST 1 
	1) 0.6mm BST, standing seam metal 2) 50mm thick Wil-Kool compressed to 45mm between standing seam clips 105mm long with 12mm neoprene pads behind at 400mm x 1200mm centres 3) Vapour barrier 4) 50mm thick Wil-Kool compressed to 40mm and 30mm HardRock 60 between Z purlins at 900mm centres with 6mm neoprene at screw fixings 5) 2 bottom decks - 45% of area perforated 3mm holes and 55% of area non-perforated	151	R_w 44 dB	UiTM 02WIFE11 TEST 2 
Impact Tests				
	1) 0.42mm BST, 20mm high steel deck 2) 50mm thick Wil-Kool 3) Double sided aluminium foil	70	$L_{n.w}$ 69 dB IIC 41 dB	UiTM 01WIFE13 TEST 12 
	1) 0.42mm BST, 24mm high steel deck 2) 50mm thick Wil-Kool 3) Double sided aluminium foil	74	$L_{n.w}$ 69 dB IIC 41 dB	UiTM 01WIFE13 TEST 13 
	1) 0.42mm BST, 38mm high steel deck 2) 50mm thick Wil-Kool 3) Double sided aluminium foil	88	$L_{n.w}$ 65 dB IIC 45 dB	UiTM 01WIFE13 TEST 11 

Acoustic Roof Structure

Roof Structure	Specification	Nominal System Thickness (mm)	Sound Test Type And Performance	Test Report Number Graph
Impact Tests				
	1) 0.42mm BST, 40mm high steel deck 2) 50mm thick Wil-Kool 3) Double sided aluminium foil	90	$L_{n,w}$ 65 dB IIC 45 dB	UiTM 01WIFE13 TEST 14 
	1) 0.6mm BST, standing seam metal 2) 50mm thick Wil-Kool compressed to 45mm between standing seam clips 105mm long with 12mm neoprene pads behind at 400mm x 1200mm centres 3) Vapour barrier 4) 50mm thick Wil-Kool compressed to 40mm and 30mm HardRock 60 between Z purlins at 900mm centres with 6mm neoprene at screw fixings 5) 2 bottom decks - 45% of area perforated 3mm holes and 55% of area non-perforated	151	$L_{n,w}$ 57 dB IIC 53 dB	UiTM 02WIFE11 TEST 4 
	1) 0.42mm thick lower deck layer 2) 50mm thick Wil-Kool (bridged by 0.8mm 60 x 70 x 60mm Z purlin at 900mm centres, with 6mm neoprene pads either side at screw points) 3) 30mm thick HardRock 60 (bridged by 0.8mm 60 x 70 x 60mm Z purlin at 900mm centres, with 6mm neoprene pads either side at screw points) 4) Vapour barrier 5) 30mm thick Wil-Kool 6) 0.6mm BST, standing seam steel deck	151	$L_{n,w}$ 55 dB IIC 55 dB	UiTM 02WIFE11 TEST 3 

Fire
Rated A1 when tested to BS EN 13501-1:2007+A1:2009 Fire classification of construction products and building elements. Classification using test data from reaction to fire tests.

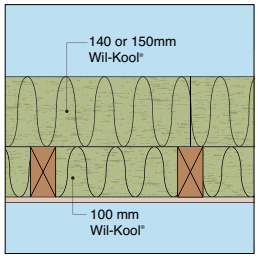
Wil-Kool® and Wil-Kool® Plus have been SIRIM QAS International Sdn Bhd certified. Certification available upon request.

U values
Wil-Kool® and Wil-Kool® Plus significantly improve the energy efficiency of the external walls and roofs.

The figures in the table below have been calculated to achieve the energy efficiency (EE) requirements as stipulated in MS 1525:2007 Energy efficiency and use of renewable energy for non-residential buildings - Code of practice and the Green Building Index (GBI). Increased thicknesses of Wil-Kool® and Wil-Kool® Plus have been shown to reduce energy consumption in buildings, thus reducing CO_2 emissions to the atmosphere.

