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Mi Panel Physical Characteristics

MODULAR
INNOVATIVE
BUILDING
TECHNOLOGIES

1. Sound Transmission

Airborne Sound Transmission Loss

STC (Sound Transmission Class) – STC figure is found by plotting the Sound Transmission Loss figures in 16-1/3 octave bands from 125 Hz to 4 KHz on graph and fitting the STC contour over as detailed in ASTM E413-73. The rating is read at the 500 Hz intersection with the STC contour.

Average Sound Reduction Index (R) Calculation

R is the mathematical mean to the nearest decibel of the values calculate in 16-1/3 octave bands from 100 Hz to 3.15 KHz. Sound insulation of panel walls may be easily increased by adding additional materials to wall surfaces internally or externally, doubling of panels or provision of a cavity in the wall composition.

Mi Panel Wall	STC Rating (Decibels)
50 mm thick Mi Panel	33
75 mm thick Mi Panel	39
Typical Timber Stud Wall Framing	
(Australian pine stress grade F7 Structural No.3 studs 75 x 35 At 600 centres)	26
Brick Veneer Wall	
(To Masonry Code AS 3700 Section 5.9)	45
Cavity Masonry Wall	
(To Masonry Code AS 3700-1988)	53
230 Clay Brick	
Solid Masonry Wall	48

2. Comparable Strength of the Mi Panel to other materials commonly used in simple building construction.

In order to compare the strength of the Mi Panel used in wall structures to that of other materials commonly used in simple single storey buildings, structural engineers, Wood & Grieve, who have been involved with Mi Panel since its inception, have examined these materials in a typical location under wind load. The bending stresses acting on the various wall types using the different materials have been calculated and these values divided into the ultimate loads in order to obtain a "relative strength factor" in order to allow comparison between Mi Panel and other wall types. The results set out hereunder and intended only as a guide to the strength of the Mi Panel as each particular wall structure requires independent analysis.

Mi Panel Wall	**Relative Strength Factor**
50 mm thick Mi Panel 75 mm thick Mi Panel	3.8
Typical Timber Stud Wall Framing	
(Australian pine stress grade F7 Structural No.3 studs 75 x 35 At 600 centres)	3.5
Brick Veneer Wall	
(To Masonry Code AS 3700 Section 5.9)	3.5
Cavity Masonry Wall	
(To Masonry Code AS 3700-1988)	1.9
230 Clay Brick	
Solid Masonry Wall	5.8

3. Thermal Properties of Mi Panel.

Terms used in calculating heat transfer.

a) Thermal Conductivity (K) – W/WK or W/MoC – This is a property of the material regardless of thickness – a measure for the material's ability to transmit heat. The units measure heat flow in 1 m^2 of material for a temperature of 1oC per metre thickness.

b) Thermal Resistivity (1/K – MK/W or MoC/W – Usually defined as the reciprocal of thermal conductivity.

c) Thermal Resistance (R) - M2K/W or M20C/W – Every material has a thermal resistance which determines the amount of heat transmitted through it. The higher the R value the better heat insulation the material provides. If the thickness of the material is known, the thermal resistance can be calculated by multiplying resistivity by thickness in metres.

d) Thermal Transmittance Coefficient (U) – W/M20C or W/M2K – This is the reciprocal of the sum of the thermal resistance of the various materials that make up the composition of the panel or wall structure.

Here under the thermal transmittance coefficients (U values) of brick work construction have been compared to the values for Mi Panel. The U value of Mi Panel walls may be enhanced greatly through the composition of the wall structure and by adding additional thermal resistant materials to the panel surfaces as indicated on the following pages.

Mi Panel Wall	Thermal Transmittance Coefficient (U value) W/M²°C
50 mm thick Mi Panel	2.17
75 mm thick Mi Panel	1.79
Brick Wall 110	
Thick Plastered	3.00
Cavity Brick Wall	
with 50 mm cavity	1.88
230 Clay Brick	
Solid Masonry Wall	1.2

4. Fire Tests

Mi Panel was tested by the CSIRO Division of Building. Construction and Engineering in accordance with Australian Standard 1530, Methods of Fire Tests on Building Materials, Components and Structures, Part 4-1990; Fire Tests on Building Materials and Structures, Parts 20 & 22, 1987 on 25 July 1991. Certificates of these tests have been provided. These test results together with those for other commonly used building materials are set out hereunder:

Mi Panel Wall	**Comparative Fire Ratings**
50 mm thick Mi Panel	1 Hour
75 mm thick Mi Panel	2 Hours
Clay Brick	
110 mm	1 Hour
250 mm Clay Brick	
Cavity Wall	3 Hours
230 Clay Brick Solid	
Masonry Wall	4 Hours