

# Acoustic Partition Walls...

This application note gives examples of timber frame internal wall constructions which, when built correctly, will meet or exceed the performance standards set out in Approved Document E, 'Resistance to the passage of sound'.

## Building Regulations Part E

Since July 2003 it has been a requirement, under Part E of The Building Regulations 2000, that houses, flats, and rooms for residential purposes are designed and constructed to provide reasonable resistance to sound from other parts of the same building and from adjoining buildings.

## Exceeding Approved Document E with Thermafleece UltraWool & Recycled Gypsum Board

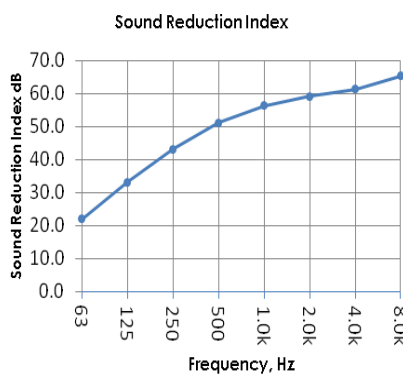
The minimum value for airborne sound insulation of an internal wall (i.e. a wall between two rooms within the same dwelling) is  $R_w = 40\text{dB}$ .  $R_w$  is the weighted sound reduction index and is the degree to which the wall reduces noise from one side were the sound is generated, to the other side were the sound is received.

A sound reduction index of up to  $R_w 54\text{dB}$  can be achieved by using Thermafleece UltraWool high density wool insulation in conjunction with single or multiple layers of recycled gypsum board or plasterboard. The wall specification varies depending on the target sound reduction index.

### Thermafleece UltraWool System – $R_w 54\text{ dB}$

#### Specification

- 70mm Softwood timber studs @ 600mm centres
- One layer 12.5 mm & one layer 10mm recycled gypsum board ( $25\text{ kg/m}^2$ ) each side
- 70 mm Thermafleece UltraWool between studs.
- Nominal thickness = 115 mm



Frequency, Hz	Sound Reduction Index (dB)
63	21.9
125	33.1
250	43.1
500	51.2
1.0k	56.4
2.0k	59.2
4.0k	61.4
8.0k	65.3

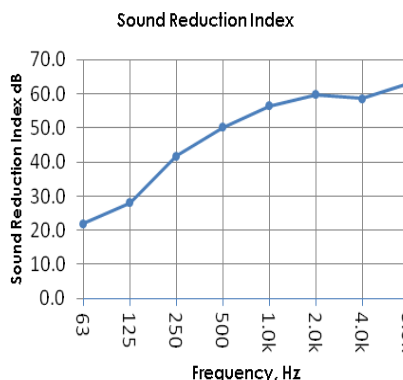
**Weighted Sound Reduction Index ( $R_w$ dB) = 54 dB**

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### Thermafleece UltraWool System - $R_w 52\text{ dB}$

#### Specification

- 70mm Softwood timber studs @ 600mm centres
- One layer 12.5 mm & one layer 10 mm recycled gypsum board ( $25\text{ kg/m}^2$ ) one side
- one layer 10mm recycled gypsum board ( $11\text{ kg/m}^2$ ) on other side
- 70 mm Thermafleece UltraWool between studs.
- Nominal thickness = 103 mm



Frequency, Hz	Sound Reduction Index (dB)
63	21.9
125	28.0
250	41.7
500	50.2
1.0k	56.5
2.0k	59.7
4.0k	58.6
8.0k	63.0

**Weighted Sound Reduction Index ( $R_w$ dB) = 52 dB**

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# Acoustic Partition Walls...

## Thermafleece UltraWool System - $R_w$ 48 dB

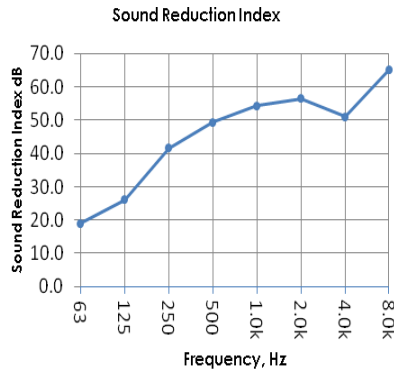
### Specification

- 70mm Softwood timber studs @ 600mm centres
- One layer 12.5mm recycled gypsum board (14 kg/m<sup>2</sup>) each side
- 70 mm Thermafleece UltraWool between studs.
- Nominal thickness = 95 mm



**Weighted Sound Reduction Index ( $R_w$ dB) = 48 dB**

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Frequency, Hz	Sound Reduction Index (dB)
63	18.9
125	26.0
250	41.6
500	49.4
1.0k	54.4
2.0k	56.4
4.0k	51.1
8.0k	65.0