Loft Spaces
U values for insulation thicknesses relating to typical loft space constructions as shown in the table below:

Between Timber Joists	+	Over Timber Joists	U Values
Thickness (mm)	+	Thickness (mm)	(W/m²K)
50	+	-	0.61
50	+	50	0.35
100	+	100	0.21
100	+	150	0.17
100	+	170	0.16
100	+	200 (2x100)	0.14

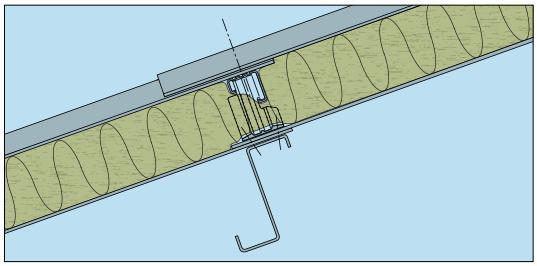


Cross layered roll


Wil-Kool® installation

Metal Clad Double Skin

Bracket and rail spacers



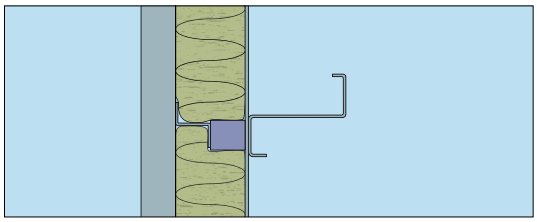
Construction: Steel sheet roof cladding on bracket and rail spacers, Wil-Kool® and Wil-Kool® Plus, steel inner lining.

U values for insulation thicknesses relating to typical roof constructions are shown in the table below:

Wil-Kool® Thickness (mm)	U Values (W/m²K)
180	0.25
200 (100 + 100)	0.22
220 (120 + 100)	0.20
250 (150 + 100)	0.18
280 (180 + 100)	0.16

Sidewall Cladding

Bracket and rail spacers



Construction: Profiled steel sidewall cladding, Wil-Kool® and Wil-Kool® Plus plain faced or Wil-Kool® and Wil-Kool® Plus Alu-faced, steel sheet liner panels, sheeting rails.

U values for insulation thicknesses relating to typical roof constructions are shown in the table below:

Wil-Kool® Thickness (mm)	U Values (W/m²K)
120	0.35
150	0.28
160	0.27
180	0.25

This wall cladding system has either brackets or rails.

Compatibility

Wil-Kool® and Wil-Kool® Plus will not react with any metal components in the loft, nor will it cause loss of plasticiser from PVC cables and pipes (see also the note on electrical cables below).

Installation

Wil-Kool® and Wil-Kool® Plus should be cross layered between and over the ceiling joists. First layer (generally of 100mm thickness) is rolled between the ceiling joists, which are normally spaced at 400mm or 600mm centres. A second layer of Wil-Kool® and Wil-Kool® Plus (e.g. 170mm thick) is then cross layered to cover the first layer of insulation and the ceiling joists.

For refurbishment work, check to see if existing insulation between joists is tightly butt jointed to the sides of timber. If not, remove and replace as above. If the existing insulation is in good condition, overlay this with 150mm at right angles to the joists. See Figure 1.

Metal Stud Partitions

For installation between metal studs, at 600 mm centres, insert Wil-Kool® and Wil-Kool® Plus using the standard 590 mm width, and friction fit.

For metal studs at 400 mm centres, cut the Wil-Kool® and Wil-Kool® Plus to size across the 1200 mm length and similarly friction fit ensuring that all horizontal joints are tightly butted.

The standard 47 and 67 mm thicknesses are designed to accommodate 50 and 70 mm metal studs respectively.

Lofts

Water Tanks

Insulation should not be placed directly under the cold water tank. Where access is required to water tanks etc, supports should be provided for a raised walkway.

Loft Hatches

To preserve continuity of insulation, covers to loft hatches should be insulated with a minimum 50mm thickness of Wil-Kool® and Wil-Kool® Plus. Adhesive tape may be used to hold insulation in place.

Electrical Cables

The IEE Wiring Regulations, 16th edition, British Standard BS 7671: 1992 and the Electricians' Handbook (latest edition) give guidance on the correct factors to be applied in down-rating cables according to situation, and each case should be separately calculated. Where possible, all cables should be lifted free of the insulation.

Handling and Safety

Wil-Kool® and Wil-Kool® Plus are very light and easy to handle. They can supplied compressed in polyethylene wrapping which provide short term protection. For long term protection, Wil-Kool® and Wil-Kool® Plus must be stored indoors or under a waterproof covering.

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