# RL ULTRATHERM ROOF SYSTEMS ACOUSTIC PERFORMANCE

**ROOFLOGIC INFORMATION SHEET** 

### INTRODUCTION

RoofLogic roof systems have been tested at the Acoustic Testing Services Laboratory, Auckland University, New Zealand. Both the RoofLogic UltraTherm MSR (metal skin roofing) system and the RoofLogic UltraTherm Xtreme (membrane) systems were tested.

Testing was carried out for both **airborne sound transmission**, measured according to ISO 10140-2:2010, and for **noise generated by artificial rainfall**, measured according to ISO 140-18:2006.

### AIRBORNE SOUND TRANSMISSION

Today there is an increasing requirement to locate buildings in relatively built up environments – near airports, highways, industrial areas or in proximity to sports and entertainment venues. Whilst the sound transmission qualities of a roofing system are not part of the direct physical protection a roof offers, the ability of a roof system to reduce sound transmission from the environment to the building interior can be of significant benefit to occupants.

The transmission of sound is measured in a standardised way, over a range of frequencies, and the result is expressed as a single number (STC or Rw.) This can be used to compare different roof assemblies and to calculate the internal noise environment due to a given sound level outside

> Sound Isolation Example 65 dB Sound Source

### RAIN NOISE

Noise produced by rainfall can be disturbing for building occupants and even moderate rain fall can produce inconvenient levels of noise.

A rain noise test has been developed (ISO 140-18:2006) whereby artificial rain is generated above the test roof assembly with the noise that is generated being measured from below the assembly. The overall sound intensity is expressed as LIAM norm (dB.) This can be used to calculate the noise level within a room with different roof assemblies. A lower number equates to a greater level of rain noise reduction.

The rain noise testing at Auckland University was conducted with the roof assemblies being subjected to an artificial rainfall rate of 40mm/hr. ISO classification terms this rainfall rate as "Heavy."





### **ROOFLOGIC SYSTEMS COMPARISON**



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- 2) RL Vapour Control Layer
- 3) RL Acoustic Board
- 4) RL PIR Board (80mm)
- 5) RL TopDeck T (Trapezoidal metal roofing profile)

#### 38 Sound Transmission Loss (STC) Rain Noise (LIAM norm) 40mm/hr 56.4

1) RL Base Deck 2) RL Vapour Control Layer 3) RL PIR Board (80mm) 4) RL Roof Board HD 5) Derbigum HP Basesheet 6) Derbigum FR Capsheet

39 Sound Transmission Loss (STC) Rain Noise (LIAM norm) 40mm/hr 47.6

- 2) RL Vapour Control Layer
- 3) RL PIR Board (80mm)
- 4) RL Roof Board HD
- 5) RL Fibertite Membrane (KEE membrane)

36 Sound Transmission Loss (STC) Rain Noise (LIAM norm) 40mm/hr 51.7

- 2) RL Vapour Control Layer
- 3) RL Roof Board HD
- 4) RL PIR Board (80mm)
- 5) RL Roof Board HD (Additional layer)
- 6) RL Fibertite Membrane (Kee Membrane)

39 Sound Transmission Loss (STC) Rain Noise (LIAM norm) 40mm/hr 46.8

## **ROOFLOGIC SYSTEMS COMPARISON**

Metal Skin Roof Systems	Sound Transmission Loss (STC)	Rain Noise Liam norm 40mm/hr
Long-run Steel (0.55mm) typical profile	15 – 20	70 - 75
Insulated Metal Roof Panel (PIR core)	22 – 25	76 - 78
RoofLogic UltraTherm MSR (with standard trapezoidal metal skin top)	38	56.4

Membrane Roof Systems	Sound Transmission Loss (STC)	Rain Noise Liam norm 40mm/hr
Roofing Membrane over 17mm Plywood (two layer bitumen membrane on ply/rafters with Fibreglass bolts between rafters)	34	56
RoofLogic UltraTherm Xtreme (two layer modified bitumen system)	39	47.6
RoofLogic UltraTherm Xtreme (single layer FiberTite KEE membrane)	36	51.7
RoofLogic UltraTherm Xtreme (single layer FiberTite KEE membrane WITH ADDITIONAL LAYER OF RL ROOF BOARD HD)	39	46.8



# **APPENDIX 1**



- Layer 1: 1 x MULTIRIB Reverse Run 0.75mm steel roofing (7.47kg/m<sup>2</sup>) fixed with 12-14x20mm class 4 Steeltek screws Layer 2: 1 x 2mm thick self adhered VEDAG TurboRoof-TURBO TU Vapour Barrier
- Layer 3: 2 x 40mm *Rooflogic RL Energy 3 PIR* (Polyisocyanurate) Layer 4: 1 x 10mm *USG SECUROCK Gypsum-Fiber Roof Board* fixed with 150mm Trufast No.14 HD drill point fastners Layer 5: 1 x 2.5mm thick *Dop nr: P310A-DEBRICOAT HP 2.5 (2.35kg/m<sup>2</sup>)* flame bonded directly to the USG SECUROCK

Layer 6: 1 x 4mm thick DoP nr: P201A-DEBRICOLOR 4 FR (5.5kg/m<sup>2</sup>) flame bonded directly to the P310A-DEBRICOAT







## **APPENDIX 1 (CONT)**



T1510-3



## APPENDIX 2



Installation of Base Deck



Underside of Base Deck installed to steel purlins @ 1600c



Installation of RL PIR and RL Roof Board HD over base deck



Installation of RL Top Deck



Installation of 2 layer bitumen membrane over Roof Board 04 475 7663 TECHNICAL@ROOFLOGIC.CO.NZ WWW.ROOFLOGIC.CO.NZ



Rainfall Testing on completed membrane roof assembly