## Thermafleece UltraWool System - $R_w$ 47 dB

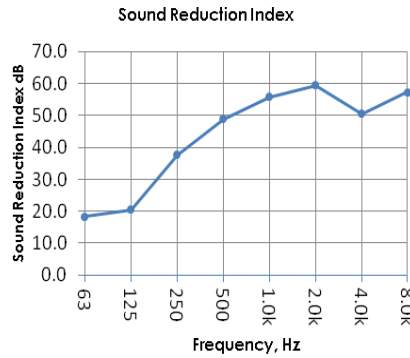
### Specification

- 70mm Softwood timber studs @ 600mm centres
- One layer 10mm recycled gypsum board (11kg/m<sup>2</sup>) each side.
- 70 mm Thermafleece UltraWool between studs.
- Nominal thickness = 90 mm.



**Weighted Sound Reduction Index ( $R_w$ dB) = 48 dB**

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Frequency, Hz	Sound Reduction Index (dB)
63	18.3
125	20.5
250	37.7
500	48.8
1.0k	55.8
2.0k	59.5
4.0k	50.5
8.0k	57.3

# Acoustic Partition Walls...

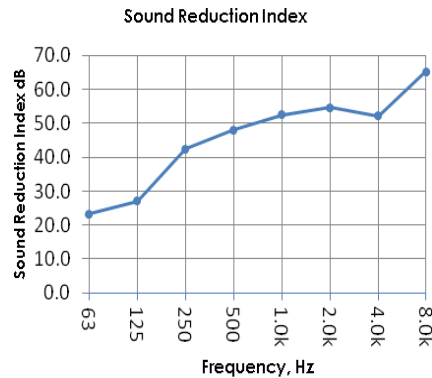
## Exceeding Approved Document E with Thermafleece UltraWool & Standard Plasterboard

The minimum sound reduction index of up to  $R_w$  48dB can be achieved by using Thermafleece UltraWool high density wool insulation in conjunction with single or multiple layers of standard plasterboard. The wall specification varies depending on the target sound reduction index.

### Thermafleece UltraWool System - $R_w$ 48 dB

#### Specification

- 70mm Softwood timber studs @ 600mm centres
- Two layers of 12.5mm plasterboard ( $16\text{kg/m}^3$ ) each side
- 70 mm Thermafleece UltraWool between studs.
- Nominal thickness = 120 mm.



Frequency, Hz	Sound Reduction Index (dB)
63	23.2
125	27.0
250	42.4
500	48.0
1.0k	52.5
2.0k	54.6
4.0k	52.1
8.0k	65.2

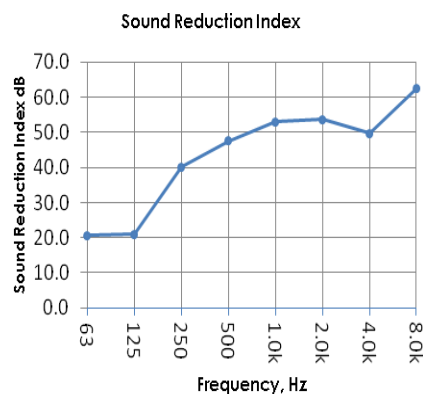
**Weighted Sound Reduction Index ( $R_w$ dB) = 48 dB**

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### Thermafleece UltraWool System - $R_w$ 45 dB

#### Specification

- 70mm Softwood timber studs @ 600mm centres
- Two layers of 12.5mm plasterboard ( $16\text{kg/m}^3$ ) one side & one layer 12.5 mm ( $8\text{kg/m}^3$ ) on other side.
- 70 mm Thermafleece UltraWool between studs.
- Nominal thickness = 108 mm.



Frequency, Hz	Sound Reduction Index (dB)
63	20.7
125	20.9
250	40.1
500	47.5
1.0k	53.0
2.0k	53.7
4.0k	49.7
8.0k	62.5

**Weighted Sound Reduction Index ( $R_w$ dB) = 45 dB**

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### Construction Guidance

- The minimum distance between inside lining faces should be no less than 70mm.
- Each additional layer of lining board should be staggered to overlap the joints of the under layer.
- Thermafleece can be friction fit between timbers.
- All joints should be well sealed.

# Acoustic Partition Walls...

## Thermafleece UltraWool Practical Absorption Co-efficients

Frequency, Hz	PRACTICAL ABSORPTION COEFFICIENT		
	50mm	70mm	90mm
125	0.20	0.45	0.50
250	0.55	0.75	1.00
500	0.85	0.95	1.00
1.0k	0.90	1.00	1.00
2.0k	1.00	1.00	1.00
4.0k	1.00	1.00	1.00
EN ISO 11654:1997	Class B	Class A	Class A
NRC to ASTM C 423-01	0.85	0.95	1.00

For help and guidance please call us on **01768 486285** or email us at [enquiries@thermafleece.com](mailto:enquiries@thermafleece.com).